Form CCR 1	Illinois Environmental Protection Agency CCR Residual Surface Impoundment Permit Application CCR Form 1 – General Provisions

Bureau of Water ID Number: **CCR Permit Number:** **Facility Name:** Will County Generating Station	For IEPA Use Only

SECTION 1: FACILITY, OPERATOR, AND OWNER INFORMATION (35 IAC 845.210(b))

Facility, Operator, and Owner Information

1.1	Facility Name		
	Will County Generating Station		
1.2	Illinois EPA CCR Permit Number (if applicable)		
	Initial Permit		
1.3	Facility Contact Information		
	Name (first and last) DeAndre Cooley	Title Environmental Specialist	Phone Number 779-279-2321
	Email address DeAndre.Cooley@NRG.com		
1.4	Facility Mailing Address		
	Street or P.O. box 529 E. Romeo Road		
	City or town Romeoville	State Illinois	Zip Code 60446
1.5	Facility Location		
	Street, route number, or other specific identifier 529 E. Romeo Road		
	County name Will	County code (if known)	
	City or town Romeoville	State Illinois	Zip Code 60446
1.6	Name of Owner/Operator		
	Midwest Generation, LLC		

Facility, Operator, and Owner Info

1.7 Owner/Operator Contact Information

Name (first and last)	Title	Phone Number
Phillip Raush	Plant Manager	815-372-4512

Email address

phillip.raush@nrg.com

1.8 Owner/Operator Mailing Address

Street or P.O. box

804 Carnegie Center

City or town	State	Zip Code
Princeton	New Jersey	08540

SECTION 2: LEGAL DESCRIPTION (35 IAC 845.210(c))

Legal Description

2.1 Legal Description of the facility boundary

ALL THT PRT OF THE SE1/4 OF SEC 19, T35N-R10E., LYING S'LY OF THE CENTERLINE OF CHANNAHON RD; NW'LY OF A LINE DESCRIBED AS COMM AT THE SW COR OF THE SE1/4 OF SD SEC 19; THC RUNNING E ON THE S LN OF SD SEC 1629 FT; THC N 41 DEG 22' E, 249.3 FT; THC N 47 DEG 46' E, 587.6 FT; THC N 53 DEG 5' 30" E, 371.1 FT; THC N 64 DEG 28' 30" E, 545.9 FT TO A PT ON THE E LN OF SD SEC 19, WHICH IS 709.6 FT S OF THE CENTERLINE OF THE PUBLIC HIGHWAY KNOWN AS CHANNAHON RD. (EX THT PRT TAKEN BY THE STATE OF ILLINOIS BY DOC# R66-013615) & (EX THEREFROM THE FOLLOWING DESCRIBED PARCEL TO WIT: THT PRT OF THE SE1/4 OF SEC 19, T35N-R10E, DAF: COMM AT A PT ON THE S LN OF SD SEC 19, BEING A CONCRETE MONUMENT 1963.03 FT (RECORD) EAST (AS MEASURED ALG THE SOUTH LN OF SD SEC 19) OF THE SW COR OF SD SEC 19 SD MONUMENT BEING ON THE BOUNDARY LN PER THE BOUNDARY LN AGREEMENT RECORDED MARCH 21, 1951 AS DOC # 688037 BETWEEN CATERPILLAR TRACTOR CO. & PUBLIC SERVICE CO. OF NORTHERN ILLINOIS; THC N 01 DEG 48' 09" W ALG THE SD BOUNDARY LN 594.54 FT; THC N 73 DEG 47' 26" E ALG THE S ROW OF RTE 6 (FORMERLY KNOWN AS CHANNAHON RD) AS HERETOFORE CONVEYED TO THE STATE OF ILLINOIS PER QUIT CLAIM AUGUST 19, 1968 AS DOC# R68-13815, A DIST OF 870.57 FT TO A PT OF CURVATURE; THC E'LY ALG THE ARC OF CURVE CONCAVE TO THE NORTH, BEING THE S ROW LN OF SD RTE 6, HAVING A RADIUS OF 38,307.20 FT, HAVING A CHORD BEARING OF N 73 DEG 38' 36" E, 196.99 FT FOR A POB; THC CONT E'LY ALG THE ARC OF A CURVE CONCAVE TO THE N, BEING THE SD S'LY ROW LN OF RTE 6, HAVING A RADIUS OF 38,307.20 FT, HAVING A CHORD BEARING OF N 72 DEG 43' 48" E, 1024.21 FT; THC S 37 DEG 17' 59" E, 391.37 FT; THC S 42 DEG 57' 20" W, 785.70 FT; THC N 55 DEG 05' 38" W, 553.84 FT; THC N 40 DEG 21' 51" W, 348.30 FT TO THE POB. NEW PARCEL ASSESSMENT DESCRIPTION NDA:

SECTION 3: PUBLICLY ACCESSIBLE INTERNET SITE REQUIREMENTS (35 IAC 845.810)

Internet Site

3.1 Web Address(es) to publicly accessible internet site(s) (CCR website)

https://midwestgenerationllc.com/illinois-ccr-rule-compliance-data-and-information/

3.2 Is/are the website(s) titled "Illinois CCR Rule Compliance Data and Information"

Yes No

SECTION 4: IMPOUNDMENT IDENTIFICATION

Impoundment Identification

4.1 List all the Impoundment Identification numbers for your facility and check the corresponding box to indicate that you have attached a written description for each impoundment.

Impoundment ID		
W1978100011-03	☑	Attached written description
W1978100011-04	☑	Attached written description
	☐	Attached written description
	☐	Attached written description
	☐	Attached written description
	☐	Attached written description
	☐	Attached written description

	☐	Attached written description
	☐	Attached written description
	☐	Attached written description

SECTION 5: CHECKLIST AND CERTIFICATION STATEMENT

Checklist and Certification Statement

5.1 In Colum 1 below, mark the sections of Form 1 that you have completed and are submitting with your application. For each section, specify in Column 2 any attachments that you are enclosing.

Column 1		**Column 2**	
Section 1: Facility, Operator, and Owner Information	☑	w/attachments	☑
Section 2: Legal Description	☑	w/attachments	☐
Section 3: Publicly Accessible Internet Site Requirement	☑	w/attachments	☐
Section 4: Impoundment Identification	☑	w/attachments	☑

5.2 **Certification Statement**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name (print or type first and last name) of Owner/Operator	Official Title
Phillip Raush	Plant Manager
Signature PJ Raush	Date Signed 10/29/21

Form CCR 2E	**Illinois Environmental Protection Agency** **CCR Residual Surface Impoundment Permit Application** **Form CCR 2E – Initial Operating Permit for Existing or Inactive CCR Surface Impoundments that have not completed an Agency approved closure before July 30, 2021**

Bureau of Water ID Number: **CCR Permit Number:** **Facility Name:**	For IEPA Use Only

SECTION 1: CONSTRUCTION HISTORY (35 IAC 845.220 AND 35 IAC 845.230)

Construction History

1.1	CCR Surface Impoundment Name
	Pond 2S
1.2	Identification number of the CCR surface impoundment (if one has been assigned by the Agency)
	W1978100011-03
1.3	Description of the boundaries of the CCR surface impoundment (35 IAC 845.210 (c))
	THAT PRT OF THE W1/2 OF SEC 2, W'LY OF THE W'LY TOP VERTICAL FACE OF THE MAIN CHANNEL OF THE SANITARY DISTRICT OF CHICAGO AS SD FACE EXISTED ON SEPTEMBER 20, 1937 & OF SEC 3, EAST & WEST OF THE DES PLAINES RIVER, T36N-R10E. DAF: BEG AT THE NW COR OF SD SEC 2, WHICH IS ALSO THE NE COR OF SD SEC 3, EAST OF THE RIVER & RUNNING THC SOUTHWARD ALG THE W LN OF SD SEC 2, A DIST OF 1,361.19 FT TO THE NW COR OF GOVERNMENT LOT 1 OF THE NW1/4 OF SD SEC 2; THC WESTWARD ALG A LN PARL TO THE N LN OF THE S1/2 OF SD SEC 3, EAST OF SD RIVER (WHICH PARL LN IS SOMETIMES KNOWN AS THE N LN OF THE S1/2 OF THE NE1/4 OF SD SEC 3, EAST OF SD RIVER), A DIST OF 510 FT, MORE OR LESS, TO THE CENTER THREAD OF SD DES PLAINES RIVER; THC SOUTHWARDLY ALG SD CENTER THREAD OF SD RIVER, A DIST OF 1,570 FT MORE OR LESS TO THE N LN OF THE S1/2 OF SD SEC 3, WEST OF THE RIVER; THC WESTWARD ALG SD N LN OF THE S1/2 OF SD SEC 3 WEST OF SD RIVER, A DIST OF 1170 FT MORE OR LESS, TO THE E LN OF THE RIGHT OF WAY OF THE PUBLIC SERVICE COMPANY OF NORTHERN ILLINOIS (WHICH EAST RIGHT OF WAY LN IS THE E LN OF THE W 600 FT OF THE E1/2 OF SD SEC 3, WEST OF SD RIVER); THC SOUTHWARD ALG SD E RIGHT OF WAY LN, A DIST OF 1320.19 FT TO THE S LN OF THE N1/2 OF SD S1/2 OF SEC 3 WEST OF SD RIVER; THC EASTWARD ALG SD S LN OF SD N1/2 OF THE S1/2 OF SEC 3, WEST OF SD RIVER & ALG AN EASTWARD EXTENSION OF SD S LN, A DIST OF 3,088.55 FT TO AN INTERSECTION WITH THE W'LY TOP VERTICAL FACE OF SD MAIN CHANNEL SD INTERSECTION BEING 46.65 FT S'LY (MEASURED ALG SD W'LY TOP VERTICAL FACE) FROM THE PT OF INTERSECTION OF SD W'LY TOP VERTICAL FACE WITH THE S LN OF THE N1/2 OF THE SW1/4 OF SD SEC 2; THC NORTHWARDLY ALG SD W'LY TOP VERTICAL FACE, A DIST OF 4,081.54 FT TO THE N LN OF THE NW1/4 OF SD SEC 2 & THC WESTWARD ALG SD N LN OF SD NW1/4, A DIST OF 1,523.17 FT TO THE POB.& (EX THEREFROM THT PRT CONVEYED TO THE VILLAGE OF ROMEOVILLE BY QUIT DEED BY DOC# R96-052181 WHICH IS PRT OF 135TH ST), ALSO (EX THEREFROM THT PRT DAF:THT PRT OF THE W1/2 OF SEC 2, T36N-R10E. DAF: COMM AT THE SW COR OF THE NW1/4 OF SD SEC 2; THC N 01 DEG 32' 18" W ALG THE W LN OF SD NW1/4, A DIST OF 835.90 FT; THC N 88 DEG 27' 42" E PERPENDICULAR TO THE LAST DESCRIBED LN 233.92 FT FOR THE POB; THC E'LY ALG A NONTANGENTIAL CURVE CONCAVE TO THE S, HAVING A RADIUS OF 403.61 FT, HAVING A CHORD BEARING OF S 89 DEG 37' 10" E, 351.51 FT; THC S 04 DEG 35' 24' W, 526.78 FT; THC S 85 DEG 24' 36" E PERPENDICULAR TO THE LAST DESCRIBED LN, 4.60 FT; THC S 04 DEG 35' 24" W PERPENDICULAR TO THE LAST DESCRIBED LN 255.46 FT; THC S 75 DEG 18' 03" E, 8.98 FT; THC S 04 DEG 35' 24" W 83.52 FT; THC N 85 DEG 24' 36' W PERPENDICULAR TO THE LAST DESCRIBED LN 31.11 FT; THC S 04 DEG 35' 24" W PERPENDICULAR TO THE LAST DESCRIBED LN 185.38 FT; THC N 85 DEG 24' 36" W PERPENDICULAR TO THE LAST DESCRIBED LN 321.92 FT; THC N 04 DEG 35' 24" E PERPENDICULAR TO THE LAST DESCRIBED LN 1027.72 FT TO THE POB.) & ALSO (EX THT PRT OF THE S1/2 OF SEC 2 & THT PRT OF THE S1/2 OF SEC 3, EAST & WEST OF THE DES PLAINES RIVER, T36N-R10E. DAF: BEG AT THE PT OF INTERSECTION OF THE S LN OF THE N1/2 OF THE S1/2 OF SEC 3, WEST OF THE DES PLAINES RIVER, WITH A LN 600 FT E OF & PARL WITH THE N & S CENTER LN OF SD SEC 3; THC N 01 DEG 58' 48" W ALG SD LN 600 FT E OF & PARL WITH THE N & S CENTER LN OF SEC 3, A DIST OF 90 FT; THC N 88 DEG 00' 10" E, ALG A LN 90 FT N OF & PARL WITH SD S LN OF THE N1/2 OF THE S1/2 OF SEC 3, WEST OF THE DES PLAINES RIVER, 1,733.87 FT; THC N 48 DEG 19' 07" E, 53.12 FT TO A PT OF CURVATURE; THC N'LY ALG THE ARC OF A CURVE CONCAVE TO THE NW, HAVING A RADIUS OF 245 FT, HAVING A CHORD BEARING OF N 26 DEG 24' 32" E, 187.38 FT TO A PT ON TANGENCY; THC N 04 DEG 29' 56" E, 1,100.29 FT; THC N 88 DEG 48' 20" E, ALG THE N LN OF THE S1/2 OF SD SEC 3, EAST OF THE DES PLAINES RIVER, 25.67 FT TO THE NW COR OF THE SW1/4 OF SEC 2; THC N 88 DEG 48' 25" E ALG THE N LN OF SD SW1/4 OF SEC 2, A DIST OF 144.08 FT; THC S 04
1.4	State the purpose for which the CCR surface impoundment is being used.
	Used as a settling pond for sluiced CCR and other process waters associated with the electrical power generating process.
1.5	How long has the CCR surface impoundment been in operation?
	44 years
1.6	List the types of CCR that have been placed in the CCR surface impoundment.
	Bottom ash and economizer ash

Construction History (Continued)	1.7	List name of the watershed within which the CCR surface impoundment is located.	
		Des Plaines River watershed	
	1.8	Size in acres of the watershed within which the CCR surface impoundment is located.	
		28,808 acres	
	1.9	Check the corresponding box to indicate that you have attached the following:	
		☑	Description of the physical and engineering properties of the foundation and abutment materials on which the CCR surface impoundment is constructed.
		☑	Description of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR surface impoundment.
		☑	Describe the method of site preparation and construction of each zone of the CCR surface impoundment.
		☑	A listing of the approximate dates of construction of each successive stage of construction of the CCR surface impoundment.
		☑	Drawing satisfying the requirements of 35 IAC 845.220(a)(1)(F).
		☑	Description of the type, purpose, and location of existing instrumentation.
		☑	Area Capacity Curves for the CCR Impoundment.
		☑	Description of each spillway and diversion design features and capacities and provide the calculations used in their determination.
		☑	Construction specifications and provisions for surveillance, maintenance, and repair of the CCR surface impoundment.
	1.10.1	Is there record(s) or knowledge of structural instability of the CCR surface impoundment?	
		☐ Yes ☑ No	
	1.10.2	If you answered yes to Item 1.10.1, provide detailed explanation of the structural instability.	

SECTION 2: ANALYSIS OF CHEMICAL CONSTITUENTS (35 IAC 845(d)(2))

Constituents	2.1	Check the corresponding boxes to indicate you have attached the following:	
		☑	An analysis of the chemical constituents found within the CCR to be placed in the CCR surface impoundment.
		☑	An analysis of the chemical constituents of all waste streams, chemical additives and sorbent materials entering or contained in the CCR surface impoundment.

SECTION 3: DEMONSTRATIONS AND CERTIFICATIONS (35 IAC 845(d)(2)(D)

Demonstrations

3.1 Indicate whether you have attached a demonstration that the CCR surface impoundment, as built, meets or an explanation of how the CCR surface impoundments fails to meet, the location standards in the following sections

Section 845.300 (Placement Above the Uppermost Aquifer)	☐	Demonstration	☑	Explanation
Section 845.310 (Wetlands)	☑	Demonstration	☐	Explanation
Section 845.320 (Fault Areas)	☑	Demonstration	☐	Explanation
Section 845.330 (Seismic Impact Zones)	☑	Demonstration	☐	Explanation
Section 845.340 (Unstable Areas and Floodplains)	☑	Demonstration	☐	Explanation

SECTION 4: ATTACHMENTS

Attachments

4.1 Check the corresponding boxes to indicate that you have attached the following:

☑	Evidence that the permanent markers required by Section 845.130 have been installed.
☑	Documentation that the CCR surface impoundment, if not incised, will be operated and maintained with one of the forms of slope protection specified in Section 845.430.
☑	Initial Emergency Action Plan and accompanying certification required by Section 845.520(e).
☑	Fugitive Dust Control Plan and accompanying certification required by Section 845.500(b)(7).
☑	Preliminary written closure plan as specified in Section 845.720(a).
☑	Initial written post-closure care plan as specified in Section 845.780(d), if applicable.
☑	A certification as specified in Section 845.400(h), or a statement that the CCR surface impoundment does not have a liner than meets the requirements of Section 845.400(b) as specified in Section 845.400(c).
☑	History of known exceedances of the groundwater protection standards in Section 845.600, and any corrective action taken to remediate the groundwater.
☑	Safety and health plan, as required by Section 845.530.
☑	For CCR surface impoundments required to close under 845.700, the proposed closure priority categorization required by Section 845.700(g).

SECTION 5: GROUNDWATER MONITORING

Groundwater Monitoring

5.1 Check the corresponding boxes to Indicate you have attached the following groundwater monitoring information:

☑	A hydrogeologic site characterization meeting the requirements of Section 845.620
☑	Design and construction plans of a groundwater monitoring system meeting the requirements of Section 845.630
☑	A groundwater sampling and analysis program that includes section of the statistical procedures to be used for evaluating groundwater monitoring data, required by Section 845.640

		☑	Proposed groundwater monitoring program that includes a minimum of eight independent samples for each background and downgradient well, required by Section 845.650(b)
SECTION 6: CERTIFICATIONS			
Certifications	6.1	Check the corresponding boxes to indicate you have attached the following certifications:	
		☑	A certification that the owner or operator meets the financial assurance requirements of Subpart I, as required by 845.230(d)(2)(N).
		☑	Hazard potential classification assessment and accompanying certifications required by Section 845.440(a)(2).
		☑	Structural stability assessment and accompanying certification, required by Section 845.450(c).
		☑	Safety factor assessment and accompanying certification, as required by Section 845.460(b).
		☑	Inflow design flood control system plan and accompanying certification, as required by Section 845.510(c)(3).

Form CCR 2E	Illinois Environmental Protection Agency CCR Residual Surface Impoundment Permit Application Form CCR 2E – Initial Operating Permit for Existing or Inactive CCR Surface Impoundments that have not completed an Agency approved closure before July 30, 2021

Bureau of Water ID Number: **CCR Permit Number:** **Facility Name:**	For IEPA Use Only

SECTION 1: CONSTRUCTION HISTORY (35 IAC 845.220 AND 35 IAC 845.230)

Construction History

1.1	CCR Surface Impoundment Name
	Pond 3S
1.2	Identification number of the CCR surface impoundment (if one has been assigned by the Agency)
	W1978100011-04
1.3	Description of the boundaries of the CCR surface impoundment (35 IAC 845.210 (c))
	THAT PRT OF THE W1/2 OF SEC 2, W'LY OF THE W'LY TOP VERTICAL FACE OF THE MAIN CHANNEL OF THE SANITARY DISTRICT OF CHICAGO AS SD FACE EXISTED ON SEPTEMBER 20, 1937 & OF SEC 3, EAST & WEST OF THE DES PLAINES RIVER, T36N-R10E. DAF: BEG AT THE NW COR OF SD SEC 2, WHICH IS ALSO THE NE COR OF SD SEC 3, EAST OF THE RIVER & RUNNING THC SOUTHWARD ALG THE W LN OF SD SEC 2, A DIST OF 1,361.19 FT TO THE NW COR OF GOVERNMENT LOT 1 OF THE NW1/4 OF SD SEC 2; THC WESTWARD ALG A LN PARL TO THE N LN OF THE S1/2 OF SD SEC 3, EAST OF SD RIVER (WHICH PARL LN IS SOMETIMES KNOWN AS THE N LN OF THE S1/2 OF THE NE1/4 OF SD SEC 3, EAST OF SD RIVER), A DIST OF 510 FT, MORE OR LESS, TO THE CENTER THREAD OF SD DES PLAINES RIVER; THC SOUTHWARDLY ALG SD CENTER THREAD OF SD RIVER, A DIST OF 1,570 FT MORE OR LESS TO THE N LN OF THE S1/2 OF SD SEC 3, WEST OF THE RIVER; THC WESTWARD ALG SD N LN OF THE S1/2 OF SD SEC 3 WEST OF SD RIVER, A DIST OF 1170 FT MORE OR LESS, TO THE E LN OF THE RIGHT OF WAY OF THE PUBLIC SERVICE COMPANY OF NORTHERN ILLINOIS (WHICH EAST RIGHT OF WAY LN IS THE E LN OF THE W 600 FT OF THE E1/2 OF SD SEC 3, WEST OF SD RIVER); THC SOUTHWARD ALG SD E RIGHT OF WAY LN, A DIST OF 1320.19 FT TO THE S LN OF THE N1/2 OF SD S1/2 OF SEC 3 WEST OF SD RIVER; THC EASTWARD ALG SD S LN OF SD N1/2 OF THE S1/2 OF SEC 3, WEST OF SD RIVER & ALG AN EASTWARD EXTENSION OF SD S LN, A DIST OF 3,088.55 FT TO AN INTERSECTION WITH THE W'LY TOP VERTICAL FACE OF SD MAIN CHANNEL SD INTERSECTION BEING 46.65 FT S'LY (MEASURED ALG SD W'LY TOP VERTICAL FACE) FROM THE PT OF INTERSECTION OF SD W'LY TOP VERTICAL FACE WITH THE S LN OF THE N1/2 OF THE SW1/4 OF SD SEC 2; THC NORTHWARDLY ALG SD W'LY TOP VERTICAL FACE, A DIST OF 4,081.54 FT TO THE N LN OF THE NW1/4 OF SD SEC 2 & THC WESTWARD ALG SD N LN OF SD NW1/4, A DIST OF 1,523.17 FT TO THE POB.& (EX THEREFROM THT PRT CONVEYED TO THE VILLAGE OF ROMEOVILLE BY QUIT DEED BY DOC# R96-052181 WHICH IS PRT OF 135TH ST), ALSO (EX THEREFROM THT PRT DAF:THT PRT OF THE W1/2 OF SEC 2, T36N-R10E. DAF: COMM AT THE SW COR OF THE NW1/4 OF SD SEC 2; THC N 01 DEG 32' 18" W ALG THE W LN OF SD NW1/4, A DIST OF 835.90 FT; THC N 88 DEG 27' 42" E PERPENDICULAR TO THE LAST DESCRIBED LN 233.92 FT FOR THE POB; THC E'LY ALG A NONTANGENTIAL CURVE CONCAVE TO THE S, HAVING A RADIUS OF 403.61 FT, HAVING A CHORD BEARING OF S 89 DEG 37' 10" E, 351.51 FT; THC S 04 DEG 35' 24' W, 526.78 FT; THC S 85 DEG 24' 36" E PERPENDICULAR TO THE LAST DESCRIBED LN, 4.80 FT; THC S 04 DEG 35' 24" W PERPENDICULAR TO THE LAST DESCRIBED LN 255.46 FT; THC S 75 DEG 18' 03" E, 8.98 FT; THC S 04 DEG 35' 24" W 83.52 FT; THC N 85 DEG 24' 36' W PERPENDICULAR TO THE LAST DESCRIBED LN 31.11 FT; THC S 04 DEG 35' 24" W PERPENDICULAR TO THE LAST DESCRIBED LN 185.38 FT; THC N 85 DEG 24' 36" W PERPENDICULAR TO THE LAST DESCRIBED LN 321.92 FT; THC N 04 DEG 35' 24" E PERPENDICULAR TO THE LAST DESCRIBED LN 1027.72 FT TO THE POB.) & ALSO (EX THT PRT OF THE S1/2 OF SEC 2 & THT PRT OF THE S1/2 OF SEC 3, EAST & WEST OF THE DES PLAINES RIVER, T36N-R10E. DAF: BEG AT THE PT OF INTERSECTION OF THE S LN OF THE N1/2 OF THE S1/2 OF SEC 3, WEST OF THE DES PLAINES RIVER, WITH A LN 600 FT E OF & PARL WITH THE N & S CENTER LN OF SD SEC 3; THC N 01 DEG 56' 48" W ALG SD LN 600 FT E OF & PARL WITH THE N & S CENTER LN OF SEC 3, A DIST OF 90 FT; THC N 88 DEG 00' 10" E, ALG A LN 90 FT N OF & PARL WITH SD S LN OF THE N1/2 OF THE S1/2 OF SEC 3, WEST OF THE DES PLAINES RIVER, 1,733.87 FT; THC N 48 DEG 19' 07' E, 53.12 FT TO A PT OF CURVATURE; THC N'LY ALG THE ARC OF A CURVE CONCAVE TO THE NW, HAVING A RADIUS OF 245 FT, HAVING A CHORD BEARING OF N 26 DEG 24' 32" E, 187.38 FT TO A PT ON TANGENCY; THC N 04 DEG 29' 56" E, 1,100.29 FT; THC N 88 DEG 48' 20" E, ALG THE N LN OF THE S1/2 OF SD SEC 3, EAST OF THE DES PLAINES RIVER, 25.67 FT TO THE NW COR OF THE SW1/4 OF SEC 2; THC N 88 DEG 48' 25" E ALG THE N LN OF SD SW1/4 OF SEC 2, A DIST OF 144.08 FT; THC S 04
1.4	State the purpose for which the CCR surface impoundment is being used.
	Has been taken out of service.
1.5	How long has the CCR surface impoundment been in operation?
	44 years
1.6	List the types of CCR that have been placed in the CCR surface impoundment.
	Bottom ash and economizer ash

Construction History (Continued)	1.7	List name of the watershed within which the CCR surface impoundment is located.
		Des Plaines River watershed
	1.8	Size in acres of the watershed within which the CCR surface impoundment is located.
		28,808 acres
	1.9	Check the corresponding box to indicate that you have attached the following:
		☑ Description of the physical and engineering properties of the foundation and abutment materials on which the CCR surface impoundment is constructed.
		☑ Description of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR surface impoundment.
		☑ Describe the method of site preparation and construction of each zone of the CCR surface impoundment.
		☑ A listing of the approximate dates of construction of each successive stage of construction of the CCR surface impoundment.
		☑ Drawing satisfying the requirements of 35 IAC 845.220(a)(1)(F).
		☑ Description of the type, purpose, and location of existing instrumentation.
		☑ Area Capacity Curves for the CCR Impoundment.
		☑ Description of each spillway and diversion design features and capacities and provide the calculations used in their determination.
		☑ Construction specifications and provisions for surveillance, maintenance, and repair of the CCR surface impoundment.
	1.10.1	Is there record(s) or knowledge of structural instability of the CCR surface impoundment?
		☐ Yes ☑ No
	1.10.2	If you answered yes to Item 1.10.1, provide detailed explanation of the structural instability.

SECTION 2: ANALYSIS OF CHEMICAL CONSTITUENTS (35 IAC 845(d)(2))

Constituents	2.1	Check the corresponding boxes to indicate you have attached the following:
		☑ An analysis of the chemical constituents found within the CCR to be placed in the CCR surface impoundment.
		☑ An analysis of the chemical constituents of all waste streams, chemical additives and sorbent materials entering or contained in the CCR surface impoundment.

SECTION 3: DEMONSTRATIONS AND CERTIFICATIONS (35 IAC 845(d)(2)(D)

Demonstrations

3.1 Indicate whether you have attached a demonstration that the CCR surface impoundment, as built, meets or an explanation of how the CCR surface impoundments fails to meet, the location standards in the following sections

Section				
Section 845.300 (Placement Above the Uppermost Aquifer)	☐	Demonstration	☑	Explanation
Section 845.310 (Wetlands)	☑	Demonstration	☐	Explanation
Section 845.320 (Fault Areas)	☑	Demonstration	☐	Explanation
Section 845.330 (Seismic Impact Zones)	☑	Demonstration	☐	Explanation
Section 845.340 (Unstable Areas and Floodplains)	☑	Demonstration	☐	Explanation

SECTION 4: ATTACHMENTS

Attachments

4.1 Check the corresponding boxes to indicate that you have attached the following:

- ☑ Evidence that the permanent markers required by Section 845.130 have been installed.
- ☑ Documentation that the CCR surface impoundment, if not incised, will be operated and maintained with one of the forms of slope protection specified in Section 845.430.
- ☑ Initial Emergency Action Plan and accompanying certification required by Section 845.520(e).
- ☑ Fugitive Dust Control Plan and accompanying certification required by Section 845.500(b)(7).
- ☑ Preliminary written closure plan as specified in Section 845.720(a).
- ☑ Initial written post-closure care plan as specified in Section 845.780(d), if applicable.
- ☑ A certification as specified in Section 845.400(h), or a statement that the CCR surface impoundment does not have a liner than meets the requirements of Section 845.400(b) as specified in Section 845.400(c).
- ☑ History of known exceedances of the groundwater protection standards in Section 845.600, and any corrective action taken to remediate the groundwater.
- ☑ Safety and health plan, as required by Section 845.530.
- ☑ For CCR surface impoundments required to close under 845.700, the proposed closure priority categorization required by Section 845.700(g).

SECTION 5: GROUNDWATER MONITORING

Groundwater Monitoring

5.1 Check the corresponding boxes to Indicate you have attached the following groundwater monitoring information:

- ☑ A hydrogeologic site characterization meeting the requirements of Section 845.620
- ☑ Design and construction plans of a groundwater monitoring system meeting the requirements of Section 845.630
- ☑ A groundwater sampling and analysis program that includes section of the statistical procedures to be used for evaluating groundwater monitoring data, required by Section 845.640

		☑	Proposed groundwater monitoring program that includes a minimum of eight independent samples for each background and downgradient well, required by Section 845.650(b)
SECTION 6: CERTIFICATIONS			
Certifications	6.1	Check the corresponding boxes to indicate you have attached the following certifications:	
		☑	A certification that the owner or operator meets the financial assurance requirements of Subpart I, as required by 845.230(d)(2)(N).
		☑	Hazard potential classification assessment and accompanying certifications required by Section 845.440(a)(2).
		☑	Structural stability assessment and accompanying certification, required by Section 845.450(c).
		☑	Safety factor assessment and accompanying certification, as required by Section 845.460(b).
		☑	Inflow design flood control system plan and accompanying certification, as required by Section 845.510(c)(3).

KPRG

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

APPLICATION FOR INITIAL OPERATING PERMIT – POND 2S & POND 3S

WILL COUNTY GENERATING STATION
MIDWEST GENERATION, LLC
ROMEOVILLE, ILLINOIS

Illinois EPA Site No. W1978100011

October 29, 2021

Submitted To:

Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, Illinois 62702

Prepared For:

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ATTACHMENTS

Introduction

Midwest Generation, LLC (Midwest Generation) currently operates the coal-fired steam electric generating station, referred to as Will County Station, located in Romeoville, Illinois ("site" or "generating station"). As part of the coal-fired operations and managing the coal combustion residuals (CCR), the station operates two active surface impoundments (Pond 2S and Pond 3S) and previously operated two now inactive surface impoundments (Pond 1N and Pond 1S). Pond 2S and Pond 3S are used as settling ponds to remove CCR from the stations process water that is sluiced into each pond and are the subject of the Operating Permit submittal. Pond 3S has recently been taken out of service. Ponds 1N and 1S were taken out of service in 2010 with the CCR remaining in place. In 2013, the water in Ponds 1N and 1S was drained, and both ponds were reconfigured so that they could not accumulate liquids. On September 9, 2021, the Illinois Pollution Control Board granted Midwest Generation a variance from certain deadlines in the Ill. Adm. Code Title 35, Part 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (State CCR Rule), including the deadline to submit an operating permit application. *Midwest Generation LLC (Will County Generating Station) v. Illinois EPA*, PCB21-108, Sept. 9, 2021. Accordingly, separate Operating Permit submittal will be submitted for Ponds 1N and 1S pursuant to the variance deadline.

Midwest Generation does not need to use both Pond 2S and Pond 3S simultaneously to manage CCR but will need to continue to use one of the surface impoundments to continue operating the generating station. Midwest Generation has ceased sending CCR and non-CCR materials to Pond 3S, but an alternative disposal capacity evaluation determined that no on-site or off-site disposal options were available for Pond 2S and it was technically infeasible to obtain alternative disposal capacity for the CCR either on-site or off-site by April 11, 2021. Because of this, Midwest Generation prepared and submitted a Demonstration for a Site-Specific Alternative Deadline to Initiate Closure ("Alternate Closure Demonstration" or "ACD") to the U.S. EPA on November 30, 2020 that proposes alternative disposal capacity to eventually replace Pond 2S.

The objective of this submittal is to apply for the initial operating permit (Permit) for Pond 2S and Pond 3S at the Will County Generating Station to continue operating both ponds in compliance with the State CCR Rule. The information required for an initial operating permit application for existing surface impoundments as specified under 35 Ill. Adm. Code 845.230(d) of the State CCR Rule is provided in the following sections.

The Permit is organized with supporting Tables and Figures that are referenced in the discussions being provided at the end of the full Permit text with the table numbers and figures tied to the Section number within which they are referenced with sequential numbering (e.g., Tables referenced in Section 9 are numbered 9-1, 9-2, etc. Figures referenced in Section 9 are numbered Figure 9-1, 9-2, etc.). Specific Attachments referenced within each Section are provided in a similar fashion (e.g., Attachment 1 information is tied to Section 1 of the Permit text, Attachment 2 information is tied to Section 2 of the Permit text, etc.). It should be noted that if Section does not reference an Attachment then that Attachment number is not included as part of the permit application. For example, Section 13 does not reference an Attachment; therefore, there is no Attachment 13 in this permit application.

1.0 History of Construction, 845.230(d)(2)(A)

The history of construction of the CCR surface impoundment as specified in Section 845.220(a)(1) is presented below.

1.1 CCR Surface Impoundment Identifying Information

The identifying information associated with the CCR surface impoundments at the generating station are listed in the table below.

Name	Owner/Operator	Impoundment ID Number
Pond 2S	Midwest Generation 804 Carnegie Center Princeton, NJ 08540	W1978100011-03
Pond 3S	Midwest Generation 804 Carnegie Center Princeton, NJ 08540	W1978100011-04

1.2 Purpose of CCR Surface Impoundment

1.2.1 Pond 2S

Pond 2S serves as a settling pond for sluiced CCR and other process water associated with the electrical power generating process occurring at site. The CCR is periodically removed as needed for operational purposes. The operation of Pond 2S was alternated with the operation of Pond 3S.

1.2.2 Pond 3S

Pond 3S formerly served as a settling pond for sluiced CCR and other process water associated with the electrical power generating process occurring at site. During its operation, the CCR was periodically removed as needed for operational purposes. The operation of Pond 3S was alternated with the operation of Pond 2S. Pond 3S has been taken out of service.

1.3 CCR Surface Impoundment Length of Operation

1.3.1 Pond 2S

Pond 2S was constructed circa 1977 and has been operating since. Based on these dates, Pond 2S has been operating for about 44 years.

1.3.2 Pond 3S

Pond 3S was constructed circa 1977 and ceased receiving CCR as of April 11, 2021. Based on these dates, Pond 3S operated for about 44 years. The notification of intent to close Pond 3S was posted on April 9, 2021.

1.4 Type of CCR in Surface Impoundment

The types of CCR in Pond 2S and Pond 3S are bottom ash and economizer ash. The chemical constituents that make up the CCR is discussed in further detail in Section 2. The CCR in Pond 2S and Pond 3S is the same type of CCR because the source of the CCR in each pond is the same electrical generating boilers and the same source of coal. The CCR source is the same because only one pond was used at a time and the CCR in each pond came from the same generating unit, Unit 4.

1.5 Name and Size of the Watershed

Pond 2S and Pond 3S are located within the Des Plaines River watershed, which is approximately 28,808 acres.

1.6 Description of CCR Surface Impoundment Foundation

Pond 2S and Pond 3S consist of partial fill embankments. The crest of the embankments surrounding Pond 2S and Pond 3S are elevated compared to the surrounding topography. A divider berm separates the two ponds and acts as the south embankment for Pond 2S and the north embankment for Pond 3S.

The following sections discuss the foundation materials' physical and engineering properties. KPRG and Associates, Inc. (KPRG) reviewed the available material associated with Pond 2S and Pond 3S from a 2005 KPRG site investigation, along with publicly available information to provide the discussions in the below sections.

1.6.1 Physical Properties of Foundation Materials

The physical properties of the foundation materials in which Pond 2S and Pond 3S were constructed consist of a fill layer with underlying sandy and gravelly units and some clay. KPRG performed a site investigation in 2005 that consisted of performing soil borings adjacent to the four existing CCR surface impoundments. The borings performed to the north and west of Pond 2S and Pond 3S show that the site stratigraphy consists of a 1.5 feet to 2.5 feet thick fill layer at the site surface that contains some ash/slag with little gravel. This surface layer is underlain by a 1-foot thick layer of sand and silt with some gravel north of Pond 2S, which is underlain by 5-feet of lean clay. The surface layer is underlain by a 3-feet thick layer of sand and gravel with clay west of Pond 3S and this layer is then underlain by 5-feet of silty clay. Bedrock was generally encountered at approximately 10 feet below ground surface (bgs) in the area of Pond 2S and Pond 3S.

1.6.2 Engineering Properties of Foundation Materials

The engineering properties for the foundation materials listed in the following table are from the site investigation performed by KPRG in 2005. The properties were determined from previous site investigations.

Material	Unit Weight (PCF)	Drained Friction Angle (Degrees)	Effective Cohesion (PSF)	Undrained Shear Strength (PSF)
Sand and Gravel	109	30	0	--
Silty Clay	120	0	1,000	--
Bedrock	150	35	0	--

The silty clay is underlain by Silurian Dolomite with an average Rock Quality Designation (RQD) of 94.84%. The RQD from the samples collected with the closest proximity to Pond 2S and Pond 3S is 99.45%. The closest proximity samples are approximately 13 to 15 miles from Pond 2S and Pond 3S. These RQDs were obtained from a study performed by the Illinois Geological Survey in 1991 titled "Geotechnical Properties of Selected Pleistocene, Silurian, and Ordovician Deposits of Northeastern Illinois". An RQD greater than 75% is considered good and an RQD greater than 90% is considered excellent. The RQD is a measure that determines the quality of rock and is used as part of the early site evaluation process when determining locations for engineered structures such as power facilities, underground tunnels, and dams. During the early site evaluation process, the RQD is used to determine any potential problems of bearing capacity, settlement, or sliding. The higher the RQD percentage, the more competent the rock and its ability to support structures, resist settlement and prevent sliding.

1.7 Description of the Construction Materials, Methods, and Dates

The descriptions of the construction materials, methods, and dates are based on the construction drawings created by Harza Engineering Company (Harza) dated 1979; the liner replacement drawings dated 2009 and 2013, for Pond 3S and Pond 2S, respectively; and a 2005 site investigation performed by KPRG.

1.7.1 Physical and Engineering Properties of Construction Materials

The Pond 2S and Pond 3S physical properties for the construction materials for this section are the same as the physical properties for the foundation materials. As described in Section 1.6.1, the physical properties for the foundation materials were described as sandy fill material with underlying sandy and gravelly units and some clay.

Based on construction documents available from Harza dated 1979, dikes existed in the area prior to construction of Pond 2S and Pond 3S. During construction, these dikes were raised and widened with compacted fill material. The interior slopes were originally lined with fill material and shot rock, which is similar to rip rap, and the pond base was originally lined with three layers consisting of a 12-inch Poz-O-Pac layer, a 12-inch fill layer, and another 12-inch Poz-O-Pac layer on top of the fill layer. The interior slopes and base were then covered with a bituminous curing coat. In 2013, Pond 2S's original upper Poz-O-Pac layer and fill material in the pond base were removed and replaced with a 60-mil HDPE geomembrane liner on the base and interior slopes for Pond 2S. The lower layer of Poz-O-Pac remained. Pond 2S also has a concrete geocell on the sides of the basin. In 2009, Pond 3S's original upper Poz-O-Pac layer and fill material in the pond base were removed and replaced with a 60-mil HDPE geomembrane liner on the base and interior slopes for Pond 3S. The lower layer of Poz-O-Pac remained. A warning layer was constructed in each pond on top of the HDPE geomembrane liner that consisted of 12 inches of sand-sized material overtopped with 6 inches of crushed stone like material.

Engineering properties used for the design and construction of Pond 2S and Pond 3S were obtained from Station personnel. These properties are provided in the following table. These properties were determined by Civil & Environmental Consultants, Inc. (CEC) using previous site investigation material, published correlations, and their experience with similar materials in the region.

Material	Unit Weight (PCF)	Drained Friction Angle (Degrees)	Effective Cohesion (PSF)	Undrained Shear Strength (PSF)
Fill Material	120	0	300	600
Poz-O-Pac	125	32	0	--

1.7.2 Construction Methods

Based on construction documents available from Harza dated 1979, dikes existed in the area prior to construction of Pond 2S and Pond 3S. During construction, these dikes were raised and widened with fill material. The fill material was placed at the desired height and width and compacted to the extent to prevent erosion. As part of placing the fill material, any unsuitable material identified within the existing foundations was specified to be removed based on the construction drawings.

The side slopes were designed with 3H:1V (horizontal:vertical) interior slopes, with 3H:1V exterior slopes when the outer embankment is the interior slope of the adjacent pond. The exterior embankment of the south slope of Pond 2S was designed with a 2H:1V slope, the exterior embankment of the west slope of Pond 2S and Pond 3S is approximately 3H:1V, and the north embankment of Pond 2S does not have an exterior slope because the crest of the embankment is at the same elevation as the ground level going north.

1.7.3 Construction Dates

Pond 2S and Pond 3S were constructed in 1977. The liner for Pond 2S was replaced in 2013 and the liner for Pond 3S was replaced in 2009.

1.8 Detailed Dimensional Drawings

Construction drawings for Pond 2S and Pond 3S created by Harza dated 1979 are included in Attachment 1-1. The liner replacement drawings for Pond 2S prepared by NRT, dated 2014, are included in Attachment 1-2 and the liner replacement drawings for Pond 3S prepared by NRT, dated 2010, are included in Attachment 1-3.

1.9 Instrumentation

A staff gauge will be installed within Pond 2S and Pond 3S to allow for the determination of water levels with each pond. The staff gauge installation is intended to meet new requirements under Section 845.650(b)(3) to allow water level estimates to be made concurrent with monthly groundwater level measurements. There is no other instrumentation present in Pond 2S or Pond 3S. Because Pond 3S is not in service, wastewater is not directed to it and the water in the pond is either rainfall or runoff.

1.10 Area-Capacity Curve

An area-capacity curve for Pond 2S is provided on Figure 1-1 and an area-capacity curve for Pond 3S is provided on Figure 1-2.

1.11 Spillway and Diversion Capacities and Calculations

The only spillway and/or diversion features are the existing outlet troughs for both Pond 2S and Pond 3S. The original drawing showing the size and shape of the outlet troughs for both Pond 2S and Pond 3S is shown in Attachment 1-1. The outlet troughs consist of rectangular structures that are semi-circular in shape, which matches the shape of the west side of each pond. The water flows over a concrete weir into a trough that is connected to the discharge piping. The outlet structure is gravity drained. The calculations used for the design of the outlet troughs were not available. The drainage capacity for the outlet troughs and discharge pipes for both Pond 2S and Pond 3S have always adequately discharged water from each pond without affecting the functionality of the ponds.

1.12 Surveillance, Maintenance, and Repair Construction Specifications

Written specifications for the original construction of Pond 2S and Pond 3S are not available. The specifications available are from the 2013 liner replacement project for Pond 2S. The specifications for the Pond 2S are included in Attachment 1-4. Written specifications for the liner replacement of Pond 3S are unavailable.

1.13 Record of Structural Instability

There is no record or knowledge of structural instability associated with Pond 2S or Pond 3S. Pond 2S and Pond 3S were inspected by CEC in August 2021. The results of their inspection did not identify signs of structural instability.

2.0 CCR Chemical Constituents Analysis, 845.230(d)(2)(B)

The CCR present in Pond 2S and Pond 3S are bottom ash and economizer ash. The CCR that was sluiced to Pond 2S was sampled and analyzed for the parameters listed in Section 845.600(a) except for total dissolved solids. The results of those analyses are presented in Table 2. The laboratory data package is included in Attachment 2. The CCR present in Pond 2S and Pond 3S is the same, and therefore the sample from Pond 2S is also representative of the ash in Pond 3S.

3.0 Chemical Constituents Analysis of Other Waste Streams, 845.230(d)(2)(C)

According to the Alternate Closure Demonstration, “Will County will not send CCR or non-CCR wastestreams to South Ash Pond 3 [3S] after April 11, 2021 and does not plan on sending any wastestreams to that basin in the interim”. Midwest Generation has submitted a request to the U.S. EPA to continue sending all CCR and non-CCR wastestreams to Pond 2S while they develop alternative capacity to replace this pond. Currently, Pond 2S is receiving the following non-CCR wastestreams:

- Overflow from the Station’s South Area Runoff Basin,
- Overflow from the Unit 4 boiler slag tanks, and

- Sludge recycle from the Station's two clarifiers.

The chemical constituents from the non-CCR wastestreams listed above are anticipated to be total suspended solids (TSS) and oil and grease as based on the sampling requirements in the stations NPDES Permit No. IL0002208. The Will County Flow Diagram is included in Attachment 3.

4.0 Location Standards Demonstration

4.1 Placement Above the Uppermost Aquifer

According to the Location Restrictions Compliance Demonstration performed by Geosyntec in October of 2018, "South Ash Pond 2S and South Ash Pond 3S are not separated from the upper limit of the uppermost aquifer by a minimum of five (5) feet". Therefore, the locations of the Pond 2S and Pond 3S are not in compliance with Section 845.300. This determination is included in Attachment 4. KPRG concurs with this determination.

4.2 Wetlands

According to the Location Restrictions Compliance Demonstration performed by Geosyntec in October of 2018, "South Ash Pond 2S and South Ash Pond 3S are not located in mapped wetlands included in the National Wetlands Inventory-Version 2 presented by the U.S. Fish and Wildlife Service (USFW) [USFW, 2018]". Therefore, the locations of the Pond 2S and Pond 3S are in compliance with Section 845.310. This determination is included in Attachment 4. KPRG concurs with this determination.

4.3 Fault Areas

According to the Location Restrictions Compliance Demonstration performed by Geosyntec in October of 2018, "South Ash Pond 2S and South Ash Pond 3S are not located within 200 feet (60 meters) of a mapped Holocene-aged fault, as mapped by the United States Geological Survey (USGS) Quaternary Fault Database [USGS, 2018]". Therefore, the locations of the Pond 2S and Pond 3S are in compliance with Section 845.320. This determination is included in Attachment 4. KPRG concurs with this determination.

4.4 Seismic Impact Zones

According to the Location Restrictions Compliance Demonstration performed by Geosyntec in October of 2018, "South Ash Pond 2S and South Ash Pond 3S are not located within a seismic impact zone", as defined in Section 845.120, "and as mapped by the United States Geological Survey (USGS) [USGS, 2014]". Therefore, the locations of the Pond 2S and Pond 3S are in compliance with Section 845.330. This determination is included in Attachment 4. KPRG concurs with this determination.

4.5 Unstable Areas

According to the Location Restrictions Compliance Demonstration performed by Geosyntec in October of 2018, "South Ash Pond 2S and South Ash Pond 3S are not located in an unstable area based on a review of subsurface investigations at the site [Patrick, 2011], published liquefaction maps [ISGS, 2008], and a site visit by Geosyntec". Therefore, the locations of the Pond 2S and Pond 3S comply with Section 845.340. This determination is included in Attachment 4. KPRG concurs with this determination.

4.6 Floodplains

Pond 2S and Pond 3S are not located in a floodplain according to the National Flood Hazard Layer FIRMette Map No. 17197C0065G as mapped by the Federal Emergency Management Agency. Therefore, the locations of Pond 2S and Pond 3S comply with Section 845.340. The relevant FIRMette is located in Attachment 4.

5.0 Permanent Markers, 845.230(d)(2)(E)

The permanent markers in accordance with 35 Ill. Adm Code 845.230(d)(2)(D) have been installed. Photographic documentation of this requirement is included in Attachment 5.

6.0 Incised/Slope Protection Documentation, 845.230(d)(2)(F)

Pond 2S and Pond 3S were constructed with fill embankments on all sides. The area north of Pond 2S is at approximately the same elevation as Pond 2S's north embankment crest, which means there is little to no downslope on the north embankment. The western exterior downstream slope of Pond 2S and Pond 3S is one long slope that is covered with established vegetation. The eastern exterior downstream embankment of Pond 2S and Pond 3S are covered with established vegetation and gravel. The southern embankment of Pond 2S and the northern embankment of Pond 3S are the same embankment that divides the two ponds. These embankments are the interior embankments of their respective pond and are covered with a geomembrane liner. The established vegetation is adequate to protect the slopes of the ponds in accordance with 845.430(b). Photo documentation is included in Attachment 6.

7.0 Emergency Action Plan

The Emergency Action Plan for Pond 2S and Pond 3S was completed by Civil and Environmental Consultants, Inc. (CEC) to comply with 40 CFR Part 257 to identify safety emergencies and the proper responses in relation to each pond. KPRG reviewed the EAP for its compliance with Section 845.520. KPRG's review ensured that all the necessary sections required by Section 845.520 are included within the EAP. This review neither accepts nor rejects the safety emergencies identified by CEC. The safety emergencies identified along with the responses are the product of CEC. KPRG has not altered the safety emergencies or the responses associated with each emergency.

The Emergency Action Plan EAP is included in Attachment 7. This plan was originally developed in April 2017 by CEC and was reviewed and updated by KPRG for compliance with Section 845.520. The EAP was updated to revise the contacts list included in the EAP and to include Ponds 1N and 1S. KPRG updated the contacts list based upon personnel changes that occurred. In accordance with 845.520(e), a certification of compliance is included in Attachment 7.

8.0 Fugitive Dust Control Plan

The Fugitive Dust Plan is included in Attachment 8. This plan was originally developed in September 2015 and was reviewed in October 2021 by KPRG for compliance with Section 845.500(b). The only update necessary was to add Ponds 1N and 1S to the plan. The attached Fugitive Dust Plan complies with Section 845.500(b).

9.0 Groundwater Monitoring Information, 845.230(d)(2)(I)

9.1 Hydrogeologic Site Characterization, 845.230(d)(2)(I)(i)

The following subsections provide information on the geology and hydrogeology of the site as required under Section 845.620(b). Site geology and hydrogeology are discussed separately below.

9.1.1 Geology

The physiography of Will County is made up of ground moraines, end moraines, outwash plains, stream terraces, flood plains and bogs. It is in the Till Plaines and Great Lakes Sections of the Central Lowland Province. Near surface soils in the vicinity of the subject impoundment are predominately Romeo Silt Loam and Joliet Silt Loam, both with areas that are frequently flooded. These soils are poorly drained. Organic content ranges from 3 to 5 percent and have a low to negligible accelerated erosion rate, a low to high corrosivity rate and a pH range from slightly acidic to slightly basic (6.1 to 8.4). Surface runoff class is low (Soil Survey of Will County Illinois). Based on the Surficial Geology Map of Romeo Quadrangle (Caron, 2017) the surficial deposits in the vicinity of the subject surface impoundments are identified as disturbed ground which is generally described as diamicton, sand, gravel, silt and peat as much as 40 feet thick. This disturbed ground is generally interpreted as disturbed land, which includes former gravel pits and major areas of construction.

The general stratigraphy in the area consists of post-glacial alluvium underlain by unconsolidated glacial deposits, which overlay Silurian dolomite. The Silurian dolomite is underlain by the Maquoketa Group, which includes the Scales Shale, which is considered a regional aquitard separating the overlying Silurian dolomite from the deeper Cambro-Ordovician sandstone and limestone aquifers. To evaluate local stratigraphy, water well logs and engineering test boring logs were obtained for water wells and engineering test borings in the vicinity of the Will County Generation Station. The depths of these wells and borings range from 50 feet to 300 feet. The stratigraphy data from these boring logs and the well locations are provided in Attachment 9-1. In addition, information from 15 monitoring wells that were installed in the vicinity of the subject surface impoundments (MW-1 through MW-15; see Figure 9-1), is also included in the stratigraphy table in Attachment 9-1. Boring logs for these monitoring wells are included in Attachment 9-2. Based on an evaluation of the monitoring well boring logs, the following general site-specific stratigraphy is defined and geologic cross-sections developed (Figures 9-2 through 9-5):

- Fill (approx. 5' to 10' thick) – Consisting of a thin layer of sand and gravel roadway followed by brown and black silty clay and silty sand mixed with gravel and crushed dolomite. The fill may include coal, black cinders and slag.

- Silty Sand, Silt and Clay (approx. 1' – 16' thick) – Consisting of gravelly tan to brown silty sand fining downward to gray/greenish mottled silty clays and clay.

- Bedrock – Dolomite bedrock. Top of weathered bedrock is generally encountered between 9 feet and greater than 20 feet below ground surface with depth increasing towards the southwest. It is noted that at monitoring well location MW-12, top of bedrock was not encountered at the terminus of the boring at 20 feet below ground surface.

The Silurian dolomite is divided into four units identified as a weathered bedrock rind, Joliet Formation dolomite, Kankakee Formation dolomite and the Elwood/Wilhelmi dolomite. Beneath the Silurian dolomite is the Ordovician age Maquoketa Group consisting of the Brainard Shale, Fort Atkinson dolomite and the Scales Shale. The Brainard Shale unit is not necessarily regionally continuous, therefore it may or may not be present beneath the subject site. The Scales Shale unit, however, is extensive and is a recognized regional aquitard, which hydraulically isolates the deeper bedrock aquifers from the shallower Silurian dolomite. Based on the available information, the dolomite bedrock thickness to the top of the Scales Shale beneath the Will County site is approximately 55 feet.

Regional and local studies and investigations document fractures in the Silurian dolomite describing a primary joint set that is vertical and oriented about N52ºE and N40ºW. The N40ºW joints are described as "more distinct". Natural spacing between the joint sets ranges from 3 to more than 10 feet, and joint apertures are described as less than $1/16^{th}$ -inch. Bedding plane fractures are also described. Descriptions from various bedrock quarry walls show significant clay infilling of the vertical joints and bedding plane fractures. Evidence of water movement through fractures is interpreted from iron staining and mineralization (primarily calcite, with some pyrite and marcasite).

Silurian dolomite is a calcium-magnesium carbonate rock that includes horizons of cherty (silica) nodules and is documented both regionally and locally to include mineralization along fractures and within vugs. The mineralization includes, but is not limited to calcite (calcium carbonate) and various sulfide minerals such as pyrite, marcasite, etc. As such, the presence of these minerals and associated weathering products can also be expected within the overlying unconsolidated materials.

There are no underground mines beneath the subject CCR surface impoundments.

9.1.2 Hydrogeology

Based on information from the Soil Survey of Will County, the average annual precipitation is approximately 37 inches with about 63% of that total falling between April and October of any given year. The average seasonal snowfall is approximately just over 10 inches. More site specific precipitation data from water stations located in Will County is provided in Table 9-1.

The nearest surface water bodies are the Des Plaines River and the Chicago Ship and Sanitary Canal (CSSC) respectively located to the west and east of the subject CCR units (see Figure 9-1). There are no drinking water intakes within the segment of river adjacent to the subject site and for that matter on any portion of the Des Plaines River downstream of the site (Meet Your Water – An Introduction to Understanding Drinking Water in Northeastern Illinois, Metropolitan Planning Council, 2017).

Groundwater beneath the subject units occurs under water table conditions. Saturated conditions are generally encountered between 8 and 12 feet bgs, depending on the well location, within the lower portion of the above defined silty sand/silt/clay unit and/or bedrock. Table 9-2 provides groundwater elevation measurements obtained for the 15 on-site monitoring wells in the vicinity of the subject CCR surface impoundments which includes data for the monitoring wells associated specifically with these impoundments (upgradient wells MW-5 and MW-6 and downgradient wells MW-9, MW-10, MW-11 and MW-12). A hydrograph of water levels is provided as Figure 9-6. A review of the hydrograph shows some slight temporal fluctuations with the highest water levels tending to be in the May timeframe and the lowest water levels generally occurring August through October timeframe.

Groundwater flow maps for the four quarters from 3rd quarter 2020 through the 2nd quarter 2021 are provided as Figures 9-7 through 9-10. The maps include groundwater elevation data from all 15 wells in the area, including the specific CCR monitoring wells associated with the subject surface impoundments. Based on a review of the maps groundwater flow is in a westerly direction. These maps are consistent with historical flow data for the site. The horizontal hydraulic gradient is fairly shallow. Table 9-3 provides a summary of the flow direction, gradient and an estimated rate of groundwater flow for each sampling event. The flow rate was calculated using the following equation:

$$V_s = \frac{K\,dh}{n_e\,dl}\text{ , where}$$

V_s is seepage velocity (distance/time)
K is hydraulic conductivity (distance/time)
dh/dl is hydraulic gradient (unitless)
n_e is effective porosity (unitless)

Hydraulic conductivity values were initially estimated for monitor wells MW-1, MW-4, MW-6, MW-7, and MW-9, screened in the carbonate unit, from slug tests completed by Patrick Engineering in 2010. The geometric mean of the data for these wells was approximately 30 feet per day (ft/d; 3.47×10^{-4} ft/sec) for each well, as calculated by Patrick Engineering Hydrogeologic Assessment Report – Will County Station, February, 2011). The slug test data were reviewed as part of the modeling study being completed for the Construction Permit application and the data were reanalyzed using corrected input values for the well casing and borehole dimensions, effective porosity of the sand filter pack material and minor line fitting refinement. The revised geometric mean of the test data for these wells decreased to approximately 20 ft/d ($2.31x10^{-4}$ ft/sec) for each well. This revised value was used in Table 9-3. The estimated effective porosity of the aquifer materials (0.2) was obtained from literature (Applied Hydrogeology, Fetter, 1980).

At this time, based on the geology discussion in Section 9.1.1 and the site specific hydrogeology discussions above, the groundwater beneath the CCR surface impoundment is considered as Class I Potable Resource Groundwater in accordance with Section 620.210. However, a Groundwater Management Zone (GMZ) in accordance with Section 620.250 and an Environmental Land Use Control (ELUC) were established where the CCR surface impoundments are located as part of a Compliance Commitment Agreement (CCA) between Midwest Generation and Illinois EPA. The ELUC states that the groundwater shall not be used as potable water. The extent of the established and approved GMZ and ELUC is provided on Figure 9-11.

A survey of all potable water sources within a 2,500 feet radius of the Will County Generating Station was completed by Natural Resources Technology (NRT) in 2009. The following databases and sources of information were utilized in order to determine community water source and water well locations and construction in the vicinity of the ash pond wastewater treatment systems:

- Illinois State Geological Survey (ISGS) -Water Well Database Query;
- Illinois State Water Survey (ISWS) Private Well Database and water well construction report request; and
- Illinois Division of Public Water Supply web-based Geographic System (GIS) files.

As part of this permit preparation, KPRG evaluated the NRT information and reviewed the new Illinois State Geological Survey database and interactive map references as “ILWATER”. The survey results are provided on Figure 9-12. There are no potable use water wells downgradient of Pond 2S and Pond 3S. There are three existing water wells on the Will County Station property owned by Midwest Generation. These are identified as well numbers 01276, 00253 and 01275 on Figure 9-12. The locations of these wells have been corrected relative to their locations plotted on the ILWATER map. All three wells are greater than 1500 feet deep. Well 01276 on the north end of the property is no longer in use (retired). Two additional wells located on the property shown as numbers 40018 and 40017 have no backup records (i.e., no installation date information and no depth/log information). Discussions with plant personnel indicate no presence or knowledge of these potential wells suggesting these may be spurious data inputs. The well located on the northeast side of the property (number 40016) within the coal storage pile area is registered to Chicks Romeo Tavern and is actually located approximately 1 mile to the west of the Will County Station along Romeo Road (715 W. Romeo Rd.). There are two wells owned by Isle Ala Cache Park/Museum to the northwest, on the other side of the Des Plaines River which is a regional hydrogeologic boundary. The well noted to the south (number 41780) is associated with the cement operation to the south.

A search of the Illinois Department of Natural Resources dedicated nature preserve database (https://www2.illinois.gov/dnr/INPC/Pages/NaturePreserveDirectory.aspx) was performed to determine whether there may be a nearby dedicated nature preserve. The Romeoville Prairie Nature Preserve is located west of the Des Plaines River and north of Romeo Road, approximately one-quarter mile northwest of the subject impoundments. It is noted that the Des Plaines River is a hydrogeologic barrier and the noted nature preserve is on the other side of the river and upstream relative to surface water flow of the river.

Based on the geology of the site presented in Section 9.1.1 and the above hydrogeology discussions, the primary contaminant migration pathway for a potential release from the subject CCR surface impoundment would be downward migration to groundwater. Due to its proximity to the Des Plaines River, which is the adjacent hydrogeologic flow boundary, minimal to no downward vertical flow mixing is anticipated. There are no other utility or man-made preferential pathway corridors that would act to potentially intercept the flow to move any contamination in a direction other than to the westerly. There are no potable water wells downgradient of the subject CCR surface impoundments screened within the aquifer of concern. Also, as previously discussed, there are no potable surface water intakes on the Des Plaines River either along or downstream of the subject site.

There is quarterly groundwater quality data associated with Pond 2S and Pond 3S dating back to December 2010. However, the parameter list established in 2010 was slightly different from that specified in Section 845.600 and included analysis of dissolved inorganic parameters rather than total inorganic parameters. That historical water quality data is provided in Attachment 9-3.

Pond 2S and Pond 3S were identified as being subject to the new federal requirements under Federal Register, Environmental Protection Agency, 40 CFR Parts 257.94, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule dated April 17, 2015 (Federal CCR Rule). As required under the Federal CCR Rule, eight rounds of background sampling were completed for the monitoring wells within the monitoring network for the subject CCR surface impoundment (MW-5, MW-6 and MW-9 through MW-12). This included the full list of Appendix III (detection monitoring) and IV (assessment monitoring) parameters. Subsequently, quarterly groundwater monitoring of these wells was continued for only Appendix III detection monitoring parameters since there were no detections of Appendix III parameters above the established statistical background for those wells and/or an Alternate Source Demonstration (ASD) was completed indication a source of impacts other than the subject surface impoundments. Since the effective date of the State CCR Rule, quarterly groundwater monitoring for the full list of parameters specified in 845.600, which includes all parameters in the Federal CCR Rule Appendix III/IV, has continued. This data is provided in Table 9-4. In addition, it is noted that Illinois EPA added turbidity measurements to the list with a required eight rounds of background of that parameter for each well in the monitoring network for the subject CCR surface impoundment. This data is provided in Table 9-5. It is noted that the tables include proposed Groundwater Protection Standards (GWPSs) in accordance with Section 845.600(2). This is further discussed under Section 9.4 below.

9.2 Groundwater Monitoring System Design and Construction Plans, 845.230(d)(2)(I)(ii)

A comprehensive monitoring well network that includes other ponds in the vicinity of Ponds 2S and 3S was established in 2010. The well spacing was developed as part of a previous hydrogeologic assessment by Patrick Engineering, Inc. The well depths were determined based on depth to groundwater and the base elevations of the ponds being monitored and were approved by Illinois EPA. Groundwater flow in the area is generally to the west towards the Des Plaines River. Monitoring wells MW-5 and MW-6 (see Figure 9-1) are the established upgradient/background water quality monitoring points. Groundwater data from these wells will be evaluated to provide a statistically representative upgradient water quality prior to that water passing beneath the regulated units. Wells MW-9, MW-10, MW-11 and MW-12, which are located essentially at the pond boundaries, will serve as down-gradient monitoring points for Ponds 2S and 3S. This proposed monitoring well network will be utilized for determining whether potential pond leakage may be causing or contributing to groundwater impacts in the vicinity of the units.

Monitoring wells MW-5, MW-6, MW-9 and MW-10 were installed in 2010 by Patrick Engineering, Inc. Wells MW-11 and MW-12 were installed by KPRG and Associates, Inc. in 2015. The wells were drilled using 4.25-inch hollow stem augers. The wells were completed with standard 2-inch inner-diameter PVC casing with 10-feet of 0.010 slot PVC screen. Filter sand pack around each screen was extended to approximately 2-feet above the top of the well screen. The remainder of the annulus was backfilled with bentonite. With the exception of well MW-12, surface completions include stick-up (above grade two to three feet) locking protector casings set in concrete aprons. The wells are further protected by traffic bollards, as necessary. Well MW-12 was completed at the surface as a flush mount. Boring logs and well construction summaries for these wells are provided in Attachment 9-2. Ground surface and top-of-casing elevations were surveyed by an Illinois licensed surveyor and are included in the previously referenced groundwater elevation table in Table 9-2.

Each of the monitoring wells within the sampling network is outfitted with a dedicated sampling system. Specifically, each well has a QED Environmental Systems (QED) Well Wizard Model P1101M dedicated sampling pump with Model No. 37789 intake screens (0.010-inch slot). The screens are set within approximately one-foot of the base of the monitoring well.

In accordance with requirements under Section 845.630(g), Attachment 9-4 includes an Illinois licensed Professional Engineer certification of the above-defined monitoring system.

9.3 Groundwater Sampling and Analysis Program, 845.230(d)(2)(I)(iii)

9.3.1 Sample Frequency

Pond 2S and Pond 3S are regulated under the Federal CCR Rule. As such, all of the above defined monitoring wells (upgradient and downgradient) have been sampled on a quarterly basis starting the 4th quarter of 2015 for eight consecutive quarters for both Appendix III and Appendix IV parameters specified in the Federal CCR Rule which is the same parameter listing as provided under the State CCR Rule Section 845.600(a) plus calcium. This dataset will facilitate the development of proper statistical evaluation procedures for the site and use in development of applicable GWPSs for each constituent pursuant to Section 845.600(b). Illinois EPA added turbidity as an additional parameter that will require development of a statistical background. Since this parameter was not included within the Federal CCR Rule, eight rounds of turbidity measurements were obtained within the 180-day period since the effective date of the State Rule. However, this restricted period of background data collection does not facilitate evaluation of potential seasonal variations during the development of statistical background for this parameter.

Currently, all wells within this CCR monitoring network are being sampled on a quarterly basis for all parameters specified in Section 845.600(a) plus calcium and turbidity. Between quarterly monitoring events, groundwater level measurements from all designated CCR monitoring wells will be also obtained and recorded. During the initial rounds of monthly groundwater level measurements after the enactment of the State CCR Rule, surface impoundment measurements were not collected because the instrumentation for these measurements was not yet in-place and available for recording the data.

Quarterly groundwater monitoring will continue during the active life of the impoundment and the post-closure care period or, if closure is by removal, then in accordance with monitoring frequency requirements under Section 845.740(b). It is noted that if after 5 years of quarterly monitoring it can be demonstrated that the facility meets the requirements specified in Section 845.650(b)(4), the owner can petition the Illinois EPA to shift the monitoring frequency to semi-annual.

9.3.2 Sampling Preparation and Calibrations

Prior to any sampling event, the Station's designated Environmental Specialist shall be notified in advance of sampling crew arrival so that any arrangements can be made, including security clearance and training.

Prior to sampling activities, and at intervals recommended by the manufacturer, all non-dedicated equipment shall be cleaned and calibrated. Specifically, the field parameter water quality meter to be used for pH, specific conductance, turbidity and temperature will be calibrated using standard reference solutions. In addition, an operational check of the electronic water level probe will also be performed by placing the probe into a bucket of water and ensuring that the audio signal is triggered when the sensor meets the water interface. The associated tape measure of the probe will also be checked for wear.

The monitoring network consists of all dedicated sampling equipment (QED Well Wizard P1101M). The controller used to operate individual bladder pumps will be checked and maintained prior to arrival at the site based on manufacturer specifications.

All lab ware shall be obtained directly from an Illinois certified laboratory. Upon arrival to the site, the monitoring wells will be assessed for structural integrity. Each well cover (either stick-up or flush mount) will be inspected for proper labels, locks, any damage and be cleared of any flora or fauna that may be on the well or in the vicinity that would affect the sample or the sampling operation. In addition to any other notable observations, all of the above shall be entered on the sampling sheets. Once the well is uncovered and unlocked, and the well casing inspected, the well head shall be inspected for damage and cleanliness. At that point, the well will be considered ready for sampling per procedures described below.

9.3.3 Groundwater Sample Collection

Prior to initiating sampling, a round of groundwater levels will be collected from each monitoring well using an electronic water level probe. The timeframe over which these water levels are collected should be minimized and should not exceed 8 hours. The depth to water will be measured to the nearest one-hundredth of a foot from the top of casing using an electronic water level meter. The water level probe should be properly decontaminated between each reading using procedures specified in Section 9.3.4.

All of the monitoring wells at this Station are equipped with dedicated, down-hole, bladder pumps. At the top of casing for each well is a manifold with air and water quick connects and a port for a water level meter probe to fit so that an undisturbed water level can be obtained. Immediately prior to sampling, the depth to water will be measured again to the nearest one-hundredth of a foot from the top of casing using an electronic water level indicator and recorded onto the sampling sheets. Once recorded, an air compressor and flow controller will be attached to the air side quick connect and disposable tubing attached to the discharge connection. The discharge tubing will be run to a flow-through cell of the water quality meter. A discharge line from the flow-through cell will be placed into a vessel to allow for the measurement of the volume of groundwater removed. The water quality meter will be attached within the flow-through cell that allows for real time readings of pH, specific conductivity and temperature. It is noted that a calibration check of the water quality meter should be performed at the start and end of each day of sampling and recorded in the field notes. If the meter calibration-check shows drift outside of manufacturer specifications, the meter should be recalibrated in the field using standard solutions per manufacturer requirements.

The air controller will be set to the necessary pressure and to the slowest pumping interval, approximately 50 second refill and 10 second pump (flow rates at this setting tend to be less than 100 milliliters/minute), and the compressor will be started. The intent of the low flow pumping will be to minimize drawdown in the well with an ideal goal of keeping the drawdown to 0.30 feet or less. Once the water has filled the flow-through cell, a reading of the parameters will be recorded. Readings will continue to be recorded until such time as all parameters are deemed stable for three consecutive measurements at which point a sample will be collected from the tubing prior to the flow-through cell. An unfiltered groundwater sample shall be collected directly from the water tubing after it is disconnected from the flow-through cell. The laboratory provided bottles shall be properly filled. Once the sample is collected, the bottles shall be properly labeled and placed on ice as necessary.

If the well would pump dry prior to stabilized field parameter readings, the well will be allowed to recover for up to 24-hours at which point water sample collection will be initiated.

In the event that a dedicated bladder pump fails to work, the following procedures should be implemented:

- Pull the dedicated tubing and pump from the well and ensure that the tubing does not come in contact with the ground.

- Visually inspect the intake of the pump for clogging from sedimentation. If clogging is noted, clean the intake with distilled water. If there is no clogging, dismantle the pump casing and inspect the bladder for any holes, cracks or tears.

- If the bladder is determined to be compromised (i.e., wear has resulted in cracking or tearing), remove the bladder and replace it with a new bladder. Properly clean all parts of the pump using procedures described in Section 9.3.4, reassemble the pump and slowly lower it back down hole. Continue sampling as described above.

- If the entire pump is determined to have failed, a new pump will need to be ordered for replacement and a modified sampling procedure will be implemented as described below.

In the case of bladder pump failure, at a specific well during a sampling event, the alternate sampling method will be the use of a portable peristaltic pump (the pump itself does not go down-hole) assuming depth to water is less than 23 feet bgs. Clean disposable polyethylene tubing will be attached to the pump and the tubing will be slowly lowered down hole along with the water level probe. The pump will be operated at the lowest rate possible to achieve the same goals as for sampling described above (generally below 300 milliliters/minute which is within the range of standard low flow protocols). Water will be collected in a clean glass jar for field parameter readings. Once stable field parameters are recorded, the sample will be collected directly onto laboratory prepared containers for analysis. Upon completion of sample collection, the water level meter and tubing should be removed from the well. The polyethylene tubing should be disconnected from the pump and discarded. The water level meter should be properly decontaminated as specified in Section 9.3.4. If depth to water is such that a peristaltic pump cannot be used, a submersible pump will need to be used. The submersible pump must be properly cleaned as specified in Section 9.3.4 prior to placement down the well. All subsequent procedures will be the same as above. The alternate sampling pump use will be recorded on the field data sheet for that well and noted in any subsequent reporting summary.

9.3.4 Equipment Decontamination

Any equipment that is used down-hole at more than one sampling location must be thoroughly decontaminated between uses. Based on procedures described above, only the water level meter is anticipated to be in this category, however, if a submersible pump needs to be used during a particular sampling event due to dedicated pump failure (see Section 9.3.3), these procedures will also apply. The water level meter probe and any measuring tape, or any other non-dedicated equipment that may need to be placed down the well that extended below the water surface will need to be cleaned with an Alconox solution, or equivalent, wash followed by a double rinse with distilled water. Any pump tubing that is not dedicated should be discarded and only clean tubing should be used down-hole.

9.3.5 Sample Preservation, Chain-of-Custody and Shipment

Since measurement of total recoverable metals is required by the State CCR Rule, the samples will not be filtered prior to collection. This will facilitate the analysis to capture both the particulate fraction and dissolved fraction of metals in natural groundwater. Groundwater samples will be collected directly into Illinois certified laboratory provided containers. Those containers will be prepared by the laboratory to contain any necessary chemical preservation. The samples shall be stored at temperatures required by the lab following sample collection. Table 9-6 includes a summary of sample bottle requirements, preservatives and holding times

All groundwater samples collected shall be transferred to the laboratory under proper COC procedures. The laboratory provided COC, completed with all pertinent information, shall be maintained from sample collection through receipt by the laboratory. The information shall include, but is not limited to, the following:

- project name and number, state samples collected in, sample name and type, time and date collected, analysis requested, and printed name and signatures of person(s) sampling.

The COC shall be completed and properly relinquished by the field sampler(s) with all samples clearly printed or typed.

All samples will be either delivered directly to the laboratory or be shipped using Federal Express or a similar overnight service. It should be noted that Total Dissolved Solids (TDS) analysis has a 7-day holding time. TDS samples should be shipped to the laboratory within 72 hours after collection. All other holding times for the specified parameters are long enough to facilitate one shipment after the full round of sampling is complete.

9.3.6 Analytical Methods
A list of the analytical methods to be used by the laboratory for each specified parameter is included in the above referenced Table 9-6. Individual detection limits for the parameters may change slightly from sample to sample depending on potential matrix interferences with a sample (e.g., amount of suspended solids/sediment) and/or the concentration of the constituent in the sample. However, the base detection limits will be set below the applicable Illinois Class I Drinking Water Standards as defined in Section 845.600(a)(1) for that compound which are also provided in Table 9-6.

9.3.7 Quality Assurance and Quality Control
Laboratory

Only an Illinois certified analytical laboratory will be used for sample analysis. The laboratory will be conducting their work under their specific approved Quality Assurance and Quality Control (QA/QC) program. A copy of their program can be available upon request. A standard Level II data documentation package will be included in all subsequent reporting, however, the lab will be requested to also provide a Level IV data documentation package (i.e., U.S. EPA Contract Laboratory Protocol equivalent) in the event more detailed data validation/evaluation is deemed necessary.

Field

The QA/QC program for field work will include the collection of blind duplicates and the use of a laboratory supplied trip blank. The blind duplicate will be collected from a random well during every sampling event in which more than three (3) samples are collected. The duplicate will be blind in the manner that there will be no way for the laboratory to determine from which well or point the sample was collected.

Upon receipt of the analytical data, a determination will be made if the duplicate is consistent with the sample collected from the well/point. A generally acceptable range for groundwater samples is +/- 30 percent. If outside the acceptable range, a resample may be determined to be necessary and reanalyzed. The trip blank analytical data will be reviewed for any values other than non-detect. If there are any questions regarding the duplicate, trip blank, or other reported analytical QA/QC runs, the laboratory will be contacted to determine the effect on data quality, if any, and usability. If necessary, a specific well may need to be re-sampled.

9.3.8 Statistical Methods
A proposed statistical evaluation plan meeting the requirements specified in Section 845.640(f) is provided in Attachment 9-5 along with a certification of the plan by an Illinois licensed Professional Engineer.

9.4 Groundwater Monitoring Program, 845.230(d)(2)(I)(iv)

The groundwater sample and water level collection frequency is discussed in Section 9.3.1 above.

As previously noted, the monitoring well system for the subject unit consists of six monitoring wells as follows:

- MW-5 and MW-6 – Upgradient
- MW-9, MW-10, MW-11 and MW-12 – Downgradient

Eight rounds of background sampling for the purposes of statistical evaluation and background determination is available from the initial groundwater sampling which occurred starting in 2015 in compliance with the Federal CCR Rule requirements. Subsequent groundwater sampling has also occurred on a quarterly basis for the seven detection monitoring parameters listed under Appendix III of the Federal CCR Rule detection monitoring requirements. All available CCR monitoring data through the end of the second quarter 2021 is summarized in Table 9-4 and the eight rounds of turbidity data collected since the enactment of the State CCR Rule in April 2021 in Table 9-5.

Using the currently available data for the subject CCR surface impoundment, site specific Groundwater Protection Standards (GWPSs) have been established in accordance with Section 845.600(b) and are summarized in Table 9-7. The background concentrations noted in Table 9-7 were calculated using the statistical evaluation approach noted in Section 9.3.7 and provided in Attachment 9-5. A presentation of the statistical evaluations, which resulted in the background concentration calculations, is provided in Attachment 9-6.

Once the proposed GWPSs presented in this permit application are approved by Illinois EPA, these values will be used for all subsequent groundwater monitoring data comparisons. Monitoring will continue on a quarterly basis for all constituents specified in Section 845.600(a)(1) plus calcium and turbidity. In accordance with Section 845.610(b)(3)(D), a data summary report will be submitted to Illinois EPA within 60-days of receipt of all analytical data (including resample data if necessary as discussed below) which will include a groundwater flow map for the quarterly sampling event, summary of water level elevations collected during the reporting period (monthly measurements), and a data summary including summary data tables with a comparison against the established/approved GWPSs. This report must be placed the facility's operating record.

If during a monitoring event, a constituent(s) is/are detected above an established and approved GWPS, that well will be resampled for the specific constituent(s) determined above the GWPS. If the resample data confirms that the constituent(s) concentration(s) is/are above the GWPS then the following will occur:

- Characterize the nature and extent of the potential release and any relevant site conditions that may affect the remedy evaluation/selection. This characterization must meet the requirements set forth under Section 845.650(d)(1).
- If groundwater impacts extend off-site, provide off-site landowner/resident notifications as specified under Section 845.650(d)(2) and place the notifications into the facility's operating record. This must occur within no more than 30-days of determination that a GWPS has been exceeded.
- An Alternate Source Demonstration (ASD) may be initiated and completed for submittal to Illinois EPA review/approval as allowed under Section 845.650(e). Place the ASD into the facility's operating record.
- Within 90-days of determining that a constituent(s) was detected above an established/approved GWPS at a downgradient waste boundary monitoring point, initiate an assessment of corrective measures meeting the requirements specified under Section 845.660 unless an ASD is submitted in accordance with Section 845.650(d)(2) and subsequently approved by the Illinois EPA.

By no later January 31st of each year, an Annual Groundwater Monitoring and Corrective Action Report will be prepared for inclusion as part of an Annual Consolidated Report for the facility. The Annual Groundwater Monitoring and Corrective Action Report will meet the requirements set forth under Section 845.610(e)(1 through 4). The Annual Consolidated Report will be placed into the facility's operating record.

10.0 Written Closure Plan

According to the preliminary Closure Plan prepared by Sargent & Lundy, LLC, dated October 29, 2021, Pond 2S and Pond 3S will be closed with the CCR remaining in place and topped with a final cover system. The final cover system will consist of a 60-mil HDPE geomembrane for the low permeability layer with a minimum of three (3) feet of vegetated soil as the final protective layer placed over the geomembrane. The Closure Plan is written in accordance with Section 845.720(a) and provided in Attachment 10. An Alternate Closure Demonstration (ACD) was completed by Sargent & Lundy, LLC and submitted on November 30, 2020 to U.S. EPA. The

ACD seeks to extend the deadline that Pond 2S can receive CCR while an alternative CCR disposal location can be identified.

11.0 Post-Closure Care Plan, 845.230(d)(2)(J)

As stated in Section 10.1, Pond 2S and Pond 3S will be closed with CCR remaining in place with a final cover system. Post closure care will occur in accordance with Section 845.780, which includes routine inspections of the final cover system and groundwater monitoring. The Pond 2S and Pond 3S post-closure plan has been prepared in accordance with Section 845.780(d) and is included in Attachment 11.

12.0 Liner Certification, 845.230(d)(2)(K)

As part of the Alternative Closure Demonstration, it was identified that the liners for Pond 2S and Pond 3S do not comply with the liner requirements of Section 845.400. The upper liner component for Pond 2S and Pond 3S consists of white 60-mil high-density polyethylene (HDPE) topped with 12-inches of sand, which is then topped with 6-inches of screenings. The lower liner component below the 60-mil HDPE liner is about one-foot of Poz-O-Pac followed by about 0.5 feet of silty clay, which is underlain by bedrock. This composition of liner components of Pond 2S and Pond 3S were evaluated against the liner design criteria using the process outlined in Section 845.400(c) to determine if Pond 2S and Pond 3S are considered lined or unlined. The calculations showing the flow rate calculations and comparison are provided in Attachment 12. The calculations indicate that the liner components for Pond 2S and Pond 3S do not comply with the requirements of Section 845.400 and the surface impoundment is considered unlined.

13.0 History of Known Exceedances, 845.230(d)(2)(L)

As previously noted in the introduction, there is no Attachment with supporting documentation for this Section since the referenced data is provided in Attachment 9 documentation. In the fourth quarter 2010, Midwest Generation voluntarily initiated groundwater monitoring in the vicinity of four ash ponds/surface impoundment which included Ponds 2S and 3S which are the subject of this Permit application. As discussed in Section 9 of this Permit application, the current combined CCR groundwater monitoring network for these two ponds is as follows:

- Upgradient monitoring wells: MW-05 and MW-06
- Downgradient Monitoring wells: MW-09 thoughMW-12

The existing CCR data for Ponds 2S and 3S groundwater monitoring network was also presented and discussed in Section 9 of this permit application. Relative to the most recent round of CCR groundwater monitoring data referenced in that Section (second quarter 2021; see Table 9-4), the following are noted above the standards provided in Section 845.600(a):

- MW-05 (upgradient): Boron and sulfate.

- MW-06 (upgradient): Boron.
- MW-09 (downgradient): Chloride.
- MW-10 (downgradient): Boron and arsenic.
- MW-11 (downgradient): Boron.
- MW-12 (downgradient): None.

All of the above wells are within the existing GMZ and ELUC. Proposed GWPSs developed in accordance with Section 845.600(b) are presented in Section 9.4 above. Once Illinois EPA reviews and approves those proposed GWPSs, those values will be used for subsequent groundwater monitoring data comparisons.

Pursuant to Part 257.95(g)(3) of the Federal CCR Rule, MWG conducted an Alternate Source Demonstration (ASD) for both ponds which concluded that the noted potential statistically significant increases for the parameters subject to the ASD were not the result of leakage of leachate from the regulated units (Ponds 2S and 3S) but rather from other potential sources. Because the GWPSs are under review, there are no approved GWPSs for the constituents in the groundwater and accordingly it cannot be determined if there is an exceedance of the groundwater protection standards in Section 845.600.

14.0 Financial Assurance, 845.230(d)(2)(N)

The financial assurance certification is included in Attachment 14.

15.0 Hazard Potential Classification Assessment, 845.230(d)(2)(O) & 845.440

The initial hazard potential classification was performed for Pond 2S and Pond 3S in October of 2016 and has been reviewed and updated by Sargent & Lundy, LLC and is included in Attachment 15.

16.0 Structural Stability Assessment, 845.230(d)(2)(P) & 845.450

The structural stability assessment was performed for Pond 2S and Pond 3S in October 2021 by CEC and is included in Attachment 16. The assessment was completed to comply with Section 845.450.

17.0 Safety Factor Assessment, 845.230(d)(2)(Q) & 845.460(b)

The safety factor assessment was performed for Pond 2S and Pond 3S by CEC and is included in Attachment 17. The assessment was completed to comply with Section 845.460.

18.0 Inflow Design Flood Control System Plan, 845.230(d)(2)(R) & 845.510(c)(3)

An Inflow Design Flood Control System Plan was previously completed for Pond 2S and Pond 3S by Geosyntec in October 2016. This plan was completed in accordance with the federal CCR rule, 40 CFR Part 257.82(c) and has been reviewed and updated by Sargent & Lundy, LLC in accordance with 845.460(b). The plan demonstrates that the existing outlets structures, conveyance piping, and downstream hydraulic structures for Pond 2S and Pond 3S adequately manage the inflow from the design event. The plan is included in Attachment 18.

19.0 Safety and Health Plan, 845.230(d)(2)(S) & 845.530

A Safety and Health Plan in accordance with Section 485.530 has been completed and included in Attachment 19.

20.0 Closure Priority Categorization, 845.230(d)(2)(M) & 845.700(g)

20.1 Pond 2S

In accordance with the requirements of Section 845.700(c), the category designation for Pond 2S is Category 7. The Category 7 designation for Pond 2S is based on the following:

- Pond 2S is an active surface impoundment;
- There are no potable wells or setbacks of existing water supply wells downgradient, and as such Midwest Generation is not aware of any imminent threat to human health or the environment;
- The Illinois EPA EJ Start tool found at https://illinois-epa.maps.arcgis.com/apps/webappviewer/index.html?id=f154845da68a4a3f837cd3b880b0233c was used to determine that Pond 2S is not located within one mile of an area of environmental justice concern.
- Pursuant to Part 257.95(g)(3) of the Federal CCR Rule, MWG conducted an Alternate Source Demonstration (ASD) for Pond 2S which concluded that the noted potential statistically significant increases for the parameters subject to the ASD were not the result of leakage of leachate from the pond but rather from other potential sources.

20.2 Pond 3S

In accordance with the requirements of Section 845.700(c), the category designation for Pond 3S is Category 7. The Category 7 designation for Pond 3S is based on the following:

- Pond 3S is an inactive surface impoundment;

- There are no potable wells or setbacks of existing water supply wells downgradient, and as such Midwest Generation is not aware of any imminent threat to human health or the environment;

- The Illinois EPA EJ Start tool found at https://illinois-epa.maps.arcgis.com/apps/webappviewer/index.html?id=f154845da68a4a3f837cd3b880b0233c was used to determine that Pond 3S is not located within one mile of an area of environmental justice concern.

- Pursuant to Part 257.95(g)(3) of the Federal CCR Rule, MWG conducted an Alternate Source Demonstration (ASD) for 3S which concluded that the noted potential statistically significant increases for the parameters subject to the ASD were not the result of leakage of leachate from the pond but rather from other potential sources.

OPERATING PERMIT TABLES

Table 2: Will County Generating Station
Pond 2S CCR Chemical Constituents Analytical Results

Parameter Name	Pond 2S Sample 10/11/2021
Sulfate	110
Chloride	41
Fluoride	<0.99
Antimony	<1.7
Arsenic	1.3
Beryllium	1.4
Boron	110
Cadmium	<0.17
Chromium	7.8
Lead	3.9
Lithium	20
Molybdenum	1.5
Thallium	1.2
Barium	2,200
Calcium	78,000
Cobalt	8.7
Selenium	<4.3
Mercury	<0.016

Notes:

All units are in milligrams per kilogram (mg/kg)

Table 9-1. Summary of Local Precipitation Data - Midwest Generation, LLC, Will County Generating Station, Romeoville, Illinois.

Will County Station	
Month	**Average Monthly Precipitation* (inches)**
January	1.87
February	1.73
March	2.11
April	3.56
May	3.87
June	3.75
July	3.54
August	3.28
September	3.04
October	3.04
November	2.41
December	1.95

Notes:
* - Historical precipitation data was obtained from the National Oceanic and Atmospheric Administration. Precipitation data was averaged from three stations located within Romeoville, St. Charles and Plainfield, Illinois. Dates of precipitation data range from 1988-2020.

Table 9-2. Groundwater Elevations - Midwest Generation, LLC, Will County Station, Romeoville, IL

Well ID	Date	Top of Casing Elevation (ft above MSL)	Depth to Groundwater (ft below TOC)	Groundwater Elevation (ft above MSL)
MW-05	11/9/2015	592.87	9.99	582.88
	2/16/2016	592.87	9.91	582.96
	5/24/2016	592.87	9.94	582.93
	8/9/2016	592.87	10.09	582.78
	10/25/2016	592.87	9.02	583.85
	1/31/2017	592.87	9.81	583.06
	5/9/2017	592.87	9.63	583.24
	6/27/2017	592.87	10.26	582.61
	9/6/2017	592.87	10.48	582.39
	11/16/2017	592.87	10.02	582.85
	2/28/2018	592.87	9.48	583.39
	5/1/2018	592.87	9.94	582.93
	10/2/2018	592.87	10.64	582.23
	5/28/2019	592.87	8.73	584.14
	12/5/2019	592.87	9.92	582.95
	5/22/2020	592.87	9.39	583.48
	11/3/2020	592.87	10.48	582.39
	5/24/2021	592.87	10.21	582.66
MW-06	11/9/2015	593.18	9.96	583.22
	2/16/2016	593.18	11.37	581.81
	5/24/2016	593.18	11.37	581.81
	8/9/2016	593.18	11.54	581.64
	10/25/2016	593.18	11.37	581.81
	1/31/2017	593.18	11.24	581.94
	5/9/2017	593.18	10.86	582.32
	6/27/2017	593.18	11.55	581.63
	9/6/2017	593.18	11.77	581.41
	11/16/2017	593.18	11.49	581.69
	2/28/2018	593.18	10.91	582.27
	5/1/2018	593.18	11.47	581.71
	10/2/2018	593.18	11.89	581.29
	5/28/2019	593.18	10.18	583.00
	12/5/2019	593.18	11.51	581.67
	5/22/2020	593.18	10.55	582.63
	11/3/2020	593.18	11.86	581.32
	5/24/2021	593.18	11.85	581.33
MW-09	11/9/2015	592.87	11.38	581.49
	2/16/2016	592.87	11.03	581.84
	5/24/2016	592.87	11.35	581.52
	8/9/2016	592.87	11.43	581.44
	10/25/2016	592.87	10.74	582.13
	1/31/2017	592.87	11.15	581.72
	5/9/2017	592.87	10.45	582.42
	6/27/2017	592.87	11.66	581.21
	9/6/2017	592.87	11.95	580.92
	11/14/2017	592.87	11.54	581.33
	2/27/2018	592.87	10.13	582.74
	5/1/2018	592.87	11.39	581.48
	10/2/2018	592.87	11.91	580.96
	5/28/2019	592.87	9.65	583.22
	12/5/2019	592.87	11.17	581.70
	5/26/2020	592.87	9.67	583.20
	11/3/2020	592.87	11.90	580.97
	5/25/2021	592.87	12.02	580.85
MW-10	11/9/2015	590.96	10.65	580.31
	2/16/2016	590.96	10.43	580.53
	5/24/2016	590.96	10.72	580.24
	8/9/2016	590.96	11.12	579.84
	10/25/2016	590.96	10.73	580.23
	1/31/2017	590.96	10.37	580.59
	5/9/2017	590.96	9.78	581.18
	6/27/2017	590.96	11.09	579.87
	9/6/2017	590.96	11.20	579.76
	11/15/2017	590.96	10.76	580.20
	2/27/2018	590.96	9.54	581.42
	5/1/2018	590.96	10.64	580.32
	10/2/2018	590.96	11.12	579.84
	5/28/2019	590.96	9.02	581.94
	12/5/2019	590.96	10.28	580.68
	5/27/2020	590.96	8.89	582.07
	11/3/2020	590.96	10.68	580.28
	5/24/2021	590.96	11.06	579.90

MSL - Mean Sea Level
TOC - Top of Casing

Table 9-2. Groundwater Elevations - Midwest Generation, LLC, Will County Station, Romeoville, IL

Well ID	Date	Top of Casing Elevation (ft above MSL)	Depth to Groundwater (ft below TOC)	Groundwater Elevation (ft above MSL)
MW-11	11/9/2015	590.69	10.28	580.41
	2/16/2016	590.69	10.15	580.54
	5/24/2016	590.69	10.25	580.44
	8/9/2016	590.69	10.66	580.03
	10/25/2016	590.69	10.42	580.27
	1/31/2017	590.69	9.91	580.78
	5/9/2017	590.69	9.21	581.48
	6/27/2017	590.69	10.48	580.21
	9/6/2017	590.69	10.73	579.96
	11/15/2017	590.69	10.43	580.26
	5/1/2018	590.69	10.18	580.51
	10/2/2018	590.69	10.59	580.10
	5/28/2019	590.69	8.32	582.37
	12/5/2019	590.69	9.85	580.84
	5/26/2020	590.69	8.09	582.60
	11/3/2020	590.69	10.58	580.11
	5/24/2021	590.69	10.76	579.93
MW-12	11/9/2015	590.81	10.15	580.66
	2/16/2016	590.81	10.24	580.57
	5/24/2016	590.81	10.31	580.50
	8/9/2016	590.81	10.73	580.08
	10/25/2016	590.81	10.45	580.36
	1/31/2017	590.81	10.16	580.65
	5/9/2017	590.81	9.88	580.93
	6/27/2017	590.81	10.62	580.19
	9/6/2017	590.81	10.61	580.20
	11/15/2017	590.81	10.20	580.61
	5/1/2018	590.81	10.30	580.51
	10/2/2018	590.81	10.77	580.04
	5/28/2019	590.81	9.17	581.64
	12/5/2019	590.81	10.15	580.66
	5/22/2020	590.81	9.88	580.93
	11/3/2020	590.81	10.49	580.32
	5/24/2021	590.81	10.65	580.16

MSL - Mean Sea Level
TOC - Top of Casing

Table 9-3. Hydraulic Gradient, Direction and Seepage Velocity. Midwest Generation, LLC, Will County Generation Station.

DATE	Groundwater Flow Direction	K_{avg} (ft/sec)*	Average Hydraulic Gradient (ft/ft)	Porosity (unitless)**	Estimated Seepage Velocity (ft/day)
11/9/2015	West	2.310E-04	0.0053	0.2	0.53
2/16/2016	West	2.310E-04	0.0030	0.2	0.29
5/24/2016	West	2.310E-04	0.0030	0.2	0.29
8/9/2016	West	2.310E-04	0.0030	0.2	0.29
10/25/2016	West	2.310E-04	0.0030	0.2	0.29
1/31/2017	West	2.310E-04	0.0030	0.2	0.29
5/9/2017	West	2.310E-04	0.0045	0.2	0.45
6/27/2017	West	2.310E-04	0.0049	0.2	0.49
9/6/2017	West	2.310E-04	0.0047	0.2	0.47
11/16/2017	West	2.310E-04	0.0026	0.2	0.26
5/1/2018	West	2.310E-04	0.0025	0.2	0.25
10/2/2018	West	2.310E-04	0.0040	0.2	0.40
5/28/2019	West	2.310E-04	0.0027	0.2	0.27
12/5/2019	West	2.310E-04	0.0027	0.2	0.27
5/22/2020	West	2.310E-04	0.0029	0.2	0.29
11/3/2020	West	2.310E-04	0.0074	0.2	0.73
5/24/2021	West	2.310E-04	0.0049	0.2	0.49

* K_{avg} - Geometric mean hydraulic conductivity (feet/second) as discussed in Section 9.1.2.

** - Porosity estimate from Groundwater, Freeze and Cherry, 1979.

Table 9-4. Groundwater Analytical Results - Midwest Generation, LLC, Will County Station, Romeoville, IL.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228 Combined	Selenium	Thallium
MW-05 up-gradient	11/11/2015	6.1	220	110	0.31	7.24	770	1,900	< 0.003	0.0014	0.071	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	0.075	-0.168	0.031	< 0.002
	2/18/2016	4.4	230	120	0.31	6.99	730	1,600	< 0.003	0.0021	0.058	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.079	0.468	0.019	< 0.002
	5/26/2016	3.7	170	110	0.33	6.73	670	1,500	< 0.003	0.0023	0.055	^ < 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.011	< 0.0002	0.077	< 0.402	0.019	< 0.002
	8/10/2016	3.6	67	120	0.72	8.62	480	970	< 0.003	0.0044	0.043	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	F1 < 0.0002	0.14	< 0.394	0.0049	< 0.002
	10/26/2016	3.6	44	120	0.70	9.08	410	920	< 0.003	0.0047	0.033	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.12	0.592	< 0.0025	< 0.002
	2/1/2017	4.6	250	48	0.35	6.81	530	1,600	< 0.003	0.0015	0.058	* < 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.016	^ < 0.0002	0.048	< 0.424	0.029	< 0.002
	5/11/2017	4.0	140	85	0.31	7.86	610	1,200	< 0.003	0.0035	0.053	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.093	< 0.388	< 0.0025	< 0.002
	6/27/2017	3.8	83	99	0.53	7.95	500	1,000	< 0.003	0.0037	0.045	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.11	0.412	< 0.0025	< 0.002
	9/8/2017	4.8	89	78	0.52	9.40	490	1,000	< 0.003	0.0038	V 0.069	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.095	0.486	0.0047	< 0.002
	11/16/2017	4.8	180	52	0.45	6.70	650	1,500	< 0.003	0.0028	0.065	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.021	< 0.0002	0.064	< 0.379	0.012	< 0.002
	5/2/2018	3.6	200	32	0.39	7.23	510	1,300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/3/2018	4.9	150	55	0.48	7.07	430	1,200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/29/2019	4.1	61	91	0.59	9.10	380	870	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/6/2019	4.9	170	31	0.41	6.95	440	1,200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/22/2020	4.5	52	70	0.59	7.39	300	870	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/4/2020	5	130	29	0.38	7.06	410	1,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/24/2021	4.7	120	28	0.53	7.07	430	1,000	< 0.003	0.0011	0.046	^1+ < 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.015	< 0.0002	0.063	DNYA	0.042	< 0.002
MW-06 up-gradient	11/10/2015	3.0	52	100	0.55	8.63	300	660	< 0.003	0.0016	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.011	< 0.0002	0.067	-0.383	0.0039	< 0.002
	2/18/2016	2.5	74	150	0.47	8.58	280	650	< 0.003	0.0014	0.068	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.015	< 0.0002	0.063	0.412	< 0.0025	< 0.002
	5/26/2016	2.7	86	92	0.44	7.79	350	800	< 0.003	0.002	0.068	^ < 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	< 0.0002	0.042	< 0.422	< 0.0025	< 0.002
	8/11/2016	3.6	110	58	0.35	7.74	330	840	< 0.003	0.0029	0.086	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.038	< 0.339	< 0.0025	< 0.002
	10/26/2016	3.8	86	74	0.40	8.16	220	800	< 0.003	0.003	0.074	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	0.043	< 0.531	< 0.0025	< 0.002
	2/1/2017	3.4	70	83	0.41	7.88	260	700	< 0.003	0.0043	0.068	* < 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	^ < 0.0002	0.05	< 0.511	0.0035	< 0.002
	5/11/2017	3.0	75	84	0.28	8.68	330	570	< 0.003	0.002	0.054	< 0.001	< 0.0005	< 0.005	< 0.001	0.00054	0.011	< 0.0002	0.054	< 0.388	< 0.0025	< 0.002
	6/27/2017	3.1	65	74	0.38	8.15	330	710	< 0.003	0.0014	0.069	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	< 0.0002	0.046	0.408	< 0.0025	< 0.002
	9/7/2017	3.5	75	67	0.40	8.20	300	740	< 0.003	0.0025	0.077	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	0.044	0.397	< 0.0025	< 0.002
	11/16/2017	3.9	88	54	0.39	7.59	280	810	< 0.003	0.0028	0.077	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.038	0.491	0.012	< 0.002
	5/3/2018	3	91	52	0.26	6.91	530	750	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	7/25/2018 R	NA	NA	NA	NA	7.47	280	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/3/2018	3.5	93	44	0.31	7.83	240	720	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/29/2019	**4.3**	120	38	0.21	7.51	350	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	7/3/2019 R	3.2	NA	NA	NA	8.28	NA	740	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/6/2019	4.2	98	31	0.33	7.91	210	740	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/22/2020	3.4	98	56	0.31	7.47	180	710	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/3/2020	3.3	100	43	0.36	7.29	170	700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/24/2021	2.6	99	46	0.33	7.65	160	610	< 0.003	0.0025	0.08	^1+< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.016	< 0.0002	0.017	DNYA	< 0.0025	< 0.002
MW-09 down-gradient	11/11/2015	1.9	56	190	0.55	9.12	460	750	< 0.003	0.0047	0.027	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.14	-0.2208	< 0.0025	< 0.002
	2/17/2016	1.8	47	160	0.55	9.10	250	600	< 0.003	0.0051	0.027	^ < 0.001	< 0.0005	< 0.005	< 0.001	0.00065	< 0.01	< 0.0002	0.089	< 0.373	< 0.0025	< 0.002
	5/24/2016	1.6	48	180	0.51	8.79	240	640	< 0.003	0.0043	0.027	^ < 0.001	< 0.0005	< 0.005	< 0.001	0.00071	< 0.01	< 0.0002	0.079	0.508	< 0.0025	< 0.002
	8/9/2016	2.2	53	140	0.48	8.35	280	750	< 0.003	0.0052	0.031	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.14	0.639	< 0.0025	< 0.002
	10/26/2016	2.2	33	130	0.81	9.16	230	660	< 0.003	0.0069	0.019	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.11	0.608	< 0.0025	< 0.002
	1/31/2017	2.0	61	250	0.57	8.59	180	710	< 0.003	0.0063	0.038	* < 0.001	< 0.0005	< 0.005	< 0.001	0.0014	< 0.01	^ < 0.0002	0.09	< 0.45	< 0.0025	< 0.002
	5/9/2017	1.8	66	340	0.38	8.58	250	900	< 0.003	0.0052	0.038	< 0.001	< 0.0005	< 0.005	< 0.001	0.00054	< 0.01	< 0.0002	0.093	< 0.361	< 0.0025	< 0.002
	6/27/2017	1.9	64	330	0.51	7.76	240	940	< 0.003	0.0046	0.039	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.091	0.638	< 0.0025	< 0.002
	9/6/2017	1.8	59	310	0.51	8.98	240	890	< 0.003	0.0047	0.038	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.1	0.454	< 0.0025	< 0.002
	11/14/2017	2.6	160	270	0.51	8.1	290	910	< 0.003	0.0017	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.018	< 0.0002	0.026	< 0.372	0.0061	< 0.002
	5/1/2018	1.7	49	200	0.52	7.81	430	820	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	7/25/2018 R	NA	NA	NA	NA	NA	320	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/2/2018	2.1	49	170	0.55	8.09	270	820	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/29/2019	1.5	48	280	0.29	8.90	150	750	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/6/2019	2.0	38	140	0.46	8.65	160	630	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/26/2020	1.3	55	320	0.32	8.66	140	720	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/3/2020	2.0	43	240	0.55	8.64	180	750	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/25/2021	1.6	67	360	0.39	8.74	180	900	< 0.003	0.0044	0.054	^1+ < 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.054	DNYA	< 0.0025	< 0.002

Notes: All units are in mg/l except pH is in standard units.
NA - Not analyzed. No confirmation resample required.
R - Resample
F1 - MS and/or MSD Recovery outside of limits.

Table 9-4. Groundwater Analytical Results - Midwest Generation, LLC, Will County Station, Romeoville, IL.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228 Combined	Selenium	Thallium
MW-10 down-gradient	11/10/2015	3.9	140	140	0.77	7.34	310	980	< 0.003	0.015	0.096	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.018	< 0.0002	0.068	1.341	< 0.0025	< 0.002
	2/16/2016	3.6	150	240	0.79	7.29	290	950	< 0.003	0.014	0.098	^ < 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.021	< 0.0002	0.075	0.952	< 0.0025	< 0.002
	5/25/2016	3.6	120	140	0.83	7.26	260	1,000	< 0.003	0.034	0.096	^ < 0.001	< 0.0005	< 0.005	< 0.001	0.00055	0.016	< 0.0002	0.065	0.51	< 0.0025	< 0.002
	8/10/2016	4.3	150	120	0.78	7.22	230	970	< 0.003	0.017	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.021	< 0.0002	0.082	0.864	< 0.0025	< 0.002
	10/26/2016	3.0	160	74	0.52	7.30	220	1,000	< 0.003	0.022	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.021	< 0.0002	0.030	0.458	< 0.0025	< 0.002
	2/2/2017	3.7	180	81	0.54	7.16	160	930	< 0.003	0.05	0.14	* < 0.001	< 0.0005	< 0.005	< 0.001	0.0013	0.02	^ < 0.0002	0.031	< 0.464	< 0.0025	< 0.002
	5/10/2017	3.0	150	100	0.44	7.83	340	860	< 0.003	0.02	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.015	< 0.0002	0.066	0.882	< 0.0025	< 0.002
	6/27/2017	2.8	130	110	0.67	7.49	250	930	< 0.003	0.0072	0.096	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.080	0.953	< 0.0025	< 0.002
	9/7/2017	2.8	120	120	0.77	7.37	290	920	< 0.003	0.0076	0.086	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	0.00058	0.096	0.921	< 0.0025	< 0.002
	11/15/2017	4.1	140	120	0.77	7.10	270	1,000	< 0.003	0.015	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.021	< 0.0002	0.071	0.893	< 0.0025	< 0.002
	5/1/2018	3.2	150	130	0.65	7.31	280	990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/3/2018	2.5	110	140	0.89	7.60	200	860	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/29/2019	2.8	100	140	0.82	7.53	260	860	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/5/2019	3.7	120	110	0.93	7.21	190	940	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/27/2020	2.3	100	170	0.90	7.29	280	850	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/3/2020	3.7	130	140	0.87	7.02	180	920	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/25/2021	3.0	160	130	0.62	7.16	160	910	< 0.003	0.018	0.18	^1+ < 0.001	< 0.0005	< 0.005	0.0013	0.0054	0.02	< 0.0002	0.036	DNYA	< 0.0025	< 0.002
MW-11 down-gradient	11/10/2015	2.6	120	89	0.61	7.60	180	620	< 0.003	0.007	0.098	< 0.001	< 0.0005	< 0.005	< 0.001	0.00064	< 0.01	< 0.0002	0.0600	0.736	< 0.0025	< 0.002
	2/16/2016	3.0	100	88	0.68	7.47	170	640	< 0.003	0.0059	0.11	^ < 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	< 0.0002	0.078	1.14	< 0.0025	< 0.002
	5/25/2016	2.8	82	98	0.75	7.43	170	640	< 0.003	0.0073	0.093	^ < 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.083	0.775	< 0.0025	< 0.002
	8/10/2016	3.1	96	86	0.72	7.57	150	660	< 0.003	0.0072	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.087	0.807	< 0.0025	< 0.002
	10/26/2016	2.5	110	67	0.53	7.82	120	630	< 0.003	0.0082	0.096	< 0.001	< 0.0005	< 0.005	< 0.001	0.00052	< 0.01	< 0.0002	0.043	0.51	< 0.0025	< 0.002
	2/1/2017	3.9	110	72	0.65	7.54	110	600	< 0.003	0.011	0.15	* < 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.076	0.909	< 0.0025	< 0.002
	5/10/2017	3.1	95	84	0.46	8.37	170	590	< 0.003	0.014	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.074	1.03	< 0.0025	< 0.002
	6/27/2017	2.8	87	90	0.59	7.57	150	680	< 0.003	0.0058	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.069	0.692	< 0.0025	< 0.002
	9/7/2017	2.8	90	94	0.58	7.40	150	*730*	< 0.003	0.0074	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.067	0.676	< 0.0025	< 0.002
	11/15/2017	2.9	96	100	0.65	7.41	160	*750*	< 0.003	0.0082	0.15	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.075	1.04	< 0.0025	< 0.002
	5/3/2018	3.8	73	110	0.69	6.74	190	670	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/3/2018	3.1	78	110	0.66	7.65	120	680	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/29/2019	2.2	86	110	0.49	7.55	120	610	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/5/2019	2.5	100	80	0.55	7.26	91	600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/26/2020	2.3	89	100	0.54	7.4	90	540	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/3/2020	4.3	85	140	0.72	7.17	68	710	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/25/2021	3.8	94	130	0.74	7.68	57	660	< 0.003	0.0067	0.16	^1+< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.077	DNYA	< 0.0025	< 0.002
MW-12 down-gradient	11/10/2015	2.3	150	160	0.59	7.44	290	1,000	< 0.003	0.0016	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	< 0.0002	0.034	0.8139	< 0.0025	< 0.002
	2/16/2016	1.8	130	140	0.52	7.38	220	850	< 0.003	0.0013	0.084	^ < 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.015	< 0.0002	0.031	< 0.407	< 0.0025	< 0.002
	5/25/2016	1.9	130	150	0.54	7.23	250	890	< 0.003	0.0013	0.12	^ < 0.001	< 0.0005	< 0.005	< 0.001	0.00063	0.014	< 0.0002	0.03	0.41	0.0026	< 0.002
	8/10/2016	2.4	170	140	0.49	7.20	280	1000	< 0.003	0.0017	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	0.0006	0.017	< 0.0002	0.04	< 0.426	0.0077	< 0.002
	10/26/2016	2.6	140	120	0.49	7.44	220	980	< 0.003	0.0016	0.11	< 0.001	< 0.0005	0.025	< 0.001	< 0.0005	0.013	< 0.0002	0.036	< 0.664	< 0.0025	< 0.002
	2/1/2017	2.0	160	120	0.48	7.30	150	900	< 0.003	0.0017	0.11	* < 0.001	< 0.0005	< 0.005	< 0.001	0.00065	0.013	< 0.0002	0.023	0.949	< 0.0025	< 0.002
	5/10/2017	2.3	200	240	0.30	7.65	260	1,300	< 0.003	0.0013	0.13	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	< 0.0002	0.029	< 0.464	0.017	< 0.002
	6/27/2017	2.4	180	280	0.44	7.31	260	1,300	< 0.003	0.0014	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.03	0.455	0.0032	< 0.002
	9/6/2017	2.6	190	270	0.49	7.26	260	1,400	< 0.003	0.0017	0.13	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.032	< 0.317	0.0043	< 0.002
	11/15/2017	1.7	55	200	0.47	6.90	250	1,200	< 0.003	0.0054	0.034	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.11	0.434	< 0.0025	< 0.002
	5/3/2018	1.8	140	170	0.47	6.60	170	960	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/2/2018	F1 2.2	150	160	0.49	7.30	170	1,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/29/2019	1.9	140	140	0.42	7.23	190	930	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/5/2019	2.1	140	71	0.53	7.02	110	820	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/22/2020	1.9	180	120	0.4	6.95	140	1,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/3/2020	2.2	160	190	0.52	7.27	160	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/25/2021	1.8	140	170	0.49	7.37	180	930	< 0.003	0.0017	0.14	^1+ < 0.001	< 0.0005	< 0.005	0.001	< 0.00085	0.014	< 0.0002	0.029	DNYA	< 0.0025	< 0.002

Notes: All units are in mg/l except pH is in standard units and radium is in pCi/L.

NA - Not analyzed. No confirmation resample required.

R - Resample

F1 - MS and/or MSD Recovery outside of limits.

Table 9-5. Groundwater Turbidity - Midwest Generation, LLC, Will County Generating Station, Romeoville, IL.

Well ID	Date	Turbidity (NTU)
MW-05	2/23/2021	0.63
	4/10/2021	1.28
	4/25/2021	2.41
	5/24/2021	3.78
	6/11/2021	2.4
	6/28/2021	2.89
	7/12/2021	3.93
	8/4/2021	1.35
	8/24/2021	3.5
	9/24/2021	3.59
MW-06	2/23/2021	0.31
	4/10/2021	11.17
	4/25/2021	15.04
	5/24/2021	5.18
	6/11/2021	2.96
	6/29/2021	4.06
	7/12/2021	6.43
	8/4/2021	3.5
	8/24/2021	7
	9/24/2021	4.2
MW-09	3/1/2021	0.86
	4/10/2021	6.91
	4/25/2021	2.08
	5/25/2021	14.12
	6/11/2021	2.39
	6/29/2021	2.97
	7/12/2021	3.94
	8/4/2021	0
	9/24/2021	3.67
MW-10	2/25/2021	172.14
	4/10/2021	29.99
	4/25/2021	34.77
	5/25/2021	44.14
	6/11/2021	92.03
	6/29/2021	29.35
	7/12/2021	23.45
	8/4/2021	47.68
	8/26/2021	27.5
	9/24/2021	542
MW-11	4/10/2021	269.25
	4/25/2021	60.28
	5/25/2021	9.56
	6/11/2021	77.09
	6/29/2021	7.43
	7/12/2021	39.12
	8/4/2021	9.53
	8/26/2021	11.4
	9/24/2021	9.68
MW-12	4/10/2021	31.67
	4/25/2021	15.04
	5/25/2021	28.65
	6/11/2021	6.1
	6/29/2021	13.04
	7/12/2021	12.99
	8/4/2021	11.97
	8/26/2021	10.9
	9/24/2021	11.97

Table 9-6. Summary of Sample Bottles, Preservation Holding Time, and Analytical Methods. Midwest Generation, LLC, Will County Generating Station, Romeoville, IL.

PARAMETER	ANALYTICAL METHOD	CONTAINER	PRESERVATION	HOLD TIME	METHOD DETECTION LIMIT (MG/L)	Section 845.600(a) Standards
Boron	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.0245	2
Calcium	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.106	NS
Chloride	SM4500 Cl-E	1 L plastic	None, < 6 °C	28 days	1.22	200
Fluoride	SM4500 F-C	1 L plastic	None, < 6 °C	28 days	0.019	4
pH	SM4500 H^+ -B	1 L plastic	None, < 6 °C	immediate *	Field Parameter	6.5 - 9.0 (secondary standard)
Sulfate	SM4500 SO_4 -E	1 L plastic	None, < 6 °C	28 days	2	400
Total Dissolved Solids	SM2400 C	1 L plastic	None, < 6 °C	7 days	6.1	1200
Antimony	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.00101	0.006
Arsenic	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000439	0.01
Barium	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000841	2
Beryllium	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000237	0.004
Cadmium	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.00019	0.005
Chromium	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000608	0.1
Cobalt	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000189	0.006
Lead	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000141	0.0075
Lithium	6010 C	250 mL plastic	HNO_3, < 6 °C	6 months	0.00215	0.04
Mercury	7470 A	250 mL plastic	HNO_3, < 6 °C	28 days	0.0000611	0.002
Molybdenum	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.00162	0.1
Selenium	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000834	0.05
Thallium	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000591	0.002
Radium 226	903.0	1 L plastic	HNO_3	180 days	1 pCi/L	5 pCi/L **
Radium 228	904.0	2 L plastic	HNO_3	180 days	1 pCi/L	5 pCi/L **

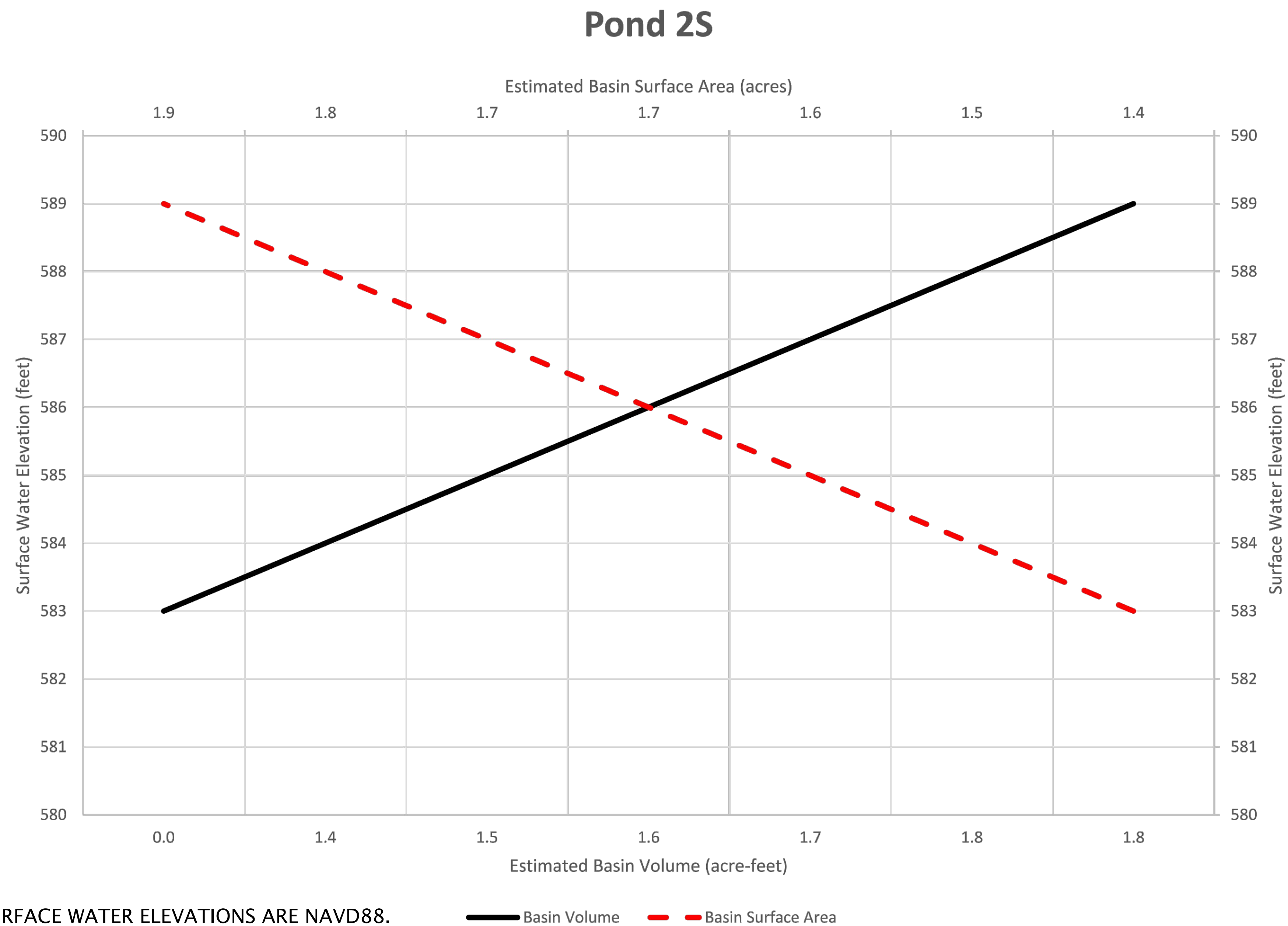
Notes: It is noted that some parameters may be combined with others within the same container.
* - The result for pH is obtained in the field and is not submitted to the laboratory.
** - Combined Radium 226/228
mL - milliliters
L - liters
°C - degrees Celsius
HNO_3 - Nitric Acid
NS- No Standard

Table 9-7. Proposed Site-Specific Groundwater Protection Standards - Will County Station Ponds 2S/3S.

Upgradient Well(s)	Parameter	Section 845.600 Standards	Interwell Background Prediction Limit	**Proposed GWPS**
MW-05 and MW-06	Antimony	0.006	0.003	**0.006**
MW-05 and MW-06	Arsenic	0.01	0.005	**0.01**
MW-06*	Barium*	2.0	0.109	**2.0**
MW-05 and MW-06	Beryllium	0.004	0.001	**0.004**
MW-06*	Boron*	2.0	4.739	**4.739**
MW-05 and MW-06	Cadmium	0.005	0.0005	**0.005**
MW-05 and MW-06*	Chloride*	200	166	**200**
MW-05 and MW-06	Chromium	0.1	0.0005	**0.1**
MW-05 and MW-06	Cobalt	0.006	0.001	**0.006**
MW-05 and MW-06	Combined Radium 226 + 228 (pCi/L)	5.0	0.601	**5.0**
MW-05	Fluoride	4.0	0.820	**4.0**
MW-05 and MW-06	Lead	0.0075	0.0005	**0.0075**
MW-05 and MW-06	Lithium	0.04	0.020	**0.04**
MW-05 and MW-06	Mercury	0.002	0.0002	**0.002**
MW-05	Molybdenum	0.10	0.172	**0.172**
MW-05	pH (standard units)	6.5-9.0	6.7-9.4	**6.5-9.4**
MW-05	Selenium	0.05	0.056	**0.056**
MW-05*	Sulfate*	400	1053	**1053**
MW-05 and MW-06	Thallium	0.002	0.002	**0.002**
MW-06*	Total Dissolved Solids*	1200	988	**1200**
MW-05	Calcium	NE	313.4	**313.4**
MW-05	Turbidity (NTU)	NE	6.33	**6.33**

All values are in mg/L (ppm) unless otherwise noted.
* - Limited to original 8 background samples.
NE - Not Established
Bold - Proposed Site-specific Groundwater Protection Standard based on Section 845.600(a)(2)

OPERATING PERMIT FIGURES



NOTES:

1. SURFACE WATER ELEVATIONS ARE NAVD88.
2. BASIN VOLUMES ARE ESTIMATED BASED ON AS-BUILT INFORMATION AND 2008 SITE TOPOGRAPHY.
3. AREA-CAPACITY CURVE CREATED BY KPRG AND ASSOCIATES, INC. AS PART OF COMPLETING THE OPERATING PERMIT N ACCORDANCE WITH TITLE 35 PART 845.

ENVIRONMENTAL CONSULTATION & REMEDIATION

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KPRG and Associates, inc.

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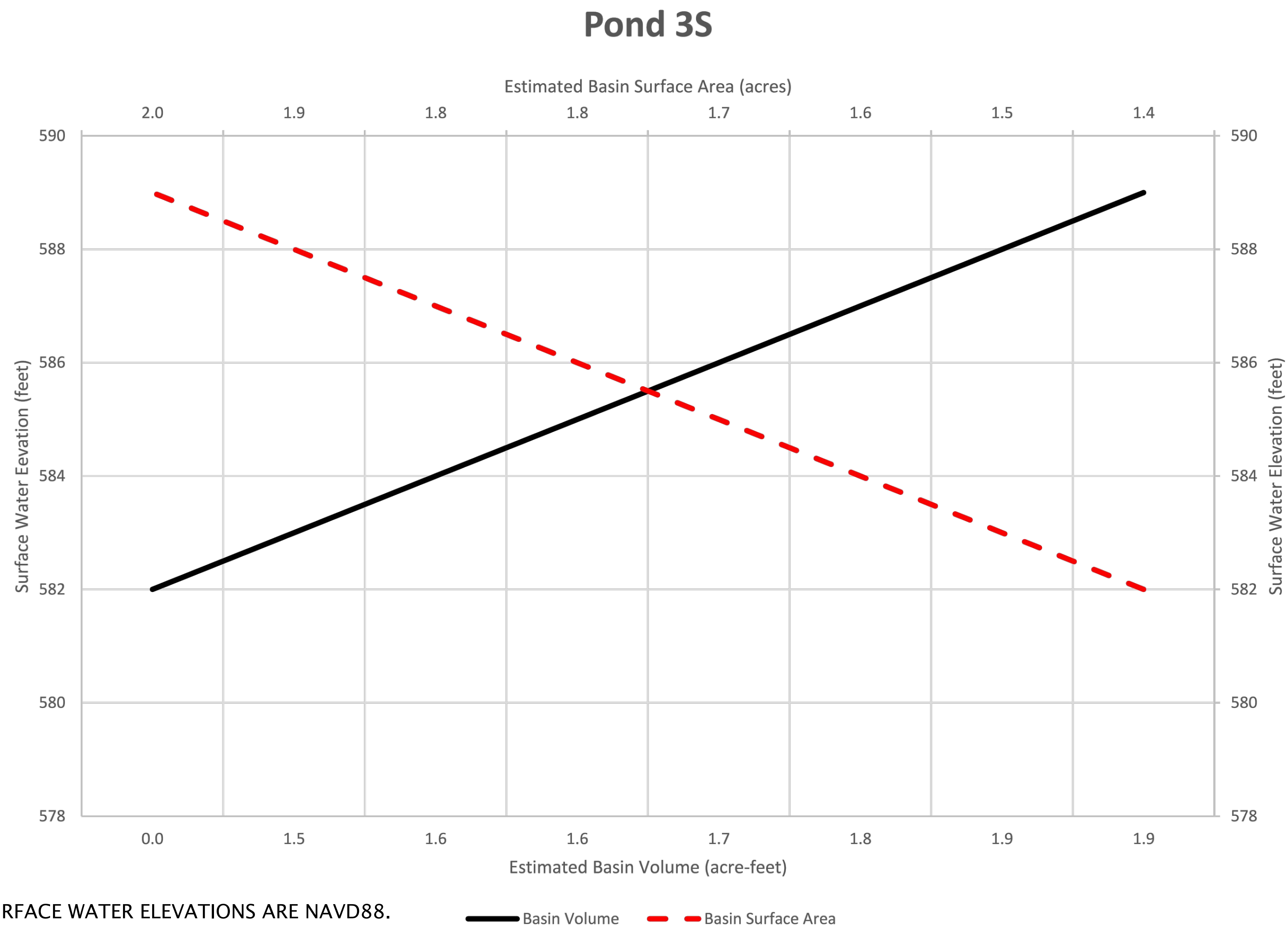
414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

POND 2S AREA-CAPACITY CURVE

WILL COUNTY STATION
ROMEOVILLE, ILLINOIS

Scale: NTS	Date: October 14, 2021
KPRG Project No. 19520.3	FIGURE 1-1



NOTES:

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POND 3S AREA-CAPACITY CURVE

WILL COUNTY STATION
ROMEOVILLE, ILLINOIS

Scale: NTS	Date: October 14, 2021
KPRG Project No. 19520.3	FIGURE 1-2

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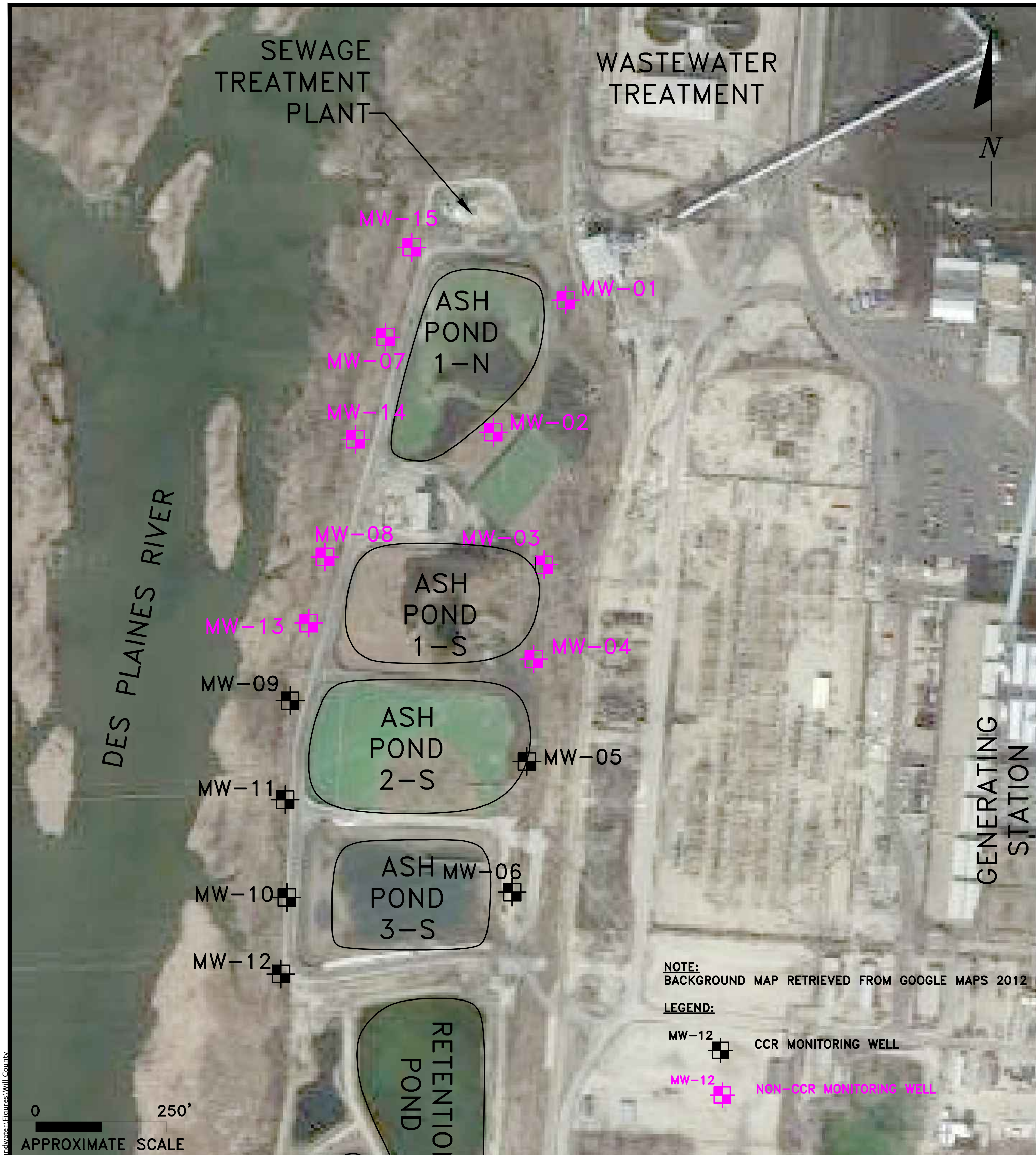

E N V I R O N M E N T A L C O N S U L T A T I O N & R E M E D I A T I O N

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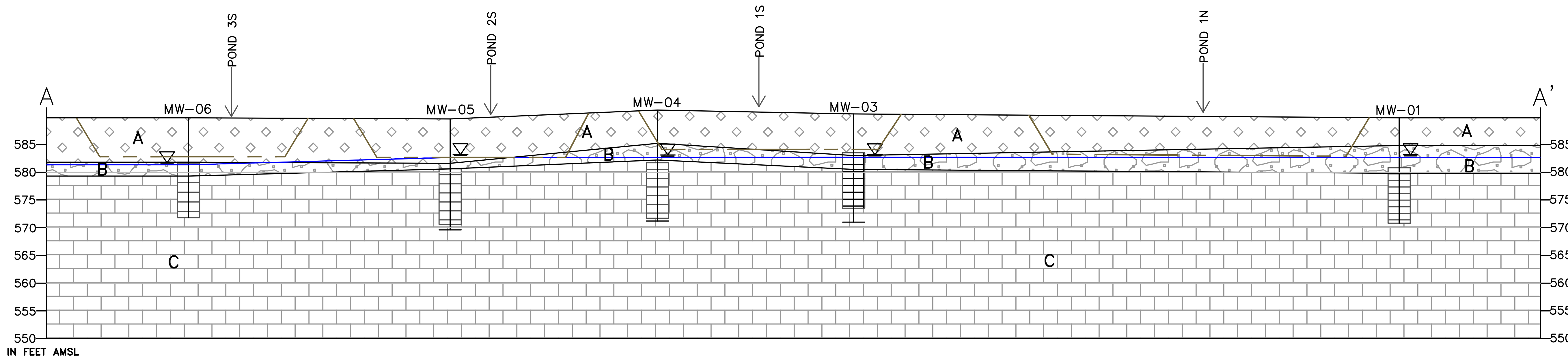
CCR MONITORING WELL LOCATIONS

WILL COUNTY STATION
ROMEOVILLE, ILLINOIS

Scale: 1" = 250'	Date: August 27, 2021
KPRG Project No. 19520.3	FIGURE 9-1



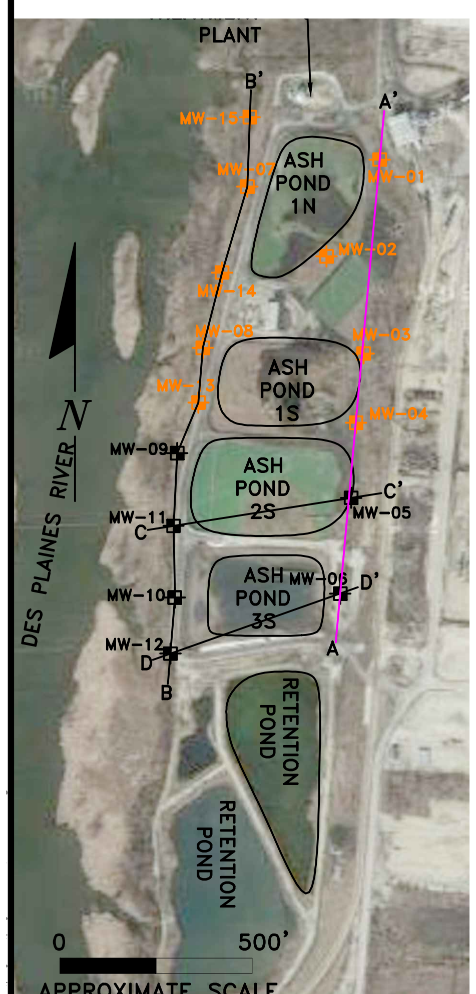
FILL: CONSISTING OF BROWN AND BLACK SILTY CLAY AND SILTY SAND MIXED WITH GRAVEL AND CRUSHED LIMESTONE. THE FILL MAY INCLUDE COAL, BLACK CINDERS AND SLAG.

SILTY SAND, SILT AND CLAY: CONSISTING OF GRAVELLY TAN TO BROWN SILTY SAND FINING DOWNWARD TO GRAY/GREENISH MOTTLED SILTY CLAYS AND CLAY.

BEDROCK: DOLIMTE BEDROCK. TOP OF WEATHERED BEDROCK IS GENERALLY ENCOUNTERED BETWEEN 9 FEET AND GREATER THAN 20 FEET BELOW GROUND SURFACE WITH DEPTH INCREASING TOWARDS THE SOUTHWEST. IT IS NOTED THAT AT MONITORING WELL LOCATION MW-12, TOP OF BEDROCK WAS NOT ENCOUNTERED AT THE TERMINUS OF THE BORING AT 20 FEET BELOW GROUND SURFACE.

WATER LEVEL (5/21)

PROJECTED POND OUTLINE



20'
100'
0
APPROXIMATE SCALE

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG

KPRG and Associates, inc.

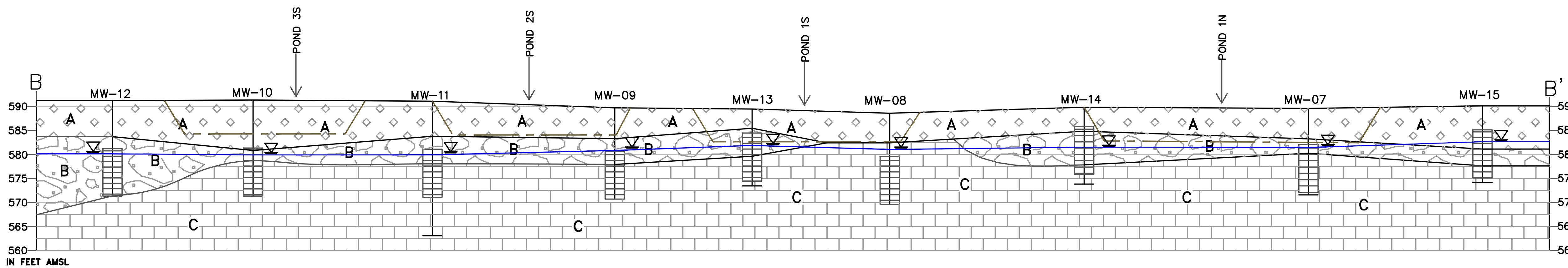
14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

CROSS SECTION A-A'

WILL COUNTY STATION
ROMEOVILLE, ILLINOIS

SEE SCALE	Date: August 23, 2021
KPRG Project No. 19520.3	FIGURE 9-2



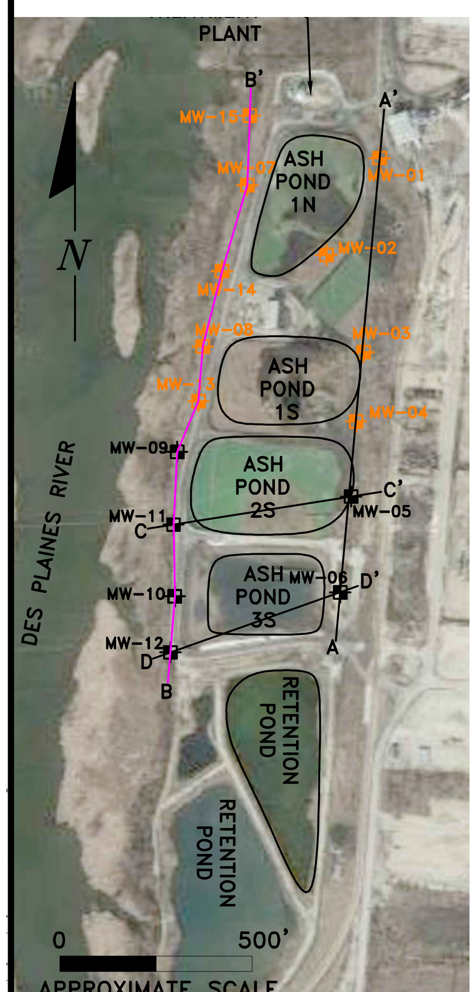
FILL: CONSISTING OF BROWN AND BLACK SILTY CLAY AND SILTY SAND MIXED WITH GRAVEL AND CRUSHED LIMESTONE. THE FILL MAY INCLUDE COAL, BLACK CINDERS AND SLAG.

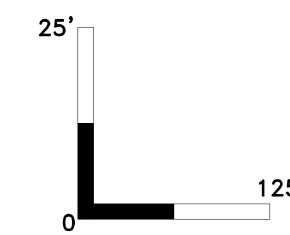
SILTY SAND, SILT AND CLAY: CONSISTING OF GRAVELLY TAN TO BROWN SILTY SAND FINING DOWNWARD TO GRAY/GREENISH MOTTLED SILTY CLAYS AND CLAY.

BEDROCK: DOLIMTE BEDROCK. TOP OF WEATHERED BEDROCK IS GENERALLY ENCOUNTERED BETWEEN 9 FEET AND GREATER THAN 20 FEET BELOW GROUND SURFACE WITH DEPTH INCREASING TOWARDS THE SOUTHWEST. IT IS NOTED THAT AT MONITORING WELL LOCATION MW-12, TOP OF BEDROCK WAS NOT ENCOUNTERED AT THE TERMINUS OF THE BORING AT 20 FEET BELOW GROUND SURFACE.

WATER LEVEL (5/21)

PROJECTED POND OUTLINE





ENVIRONMENTAL CONSULTATION & REMEDIATION

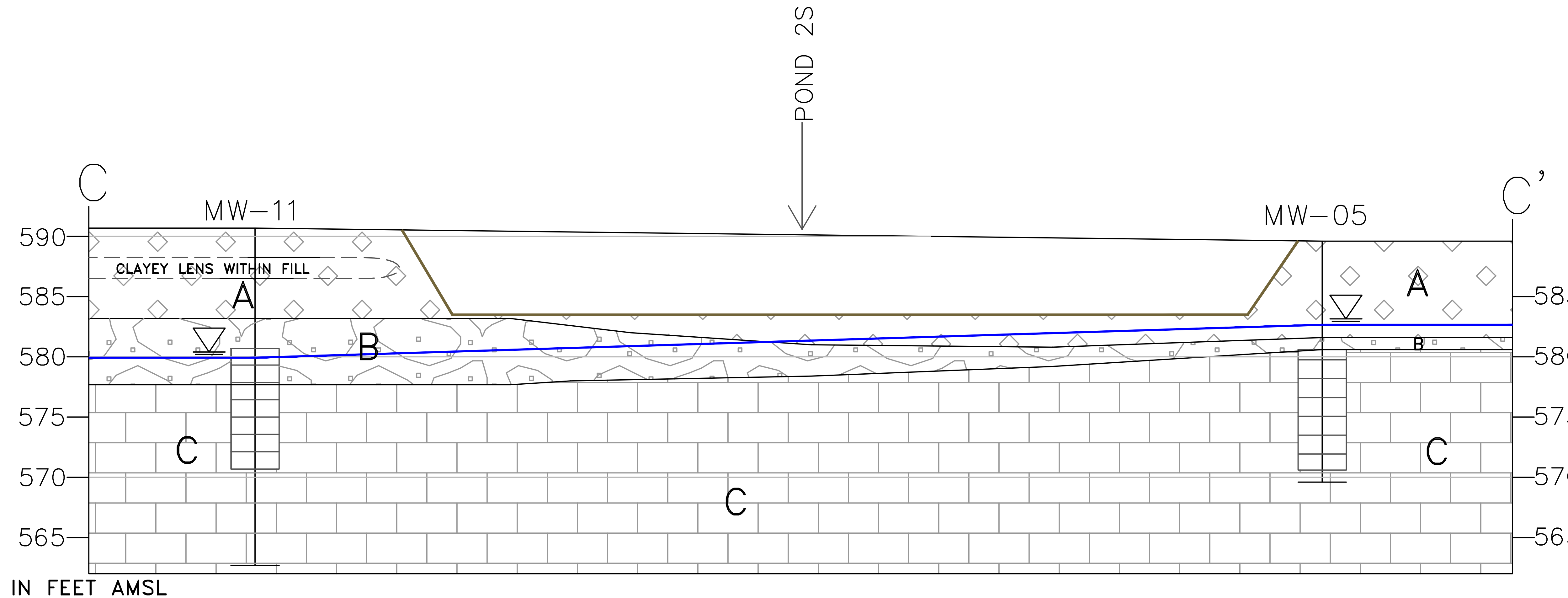
KPRG

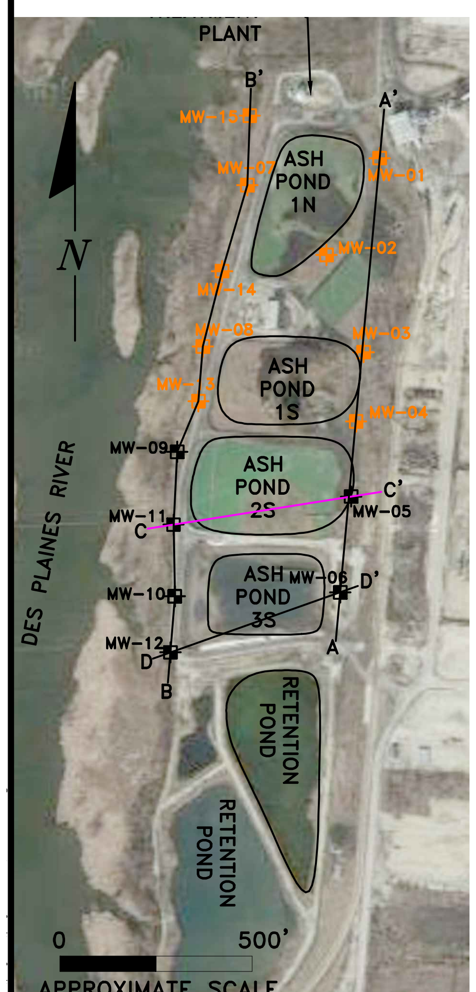
KPRG and Associates, inc.

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

CROSS SECTION B-B'	
WILL COUNTY STATION ROMEOVILLE, ILLINOIS	
SEE SCALE	Date: August 24, 2021
KPRG Project No. 19520.3	FIGURE 9-3





A — FILL: CONSISTING OF BROWN AND BLACK SILTY CLAY AND SILTY SAND MIXED WITH GRAVEL AND CRUSHED LIMESTONE. THE FILL MAY INCLUDE COAL, BLACK CINDERS AND SLAG.

B — SILTY SAND, SILT AND CLAY: CONSISTING OF GRAVELLY TAN TO BROWN SILTY SAND FINING DOWNWARD TO GRAY/GREENISH MOTTLED SILTY CLAYS AND CLAY.

C — BEDROCK: DOLIMTE BEDROCK. TOP OF WEATHERED BEDROCK IS GENERALLY ENCOUNTERED BETWEEN 9 FEET AND GREATER THAN 20 FEET BELOW GROUND SURFACE WITH DEPTH INCREASING TOWARDS THE SOUTHWEST. IT IS NOTED THAT AT MONITORING WELL LOCATION MW-12, TOP OF BEDROCK WAS NOT ENCOUNTERED AT THE TERMINUS OF THE BORING AT 20 FEET BELOW GROUND SURFACE.

WATER LEVEL (5/21)

POND OUTLINE

10'

50'

0

APPROXIMATE SCALE

ENVIRONMENTAL CONSULTATION & REMEDIATION

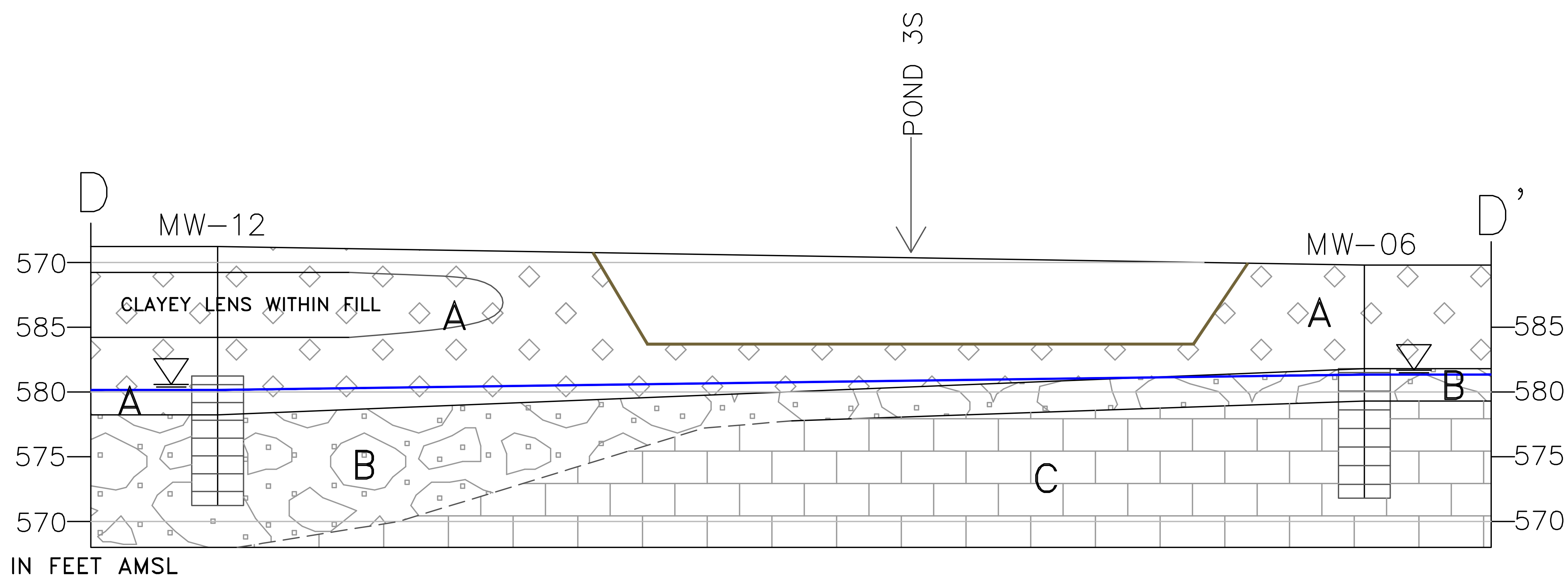
KPRG

KPRG and Associates, inc.

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

CROSS SECTION C-C'	
WILL COUNTY STATION ROMEOVILLE, ILLINOIS	
SEE SCALE	Date: August 23, 2021
KPRG Project No. 19520.3	FIGURE 9-4



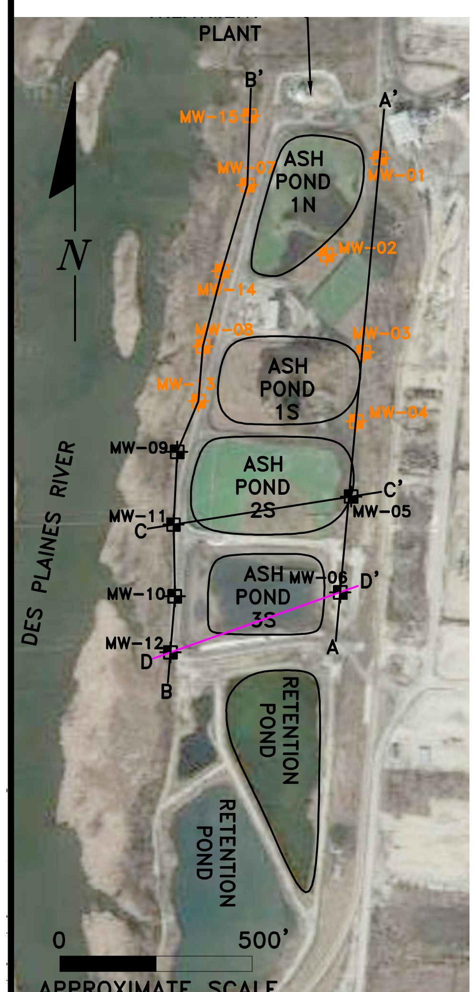
FILL: CONSISTING OF BROWN AND BLACK SILTY CLAY AND SILTY SAND MIXED WITH GRAVEL AND CRUSHED LIMESTONE. THE FILL MAY INCLUDE COAL, BLACK CINDERS AND SLAG.

SILTY SAND, SILT AND CLAY: CONSISTING OF GRAVELLY TAN TO BROWN SILTY SAND FINING DOWNWARD TO GRAY/GREENISH MOTTLED SILTY CLAYS AND CLAY.

BEDROCK: DOLIMTE BEDROCK. TOP OF WEATHERED BEDROCK IS GENERALLY ENCOUNTERED BETWEEN 9 FEET AND GREATER THAN 20 FEET BELOW GROUND SURFACE WITH DEPTH INCREASING TOWARDS THE SOUTHWEST. IT IS NOTED THAT AT MONITORING WELL LOCATION MW-12, TOP OF BEDROCK WAS NOT ENCOUNTERED AT THE TERMINUS OF THE BORING AT 20 FEET BELOW GROUND SURFACE.

WATER LEVEL (5/21)

POND OUTLINE



10'
0
50'
APPROXIMATE SCALE

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG

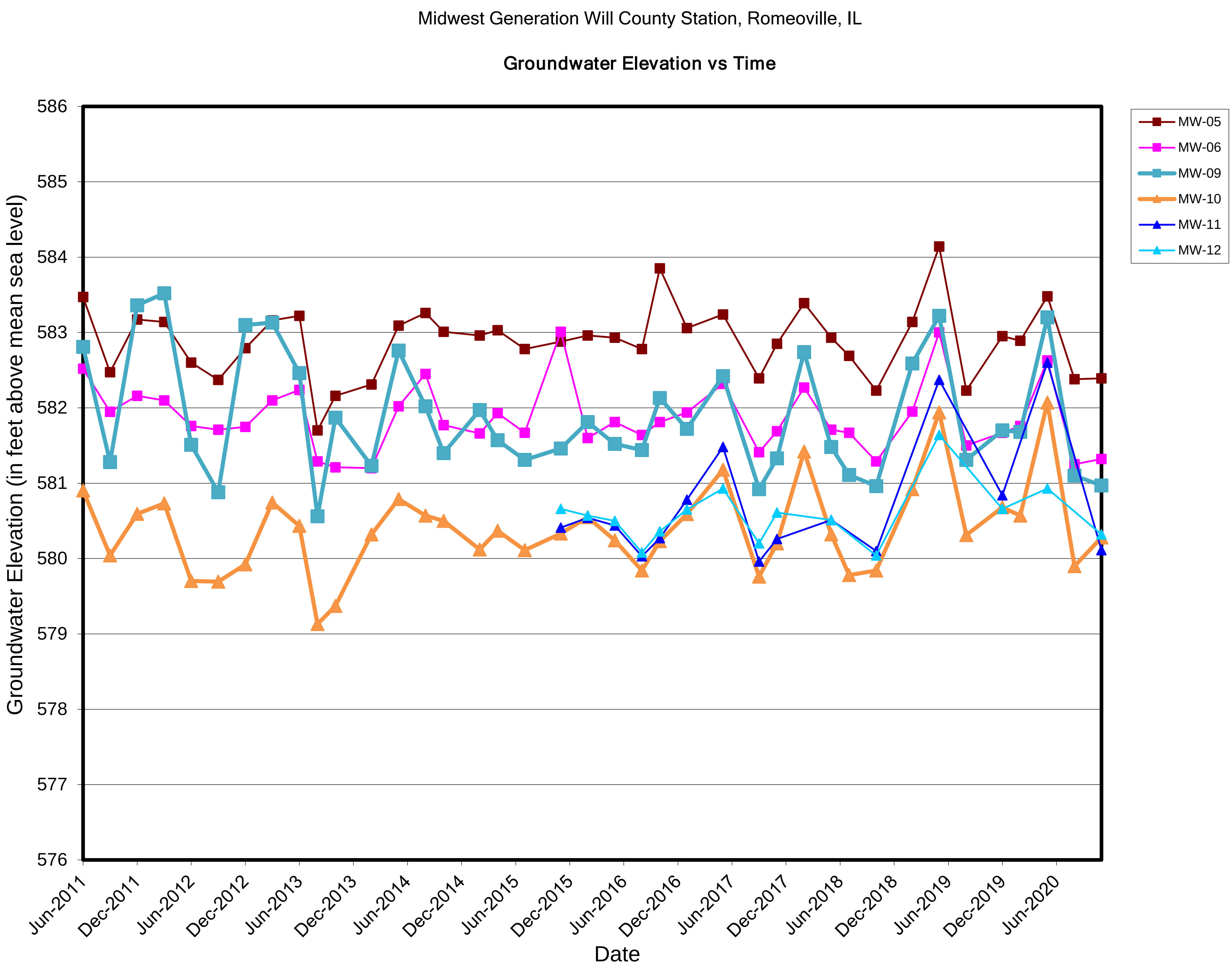
KPRG and Associates, inc.

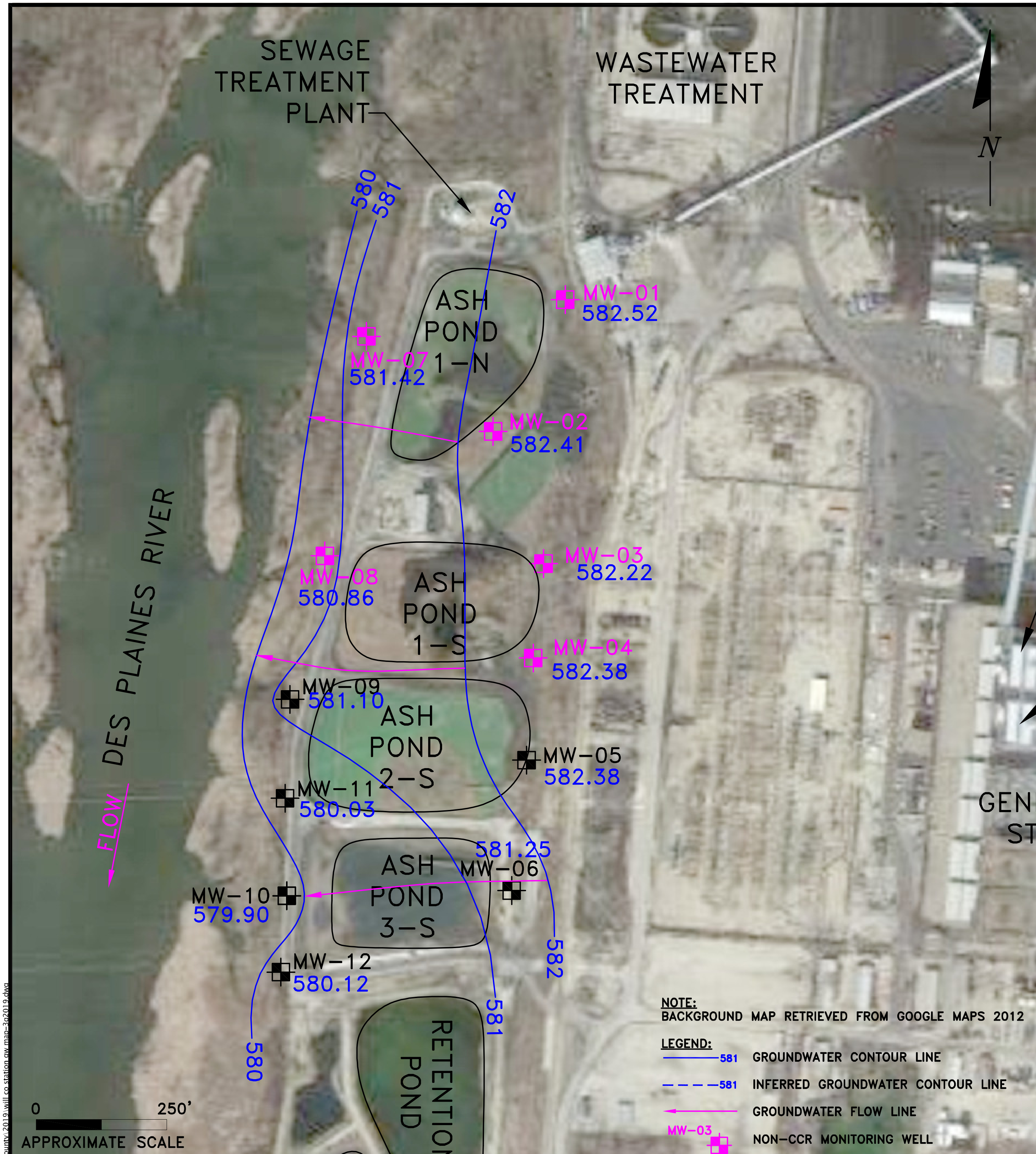
14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

CROSS SECTION D-D'	
WILL COUNTY STATION ROMEOVILLE, ILLINOIS	
SEE SCALE	Date: August 23, 2021
KPRG Project No. 19520.3	FIGURE 9-5

Figure 9-6.


Midwest Generation Will County Station, Romeoville, IL
Groundwater Elevation vs Time
Groundwater Elevation (in feet above mean sea level)
586
585
584
583
582
581
580
579
578
577
576
Jun-2011
Dec-2011
Jun-2012
Dec-2012
Jun-2013
Dec-2013
Jun-2014
Dec-2014
Jun-2015
Dec-2015
Jun-2016
Dec-2016
Jun-2017
Dec-2017
Jun-2018
Dec-2018
Jun-2019
Dec-2019
Jun-2020
Date
MW-05
MW-06
MW-09
MW-10
MW-11
MW-12



E N V I R O N M E N T A L   C O N S U L T A T I O N & R E M E D I A T I O N

K P R G

KPRG and Associates, inc.

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

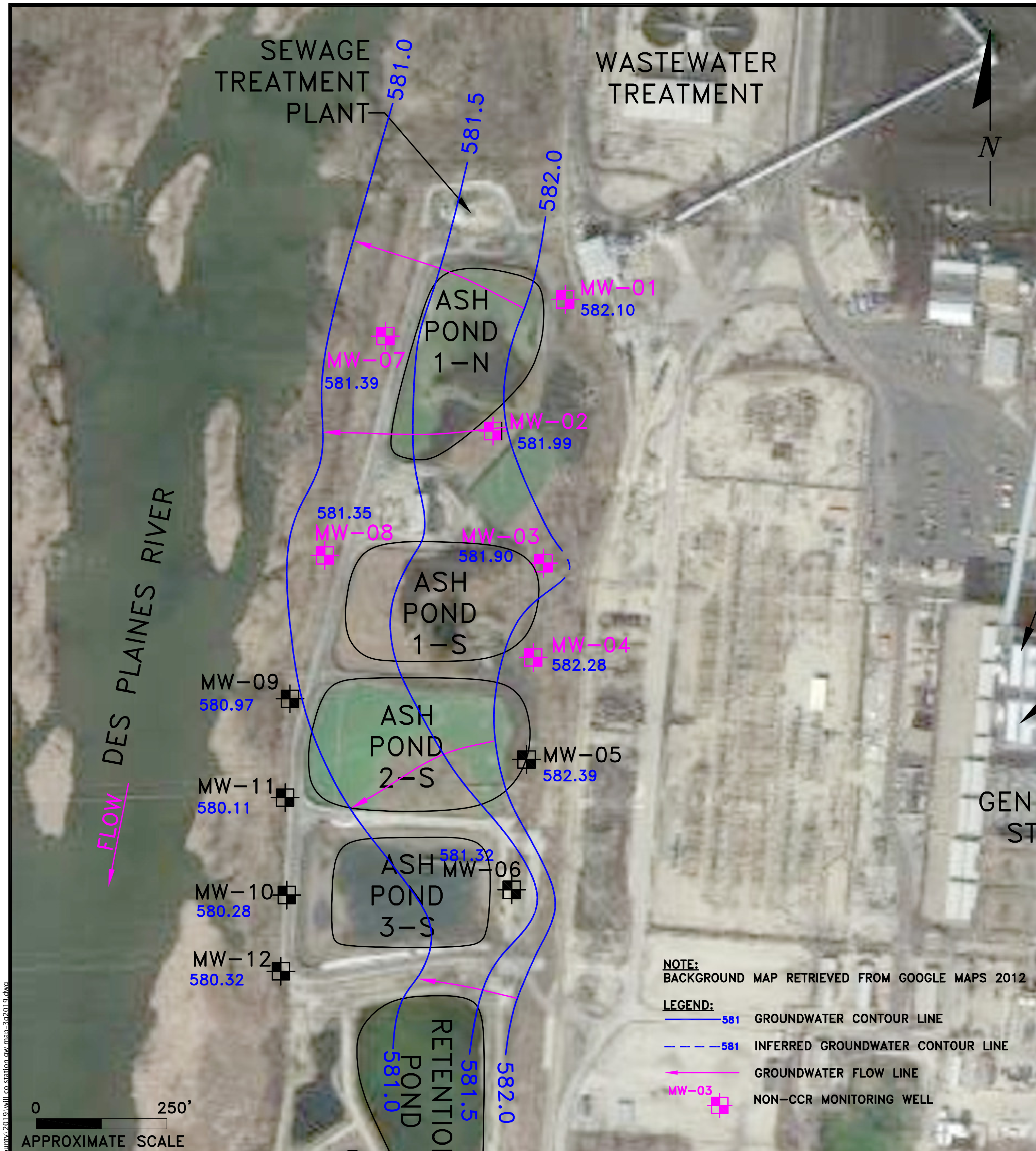
414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

GROUNDWATER CONTOUR MAP 08/2020

WILL COUNTY STATION
ROMEOVILLE, ILLINOIS

Scale: 1" = 250'	Date: September 04, 2020
KPRG Project No. 12313.3	FIGURE 9-7

W:\projects\midwest generation\12313\figures\will county\2019\will co station gw map-3q2019.dwg



E N V I R O N M E N T A L C O N S U L T A T I O N & R E M E D I A T I O N

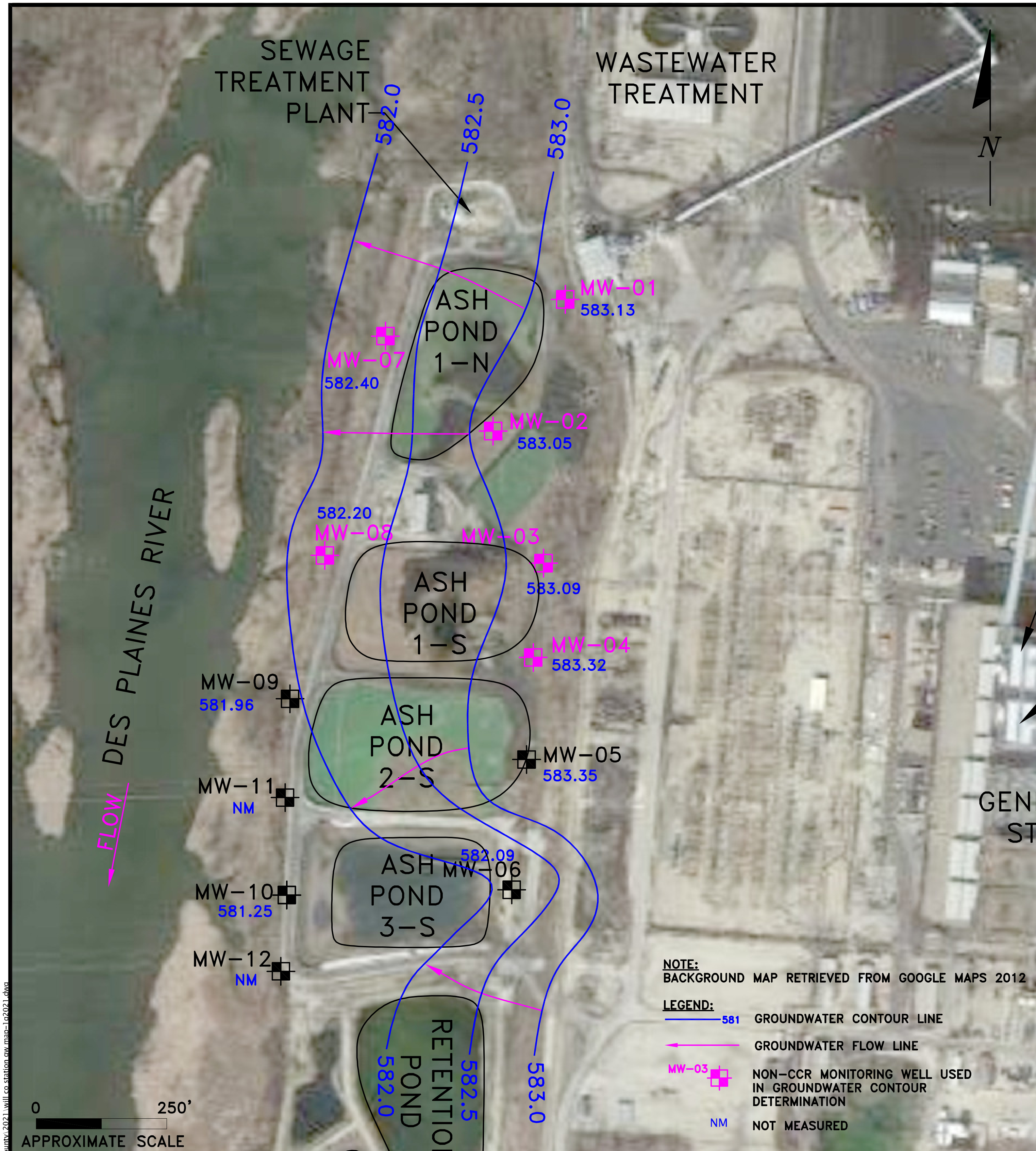
K P R G

KPRG and Associates, inc.

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

PROPOSED NEW CCR WELL LOCATIONS	
WILL COUNTY STATION ROMEOVILLE, ILLINOIS	
Scale: 1" = 250'	Date: March 12, 2021
KPRG Project No. 19520.3	FIGURE 9-8



ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG

KPRG and Associates, inc.

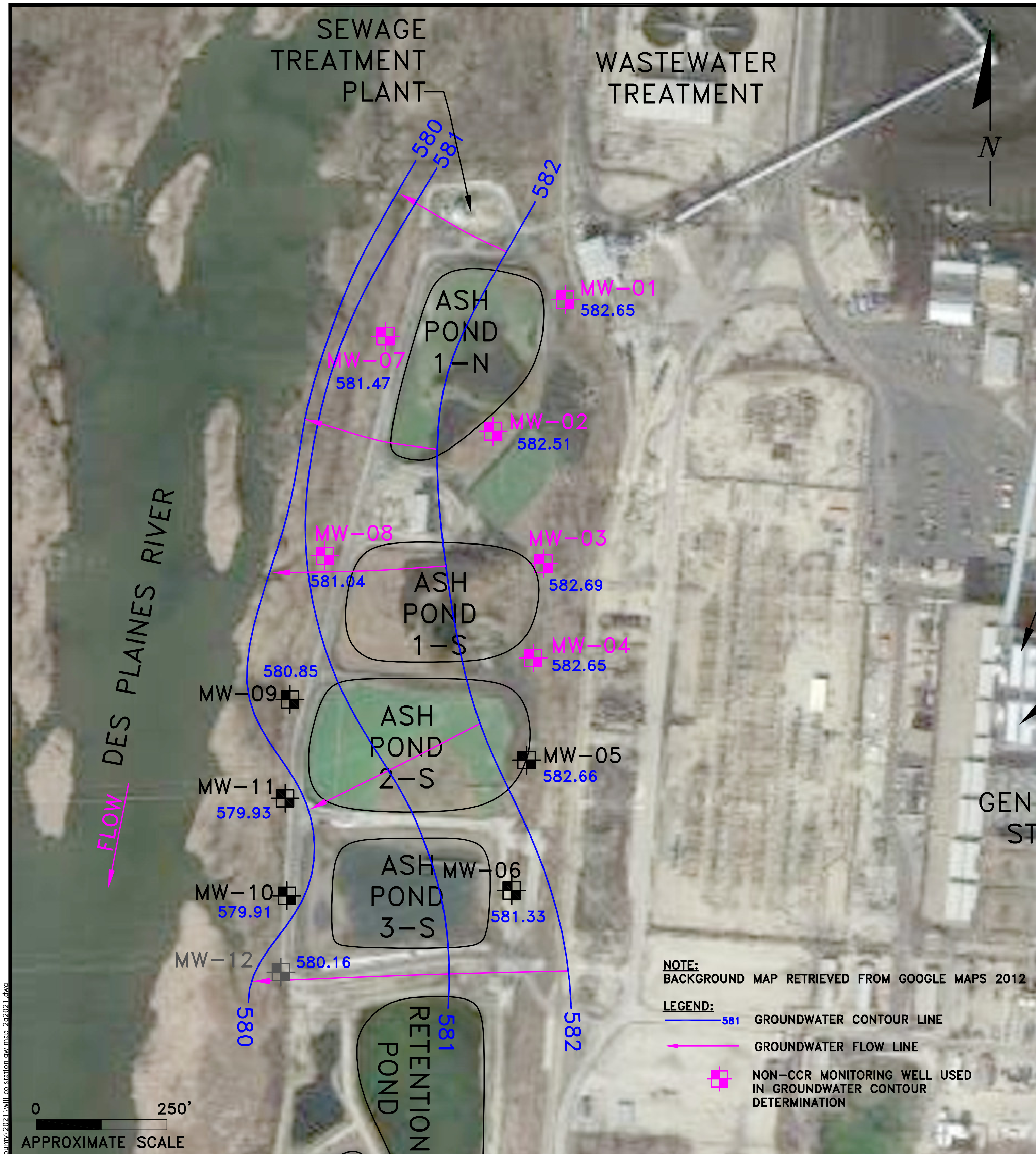
14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

GROUNDWATER CONTOUR MAP 3/2021

WILL COUNTY STATION
ROMEOVILLE, ILLINOIS

Scale: 1" = 250'	Date: April 2, 2021
KPRG Project No. 12313.3	FIGURE 9-9



ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG

KPRG and Associates, inc.

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

GROUNDWATER CONTOUR MAP 7/2021	
WILL COUNTY STATION ROMEOVILLE, ILLINOIS	
Scale: 1" = 250'	Date: July 14, 2021
KPRG Project No. 12313.3	FIGURE 9-10

W:\c-p&p\projects\midwest generation\ash pond issues\eluc & gmz\will co station gmz.dwg(proposed gmz)

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG

KPRG and Associates, inc.

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

14665 West Lisbon Road, Suite 2B Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

GROUNDWATER MANAGEMENT ZONE

WILL COUNTY STATION
ROMEOVILLE, ILLINOIS

Scale: 1" = 500'	Date: August 27, 2021
KPRG Project No. 18311.41	FIGURE 9-11

LEGEND

SITE BOUNDARY
WATER WELLS
40020 SHORT API WELL ID
300 TOTAL DEPTH

0 800'
APPROXIMATE SCALE

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG

KPRG and Associates, inc.

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

2500' RADIUS POTABLE WELLS MAP

WILL COUNTY GENERATING STATION
ROMEOVILLE, ILLINOIS

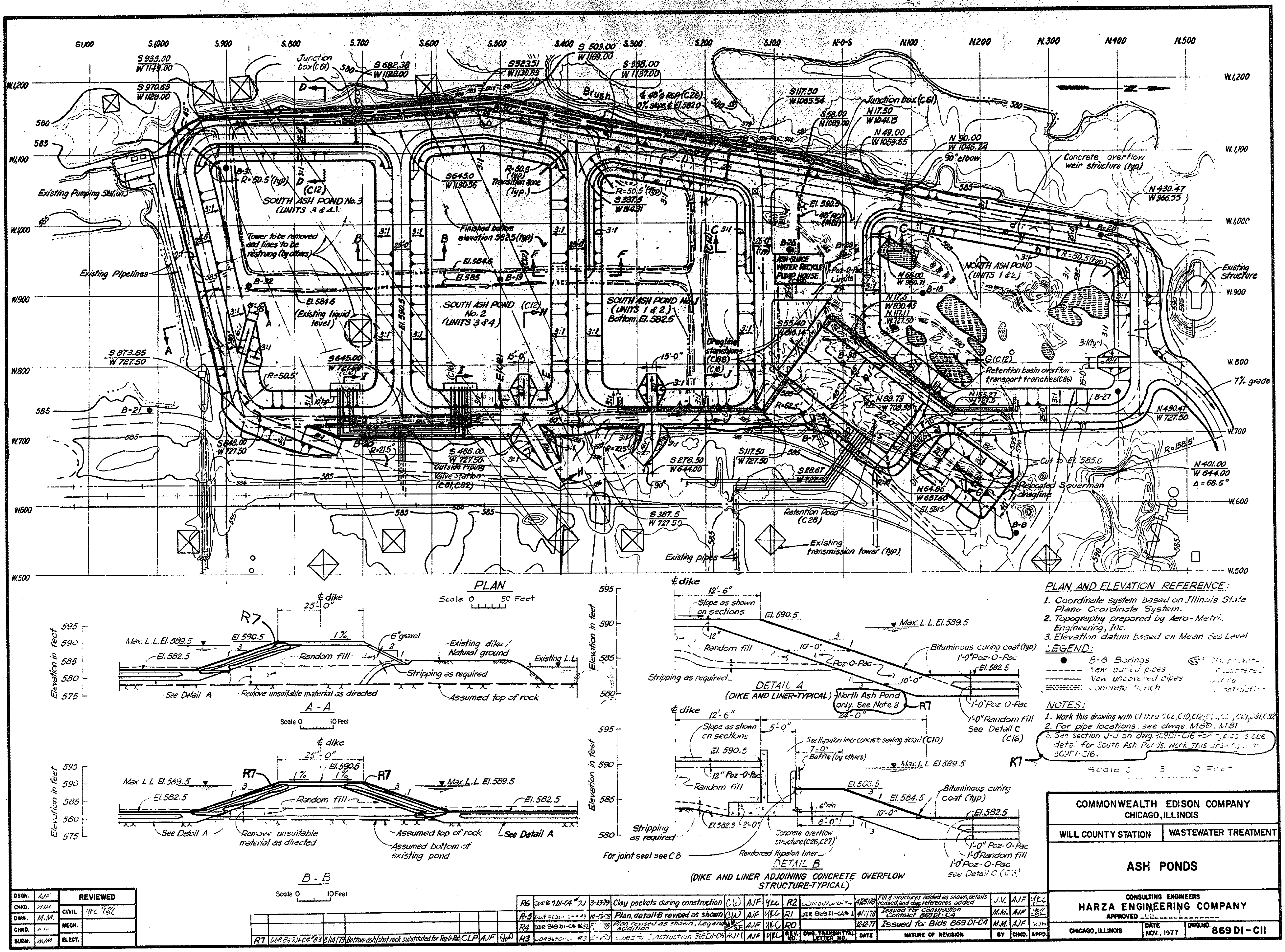
Scale: 1" = 800'	Date: August 25, 2021
KPRG Project No. 19520.3	FIGURE 9-12

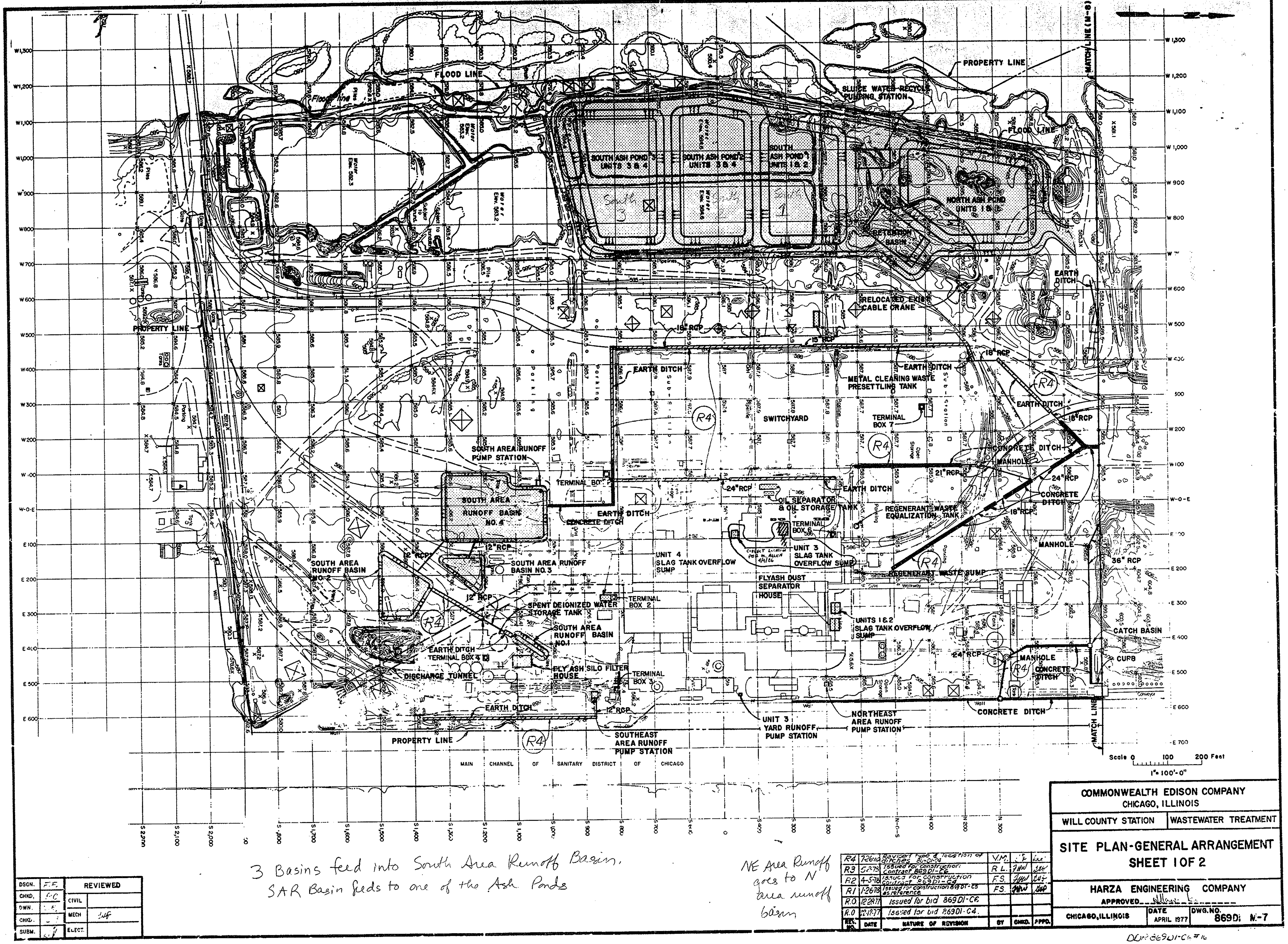
W:\projects\project folder\file name.dwg

OPERATING PERMIT ATTACHMENTS

ATTACHMENT 1
HISTORY OF CONSTRUCTION

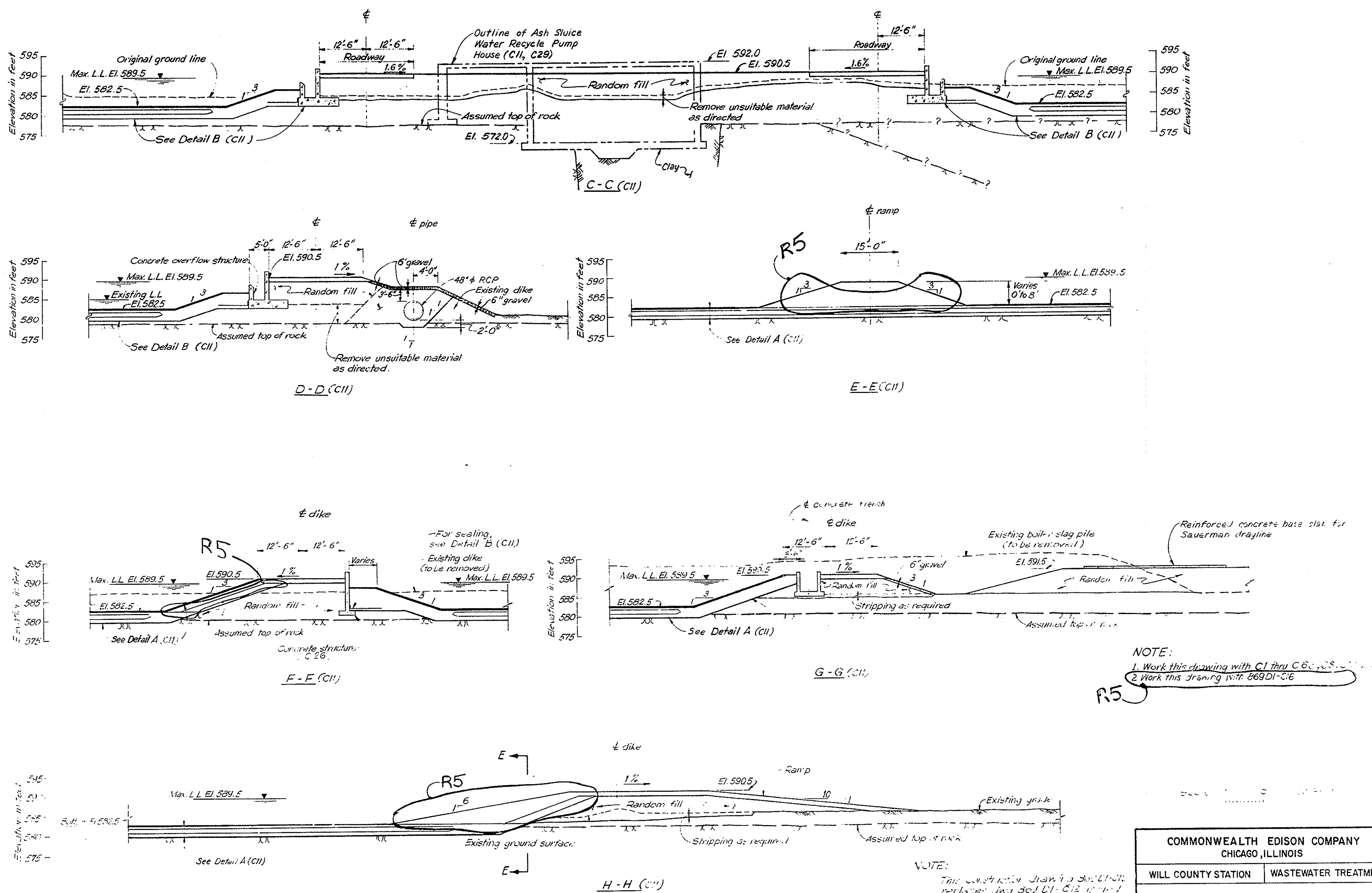
Attachment 1-1 – Harza Construction Drawings


SOUTH ASH POND No. 3 (UNITS 3 & 4)
SOUTH ASH POND No. 2 (UNITS 3 & 4)
SOUTH ASH POND No. 1 (UNITS 1 & 2) Bottom El. 582.5
NORTH ASH POND (UNITS 1 & 2)
Existing Pumping Station
Existing Pipelines
Tower to be removed and lines to be restrung (by others)
Finished bottom elevation 582.5 (typ)
Concrete overflow weir structure (typ)
Retention basin overflow transport trenches (C86)
Relocated Sauerman dragline
Retention Pond (C28)
Existing transmission tower (typ)
Existing pipes
Outside Piping Valve Station (C81, C82)
Junction box (C61)
ASH SLUICE WATER RECYCLE PUMP HOUSE
Existing Structure
7% grade
PLAN
Scale 0 50 Feet
A - A
Scale 0 10 Feet
B - B
Scale 0 10 Feet
DETAIL A
(DIKE AND LINER-TYPICAL)
DETAIL B
(DIKE AND LINER ADJOINING CONCRETE OVERFLOW STRUCTURE-TYPICAL)
PLAN AND ELEVATION REFERENCE:
1. Coordinate system based on Illinois State Plane Coordinate System.
2. Topography prepared by Aero-Metric Engineering, Inc.
3. Elevation datum based on Mean Sea Level
LEGEND:
B-8 Borings
New buried pipes
New uncovered pipes
Concrete trench
NOTES:
1. Work this drawing with C1 thru C6c, C10, C12, C...
2. For pipe locations, see dwgs. M80, M81
3. See section J-J on dwg. 869DI-C16 for typical slope details for South Ash Ponds. Work this drawing with 869DI-C16.
COMMONWEALTH EDISON COMPANY
CHICAGO, ILLINOIS
WILL COUNTY STATION
WASTEWATER TREATMENT
ASH PONDS
CONSULTING ENGINEERS
HARZA ENGINEERING COMPANY
CHICAGO, ILLINOIS
DATE NOV., 1977
DWG. NO. 869 DI-C11
R7 Bottom ash/shot rock substituted for Poz-O-Pac
R6 Clay pockets during construction
R5 Plan, detail B revised as shown
R4 Plan revised as shown, Legend addition
R3 Issued for Construction 869DI-C6
R2 Fill & structures added as shown, details revised and dwg. references added
R1 Issued for construction Contract 869DI-C4
R0 Issued for Bids 869 DI-C4
NATURE OF REVISION



3 Basins feed into South Area Runoff Basin.
SAR Basin feeds to one of the Ash Ponds

NE Area Runoff goes to N area runoff basin



NOTE:

REV. NO.	DWG. TRANSMITTAL LETTER NO.	DATE	NATURE OF REVISION	BY	CHKD.	APPD.
R5		8/14/79	Bottom ash/crushed rock substituted for Poz-O-Pac	CLP	AJF	
R4			Sect. C-C, E-E & H-H revised	JLW	AJF	
R3	DLF	8/25/78	Sect. C-C, D-D, E-E, G-G & H-H revised	S.F.	AJF	
R2		4/25/78	Sections F-F and D-D revised	J.V.	AJF	
R1		4.5	Issued for Construction Contract 869 DI-C4		AJF	
R0		12-12-77	Issued for Bids 869 DI-C4		AJF	

DSGN	AJF	REVIEWED
CHKE	WM	
DWN	M.M.	MECH
CHKD.		
SUBM.		ELECT

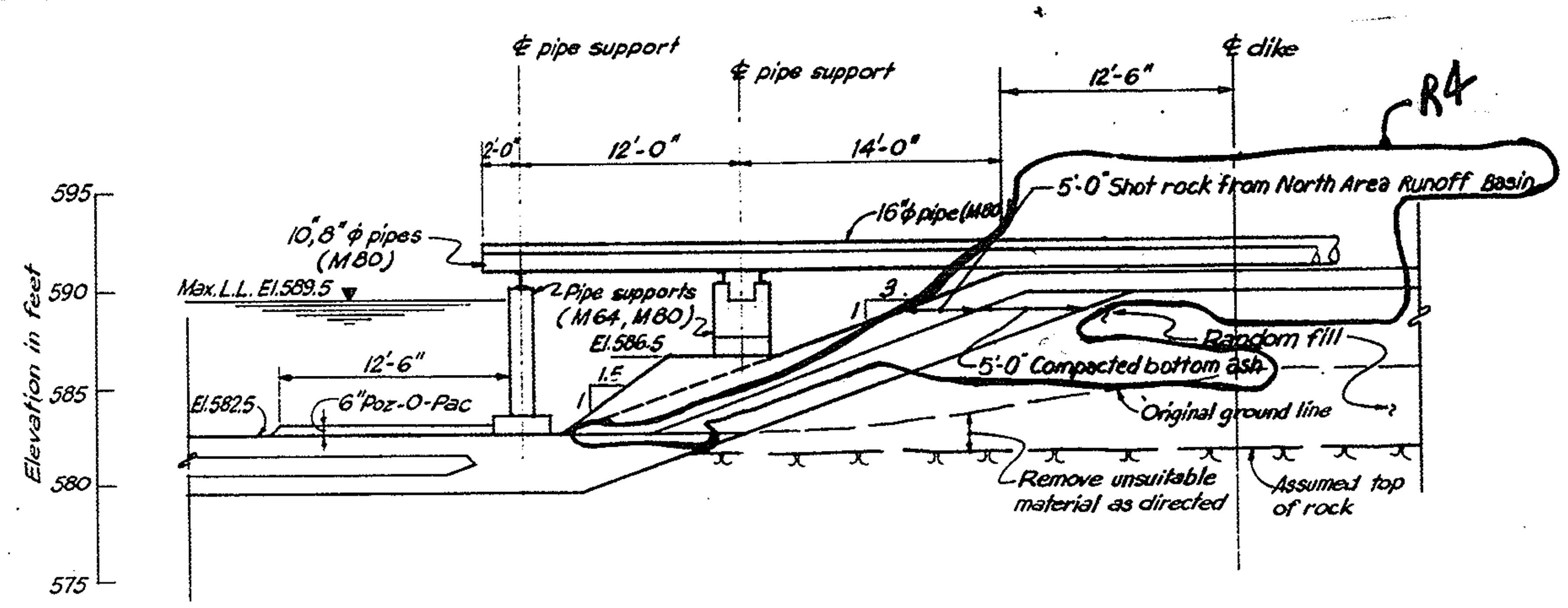
COMMONWEALTH EDISON COMPANY
CHICAGO, ILLINOIS

WILL COUNTY STATION | WASTEWATER TREATMENT

ASH POND SECTIONS

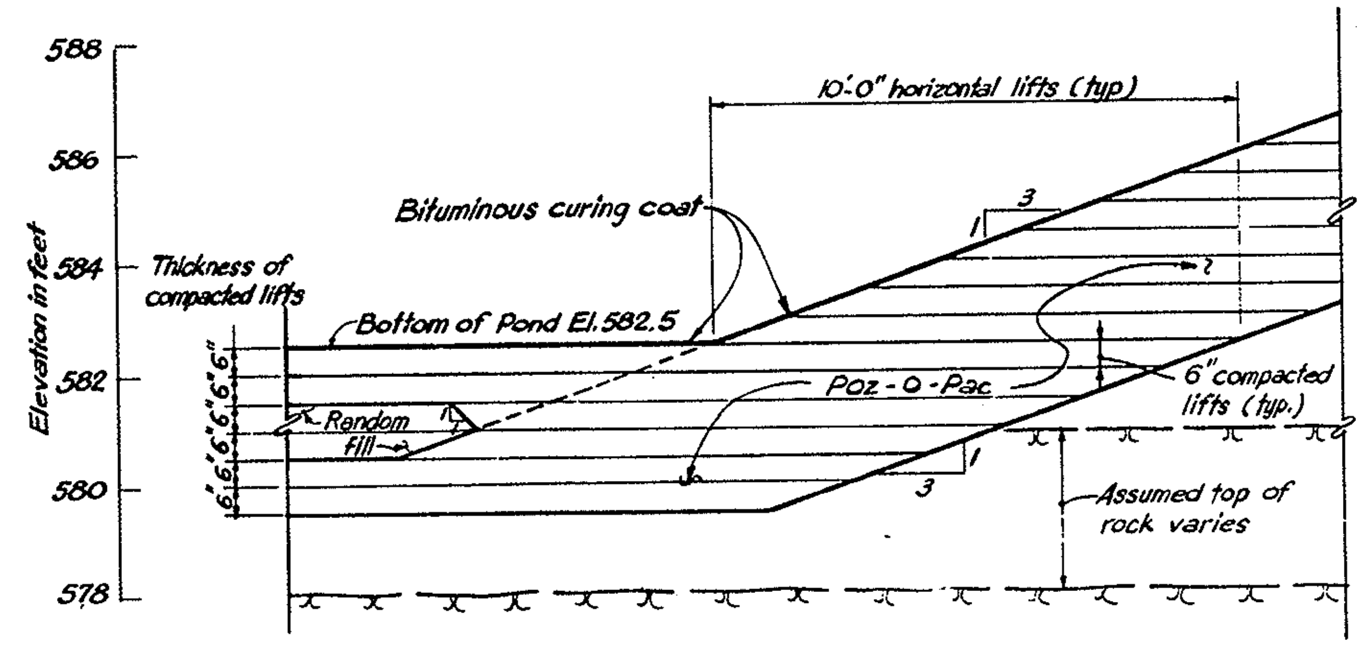
CONSULTING ENGINEERS
HARZA ENGINEERING COMPANY
APPROVED

CHICAGO, ILLINOIS | DATE NOV., 1977 | DWG.NO. 869-DI-C12



I - I (C11)

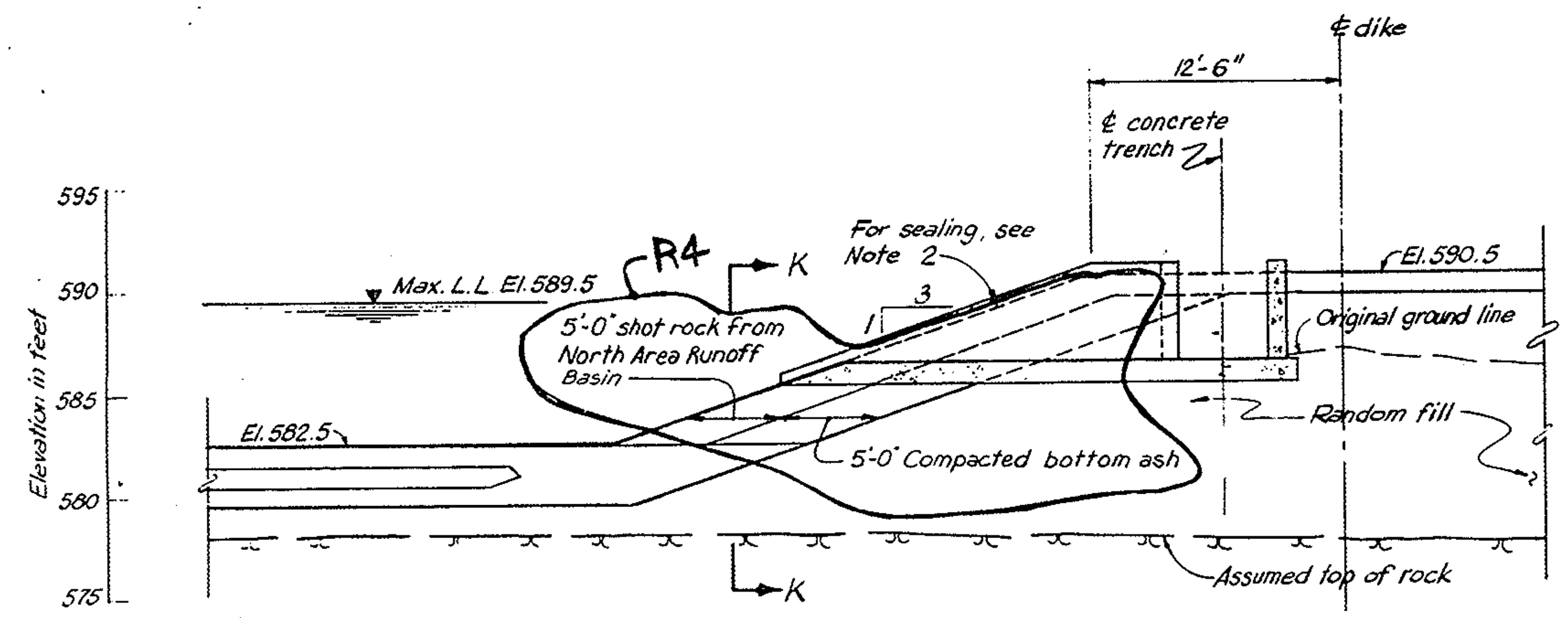
Scale 0 5 Feet



DETAIL C

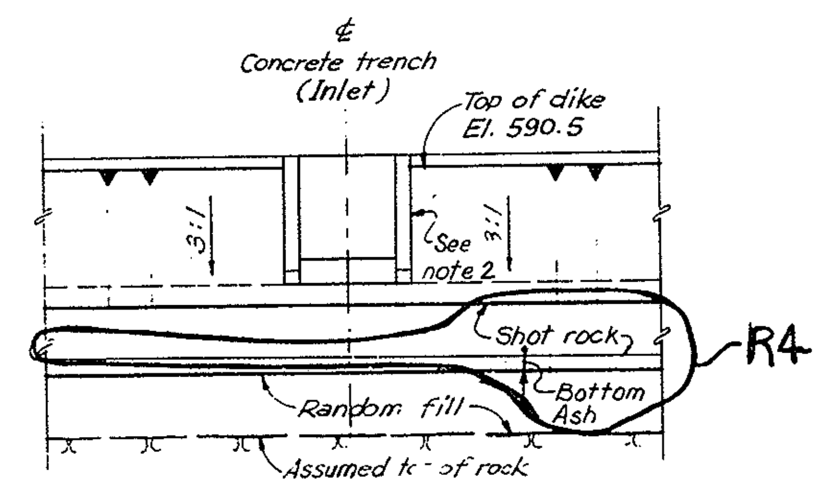
(POZ-O-PAC PLACEMENT IN ASH POND)

Scale 0 2 Feet



J - J (C11)

Scale 0 5 Feet



K - K

Scale 0 5 Feet

NOTES:

1. Work this drawing with C1 thru C6c, C11 and C14.
2. Apply joint sealant as directed by the Owners Representative, at concrete/Poz-O-Pac joints.

DSGN.	AJF	REVIEWED	
CHKD		CIVIL	
DWN.		MECH.	
CHKD.	AJF	ELECT.	
SUBM.			

REV. NO.	DWG. TRANSMITTAL LETTER NO.	DATE	NATURE OF REVISION	BY	CHKD.	APPD.
R4	DLR 869 DI-C4 #33	8/14/79	Bottom ash/shot rock substituted for Poz-O-Pac.	CLP	AJF	
R3	DDR 869 DI-C4 #32	8/25/78	Sections and details revised as shown	M.M.	AJF	
R2	DDR 869 DI-C4 #4	4/25/78	Details and sections revised as shown	J.V.	AJF	
R1		4/5/78	Issued for construction Contract 869 DI-C4	M.M.	AJF	

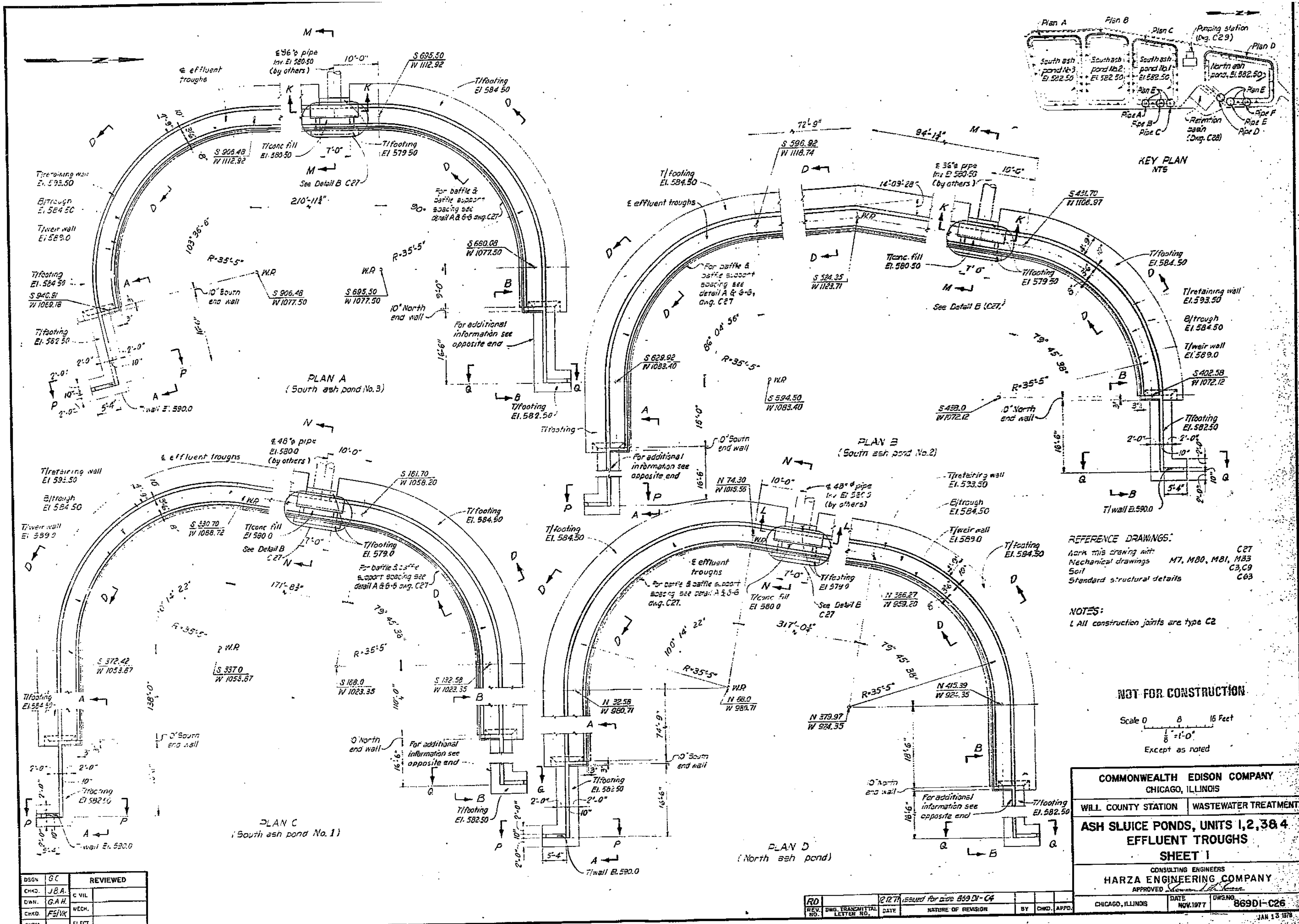
COMMONWEALTH EDISON COMPANY
CHICAGO, ILLINOIS

WILL COUNTY STATION | WASTEWATER TREATMENT

ASH POND SECTIONS & DETAILS

CONSULTING ENGINEERS
HARZA ENGINEERING COMPANY
APPROVED

CHICAGO, ILLINOIS | DATE APRIL, 1978 | DWG. NO. 869 DI - C16



PLAN A
(South ash pond No.3)
PLAN B
(South ash pond No.2)
PLAN C
(South ash pond No. 1)
PLAN D
(North ash pond)
KEY PLAN
NTS
Plan A
Plan B
Plan C
Plan D
Pumping station (Dwg. C29)
South ash pond No.3 El. 582.50
South ash pond No.2 El. 582.50
South ash pond No.1 El. 582.50
North ash pond El. 582.50
Retention basin (Dwg. C28)
℄ effluent troughs
T/footing El. 584.50
T/retaining wall El. 593.50
B/trough El. 584.50
T/weir wall El. 589.0
T/footing El. 582.50
T/footing El. 579.50
T/conc fill El. 580.50
T/wall El. 590.0
See Detail B C27
For baffle & baffle support spacing see detail A & 6-6 dwg. C27
For additional information see opposite end
10' South end wall
10' North end wall
R=35'-5"
W.P.
REFERENCE DRAWINGS:
Work this drawing with C27
Mechanical drawings M7, M80, M81, M83
Soil C3, C9
Standard structural details C63
NOTES:
1. All construction joints are type C2
NOT FOR CONSTRUCTION
Scale 0 8 16 Feet
1/8" = 1'-0"
Except as noted
COMMONWEALTH EDISON COMPANY
CHICAGO, ILLINOIS
WILL COUNTY STATION
WASTEWATER TREATMENT
ASH SLUICE PONDS, UNITS 1,2,3 & 4
EFFLUENT TROUGHS
SHEET 1
CONSULTING ENGINEERS
HARZA ENGINEERING COMPANY
APPROVED
CHICAGO, ILLINOIS
DATE NOV. 1977
DWG. NO. 86901-C26
R0 12-12-77 Issued for bids 86901-C4
REV. NO.
DWG. TRANSMITTAL LETTER NO.
DATE
NATURE OF REVISION
BY
CHKD.
APPD.
DSGN. G.C.
CHKD. J.B.A.
DWN. G.A.H.
CHKD. FS/VK
REVIEWED
C. VIL.
MECH.
ELECT.
JAN 13 1978

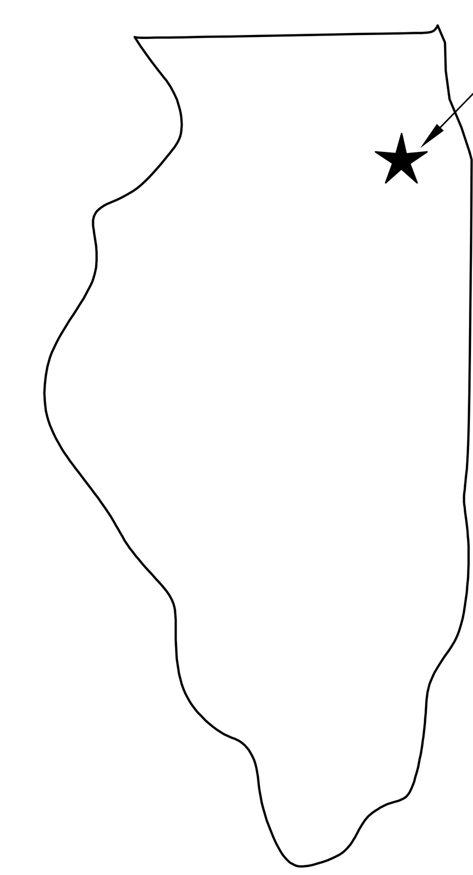
Attachment 1-2 – Pond 2S Liner Replacement Drawings

SOUTH ASH POND 2 LINER REPLACEMENT
WILL COUNTY GENERATING STATION
MIDWEST GENERATION
ROMEOVILLE, WILL COUNTY, ILLINOIS

LIST OF DRAWINGS

RECORD DRAWING LEGEND

~~PROPOSED~~	CROSSED OUT TEXT INDICATES CHANGES FROM THE FINAL DESIGN TO RECORD CONSTRUCTION
PRE-CONSTRUCTION	UNDERLINED TEXT INDICATES ADDED NOTES OR COMMENTS, AND DOCUMENTS CHANGES FROM THE FINAL DESIGN TO RECORD CONSTRUCTION
	"CLOUDS" DOCUMENT ADDITIONS AND/OR CHANGES FROM THE FINAL DESIGN TO RECORD CONSTRUCTION
	"CROSS OUTS" DOCUMENT OBJECTS REMOVED FROM THE FINAL DESIGN TO RECORD CONSTRUCTION



ILLINOIS

PREPARED FOR:

MIDWEST GENERATION, LLC
528 E. 135TH STREET
ROMEOVILLE, IL 60446

JULY 2014

6.			
5.			
4.			
3.	ISSUED FOR RECORD DOCUMENTATION	07/03/14	EJT
2.	ISSUED FOR CONSTRUCTION	06/28/13	HMS
1.	ISSUED FOR BID	04/19/13	HMS
0.	ISSUED FOR PERMIT	12/20/12	HMS
REVISION:		DATE:	APP'D BY:

NATURAL
RESOURCE
TECHNOLOGY

PROJECT NO. 2113.1
DRAWN BY: RLH 12/19/12
CHECKED BY: RJB 12/19/12
APPROVED BY: HMS 12/20/12

TITLE SHEET

SOUTH ASH POND 2 LINER REPLACEMENT
WILL COUNTY GENERATING STATION
MIDWEST GENERATION
ROMEOVILLE, WILL COUNTY, ILLINOIS

DRAWING NO: D21131TS-03
REFERENCE: .

SHEET NO.
TS

Jul 17, 2014 1:19pm PLOTTED BY: dduda SAVED BY: dduda
Y:\ACADdata\Projects\21\2113\21131_Will Co\RECORD DWGS\Final set 070314\D21131TS-03.dwg TS-02
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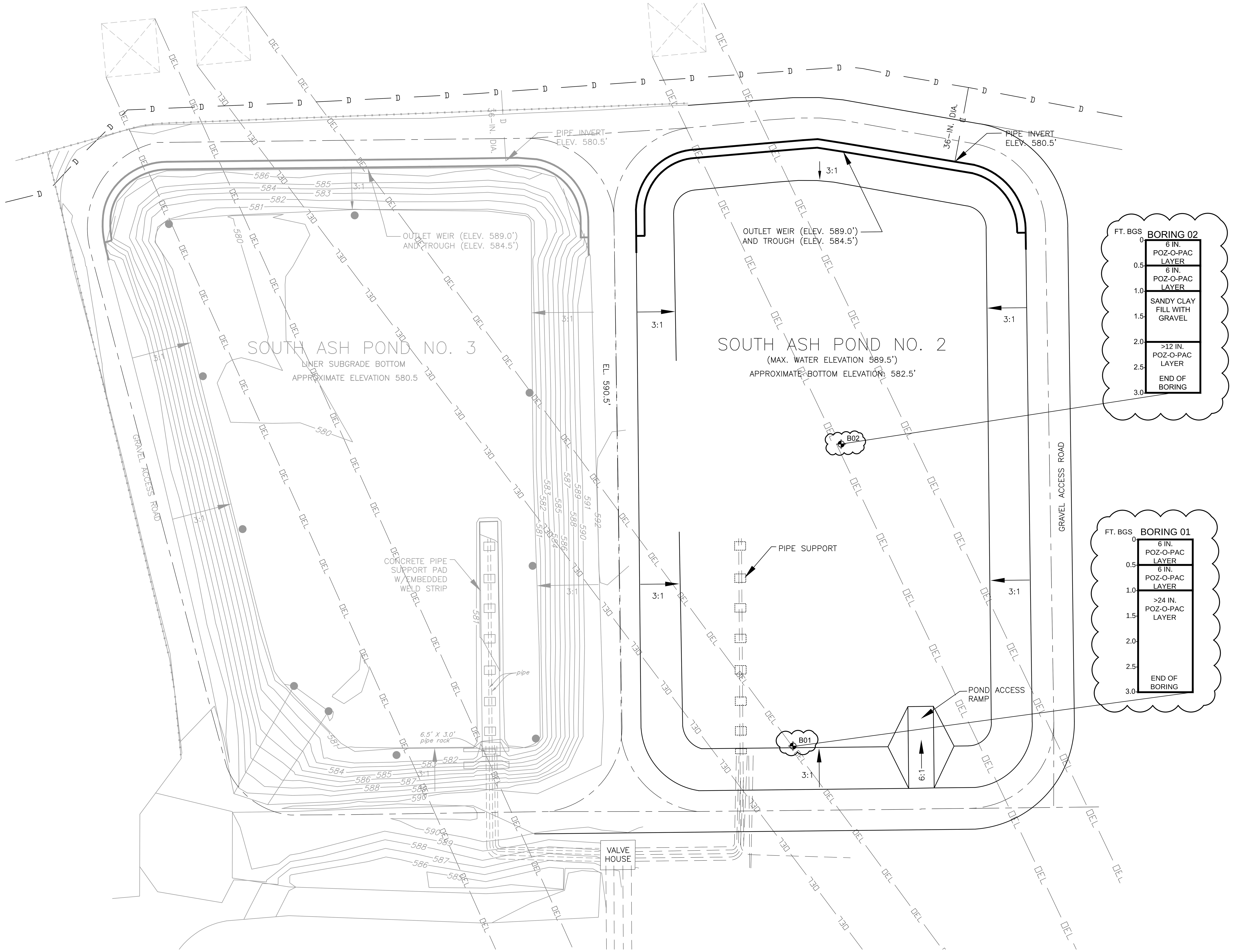

ABOVEGROUND INLET PIPE

D — UNDERGROUND DISCHARGE PIPING

DEL — OVERHEAD ELECTRIC LINE

B01 BORING LOCATION

MARKER POST LOCATION

CONTRACTOR NOTES: COMPLETED DURING CONSTRUCTION
1. CONTRACTOR SHALL NOT DISTURB OPERATIONS OF ASH POND 3 WHEN WORKING ON ASH POND 2.

N

0 15 30 60
SCALE IN FEET
(APPROXIMATE)

SOURCE NOTES:
1. THIS DRAWING WAS DEVELOPED FROM DRAWING NO. 869D1-C11 REV. 7, BY HARZA ENGINEERING COMPANY, CHICAGO, ILLINOIS, DATED AUG. 1979, PROVIDED BY MIDWEST GENERATION.
2. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. PIPING AND OTHER UTILITY LOCATIONS ARE APPROXIMATE.
3. BORINGS WERE DRILLED BY BRIESER CONSTRUCTION COMPANY, INC. ON 07/17/13.

REVISION:		DATE:	APP'D BY:
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3.	ISSUED FOR RECORD DOCUMENTATION	07/17/14	EJT
2.	ISSUED FOR CONSTRUCTION	06/28/13	HMS
1.	ISSUED FOR BID	04/19/13	HMS
0.	ISSUED FOR PERMIT	12/20/12	HMS

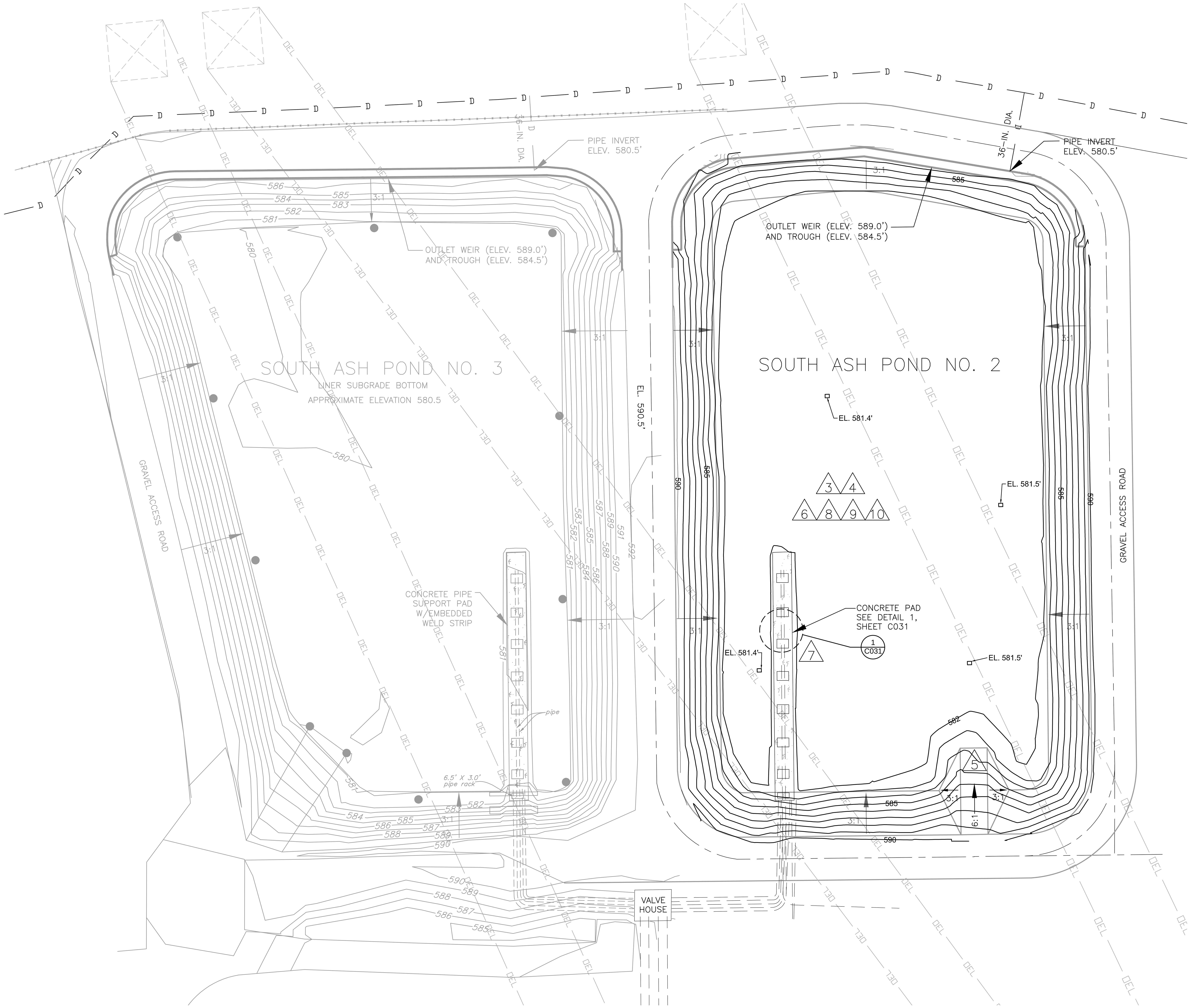
NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2113.1
DRAWN BY: RLH 12/19/12
CHECKED BY: RJB 12/19/12
APPROVED BY: HMS 12/20/12

PRE-CONSTRUCTION SITE CONDITIONS

SOUTH ASH POND 2 LINER REPLACEMENT
WILL COUNTY GENERATING STATION
MIDWEST GENERATION
ROMEOVILLE, WILL COUNTY, ILLINOIS

DRAWING NO: D21131C010-03
REFERENCE: .
SHEET NO. C010



	MAJOR CONTOUR LINE
	MINOR CONTOUR LINE
583	EXISTING CONTOUR
	ABOVEGROUND INLET PIPE
	EXISTING FENCE
D	UNDERGROUND DISCHARGE PIPING
DEL	OVERHEAD ELECTRIC LINE
	MARKER POST LOCATION
	CONCRETE

CONTRACTOR NOTES: △ COMPLETED DURING CONSTRUCTION

1. CONTRACTOR SHALL STORE ~~ALL GEOSYNTHETICS AND~~ SUBGRADE MATERIALS IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
2. CONTRACTOR SHALL STORE AND STAGE EQUIPMENT AT LOCATION APPROVED BY MIDWEST GENERATION.
3. PROTECT ALL CONCRETE AND UTILITY STRUCTURES THROUGHOUT PROJECT DURATION.
4. CONTRACTOR SHALL REMOVE ALL VEGETATION, ROCKS, AND OTHER DEBRIS GREATER THAN 1 INCH IN SIZE FROM POND SUBGRADE AND DISPOSE OF IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
5. CONTRACTOR SHALL CLEAN OFF THE RAMP CONCRETE SURFACE TO THE EXTENT PRACTICAL TO REMOVE ROCKS THAT MAY POSE A HAZARD TO GEOMEMBRANE, AS APPROVED BY GEOMEMBRANE INSTALLER, ENGINEER AND/OR MWG.
6. ~~CONTRACTOR SHALL REMOVE ENTIRE LAYER OF EXISTING POZ-O-PAC LINER FROM THE BASE OF THE ASH POND AND 6 INCHES OF EXISTING FILL MATERIAL BELOW THE POZ-O-PAC, EXCLUDING AREA AROUND PIPE SUPPORTS, AS NEEDED TO ACHIEVE FINAL SUBGRADE ELEVATION 581 FT. LOWER LAYER OF POZ-O-PAC SHALL REMAIN IN PLACE.~~ CONTRACTOR SHALL REMOVE POZ-O-PAC LAYERS AND EXISTING FILL MATERIAL, AS NEEDED, TO ACHIEVE APPROXIMATE FINAL SUBGRADE ELEVATION 581.5 FT., EXCLUDING AREA AROUND PIPE SUPPORTS.
7. CONTRACTOR SHALL CONSTRUCT CONCRETE PAD IN ACCORDANCE WITH THE CONTRACT DOCUMENTS (SEE DETAIL 1 ON SHEET C031).
8. CONTRACTOR SHALL PLACE 16 OZ/SY NONWOVEN GEOTEXTILE OVER THE PREPARED SUBGRADE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
9. SUBGRADE SHALL BE APPROVED BY MWG AND/OR ENGINEER PRIOR TO INSTALLATION OF GEOMEMBRANE.
10. CONTRACTOR SHALL PROVIDE MEANS TO PROTECT SUBGRADE FROM EROSION, STORM WATER, AND HEAVY EQUIPMENT TRAFFIC. DAMAGE TO SUBGRADE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

N

0 15 30 60

SCALE IN FEET

(APPROXIMATE)

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM DRAWING NO. 869D1-C11 REV. 7, BY HARZA ENGINEERING COMPANY, CHICAGO, ILLINOIS, DATED AUG. 1979, PROVIDED BY MIDWEST GENERATION.
2. ALSO FROM DRAWING NO. 309-1053-T BY RUETTIGER, TONELLI & ASSOCIATES, INC., JOLIET, ILLINOIS, DATED OCTOBER 5, 2009.
3. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. PIPING AND OTHER UTILITY LOCATIONS ARE APPROXIMATE.
4. SUBGRADE CONTOURS AND POINT ELEVATIONS FROM SURVEY FILE "7017 AB LINER.DWG" DATED AUGUST 12, 2013, BY DLZ INDUSTRIAL SURVEYING, INC., JOLIET, ILLINOIS.

REVISION:		DATE:	APP'D BY:
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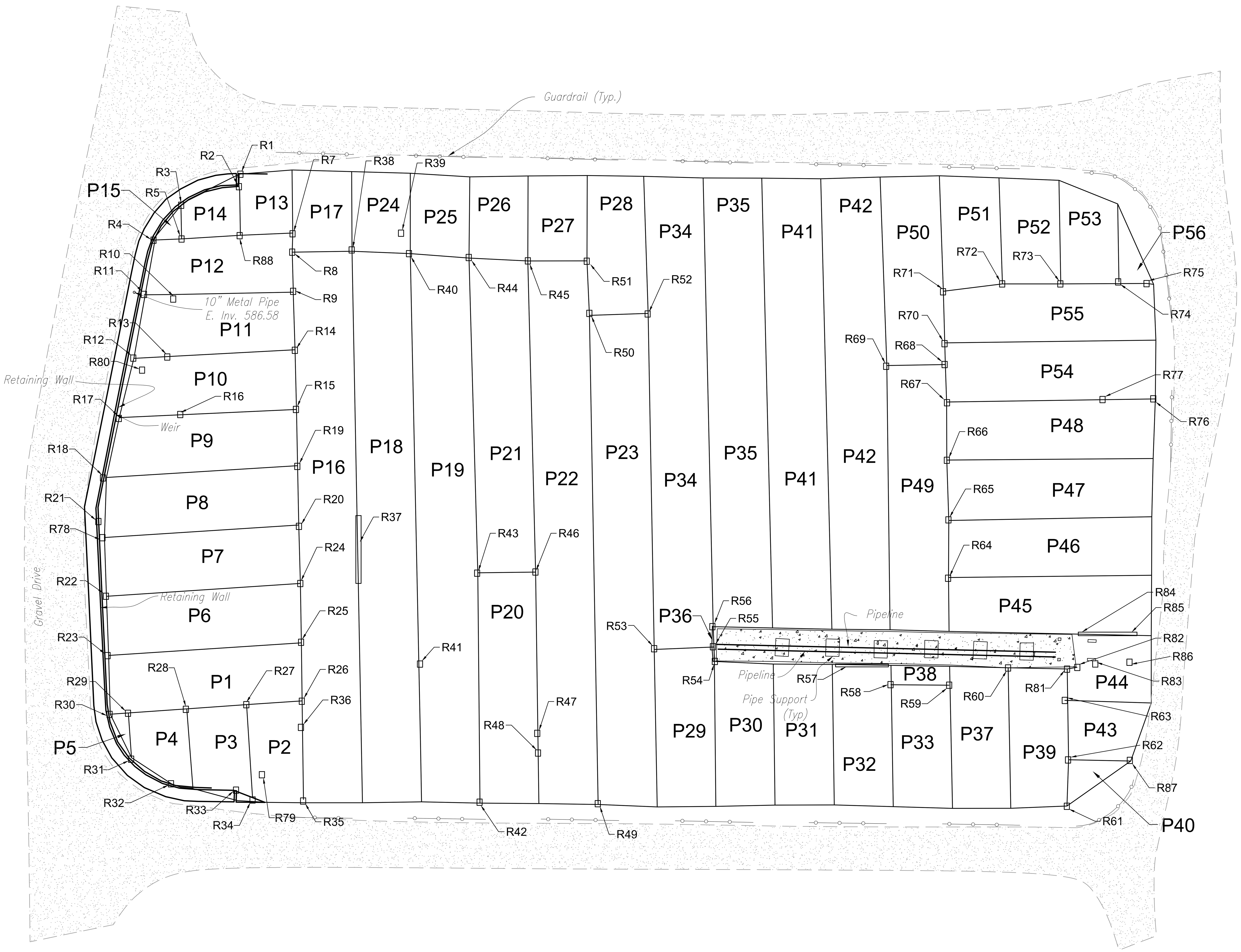
3.	ISSUED FOR RECORD DOCUMENTATION	07/17/14	EJT
2.	ISSUED FOR CONSTRUCTION	06/28/13	HMS
1.	ISSUED FOR BID	04/19/13	HMS
0.	ISSUED FOR PERMIT	12/20/12	HMS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2113.1	# LINER SUBGRADE PREPARATION
DRAWN BY: RLH 12/19/12	SOUTH ASH POND 2 LINER REPLACEMENT WILL COUNTY GENERATING STATION
CHECKED BY: RJB 12/19/12	MIDWEST GENERATION ROMEOVILLE, WILL COUNTY, ILLINOIS
APPROVED BY: HMS 12/20/12	DRAWING NO: D21131C020-03 REFERENCE: .
SHEET NO.	C020



P23	GEOMEMBRANE PANEL AND PANEL NUMBER
	GEOMEMBRANE PANEL SEAM
R3	GEOMEMBRANE REPAIR LOCATION (NOT TO SCALE)
	CONCRETE
	GUARD RAIL
	GRAVEL DRIVE

N

0 20 40

SCALE IN FEET

SOURCE:
1. THIS FIGURE WAS DEVELOPED FROM SURVEY FILE 7017 AB LINER.dwg, DATED AUGUST 12, 2013, BY DLZ INDUSTRIAL SURVEYING, INC., JOLIET, ILLINOIS.

	REVISION:	DATE:	APP'D BY:
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0.	ISSUED FOR RECORD DOCUMENTATION	07/17/14	EJT

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2113.1

DRAWN BY: RLH 11/22/13

CHECKED BY: JRR 01/28/14

APPROVED BY: EJT 07/17/14

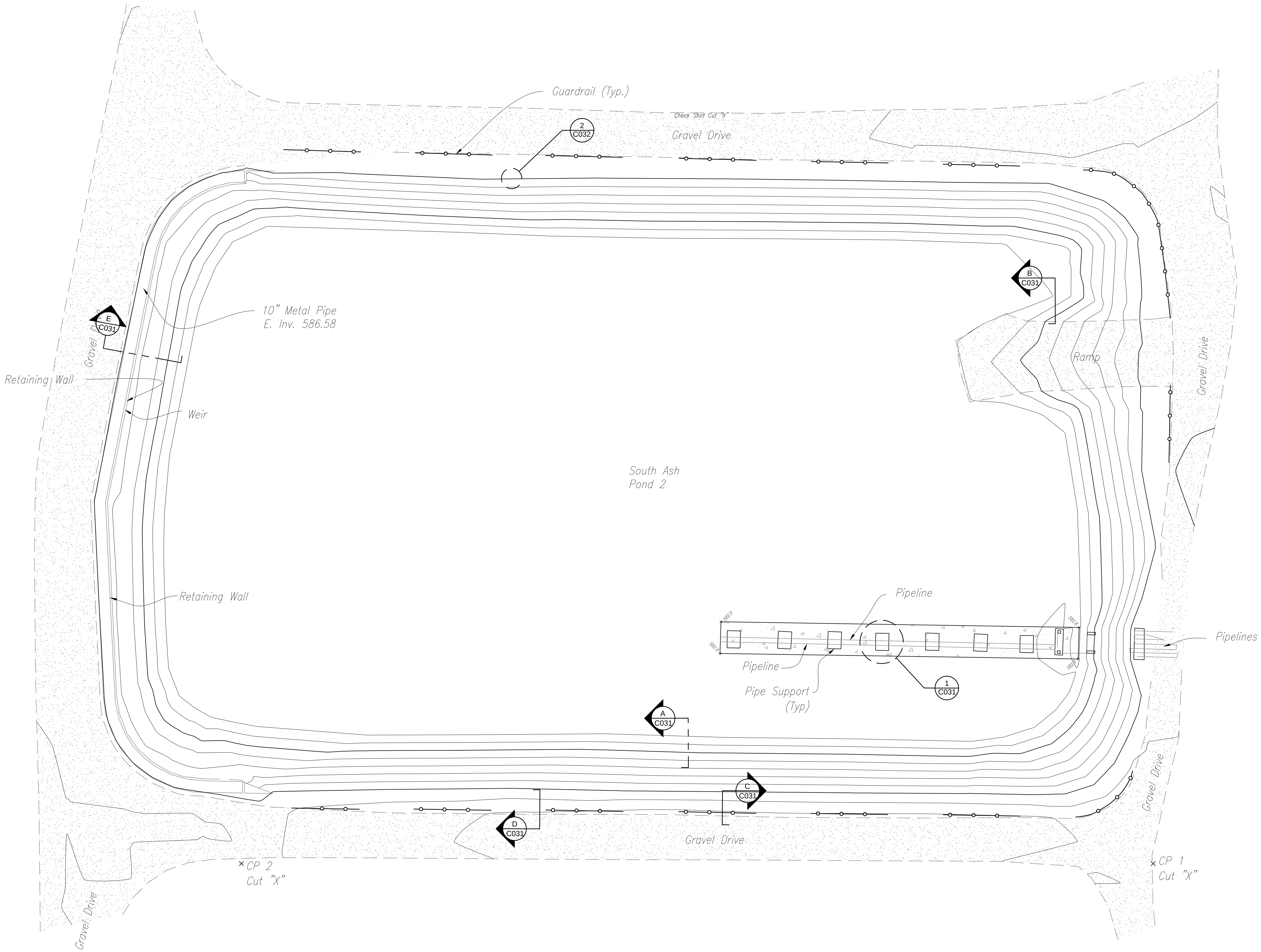
GEOMEMBRANE PANEL LAYOUT

SOUTH ASH POND 2 LINER REPLACEMENT
WILL COUNTY GENERATING STATION
MIDWEST GENERATION
ROMEOVILLE, WILL COUNTY, ILLINOIS

DRAWING NO: D21131C021-00

REFERENCE: .

SHEET NO. C021



	ABOVEGROUND INLET PIPE
	UNDERGROUND DISCHARGE PIPE
OEL	OVERHEAD ELECTRIC LINE
	ANCHOR TRENCH
	GUARD RAIL
	MARKER POST LOCATION
	CONCRETE
	~~WARNING LAYER~~
	~~GEOCELL~~
	GRAVEL DRIVE

CONTRACTOR NOTES: △ COMPLETED DURING CONSTRUCTION

1. CONTRACTOR SHALL INSTALL 60 MIL HDPE, WHITE, TEXTURED GEOMEMBRANE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS PRIOR TO PLACEMENT OF THE CUSHION AND WARNING LAYERS. CONTRACTOR SHALL PROVIDE AND FOLLOW AN APPROVED GEOMEMBRANE LAYOUT PLAN.
2. GEOMEMBRANE SHALL BE ANCHORED INTO 2.5 FEET DEEP TRENCHES ALONG TOP OF POND BANK, AS SHOWN ON SHEET C031. CONTRACTOR SHALL ADVISE MWG AND/OR ENGINEER IF PROPOSED LOCATION FOR ANCHOR TRENCH IS NOT POSSIBLE.
3. CONTRACTOR SHALL PLACE 16 OZ/SY NONWOVEN GEOTEXTILE OVER THE GEOMEMBRANE FOLLOWING ENGINEER APPROVAL AND PASSING QUALITY CONTROL RESULTS IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS (SEE SHEET C031).
4. GEOCELL SHALL BE INSTALLED ALONG SIDE SLOPES IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS AND MANUFACTURER'S RECOMMENDATIONS (SEE SHEET C032). NO VEHICULAR TRAFFIC IS ALLOWED ON THE GEOCELL PRIOR TO INFILL.
5. CUSHION MATERIAL AND WARNING LAYER MATERIAL SHALL BE PLACED AT THE BASE OF POND IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS (SEE SHEET C031).
6. RESTORE AREAS DISTURBED BY EQUIPMENT AND MATERIAL LAYDOWN.
7. CONTRACTOR SHALL PROVIDE SURVEY DOCUMENTATION OF THE ITEMS LISTED IN THE TECHNICAL SPECIFICATIONS.
8. CONTRACTOR SHALL PERFORM A LEAK LOCATION SURVEY IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS FOLLOWING PLACEMENT OF GEOCELL, CUSHION, AND WARNING LAYERS.
9. CONTRACTOR SHALL INSTALL GUARDRAILS ALONG TOP OF SLOPE EVERY 20 FEET AS SHOWN (SEE DETAIL ON SHEET C031) AND IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS/INSTRUCTIONS AS APPROVED BY MWG AND/OR ENGINEER.

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM DRAWING NO. 7017AB2, BY DLZ INDUSTRIAL, LLC BURNS HARBOR, INDIANA, DATED AUGUST 12 2013, PROVIDED BY BREISER CONSTRUCTION CO. FINAL ELEVATIONS SURVEYED SEPTEMBER 6, 2013.

REVISION:		DATE:	APP'D BY:
6.			
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3.	ISSUED FOR RECORD DOCUMENTATION	07/17/14	EJT
2.	ISSUED FOR CONSTRUCTION	06/28/13	HMS
1.	ISSUED FOR BID	05/03/13	HMS
0.	ISSUED FOR PERMIT	12/20/12	HMS

NATURAL RESOURCE TECHNOLOGY

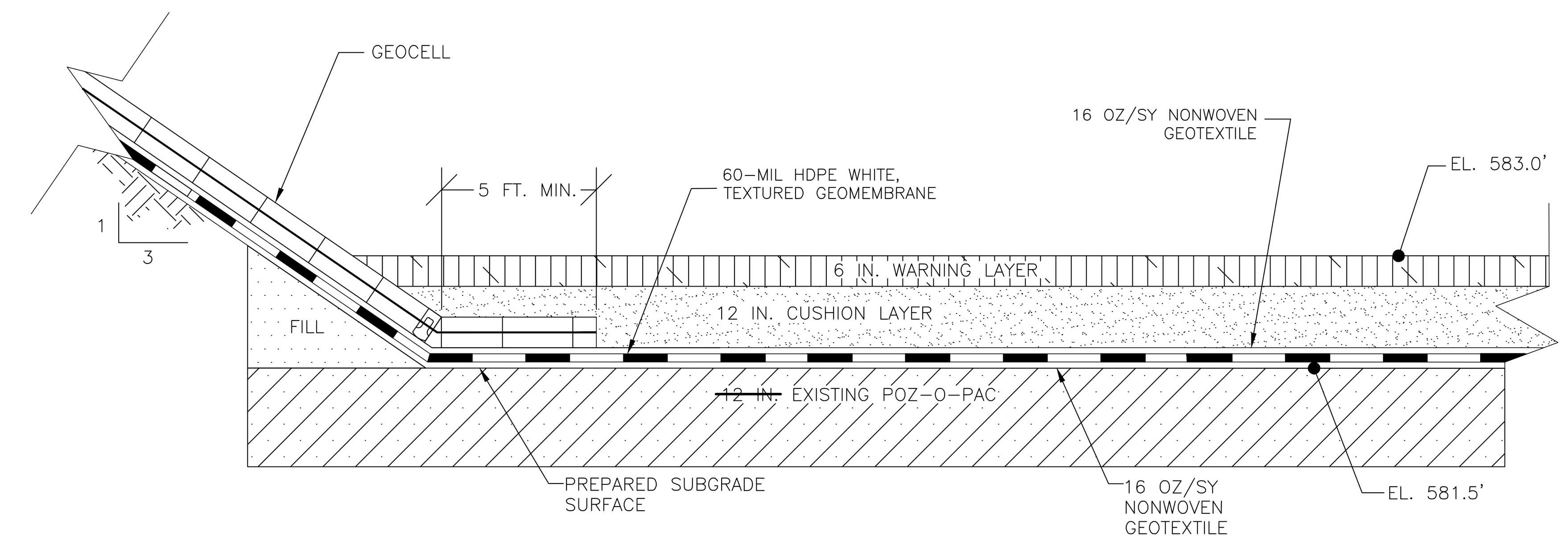
PROJECT NO. 2113.1
DRAWN BY: RLH 12/19/12
CHECKED BY: RJB 12/19/12
APPROVED BY: HMS 12/20/12

GEOCELL AND WARNING LAYER PLAN

SOUTH ASH POND 2 LINER REPLACEMENT
WILL COUNTY GENERATING STATION
MIDWEST GENERATION
ROMEOVILLE, WILL COUNTY, ILLINOIS

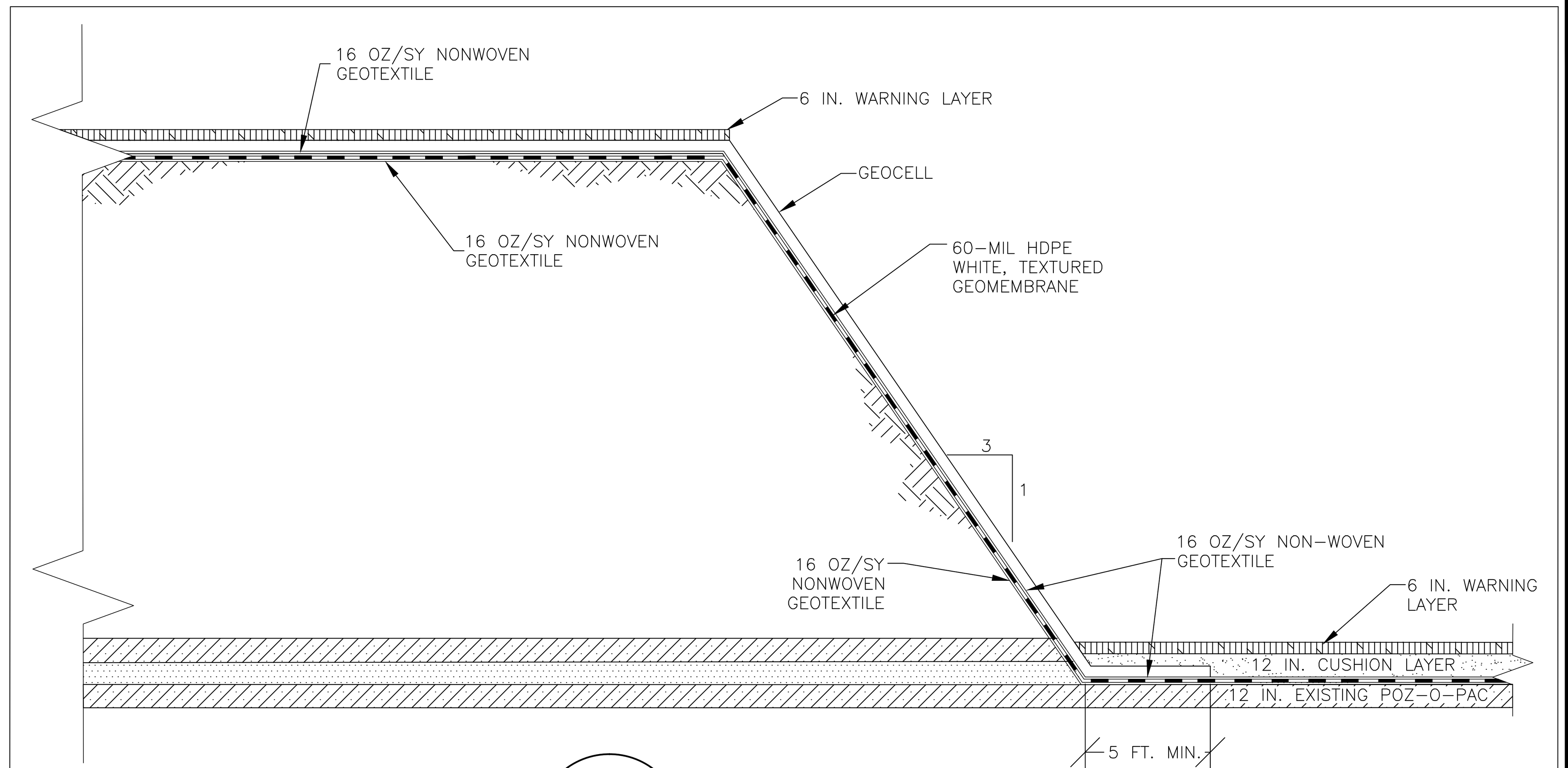
DRAWING NO: D21131C030-02
REFERENCE: .

SHEET NO. C030

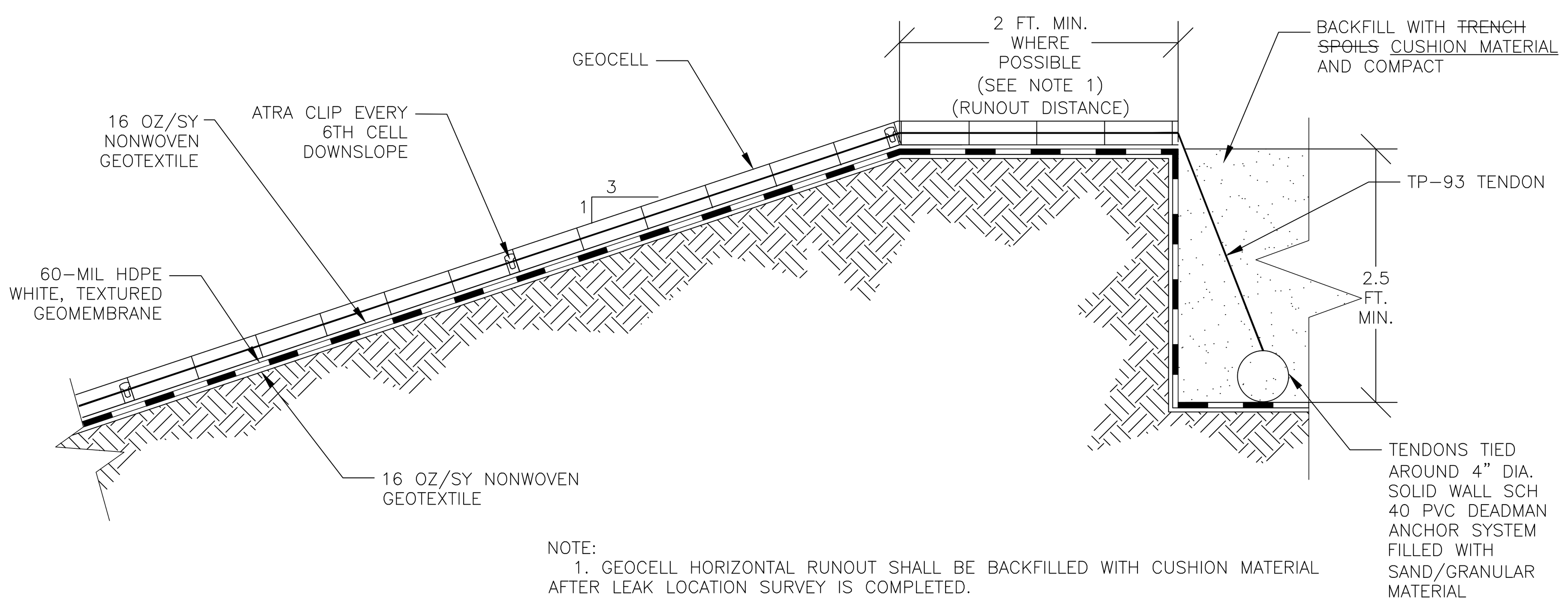


NOTE:
1. GEOMEMBRANE SEAMS SHALL BE PLACED MINIMUM 5 FT. FROM TOE OF SLOPE.

A / C030 SLOPE TRANSITION SECTION
NOT TO SCALE

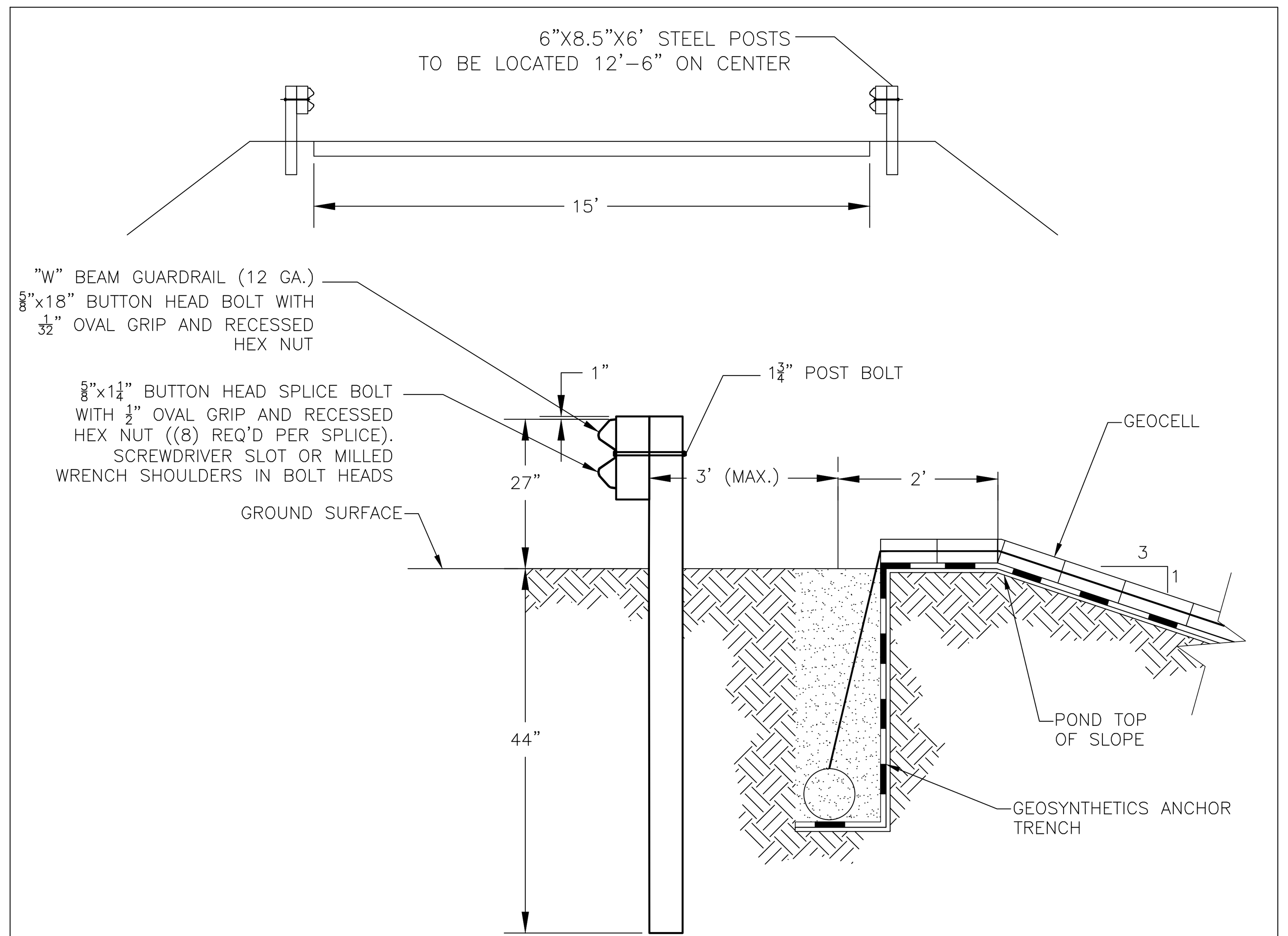


B / C030 RAMP SECTION
NOT TO SCALE

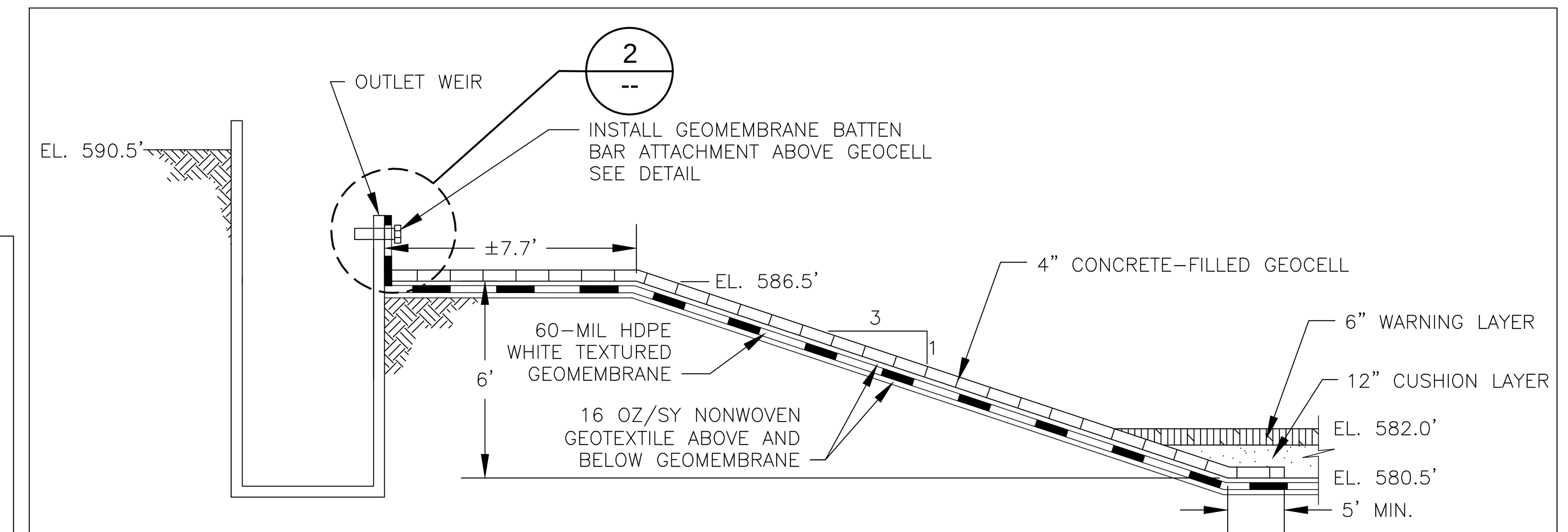


NOTE:
1. GEOCELL HORIZONTAL RUNOUT SHALL BE BACKFILLED WITH CUSHION MATERIAL AFTER LEAK LOCATION SURVEY IS COMPLETED.

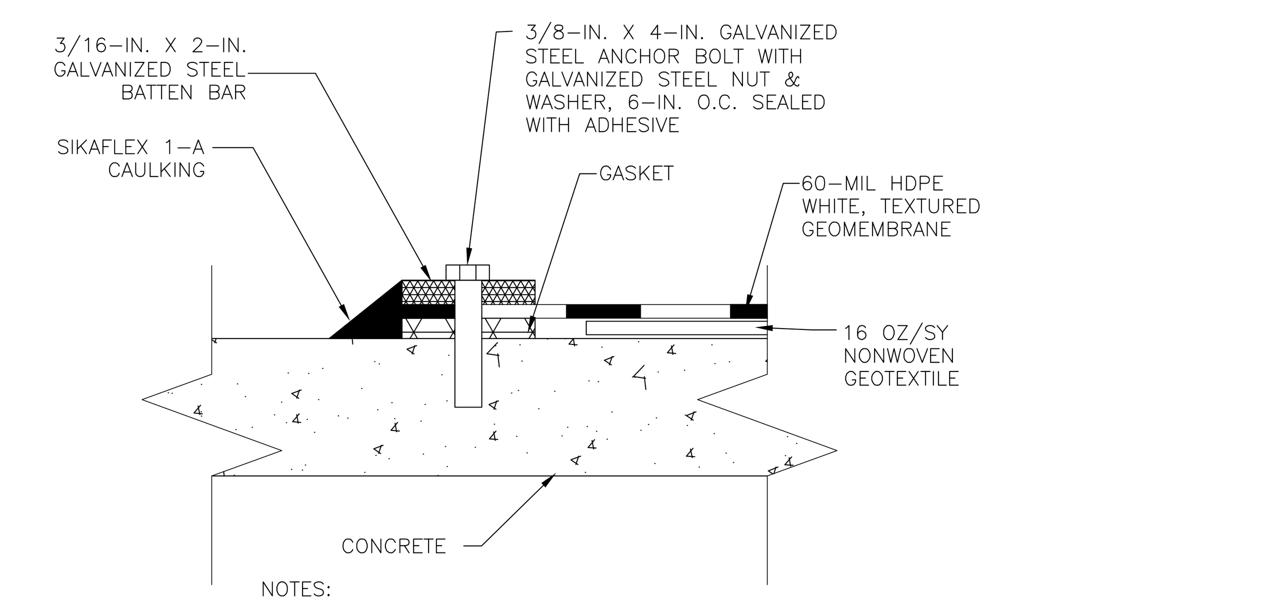
C / C030 ANCHOR TRENCH SECTION
NOT TO SCALE



D / C030 GUARDRAIL SECTION
NOT TO SCALE

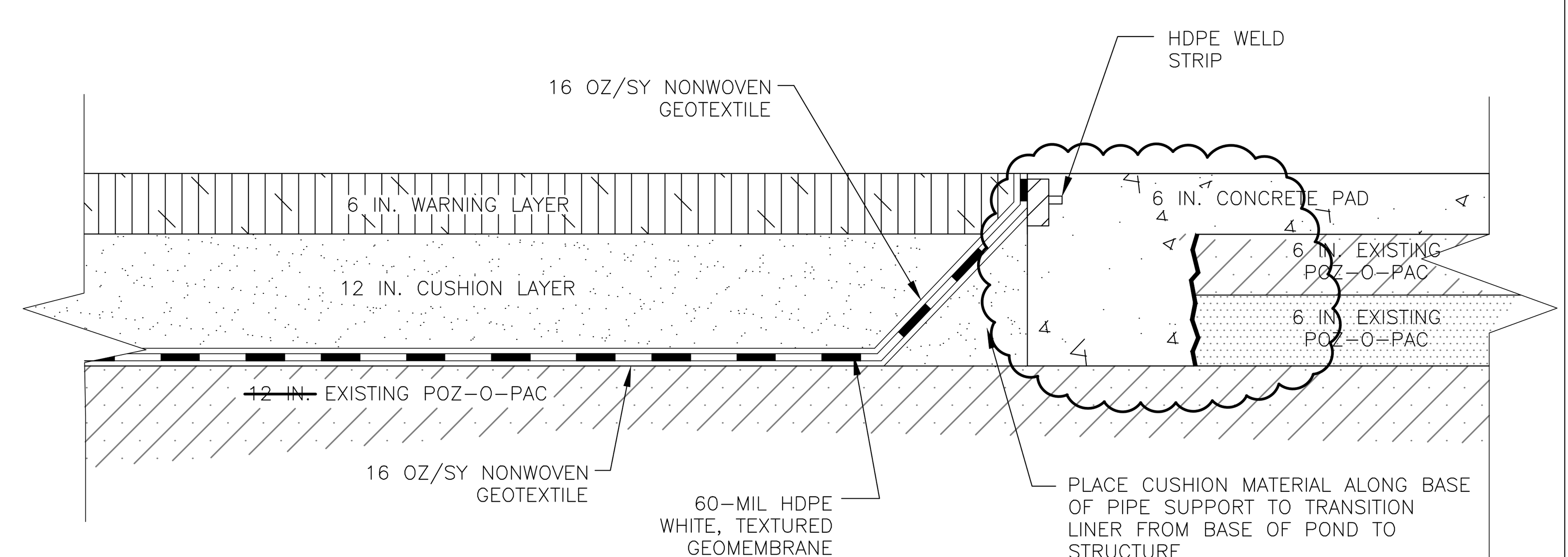


E / C030 WEIR AND GEOCELL SECTION
NOT TO SCALE



NOTES:
1. ANCHOR BOLTS 6 IN. ON CENTER.

2 / -- BATTEN BAR ATTACHMENT
NOT TO SCALE



1 / C020 C030 CONCRETE PAD DETAIL
NOT TO SCALE

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3.	ISSUED FOR RECORD DOCUMENTATION	07/17/14	EJT
2.	ISSUED FOR CONSTRUCTION	07/01/13	HMS
1.	ISSUED FOR BID	05/03/13	HMS
0.	ISSUED FOR PERMIT	12/20/12	HMS
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2113.1	
DRAWN BY: RLH 12/19/12	
CHECKED BY: RJB 12/19/12	
APPROVED BY: HMS 12/20/12	DRAWING NO: D21131C031-03 / REFERENCE: .

DETAILS AND SECTIONS

SOUTH ASH POND 2 LINER REPLACEMENT
WILL COUNTY GENERATING STATION
MIDWEST GENERATION
ROMEOVILLE, WILL COUNTY, ILLINOIS

SHEET NO. C031

Jul 17, 2014 1:27pm PLOTTED BY: dduda SAVED BY: dduda
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IMAGES: \source\1900 scan.tif; Y:\ACADdata\Projects\19\1900\source\1900-rlh.tif;
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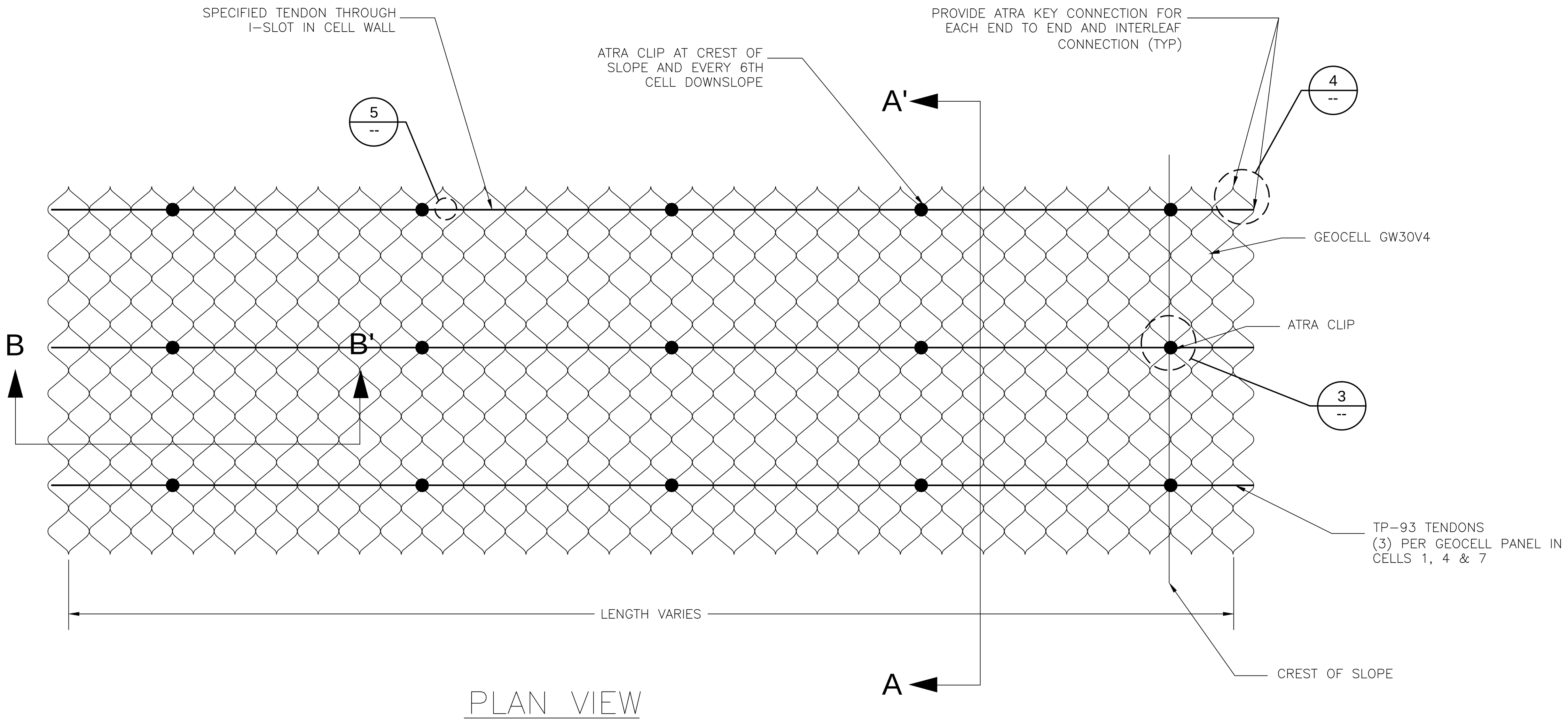
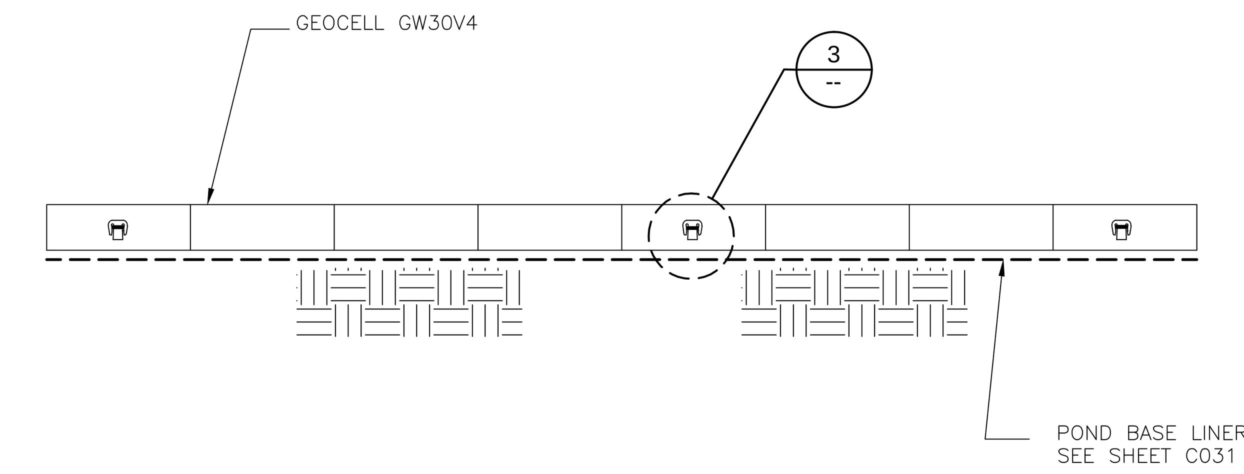
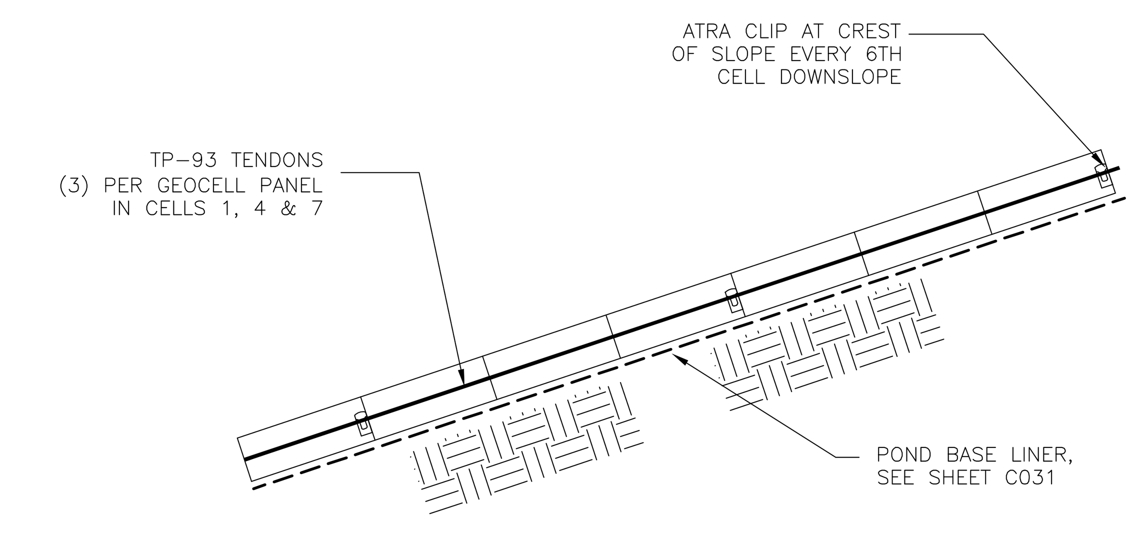


PLAN VIEW



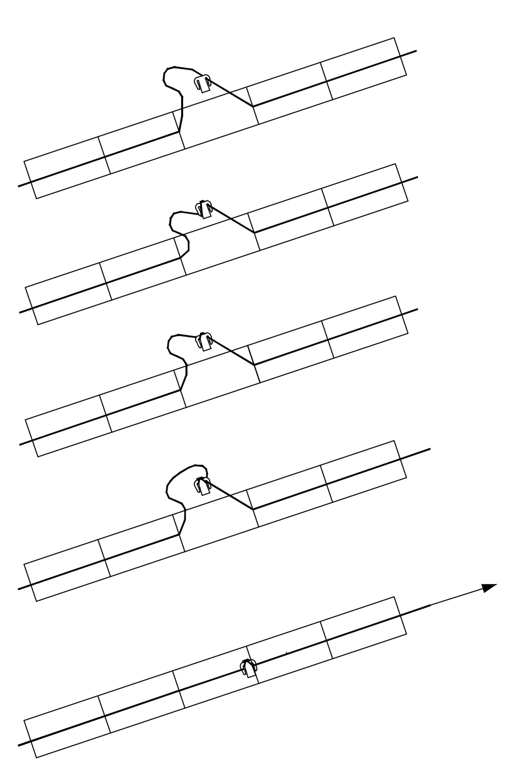
SECTION A–A'



SECTION B–B'

2 / C030 GEOCELL PANEL AND CONNECTIONS DETAIL

NOT TO SCALE



STEPS:

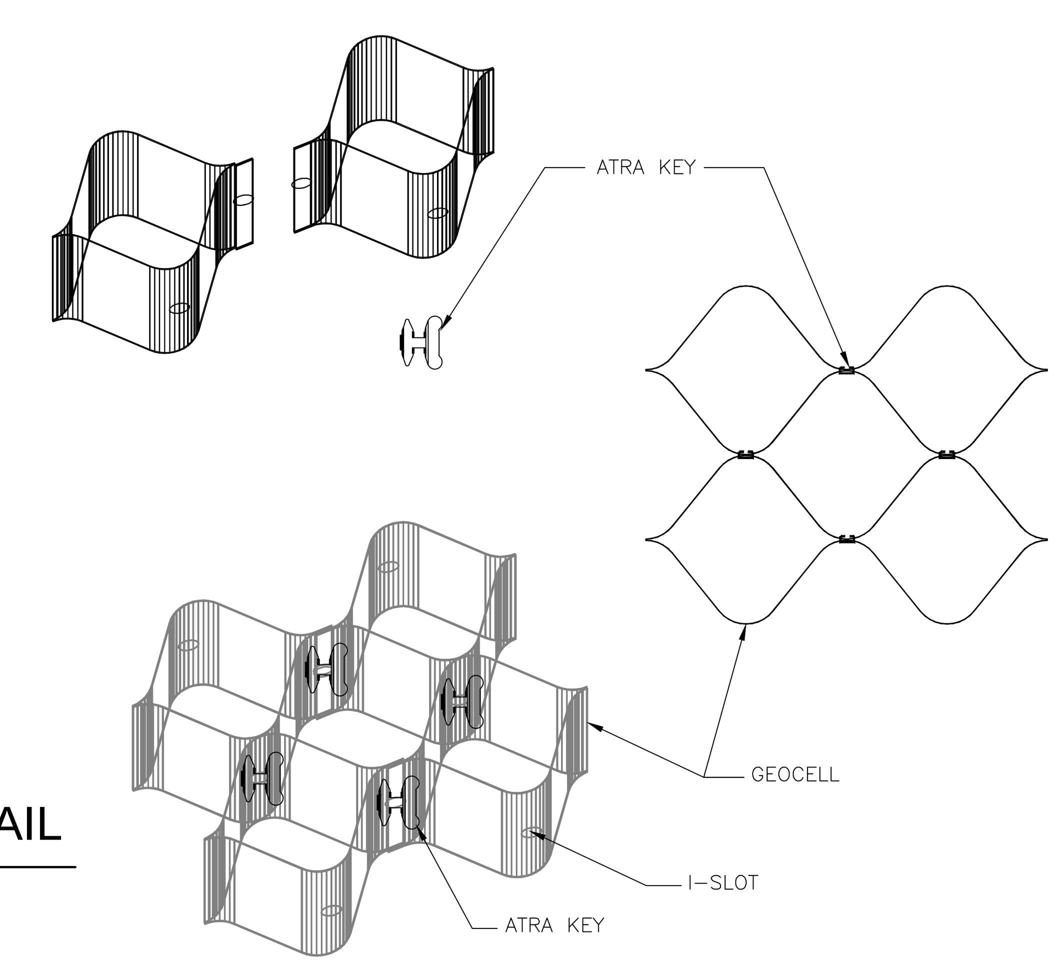
1. PLACE THE TENDON UNDER THE ARM OF THE ATRA CLIP.
2. DIAGONALLY CROSS THE TENDON OVER THE TOP OF THE ATRA CLIP.
3. PLACE THE TENDON UNDER THE OTHER ARM AND PULL TIGHT TO REMOVE SLACK.
4. DIAGONALLY CROSS THE TENDON BACK OVER THE TOP OF THE ATRA CLIP AND PLACE TENDON UNDER THE FIRST ARM.
5. PULL THE TENDON TIGHT TO REMOVE SLACK.
6. ATRA CLIP SHALL BE TIGHT AGAINST THE UPPER CELL WALL AFTER SECURING.
7. PULL TENDON TIGHT AT LOCATION OF NEXT ATRA CLIP.

3 / -- ATRA® CLIP INSTALLATION DETAIL

NOT TO SCALE

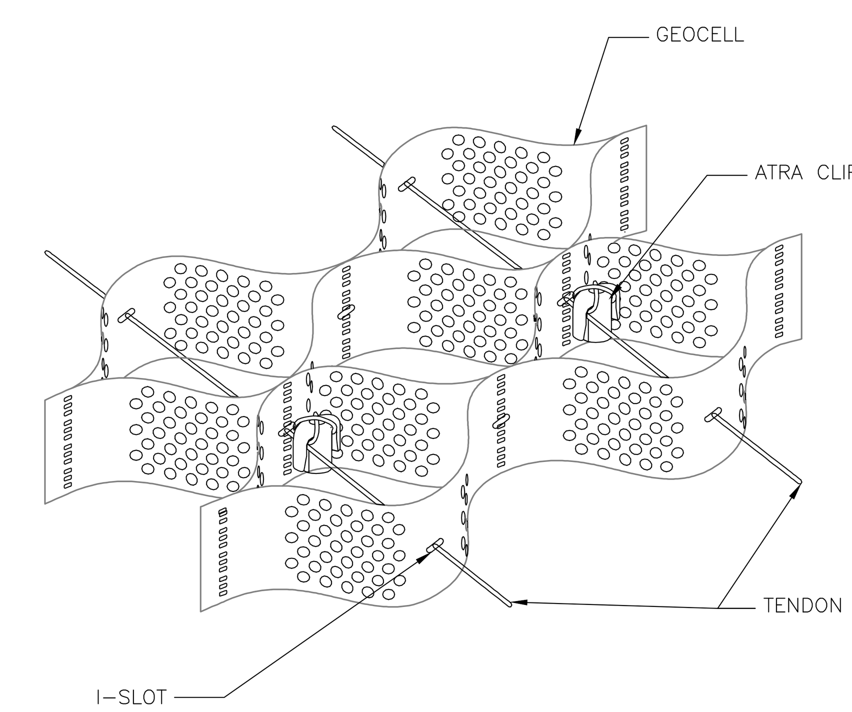
ATRA KEY® CONNECTION DETAILS

GEOCELL CONNECTION NOTES:
1. THE TOP EDGES OF ADJACENT CELL WALLS SHALL BE FLUSH WHEN CONNECTING.
2. ALIGN THE I-SLOTS FOR INTERLEAF AND END TO END CONNECTIONS.
3. THE GEOCELL PANELS SHALL BE CONNECTED WITH ATRA KEYS AT EACH INTERLEAF AND END TO END CONNECTION.



4 / -- GEOCELL SIDE AND END CONNECTION DETAIL

NOT TO SCALE



5 / -- TENDON DETAIL

NOT TO SCALE

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3.	ISSUED FOR RECORD DOCUMENTATION	07/03/14	EJT
2.	ISSUED FOR CONSTRUCTION	06/28/13	HMS
1.	ISSUED FOR BID	04/19/13	HMS
0.	ISSUED FOR PERMIT	12/20/12	HMS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.	2113.1
DRAWN BY:	RLH 12/13/12
CHECKED BY:	RJB 12/13/12
APPROVED BY:	HMS 12/20/12

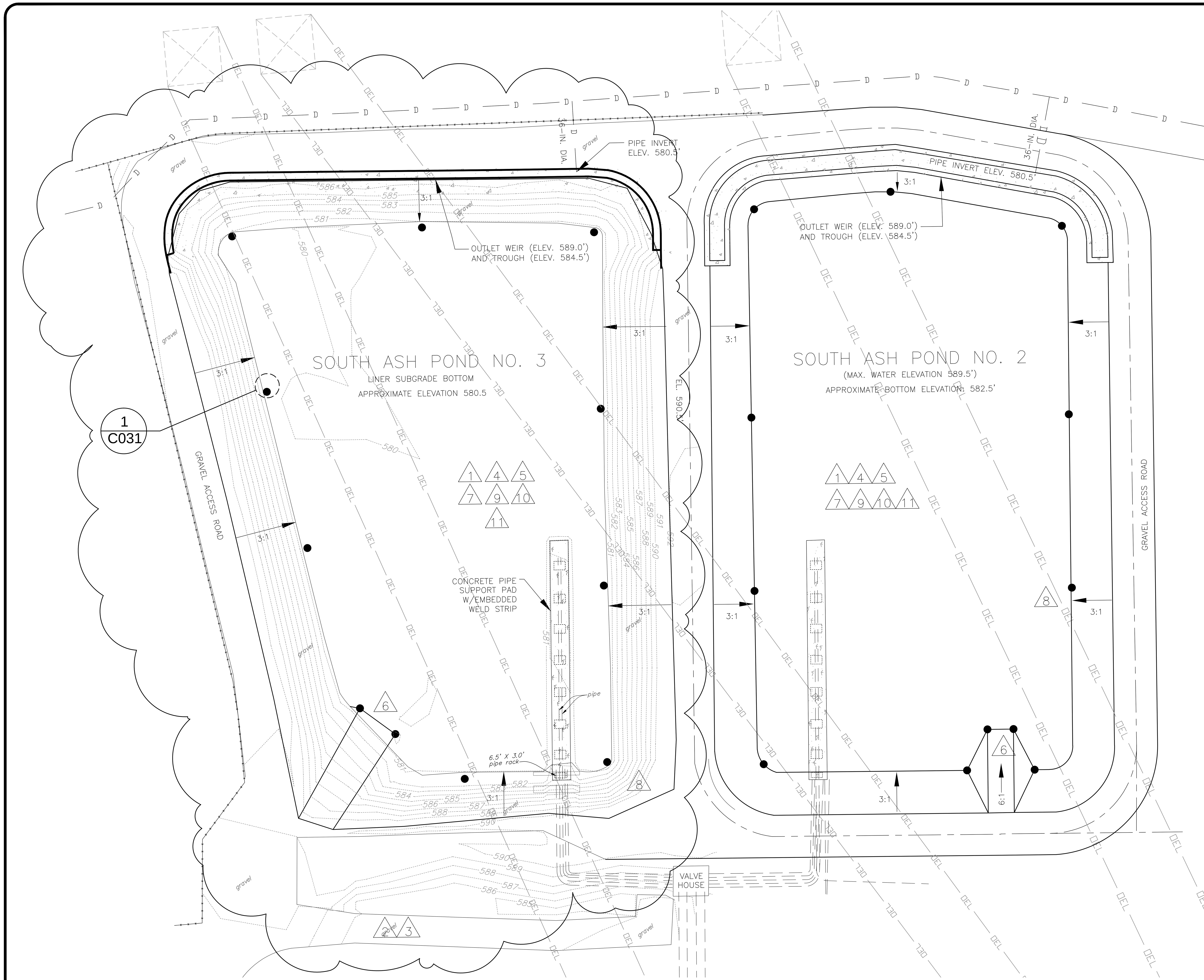
GEOCELL DETAILS AND SECTIONS

SOUTH ASH POND 2 LINER REPLACEMENT
WILL COUNTY GENERATING STATION
MIDWEST GENERATION
ROMEOVILLE, WILL COUNTY, ILLINOIS

DRAWING NO: D21131C032-03
REFERENCE: .

SHEET NO. C032

Attachment 1-3 – Pond 3S Liner Replacement Drawings



LEGEND

583	EXISTING CONTOUR
	ABOVEGROUND INLET PIPE
	EXISTING FENCE
D	UNDERGROUND DISCHARGE PIPING
DEL	OVERHEAD ELECTRIC LINE
●	MARKER POST LOCATION
	CONCRETE
MWG	MIDWEST GENERATION, LLC
	RECORD DOCUMENTATION

CONTRACTOR NOTES:

1. CONTRACTOR SHALL BEGIN CONSTRUCTION SEQUENCE WITH SOUTH ASH POND NO. 3.
2. CONTRACTOR SHALL STORE ALL GEOSYNTHETICS AND SUBGRADE MATERIALS IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
3. CONTRACTOR SHALL STORE AND STAGE EQUIPMENT AT LOCATION APPROVED BY MIDWEST GENERATION.
4. PROTECT ALL CONCRETE AND UTILITY STRUCTURES THROUGHOUT PROJECT DURATION.
5. CONTRACTOR SHALL REMOVE ALL VEGETATION, ROCKS, AND OTHER DEBRIS GREATER THAN 3 INCHES IN SIZE FROM POND SUBGRADE AND DISPOSE OF IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
6. CONTRACTOR SHALL CLEAN OFF THE RAMP CONCRETE SURFACE TO THE EXTENT PRACTICAL TO REMOVE ROCKS THAT MAY POSE A HAZARD TO GEOMEMBRANE, AS APPROVED BY GEOMEMBRANE INSTALLER, ENGINEER AND/OR MWG.
7. CONTRACTOR SHALL REMOVE ENTIRE LAYER OF EXISTING POZ-O-PAC LINER FROM THE BASE OF THE ASH PONDS AND 6 INCHES OF EXISTING FILL MATERIAL BELOW THE LINER, EXCLUDING AREA AROUND PIPE SUPPORTS AS NEEDED TO ACHIEVE FINAL SUBGRADE ELEVATION 581 FT. LOWER LAYER OF POZ-O-PAC SHALL REMAIN IN PLACE.
8. CONTRACTOR SHALL INSTALL MARKER POSTS ALONG THE BASE OF THE ASH PONDS AS SHOWN AND IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
9. CONTRACTOR SHALL PLACE 16 OZ. NONWOVEN GEOTEXTILE OVER THE PREPARED SUBGRADE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
10. SUBGRADE SHALL BE APPROVED BY MWG AND/OR ENGINEER PRIOR TO INSTALLATION OF GEOMEMBRANE.
11. CONTRACTOR SHALL PROVIDE MEANS TO PROTECT SUBGRADE FROM EROSION, STORM WATER, AND HEAVY EQUIPMENT TRAFFIC. DAMAGE TO SUBGRADE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

N

0 15 30 60

SCALE IN FEET

(APPROXIMATE)

SOURCE:
THIS DRAWING WAS DEVELOPED FROM DRAWING NO. 869D1-C11 REV. 7, BY HARZA ENGINEERING COMPANY, CHICAGO, ILLINOIS, DATED AUG. 1979, PROVIDED BY MIDWEST GENERATION.
ALSO FROM DRAWING NO. 309-1053-T BY RUETTINGER, TONELLI AND ASSOCIATES, INC., JOLIET, ILLINOIS, DATED OCTOBER 5, 2009.
ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. PIPING AND OTHER UTILITY LOCATIONS ARE APPROXIMATE.

REVISION:		DATE:	APP'D BY:
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3.	RECORD DOCUMENTATION FOR SOUTH ASH POND 3	12/30/09	HMS
2.	ISSUED FOR CONSTRUCTION	08/28/09	HMS
1.	ISSUED FOR BID	08/20/08	HMS
0.	ISSUED FOR PERMIT	07/15/08	HMS

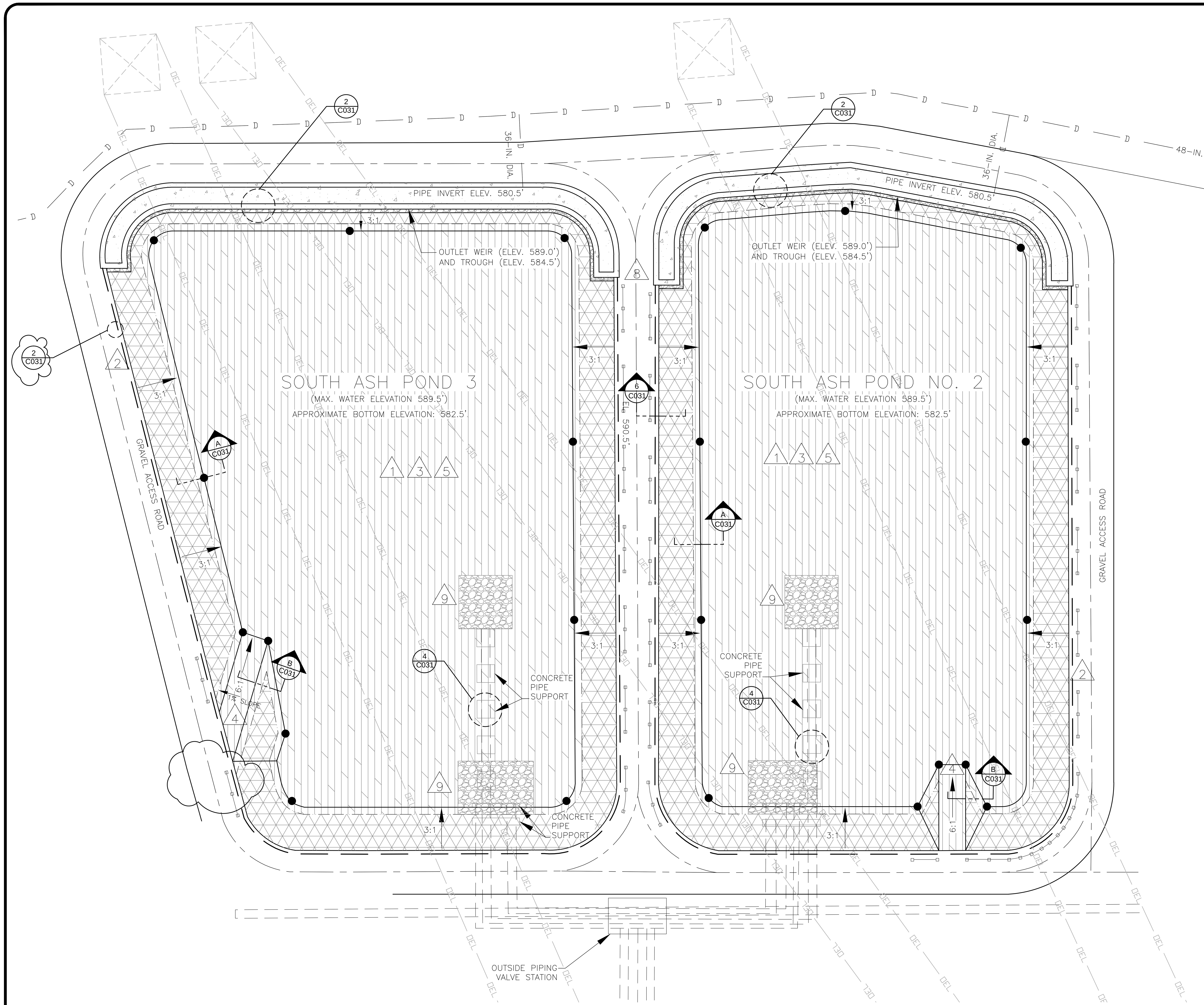
NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1900	
DRAWN BY: RLH/KNW 6/23/08	
CHECKED BY: EJT 6/23/08	
APPROVED BY: HMS 7/15/08	DRAWING NO: D1900C020-03
	REFERENCE: \bids-con

LINER SUBGRADE PREPARATION

SOUTH ASH POND LINER REPLACEMENT
MIDWEST GENERATION
WILL COUNTY GENERATING STATION
ROMEOVILLE, ILLINOIS

SHEET NO. C020



CONTRACTOR NOTES: △

1. CONTRACTOR SHALL INSTALL 60 MIL HDPE, WHITE, TEXTURED GEOMEMBRANE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION PRIOR TO PLACEMENT OF THE WARNING LAYER. CONTRACTOR SHALL PROVIDE AND FOLLOW AN APPROVED GEOMEMBRANE LAYOUT PLAN.
2. GEOMEMBRANE SHALL BE ANCHORED INTO 2.5 FEET DEEP TRENCHES ALONG TOP OF POND BANK, AS SHOWN ON SHEET C031. CONTRACTOR SHALL ADVISE MWG AND/OR ENGINEER IF PROPOSED LOCATION FOR ANCHOR TRENCH IS NOT POSSIBLE.
3. CONTRACTOR SHALL PLACE 12-OZ. NON-WOVEN GEOTEXTILE, CUSHION MATERIAL AND WARNING LAYER MATERIAL OVER THE GEOMEMBRANE AT BASE AND 4 FEET ON SIDE SLOPES FOLLOWING ENGINEER APPROVAL AND PASSING QUALITY CONTROL RESULTS IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS (SEE SHEET C031).
4. CONTRACTOR SHALL PLACE 2 LAYERS OF 12-OZ. NONWOVEN GEOTEXTILE, CUSHION AND WARNING LAYER MATERIALS OVER THE GEOMEMBRANE ON THE RAMP, AS SHOWN ON SHEET C031.
5. RESTORE AREAS DISTURBED BY EQUIPMENT AND MATERIAL LAYDOWN.
6. CONTRACTOR SHALL PROVIDE SURVEY DOCUMENTATION OF THE ITEMS LISTED IN THE TECHNICAL SPECIFICATIONS.
7. CONTRACTOR SHALL PERFORM A LEAK LOCATION SURVEY IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS.
8. CONTRACTOR SHALL INSTALL GUARDRAILS ALONG TOP OF SLOPE EVERY 20 FEET AS SHOWN (SEE DETAIL ON SHEET C031) AND IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS/INSTRUCTIONS AS APPROVED BY MWG AND/OR ENGINEER.
9. CONTRACTOR SHALL PLACE RIPRAP 18 INCHES THICK, AT PIPE OUTFALLS ABOVE CUSHION LAYER AND OVER 12-OZ. NON-WOVEN GEOTEXTILE.

LEGEND

- ABOVEGROUND INLET PIPE
- D — UNDERGROUND DISCHARGE PIPE
- DEL — OVERHEAD ELECTRIC LINE
- ANCHOR TRENCH
- 12 OZ. NON-WOVEN GEOTEXTILE
- GUARD RAIL
- MARKER POST LOCATION
- CONCRETE
- WARNING LAYER
- HDPE GEOMEMBRANE
- RIPRAP

N

0 15 30 60

SCALE IN FEET
(APPROXIMATE)

SOURCE:
THIS DRAWING WAS DEVELOPED FROM DRAWING NO. 869D1-C11 REV. 7, BY HARZA ENGINEERING COMPNAY, CHICAGO, ILLINOIS, DATED AUG. 1979, PROVIDED BY MIDWEST GENERATION.
ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. PIPING AND OTHER UTILITY LOCATIONS ARE APPROXIMATE.

REVISION:		DATE:	APP'D BY:
6.			
5.			
4.	ASBUILT	.	.
3.	ISSUED FOR CONSTRUCTION	08/28/09	HMS
2.	ADDENDUM NO. 1	09/15/08	HMS
1.	ISSUED FOR BID	08/20/08	HMS
0.	ISSUED FOR PERMIT	07/15/08	HMS

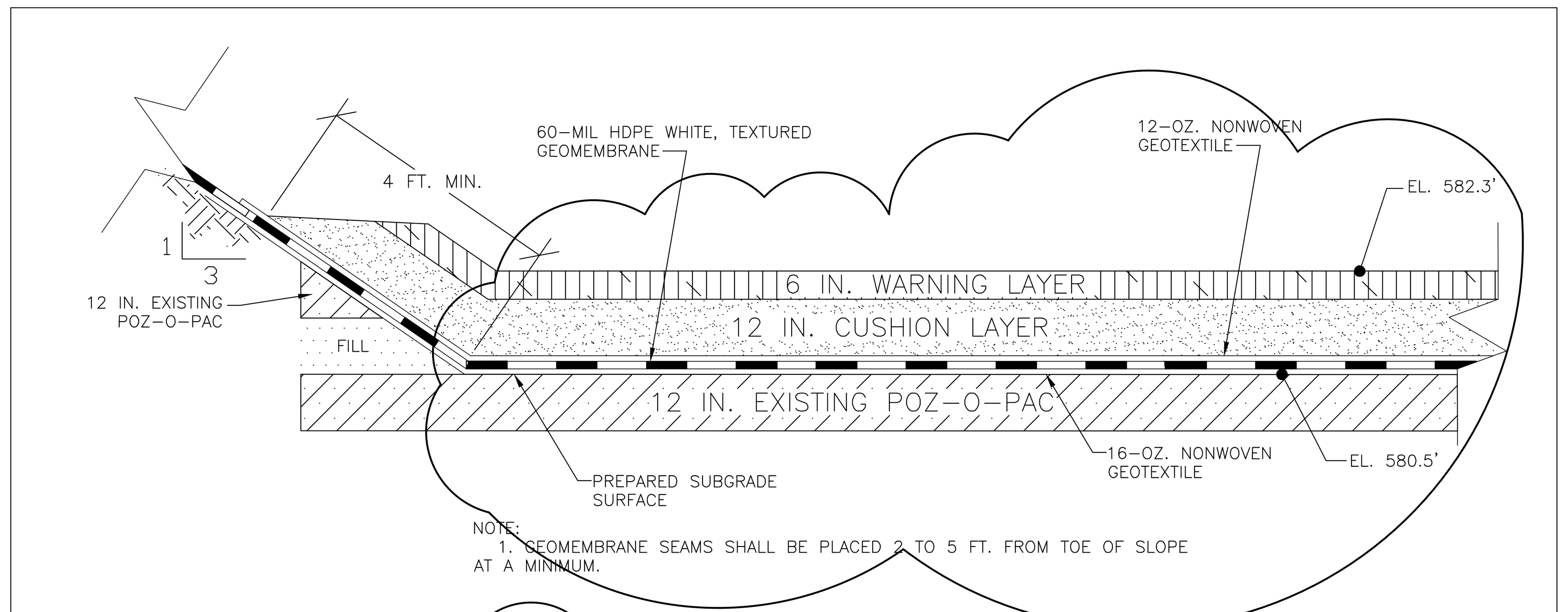
NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1900
DRAWN BY: RLH/KNW 11/30/09
CHECKED BY: RJG 11/30/09
APPROVED BY: .

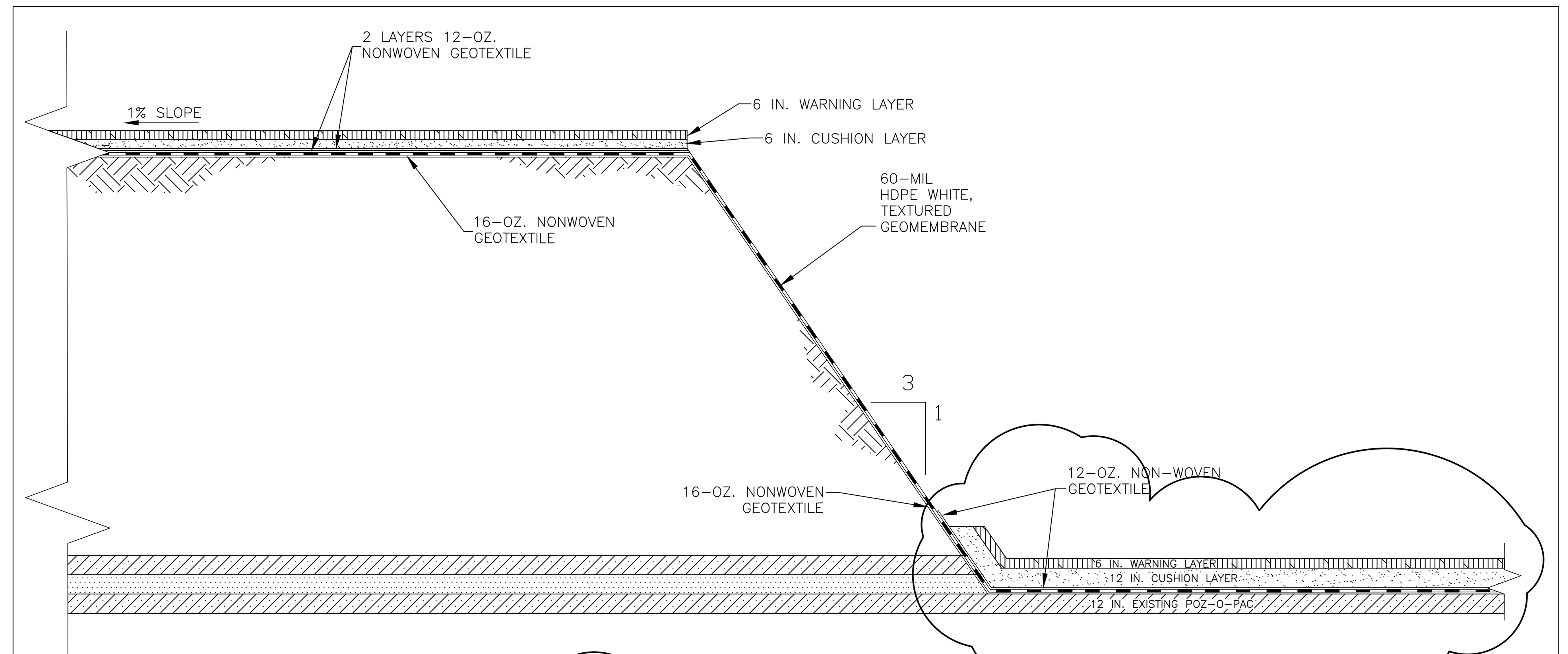
WARNING LAYER PLAN

SOUTH ASH POND LINER REPLACEMENT
MIDWEST GENERATION
WILL COUNTY GENERATING STATION
ROMEOVILLE, ILLINOIS

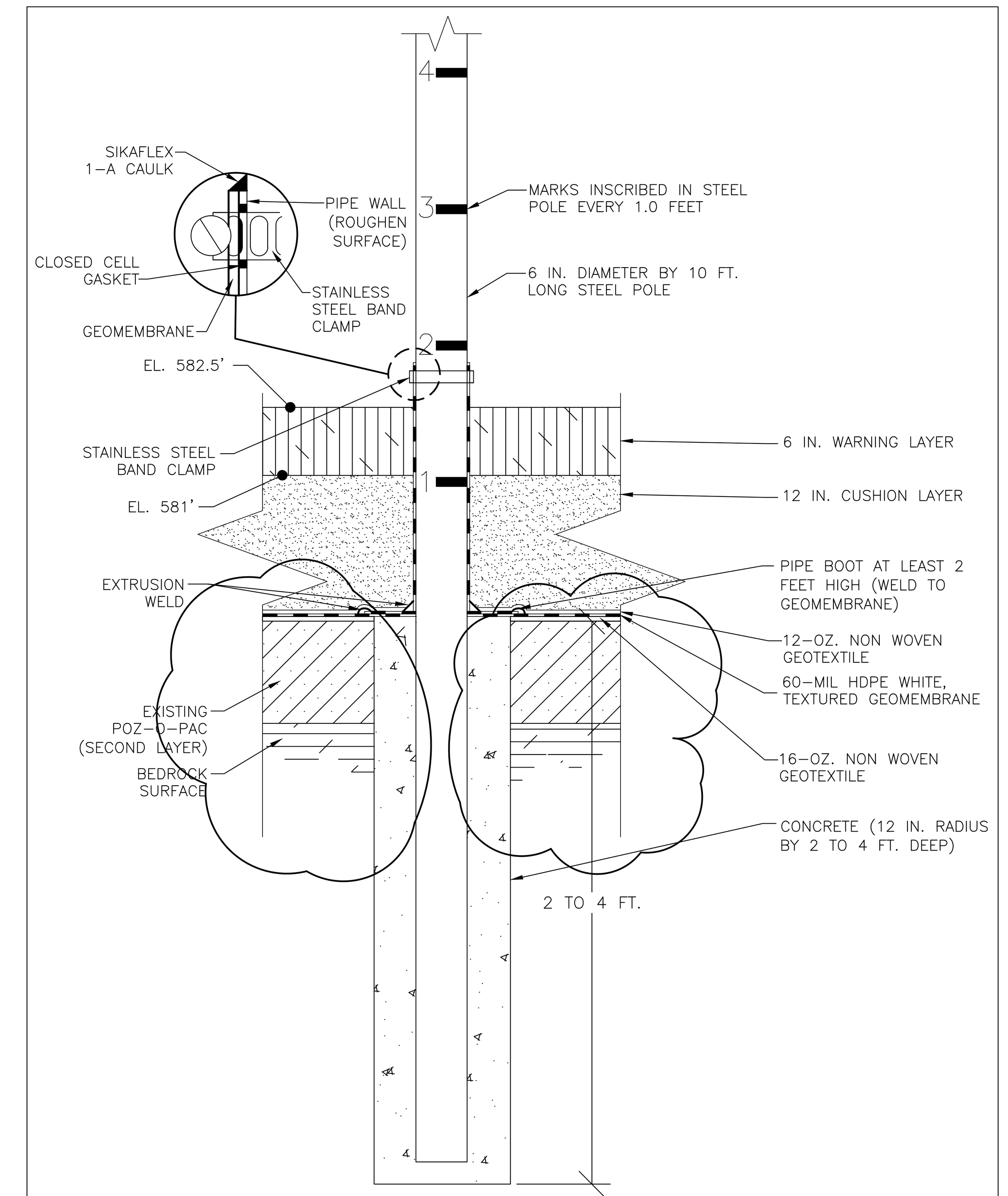
DRAWING NO: D1900C030-04
REFERENCE: .
SHEET NO. C030



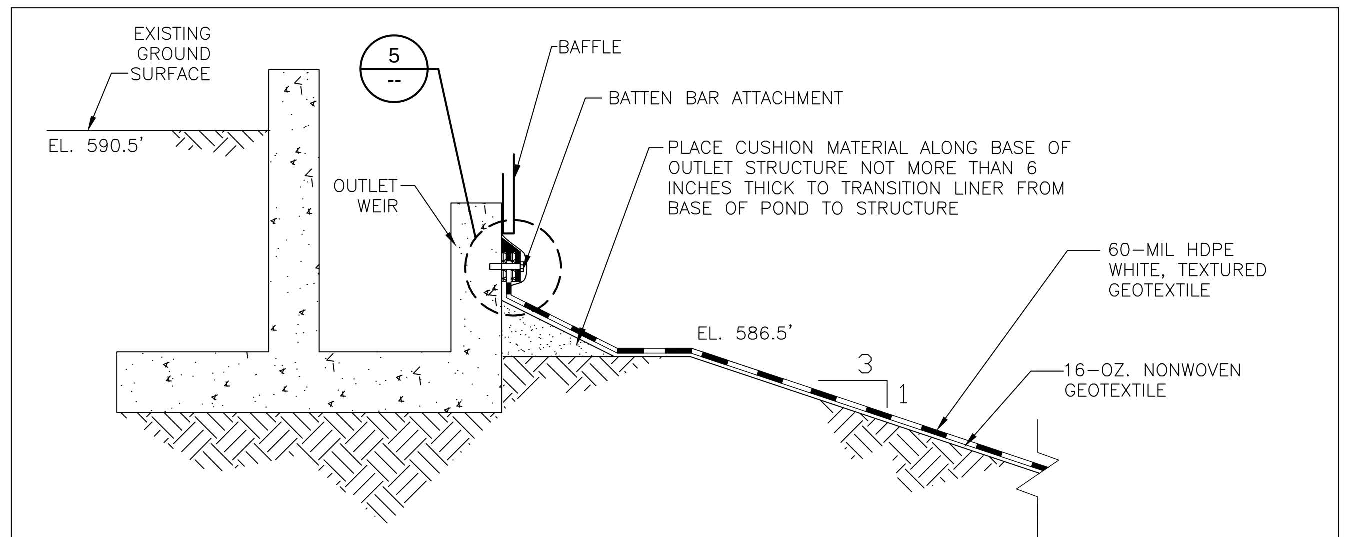
A / C030 SLOPE TRANSITION SECTION
NOT TO SCALE



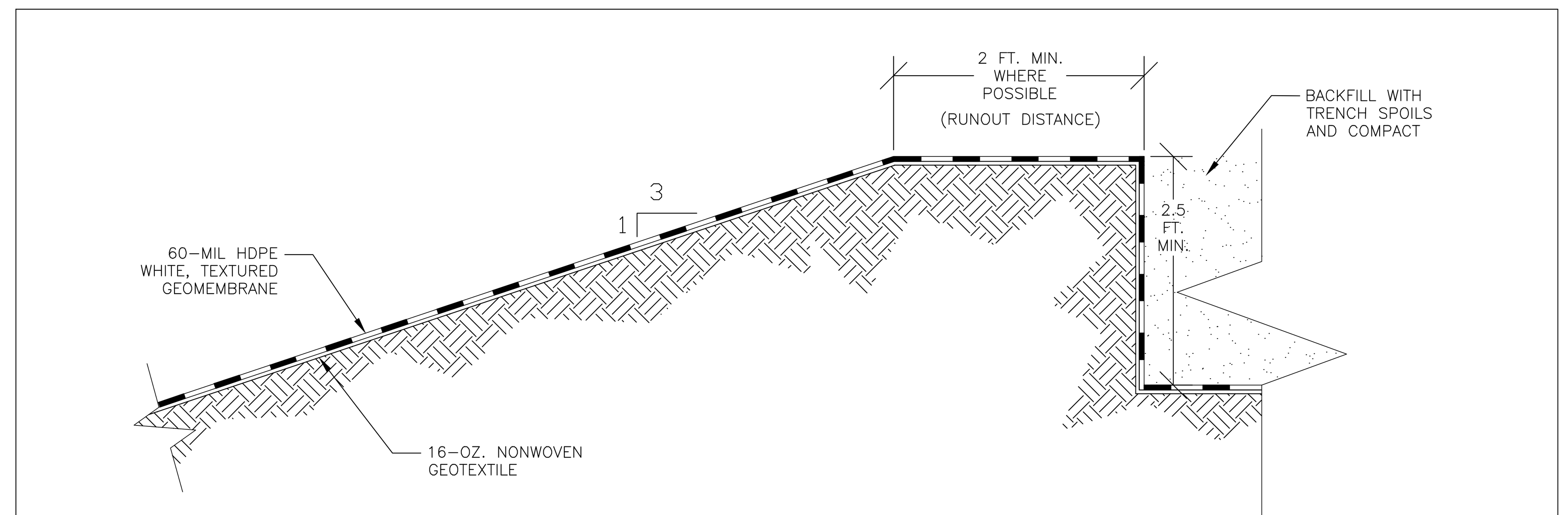
B / C030 RAMP SECTION
NOT TO SCALE



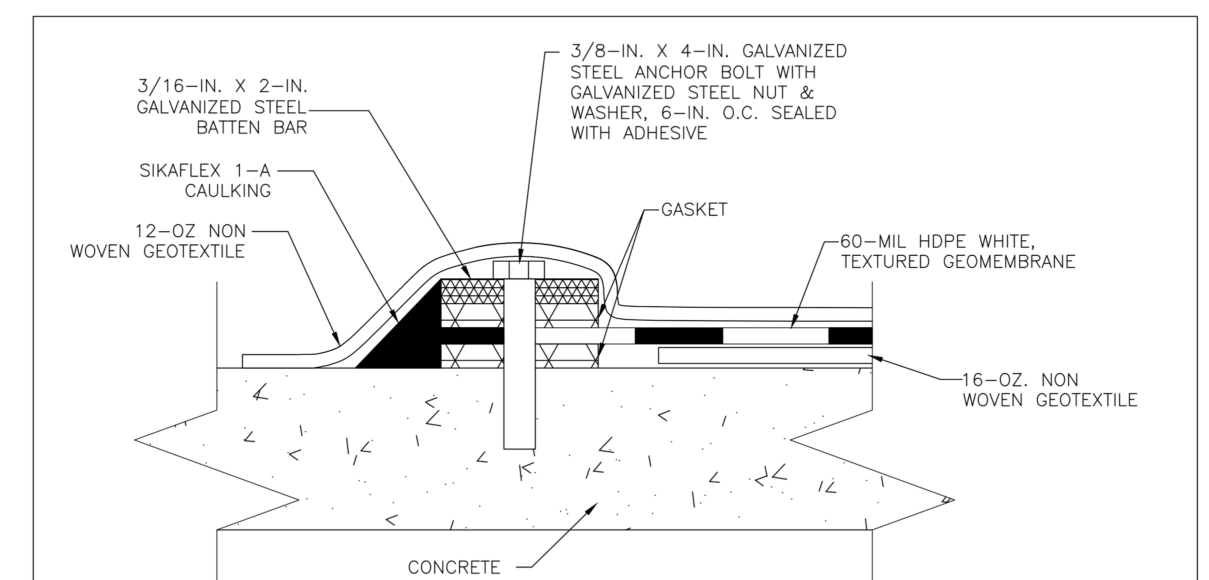
1 / C020 MARKER POST DETAIL
NOT TO SCALE



2 / C030 OUTLET WEIR DETAIL
NOT TO SCALE

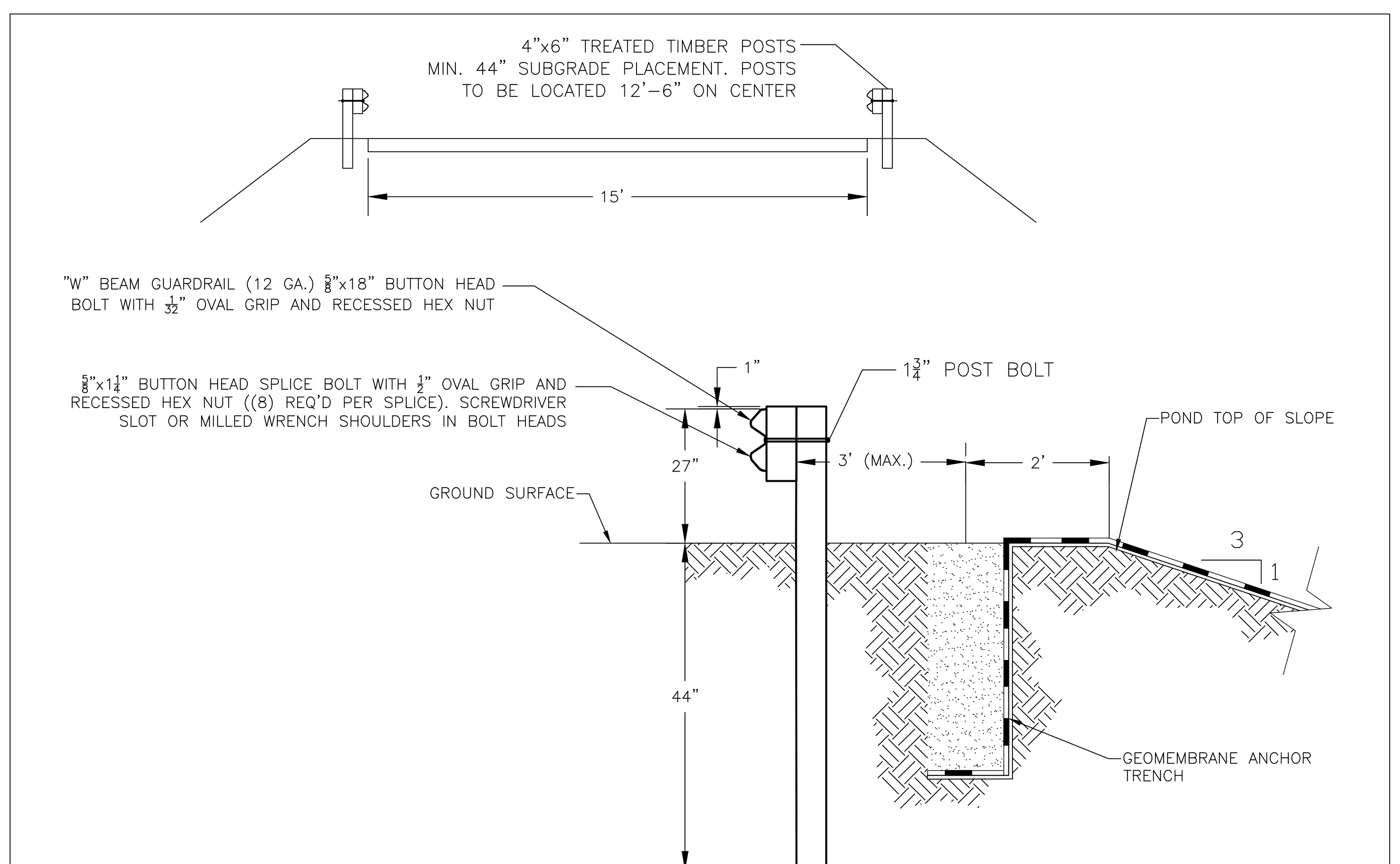


3 / C030 ANCHOR TRENCH DETAIL
NOT TO SCALE

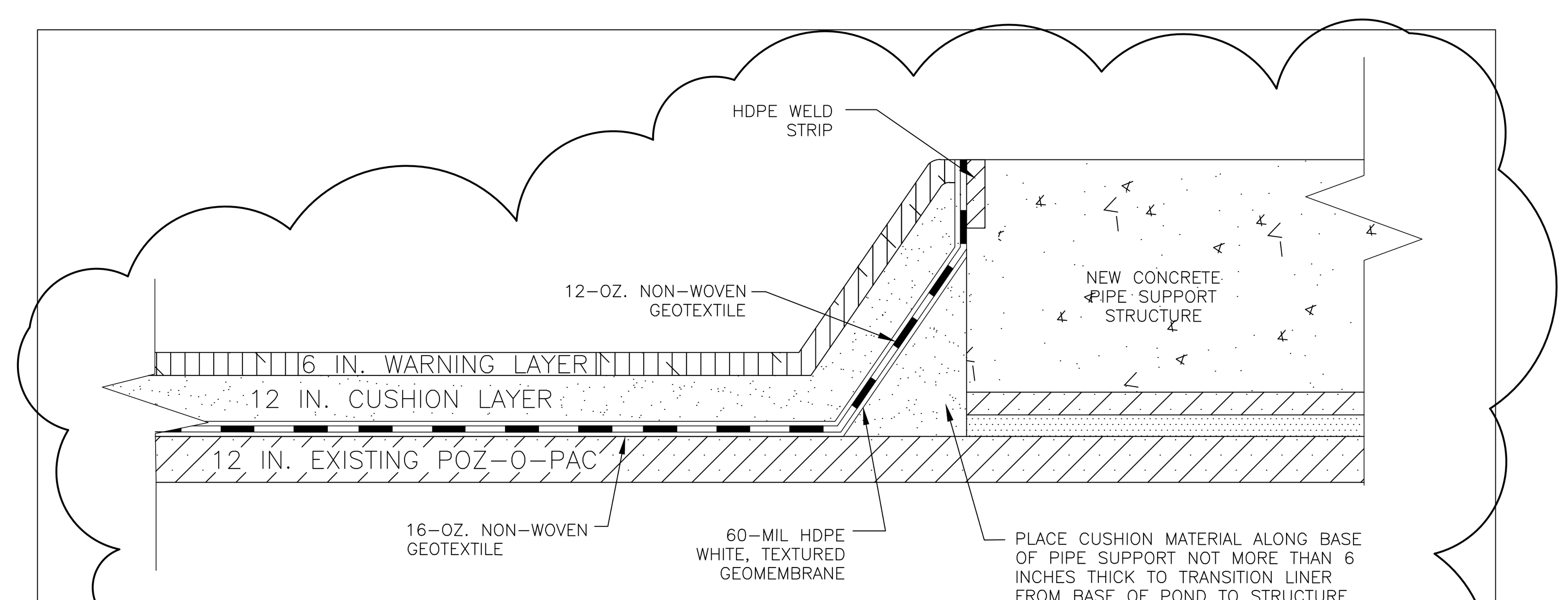


NOTE:
1. ANCHOR BOLTS 6 IN. ON CENTER.

5 / -- BATTEN BAR ATTACHMENT
NOT TO SCALE



6 / C030 GUARDRAIL DETAIL
NOT TO SCALE



4 / C030 NEW PIPE SUPPORT DETAIL
NOT TO SCALE

REVISION:		DATE:	APP'D BY:
6.			
5.			
4.	RECORD DOCUMENTATION FOR SOUTH ASH POND 3	12/30/09	HMS
3.	ISSUED FOR CONSTRUCTION	08/28/09	HMS
2.	ADDENDUM NO. 1	09/15/08	HMS
1.	ISSUED FOR BID	08/20/08	HMS
0.	ISSUED FOR PERMIT	07/15/08	HMS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1900
DRAWN BY: RLH/KNW 6/23/08
CHECKED BY: EJT 6/23/08
APPROVED BY: HMS 7/15/08

DETAILS AND SECTIONS
SOUTH ASH POND LINER REPLACEMENT
MIDWEST GENERATION
WILL COUNTY GENERATING STATION
ROMEOVILLE, ILLINOIS

DRAWING NO: D1900C031-04
REFERENCE: \bids-con
SHEET NO. C031

Attachment 1-4 – Pond 2S Liner Replacement Specifications

SECTION 00001
SPECIFICATION DATA SHEET

INTRODUCTORY PAGE

SPECIFICATION TITLE:	South Ash Pond 2 Liner Replacement Midwest Generation, LLC Will County Generating Station Romeoville, Illinois
REVISION NO.:	0
DATE:	May 5, 2013
MIDWEST GENERATION PROJECT MANAGER:	Jeffrey Beaudry – (815) 372-4631
NATURAL RESOURCE TECHNOLOGY, INC. (NRT) ENGINEERS:	Heather M. Simon, PE – Project Manager – (907) 782-5114 Eric J. Tlachac, PE – Project Engineer – (262) 522-1214 Ryan Baeten, PE – Project Engineer – (920) 362-8133

DESCRIPTION OF WORK SUMMARY:

Replacement of liner in South Ash Pond 2 at Will County Generating Station in Romeoville, Illinois. Site activities will consist of subgrade preparation, liner preparation and installation, protection layer installation, and leak location survey. Site activities will consist of removal of existing Poz-o-Pac layer, subgrade preparation, including grading, excavation, transport, stockpiling and disposal (as needed to meet 3H:1V slopes), placement of concrete pad around pipe supports, excavation of anchor trench, installation of white, 60-mil HDPE geomembrane and surrounding geotextile, placement of warning layer and cushion layer materials, installation of concrete-filled Geocell, and leak location survey of geomembrane.

END OF SECTION

SECTION 01050
CONSTRUCTION DOCUMENTATION AND SURVEYING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Work by Contractor

B. Contractor's Responsibilities and Submittals

C. Survey Data for Construction Documentation

D. Construction Documentation Drawings

1.02 WORK BY CONTRACTOR: Contractor shall provide construction documentation and surveying services as required for proper completion of work including:

A. Documenting topography of prepared subgrade prior to geomembrane placement.

B. Documenting location and dimensions of anchor trench.

C. Documenting location and elevation of geomembrane panels, seams, and repairs.

D. Documenting location of guardrails.

E. Documenting topography of warning layer and geocell layer (final surface).

1.03 CONTRACTOR'S RESPONSIBILITIES AND SUBMITTALS

A. Upon commencement of construction work, become familiar with the location of existing benchmarks, control points, and other necessary reference points. Maintain their accuracy and prevent disturbance or destruction. Contractor is responsible for re-establishing control points and benchmarks if such items are damaged and/or destroyed at no cost to Owner.

B. Establish and verify grades, lines, levels, locations, and dimensions as shown on Drawings and report any errors or inconsistencies to Owner and/or Engineer before commencing work

C. Initial staking of underground utilities and anchor trench.

D. Lay out work and be responsible for all surveys, lines, elevations, and measurements of structures and other work executed under Contract. Exercise proper preparation to verify dimensions on Drawings, within construction limits, before laying out work. Any error resulting from failure to exercise such precautions or work done without being properly located may be removed at Owner's direction and corrected or replaced at Contractor's expense.

E. Contractor shall verify work with respect to design grades prior to documentation surveys. Areas deficient will be corrected and resurveyed at Contractor's expense.

1.04 SURVEY DATA FOR CONSTRUCTION DOCUMENTATION

A. Survey work performed by Contractor shall be certified by a Professional Land Surveyor (PLS) licensed in the State of Illinois, and will include items identified in Table 1.

B. Frequency of surveys for each item is summarized in Table 1 and relevant Sections of the Technical Specifications.

C. Engineer shall be present for documentation survey. Contractor shall notify Engineer at least 2 working days prior to performance of each documentation survey.

D. Survey data shall be submitted to Owner and/or Engineer in one of the following formats within two working days after completion of survey:

1. Topographic map (electronic files compatible with AutoCAD and Portable Document Format or PDF).

2. Tabular (electronic file compatible with Microsoft Excel according to Table 1, at minimum indicating: northing, easting, elevation, and description).

E. Contractor will be notified by Owner and/or Engineer of areas to be adjusted or will be given written approval of surveyed area within two working days of receiving survey data.

F. Contractor shall obtain written approval from Owner and/or Engineer for each surveyed area prior to placement of any overlying materials.

1.05 CONSTRUCTION DOCUMENTATION DRAWINGS

A. Contractor shall submit record drawings to Owner and/or Engineer based on results of documentation survey within four working days following completion of survey for a particular surface or set of features as prepared by the PLS.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01300
SUBMITTALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. General Requirements

B. Submittal Format

C. Submittal Procedures

1.02 GENERAL REQUIREMENTS

A. Procedures and format for submittals required by the Contract Documents that may include, but are not limited to:

1. Soil and/or material test data.

2. Survey data.

3. Product test data.

4. Progress reports.

5. Shop drawings.

6. Manufacturer's instructions, certificates, guarantees, and warranties.

7. Management, staging, and sequencing plans.

8. Schedules.

B. Refer to Contract Documents and Table 2 for list of submittals.

1.03 SUBMITTAL FORMAT

A. Submittals shall be transmitted by Contractor with the following identified on the cover sheet:

1. Project name and contract number.

2. Applicable Specification (Section) and submittal number.

3. Date (or revision number).

4. Sequential page numbers.

B. Submittals shall be made electronically via email.

C. Stamp, sign, or initial submittal certifying products or field dimensions, whichever pertains, are in accordance with requirements of the Contract Documents.

1.04 SUBMITTAL PROCEDURES

A. Provide all submittals and information as identified in Contract Documents to named parties in the time frames indicated in Table 2. Payments may be withheld, in whole or in part, at the discretion of the Owner in the event that submittals are not made within times specified unless previously requested in writing by the Contractor (to Owner and/or Engineer) and approved in writing by Owner and/or Engineer.

Transmit Submittals to Owner Representative:
Jeffrey Beaudry
Will County Generating Station – Midwest Generation, LLC
529 E. 135th Street
Romeoville, IL 60446

jbeaudry@mwgen.com
Phone: (815) 372-4631
Fax: (815) 372-4565

Transmit Submittals to the Project Engineers:

Eric J. Tlachac, PE	Ryan Baeten, PE
etlachac@naturalrt.com	rbaeten@naturalrt.com

Natural Resource Technology, Inc.
23713 W. Paul Rd., Suite D
Pewaukee, WI 53072
Phone: (262) 523-9000
Fax: (262) 523-9001

B. Transmit submittals by appropriate means to expedite review of submittal. Submittals delivered by hand, facsimile, or mail service are acceptable, however, email is preferred. Business addresses of project representatives will be provided at the pre-construction meeting.

C. Submittals shall be made far enough in advance of the scheduled approval dates to allow adequate time for reviews, approvals, and revisions.

D. Submittals shall identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of completed work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01400
QUALITY ASSURANCE AND CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Construction Quality Assurance

B. Contractor’s Role (Quality Control)

C. Engineer’s Role

D. Owner’s Role

1.02 CONSTRUCTION QUALITY ASSURANCE

A. Owner shall arrange for and inform Contractor of inspection and testing activities to confirm that the construction activities and completed Work complies with Contract Documents.

B. Owner’s inspection and testing activities shall consist of following activities:

1. Daily observation and record of Contractor activities.

2. Obtain material samples and transport samples to laboratory, as necessary.

3. On-site visual material inspection and testing.

4. Verifying compliance with Contract Documents.

1.03 CONTRACTOR’S ROLE (QUALITY CONTROL)

A. Perform work in strict accordance with Contract Documents, using necessary construction procedures and techniques. Coordinate, supervise, and oversee subcontractors as needed to perform construction activities.

B. Perform testing as deemed necessary to satisfy requirements of Contract Documents related to off-site materials prior to delivery to site. Materials that do not meet specifications shall be removed from site at Contractor’s expense.

C. Contractor shall replace and/or recompact material at Contractor’s expense, if soil compaction is not acceptable, in accordance with compaction requirements.

D. Furnish material samples and provide assistance with on-site inspection and test activities.

E. Provide submittals required by Contract Documents within times specified. Failure to do so will result in withholding of payment.

F. Perform or arrange survey and layout to perform Work in accordance with Contract Documents.

G. If manufacturer's instructions and/or standard industry practice conflicts with Contract Documents, request clarification from Owner and/or Engineer before proceeding.

H. Communicate any pertinent issues with the Owner and/or Engineer.

1.04 ENGINEER'S ROLE

A. Provide clarifications to Contract Documents, as well as any necessary design changes requested by the Owner.

B. Issue a Field Directive in cases where deviation from specified design or Contract Documents is necessary.

C. Communicate any pertinent issues with the Owner and/or Contractor.

D. Confirm construction compliance with Contract Documents by performing observations, inspections, verifications, and documentation activities, as directed by Owner.

E. Provide photo documentation and daily written reports documenting construction activities.

F. Perform or observe soil and/or geosynthetic inspections and testing to confirm materials and installed products meet requirements herein, as directed by Owner.

1.05 OWNER'S ROLE

A. Perform Owner's engineering review and monitor construction progress, provide progress payment approvals, and provide approval of field job orders.

B. Confirm construction compliance with Contract Documents by performing observations, inspections, verifications, and documentation activities, as necessary.

C. Perform Owner's administrative and managerial responsibilities. Owner has authority to accept/reject materials and workmanship, and for dispute resolution.

D. Communicate any pertinent issues with Contractor and/or Engineer. Maintain communication with IEPA, as necessary.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01500
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Use of Site Facilities

B. Security

C. Access Roads and Parking

D. Telephone Service

E. Temporary Utilities

F. Sanitary Facilities

G. Equipment Storage Locations

H. Dust and Mud Controls

I. Construction Noise

J. Water and Erosion Controls

K. Barriers and Protection of Installed Work.

L. Site Progress Cleaning

M. Fuel Storage and Handling

N. Protection of the Environment

O. Public Road Requirements

P. Additional Requirements

1.02 USE OF SITE FACILITIES

A. Use of Site

1. Contractor shall consult with the Owner and/or Engineer regarding locations for offices, trailers, material storage, access roads, fences, gates, and areas within construction limits for use by Contractor.

2. Contractor shall conduct construction activities in a manner to minimize interference with plant operations.

3. Confine equipment, storage of materials, and operations of workmen to areas designated by the Owner. Do not bring materials onto site until reasonably required for progress of work. No area outside of construction limit or staging area may be used for any purpose by Contractor or subcontractors unless expressly approved by the Owner in writing.

4. Store, place, and handle material and equipment to protect from any damage. Contractor shall move materials, sheds, or storage platforms, as necessary or when required for continuing construction at Contractor's expense.

5. Owner assumes no responsibility for project material or equipment stored on-site or off-site. Contractor assumes full responsibility for damage due to storage of materials.

6. Contractor is responsible to schedule work, storage of materials, etc., to minimize interference with construction activities.

7. Contractor is responsible for all snow removal as necessary during duration of project, as necessary.

8. Contractor is responsible for controlling sediment migration, preventing tracking of sediment onto site access roads and public roads, and cleaning site access roads and public right-of-ways and streets daily (or as deemed necessary by Owner) with commercial street sweepers.

B. Contractor shall inspect site with Owner and/or Engineer prior to start of work to determine existing conditions in conjunction with preconstruction meeting.

1.03 SECURITY

A. Security is not provided by Owner for Contractor's property.

B. Contractor is responsible for loss or injury to persons or property where his work is involved, and shall provide security and take precautionary measures as deemed necessary to protect Contractor's and Owner's interests.

1.04 ACCESS ROADS AND PARKING

A. Contractor shall maintain the service road accessing the construction areas and stockpile areas as necessary, or as directed by Owner and/or Engineer.

B. Contractor shall use the south plant entrance that crosses over station train tracks for truck access to deliver material. Note train traffic occurs frequently and has the right of way, which may cause trucks to wait and delay delivery.

C. Parking areas on-site shall be within the work area or area designated by Owner

1.05 TELEPHONE SERVICE

A. Contractor shall provide, maintain, and pay for cellular phone service for Contractor's designated on-site superintendent or foreman. In addition, subcontractor's designated on-site personnel shall have cellular phones.

1.06 TEMPORARY UTILITIES

A. Electricity

1. Contractor shall arrange with Owner for temporary electrical service as needed.

3. OSHA regulations require that employers shall use either ground fault circuit interrupters (GFCIs) or an assured equipment grounding conductor program (AEGCP) in addition to any other regulations for equipment grounding conductors.

4. Utilize and remove upon completion of project an electrical distribution system for temporary light and power during construction, if necessary.

B. Water

1. Contractor shall arrange with Owner for water service as needed. Contractor shall furnish and install all temporary connections required to complete Work and shall furnish his own shutoff valves and hose connections.

2. Contractor may use the water in the South Run-off Basin or shall provide clean water to be used for dust suppression in work areas. Dust suppression will be necessary for haul roads, stockpile areas, and within construction limits. Submit source of clean water to be used for dust suppression to Owner and/or Engineer for approval prior to project commencement.

3. Contractor shall provide potable water for Contractor's employees, as necessary.

1.07 SANITARY FACILITIES

A. Contractor shall provide sanitary facilities on-site conforming to state and local health and sanitation regulations in sufficient number for use of Contractor's employees.

B. Contractor shall maintain on-site facilities in sanitary condition at all times.

1.08 EQUIPMENT STORAGE LOCATIONS

A. Contractor shall park equipment and store materials only in areas proposed by Contractor and approved by Owner.

B. Restore disturbed areas to pre-construction condition upon project completion.

1.09 DUST AND MUD CONTROLS

A. Conduct operations and maintain site to minimize creation and dispersion of dust and mud.

B. Provide equipment necessary to control dust generation resulting from wind effects on open stockpiles, excavations, and from Contractor's vehicle and equipment traffic at all times. Control dust by application of water to affected areas, such that surfaces are moistened to prevent dust from becoming a nuisance to public, neighbors, and concurrent performance of other work at site. Contractor shall prevent dusting 24 hours a day from project commencement to substantial completion of the work.

D. Control mud and tracking of mud over site access roads and public roads along haul routes. Maintain surfaces in proper condition to facilitate removal efficiency.

E. The Owner and/or Engineer shall monitor site conditions related to dust and mud generation on a daily basis and direct Contractor to take actions as necessary to address deficient practices or conditions deleterious to construction and/or public.

F. Clean public right-of-ways and streets as deemed necessary by Owner with commercial street sweepers.

1.10 CONSTRUCTION NOISE

A. The Owner shall decide on the adequacy of provision and maintenance of noise reduction equipment. When so instructed by the Owner, the Contractor shall immediately withdraw any equipment from service and carry out all necessary additions, replacements, or repairs to the noise reduction equipment to the satisfaction of the Owner.

1.11 WATER AND EROSION CONTROLS

A. Contractor shall install and maintain erosion control measures necessary to prevent runoff, tracking, or loss of soil materials by water or mechanical action from disturbed portions of the site or excavation areas(s), as shown on the Contract Drawings and in accordance with the project's Storm Water Pollution Prevention Plan (SWPPP), as presented in Appendix A.

B. No direct discharge shall be allowed into any of the ponds on-site without the approval from Owner.

1.12 BARRIERS AND PROTECTION OF INSTALLED WORK

A. Contractor shall protect installed work and provide special protection as needed.

B. Construction traffic shall be prohibited on completed and/or landscaped areas.

C. Protect existing facilities and adjacent properties from damage during construction operations.

1.13 SITE PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Site shall be maintained in clean and orderly condition.

B. Remove waste materials, debris, and rubbish from site weekly and dispose off-site at Contractor's expense and in accordance with federal, state, and local regulations.

C. Contractor shall provide a dumpster on-site for general waste materials and rubbish during site activities.

1.14 FUEL STORAGE AND HANDLING

A. Store fuel according to local, state, and federal laws.

B. At no time shall overtopping fuel tanks or spillage to the ground surface be allowed.

1.16 PROTECTION OF THE ENVIRONMENT

A. Minimize air pollution by use of properly operating emission control devices on construction vehicles and equipment. Encourage shutdown of motorized equipment not in use.

B. Trash burning not permitted on-site.

C. All areas for handling and storage of fuels, oils, and other potentially hazardous liquids shall have spill containment or release prevention measures. Maintenance of equipment on-site shall be with prior approval of the Owner and/or Engineer.

D. All waste materials shall be recycled, hauled to a licensed solid waste landfill, or otherwise disposed of in an environmentally sound manner and in compliance with all applicable local, state, and federal rules.

E. All hazardous waste shall be stored, handled, and disposed of in compliance with applicable local, state, and federal rules.

F. Other measures shall be taken, as necessary, to maintain work site in an environmentally sound matter.

G. All spills or leaks of fuels, oil, or other IEPA-reportable liquids resulting from handling or equipment malfunctions shall be reported immediately to Owner and/or Engineer. Affected soils shall be properly removed from limits of construction and disposed in accordance with applicable local, state, and federal rules at the sole expense of the Contractor and as agreed by the Owner and/or Engineer. Copies of manifests, if necessary, shall be provided to Owner and/or Engineer within five working days of disposal. Waste Generator Manifests shall not state Owner as Generator. Owner reserves right to order leaking equipment removed from site.

1.17 PUBLIC ROAD REQUIREMENTS

A. Contractor shall comply with Local Weight Limits. Local roads shall be cleaned daily, as necessary, to maintain their condition free of mud and dirt.

B. The Contractor shall conduct his operations on the site in a manner that will minimize interference with the normal operation of plant, adjoining public and private roads and parking lots, and shall implement all specified and other appropriate measures to ensure the safety of all users of the adjoining public and private roads and parking lots.

C. Contractor shall provide flag person(s) as necessary and at request of Owner and/or Engineer.

1.18 ADDITIONAL REQUIREMENTS

A. No cameras are allowed on the site without permission from the Owner.

B. No firearms or explosives are allowed on-site.

C. Possession and/or use of intoxicating beverages and nonprescription drugs are prohibited at all times. Persons caught in possession or under the influence of drugs or alcohol will be immediately dismissed and removed from the site.

D. Smoking will be allowed in designated areas only.

E. No horseplay is permitted on the job site.

F. Visitors or personnel not employed by the Contractor or his approved Subcontractors shall not be permitted on-site without prior approval by the Owner.

G. Owner and/or Engineer reserve the right to require that any of the Contractor's personnel be excluded from work at the site at any time.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01700
PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Description of Work

B. Procedures

C. Record Documents

1.02 DESCRIPTION OF WORK

A. To provide an orderly and efficient transfer of the completed Work to the Owner.

1.03 PROCEDURES

A. Remove temporary above grade or buried utilities, equipment, and materials prior to final application or payment inspection, Clean and repair damage caused by installation or use of temporary facilities.

B. Substantial Completion: When all work described in the contract documents is completed:

1. Owner and/or Engineer will prepare and submit a list of items to be completed for Contractor review and completion.

2. Should the Owner and/or Engineer determine that the Work is not substantially complete; Contractor will remedy the deficiencies and notify the Owner and/or Engineer when ready for re-inspection.

C. Final Completion:

1. Remove waste and surplus materials, rubbish, and construction facilities from site.

2. Prepare and submit the notice that all Work is complete.

3. Certify in writing that the Work is complete and ready for final inspection.

4. Owner and/or Engineer will make a final inspection to verify status of completion.

1.04 RECORD DOCUMENTS

A. Contractor will maintain on-site one set of record documents of all items of Work:

1. Drawings.

2. Technical Specifications.

3. Change orders and other modifications to contract.

4. A copy of approvals of work performed.

5. Submittals.

B. Engineer, as directed by Owner, will record information concurrent with construction progress including changes made by addenda and modifications.

C. Contractor will maintain a Daily Field Log including work times, personnel on-site, equipment used, and other essential information of the Work progress.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 02078
GEOCELL CELLULAR CONFINEMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section includes providing all material, labor, tools, and equipment for installation of geocell cellular confinement as shown in the Contract Documents and as specified in this Section.

B. The geocell cellular confinement system shall be used for slope protection.

1.02 REFERENCES

A. Latest version of ASTM International standards:

1. ASTM D638 - Standard Test Method for Tensile Properties of Plastics

2. ASTM D1505 - Standard Test Method for Density of Plastics by the Density-Gradient Technique

3. ASTM D1603 - Standard Test Method for Carbon Black Content in Olefin Plastics

4. ASTM D1693 - Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics

5. ASTM D5199 - Standard Test Method for Measuring the Nominal Thickness of Geosynthetics

6. ASTM E41 - Terminology Relating to Conditioning

1.03 SUBMITTALS

A. Submit manufacturer's shop drawings in accordance with the Contract Documents, including Manufacturer's product data, samples, and section layout.

B. Five days prior to delivery, submit manufacturer's certification of polyethylene used to make geocell material including:

1. Manufacturer's certification of percentage of carbon black.

2. Resin manufacturer's certification of polyethylene density and environmental stress crack resistance (ESCR).

3. Origin (supplier's name and production plant) and identification (brand name and number) of resin used to manufacture geocell.

4. Copies of dated quality control certificates issued by resin supplier.

5. Results of tests conducted by geocell manufacturer to verify that resin used to manufacture geocell meets Specifications.

6. Installation schedule.

7. List of geocell section numbers corresponding to the QA Testing List of materials that comprise geocell, expressed in following categories as percent by weight: polyethylene, carbon black, other additives.

8. Written certification that geocell manufacturer guarantees minimum values given in manufacturer's specification.

9. Quality control certificates, signed by geocell manufacturer. Each quality control Certificate shall include applicable roll identification numbers, testing procedures, and results of quality control tests.

C. With bid, qualification certifying the Geocell Installer has 5 years of experience installing the specified products in the specified application. Include resumes of Geocell Installer superintendent and technicians, including dates and duration of employment.

1. Qualified Geocell Installer approved by Engineer:

a. Clean Air and Water Systems, LLC (CAAWS)
123 Elm Street, Dousman, WI 53118
Brian McKeown, Owner & Construction Manager
Phone: (262) 965-4366

b. Or other approved by Owner and/or Engineer.

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1.04 QUALITY ASSURANCE AND CONTROL

A. The geocell cellular confinement system material shall be provided from a single Manufacturer for the entire project.

B. The Manufacturer shall provide certification of compliance to all applicable testing procedures and related specifications prior to delivery.

C. Pre-Installation Meeting: Prior to installation of any materials, conduct a pre-installation meeting to discuss the scope of work and review installation requirements. The pre-installation meeting shall be attended by all parties involved with the installation of the cellular confinement system.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in Manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and Manufacturer.

B. The materials shall be stored in accordance with Manufacturer's instructions. The materials shall be protected from damage and out of direct sunlight.

C. The materials shall be delivered, unloaded, and installed in a manner to prevent damage.

1.06 WARRANTY

A. The Manufacturer shall warrant each geocell section that it ships to be free from defects in materials and workmanship at the time of manufacture. The Manufacturer's exclusive liability under this warranty or otherwise will be to furnish, without charge to the original freight on board (f.o.b.) point, a replacement for any section which proves to be defective.

B. This warranty shall not cover defects attributable to causes or occurrences beyond the Manufacturer's control and unrelated to the manufacturing process, including, but not limited to, abuse, misuse, mishandling, neglect, improper storage, improper installation, improper alteration, or improper application.

PART 2 - PRODUCTS

2.01 GEOCELL CELLULAR CONFINEMENT SYSTEM

A. Base Materials

1. Polyethylene Stabilized with Carbon Black

a. Density shall be 58.4 to 60.2 pound/ft^3 (0.935 to 0.965 g/cm^3) in accordance with ASTM D1505.

b. Environmental Stress Crack Resistance (ESCR) shall be 5,000 hours in accordance with ASTM D1693.

c. Ultra-Violet light stabilization with carbon black.

d. Carbon Black content shall be 1.5 to 2 percent by weight, through addition of a carrier with certified carbon black content.

e. Carbon black shall be homogeneously distributed throughout material.

f. The manufacturer must have an in-place quality control program to prevent irregularities in strip material.

B. Cell Properties

1. Individual cells shall be uniform in shape and size when expanded.

2. Individual cell dimensions (nominal) shall be dimensions ± 10%.

3. Geoweb® GW30V4 manufactured by Presto Geosystems

a. Length shall be 11.3 inches.

b. Width shall be 12.6 inches.

c. Nominal area shall be 71.3 in^2 plus or minus 1%.

d. Nominal depth shall be 4 inches.

C. Strip Properties and Assembly

1. Perforated Textured Strip/Cell

a. Strip sheet thickness shall be 50 mil, minus 5 percent, plus 10 percent in accordance with ASTM D5199. Determine thickness flat, before surface disruption.

b. Polyethylene strips shall be textured surface.

c. Textured sheet thickness shall be 60 mil plus or minus 6 mil.

d. Textured surface density shall be 140 to 200 per in^2.

e. Perforated with horizontal rows of 0.4-inch diameter holes.

f. Perforations within each row shall be 0.75 inches on-center.

g. Horizontal rows shall be staggered and separated 0.50 inches relative to hole centers.

h. Edge of strip to nearest edge of perforation shall be a minimum of 0.3 inches.

i. Centerline of spot weld to nearest edge of perforation shall be a minimum of 0.7 inches.

j. A slot with a dimension of 3/8 inch × 1-3/8 inch is standard in the center of the nonperforated areas and at the center of each weld.

k. Geocell strips shall have a minimum strength at yield of 1025 lb/ft as determined in accordance with ASTM D638 and tested on the geocell strip in the area with the densest perforations.

2. Assembly of Geocell Sections

a. Fabricate using strips of sheet polyethylene each with a length of 142 inches and a width equal to cell depth.

b. Connect strips using full depth ultrasonic spot-welds aligned perpendicular to longitudinal axis of strip.

c. Ultrasonic weld melt-pool width shall be 1.0 inch maximum.

d. Weld spacing for Geoweb® GW30V4 sections shall be 17.5 inches plus or minus 0.10 inch.

D. Cell Seam Strength Tests

1. Minimum seam strengths are required by design and shall be reported in test results. Materials submitted with average or typical values will not be accepted. Written certification of minimum strengths must be supplied to the engineer at the time of submittals.

2. Short-Term Seam Peel-Strength Test

    a. Cell seam strength shall be uniform over full depth of cell.

    b. Minimum seam peel strength shall be 320 lbf for 4-inch deep geocell.

3. Long-Term Seam Peel-Strength Test

    a. Conditions: Minimum of 7 days in a temperature-controlled environment that undergoes change on a 1 hour cycle from room temperature to 130 degrees F (54 degrees C).

    b. Room temperature shall be in accordance with ASTM E41.

    c. Test samples shall consist of two, 4-inch wide strips welded together.

    d. Test sample consisting of two carbon black stabilized strips shall support a 160 pound load for test period.

2.02 INTEGRAL COMPONENTS

A. ATRA® Clip

1. The ATRA® clip is a molded, high-strength polyethylene device available in standard 0.5 inch and metric 10-12 mm versions.

B. ATRA® Key

1. ATRA® keys shall be constructed of polyethylene and provide a high strength connection.

2. ATRA® keys shall be used to connect geocell panels together at each interleaf and end to end connection.

C. TP-93 Tendon

1. Polyester tendons manufactured from bright, high-tenacity, industrial-continuous filament polyester yarn woven into a braided strap. Elongation shall be 9 – 15% at break.

2. The tendon diameter/width and minimum break strength shall be:

    a. Diameter/Width: 0.75 inches

    b. Minimum Break Strength: 2090 lbf

2.03 INFILL MATERIAL

A. Infill material shall be concrete that is furnished and installed in accordance with Section 03300- Cast-In-Place Concrete.

B. Material along horizontal runout shall be cushion material that is furnished and installed in accordance with Section 02300-Earthwork, as shown on Sheet C031.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify site conditions are as indicated on the drawings. Notify the Engineer if site conditions are not acceptable. Do not begin preparation or installation until unacceptable conditions have been corrected.

B. Verify layout of structure is as indicated on the drawings. Notify the Engineer if layout of structure is not acceptable. Do not begin preparation or installation until unacceptable conditions have been corrected.

3.02 INSTALLATION OF THE CELLULAR CONFINEMENT SYSTEM

A. Prepare subgrade and install geocell confinement system in accordance with Manufacturer's recommendations.

B. Geocell Section Placement and Connection

1. Verify all geocell sections are expanded uniformly to required dimensions and that outer cells of each section are correctly aligned. Interleaf or overlap edges of adjacent sections. Ensure upper surfaces of adjoining geocell sections are flush at joint and adjoining cells are fully aligned at the cell wall slot.

2. Connect the geocell sections with ATRA® keys at each interleaf and end to end connection. Insert the ATRA® key through the cell wall slot before inserting through the adjacent cell. Turn the ATRA® key 90 degrees to lock the panels together.

3. No foot or vehicle traffic shall be allowed on the deployed Geocell sections prior to infill placement.

C. Infill Placement

1. Place infill in expanded cells with suitable material handling equipment, such as a backhoe, front-end loader, conveyor, or crane-mounted skip.

2. Limit drop height to a maximum of 3 feet to avoid damage or displacement of the cell walls.

3. Fill geocell sections from the crest of the slope to toe with infill material (concrete) or as directed by Engineer's. Geocell sections at crest of the slope

along horizontal runout to be filled with cushion material following completion of leak location survey, as shown on Sheet C031.

4. Infill material shall be free-flowing and not frozen when placed into the geocell sections.

5. Evenly spread infill into place.

END OF SECTION

SECTION 02300
EARTHWORK

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Contractor shall remove any accumulated ash, sludge/sediment, and debris from pond by means approved by Owner and/or Engineer. Load, transport, and dispose/stockpile of ash and sludge/sediment on-site.

B. Removal of Poz-O-Pac liner and existing fill material from bottom of South Ash Ponds 2, excluding the area around the pipe support foundations, as needed to achieve subgrade elevation.

C. Load and transport Poz-O-Pac liner material from pond to an approved recycling or disposal facility.

D. Load, transport, and stockpile excavated existing fill material to Owner's approved location on-site for reuse, as needed.

E. Clearing and grubbing vegetation and removing rocks and other debris greater than 3 inches in diameter along sideslopes and base of pond.

F. Load and transport rocks and other debris removed from liner subgrade determined not suitable for on-site disposal by Owner and/or Engineer to an approved recycling or disposal facility.

G. Trenching, backfilling, and compaction for anchoring geomembrane and geotextile including field verifying the location of underground utilities, protection and maintenance of trench, and support of existing structures (e.g. aboveground piping, outlet and inlet).

H. Placement, grading, and compaction of excavated existing fill material or excavated subgrade material, including loading and transporting from on-site stockpile area to reuse as cushion material following installation of Geomembrane, as approved and directed by Owner and/or Engineer.

I. Delivery, placement, and grading of cushion material following installation of geomembrane.

J. Delivery, placement, grading, and compaction of Warning Layer material following placement of cushion material.

1.02 RELATED SECTIONS

A. Section 01050 – Construction Documentation and Surveying

B. Section 02600 – HDPE Geomembrane

1.03 DEFINITIONS

A. Geotechnical Laboratory: Party, independent from the Owner and Contractor, responsible for conducting laboratory tests on soils obtained at the Site under contract with the Contractor.

B. Geotechnical Field Technician: Party, independent from the Owner and Contractor, responsible for conducting field tests on compacted soils at the Site under contract with the Contractor.

C. Structures and Surface Features: Existing structures and surface features, including buildings, signs, posts, utility poles, fences, trees, shrubs, landscaped surface features, and other miscellaneous items.

D. Utilities: Existing gas mains, water mains, electric lines, storm sewers and conduits, telephone and other communication lines and conduits, sewer pipe, cable television, other utilities, and appurtenances.

E. Clearing and Grubbing: cutting, removal, and disposal of trees, roots, brush, stumps, windfalls, logs, and other vegetation.

1.04 REFERENCES

A. ASTM D422 – Standard Test Method for Particle-Size Analysis of Soils.

B. ASTM D2487-93 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

C. ASTM D2940 – Standard Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports

D. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort, (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

E. ASTM D6938 – Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

F. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

G. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

H. State of Illinois, Department of Transportation (IDOT), Standard Specifications for Road and Bridge Construction, current edition.

I. OSHA 29 CFR Part 1926, Occupational Safety and Health Standards: Excavations.

1.05 PERFORMANCE REQUIREMENTS

A. Excavation and grading shall be done without damage to adjacent property or structures and without interference to public and/or plant, pedestrian, and vehicular traffic.

B. Complete Work to required grades as indicated in the Contract Drawings.

1.06 SUBMITTALS

A. In accordance with Section 01300.

B. Submit with the bid, the name and location of the recycling or disposal facility for the Poz-O-Pac material, rocks, and debris removed from pond deemed unsuitable for on-site disposal by Owner and/or Engineer.

C. Submit prior to start of construction, the name and location of all sources that will be used to obtain the materials specified in this Section.

D. Provide Owner and/or Engineer written notice of construction start date at least five working days prior to beginning site activities.

E. Submit for documentation certificates and/or test results for one sample of each material obtained from off-site sources indicating compliance with Specifications prior to start of construction. Owner and/or Engineer may take random samples of the material upon delivery or placement to verify compliance with the Specifications.

F. Submit geotechnical field test results to Engineer within 24 hours of test completion.

PART 2 - PRODUCTS

2.01 GENERAL SOIL MATERIALS

A. Provide borrow soil materials when sufficient satisfactory soil materials are not available from on-site excavations.

1. Satisfactory Soils: ASTM D2487 soil classification groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 1 inch in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

2. Unsatisfactory Soils: ASTM D2487 soil classification groups GC, SC, ML, CL, MH, CH, OL, OH, and PT, or a combination of these group symbol where clay,

organic soils, or other non-aggregate base course type materials are found in quantities that may impair shear strength, limit drainage, or cause frost heave. Also includes materials containing ash, slag, cinders, or foundry sand.

B. <u>Poz-O-Pac Material</u>: Unidentified quantity of material at the base of the pond is a stabilized subgrade/liner that is comprised of lime, fly ash, and aggregate. Compressive strength of the Poz-O-Pac could be between 500 to 3,000 psi.

D. <u>Excavated Existing Fill Material</u>: Excavated material from base of the pond between the first and second Poz-O-PacO-Pac liners that does not require disposal and may be reused as backfill, subject to Owner’s and/or Engineer’s approval.

E. <u>Excavated Subgrade Material</u>: Excavated material from the pond side slopes that may be reused as backfill, subject to Owner’s and/or Engineer’s approval.

F. <u>Anchor Trench Backfill</u>: Trench spoils free of rock or gravel larger than 1 inch in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

2.02 RECONSTRUCTED BANK MATERIAL

A. Conform to Section 1003.01, Fine Aggregates, of IDOT Standard Specifications for Road and Bridge Construction:

1. Description: Sand or screenings;

2. Grade No. FA3 or FA5 shall be used;

3. Excavated Subgrade Material or Existing Fill Material subject to Owner’s and/or Engineer’s approval; or

4. Other materials with greater or equal characteristics with the written approval of the Owner and/or Engineer.

B. Contractor shall provide Owner and/or Engineer a representative gradation (ASTM D422) and classification (ASTM D2487) for the Cushion Layer Material two weeks prior to delivery to site.

2.03 CUSHION LAYER MATERIAL

B. Cushion Layer Material shall be obtained from on-site, or an off-site borrow source of the Contractor’s choice, and shall, at a minimum, satisfy the following specifications:

1. Conform to Section 1003.01, Fine Aggregates, of IDOT Standard Specifications for Road and Bridge Construction:

a. Description: Sand or screenings; and

b. Grade No. FA 1, FA 2, FA 3, or FA 5 shall be used

2. Excavated Subgrade Material or Existing Fill Material subject to Owner’s and/or Engineer’s approval; or

3. Other materials recommended by the Contractor for the specific application with the written approval of the Owner and/or Engineer.

C. Contractor shall provide Owner and/or Engineer with a representative gradation (ASTM D422) and classification (ASTM D2487) for the Cushion Layer two weeks prior to delivery to site.

2.04 WARNING LAYER MATERIAL

A. Warning Layer Material shall be obtained from an off-site borrow source of the Contractor’s choice and shall, at a minimum, satisfy the following specifications:

1. Conform to Section 1004.04, Coarse Aggregate for Stabilized Subbase, of IDOT Standard Specifications for Road and Bridge Construction:

   a. Grade No. CA 6 shall be used.

   b. Material shall be angular in nature (e.g., crushed stone).

2. Other materials recommended by the Contractor for the specific application with the written approval of the Owner and/or Engineer.

B. Contractor shall provide Owner and/or Engineer with a representative gradation (ASTM D422) and classification (ASTM D2487) for the Warning Layer Material two weeks prior to delivery to site.

PART 3 - EXECUTION

3.01 PROTECTION OF UTILITIES AND STRUCTURES

A. At least 10 business days before beginning Work, coordinate utility locate with a private utility locator for Owner’s private utilities near South Ash Pond 2.

B. Protect against damage existing utilities not specified for removal.

C. Locate existing underground utilities by hand or vacuum excavation methods only.

D. If unmarked utilities are encountered during excavation, stop Work, place Work in a safe condition, and notify Owner and/or Engineer.

E. Preserve and protect benchmarks and other structures. If damaged during construction, notify Owner and/or Engineer immediately. If determined by Owner and/or Engineer that the integrity of the structure is compromised, Contractor shall repair damaged benchmarks or other structures at Contractor's expense under observation of Owner and/or Engineer.

F. Protect, support, and maintain conduits, wires, pipes, or other utilities that are to remain in place during Work as indicated in the Contract Drawings.

3.02 PREPARATION

A. Contractor shall perform, as necessary, additional survey and layout to establish location, line, and grades for controlling the Work.

B. Vicinity Controls

1. Surface Water: Contractor is responsible for management of surface water and maintaining adequate berms and drainage to control surface water run-on into the South Ash Pond 2, as needed. Surface water and run-on water may be directed to the South Ash Pond 3, as needed to complete Work and as approved by Owner.

2. Erosion Controls: Contractor shall undertake erosion control measures as shown on the Contract Drawings and in accordance with the project's Storm Water Pollution Prevention Plan (SWPPP), as presented in Appendix A. The following general practices shall be used where applicable:

a. Minimize disturbed areas, and sequence Work to minimize exposure time.

b. Utilize dikes, brush, straw bales, or silt fence to trap sediment.

c. Reduce volume and velocity of water crossing disturbed areas by utilizing diversion berms, straw bales, or other facilities approved by Owner and/or Engineer.

d. Maintain or replace erosion and sediment control measures, as necessary, to accommodate the sequencing and progression of Work (e.g., as increases in grade occur).

e. Maintain and clean access road, as necessary.

3. Dust Controls: Dust shall be minimized at all times. Appropriate engineering controls that include using a light water spray, with or without additives approved by the Owner and/or Engineer, to minimize off-site migration of fugitive dust from stockpiles, truck routes, and other Contractor-disturbed areas.

3.03 SLOPE RECONSTRUCTION (AS NEEDED)

A. Grade and compact slopes to match pre-existing slope, approximately 3H:1V, as approved by the Owner and/or Engineer. Smooth subgrade with smooth-drum roller. Do not roll wet or saturated subgrade. The geomembrane shall be placed above the repaired areas approved by Owner and/or Engineer and Geomembrane Installer.

3.04 LINER SUBGRADE PREPARATION

A. Contractor shall remove any accumulated ash, sludge/sediment, and debris from pond by means approved by Owner and/or Engineer. Majority of the ash will be removed by Owner prior to commencement of Work. Contractor shall be responsible to manage any ash remaining as necessary to facilitate Work.

B. Load, transport, and dispose/stockpile of ash and sludge/sediment on-site as directed by Owner and/or Engineer.

C. Remove entire first layer of Poz-O-Pac liner (estimated thickness 12 inches) from base of pond, excluding the area around the pipe support foundations, as indicated on Contract Drawings. Poz-O-Pac liner may not exist in some areas at the original base elevation of 582.5 feet above mean sea level (NGVD 29 datum). Contractor shall verify base of pond elevation prior to removal of material.

D. Load, transport and dispose of Poz-O-Pac material at a disposal or recycling facility approved by Owner. An approved facility by Owner: Orange Crush, LLC in Romeoville, IL, or other approved by Owner. If necessary, the material to be stockpiled on-site, as directed by Owner. Analytical results of the Poz-O-Pac material are presented as Appendix B. Any additional laboratory sampling and waste profiling of material will be managed by Owner, if necessary. Contractor shall be responsible for handling and transporting excavated Poz-O-Pac liner to approved facility.

E. Contractor shall excavate 6 inches of Existing Fill Material from beneath first layer of Poz-O-Pac liner. Contractor shall verify final base of pond subgrade surface is at approximately 581 feet above mean sea level (NGVD 29 datum) and not exceed a 1% slope (shall be relatively flat). Second layer of Poz-O-Pac liner and/or bedrock surface shall not be exposed at the base of the pond.

F. Existing Fill Material shall be stockpiled on-site, as directed by Owner. Fill material to be reused as Cushion Material, as described in Part 3.04K and subject to Engineer and/or Owner approval.

G. Contractor shall prepare the geomembrane subgrade, including ramp surface, for installation by clearing and grubbing vegetation and removing rocks and other debris greater than 1 inch in diameter along side slopes and base of pond.

H. Over excavate soft spots, fill low spots, and trim high spots to match pre-existing slope, approximately 3 horizontal to 1 vertical (3H:1V), as approved by Engineer and/or Owner. Do not over excavate to remove unsuitable material without Owner or Engineer's approval. Excavated subgrade material shall be stockpiled on-site, as directed by Owner and/or Engineer. Visually inspect and proof roll all areas to determine if further excavation and removal of existing subgrade materials is required. Where clay, organic soils, or other non-aggregate type materials are found in quantities that may impair shear strength, limit drainage, or cause frost heave, these materials shall be removed to a depth of 12 inches below the subgrade surface.

I. Backfill repair areas with Reconstructed Bank Material approved by Owner and/or Engineer. Grade and compact backfill to match pre-existing slope, approximately 3 horizontal to 1 vertical (3H:1V), as approved by the Owner and/or Engineer. Smooth subgrade with smooth-drum compactor. Do not roll wet or saturated subgrade. The geomembrane liner shall be placed above the repaired, backfilled areas approved by Owner and/or Engineer and Geomembrane Installer.

J. Contractor shall notify Engineer and/or Owner of unexpected subgrade conditions.

K. Place Cushion Material at base of pipe supports to provide a smooth transition between the base of the pond and pipe support structure for placement of the geomembrane liner, as shown on the Contract Drawings.

L. Reconstruct liner subgrade damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Owner and/or Engineer and Geomembrane Installer.

M. The surface of the subgrade shall be acceptable to the Owner and/or Engineer and Geomembrane Installer, and graded so it is free of irregularities, protrusions, loose soil, and abrupt changes in grade. Rocks with sharp protrusions and rocks or other debris greater than 1 inch in any dimension shall be removed.

N. Vegetation, rocks, and other debris removed during subgrade preparation shall be loaded and transported to a disposal facility approved by the Owner and/or Engineer.

3.05 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Reconstructed Bank Material for subgrade preparation unless otherwise specified:

1. Place in layers essentially parallel with the side-slopes or pond bottom in lifts not more than 6 inches in depth after compaction by heavy equipment (min. 25,000 pounds, static weight), and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

2. Place evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

3. Compact to at least 90 percent as determined by the Modified Proctor test (ASTM D1557) within plus or minus two percentage points of the optimum moisture content (OMC).

3.06 FIELD QUALITY CONTROL

A. Allow Geotechnical Field Technician to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

B. Geotechnical Laboratory and Field Testing of Backfill areas with Reconstructed Bank Material (Table 3):

1. Contractor shall have the following laboratory and field testing performed on the Reconstructed Bank Material:

a. <u>Geotechnical Laboratory testing prior to start of work</u>: at least one representative, composite sample of imported Reconstructed Bank Material. Samples shall be tested for grain size (ASTM D422), classification (ASTM D2487), moisture content (ASTM D2216), and Modified Proctor (ASTM D1557). Test results shall be submitted to the Engineer two weeks prior to the start of bank reconstruction.

b. <u>Geotechnical Field Testing during bank reconstruction</u>: in-place density and moisture content (ASTM D6938) tests on a 25-foot grid for every 6-inch lift of Reconstructed Bank Material placed, with at least five tests performed per lift. 25-foot grid shall be offset for each lift. Additional field tests shall be collected at the discretion of the Geotechnical Field Technician and/or Engineer. All related reports and test findings shall be sent directly to the Engineer and Contractor within 24 hours of test completion.

2. Geotechnical field testing shall be performed by Geotechnical Field Technician under contract with Contractor and in a manner that minimizes delays in performance of work.

C. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

D. Field samples shall be collected at random locations selected by the Engineer. If additional field tests are necessary, in the opinion of the Engineer, such tests shall be made.

3.07 ANCHOR TRENCH

A. Excavate to required alignment and dimensions indicated on the Contract Drawings. Where feasible, Contractor shall place anchor trench at least 2 feet laterally from top of side slopes. If not feasible, Contractor shall submit proposed alignment to Owner and/or Engineer for approval.

B. Contractor shall not excavate more than the amount of anchor trench required for one day of geosynthetics deployment, unless otherwise specified by the Owner and/or Engineer. Rounded corners shall be provided in the trenches where the geosynthetics enter the trench to allow them to be uniformly supported by the subgrade and to avoid sharp bends.

C. Remove water that may accumulate in trench. Water shall be pumped to South Ash Pond 3 (active pond), or as directed by Owner and/or Engineer.

D. Owner and/or Engineer may limit amount of open trench where field conditions dictate.

E. Excavations shall be backfilled with trench spoils free of rock/debris no greater than 1 inch in any dimension, as directed by Owner and/or Engineer. Care shall be taken when backfilling to prevent any damage to Geomembrane or other geosynthetics that may be placed prior to backfilling.

F. Anchor trench backfill shall be mechanically compacted to a hard durable surface with no evidence of pumping or ponding of water. Backfill shall be compacted to the degree that no further appreciable consolidation is evident under the action of compaction equipment. The geosynthetics shall not be supported by loose soils in anchor trenches.

G. Anchoring, backfilling, and compaction of anchor trench will be observed by Owner and/or Engineer.

3.08 PLACEMENT OF CUSHION AND WARNING LAYER MATERIALS

A. Prior to placement of the Cushion and Warning Layer Materials, the Owner and/or Engineer and Geomembrane Installer shall verify completion of geomembrane installation and provide Contractor notification to proceed with placement of Cushion and Warning Layers.

B. Contractor shall place Cushion Layer Material over the upper 16-oz/sy nonwoven geotextile to achieve a minimum 12-inch thickness, as indicated on Contract Drawings..

C. Contractor shall place Warning Layer Material over the Cushion Layer Material to achieve a minimum 6-inch thickness, as indicated on Contract Drawings.

D. Cushion and Warning Layer Materials shall not be placed directly on the installed geomembrane.

E. Place materials evenly on all sides of structures to required thickness and elevation.

F. Apply the following general criteria for covering of the 16-oz/sy nonwoven geotextile and geomembrane:

1. Do not place soils on the geosynthetics at an ambient temperature below 32 degrees F, (0 degrees C) nor above 104 degrees F (40 degrees C), unless otherwise specified.

2. Do not drive equipment used for placing soil directly on the geotextile / geomembrane.

3. A minimum thickness of 1 foot of soil shall be maintained between tracked equipment and the geomembrane.

4. Damage to the geomembrane resulting from placement of soil shall be repaired in accordance with Section 02600 by the Geomembrane Installer at the Contractor's expense.

5. Do not push soils down slope. Soil shall be placed over the geomembrane starting from base of the slope and up to the elevation required by this Section and/or the Contract Drawings.

3.09 RAMP CONSTRUCTION

A. Following installation of 16-oz/sy nonwoven geotextile and geomembrane, and concrete-filled Geocell, Contractor shall place Warning Layer material to achieve 6-inch thickness over the concrete-filled Geocell. Concrete shall have cured for at least 24 hours prior to placement of Warning Layer material.

B. The final ramp surface shall maintain 6H:1V slope toward the base of the ramp, as indicated on Contract Drawings.

C. Compaction of Warning Layer material shall be conducted without vibratory action, if equipped. Materials shall be compacted to the degree that no further appreciable consolidation is evident under the action of heavy-construction equipment.

3.10 GUARDRAIL (OPTION)

A. Furnish and install guardrails along edge of pond, as shown on Contract Drawings and as directed by Owner based on field conditions. Guardrails are to be placed along the outside edge of the geomembrane anchor trench and no more than 5 feet from the top of pond slope. Access road between South Ash Ponds 2 and 3 shall be no less than 15 feet wide between installed guardrails. Guardrails sections shall be placed every 20 feet, as shown on Contract Drawings and as approved by Owner and/or Engineer.

B. Drill approximately 44 inch deep hole every 12 feet, 6 inches at locations shown on Contract Drawings. Install 6 inch x 8.5 inch x 6 feet steel post in each hole.

C. Attach 12 feet, 6 inch or 25-foot length, 12 gauge steel W-Beam guardrail to posts. The finished guardrail height shall be 27 inches above the ground surface, as shown on Contract Drawings. Secure guardrail to post in accordance with manufacture's requirements/instructions.

D. Flared end sections shall be installed at each end of guardrail.

3.11 BACKFILLING, GENERAL

A. Material used to construct surface water diversion berms, as needed, may be reused for backfill, as directed by the Owner and/or Engineer.

B. Imported backfill materials shall be pre-approved by the Owner and/or Engineer before delivery to the site in accordance with this Section.

C. Materials placed that do not conform to the Contract Documents, shall be re-worked or removed. Replacement material and fill surfaces upon which it is placed shall conform to all requirements of this specification. All reworking or removal and replacement will be performed at Contractor's expense.

D. Mechanical tamping shall be done in no greater than 6-inch thick lifts.

3.12 STOCKPILING, GENERAL

A. Stockpile materials on-site at locations specified by Owner.

B. Stockpile in sufficient quantities to meet project schedule and requirements.

C. Separate differing materials and stockpile separately to prevent mixing, as directed by Owner and/or Engineer.

D. Direct surface water away from stockpiles to prevent erosion or deterioration of materials, as needed.

3.13 COMPACTION

A. Warning Layer Materials: Compact Warning Layer Material with smooth-drum roller to achieve a hard, durable surface with no evidence of pumping or ponding of water. Materials shall be compacted to the degree that no further appreciable consolidation is evident under the action of compaction equipment. Soft areas or areas exhibiting pumping or excess water shall be reconditioned and replaced.

3.14 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.

2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.15 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Owner and/or Engineer, reshape and recompact.

C. Where settling occurs before Project completion, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

D. Restore appearance, quality, and condition of finished surfacing to match adjacent Work, and eliminate evidence of restoration to the greatest extent possible.

3.16 SITE RESTORATION AND CLEANUP

A. Remove surplus soil and waste material, including unsatisfactory soil, trash, and debris, and transport off-site for disposal as directed by the Owner.

B. Restore pavement, base course, topsoil, landscaping, and utilities that are disturbed during the performance of the Work to preconstruction condition.

C. Temporary erosion control measures shall be removed.

D. Contractor shall correct, at no expense to the Owner, any damage to buildings, telephone or other cables, overhead and underground utilities, or their structures as a result of his construction, whether or not the item is shown on the Contract Drawings.

E. All Contractor equipment and materials shall be removed from the site.

END OF SECTION

SECTION 02600
HIGH DENSITY POLYETHYLENE (HDPE) GEOMEMBRANE AND NONWOVEN GEOTEXTILE

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary for installation of 60-mil High Density Polyethylene (HDPE) geomembrane and 16 oz/sy nonwoven geotextile, as specified herein, and as shown on Contract Drawings.

B. Requirements for performance of an electrical leak location survey for post-geomembrane installation performance for a single geomembrane covered with earth materials and underlain by earth materials.

1.02 REFERENCE STANDARDS

A. ASTM D5641 – Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber

B. ASTM D5820 – Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes

C. ASTM D6365 – Standard Practice for the Nondestructive Testing of Geomembrane Seams using the Spark Test

D. ASTM D6392 –Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods.

D. ASTM D7007 - Standard Practices for Electrical Methods for Locating Leaks in Geomembranes Covered with Water or Earth Materials.

E. GRI Test Method, GM 13 - Test Methods, Test Properties and Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes

F. GRI Test Method, GM 14 – Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using the Method of Attributes.

G. GRI Test Method, GM 19 – Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes.

H. GRI Test Method GT12(a) - ASTM Version - Test Methods and Properties for Nonwoven Geotextiles Used as Protection (or Cushioning) Materials.

1.03 DEFINITIONS

A. Installer: hired by Contractor responsible for field handling, transporting, storing, deploying, seaming, and testing of the geomembrane seams and installation of the nonwoven geotextile.

B. Geosynthetic Manufacturer: A company that manufactures geosynthetics from raw materials.

C. Leak Location Contractor: hired by Contractor and responsible for locating potential holes in the installed geomembrane using electrical methods.

D. Geosynthetic Quality Assurance Laboratory (Testing Laboratory): Laboratory, independent from the Owner, Manufacturer, and Installer responsible for conducting laboratory tests on samples of geosynthetics obtained at the site or during manufacturing, usually under the direction of the Owner.

E. Lot: A quantity of resin (usually the capacity of one rail car) used in the manufacture of geosynthetics. Finished roll will be identified by a roll number traceable to the resin lot used.

F. Resin Supplier: selected by Geosynthetic Manufacturer to provide resin used in manufacturing geomembrane.

G. Panel: Unit area of a geomembrane that will be seamed in the field that is larger than $100ft^2$.

H. Patch: Unit area of a geomembrane that will be seamed in the field that is less than $100ft^2$.

I. Subgrade Surface: Soil Layer surface which immediately underlies the geosynthetic material(s).

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Geosynthetic Manufacturer shall have a minimum of 5 years of continuous experience manufacturing HDPE geomembrane totaling 2,000,000 square feet.

2. Installer:

a. 5 years of continuous experience in installation of HDPE geomembrane.

b. Experience totaling a minimum of 5,000,000 square feet of installed HDPE geomembrane on some combination of at least 10 completed facilities.

c. Personnel performing seaming operations qualified by experience or by successfully passing seaming tests. Master Seamer shall have experience seaming a minimum of 3,000,000 square feet of geomembrane using same type of seaming apparatus to be used on this project.

d. Installers that are qualified and approved by Engineer are listed below:

i. Clean Air and Water Systems
Dousman, WI
Brain McKeown
262-965-4366

3. Leak Location Contractor:

a. Three years of continuous experience in performing leak location surveys using electrical methods.

b. Experience totaling a minimum of 2,000,000 square feet of geomembrane leak location surveys on some combination of at least 5 completed facilities.

c. Personnel performing survey qualified by experience with at least 2 years of geomembrane testing experience using the leak location survey electrical method.

d. Leak Location Contractors that are qualified and approved by Engineer are listed below:

i. Leak Location Services, Inc.
San Antonio, TX
210-408-1241

ii. Or other approved by Owner and/or Engineer.

B. Quality Assurance Program:

1. Geosynthetic Manufacturer and Geomembrane Installer shall conform with requirements of these Technical Specifications.

2. The Owner and/or Engineer may document geosynthetic installation including panel placement, seaming, pre-qualification seam testing, non-destructive seam and repair testing, repair size and locations, and weather conditions, as applicable.

3. The Owner may engage and pay for the services of Engineer and QA Laboratory to monitor geosynthetic installation.

1.05 SUBMITTALS

A. Prior to project start Installer to submit the following to Owner and/or Engineer in accordance with Section 01300, Submittals:

1. Raw Materials:

    a. Name of Resin Supplier, location of supplier's production plant(s), resin brand name, and product number.

    b. Source and nature of plasticizers, fillers, carbon black, and any other additives along with their percent addition to geomembrane material.

    c. Test results documenting conformance with the "index properties" of GRI Test Method, GM 13.

2. Geosynthetic Manufacturer's Certification:

    a. Written certification that Geosynthetic Manufacturer's Quality Control Plan was fully implemented during production of geosynthetic material supplied for this project.

3. Geosynthetic Manufacturer Production Information:

    a. Corporate background information indicating compliance with qualification requirements.

    b. Quality control plan for manufacturing.

    c. Copy of quality control certificates demonstrating compliance with the quality control plan for manufacturing and the test property requirements of GRI Test method, GM 13 or GT12(a), as applicable (i.e., mill certificates).

4. Installer shall provide the Engineer a certificate stating the name of the geotextile manufacturer, product name, chemical composition of the filaments, and other pertinent information to fully describe the geotextile.

B. Prior to project start, submit the following to Owner and/or Engineer in accordance with Section 01300, Submittals:

1. Installer's Seaming Personnel

    a. Training completed by personnel.

    b. Seaming experience for each personnel.

2. Installer's Information:

    a. Resumes of personnel performing field seaming operation, along with pertinent experience information. Include documentation regarding which seamers are qualified to use thermal fusion welding apparatus.

    b. Installation quality control plan. Including a copy of the Installer's standard operating procedure (SOP) for operating an ATV on site, particularly with respect to specific uses of the ATV and the prevention of damage to materials.

3. Installation panel layout diagram identifying placement of geomembrane panels, seams, and any variance or additional details which deviate from Contract Drawings or Technical Specifications. Layout shall be drawn to scale and shall be adequate for use as a construction plan. Layout shall include dimensions and pertinent seam and anchorage details.

4. Installation Sequence and Schedule shall be included as part of Construction Progress Schedule.

5. Description of seaming apparatus to be used indicating compliance with specified requirements.

C. With bid, submit the following to Owner and/or Engineer in accordance with Section 01300, Submittals

1. Leak Location Contractor’s Work Plan:

a. Corporate background information indicating compliance with qualification requirements, if Leak Location Contractor differs from the preapproved contractor(s) listed above.

b. List of completed facilities, totaling 2,000,000 square feet minimum of geomembrane leak location surveys on some combination of at least 5 completed facilities. Include name and purpose of facility, location, date of survey, survey method, and quantity surveyed, if Leak Location Contractor differs from the preapproved contractor(s) listed above.

c. Resumes of personnel performing leak location survey, along with pertinent experience information.

d. Leak Location Contractor quality control plan including description of the proposed survey methods and procedures, and field calibration procedures.

e. Leak Location Contractor’s required site preparations to be completed to perform the proposed leak location survey, and estimated duration to complete the survey.

f. An example of a final report (per ASTM D 7007) provided by the Leak Location Contractor following the completion of the survey.

D. During installation, submit the following to the Owner and/or Engineer:

1. Daily records/logs prepared by Installer documenting work performed, personnel involved, general working conditions, and any problems encountered or anticipated on project. Submit on a daily basis.

2. Copy of subgrade acceptance signed by Installer for areas to be covered with geosynthetics each day.

E. Within 10 working days of geosynthetic installation completion, submit the following to Owner and/or Engineer:

1. Geosynthetic installation certification that Work was performed under Installer's approved quality control plan and in substantial compliance with Technical Specifications and Contract Drawings.

2. As-built panel diagram identifying placement of geomembrane panels, seams, repairs, and destructive seam sample locations.

3. Copy of warranty for material (including factory seams) and installation covering both for a period of 2 years from the date of substantial completion.

F. The Owner and/or Engineer will review and inspect geosynthetic installation upon completion of all Work specified in this Section. Deficiencies noted shall be corrected at no additional cost to the Owner.

G. The Owner and/or Engineer will provide written final acceptance of the geosynthetic installation after completion of the leak location survey. Written conditional geosynthetic installation acceptance can be provided to the Contractor prior to completion of the leak location survey when the following conditions are satisfied, if necessary, and requested by the Contractor:

1. The entire geosynthetic installation is completed or any pre-determined subsection if the project is phased.

2. All installation quality assurance/control documentation has been completed and submitted to the Owner and/or Engineer.

3. Verification of the adequacy of all field seams, repairs, and associated testing is complete.

H. Within 14 days of completion of the leak location survey, submit final written report (per ASTM D 7007) of the leak location survey provided by Leak Location Contractor.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Transportation:

1. Geosynthetic rolls shall be transported, unloaded and handled at the job site in accordance with manufacturer recommendations. Damaged material may be rejected by the Owner and/or Engineer.

B. On-Site Storage:

1. Geosynthetic rolls which have been delivered to job site shall be unloaded and stored in original, unopened packaging in a secure location, determined by Owner and/or Engineer.

2. Store geosynthetic rolls to ensure adequate protection against exposure to the following:

   a. Equipment;

   b. Strong oxidizing chemicals, acids, or bases;

   c. Flames, including welding sparks;

   d. Temperatures in excess of 160 deg. F;

   e. Dust;

   f. Ultraviolet radiation (i.e. sunlight); and

   g. Inclement weather.

C. On-Site Handling:

1. Handle rolls per Geomembrane Manufacturer's recommendations and as necessary to prevent damage.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Geotextile to be used for cushioning above and below geomembrane shall be polyester or polypropylene, nonwoven needle punched fabric, and shall conform to the following requirements:

GEOTEXTILE PROPERTIES

Property	Units	Value	Test	Criterion
Mass Per Unit Area	oz/yd^2	16	ASTM D5261	MARV
Puncture Strength	lb	170	ASTM D4833	MARV
Trapezoid Tear	lb	145	ASTM D4533	MARV
Grab Tensile Strength	lb	370	ASTM D4632	MARV
Grab Elongation	%	50	ASTM D4632	MARV
UV Resistance @500 hours	% retained	70	ASTM D4355	Minimum

B. High Density Polyethylene (HDPE) White Textured Geomembrane

1. HDPE geomembrane shall be white (one or both sides), textured (both sides), 60-mil product approved by the Owner and/or Engineer.

2. The Contractor shall submit, with the bid, written certification from the proposed Geosynthetic Manufacturer that geomembrane products proposed in the bid satisfy the following requirements:

   a. The proposed HDPE compound shall be comprised entirely of virgin materials. Compliance with this specification shall be documented in accordance with Geosynthetic Manufacturer's quality control program and submitted to the Owner and/or Engineer with the written conformance certification.

   b. The proposed Geosynthetic Manufacturer shall certify that any plasticizers, fillers, and additives incorporated into the manufacturing process for the proposed HDPE geomembrane have demonstrated acceptable performance on past projects.

   c. The proposed geomembrane shall meet the requirements of Geosynthetic Research Institute’s test method GM 13.

   d. The nominal thickness of proposed geomembrane shall be 60 mil..

   e. Geosynthetic Manufacturer that is qualified and approved by Engineer are listed below:

      i. GSE
      Houston, TX
      800-435-2008

3. Geomembrane sheets shall be visually consistent in appearance and shall contain no holes, blisters, undisbursed raw materials, or other signs of contamination by foreign material. Geomembrane must have no striations, roughness or bubbles on the surface.

C. HDPE Weld Strips

1. For cast-in-place concrete structures with HDPE weld strips, welds shall be made by a butt weld and fusing the strips together by a thermal process such as an extrusion weld, fusion weld, or equal so as to produce continuous welded seams. Shop welded seams shall show no cracks or separations.

2. During installation of the embedment strips onto the forms, there shall be no cuts made within the strips for any purpose.

D. Seaming Apparatus

1. Thermal fusion welding machines used for joining geomembrane surfaces shall be hot wedge type. These machines shall include sufficient temperature and rate-of-travel monitoring devices to allow continuous monitoring of operating conditions.

2. One spare, operable thermal fusion seaming device shall be maintained on site at all times.

E. Field Test Equipment

1. Field Tensiometer: the field tensiometer shall be calibrated within three months prior to project start date over the range of field test values. Tensiometer shall be capable of maintaining constant jaw separation rate of 2 inches per minute.

2. Air Channel Test Equipment: air channel test equipment shall consist of hoses, fittings, valves, and pressure gauge(s) needed to deliver and monitor the pressure of compressed air through an approved pressure feed device.

3. Air Compressor: the air compressor utilized for field testing shall be capable of producing and maintaining an operating pressure of at least 50 psi.

4. Vacuum Box: the vacuum box shall consist of a vacuum gage, valve, and a gasket around the edge of the open bottom needed to apply vacuum to a surface.

2.02. CONFORMANCE TESTING REQUIREMENTS

A. Geosynthetics shipped to site shall undergo conformance testing. Manufacturer’s roll certificates may be used for conformance evaluation at the option of the Owner and/or Engineer. Nonconforming material shall either be retested at the direction of the Owner and/or Engineer or removed from site and replaced at Contractor's expense.

B. Conformance Test Methods

1. Samples will be located and collected by the Owner and/or Engineer at a rate of one sample per 100,000 square feet of geomembrane delivered to site.

2. One sample will be obtained from each geomembrane production batch delivered to the site.

3 Samples shall be cut by Installer and be at least 45 square feet in size.

4. Samples shall be tested in accordance with Table 2 (HDPE Geomembrane - Textured) specified in GRI Test Method GM13.

5. Geomembrane thickness shall be measured a minimum of three times per panel during deployment to verify conformance with GRI Test Method GM13.

C. Role of Testing Laboratories

1. The Owner and/or Engineer will be responsible for acquiring samples of the geomembrane for conformance testing. The Owner or Engineer will retain an

independent, third party laboratory to perform conformance testing on samples of geomembrane.

2. Retesting of geomembrane panels by the Installer because of failure to meet any of the conformance specifications can only be authorized by the Owner and/or Engineer.

3. The Geosynthetic Manufacturer and/or Installer may perform independent tests in accordance with methods and procedures specified in GRI GM 13. Results shall not be substituted for quality assurance testing described herein.

D. Procedures for Determining Conformance Test Failures

1. If conformance test results fail to meet specifications, the roll and/or batch may be retested at the Installer's expense using specimens from either the original roll sample or from another sample collected by the Owner and/or Engineer. Two additional tests (retests) shall be performed for each failed test procedure. Each retest shall consist of multiple specimen tests if multiple specimens are specified in the test procedure. If the results of both retests meet specifications, the roll and batch will be considered to have passed conformance testing.

2. Failure of any retest shall be cause for rejection of the entire roll or batch depending on the type of failing test. The Owner and/or Engineer reserves the right to collect samples from other rolls of a particular batch for further conformance testing. The Owner and/or Engineer may choose to accept only a portion of the batch on the basis of the results of conformance testing of samples collected from other rolls.

3. If retesting does not result in conformance with the specifications as defined in preceding paragraph, or if there are any other nonconformities with the material specifications, the Contractor shall remove the rolls from use in the project. The Contractor shall also be responsible for removal of rejected geomembrane from the site and replacement with acceptable geomembrane at no additional cost to the Owner.

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION MEETING

A. A Pre-Construction Meeting shall be held at the site to discuss and plan the details of geosynthetic installation. This meeting shall be attended by the Installer, Owner, Engineer, and the Contractor.

B. The following topics relating to geosynthetic installation shall be addressed:

1. Responsibilities of each party.

2. Lines of authority and communication.

3. Methods for documenting, reporting, and distributing documents and reports.

4. Procedures for packaging and storing archive samples.

5. Review of the schedule for all installation and quality assurance testing, including third-party testing turnaround times.

6. Review of panel layout, access and numbering systems for panels and seams including details for marking on the HDPE geomembrane.

7. Procedures and responsibilities for preparation and submittal of as-built drawings.

8. Temperature and weather limitations, installation procedures for adverse weather conditions, and defining acceptable subgrade or ambient moisture and temperature conditions for working during liner installation.

9. Subgrade conditions, dewatering responsibilities, and subgrade maintenance plan.

10. Deployment techniques including allowable subgrade for geosynthetics.

11. Procedures for covering of the geosynthetics to prevent damage.

12. Plan for minimizing wrinkles in the geomembrane.

13. Measurement and payment schedules.

14. Site health and safety procedures/protocols.

3.02 SUBGRADE PREPARATION

A. The Installer and Engineer shall visually inspect the subgrade immediately prior to geosynthetic deployment. Inspection shall verify that there are no potentially harmful foreign objects present, such as sharp rocks and other deleterious debris. Any foreign objects encountered shall be removed by Installer or Contractor. All subgrade damaged by construction equipment and deemed unsuitable for geosynthetic deployment shall be repaired prior to geosynthetic deployment. All repairs shall be approved by the Owner and/or Engineer and Installer. The responsibility for preparation, repairs, and maintenance of the subgrade shall be defined in the preconstruction meeting. The Installer shall provide the Owner and/or Engineer with written acceptance of subgrade surface over which geotextile and geomembrane is deployed (Part 1.05C*)* for each day of deployment.

3.03 GEOMEMBRANE LINER DEPLOYMENT

A. Installer shall deploy 16-oz/sy nonwoven geotextile following applicable certifications/quality control certificates listed in Part 1.05 of this section and approved by the Owner and/or Engineer. Any 16-oz/sy nonwoven geotextile placed prior to approval by the Owner and/or Engineer shall be at the sole risk of the Contractor. If geotextile installed prior to approval by the Owner and/or Engineer does not meet the requirements of this specification, it shall be removed from the site at no additional cost to the Owner.

B. Geomembrane will be deployed following installation of the geotextile and applicable certifications/quality control certificates listed in Part 1.05 of this section according to the submitted panel layout drawing as approved by the Owner and/or Engineer. The Owner and/or Engineer shall be notified of and approve any revisions or modifications to the approved panel layout drawing prior to deploying geomembrane in the area of review.

C. Adequate temporary anchoring (sand bags) that will not damage the geomembrane shall be placed on a deployed panel to prevent uplift by wind.

D. Geomembrane shall not be deployed if:

1. Ambient temperatures are below 41 degrees F (5 degrees C) or above 104 degrees F (40 degrees C) measured six inches above geomembrane surface unless approved by the Owner and/or Engineer.

2. Precipitation is expected or in the presence of excessive moisture or ponded water on the subgrade surface.

3. Winds are excessive as determined by Installer in agreement with the Owner and/or Engineer.

4. The Owner and/or Engineer will have the authority to suspend work during such conditions.

E. The Installer shall be responsible for conformance with the following requirements:

1. Equipment utilized for installation/quality assurance testing (e.g. generators) does not damage geosynthetics. Such equipment shall have rubber tires and a ground pressure not exceeding 5 psi or total loaded weight not exceeding 750 lbs. Only equipment necessary for installation and quality assurance testing is allowed on the deployed geosynthetics.

a. Any use of ATVs on the site must be pre-approved by the Engineer. The Installer shall submit an SOP describing how ATVs are to be used, if at all, in the deployment of geomembrane at the site. As a minimum, the following shall apply:

i. Any damage resulting from the use of ATVs, as determined by the Engineer, shall be repaired according to the Contract Documents, at no additional cost to the Owner. If repeated repairs are required as the result of the use of ATVs operating on geosynthetic material, further use of ATVs will be prohibited.

ii. Any and all ATVs proposed to be used in the deployment of geosynthetics will be inspected by the Engineer. ATVs which are found to be leaking oil or fuel, or which in any other way exhibit the potential to damage the lining system components, will not be permitted.

iii. Any oil or fuel which leaks onto geosynthetic materials shall be thoroughly removed (cleaned) by the Installer, or the geosynthetic material shall be replaced at the discretion of the Engineer, at no additional cost to the Owner.

iv. Re-fueling of ATVs on geosynthetic materials is prohibited.

v. ATVs shall have tires with low ground pressure, typically less than 5 psi, and shall have shallow treads.

vi. ATVs shall be operated by a single operator at speeds less than 5 mph.

vii. Quick starts, stops, spinning wheels and sharp turns will not be permitted above any geosynthetic material.

2. Personnel working on geosynthetics do not damage geosynthetics [activities such as smoking or wearing damaging clothing (boots or shoes) shall not be allowed].

3. Method of deployment does not damage the geosynthetics.

4. Method of deployment minimizes wrinkles.

5. Temporary loading or anchoring does not damage the geosynthetics.

F. Installer shall place 16-oz/sy nonwoven geotextile above the geomembrane at the base of pond, as indicated on Contract Drawings. Installer shall cover the batten bar attachments with the nonwoven geotextile.

G. No vehicles shall be allowed on deployed geosynthetics other than an approved low ground pressure vehicle or equivalent.

3.04 FIELD SEAMS

A. Seam Layout

1. In general, seams shall be oriented parallel to the line of the maximum slope. In corners and at other odd-shaped geometric intersections, the number of seams should be minimized. If at all possible, seams shall not be located at low points in the subgrade unless geometry requires seaming to be done at these locations.

2. A seam numbering system compatible with the panel numbering system shall be agreed upon at the Pre-Construction Meeting.

B. Geomembrane Seaming Processes/Equipment

1. Approved processes for field seaming (panel to panel) are extrusion or hot wedge fusion-type seam methods. No other processes can be used without prior written authorization from the Owner and/or Engineer. Only equipment which has been specifically approved by make and model shall be used, if applicable.

2. The Installer will meet the following requirements regarding use, availability, and cleaning of welding equipment at job site:

   a. Intersecting hot wedge seams shall be patched using extrusion welding process.

   b. Electric generator for equipment shall be placed on a smooth base such that no damage occurs to geosynthetics. A smooth insulating plate or fabric shall be placed beneath hot equipment placed on the geosynthetics.

3. The Installer shall keep records for performance and testing of all seams.

C. Seaming Requirements/Procedures

1. Weather Conditions - Range of weather conditions under which geomembrane seaming can be performed are as follows:

   a. Unless otherwise authorized in writing by Owner and/or Engineer, no seaming shall be attempted or performed at an ambient temperature below 41 degrees F (5 degrees C) or above 104 degrees F (40 degrees C).

   b. Between ambient temperatures of 32 degrees F (0 degrees C) and 41 degrees F (5 degrees C), seaming shall follow GRI GM9 cold weather seaming guidelines. Pre-qualification seams shall be produced to determine appropriate seaming parameters and for Engineer’s approval.

   c. Above 41 degrees F (5 degrees C), no special conditions will be required.

   d. Geomembrane shall be dry and protected from wind.

   e. Seaming shall not be performed during any precipitation event.

   f. Seaming shall not be performed in areas where ponded water has collected below surface of geomembrane.

2. If the Installer chooses to use methods which may allow seaming at ambient temperatures below 41 degrees F or above 104 degrees F, the Installer shall demonstrate and submit certification to Owner and/or Engineer that the methods and techniques used to perform seaming produce seams that are equivalent to seams produced at temperatures above 41 degrees F and below 104 degrees F. The Owner and/or Engineer may deny approval for use of the proposed technique regardless of demonstration results.

3. Overlapping - Geosynthetic panels shall have finished overlap as follows:

    a. Minimum of 4 inches.

    b. Insufficient overlap will be considered a failed seam.

4. Pre-qualification tests for geomembrane welding shall be conducted for each welding machine and by each seaming technician performing welding with that machine. At least one test shall be performed at the start of each work day, with tests at intervals of no greater than 5 hours and additional pre-qualification tests following work interruptions, weather changes, changes to machine settings, or as directed by the Owner and/or Engineer. Pre-qualification seams shall be made under the same conditions as the actual seams.

    a. Pre-qualification seam samples shall be 5 feet long by 1-foot wide (minimum) after seaming, with seam centered along its length. Each pre-qualification seam shall be labeled with the date, machine temperature and speed, seaming unit identifier, technician performing the test seam, and description of testing results.

    b. Seam overlap shall be in accordance with Part 3.04.C.3.

    c. Pre-qualification seams shall be inspected for proper squeeze-out, footprint pressure, and general appearance.

    d. Four specimens, each 1-inch wide, shall be cut from opposite ends of the pre-qualification seam sample by the Installer. The remainder of pre-qualification seam shall be retained by the Owner and/or Engineer and may be submitted for laboratory testing.

    e. The Installer shall complete two shear tests and two peel tests in accordance with GRI GM 19.

    f. Pre-qualification seams failed by inspection or testing may be retested at request of the Installer. If the second pre-qualification seam fails, then the seaming apparatus or seaming technique shall be disqualified from use until two consecutive, satisfactory pre-qualification seams are obtained.

5. Seam Preparation

    a. Prior to seaming, seam area shall be clean and free of moisture, dust, dirt, debris of any kind, and foreign material.

    b. Seams shall be aligned so as to minimize number of wrinkles and fishmouths.

6. General Seaming Procedures - Geomembrane

a. Fishmouths or wrinkles at seam overlaps shall be cut along ridge of the wrinkle to achieve a flat overlap. Cut fishmouths or wrinkles shall be repaired, and/or patched in accordance with Part 3.07.

b. Seaming shall extend to the outside edge of geomembrane panels including material placed in anchor trenches.

c. The intersecting thermal fusion seams shall be patched using the extrusion welding process.

7. General Seaming Procedures – Geotextile

a. Geotextile seams shall be completed by one of the following methods:

i. Heat bond, with either torch, leister, or hot-wedge welding equipment

ii. Sewing

3.05 NON-DESTRUCTIVE TESTING

A. Each field seam shall be non-destructively tested over its entire length by the Installer. Testing shall be conducted as field seaming progresses, not at completion of all seams, unless specifically agreed to by the Owner and/or Engineer in writing.

B. Vacuum Testing – shall be performed in accordance with ASTM D5641.

C. Air Pressure Testing – shall be performed in accordance with ASTM D5820, and GRI GM 6.

D. Each seam tested non-destructively shall be marked with the date of the test, name of the testing technician, length of the seam, test method, and results. The same shall also be recorded by the Owner and/or Engineer on the appropriate CQA documentation.

E. Non-Destructive Seam Test Failures

1. Seams failing non-destructive testing shall be repaired by the Installer according to Part 3.07. Seams shall be non-destructively retested. If the seam defect cannot be located, the entire section of seam affected shall be repaired or replaced.

3.06 ELECTRICICAL LEAK LOCATION SURVEY

A. Leak Location Contractor shall identify actions required by Contractor to prepare the site for the electrical leak location survey prior to placement of materials over the geosynthetics.

B. Contractor shall ensure that the cushion and warning layers, and geotextile above and below the geomembrane contains sufficient moisture to conduct a leak location survey. Typically, a moisture content of earth materials of 1% to 2% by weight is sufficient to conduct the survey. If the moisture content of the cushion layer, warning layer and subgrade is not sufficient per the requirements of the Leak Location Contractor, Contractor shall add moisture to the layers, as required.

C. Contractor shall provide electrical isolation of the batten bars and concrete structures, as requested by Leak Location Contractor.

D. Leak Location Contractor shall inspect the site prior to commencing the survey to ensure all site preparations are completed and the site conditions are appropriate for conducting the leak location survey.

E. Any discrepancy in the required site preparation detailed in the Leak Location Contractor's Work Plan or site conditions shall be reported to the Contractor for corrective or appropriate action.

F. After the warning layer is placed and compacted, conduct a leak location survey on the warning layer material using the procedures for surveys with earth materials covering the Geomembrane as described in ASTM D 7007.

G. A leak detection sensitivity test using an artificial leak shall be conducted on the geomembrane for each set of equipment used before the equipment is used on for the leak location survey, as described in ASTM D 7007 to determine the detection distance for the survey.

H. The leak location survey shall be taken on survey lines or on a grid spaced no farther apart than twice the leak detection distance as determined in the leak detection sensitivity test.

I. The Leak Location Contractor shall inform the Owner and/or Engineer and mark the locations of all identified or indicated leaks with a flag or spray paint. The Installer shall repair the defect/hole as detailed in Part 3.07 of this Section.

3.07 DEFECTS AND REPAIRS

A. The geosynthetics shall be examined by the Installer and the Owner and/or Engineer for defects, holes, blisters, undispersed raw materials, and any signs of contamination by foreign matter. The geomembrane surface shall be swept and/or washed by the Installer if the amount of dust or mud inhibits examination. The Contractor shall provide a water truck, an operator, clean water and hoses as reasonably necessary to assist the Installer in this activity.

B. Portions of geomembrane exhibiting flaws, or failing a non-destructive or destructive (if conducted) test, shall be repaired or replaced by the Installer. Repair procedures available include:

1. Patching - used to repair holes, tears, undispersed raw materials, contamination by foreign matter, holes resulting from destructive sampling (if conducted), and locations where seam overlap is insufficient;

2. Capping - used to repair large lengths of failed seams; and

3. Additional Procedures - used upon recommendation of the Installer if agreed to by the Owner and/or Engineer.

C. Patches or caps.

1. Extend patch or cap 6 inches (minimum) beyond the edge of the defect. All patched shall be a minimum of one square foot in size.

2. Round corners of patch and/or cap with a minimum 3-inch radius.

3. Repair procedures, equipment, materials, and techniques will be approved by the Owner and/or Engineer prior to repair.

4. Geomembrane below large caps shall be appropriately cut to avoid water or gas collection between two sheets.

D. The Installer shall mark on the geomembrane (using a non-puncturing writing utensil), repair date, time, and personnel involved.

E. Each repair shall be non-destructively tested in accordance with Part 3.05.

F. Repairs which fail testing shall be redone and retested until a passing result is obtained. The Installer will perform non-destructive testing on repairs and will document retesting of repairs.

G. The Installer will document repairs, repair testing, and retesting results.

H. The Installer shall cut and seam wrinkles which may adversely affect long-term integrity of the geomembrane, hinder subsequent construction of overlying layers, or impede drainage off of the geomembrane after it is covered by soil. Seaming shall be done in accordance with procedures described in Parts 3.04(B) and 3.04(C), and it shall be subject to test provisions of Parts 3.05 (non-destructive testing).

3.08 PROTRUSIONS AND CONNECTIONS TO GEOMEMBRANE

A. If required, the Installer shall install geosynthetics around utility poles, guy wires, marker posts, concrete structures, and other structures according to the Contract Drawings and the following requirements:

1. Use minimum 2-ft long geomembrane pipe boots and steel clamps to seal the geomembrane around pole or structure.

2. Use welding procedures to seam the geomembrane boot or weld strip to the geomembrane in accordance with the instruction of the manufacture.

a. Weld strip joints shall be butt-welded together to provide continuous support for the HDPE Liner and a secure seal or by some other method acceptable to the Engineer to create a continuous, water-tight weld strip.

b. Weld strip to be attached to the inside of the concrete form with finishing nails prior to concrete placement. Finishing nails shall be 1-inch or smaller. The nails to be flush with the back of the weld strip to allow for easy removal when the forms are removed.

c. After the concrete has set and the forms are removed, the finishing nails that remain in the weld strip shall be removed, and the resulting holes clearly marked. If concrete gets between the weld strip and the form, the concrete shall be chipped away to reveal the face of the weld strip.

3. Seaming performed on and around penetrations, and other appurtenances shall be non-destructively tested using the spark test method (ASTM D6365).

3.09 SURVEY DOCUMENTATION

A. Prior to covering the geomembrane, the Installer shall provide the Contractor, Owner and/or Engineer with 24-hour notification to conduct a survey. The Contractor shall survey the location of all seams (at panel corners and seam terminations in the anchor trench), and repairs. The Contractor shall provide survey data to the Owner and/or Engineer within two working days of survey completion and in accordance with Section 01050.

3.10 DAILY FIELD INSTALLATION REPORTS

A. At the beginning of each day, the Installer shall provide the Owner and/or Engineer with a report for all work completed the previous day.

B. The Daily Field Installation Report shall include the following:

1. The total amount and location of geosynthetics placed.

2. The total length and location of seams completed, technician name and welding unit numbers.

3. A drawing or sketch depicting the geomembrane installed the previous day including the panel number, seam number, and locations of non-destructive and destructive testing (if conducted).

4. Results of pre-qualification test seams.

5. Results of non-destructive testing.

C. Destructive test results (if conducted) shall be reported within 48 hours or prior to covering the geomembrane, whichever is practical.

END OF SECTION

SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION

A. Provide labor, materials, equipment, and incidentals necessary to furnish and install cast-in-place concrete as specified and as shown on contract drawings.

1.02 REFERENCES

A. American Concrete Institute (ACI), latest edition

1. ACI 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete

2. ACI 214R: Recommended Practice for Evaluation of Strength Test Results of Concrete

3. ACI 301: Standard Specifications for Structural Concrete

4. ACI 304R: Guide for Measuring, Mixing, Transporting and Placing Concrete

5. ACI 304.2R: Placing Concrete by Pumping Methods

6. ACI 305R: Hot Weather Concreting

7. ACI 306R: Cold Weather Concreting

8. ACI 308: Standard Practice for Curing Concrete

9. ACI 309R: Guide for Consolidation of Concrete

10. ACI 311.4R: Guide for Concrete Inspection

11. ACI 318: Building Code Requirements for Structural Concrete

B. ASTM International, latest edition

1. ASTM C31: Standard Practice for Making and Curing Concrete Test Specimens in the Field

2. ASTM C33: Standard Specification for Concrete Aggregates

3. ASTM C39: Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

4. ASTM C40: Standard Test Method for Organic Impurities in Fine Aggregates for Concrete

5. ASTM C42: Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

6. ASTM C88: Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate

7. ASTM C94: Standard Specification for Ready-Mixed Concrete

8. ASTM C136: Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

9. ASTM C138: Standard Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete

10. ASTM C150: Standard Specification for Portland Cement

11. ASTM C171: Standard Specification for Sheet Materials for Curing Concrete

12. ASTM C172: Standard Practice for Sampling Freshly Mixed Concrete

13. ASTM C192: Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory

14. ASTM C231: Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.

15. ASTM C260: Standard Specification for Air-Entraining Admixtures for Concrete

16. ASTM C289: Standard Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method)

17. ASTM C295: Standard Guide for Petrographic Examination of Aggregates for Concrete

18. ASTM C309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

19. ASTM C311: Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland Cement Concrete

20. ASTM C494: Standard Specification for Chemical Admixtures for Concrete

21. ASTM C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete

22. ASTM C881: Standard Test Method for Epoxy Resin Base Bonding Systems for Concrete

23. ASTM C882: Standard Test Method for Bond Strength of Epoxy Resin Systems Used with Concrete by Slant Shear

24. ASTM C1017: Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete

25. ASTM C1064: Standard Test Method for Temperature of Freshly Mixed Portland Cement Concrete

26. ASTM C1107: Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

27. ASTM D75: Standard Practice for Sampling Aggregates

28. ASTM E329: Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials used in Construction

C. American Association of State Highway and Transportation Officials (AASHTO), latest edition

1. AASHTO M182: Standard Specification for Burlap Cloth Made from Jute or Kenaf and Cotton Mats

1.03 SUBMITTALS

A. Two weeks prior to delivery, submit the following product data:

1. Manufacturer's specifications and instructions including Material safety Data Sheets (MSDS) for admixtures, non-shrink non-metallic grout, and curing materials. Manufacturer's certification of compatibility of all admixtures.

2. For commercially manufactured grout, include catalogue cuts, technical data, storage requirements, product life, working time after mixing, temperature considerations, conformity to referenced ASTM standards, and Material Safety Data Sheet.

B. Two weeks prior to delivery, submit the following certification:

1. Provide certificate that cement used complies with ASTM C150 and these specifications.

2. Provide certificates that aggregates comply with ASTM C33. Submit gradation analysis with concrete mix designs.

3. Provide certificate of compliance with these specifications from the manufacturer of the concrete admixtures.

4. For each formulation of concrete proposed, prepare mix designs in accordance with ACI 318, Chapters 4 and 5, except as modified herein. Submit mix design for review by the Engineer at least 2 weeks before placing of any concrete.

5. Proposed special procedures for protection of concrete under wet weather placement conditions.

6. Proposed special procedures for protection and curing of concrete under hot and cold weather conditions.

7. Independent testing agency ACI Concrete Field Technician, Grade I, or equivalent certification to perform concrete quality testing and inspection.

C. Manufacturers' Instructions

1. Provide epoxy bonding compound manufacturer's specific instructions for use. Provide manufacturer's data sheets as to suitability of product to meet job requirements with regard to surface, pot life, set time, vertical or horizontal application, and forming restrictions.

D. Within 24 hours of test completion, submit the following Quality Control/Assurance Submittals:

1. Provide delivery tickets for ready-mix concrete or weighmasters certificate per ASTM C94, including weights of cement and each size aggregate and amount of water added at the plant and record of pours. Record the amount of water added on the job on the delivery ticket. Water added at the plant shall account for moisture in both coarse and fine aggregate.

2. Provide Concrete Quality Test results following analysis to the Engineer.

1.04 QUALITY ASSURANCE

A. Unless otherwise indicated, materials, workmanship, and practices shall conform to the following standards:

1. ACI 301, “Structural Concrete for Buildings”

2. ACI 318, “Building Code Requirements for Reinforced Concrete”

B. Where provisions of pertinent codes and standards conflict with this specification, the more stringent provisions govern.

C. Concrete not meeting the minimum specified 28-day design strength shall be cause for rejection and removal from the work.

D. Perform concrete work in conformance with ACI 301 unless otherwise specified.

E. Do not use admixtures, including calcium chloride, which will cause accelerated setting of cement in concrete.

F. Grout manufacturer to have a minimum of 5-years experience in the production and use of the type of grout proposed for the Work.

G. Do not place concrete until design mix, material tests, and trial concrete batch mix compression test results are accepted by the Engineer.

H. Employ an independent testing laboratory, acceptable to the Engineer, to develop concrete mix designs and testing. Concrete testing shall be performed by an ACI Concrete Field Technician, Grade I, or equivalent.

I. Employ an independent testing laboratory, to test conformity of materials to specifications. Concrete and grout testing shall be performed by an ACI Concrete Field Technician, Grade I, or equivalent. Allow free access to obtain test samples.

J. Methods of Sampling and Testing

1. Fresh Concrete Sampling: ASTM C172
2. Specimen Preparation: ASTM C31
3. Compressive Strength: ASTM C39
4. Air Content: ASTM C231
5. Slump: ASTM C143
6. Temperature: ASTM C1064
7. Unit Weight: ASTM C138
8. Obtaining Drilled Cores: ASTM C42

K. Acceptance of Structure: Acceptance of completed concrete work requires conformance with dimensional tolerances, appearance, and strength as indicated or specified.

L. Hot weather concrete to conform to ACI 305R and as specified herein.

M. Cold weather concrete to conform to ACI 306R and as specified herein.

N. Reject concrete delivered to job site that exceeds the time limit or temperature limitations specified.

O. Do not place concrete in water or on frozen or unstable ground.

P. Workability

1. Concrete shall be of such consistency and composition that it can be worked readily into the forms and around the reinforcement without excessive vibrating and without permitting the materials to segregate or free water to collect on the surface.

2. Adjust the proportions to secure a plastic, cohesive mixture, and one that is within the specified slump range.

3. To avoid unnecessary changes in consistency, obtain the aggregate from a source with uniform quality, moisture content, and grading. Handle materials to minimize variations in moisture content that would interfere with production of concrete of the established degree of uniformity and slump.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver concrete to discharge locations in watertight agitator or mixer trucks without altering the specified properties of water-cement ratio, slump, air entrainment, temperature, and homogeneity.

B. Reject concrete not conforming to specification, unsuitable for placement, exceeding the time or temperature limitations, or not having a complete delivery batch ticket.

C. Deliver grout materials to the jobsite in original, unopened packages, clearly labeled with the manufacturers name, product identification, batch numbers, and printed instructions.

D. Store grout materials in accordance with the manufacturer's recommendations. Total storage time from date of manufacture to date of installation shall be limited to six months or the manufacturer's recommended storage time, whichever is less.

E. Reject grout material that becomes damp, lumpy or otherwise unacceptable and immediately remove from the site and replace with acceptable material at no cost to the Owner.

F. Deliver grouts as pre-blended, prepackaged mixes requiring only the addition of water.

1.06 SITE CONDITIONS

A. Do not place concrete until conditions and facilities for making and curing control test specimens are in compliance with ASTM C 31 and as specified herein.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cement

1. Portland Cement, ASTM C150, Type II.

2. Use only one brand of cement in any individual structure. Use no cement that has become damaged, partially set, lumpy, or caked. Reject the entire contents of the sack or container that contains such cement. Use no salvaged or reclaimed cement.

3. Maximum tricalcium aluminate shall not exceed 8 percent. The maximum percent alkalis shall not exceed 0.6 percent.

B. Fly Ash

1. Provide fly ash conforming to the following requirements:

a. Class F fly ash conforming to ASTM C618 for chemical and physical properties.

b. Supplemental requirements in percent

i. Maximum carbon content: 3 percent

ii. Maximum sulfur trioxide ($S0_3$) content: 4 percent

iii. Maximum loss on ignition: 3 percent

iv. Maximum water requirement (as a percent of control): 100 percent

v. Fineness, maximum retained on No. 325 sieve: 25 percent

C. Fine Aggregates

1. Clean, sharp, natural sand conforming to requirements of ASTM C33 with a fineness modulus between 2.5 and 3.0.

D. Coarse Aggregate

1. Well graded crushed stone, natural rock conforming to requirements of ASTM C33.

2. Limit deleterious substances in accordance with ASTM C33, Table 3. Severe Weathering Regions, limit clay lumps not to exceed 1.0 percent by weight, and limit loss when tested for soundness using magnesium sulfate to 12 percent.

E. Water and Ice

1. Use water and ice free from injurious amounts of oil, acid, alkali, salt, organic matter, or other deleterious substances and conform to requirements of ASTM C94.

2. Water shall not contain more than 500 mg/L of chlorides or more than 500 mg/L of sulfate.

3. Heat or cool water to obtain concrete temperatures specified, and in conformance with ACI 305R and ACI 306R.

F. Concrete Admixtures

1. Maintain compressive strength and maximum water-cement ratios specified in Table 03300-1 when using admixtures. Include admixtures in solution form in the water-cement ratio calculations.

2. Do not use any admixture that contains chlorides or other corrosive elements in any concrete. Admixtures shall be nontoxic after 30 days.

3. Use admixtures in compliance with the manufacturer's printed instructions. The manufacturer shall certify the compatibility of multiple admixtures used in the same mix.

4. Do not use admixtures in greater dosages than recommended by manufacturer.

5. Air Entrainment

    a. An air-entraining admixture conforming to ASTM C260

    b. Products

        i. BASF Corporation; MB-AE 90

        ii. Sika Corporation, AER

        iii. Or accepted equivalent product

    c. Adjust the admixture content to accommodate fly ash or pozzolan requirements, and other admixtures when used, in order to obtain the specified air content.

6. Water Reducing

    a. A water-reducing admixture conforming to ASTM C494, Type A and compatible with the air-entraining admixtures. The amount of admixture added to the concrete shall be in accordance with the manufacturer's recommendations.

    b. Products

        i. BASF Corporation; Polyheed Series

        ii. Sika Corporation, Plastocrete 161

        iii. WR Grace & Co.; Darex II-AEA

        iv. Euclid Chemical Company; Eucon NW

        v. Or accepted equivalent product

7. High-Range Water-Reducing Admixture (Superplasticizer)

    a. A High-Range water-reducing admixture conforming to ASTM C494, Type F or ASTM C1017, Type I.

    b. Products

        i. BASF Corporation; Glenium Series

        ii. WR Grace & Co.; Daracem 100

        iii. Euclid Chemical company; Eucon SPC

        iv. Or accepted equivalent product

G. Non-shrink Grout

1. Non-shrink grout shall be a high precision, fluid, extended working time grout. The minimum 28-day compressive strength shall be 7,500 psi (50 MPa), when mixed at a fluid consistency.

2. Grout shall have an extended working time of 30 minutes minimum when mixed to a fluid consistency as defined in ASTM C827 at temperature extremes of 45 to 90 degrees F (7 to 32 degrees C) in accordance with ASTM C1107.

3. Non-shrink grouts shall meet the requirements of ASTM C1107; Grade B or C when tested using the amount of water needed to achieve fluid consistency per ASTM C939.

4. The grout when tested shall not bleed or segregate at maximum allowed water.

5. Products

   a. Master Builders, Inc.; Masterflow 928

   b. The Euclid Chemical Co.; Hi-Flow Grout

   c. Sika Corp.; SikaGrout 212

   d. Or acceptable equivalent product

H. Epoxy Bonding Agent

1. Epoxy bonding agent shall conform to ASTM C881 Type I, II, IV or V; Grade 2 for epoxy resin adhesives. The class of epoxy bonding agent shall be suitable for ambient and substrate temperatures.

2. Products

   a. Sika Corp.; Sikadur 32

   b. Euclid Chemical Company; Duralcrete

   c. BASF Corporation, Concresive Liquid LPL

   d. Or accepted equivalent product

I. Curing Compound

1. Liquid form, which will form impervious membrane over, exposed surface of concrete when applied to fresh concrete by means of spray gun. Use Type l-D compound with red fugitive dye, Class B, having 18 percent minimum solids conforming to ASTM C309.

2. Products

   a. BASF Building Systems; Kure 1315

b. Euclid Chemical Company; Super Diamond Clear VOX

c. W. R. Meadows, Inc.; VOCOMP-30

d. Dayton Superior Corp; Safe Cure and Seal 30 percent

e. Or accepted equivalent product

J. Burlap Mats

1. Conform to AASHTO M182

K. Sisal-Kraft Paper and Polyethylene Sheets for Curing

1. Conform to ASTM C171

2.02 MIXES

A. Conform to ASTM C94, except as modified by these specifications.

B. Air content as determined by ASTM C231

1. 6 ± 1 ½ percent for concrete using ¾ inch or 1 inch maximum aggregate size.

C. Provide concrete with the following compressive strengths at 28 days and proportion it for strength and quality requirements in accordance with ACI 318. The resulting mix shall not conflict with limiting values specified in Table 03300-1.

Table 03300-1

Class	Type of Work	28-day Minimum Compressive Strength, psi [MPa]	Minimum Cementitious Content, lbs per CY	Maximum Water/ Cement Ratio
A	Concrete for all structures and concrete not otherwise specified	4,000 [28]	560	0.44

D. Measure slump in accordance with ASTM C143:

1. Proportion and produce the concrete to have a maximum slump of 4 inches. A tolerance of up to 1 inch above the indicated maximum is allowed for individual batches provided the average for all batches or the most recent 10 batches tested, whichever is fewer, does not exceed the maximum limit. Concrete of lower than usual slump may be used provided it is properly placed and consolidated.

2. Mixes containing water reducers shall have a maximum slump of 6 inches after the addition of a mid-range water reducer and maximum slump of 8 inches after the addition of a high range water reducer.

E. Pozzolan Content

1. Fly ash shall not exceed 20 percent of the total cementitious content.

F. Aggregate Size

1. Aggregate size shall be 3/4-inch maximum for slabs and sections 8 inches thick and less. Aggregate size shall be 1 inch maximum for all larger slabs and sections.

2. Combined aggregate grading shall be as shown in Table 03300-2.

Table 03300-2

	Maximum Aggregate Size	
	1 inch	**¾ inch**
Sieve Sizes	**Percent Passing**	
2 inch	---	---
1 ½ inch	100	---
1 inch	90 - 100	100
¾ inch	55 - 100	90 - 100
3/8 inch	45 - 75	60 - 80
No. 4	35 - 60	40 - 60
No. 8	27 - 45	30 - 45
No. 16	20 - 35	20 - 35
No. 30	12 - 25	13 - 23
No. 50	5 - 15	5 - 15
No. 100	1 - 5	0 - 5
No. 200	0 - 2	0 - 2

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine the subgrade and the conditions under which work is to be performed and notify the Engineer in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions are corrected to comply with specified subgrade conditions in a manner acceptable to the Engineer.

3.02 MIXING AND TRANSPORTING CONCRETE

A. General: Conform to concreting procedures set forth in ASTM C94, ACI 304R and as specified herein.

1. Transport concrete to discharge locations without altering the specified properties of water-cement ratio, slump, air entrainment, temperature, and homogeneity.

2. Discharge concrete into forms within 1 ½ hours after cement has entered mixing drum or before the drum has revolved 300 revolutions after the addition of water, whichever occurs first.

3. Do not add water at the jobsite unless permitted by the Engineer. If it is necessary to add water to obtain the specified slump, add water per ASTM C 94, but do not exceed the maximum water content in the reviewed concrete design mix. Added water shall be incorporated by additional mixing of at least 35 revolutions.

4. Do not add water to concrete containing high range water reducing admixture. Do not add water to concrete in delivery equipment not acceptable for mixing.

5. Keep a record showing time and place of each pour of concrete, together with transit-mix delivery slips certifying the contents of the pour.

6. Discharge of concrete shall be completed within the limits set out in Table 03300-3.

Table 03300-3

Maximum Time to Concrete Discharge	
Concrete Temperature	**Limit**
Over 90°F	Remove concrete from jobsite and discard concrete
86 to 90°F	45 minutes
81 to 85°F	60 minutes
70 to 80°F	75 minutes
Below 70°F	90 minutes

B. Conveying: Convey concrete from agitator or mixer truck to place of final deposit in forms by one of the following methods:

1. Buckets or hoppers with discharge gates having a clear opening equal to not less than one-third the maximum interior horizontal area or five times the maximum aggregate size being used, whichever is greater, and side slopes of not less than 60 degrees to horizontal.

2. Buggies or wheelbarrows equipped with pneumatic tires.

3. Round bottom, metal or metal-lined chutes with inclined slope of between 2 to 3 feet horizontally to 1 foot vertically and of sufficient capacity to avoid overflow.

4. Circular drop pipes with a top diameter of at least eight times the maximum aggregate size, but not less than 6 inch, or tapered to not less than six times maximum aggregate size.

3.03 CONCRETE ACCEPTANCE

A. Accept or reject each batch of concrete delivered to the point of agitator or mixer truck discharge. Sign delivery batch tickets to indicate concrete acceptance.

B. Reject concrete delivered without a complete concrete delivery batch ticket as specified herein. The concrete supplier will furnish copies of the signed batch ticket to the Contractor and Engineer.

C. The testing agency shall perform field tests at the point of agitator or mixer truck discharge. Accept or reject concrete on the basis of conformity with slump, air content, and temperature specified.

D. The testing agency shall inspect concrete transit truck's barrel revolution counter and gauge for measuring water added to the concrete. Reject concrete that exceeds the maximum barrel revolution of 300, the limits in Table 03300-3, or concrete that has water content exceeding the specified water-cement ratio.

E. Reject concrete not conforming to specification before discharging into the forms.

3.04 PREPARATION AND COORDINATION

A. Contractor shall notify the Engineer of readiness to place concrete in any portion of the work a minimum of 5 working days prior to concrete placement. Failure to provide this notification will be cause for delay in placing until observations can be completed.

B. Reinforcement, positioning of embedded items, and condition of formwork will be observed by the Engineer prior to concrete placement.

C. Coordinate the sequence of placement such that construction joints will occur only as designed.

D. Schedule sufficient equipment for continuous concrete placing. Provide for backup equipment and procedures to be taken in case of an interruption in placing. Provide backup concrete vibrators at the project site. Test concrete vibrators the day before placing concrete.

E. Compact the subgrade and/or bedding. Saturate the subgrade approximately eight hours before placement. Remove standing water, mud, and foreign matter before concrete is deposited.

F. Where shown on contract drawings, intentionally roughen surfaces of set concrete in a manner to expose bonded aggregate uniformly at joints.

G. When shown on contract drawings, install a granular base beneath slabs on ground. Place granular material on a compacted subgrade and compact granular base.

H. Where concrete is required to be placed and bonded to existing concrete, coat the contact surfaces with epoxy bonding agent. The method of preparation and application of the bonding agent shall conform to the manufacturer's recommendations.

I. Clean concrete surfaces to receive grout free of ice, frost, dirt, grease, oil, curing compounds, laitance and paints, and free of all loose or unsound material or foreign matter that may affect the bond or performance of the grout.

J. Roughen concrete surfaces by chipping, sandblasting, or other mechanical means to ensure bond of the grout to the concrete. Remove loose or broken concrete. Irregular voids or projecting coarse aggregate need not be removed if they are sound, free of laitance and firmly embedded into the parent concrete.

K. Construct grout forms or other leak proof containment. Forms shall be lined or coated with release agents recommended by the grout manufacturer.

3.05 CONCRETE PLACEMENT

A. Placement shall conform to ACI 304R as modified by these specifications.

B. Alternate sections of concrete walls and slabs may be cast simultaneously. Do not place adjacent sections of walls and slabs until seven days after placement of first placed concrete.

C. Do not place concrete until free water has been removed or has been diverted by pipes or other means and carried out of the forms, clear of the work. Do not deposit concrete underwater, and do not allow free water to rise on any concrete until the concrete has attained its initial set. Do not permit free or storm water to flow over surfaces of concrete so as to injure the quality or surface finish.

D. Do not place concrete during inclement weather. Protect concrete placed from inclement weather. Keep sufficient protective covering ready at all times for this purpose.

E. Deposit concrete at or near its final position to avoid segregation caused by rehandling or flowing. Do not deposit concrete in large quantities in one place to be worked along the forms with a vibrator.

F. Deposit concrete continuously and in level layers 1 to 2 feet thick.

G. Do not deposit partially hardened concrete in forms. Retempering of partially hardened concrete is not permitted. Remove partially hardened concrete from site at no additional compensation.

H. Do not allow concrete to fall freely in forms to cause segregation (separation of coarse aggregate from mortar). Limit maximum free fall of concrete to 4 feet. Do not move concrete horizontally more than four feet from point of discharge. Space points of deposit not more than eight feet apart.

I. Consolidate concrete using mechanical vibrators operated within the mass of concrete and/or on the forms conforming to procedures set forth in ACI 309R and as specified herein.

J. Conduct vibration to produce concrete of uniform texture and appearance, free of honeycombing, streaking, cold joints, or visible lift lines.

K. Conduct vibration in a systematic manner with regularly maintained vibrators. Furnish sufficient backup units at job site. Use vibrators having minimum frequency of 8,000 vibrations per minute and of sufficient amplitude to consolidate concrete. Use not less than one vibrator with crew for each 35 to 40 cubic yards of concrete placed per hour.

L. Insert and withdraw vibrator vertically at a uniform spacing over the entire area of placement. Space distances between insertions such that spheres of influence of each insertion overlap.

M. Use additional vibration with pencil vibrators on vertical surfaces and on exposed concrete to bring full surface of mortar against the forms so as to eliminate air voids, bug holes, and other surface defects. Employ the following additional procedures for vibrating concrete as necessary to maintain proper consolidation of concrete:

1. Reduce distance between internal vibration insertions and increase time for each insertion.

2. Insert vibrator as close to face of form as possible without contacting form or reinforcement.

3. Use spading as a supplement to vibration where particularly difficult conditions exist.

N. Pumping Concrete

1. Conform to the recommendations of ACI 304.2R except as modified herein.

2. Base pump size on rate of concrete placement, length of delivery pipe or hose, aggregate size, mix proportions, vertical lift, and slump of concrete.

3. Use pipe with inside diameter of at least three times the maximum coarse aggregate size, but not less than 2 inches.

4. Do not use aluminum pipes for delivery of concrete to the forms.

3.06 CURING AND PROTECTION

A. General

1. Protect concrete from premature drying, hot or cold temperatures, and mechanical injury, beginning immediately after placement and maintain concrete with minimal moisture loss at relatively constant temperature.

2. Comply with curing procedures set forth in ACI 301, ACI 308, and as specified herein.

3. Perform hot weather concreting in conformance with ACI 305R and as specified herein when the ambient atmospheric temperature is 80 degrees F (27 degrees C) or above.

4. Perform cold weather concreting in conformance with ACI 306R.

5. Concrete required to be moist cured shall remain moist for the entire duration of the cure. Repeated wetting and drying cycles of the curing process will not be allowed.

B. Curing Duration

1. Start initial curing after placing and finishing concrete as soon as free moisture has disappeared from unformed concrete surfaces. Initial curing starts as soon as

concrete achieves final set. Forms left tightly in place are considered as part of the curing system, provided that wooden forms are kept continuously moist. Keep continuously moist for not less than 72 hours.

2. Begin final curing procedures immediately following initial curing and before the concrete has dried. Continue final curing for at least 7 days and in accordance with ACI 301 procedures for a total curing period, initial plus final, of at least 10 days.

3. Avoid rapid drying at the end of the final curing period.

C. Curing Requirements

1. Unformed Surfaces: Cover and cure entire surface of newly placed concrete immediately after completing finishing operations and water film has evaporated from surface or as soon as marring of concrete will not occur. Protect finished slabs from direct rays of the sun to prevent checking, crazing, and plastic shrinkage.

2. Formed Surfaces: Minimize moisture loss for formed surfaces exposed to heating by the sun by keeping forms wet until safely removed. Keep surface continuously wet by warm water spray or warm water saturated fabric immediately following form removal unless otherwise permitted by the Engineer.

3. Below Grade Structures: Moist cure by the application of water to maintain the surface in a continually wet condition unless otherwise permitted by the Engineer. Use water that is free of impurities that could etch or discolor exposed concrete surfaces.

4. Other concrete: Moist cure by moisture-retaining cover curing, or by the use of curing compound.

D. Curing Methods

1. Water Curing: Use water curing for unformed surfaces. Continuously water cure all exposed concrete for the entire curing period. Provide moisture curing by any of the following methods:

a. Keeping the surface of the concrete continuously wet by ponding or immersion.

b. Continuous water-fog spray or sprinkling.

c. Covering the concrete surface with curing mats, thoroughly saturating the mats with water, and keeping the mats continuously wet with sprinklers or porous hoses. Place curing mats so as to provide coverage of the concrete surfaces and edges, with a 4 inch lap over adjacent mats. Weight down the curing cover to maintain contact with the concrete surface.

2. Sealing Materials

   a. Use common sealing materials such as plastic film or waterproofing (kraft) paper.

   b. Lap adjacent sheets a minimum of 12 inch. Seal edges with waterproof tape or adhesive. Use sheets of sufficient length to cover sides of concrete member.

   c. Place sheet materials only on moist concrete surfaces. Wet concrete surface with fine water spray if the surface appears dry before placing sheet material.

   d. The presence of moisture on concrete surfaces at all times during the prescribed curing period is proof of acceptable curing using sheet material.

3. Membrane Curing Compound

   a. Apply membrane-curing compound uniformly over concrete surface by means of roller or spray at a rate recommended by the curing compound manufacturer, but not less than 1 gallon per 150 sq. ft. of surface area. Agitate curing material in supply container immediately before transfer to distributor and thoroughly agitate it during application for uniform consistency and dispersion of pigment.

   b. Do not use curing compounds on construction and expansion joints.

   c. Reapply membrane-curing compound to concrete surfaces that have been subjected to wetting within 3 hours after curing compound has been applied by method for initial application.

E. Protection from environmental conditions: Maintain the concrete temperature above 50 degrees F (10 degrees C) continuously throughout the curing period. Make arrangements before concrete placing for heating, covering, insulation, or housing to maintain the specified temperature and moisture conditions continuously for the curing period.

1. When the atmospheric temperature is 80 degrees F (25 degrees C) and above, or during other climatic conditions which will cause too rapid drying of the concrete, make arrangements before the start of concrete placing for the installation of wind breaks or shading, and for fog spraying, wet sprinkling, or moisture-retaining covering.

2. Protect the concrete continuously for the entire curing period.

3. Maintain concrete temperature as uniformly as possible, and protect from rapid atmospheric temperature changes.

4. Avoid temperature changes in concrete that exceed 5 degrees F (3 degrees C) in any one hour and 50 degrees F (10 degrees C) in any 24-hour period.

F. Protection from physical injury: Protect concrete from physical disturbances such as shock and vibration during curing period. Protect finished concrete surfaces from damage by construction equipment, materials, curing procedures, and rain or running water. Do not load concrete in such a manner as to overstress concrete.

G. Protection from Deicing Agents: Do not apply deicing chemicals to concrete.

3.07 CONCRETE FINISHING

A. Unless otherwise indicated, provide the following slab finishes for concrete pad and Geocell infill: Float and broom finish.

B. Concrete shall be within ¼ inch of a 10 foot straightedge in all directions except where slabs are dished for drains. Deviations from the elevation indicated shall not exceed ¼ inch.

C. Slabs sloped for drainage shall not have depressions that retain water.

D. Immediately after placement, screed concrete with straightedges or power strikeoffs. Do not use roller screeds or vibrating screeds.

E. Stakes shall not be used during placement of geocell concrete infill to avoid damage to underlying geomembrane.

F. Immediately after screeding, darby surface with wood or magnesium darby to eliminate ridges and to fill in voids left by screeding.

3.08 FLOAT FINISH

A. Float concrete using hand floats or power driven floats after the concrete has stiffened to a point where only a ¼ inch indentation can be imparted by normal foot pressure.

B. Float finish shall result in a uniform, smooth, granular texture. After floating, check slab tolerances with 10-foot straightedge. Cut down high spots, and fill low spots with fresh concrete; do not sprinkle with dry cement.

3.09 BROOMING

A. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route, or direction of water flow.

3.10 INSTALLATION OF GROUT

A. Mix in accordance with the manufacturer's recommendations. Do not add cement, sand, pea gravel, or admixtures without prior approval by the grout manufacturer and the Engineer.

B. Avoid mixing by hand. Pre-wet the mixer and empty excess water. Add premeasured amount of water for mixing, followed by the grout Begin with the minimum amount of water recommended by the manufacturer and then add the additional water required to obtain workability. However, do not exceed the manufacturer's maximum recommended water content.

C. Place grout into the designated areas in a manner that will avoid segregation or entrapment of air. Do not vibrate grout to release air or to consolidate the material. Placement should proceed in a manner that will ensure the filling of all spaces and provide full contact between the grout and adjoining surfaces. Provide grout holes as necessary. Place grout rapidly and continuously to avoid cold joints. Do not place cement grouts in layers. Do not add additional water to the mix (re-temper) after initial stiffening.

D. Begin curing immediately after form removal, cutback, and finishing. Keep grout moist and within its recommended placement temperature range for at least 24 hours after placement or longer if recommended by the manufacturer.

3.11 FIELD QUALITY CONTROL

A. Hot Weather Requirements

1. During hot weather, give proper attention to ingredients, production methods, handling, placing, protection, and curing to prevent excessive concrete temperatures or water evaporation in accordance with ACI 305R.

2. When the weather is such that the temperature of the concrete as placed would exceed 90 degrees F (32.2 degrees C), use ice, or other means of cooling the concrete during mixing and transportation so that the temperature of the concrete as placed will not exceed 90 degrees F (32.2 degrees C).

3. Take precautions when placing concrete during hot, dry weather to eliminate early setting of concrete. This includes protection of reinforcing from direct sunlight to prevent heating of reinforcing, placing concrete during cooler hours of the day, and the proper and timely application of specified curing methods.

4. There will be no additional reimbursement to the Contractor for costs incurred for placing concrete in hot weather.

B. Cold Weather Requirements

1. Provide adequate equipment for heating concrete materials and protecting concrete during freezing or near-freezing weather in accordance with ACI 306R.

2. When the temperature of the surrounding atmosphere is 40 degrees F (4.4 degrees C) or is likely to fall below this temperature, use heated mixing water not to exceed 140 degrees F (60 degrees C). Do not allow the heated water to come in contact with the cement before the cement is added to the batch.

3. When placed in the forms during cold weather, maintain concrete temperature at not less than 55 degrees F (12.8 degrees C). Materials shall be free from ice, snow, and frozen lumps before entering the mixer.

4. Maintain the air and the forms in contact with the concrete at temperatures above 40 degrees F (4.4 degrees C) for the first five days after placing, and above 35 degrees F (1.7 degrees C) for the remainder of the curing period. Provide thermometers to indicate the ambient temperature and the temperature 2 inches inside the concrete surface.

5. There will be no additional reimbursement made to the Contractor for costs incurred for placing concrete during cold weather.

C. Concrete Testing

1. Engage an independent testing agency to perform concrete quality testing and inspection.

2. The testing agency shall use concrete samples provided by the Contractor at the point of agitator or mixer truck discharge to perform slump (per ASTM C143) , air content (per ASTM C231), and temperature tests (per ASTM C1064) and for field control test specimens.

3. The testing agency shall submit test reports of concrete field measurements specified above to the Contractor and to the Engineer.

4. Provide and maintain facilities for safe storage and proper curing of concrete test specimens on the project site, as required by ASTM C31.

5. Concrete Quality Test Specimen

    a. Perform sampling and curing of test specimen in accordance with ASTM C31.

    b. Testing agency personnel shall record truck and load number from the delivery batch ticket, the concrete placement location of each specimen, the date, concrete strength, slump, air content, and temperature.

    c. The testing agency shall cast a minimum of one set of 4 test specimens (4 inch diameter by 8 inch long cylinders) for each 50 cubic yards of each mix design of concrete but not less than once a day nor less than once for each 5,000 sq. ft. of surface area of footings, slabs on grade, or walls.

    d. Test cylinders in accordance with ASTM C39. Test one cylinder at 7 days for information; test 2 cylinders at 28 days for acceptance; and hold one reserve cylinder for 56 days to be tested only at the direction of the Engineer. Strength acceptance will be based on the average of the strengths of the 2 cylinders tested at 28 days. If one cylinder of a 28-day test manifests evidence of improper sampling, molding, or testing, other than low strength, discard it and use a reserve cylinder for the test result.

6. The Contractor may take field control test specimens for small quantities of concrete.

7. Concrete acceptance shall be based on the requirements of ACI 318.

8. Field cured cylinders conforming to ASTM C31 will be required to determine field compressive strength of concrete. Laboratory cured cylinders for concrete quality testing shall not be used for determining field compressive strength.

9. Concrete Coring

   a. When the concrete quality test specimen compression tests fail to be in compliance with the Contract Documents or when the Engineer detects deficiencies in the concrete, the Contractor will take concrete cores at least 2 inches in diameter from the structure in conformance with ASTM C 42 at locations determined by the Engineer.

      i. Where applicable, Contractor shall be responsible for repairing damage to underlying geosynthetics caused by concrete coring.

   b. Obtain at least three representative cores from each member or area of concrete that is considered potentially deficient.

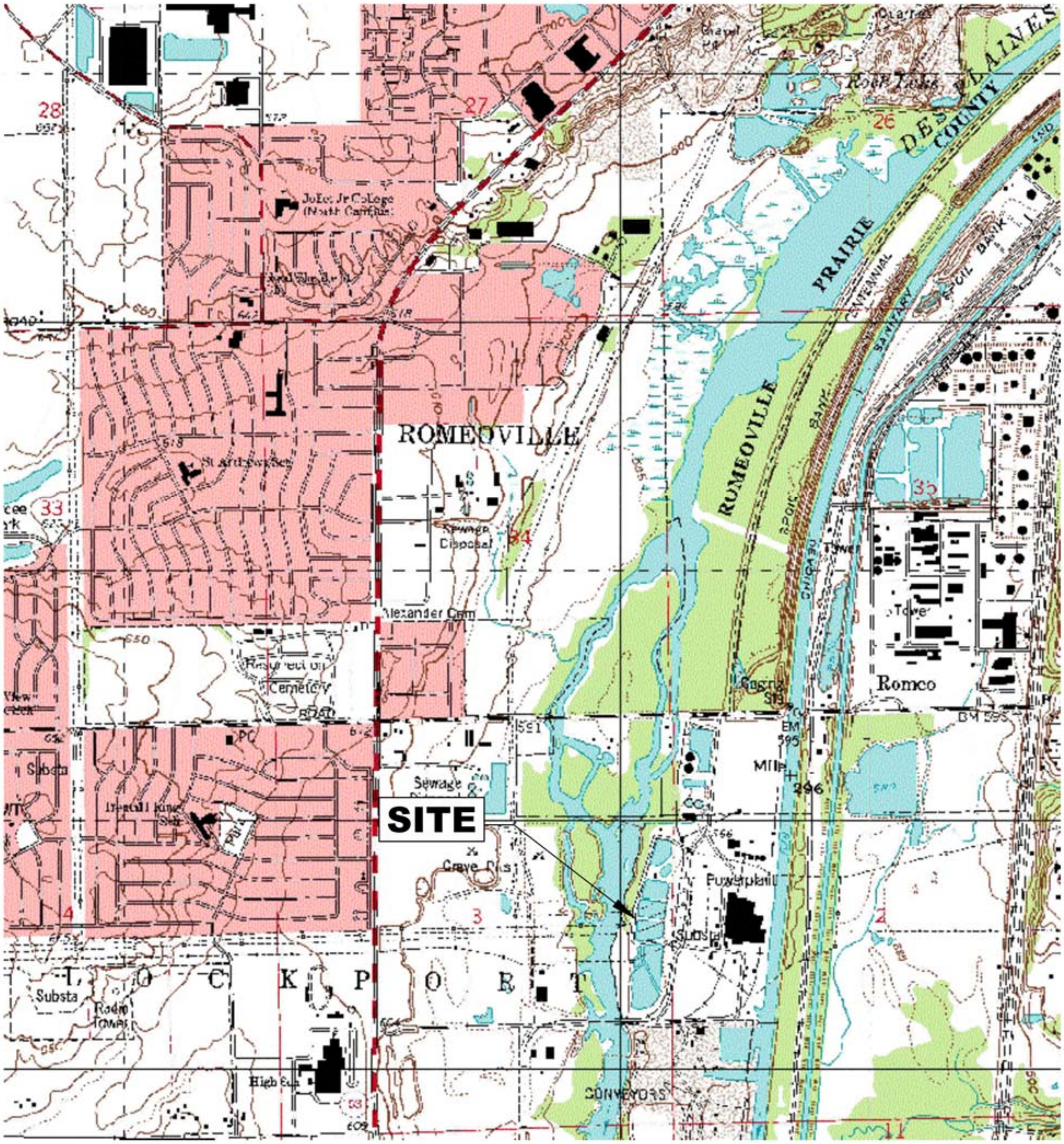
   c. Obtain additional cores to replace cores that show evidence of having been damaged subsequent to or during removal from the structure.

   d. The testing agency shall compression test the cores taken from the structure in conformance with ASTM C39 and submit test strength test results of cores specified above to the Contractor and to the Engineer.

   e. All costs associated with coring and testing of cores will be borne by the Contractor at no additional cost to the Owner.

END OF SECTION

FIGURES



SOURCE: DIGITAL DOWNLOAD FROM
http://STORE.USGS.GOV.
USGS 7.5 MINUTE QUADRANGLE,
ROMEOVILLE, ILL.
DATED 1998.

QUADRANGLE LOCATION

N

0 2000 4000

SCALE IN FEET

CONTOUR INTERVAL 10 FEET

SITE LOCATION MAP

MIDWEST GENERATION
WILL COUNTY POWER PLANT
ROMEOVILLE, ILLINOIS

NATURAL
RESOURCE
TECHNOLOGY

DRAWN BY: RLH 01/09/08 APP'D BY: HMS DATE: 01/25/08

PROJECT NO.
1900

DRAWING NO.
1900–A01

FIGURE NO.
1

TABLES

Table 1. List of Documentation Surveys
South Ash Pond 2 Liner Replacement Specifications
Midwest Generation – Will County Generating Station

Survey	Responsible Party	Frequency	Technical Specification Reference
Topographic survey of prepared subgrade prior to placement of geomembrane	Contractor	Min. 50 ft square grid and at grade changes	Section 01050, 1.02A
Location and dimensions of anchor trench	Contractor	Every 25 ft intervals	Section 01050, 1.02B
Location and elevation geomembrane panels, seams, and repairs	Contractor	At panel corners, termination in anchor trench, and repairs, as necessary to develop an as-built drawing	Section 01050, 1.02C Section 02600, 1.05D, 3.09A
Location of guardrails	Contractor	As necessary	Section 01050, 1.02D
Topographic survey of geocell layer	Contractor	Min. 50 ft square grid and at grade changes, at same locations surveyed prior to placement of geomembrane	Section 01050, 1.02E
Topographic survey of warning layer	Contractor	Min. 50 ft square grid and at grade changes, at same locations surveyed prior to placement of geomembrane	Section 01050, 1.02E

Notes

1. Contractor shall provide Owner and/or Engineer results of survey within 2 working days after completion.
2. Owner and/or Engineer acceptance or rejection will be provided within 2 working days following receipt of documentation survey.

Table 2 - List of Submittals

South Ash Pond 2 Liner Replacement Specifications

Midwest Generation – Will County Generating Station

	Submittal [(1)]	From	To	Time Frame	Technical Specification Section	Technical Specification Part
1	Subcontractor List	Contractor	Owner and/or Engineer	**With bid documents**		
2	Baseline Construction Schedule	Contractor	Owner and/or Engineer	**With bid documents** and update within 10 calendar days of the date of the Contract award		
3	Geocell Installer Qualifications	Contractor	Owner and/or Engineer	**With bid documents**	02078	1.03C
4	Name and Location of Recycling / Disposal Facility	Contractor	Owner and/or Engineer	**With bid documents**	02300	1.06B
5	Supplier and Location of all Material Sources	Contractor	Owner and/or Engineer	**With bid documents**	02300	1.06C
7	Leak Location Contractor's Work Plan	Contractor	Owner and/or Engineer	**With bid documents**	02600	1.05.C
8	IEPA Water Pollution Control Construction Permit	Owner through Engineer	Contractor	Prior to project start		
9	General Permit for Storm Water Discharges from Construction Site Activities	Owner through Engineer	Contractor	Prior to project start		
10	Site Superintendent/Foreman's Name & Phone Number	Contractor	Owner and/or Engineer	Prior to project start		
11	Borrow Material Documentation Certificates and Test Results	Contractor	Owner and/or Engineer	Prior to project start	02300	1.06E
12	Geosynthetics Raw Materials Information	Installer	Owner and/or Engineer	Prior to project start	02600	1.05A.1
13	Geosynthetics Manufacturer's Certification - Production Information includes QC Plan	Installer	Owner and/or Engineer	Prior to project start	02600	1.05A.2 & 1.05A.3
14	Geotextile Manufacture's Certification	Installer	Owner and/or Engineer	Prior to project start	02600	1.05A.4
15	Geomembrane Installer's Personnel and Information	Contractor	Owner and/or Engineer	Prior to project start	02600	1.05B.1 & B.2

Natural Resource Technology

Table 2 - List of Submittals

South Ash Pond 2 Liner Replacement Specifications

Midwest Generation – Will County Generating Station

	Submittal [1]	From	To	Time Frame	Technical Specification	
					Section	Part
16	Geomembrane Panel Layout Drawing	Contractor	Owner and/or Engineer	Prior to project start	02600	1.05B.3
17	Construction Progress Schedule	Contractor	Owner and/or Engineer	Prior to project start	02600	1.05B.4
18	Description of seaming apparatus to be used indicating compliance with specified requirements	Contractor	Owner and/or Engineer	Prior to project start	02600	1.05B.5
19	Construction Start Date	Contractor	Owner and/or Engineer	At least 5 Working days prior to construction start	02300	1.06D
20	Geocell Warranty	Contractor	Owner and/or Engineer	Two weeks prior to delivery	02078	1.06
21	Reconstructed Bank Material Represenative Sample	Contractor	Owner and/or Engineer	Two weeks prior to delivery	02300	2.02
21	Cushion Material Representative Sample	Contractor	Owner and/or Engineer	Two weeks prior to delivery	02300	2.03
22	Warning Layer Representative Sample	Contractor	Owner and/or Engineer	Two weeks prior to delivery	02300	2.04
23	Concrete Accessories and Admixtures Manufacturere's Certificate and Literature	Contractor	Owner and/or Engineer	Two weeks prior to delivery	03300	1.03A
24	Cement & Aggregate Certifications	Contractor	Owner and/or Engineer	Two weeks prior to delivery	03300	1.03B.1 & B.2
25	Certificate of Compliance with Concrete Admixtures	Contractor	Owner and/or Engineer	Two weeks prior to delivery	03300	1.03B.3
26	Concrete Mix Design	Contractor	Owner and/or Engineer	Two weeks prior to delivery	03300	1.03B.4
27	Procedures for Protection of Concrete during Wet, Cold, and Hot Weather	Contractor	Owner and/or Engineer	Two weeks prior to delivery	03300	1.03B.5 & B.6
28	Concrete Independent Testing Agency Certification	Contractor	Owner and/or Engineer	Two weeks prior to delivery	03300	1.03B.7
29	Expoxy Bonding Compound Manufacturer's Instruction & Data	Contractor	Owner and/or Engineer	Two weeks prior to delivery	03300	1.03C

Table 2 - List of Submittals

South Ash Pond 2 Liner Replacement Specifications

Midwest Generation – Will County Generating Station

	Submittal [1]	From	To	Time Frame	Technical Specification	
					Section	Part
30	Geocell Manufacturer's Shop Drawings	Contractor	Owner and/or Engineer	5 working days prior to material delivery to site	02078	1.03A
31	Geocell Manufacturer's Certification	Contractor	Owner and/or Engineer	5 working days prior to material delivery to site	02078	1.03B & 1.04B
32	Accident Reports, Work Stoppage/Dispute Records, Contractor Invoices, Schedule of Values, Test Report Records, and Equipment Check Records	Contractor	Owner and/or Engineer	As Necessary		
33	Geotechnical Field Test Results	Contractor and/or Field Technician	Engineer	Within 24 hours of test completion	02300	1.06F
34	Concrete Quality Control/Assurance - delivery tickets, cement weight, aggregate size, water added, test results etc.	Contractor	Engineer	Within 24 hours of test completion	03300	1.03D 3.11B
35	Geomembrane Installer's Daily Logs and Quality Control Documentation	Contractor	Owner and/or Engineer	During geomembrane installation, on a weekly basis	02600	1.05D.1
36	Geomembrane Installer's Subgrade Acceptance	Contractor	Owner and/or Engineer	Each day prior to geomembrane installation	02600	1.05D.2 3.02
37	Survey Data (See Table 1)	Contractor	Owner and/or Engineer	Within 4 days following completion of survey	01050	1.05
38	Contractor Notice to Proceed with Placement of Cushion and Warning Layer	Owner and/or Engineer	Contractor	Upon verification of completion of geosynthetics installation	02300	3.08A
39	Conditional and/or Final Geomembrane Installation Acceptance	Owner and/or Engineer	Contractor	Upon completion of geomembrane installation and submittals	02600	1.05F & G
40	Geomembrane Installation Certificate, As-Builts, and Warranties	Contractor	Owner and/or Engineer	Within 10 working days of geomembrane installation completion	02600	1.05E

Table 2 - List of Submittals

South Ash Pond 2 Liner Replacement Specifications

Midwest Generation – Will County Generating Station

	Submittal [(1)]	From	To	Time Frame	Technical Specification	
					Section	**Part**
41	Final Leak Location Survey Report	Contractor	Owner and/or Engineer	Within 14 days following completion of leak location survey	02600	1.05H
42	Notice of Final Completion and Written Certification for Project	Contractor	Owner and/or Engineer	Upon completion of work	01700	1.03B & C
43	Record Documents	Contractor	Owner and/or Engineer	Prior to submittal of final invoice	01700	1.04

(1) The list of sunbmittals is not all-inclusive. Referer to the Contract Documents to determine necessary submittals.

TABLE 3
SUMMARY OF CQA MATERIAL TESTS
Midwest Generation-Will County South Pond 2 Liner Replacement

Laboratory Testing							
Material	**Test Designation**	**Test Standard**	**Frequency**	**Acceptance Criteria**	**Coordinating Responsible Party**	**Submittal Criteria**	**Responsible Party to Perform Tests**
Imported Reconstructed Bank Material	Grain Size	ASTM D422	One sample before bank construction	Section 02300, Part 2.02	Contractor	Results 2 weeks prior to the start of bank construction	Geotechnical Laboratory
	USCS Classification & organic content	ASTM D2487	One sample before bank construction	N/A	Contractor	Results 2 weeks prior to the start of bank construction	Geotechnical Laboratory
	Moisture Content	ASTM D2216	One sample before bank construction	N/A	Contractor	Results 2 weeks prior to the start of bank construction	Geotechnical Laboratory
	Modified Proctor	ASTM D1557	One sample before bank construction	N/A	Contractor	Results 2 weeks prior to the start of bank construction	Geotechnical Laboratory
Cushion Layer & Warning Layer Material	Grain Size	ASTM D422	One sample two weeks prior to delivery to site	Section 02300, Part 2.03, & 2.04	Contractor	Results 2 weeks prior to delivery to the site	Geotechnical Laboratory
	USCS Classification & organic content	ASTM D2487	One sample two weeks prior to delivery to site	Section 02300, Part 2.03, & 2.04	Contractor	Results 2 weeks prior to delivery to the site	Geotechnical Laboratory
Field Testing							
Material	**Test Designation**	**Test Standard**	**Frequency**	**Acceptance Criteria**	**Coordinating Responsible Party**	**Submittal Criteria**	**CQA Laboratory Performing Tests**
Reconstructed Bank Material	In place Density and Moisture Content	ASTM D6938	Every 6-inch lift on a 25-foot grid offset for each lift (minimum of 5 test per lift)	90% of maximum dry density	Contractor	Within 24-hours of test completion	Geotechnical Field Technician

APPENDIX A

STORM WATER POLLUTION PREVENTATIVE PLAN

STORM WATER POLLUTION PREVENTION PLAN
April 24, 2013

PROJECT: Midwest Generation Will County Generating Station
Romeoville, Illinois
South Ash Ponds 2 Liner Replacement

Project Description and Proposed Construction Activities

South Ash Ponds 2 is a settling pond for bottom ash sluiced from coal combustion boilers associated with electrical power generation. The operating volume of South Ash Pond 2 is approximately 3.7 million gallons at 1.0 foot of freeboard. The effluent from each pond is either recycled into the electric generating process or treated before discharge to the Chicago Sanitary and Ship Canal, as authorized under the station's NPDES Permit No. IL0002208.

Liner replacement activities will include:

- Subgrade preparation for the new HDPE geomembrane liner, including partial removal of the existing Poz-o-Pac liner to accommodate a warning layer above the replacement liner, as described below;
- Poz-o-Pac and associated fill soils removed from the existing liner will be either stockpiled for reuse or recycled/disposed;
- Deployment and seaming of the new liner; and
- Placement of cushion and warning layers over the new liner.

Land disturbance will occur at the base of the pond and temporary stockpile area, as shown on Figure 1. Approximately 2 acres of total area is estimated to be disturbed by excavation, grading, and/or other activities during construction (0.5 acres in stockpile area and 1.3 acres at the base of Pond 2). Details regarding the site, including truck entrance/exit, drainage patterns, area of disturbance, stockpile area, and erosion control measures are shown on the enclosed Figure 1.

Erosion and Sediment Controls

The following erosion and sediment controls will be utilized:

- Placement of a gravel berm or silt fence around stockpiled materials (Figure 1);
- Inactive stockpiles (i.e., material not added to or removed from stockpiles for 7 days) will be covered and anchored with temporary plastic to prevent erosion;
- No land will be disturbed outside the pond footprint, except the stockpile area, that will cause a change in storm water flow;
- Storm water runoff that enters the pond (disturbed area) will be pumped and discharged to an active operating pond for treatment prior to plant reuse or discharge to the Chicago Sanitary and Ship Canal;
- Storm water runoff that enters the South Run-off Basin is treated prior to plant reuse or discharge to the Chicago Sanitary and Ship Canal; and
- Active control of dust, mud, water, and erosion along haul route and of stockpile will be

conducted at the site, as specified in technical specification Section 01500 – Construction Facilities and Temporary Controls (Appendix A).

Maintenance

During construction, the Contractor will:

- Maintain a clean working area and avoid grade changes outside the ponds to circumvent changes in runoff direction and concentration;
- Maintain or replace erosion and sediment control measures, as necessary;
- Maintain/clean access road, as necessary;
- Maintain dewatering equipment to prevent leaks and spills outside the vicinity of the ponds; and
- At project completion, erosion and sediment control measures will be removed and the stockpile areas will be restored to pre-construction conditions.

Inspections

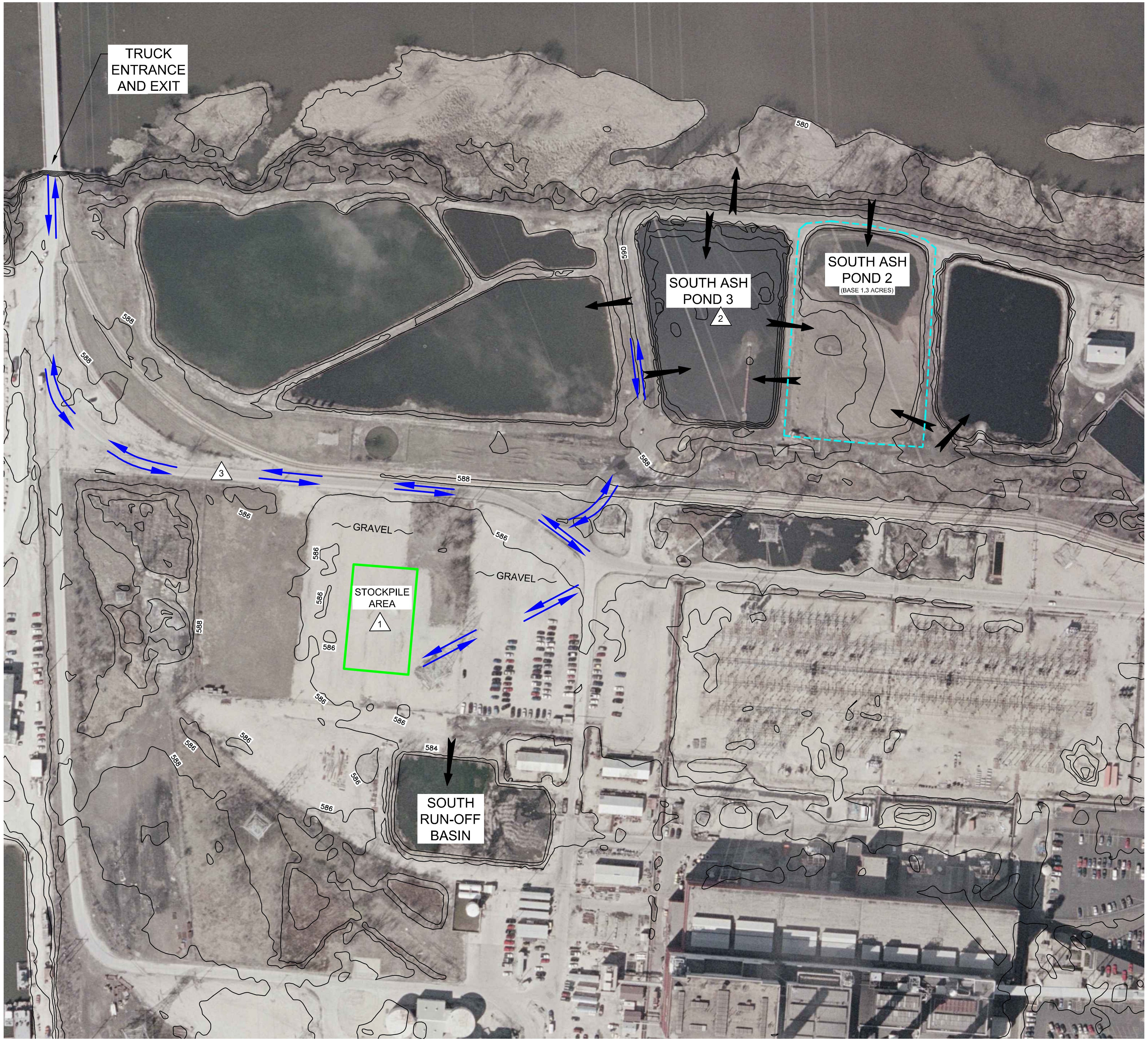
Qualified personnel, as defined under the General Permit for Storm Water Discharges, will inspect erosion and sediment controls and locations where vehicles enter or exit the site. Such inspections will be conducted at least once every seven calendar days and within 24 hours of the end of a storm that is 0.5 inch of rain or greater. Disturbed areas and areas used for storage of materials that are exposed to storm water will be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the plan will be inspected to verify that they are operating correctly. Areas where construction traffic enters or exits the site will be inspected for evidence of off-site sediment tracking.

Based on results of the inspection, the erosion and sediment control measures identified under “Controls” above will be maintained as necessary as soon as practicable after inspection. A summary of the inspection, including the following information, will be recorded on the inspection form (Appendix B):

- Name(s) and qualifications of personnel making the inspection;
- Date(s) of inspection;
- Major observations relating to the implementation of the SWPPP; and
- Actions taken.

Enclosure: Figure 1 – Site Map
Appendix A – Specification Section 01500, Construction Facilities
Appendix B – Inspection Form

FIGURES



	2007 GROUND SURFACE CONTOURS
	LIMIT OF DISTURBED AREA
	TRUCK ROUTE
	SILT FENCE OR GRAVEL BERM
	SURFACE WATER FLOW DIRECTION
586	ELEVATION (FEET)

NOTES:

1. INACTIVE STOCKPILES (ie., MATERIAL NOT ADDED TO OR REMOVED FROM STOCKPILE FOR 7 DAYS) SHALL BE COVERED AND ANCHORED WITH TEMPORARY PLASTIC TO PREVENT EROSION.

2. MANAGE AND DISCHARGE STORMWATER TO ACTIVE (OPERATING) SOUTH ASH POND 3 FOR TREATMENT.

3. CONTROL TRACKING OF MUD FROM TRUCK ROUTE.

N

0 100 200

SCALE IN FEET

SOURCE:

1. TOPOGRAPHIC SURVEY OF 2007 (CONTOUR INTERVAL 2 FEET) FROM WILL COUNTY GEOGRAPHIC INFORMATION SYSTEMS DEPARTMENT.

2. ILLINOIS NATURAL RESOURCES GEOSPATIAL DATA CLEARINGHOUSE. ILLINOIS STATE PLANE EAST ZONE NAD 83 DATUM CAPTURED SPRING 2005.

DRAWN BY: RLH DATE: 04/19/13

CHECKED BY: HMS DATE: 04/19/13

APPROVED BY: . DATE: .

DRAWING NO: 21131-32-B01C

REFERENCE:

DRAFT

SITE MAP

STORM WATER POLLUTION PREVENTION PLAN
ASH POND LINER REPLACEMENT
MIDWEST GENERATION
WILL COUNTY GENERATING STATION
ROMEOVILLE, ILLINOIS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
2113.1/3.2

FIGURE NO.
1

APPENDIX A

SPECIFICATION SECTION 01500
CONSTRUCTION FACILITIES
AND TEMPORARY CONTROLS

SECTION 01500
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Use of Site Facilities

B. Security

C. Access Roads and Parking

D. Telephone Service

E. Temporary Utilities

F. Sanitary Facilities

G. Equipment Storage Locations

H. Dust and Mud Controls

I. Construction Noise

J. Water and Erosion Controls

K. Barriers and Protection of Installed Work.

L. Site Progress Cleaning

M. Fuel Storage and Handling

N. Protection of the Environment

O. Public Road Requirements

P. Additional Requirements

1.02 USE OF SITE FACILITIES

A. Use of Site

1. Contractor shall consult with the Owner and/or Engineer regarding locations for offices, trailers, material storage, access roads, fences, gates, and areas within construction limits for use by Contractor.

2. Contractor shall conduct construction activities in a manner to minimize interference with plant operations.

3. Confine equipment, storage of materials, and operations of workmen to areas designated by the Owner. Do not bring materials onto site until reasonably required for progress of work. No area outside of construction limit or staging area may be used for any purpose by Contractor or subcontractors unless expressly approved by the Owner in writing.

4. Store, place, and handle material and equipment to protect from any damage. Contractor shall move materials, sheds, or storage platforms, as necessary or when required for continuing construction at Contractor's expense.

5. Owner assumes no responsibility for project material or equipment stored on-site or off-site. Contractor assumes full responsibility for damage due to storage of materials.

6. Contractor is responsible to schedule work, storage of materials, etc., to minimize interference with construction activities.

7. Contractor is responsible for all snow removal as necessary during duration of project, as necessary.

8. Contractor is responsible for controlling sediment migration, preventing tracking of sediment onto site access roads and public roads, and cleaning site access roads and public right-of-ways and streets daily (or as deemed necessary by Owner) with commercial street sweepers.

B. Contractor shall inspect site with Owner and/or Engineer prior to start of work to determine existing conditions in conjunction with preconstruction meeting.

1.03 SECURITY

A. Security is not provided by Owner for Contractor's property.

B. Contractor is responsible for loss or injury to persons or property where his work is involved, and shall provide security and take precautionary measures as deemed necessary to protect Contractor's and Owner's interests.

1.04 ACCESS ROADS AND PARKING

A. Contractor shall maintain the service road accessing the construction areas and stockpile areas as necessary, or as directed by Owner and/or Engineer.

B. Contractor shall use the south plant entrance that crosses over station train tracks for truck access to deliver material. Note train traffic occurs frequently and has the right of way, which may cause trucks to wait and delay delivery.

C. Parking areas on-site shall be within the work area or area designated by Owner

1.05 TELEPHONE SERVICE

A. Contractor shall provide, maintain, and pay for cellular phone service for Contractor's designated on-site superintendent or foreman. In addition, subcontractor's designated on-site personnel shall have cellular phones.

1.06 TEMPORARY UTILITIES

A. Electricity

1. Contractor shall arrange with Owner for temporary electrical service as needed.

3. OSHA regulations require that employers shall use either ground fault circuit interrupters (GFCIs) or an assured equipment grounding conductor program (AEGCP) in addition to any other regulations for equipment grounding conductors.

4. Utilize and remove upon completion of project an electrical distribution system for temporary light and power during construction, if necessary.

B. Water

1. Contractor shall arrange with Owner for water service as needed. Contractor shall furnish and install all temporary connections required to complete Work and shall furnish his own shutoff valves and hose connections.

2. Contractor may use the water in the South Run-off Basin or shall provide clean water to be used for dust suppression in work areas. Dust suppression will be necessary for haul roads, stockpile areas, and within construction limits. Submit source of clean water to be used for dust suppression to Owner and/or Engineer for approval prior to project commencement.

3. Contractor shall provide potable water for Contractor's employees, as necessary.

1.07 SANITARY FACILITIES

A. Contractor shall provide sanitary facilities on-site conforming to state and local health and sanitation regulations in sufficient number for use of Contractor's employees.

B. Contractor shall maintain on-site facilities in sanitary condition at all times.

1.08 EQUIPMENT STORAGE LOCATIONS

A. Contractor shall park equipment and store materials only in areas proposed by Contractor and approved by Owner.

B. Restore disturbed areas to pre-construction condition upon project completion.

1.09 DUST AND MUD CONTROLS

A. Conduct operations and maintain site to minimize creation and dispersion of dust and mud.

B. Provide equipment necessary to control dust generation resulting from wind effects on open stockpiles, excavations, and from Contractor's vehicle and equipment traffic at all times. Control dust by application of water to affected areas, such that surfaces are moistened to prevent dust from becoming a nuisance to public, neighbors, and concurrent performance of other work at site. Contractor shall prevent dusting 24 hours a day from project commencement to substantial completion of the work.

D. Control mud and tracking of mud over site access roads and public roads along haul routes. Maintain surfaces in proper condition to facilitate removal efficiency.

E. The Owner and/or Engineer shall monitor site conditions related to dust and mud generation on a daily basis and direct Contractor to take actions as necessary to address deficient practices or conditions deleterious to construction and/or public.

F. Clean public right-of-ways and streets as deemed necessary by Owner with commercial street sweepers.

1.10 CONSTRUCTION NOISE

A. The Owner shall decide on the adequacy of provision and maintenance of noise reduction equipment. When so instructed by the Owner, the Contractor shall immediately withdraw any equipment from service and carry out all necessary additions, replacements, or repairs to the noise reduction equipment to the satisfaction of the Owner.

1.11 WATER AND EROSION CONTROLS

A. Contractor shall install and maintain erosion control measures necessary to prevent runoff, tracking, or loss of soil materials by water or mechanical action from disturbed portions of the site or excavation areas(s), as shown on the Contract Drawings and in accordance with the project's Storm Water Pollution Prevention Plan (SWPPP), as presented in Appendix A.

B. No direct discharge shall be allowed into any of the ponds on-site without the approval from Owner.

1.12 BARRIERS AND PROTECTION OF INSTALLED WORK

A. Contractor shall protect installed work and provide special protection as needed.

B. Construction traffic shall be prohibited on completed and/or landscaped areas.

C. Protect existing facilities and adjacent properties from damage during construction operations.

1.13 SITE PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Site shall be maintained in clean and orderly condition.

B. Remove waste materials, debris, and rubbish from site weekly and dispose off-site at Contractor's expense and in accordance with federal, state, and local regulations.

C. Contractor shall provide a dumpster on-site for general waste materials and rubbish during site activities.

1.14 FUEL STORAGE AND HANDLING

A. Store fuel according to local, state, and federal laws.

B. At no time shall overtopping fuel tanks or spillage to the ground surface be allowed.

1.16 PROTECTION OF THE ENVIRONMENT

A. Minimize air pollution by use of properly operating emission control devices on construction vehicles and equipment. Encourage shutdown of motorized equipment not in use.

B. Trash burning not permitted on-site.

C. All areas for handling and storage of fuels, oils, and other potentially hazardous liquids shall have spill containment or release prevention measures. Maintenance of equipment on-site shall be with prior approval of the Owner and/or Engineer.

D. All waste materials shall be recycled, hauled to a licensed solid waste landfill, or otherwise disposed of in an environmentally sound manner and in compliance with all applicable local, state, and federal rules.

E. All hazardous waste shall be stored, handled, and disposed of in compliance with applicable local, state, and federal rules.

F. Other measures shall be taken, as necessary, to maintain work site in an environmentally sound matter.

G. All spills or leaks of fuels, oil, or other IEPA-reportable liquids resulting from handling or equipment malfunctions shall be reported immediately to Owner and/or Engineer. Affected soils shall be properly removed from limits of construction and disposed in accordance with applicable local, state, and federal rules at the sole expense of the Contractor and as agreed by the Owner and/or Engineer. Copies of manifests, if necessary, shall be provided to Owner and/or Engineer within five working days of disposal. Waste Generator Manifests shall not state Owner as Generator. Owner reserves right to order leaking equipment removed from site.

1.17 PUBLIC ROAD REQUIREMENTS

A. Contractor shall comply with Local Weight Limits. Local roads shall be cleaned daily, as necessary, to maintain their condition free of mud and dirt.

B. The Contractor shall conduct his operations on the site in a manner that will minimize interference with the normal operation of plant, adjoining public and private roads and parking lots, and shall implement all specified and other appropriate measures to ensure the safety of all users of the adjoining public and private roads and parking lots.

C. Contractor shall provide flag person(s) as necessary and at request of Owner and/or Engineer.

1.18 ADDITIONAL REQUIREMENTS

A. No cameras are allowed on the site without permission from the Owner.

B. No firearms or explosives are allowed on-site.

C. Possession and/or use of intoxicating beverages and nonprescription drugs are prohibited at all times. Persons caught in possession or under the influence of drugs or alcohol will be immediately dismissed and removed from the site.

D. Smoking will be allowed in designated areas only.

E. No horseplay is permitted on the job site.

F. Visitors or personnel not employed by the Contractor or his approved Subcontractors shall not be permitted on-site without prior approval by the Owner.

G. Owner and/or Engineer reserve the right to require that any of the Contractor's personnel be excluded from work at the site at any time.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

APPENDIX B

INSPECTION FORM

Stormwater Construction Site Inspection Report

General Information			
Project Name	MWG Will County South Ash Pond 2 Liner Replacement		
NPDES Tracking No.		**Location**	
Date of Inspection		**Start/End Time**	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Describe present phase of construction			
Type of Inspection: ❑ Regular ❑ Pre-storm event ❑ During storm event ❑ Post-storm event			
Weather Information			
Has there been a storm event since the last inspection? ❑Yes ❑No **If yes, provide:** Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):			
Weather at time of this inspection? ❑ Clear ❑Cloudy ❑ Rain ❑ Sleet ❑ Fog ❑ Snowing ❑ High Winds ❑ Other: Temperature:			
Have any discharges occurred since the last inspection? ❑Yes ❑No **If yes, describe:**			
Are there any discharges at the time of inspection? ❑Yes ❑No **If yes, describe:**			

Site-specific BMPs

- *Number the structural and non-structural BMPs identified in your SWPPP on your site map and list them below (add as many BMPs as necessary). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.*
- *Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.*

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
1		❑Yes ❑No	❑Yes ❑No	
2		❑Yes ❑No	❑Yes ❑No	
3		❑Yes ❑No	❑Yes ❑No	
4		❑Yes ❑No	❑Yes ❑No	
5		❑Yes ❑No	❑Yes ❑No	
6		❑Yes ❑No	❑Yes ❑No	
7		❑Yes ❑No	❑Yes ❑No	
8		❑Yes ❑No	❑Yes ❑No	
9		❑Yes ❑No	❑Yes ❑No	
10		❑Yes ❑No	❑Yes ❑No	
11		❑Yes ❑No	❑Yes ❑No	

Overall Site Issues

Below are some general site issues that should be assessed during inspections.

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	❑Yes ❑No	❑Yes ❑No	
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	❑Yes ❑No	❑Yes ❑No	
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	❑Yes ❑No	❑Yes ❑No	
4	Is the construction exit preventing sediment from being tracked into the street?	❑Yes ❑No	❑Yes ❑No	
5	Is trash/litter from construction work area collected and placed in covered dumpsters?	❑Yes ❑No	❑Yes ❑No	
6	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	❑Yes ❑No	❑Yes ❑No	
7	Are materials that are potential stormwater contaminants stored inside or under cover?	❑Yes ❑No	❑Yes ❑No	
8	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	❑Yes ❑No	❑Yes ❑No	

Non-Compliance

Describe any incidents of non-compliance not described above:

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name and title: ____

Signature:____ Date:_____________________

APPENDIX B

POZ-O-PAC MATERIAL
LABORATORY TEST RESULTS

ANALYTICAL REPORT

Job Number: 500-19261-1

Job Description: Will County 3S Ash Pond Poz-o-Pac

For:
Midwest Generation EME LLC
529 E 135th Street
Romeoville, IL 60446-1538

Attention: Beckie Maddox

Approved for release.
Bonnie M Stadelmann
Project Manager II
6/18/2009 1:47 PM

Bonnie M Stadelmann
Project Manager II
bonnie.stadelmann@testamericainc.com
06/18/2009

cc: Ms. Maria Race

These test results meet all the requirements of NELAC for accredited parameters.

The Lab Certification ID#:
TestAmerica Chicago 100201
TestAmerica North Canton 9503
TestAmerica St. Louis MO00054

All questions regarding this test report should be directed to the TestAmerica Project Manager whose signature appears on this report. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

TestAmerica Laboratories, Inc.
TestAmerica Chicago 2417 Bond Street, University Park, IL 60484
Tel (708) 534-5200 Fax (708) 534-5211 www.testamericainc.com

Job Narrative
500-J19261-1

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
No analytical or quality issues were noted.

GC/MS Semi VOA
Method(s) 8270C: Internal standard (ISTD) response for the following sample(s) was outside of acceptance limits: 3S ASH POND BORING (500-19261-1). The sample(s) was not re-analyzed as there were no hits associated with these internal standards.

Method(s) 8270C: One surrogate has a recovery below the method/QAPP stated surrogate limit, but greater than 10%. No corrective action was required per the method. 3S ASH POND BORING (500-19261-1)

Method(s) 8270C: Internal standard (ISTD) response for the following sample(s) was outside of acceptance limits: TCLP blank LB 500-65336 (8270). The sample(s) was not re-analyzed as there were no hits assoiciated with these Internal Standards.

No other analytical or quality issues were noted.

GC Semi VOA
Method(s) 8081A: The grand mean exception, as outlined in EPA Method 8000B, was applied to continuing calibration verification (CCV) standards. This rule states that when one or more compounds in the CCV fail to meet acceptance criteria, the initial calibration (ICAL) may be used for quantitation if the average %D (the grand mean) of all the compounds in the CCV is less than or equal to 30 %D.

Method(s) 8151A: The grand mean exception, as outlined in EPA Method 8000B, was applied to continuing calibration verification (CCV) standards. This rule states that when one or more compounds in the CCV fail to meet acceptance criteria, the initial calibration (ICAL) may be used for quantitation if the average %D (the grand mean) of all the compounds in the CCV is less than or equal to 15 %D.3S ASH POND BORING (500-19261-1)

No other analytical or quality issues were noted.

Metals
No analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

Organic Prep
No analytical or quality issues were noted.

SAMPLE SUMMARY

Client: Midwest Generation EME LLC

Job Number: 500-19261-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
500-19261-1	3S ASH POND BORING	Solid	06/03/2009 1530	06/04/2009 1105

Beckie Maddox
Midwest Generation EME LLC
529 E 135th Street
Romeoville, IL 60446-1538

Job Number: 500-19261-1

Client Sample ID: 3S ASH POND BORING
Lab Sample ID: 500-19261-1

Date Sampled: 06/03/2009 1530
Date Received: 06/04/2009 1105
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: TCLP-8260B		Date Analyzed:	06/08/2009 2148	
Prep Method: 5030B		Date Prepared:	06/08/2009 2148	
Benzene	<0.0040	mg/L	0.0040	20
Carbon tetrachloride	<0.0040	mg/L	0.0040	20
Chlorobenzene	<0.0040	mg/L	0.0040	20
Chloroform	<0.0040	mg/L	0.0040	20
1,2-Dichloroethane	<0.0040	mg/L	0.0040	20
1,1-Dichloroethene	<0.0040	mg/L	0.0040	20
Methyl ethyl ketone (MEK)	<0.020	mg/L	0.020	20
Tetrachloroethene	<0.0040	mg/L	0.0040	20
Trichloroethene	<0.0040	mg/L	0.0040	20
Vinyl chloride	<0.0040	mg/L	0.0040	20
Surrogate			Acceptance Limits	
4-Bromofluorobenzene (Surr)	99	%	75 - 120	
1,2-Dichloroethane-d4 (Surr)	105	%	70 - 125	
Toluene-d8 (Surr)	103	%	75 - 120	
Dibromofluoromethane	109	%	75 - 120	
Method: TCLP-8270C		Date Analyzed:	06/09/2009 1829	
Prep Method: 3510C		Date Prepared:	06/08/2009 0731	
1,4-Dichlorobenzene	<0.10	mg/L	0.10	1.0
2,4-Dinitrotoluene	<0.10	mg/L	0.10	1.0
Hexachlorobenzene	<0.10	mg/L	0.10	1.0
Hexachloro-1,3-butadiene	<0.10	mg/L	0.10	1.0
Hexachloroethane	<0.10	mg/L	0.10	1.0
2-Methyl-phenol	<0.10	mg/L	0.10	1.0
3 & 4 Methylphenol	<0.10	mg/L	0.10	1.0
Nitrobenzene	<0.10	mg/L	0.10	1.0
Pentachlorophenol	<0.50	mg/L	0.50	1.0
Pyridine	<0.20	mg/L	0.20	1.0
2,4,5-Trichlorophenol	<0.50	mg/L	0.50	1.0
2,4,6-Trichlorophenol	<0.10	mg/L	0.10	1.0
Total Cresols, TCEQ Definition	<0.10	mg/L	0.10	1.0
Surrogate			Acceptance Limits	
2-Fluorobiphenyl	48	%	37 - 120	
2-Fluorophenol	27	%	20 - 110	
Nitrobenzene-d5	46	%	36 - 120	
Phenol-d5	18 X	%	20 - 110	
Terphenyl-d14	80	%	24 - 134	
2,4,6-Tribromophenol	60	%	37 - 134	

Beckie Maddox
Midwest Generation EME LLC
529 E 135th Street
Romeoville, IL 60446-1538

Job Number: 500-19261-1

Client Sample ID: 3S ASH POND BORING
Lab Sample ID: 500-19261-1

Date Sampled: 06/03/2009 1530
Date Received: 06/04/2009 1105
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: TCLP-8081A		Date Analyzed:	06/09/2009 0025	
Prep Method: 3510C		Date Prepared:	06/08/2009 0729	
Chlordane (technical)	<0.010	mg/L	0.010	1.0
Endrin	<0.0050	mg/L	0.0050	1.0
Heptachlor	<0.0050	mg/L	0.0050	1.0
Heptachlor epoxide	<0.0050	mg/L	0.0050	1.0
gamma-BHC (Lindane)	<0.0050	mg/L	0.0050	1.0
Methoxychlor	<0.010	mg/L	0.010	1.0
Toxaphene	<0.050	mg/L	0.050	1.0
Surrogate			Acceptance Limits	
DCB Decachlorobiphenyl	108	%	20 - 120	
Tetrachloro-m-xylene	95	%	31 - 121	
Method: 8082		Date Analyzed:	06/11/2009 1533	
Prep Method: 3541		Date Prepared:	06/09/2009 0729	
PCB-1016	<17	ug/Kg	17	1.0
PCB-1221	<17	ug/Kg	17	1.0
PCB-1232	<17	ug/Kg	17	1.0
PCB-1242	<17	ug/Kg	17	1.0
PCB-1248	<17	ug/Kg	17	1.0
PCB-1254	<17	ug/Kg	17	1.0
PCB-1260	<17	ug/Kg	17	1.0
Surrogate			Acceptance Limits	
Tetrachloro-m-xylene	72	%	30 - 120	
DCB Decachlorobiphenyl	75	%	40 - 141	
Method: TCLP-8151A		Date Analyzed:	06/11/2009 2044	
Prep Method: 8151A		Date Prepared:	06/11/2009 0848	
2,4-D	<0.10	mg/L	0.10	1.0
Silvex (2,4,5-TP)	<0.010	mg/L	0.010	1.0
Surrogate			Acceptance Limits	
DCAA	43	%	42 - 120	
Method: TCLP-6010B		Date Analyzed:	06/08/2009 1424	
Prep Method: 3010A		Date Prepared:	06/08/2009 0800	
Arsenic	<0.050	mg/L	0.050	1.0
Barium	0.64	mg/L	0.50	1.0
Cadmium	<0.0050	mg/L	0.0050	1.0
Chromium	<0.025	mg/L	0.025	1.0
Lead	<0.0075	mg/L	0.0075	1.0
Selenium	<0.050	mg/L	0.050	1.0

Beckie Maddox
Midwest Generation EME LLC
529 E 135th Street
Romeoville, IL 60446-1538

Job Number: 500-19261-1

Client Sample ID: 3S ASH POND BORING
Lab Sample ID: 500-19261-1

Date Sampled: 06/03/2009 1530
Date Received: 06/04/2009 1105
Client Matrix: Solid

Analyte	Result/Qualifier	Unit		RL	Dilution
Silver	<0.025	mg/L		0.025	1.0
Method: TCLP-7470A		Date Analyzed:	06/08/2009 1333		
Prep Method: 7470A		Date Prepared:	06/08/2009 0930		
Mercury	<0.0020	mg/L		0.0020	1.0
Method: 9014		Date Analyzed:	06/08/2009 1358		
Prep Method: 9010B		Date Prepared:	06/08/2009 1050		
Cyanide, Reactive	<0.44	mg/Kg		0.44	1.0
Method: 9023		Date Analyzed:	06/12/2009 1000		
Halogens, Extractable Organic	<20	mg/Kg		20	1.0
Method: 9034		Date Analyzed:	06/08/2009 1448		
Prep Method: 7.3.4		Date Prepared:	06/08/2009 1153		
Sulfide, Reactive	<49	mg/Kg		49	1.0
Method: 9045C		Date Analyzed:	06/05/2009 1729		
pH	9.55	SU		0.200	1.0
Method: 9066		Date Analyzed:	06/13/2009 1002		
Prep Method: Distill/Phenol		Date Prepared:	06/12/2009 0900		
Phenolics, Total Recoverable	<0.38	mg/Kg		0.38	1.0
Method: 9095A		Date Analyzed:	06/16/2009 1620		
Paint Filter	pass	mL/100g			1.0
Method: D92		Date Analyzed:	06/17/2009 0845		
Flashpoint	>200	Fahrenheit		40	1.0
Method: Moisture		Date Analyzed:	06/07/2009 2126		
Percent Moisture	1.5	%		0.10	1.0

QUALITY CONTROL RESULTS

Client: Midwest Generation EME LLC Job Number: 500-19261-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC/MS VOA					
Prep Batch: 500-65339					
LB 500-65339/1-A	TCLP SPLPE Leachate Blank	P	Solid	1311	
500-19261-1	3S ASH POND BORING	P	Solid	1311	
Analysis Batch:500-65430					
LB 500-65339/1-A	TCLP SPLPE Leachate Blank	P	Solid	8260B	
LCS 500-65430/5	Lab Control Sample	T	Water	8260B	
MB 500-65430/4	Method Blank	T	Water	8260B	
500-19261-1	3S ASH POND BORING	P	Solid	8260B	

Report Basis
P = TCLP
T = Total

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC/MS Semi VOA					
Prep Batch: 500-65336					
LB 500-65336/1-C	TCLP SPLPE Leachate Blank	P	Solid	1311	
500-19261-1	3S ASH POND BORING	P	Solid	1311	
500-19261-1MS	Matrix Spike	P	Solid	1311	
Prep Batch: 500-65368					
LCS 500-65368/2-A	Lab Control Sample	T	Water	3510C	
MB 500-65368/1-A	Method Blank	T	Water	3510C	
LB 500-65336/1-C	TCLP SPLPE Leachate Blank	P	Solid	3510C	500-65336
500-19261-1	3S ASH POND BORING	P	Solid	3510C	500-65336
500-19261-1MS	Matrix Spike	P	Solid	3510C	500-65336
Analysis Batch:500-65428					
LB 500-65336/1-C	TCLP SPLPE Leachate Blank	P	Solid	8270C	500-65368
LCS 500-65368/2-A	Lab Control Sample	T	Water	8270C	500-65368
MB 500-65368/1-A	Method Blank	T	Water	8270C	500-65368
500-19261-1MS	Matrix Spike	P	Solid	8270C	500-65368
Analysis Batch:500-65573					
500-19261-1	3S ASH POND BORING	P	Solid	8270C	500-65368

Report Basis
P = TCLP
T = Total

Client: Midwest Generation EME LLC | Job Number: 500-19261-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC Semi VOA					
Prep Batch: 500-65336					
LB 500-65336/1-B	TCLP SPLPE Leachate Blank	P	Solid	1311	
LB 500-65336/1-F	TCLP SPLPE Leachate Blank	P	Solid	1311	
500-19261-1	3S ASH POND BORING	P	Solid	1311	
500-19261-1MS	Matrix Spike	P	Solid	1311	
Prep Batch: 500-65367					
LCS 500-65367/2-A	Lab Control Sample	T	Water	3510C	
LCS 500-65367/3-A	Lab Control Sample	T	Water	3510C	
MB 500-65367/1-A	Method Blank	T	Water	3510C	
LB 500-65336/1-B	TCLP SPLPE Leachate Blank	P	Solid	3510C	500-65336
500-19261-1	3S ASH POND BORING	P	Solid	3510C	500-65336
500-19261-1MS	Matrix Spike	P	Solid	3510C	500-65336
Prep Batch: 500-65448					
LCS 500-65448/2-A	Lab Control Sample	T	Solid	3541	
MB 500-65448/1-A	Method Blank	T	Solid	3541	
500-19261-1	3S ASH POND BORING	T	Solid	3541	
Analysis Batch:500-65575					
LB 500-65336/1-B	TCLP SPLPE Leachate Blank	P	Solid	8081A	500-65367
LCS 500-65367/2-A	Lab Control Sample	T	Water	8081A	500-65367
LCS 500-65367/3-A	Lab Control Sample	T	Water	8081A	500-65367
MB 500-65367/1-A	Method Blank	T	Water	8081A	500-65367
500-19261-1	3S ASH POND BORING	P	Solid	8081A	500-65367
500-19261-1MS	Matrix Spike	P	Solid	8081A	500-65367
Prep Batch: 500-65641					
LCS 500-65641/2-A	Lab Control Sample	T	Water	8151A	
MB 500-65641/1-A	Method Blank	T	Water	8151A	
LB 500-65336/1-F	TCLP SPLPE Leachate Blank	P	Solid	8151A	500-65336
500-19261-1	3S ASH POND BORING	P	Solid	8151A	500-65336
500-19261-1MS	Matrix Spike	P	Solid	8151A	500-65336
Analysis Batch:500-65740					
LCS 500-65448/2-A	Lab Control Sample	T	Solid	8082	500-65448
MB 500-65448/1-A	Method Blank	T	Solid	8082	500-65448
500-19261-1	3S ASH POND BORING	T	Solid	8082	500-65448
Analysis Batch:500-65746					
LB 500-65336/1-F	TCLP SPLPE Leachate Blank	P	Solid	8151A	500-65641
LCS 500-65641/2-A	Lab Control Sample	T	Water	8151A	500-65641
MB 500-65641/1-A	Method Blank	T	Water	8151A	500-65641
500-19261-1	3S ASH POND BORING	P	Solid	8151A	500-65641
500-19261-1MS	Matrix Spike	P	Solid	8151A	500-65641

Client: Midwest Generation EME LLC   Job Number: 500-19261-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch

Report Basis
P = TCLP
T = Total

Metals

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Prep Batch: 500-65336					
LB 500-65336/1-D	TCLP SPLPE Leachate Blank	P	Solid	1311	
LB 500-65336/1-E	TCLP SPLPE Leachate Blank	P	Solid	1311	
500-19261-1	3S ASH POND BORING	P	Solid	1311	
Prep Batch: 500-65395					
LCS 500-65395/2-A	Lab Control Sample	T	Water	3010A	
LB 500-65336/1-D	TCLP SPLPE Leachate Blank	P	Solid	3010A	500-65336
500-19261-1	3S ASH POND BORING	P	Solid	3010A	500-65336
Prep Batch: 500-65419					
LCS 500-65419/2-A	Lab Control Sample	T	Water	7470A	
MB 500-65419/1-A	Method Blank	T	Water	7470A	
LB 500-65336/1-E	TCLP SPLPE Leachate Blank	P	Solid	7470A	500-65336
500-19261-1	3S ASH POND BORING	P	Solid	7470A	500-65336
Analysis Batch:500-65426					
LB 500-65336/1-E	TCLP SPLPE Leachate Blank	P	Solid	7470A	500-65419
LCS 500-65419/2-A	Lab Control Sample	T	Water	7470A	500-65419
MB 500-65419/1-A	Method Blank	T	Water	7470A	500-65419
500-19261-1	3S ASH POND BORING	P	Solid	7470A	500-65419
Analysis Batch:500-65446					
LB 500-65336/1-D	TCLP SPLPE Leachate Blank	P	Solid	6010B	500-65395
LCS 500-65395/2-A	Lab Control Sample	T	Water	6010B	500-65395
500-19261-1	3S ASH POND BORING	P	Solid	6010B	500-65395

Report Basis
P = TCLP
T = Total

Quality Control Results

Client: Midwest Generation EME LLC　　　　Job Number: 500-19261-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Prep Batch: 500-65342					
LCS 500-65342/2-A	Lab Control Sample	T	Solid	7.3.4	
MB 500-65342/1-A	Method Blank	T	Solid	7.3.4	
500-19261-1	3S ASH POND BORING	T	Solid	7.3.4	
500-19261-1MS	Matrix Spike	T	Solid	7.3.4	
500-19261-1MSD	Matrix Spike Duplicate	T	Solid	7.3.4	
Analysis Batch:500-65362					
500-19261-1	3S ASH POND BORING	T	Solid	Moisture	
Analysis Batch:500-65373					
500-19261-1	3S ASH POND BORING	T	Solid	9045C	
Prep Batch: 500-65386					
LCS 500-65386/2-A	Lab Control Sample	T	Solid	9010B	
MB 500-65386/1-A	Method Blank	T	Solid	9010B	
500-19261-1	3S ASH POND BORING	T	Solid	9010B	
Analysis Batch:500-65431					
LCS 500-65342/2-A	Lab Control Sample	T	Solid	9034	500-65342
MB 500-65342/1-A	Method Blank	T	Solid	9034	500-65342
500-19261-1	3S ASH POND BORING	T	Solid	9034	500-65342
500-19261-1MS	Matrix Spike	T	Solid	9034	500-65342
500-19261-1MSD	Matrix Spike Duplicate	T	Solid	9034	500-65342
Analysis Batch:500-65435					
LCS 500-65386/2-A	Lab Control Sample	T	Solid	9014	500-65386
MB 500-65386/1-A	Method Blank	T	Solid	9014	500-65386
500-19261-1	3S ASH POND BORING	T	Solid	9014	500-65386
Prep Batch: 500-65786					
LCS 500-65786/18-A	Lab Control Sample	T	Solid	Distill/Phenol	
MB 500-65786/17-A	Method Blank	T	Solid	Distill/Phenol	
500-19261-1	3S ASH POND BORING	T	Solid	Distill/Phenol	
500-19261-1MS	Matrix Spike	T	Solid	Distill/Phenol	
500-19261-1MSD	Matrix Spike Duplicate	T	Solid	Distill/Phenol	
Analysis Batch:500-65787					
LCS 500-65786/18-A	Lab Control Sample	T	Solid	9066	500-65786
MB 500-65786/17-A	Method Blank	T	Solid	9066	500-65786
500-19261-1	3S ASH POND BORING	T	Solid	9066	500-65786
500-19261-1MS	Matrix Spike	T	Solid	9066	500-65786
500-19261-1MSD	Matrix Spike Duplicate	T	Solid	9066	500-65786
Analysis Batch:500-65948					
500-19261-1	3S ASH POND BORING	T	Solid	9095A	

Client: Midwest Generation EME LLC | Job Number: 500-19261-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:500-66037					
500-19261-1	3S ASH POND BORING	T	Solid	D92	
Analysis Batch:680-140283					
LCS 680-140283/2	Lab Control Sample	T	Solid	9023	
MB 680-140283/1	Method Blank	T	Solid	9023	
500-19261-1	3S ASH POND BORING	T	Solid	9023	
500-19261-1MS	Matrix Spike	T	Solid	9023	
500-19261-1MSD	Matrix Spike Duplicate	T	Solid	9023	

Report Basis
T = Total

Client: Midwest Generation EME LLC   Job Number: 500-19261-1

Method Blank - Batch: 500-65430

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 500-65430/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 06/08/2009 1233
Date Prepared: 06/08/2009 1233

Analysis Batch: 500-65430
Prep Batch: N/A
Units: mg/L

Instrument ID: Agilent 6890N GC - 5973N
Lab File ID: 6M0608A.D
Initial Weight/Volume: 10 mL
Final Weight/Volume: 10 mL

Analyte	Result	Qual	RL
Benzene	<0.0010		0.0010
Carbon tetrachloride	<0.0010		0.0010
Chlorobenzene	<0.0010		0.0010
Chloroform	<0.0010		0.0010
1,2-Dichloroethane	<0.0010		0.0010
1,1-Dichloroethene	<0.0010		0.0010
Methyl ethyl ketone (MEK)	<0.0050		0.0050
Tetrachloroethene	<0.0010		0.0010
Trichloroethene	<0.0010		0.0010
Vinyl chloride	<0.0010		0.0010

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	98	75 - 120
1,2-Dichloroethane-d4 (Surr)	104	70 - 125
Toluene-d8 (Surr)	101	75 - 120
Dibromofluoromethane	102	75 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Midwest Generation EME LLC | Job Number: 500-19261-1

TCLP SPLPE Leachate Blank - Batch: 500-65430

Method: 8260B
Preparation: 5030B
TCLP

Lab Sample ID:	LB 500-65339/1-A	Analysis Batch:	500-65430	Instrument ID:	Agilent 6890N GC - 5973N
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	6X0608.D
Dilution:	20	Units:	mg/L	Initial Weight/Volume:	10 mL
Date Analyzed:	06/08/2009 1319			Final Weight/Volume:	10 mL
Date Prepared:	06/08/2009 1319				
Date Leached:	06/05/2009 1404	Leachate Batch:	500-65339		

Analyte	Result	Qual	RL
Benzene	<0.020		0.020
Carbon tetrachloride	<0.020		0.020
Chlorobenzene	<0.020		0.020
Chloroform	<0.020		0.020
1,2-Dichloroethane	<0.020		0.020
1,1-Dichloroethene	<0.020		0.020
Methyl ethyl ketone (MEK)	<0.10		0.10
Tetrachloroethene	<0.020		0.020
Trichloroethene	<0.020		0.020
Vinyl chloride	<0.020		0.020

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	99	75 - 120
1,2-Dichloroethane-d4 (Surr)	96	70 - 125
Toluene-d8 (Surr)	99	75 - 120
Dibromofluoromethane	94	75 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Midwest Generation EME LLC

Job Number: 500-19261-1

Lab Control Sample - Batch: 500-65430

Method: 8260B
Preparation: 5030B

Lab Sample ID: LCS 500-65430/5
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 06/08/2009 1209
Date Prepared: 06/08/2009 1209

Analysis Batch: 500-65430
Prep Batch: N/A
Units: mg/L

Instrument ID: Agilent 6890N GC - 5973N
Lab File ID: 6S0608.D
Initial Weight/Volume: 10 mL
Final Weight/Volume: 10 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Benzene	0.0250	0.0240	96	68 - 120	
Carbon tetrachloride	0.0250	0.0252	101	67 - 121	
Chlorobenzene	0.0250	0.0236	94	75 - 120	
Chloroform	0.0250	0.0241	96	65 - 127	
1,2-Dichloroethane	0.0250	0.0243	97	68 - 120	
1,1-Dichloroethene	0.0250	0.0246	99	50 - 121	
Methyl ethyl ketone (MEK)	0.0250	0.0243	97	36 - 157	
Tetrachloroethene	0.0250	0.0231	93	65 - 120	
Trichloroethene	0.0250	0.0248	99	73 - 120	
Vinyl chloride	0.0250	0.0291	116	57 - 135	

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	98	75 - 120
1,2-Dichloroethane-d4 (Surr)	97	70 - 125
Toluene-d8 (Surr)	101	75 - 120
Dibromofluoromethane	100	75 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Midwest Generation EME LLC

Job Number: 500-19261-1

Method Blank - Batch: 500-65368

Method: 8270C
Preparation: 3510C

Lab Sample ID: MB 500-65368/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 06/08/2009 1427
Date Prepared: 06/08/2009 0731

Analysis Batch: 500-65428
Prep Batch: 500-65368
Units: mg/L

Instrument ID: Agilent 6890N GC - 5973N
Lab File ID: 65368M.D
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 1.0 mL
Injection Volume: 1.0 uL

Analyte	Result	Qual	RL
1,4-Dichlorobenzene	<0.010		0.010
2,4-Dinitrotoluene	<0.010		0.010
Hexachlorobenzene	<0.010		0.010
Hexachloro-1,3-butadiene	<0.010		0.010
Hexachloroethane	<0.010		0.010
2-Methyl-phenol	<0.010		0.010
3 & 4 Methylphenol	<0.010		0.010
Nitrobenzene	<0.010		0.010
Pentachlorophenol	<0.050		0.050
Pyridine	<0.020		0.020
2,4,5-Trichlorophenol	<0.050		0.050
2,4,6-Trichlorophenol	<0.010		0.010
Total Cresols, TCEQ Definition	<0.010		0.010

Surrogate	% Rec	Acceptance Limits
2-Fluorobiphenyl	55	37 - 120
2-Fluorophenol	31	20 - 110
Nitrobenzene-d5	49	36 - 120
Phenol-d5	22	20 - 110
Terphenyl-d14	86	24 - 134
2,4,6-Tribromophenol	64	37 - 134

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Midwest Generation EME LLC

Job Number: 500-19261-1

TCLP SPLPE Leachate Blank - Batch: 500-65368

Method: 8270C
Preparation: 3510C
TCLP

Lab Sample ID: LB 500-65336/1-C	Analysis Batch: 500-65428	Instrument ID: Agilent 6890N GC - 5973N
Client Matrix: Solid	Prep Batch: 500-65368	Lab File ID: 65336LB.D
Dilution: 1.0	Units: mg/L	Initial Weight/Volume: 100 mL
Date Analyzed: 06/08/2009 1541		Final Weight/Volume: 1.0 mL
Date Prepared: 06/08/2009 0731		Injection Volume: 1.0 uL
Date Leached: 06/05/2009 1357	Leachate Batch: 500-65336	

Analyte	Result	Qual	RL
1,4-Dichlorobenzene	<0.10		0.10
2,4-Dinitrotoluene	<0.10		0.10
Hexachlorobenzene	<0.10		0.10
Hexachloro-1,3-butadiene	<0.10		0.10
Hexachloroethane	<0.10		0.10
2-Methyl-phenol	<0.10		0.10
3 & 4 Methylphenol	<0.10		0.10
Nitrobenzene	<0.10		0.10
Pentachlorophenol	<0.50		0.50
Pyridine	<0.20		0.20
2,4,5-Trichlorophenol	<0.50		0.50
2,4,6-Trichlorophenol	<0.10		0.10
Total Cresols, TCEQ Definition	<0.10		0.10

Surrogate	% Rec	Acceptance Limits
2-Fluorobiphenyl	64	37 - 120
2-Fluorophenol	35	20 - 110
Nitrobenzene-d5	59	36 - 120
Phenol-d5	24	20 - 110
Terphenyl-d14	91	24 - 134
2,4,6-Tribromophenol	77	37 - 134

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Midwest Generation EME LLC Job Number: 500-19261-1

Lab Control Sample - Batch: 500-65368

Method: 8270C
Preparation: 3510C

Lab Sample ID: LCS 500-65368/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 06/08/2009 1452
Date Prepared: 06/08/2009 0731

Analysis Batch: 500-65428
Prep Batch: 500-65368
Units: mg/L

Instrument ID: Agilent 6890N GC - 5973N
Lab File ID: 65368BS.D
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 1.0 mL
Injection Volume: 1.0 uL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
1,4-Dichlorobenzene	0.0500	0.0322	64	39 - 110	
2,4-Dinitrotoluene	0.0500	0.0447	89	64 - 119	
Hexachlorobenzene	0.0500	0.0468	94	57 - 116	
Hexachloro-1,3-butadiene	0.0500	0.0383	77	34 - 110	
Hexachloroethane	0.0500	0.0313	63	34 - 110	
2-Methyl-phenol	0.0500	0.0322	64	39 - 110	
3 & 4 Methylphenol	0.0500	0.0317	63	35 - 110	
Nitrobenzene	0.0500	0.0357	71	54 - 111	
Pentachlorophenol	0.0500	<0.050	94	32 - 124	
Pyridine	0.0500	<0.020	33	10 - 110	
2,4,5-Trichlorophenol	0.0500	<0.050	80	63 - 118	
2,4,6-Trichlorophenol	0.0500	0.0401	80	58 - 116	

Surrogate	% Rec	Acceptance Limits
2-Fluorobiphenyl	78	37 - 120
2-Fluorophenol	45	20 - 110
Nitrobenzene-d5	72	36 - 120
Phenol-d5	31	20 - 110
Terphenyl-d14	92	24 - 134
2,4,6-Tribromophenol	97	37 - 134

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Midwest Generation EME LLC | Job Number: 500-19261-1

Matrix Spike - Batch: 500-65368

Method: 8270C
Preparation: 3510C
TCLP

Lab Sample ID: 500-19261-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/08/2009 1656
Date Prepared: 06/08/2009 0731
Date Leached: 06/05/2009 1357

Analysis Batch: 500-65428
Prep Batch: 500-65368
Units: mg/L
Leachate Batch: 500-65336

Instrument ID: Agilent 6890N GC - 5973N
Lab File ID: 19261-1S.D
Initial Weight/Volume: 100 mL
Final Weight/Volume: 1.0 mL
Injection Volume: 1.0 uL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
1,4-Dichlorobenzene	<0.10	0.500	0.284	57	39 - 110	
2,4-Dinitrotoluene	<0.10	0.500	0.505	101	64 - 119	
Hexachlorobenzene	<0.10	0.500	0.485	97	57 - 116	
Hexachloro-1,3-butadiene	<0.10	0.500	0.341	68	34 - 110	
Hexachloroethane	<0.10	0.500	0.277	55	34 - 110	
2-Methyl-phenol	<0.10	0.500	0.296	59	39 - 110	
3 & 4 Methylphenol	<0.10	0.500	0.276	55	35 - 110	
Nitrobenzene	<0.10	0.500	0.328	66	54 - 111	
Pentachlorophenol	<0.50	0.500	<0.50	99	32 - 124	
Pyridine	<0.20	0.500	<0.20	31	10 - 110	
2,4,5-Trichlorophenol	<0.50	0.500	<0.50	82	63 - 118	
2,4,6-Trichlorophenol	<0.10	0.500	0.402	80	58 - 116	

Surrogate	% Rec	Acceptance Limits
2-Fluorobiphenyl	76	37 - 120
2-Fluorophenol	40	20 - 110
Nitrobenzene-d5	68	36 - 120
Phenol-d5	28	20 - 110
Terphenyl-d14	92	24 - 134
2,4,6-Tribromophenol	109	37 - 134

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Midwest Generation EME LLC | Job Number: 500-19261-1

Method Blank - Batch: 500-65367

Method: 8081A
Preparation: 3510C

Lab Sample ID:	MB 500-65367/1-A	Analysis Batch:	500-65575	Instrument ID:	HP 6890 GC
Client Matrix:	Water	Prep Batch:	500-65367	Lab File ID:	06080915_027.d
Dilution:	1.0	Units:	mg/L	Initial Weight/Volume:	1000 mL
Date Analyzed:	06/08/2009 2244			Final Weight/Volume:	10.0 mL
Date Prepared:	06/08/2009 0729			Injection Volume:	1.0 uL
				Column ID:	PRIMARY

Analyte	Result	Qual	RL
Chlordane (technical)	<0.00010		0.00010
Endrin	<0.000050		0.000050
Heptachlor	<0.000050		0.000050
Heptachlor epoxide	<0.000050		0.000050
gamma-BHC (Lindane)	<0.000050		0.000050
Methoxychlor	<0.00010		0.00010
Toxaphene	<0.00050		0.00050

Surrogate	% Rec	Acceptance Limits
DCB Decachlorobiphenyl	107	20 - 120
Tetrachloro-m-xylene	89	31 - 121

TCLP SPLPE Leachate Blank - Batch: 500-65367

Method: 8081A
Preparation: 3510C
TCLP

Lab Sample ID:	LB 500-65336/1-B	Analysis Batch:	500-65575	Instrument ID:	HP 6890 GC
Client Matrix:	Solid	Prep Batch:	500-65367	Lab File ID:	06080915_030.d
Dilution:	1.0	Units:	mg/L	Initial Weight/Volume:	10 mL
Date Analyzed:	06/09/2009 0000			Final Weight/Volume:	10.0 mL
Date Prepared:	06/08/2009 0729			Injection Volume:	1.0 uL
Date Leached:	06/05/2009 1357	Leachate Batch:	500-65336	Column ID:	PRIMARY

Analyte	Result	Qual	RL
Chlordane (technical)	<0.010		0.010
Endrin	<0.0050		0.0050
Heptachlor	<0.0050		0.0050
Heptachlor epoxide	<0.0050		0.0050
gamma-BHC (Lindane)	<0.0050		0.0050
Methoxychlor	<0.010		0.010
Toxaphene	<0.050		0.050

Surrogate	% Rec	Acceptance Limits
DCB Decachlorobiphenyl	113	20 - 120
Tetrachloro-m-xylene	87	31 - 121

Calculations are performed before rounding to avoid round-off errors in calculated results.

Lab Control Sample - Batch: 500-65367

Method: 8081A
Preparation: 3510C

Lab Sample ID: LCS 500-65367/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 06/08/2009 2310
Date Prepared: 06/08/2009 0729

Analysis Batch: 500-65575
Prep Batch: 500-65367
Units: mg/L

Instrument ID: HP 6890 GC
Lab File ID: 06080915_028.d
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 10.0 mL
Injection Volume: 1.0 uL
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Endrin	0.000100	0.0000924	92	63 - 119	
Heptachlor	0.000100	0.0000883	88	69 - 110	
Heptachlor epoxide	0.000100	0.0000987	99	73 - 110	
gamma-BHC (Lindane)	0.000100	0.0000912	91	75 - 110	
Methoxychlor	0.00100	0.000932	93	67 - 113	

Surrogate	% Rec	Acceptance Limits
DCB Decachlorobiphenyl	93	20 - 120
Tetrachloro-m-xylene	89	31 - 121

Lab Control Sample - Batch: 500-65367

Method: 8081A
Preparation: 3510C

Lab Sample ID: LCS 500-65367/3-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 06/08/2009 2335
Date Prepared: 06/08/2009 0729

Analysis Batch: 500-65575
Prep Batch: 500-65367
Units: mg/L

Instrument ID: HP 6890 GC
Lab File ID: 06080915_029.d
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 10.0 mL
Injection Volume: 1.0 uL
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Toxaphene	0.0102	0.00930	91	69 - 116	

Surrogate	% Rec	Acceptance Limits
DCB Decachlorobiphenyl	105	20 - 120
Tetrachloro-m-xylene	87	31 - 121

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Midwest Generation EME LLC | Job Number: 500-19261-1

Matrix Spike - Batch: 500-65367

Method: 8081A
Preparation: 3510C
TCLP

Lab Sample ID: 500-19261-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/09/2009 0050
Date Prepared: 06/08/2009 0729
Date Leached: 06/05/2009 1357

Analysis Batch: 500-65575
Prep Batch: 500-65367
Units: mg/L
Leachate Batch: 500-65336

Instrument ID: HP 6890 GC
Lab File ID: 06080915_032.d
Initial Weight/Volume: 10 mL
Final Weight/Volume: 10.0 mL
Injection Volume: 1.0 uL
Column ID: PRIMARY

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Endrin	<0.0050	0.0100	0.00891	89	63 - 119	
Heptachlor	<0.0050	0.0100	0.00878	88	69 - 110	
Heptachlor epoxide	<0.0050	0.0100	0.00950	95	73 - 110	
gamma-BHC (Lindane)	<0.0050	0.0100	0.00893	89	75 - 110	
Methoxychlor	<0.010	0.100	0.0927	92	67 - 113	

Surrogate	% Rec	Acceptance Limits
DCB Decachlorobiphenyl	109	20 - 120
Tetrachloro-m-xylene	91	31 - 121

Matrix Spike - Batch: 500-65367

Method: 8081A
Preparation: 3510C
TCLP

Lab Sample ID: 500-19261-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/09/2009 0115
Date Prepared: 06/08/2009 0729
Date Leached: 06/05/2009 1357

Analysis Batch: 500-65575
Prep Batch: 500-65367
Units: mg/L
Leachate Batch: 500-65336

Instrument ID: HP 6890 GC
Lab File ID: 06080915_033.d
Initial Weight/Volume: 10 mL
Final Weight/Volume: 10.0 mL
Injection Volume: 1.0 uL
Column ID: PRIMARY

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Toxaphene	<0.050	1.02	0.962	94	69 - 116	

Surrogate	% Rec	Acceptance Limits
DCB Decachlorobiphenyl	108	20 - 120
Tetrachloro-m-xylene	94	31 - 121

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Midwest Generation EME LLC

Job Number: 500-19261-1

Method Blank - Batch: 500-65448

Method: 8082
Preparation: 3541

Lab Sample ID: MB 500-65448/1-A	Analysis Batch: 500-65740	Instrument ID: Agilent 6890A Series Plus (
Client Matrix: Solid	Prep Batch: 500-65448	Lab File ID: 06040947_215.d
Dilution: 1.0	Units: ug/Kg	Initial Weight/Volume: 15.0000 g
Date Analyzed: 06/11/2009 1506		Final Weight/Volume: 5.0 mL
Date Prepared: 06/09/2009 0729		Injection Volume: 1.0 uL
		Column ID: PRIMARY

Analyte	Result	Qual	RL
PCB-1016	<17		17
PCB-1221	<17		17
PCB-1232	<17		17
PCB-1242	<17		17
PCB-1248	<17		17
PCB-1254	<17		17
PCB-1260	<17		17

Surrogate	% Rec	Acceptance Limits
Tetrachloro-m-xylene	43	30 - 120
DCB Decachlorobiphenyl	80	40 - 141

Lab Control Sample - Batch: 500-65448

Method: 8082
Preparation: 3541

Lab Sample ID: LCS 500-65448/2-A	Analysis Batch: 500-65740	Instrument ID: Agilent 6890A Series Plus (
Client Matrix: Solid	Prep Batch: 500-65448	Lab File ID: 06040947_216.d
Dilution: 1.0	Units: ug/Kg	Initial Weight/Volume: 15.0000 g
Date Analyzed: 06/11/2009 1519		Final Weight/Volume: 5.0 mL
Date Prepared: 06/09/2009 0729		Injection Volume: 1.0 uL
		Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
PCB-1016	167	113	68	46 - 119	
PCB-1260	167	119	71	58 - 123	

Surrogate	% Rec	Acceptance Limits
Tetrachloro-m-xylene	70	30 - 120
DCB Decachlorobiphenyl	80	40 - 141

Calculations are performed before rounding to avoid round-off errors in calculated results.

Method Blank - Batch: 500-65641

Method: 8151A
Preparation: 8151A

Lab Sample ID:	MB 500-65641/1-A	Analysis Batch:	500-65746	Instrument ID:	HP 5890 GC
Client Matrix:	Water	Prep Batch:	500-65641	Lab File ID:	06030930_096.d
Dilution:	1.0	Units:	mg/L	Initial Weight/Volume:	1000 mL
Date Analyzed:	06/11/2009 1926			Final Weight/Volume:	10.0 mL
Date Prepared:	06/11/2009 0848			Injection Volume:	1 uL
				Column ID:	PRIMARY

Analyte	Result	Qual	RL
2,4-D	<0.0010		0.0010
Silvex (2,4,5-TP)	<0.00010		0.00010

Surrogate	% Rec	Acceptance Limits
DCAA	100	42 - 120

TCLP SPLPE Leachate Blank - Batch: 500-65641

Method: 8151A
Preparation: 8151A
TCLP

Lab Sample ID:	LB 500-65336/1-F	Analysis Batch:	500-65746	Instrument ID:	HP 5890 GC
Client Matrix:	Solid	Prep Batch:	500-65641	Lab File ID:	06030930_098.d
Dilution:	1.0	Units:	mg/L	Initial Weight/Volume:	10 mL
Date Analyzed:	06/11/2009 2018			Final Weight/Volume:	10.0 mL
Date Prepared:	06/11/2009 0848			Injection Volume:	1 uL
Date Leached:	06/05/2009 1357	Leachate Batch:	500-65336	Column ID:	PRIMARY

Analyte	Result	Qual	RL
2,4-D	<0.10		0.10
Silvex (2,4,5-TP)	<0.010		0.010

Surrogate	% Rec	Acceptance Limits
DCAA	58	42 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Midwest Generation EME LLC

Job Number: 500-19261-1

Lab Control Sample - Batch: 500-65641

Method: 8151A
Preparation: 8151A

Lab Sample ID:	LCS 500-65641/2-A	Analysis Batch:	500-65746	Instrument ID:	HP 5890 GC
Client Matrix:	Water	Prep Batch:	500-65641	Lab File ID:	06030930_097.d
Dilution:	1.0	Units:	mg/L	Initial Weight/Volume:	1000 mL
Date Analyzed:	06/11/2009 1952			Final Weight/Volume:	10.0 mL
Date Prepared:	06/11/2009 0848			Injection Volume:	1 uL
				Column ID:	PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
2,4-D	0.00400	0.00161	40	11 - 110	
Silvex (2,4,5-TP)	0.00400	0.00229	57	39 - 110	

Surrogate	% Rec	Acceptance Limits
DCAA	64	42 - 120

Matrix Spike - Batch: 500-65641

Method: 8151A
Preparation: 8151A
TCLP

Lab Sample ID:	500-19261-1	Analysis Batch:	500-65746	Instrument ID:	HP 5890 GC
Client Matrix:	Solid	Prep Batch:	500-65641	Lab File ID:	06030930_100.d
Dilution:	1.0	Units:	mg/L	Initial Weight/Volume:	10 mL
Date Analyzed:	06/11/2009 2110			Final Weight/Volume:	10.0 mL
Date Prepared:	06/11/2009 0848			Injection Volume:	1 uL
Date Leached:	06/05/2009 1357	Leachate Batch:	500-65336	Column ID:	PRIMARY

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
2,4-D	<0.10	0.400	0.133	33	11 - 110	
Silvex (2,4,5-TP)	<0.010	0.400	0.207	52	39 - 110	

Surrogate	% Rec	Acceptance Limits
DCAA	64	42 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Midwest Generation EME LLC　　Job Number: 500-19261-1

TCLP SPLPE Leachate Blank - Batch: 500-65395

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: LB 500-65336/1-D
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/08/2009 1411
Date Prepared: 06/08/2009 0800
Date Leached: 06/05/2009 1357

Analysis Batch: 500-65446
Prep Batch: 500-65395
Units: mg/L
Leachate Batch: 500-65336

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50608A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL
Arsenic	<0.050		0.050
Barium	<0.50		0.50
Cadmium	<0.0050		0.0050
Chromium	<0.025		0.025
Lead	<0.0075		0.0075
Selenium	<0.050		0.050
Silver	<0.025		0.025

Lab Control Sample - Batch: 500-65395

Method: 6010B
Preparation: 3010A

Lab Sample ID: LCS 500-65395/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 06/08/2009 1417
Date Prepared: 06/08/2009 0800

Analysis Batch: 500-65446
Prep Batch: 500-65395
Units: mg/L

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50608A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Arsenic	0.100	0.0981	98	80 - 120	
Barium	2.00	1.91	96	80 - 120	
Cadmium	0.0500	0.0499	100	80 - 120	
Chromium	0.200	0.203	102	80 - 120	
Lead	0.100	0.101	101	80 - 120	
Selenium	0.100	0.0944	94	80 - 120	
Silver	0.0500	0.0492	98	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Midwest Generation EME LLC Job Number: 500-19261-1

Method Blank - Batch: 500-65419

Method: 7470A
Preparation: 7470A

Lab Sample ID: MB 500-65419/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 06/08/2009 1319
Date Prepared: 06/08/2009 0930

Analysis Batch: 500-65426
Prep Batch: 500-65419
Units: mg/L

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 25 mL
Final Weight/Volume: 25 mL

Analyte	Result	Qual	RL
Mercury	<0.00020		0.00020

TCLP SPLPE Leachate Blank - Batch: 500-65419

Method: 7470A
Preparation: 7470A
TCLP

Lab Sample ID: LB 500-65336/1-E
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/08/2009 1324
Date Prepared: 06/08/2009 0930
Date Leached: 06/05/2009 1357

Analysis Batch: 500-65426
Prep Batch: 500-65419
Units: mg/L
Leachate Batch: 500-65336

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 2.5 mL
Final Weight/Volume: 25 mL

Analyte	Result	Qual	RL
Mercury	<0.0020		0.0020

Lab Control Sample - Batch: 500-65419

Method: 7470A
Preparation: 7470A

Lab Sample ID: LCS 500-65419/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 06/08/2009 1321
Date Prepared: 06/08/2009 0930

Analysis Batch: 500-65426
Prep Batch: 500-65419
Units: mg/L

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 25 mL
Final Weight/Volume: 25 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.00200	0.00198	99	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Midwest Generation EME LLC　　Job Number: 500-19261-1

Method Blank - Batch: 500-65386

Method: 9014
Preparation: 9010B

Lab Sample ID: MB 500-65386/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/08/2009 1356
Date Prepared: 06/08/2009 1050

Analysis Batch: 500-65435
Prep Batch: 500-65386
Units: mg/Kg

Instrument ID: ThermoSpectronic Genesys
Lab File ID: N/A
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL
Cyanide, Reactive	<0.50		0.50

Lab Control Sample - Batch: 500-65386

Method: 9014
Preparation: 9010B

Lab Sample ID: LCS 500-65386/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/08/2009 1357
Date Prepared: 06/08/2009 1050

Analysis Batch: 500-65435
Prep Batch: 500-65386
Units: mg/Kg

Instrument ID: ThermoSpectronic Genesys
Lab File ID: N/A
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cyanide, Reactive	5.00	5.05	101	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Midwest Generation EME LLC | Job Number: 500-19261-1

Method Blank - Batch: 680-140283 | **Method: 9023** | **Preparation: N/A**

Lab Sample ID:	MB 680-140283/1	Analysis Batch:	680-140283	Instrument ID:	Euroglass ETS-1200 - EUF
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Units:	mg/Kg	Initial Weight/Volume:	2 g
Date Analyzed:	06/12/2009 1000			Final Weight/Volume:	10 mL
Date Prepared:	N/A				

Analyte	Result	Qual	RL
Halogens, Extractable Organic	<20		20

Lab Control Sample - Batch: 680-140283 | **Method: 9023** | **Preparation: N/A**

Lab Sample ID:	LCS 680-140283/2	Analysis Batch:	680-140283	Instrument ID:	Euroglass ETS-1200 - EUF
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Units:	mg/Kg	Initial Weight/Volume:	2 g
Date Analyzed:	06/12/2009 1000			Final Weight/Volume:	10 mL
Date Prepared:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Halogens, Extractable Organic	50.0	67.0	134	60 - 140	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 680-140283 | **Method: 9023** | **Preparation: N/A**

MS Lab Sample ID:	500-19261-1	Analysis Batch:	680-140283	Instrument ID:	Euroglass ETS-1200 -
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	2 g
Date Analyzed:	06/12/2009 1000			Final Weight/Volume:	10 mL
Date Prepared:	N/A				

MSD Lab Sample ID:	500-19261-1	Analysis Batch:	680-140283	Instrument ID:	Euroglass ETS-1200 - EUF
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	2 g
Date Analyzed:	06/12/2009 1000			Final Weight/Volume:	10 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Halogens, Extractable Organic	97	118	60 - 140	20	50		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Midwest Generation EME LLC Job Number: 500-19261-1

Method Blank - Batch: 500-65342 **Method: 9034**
Preparation: 7.3.4

Lab Sample ID: MB 500-65342/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/08/2009 1445
Date Prepared: 06/08/2009 1130

Analysis Batch: 500-65431
Prep Batch: 500-65342
Units: mg/Kg

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10.0000 g
Final Weight/Volume: 10 mL

Analyte	Result	Qual	RL
Sulfide, Reactive	<50		50

Lab Control Sample - Batch: 500-65342 **Method: 9034**
Preparation: 7.3.4

Lab Sample ID: LCS 500-65342/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/08/2009 1445
Date Prepared: 06/08/2009 1134

Analysis Batch: 500-65431
Prep Batch: 500-65342
Units: mg/Kg

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10.0000 g
Final Weight/Volume: 10 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfide, Reactive	206	188	91	25 - 116	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-65342 **Method: 9034**
Preparation: 7.3.4

MS Lab Sample ID: 500-19261-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/08/2009 1448
Date Prepared: 06/08/2009 1158

Analysis Batch: 500-65431
Prep Batch: 500-65342

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10.2226 g
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 500-19261-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/08/2009 1449
Date Prepared: 06/08/2009 1202

Analysis Batch: 500-65431
Prep Batch: 500-65342

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10.2025 g
Final Weight/Volume: 10 mL

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Sulfide, Reactive	75	53	25 - 116	35	50		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Midwest Generation EME LLC   Job Number: 500-19261-1

Method Blank - Batch: 500-65786

Method: 9066
Preparation: Distill/Phenol

Lab Sample ID: MB 500-65786/17-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/13/2009 1100
Date Prepared: 06/12/2009 0900

Analysis Batch: 500-65787
Prep Batch: 500-65786
Units: mg/Kg

Instrument ID: Seal AQ-2
Lab File ID: N/A
Initial Weight/Volume: 1 g
Final Weight/Volume: 100 mL

Analyte	Result	Qual	RL
Phenolics, Total Recoverable	<0.50		0.50

Lab Control Sample - Batch: 500-65786

Method: 9066
Preparation: Distill/Phenol

Lab Sample ID: LCS 500-65786/18-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/13/2009 1101
Date Prepared: 06/12/2009 0900

Analysis Batch: 500-65787
Prep Batch: 500-65786
Units: mg/Kg

Instrument ID: Seal AQ-2
Lab File ID: N/A
Initial Weight/Volume: 1 g
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Phenolics, Total Recoverable	10.0	9.87	99	90 - 110	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-65786

Method: 9066
Preparation: Distill/Phenol

MS Lab Sample ID: 500-19261-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/13/2009 1004
Date Prepared: 06/12/2009 0900

Analysis Batch: 500-65787
Prep Batch: 500-65786

Instrument ID: Seal AQ-2
Lab File ID: N/A
Initial Weight/Volume: 1.09 g
Final Weight/Volume: 100 mL

MSD Lab Sample ID: 500-19261-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/13/2009 1005
Date Prepared: 06/12/2009 0900

Analysis Batch: 500-65787
Prep Batch: 500-65786

Instrument ID: Seal AQ-2
Lab File ID: N/A
Initial Weight/Volume: 1.09 g
Final Weight/Volume: 100 mL

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Phenolics, Total Recoverable	94	104	75 - 125	10	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

DATA REPORTING QUALIFIERS

Client: Midwest Generation EME LLC　　Job Number: 500-19261-1

Lab Section	Qualifier	Description
GC/MS Semi VOA		
	X	Surrogate exceeds the control limits

M

SEVERN TRENT **STL**

Chicago Laboratory
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Beckie Maddox
Company: Midwest Generation--Will County Station
Address: 529 East 135th Street
Romeoville, Il 60446
Phone: 815-372-4589
Fax: 815-886-4296

Bill To:
Contact:
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only ___ of ___

Lab Lot # 500-19261

Package Sealed Yes No	Samples Sealed Yes No
Received on Ice Yes No	Samples Intact Yes No
Temperature °C of Cooler	
Within Hold Time Yes No	Preserv. indicated Yes No NA
pH Check ok Yes No NA	Res. Cl_2 Check ok Yes No NA
Sample Labels and COC Agree Yes No COC not present	

Sampler Name: Beckie Maddox
Signature:
Project Name: 3S Ash Pond Poz-o-Pac
~~Project Number:~~ PO # 4500037430
Project Location:
Lab PM:
Date Required Hard Copy: ___/___/___ Fax:

Refrg # / #/ Cont. / Volume / Preserv

Laboratory ID	MS MSD	Client Sample ID	Sampling Date	Sampling Time	Matx	Grab	Paint Filter	Flash Point – Open Cup	TCLP Metals	TCLP Organics	Total PCBs	EOX	pH	Tot Cyanide	Sulfide (reactive)	Phencl (tot)	Additional Analyses / Remarks
1		3S Ash Pond Boring	6/3/09	3:30pm	SD	X	X	X	X	X	X	X	X	X	X	X	Results Copy Beckie Maddox
																	rmaddox@mwgen.com
																	815-372-4589

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[signature]	MWGen	6/4/09	1030	[signature]			
				[signature]	TA	6/4/09	1105

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn Acetate, Cool to 4°
6. Cool to 4°

COMMENTS:
if this sample is too thick and you can't break down, please call + we will arrange for a smaller sample.

Date Received 6,4,09
Courier: TA Hand Delivered [X]
Bill of Lading:

STL Chicago Chain of Custody: CHI-22-09-231/A-5/99.

Login Sample Receipt Check List

Client: Midwest Generation EME LLC

Job Number: 500-19261-1

Login Number: 19261
Creator: Lunt, Jeff T
List Number: 1

List Source: TestAmerica Chicago

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	N/A	
Samples were received on ice.	False	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

Login Sample Receipt Check List

Client: Midwest Generation EME LLC　　Job Number: 500-19261-1

Login Number: 19261
Creator: Daughtry, Beth
List Number: 1

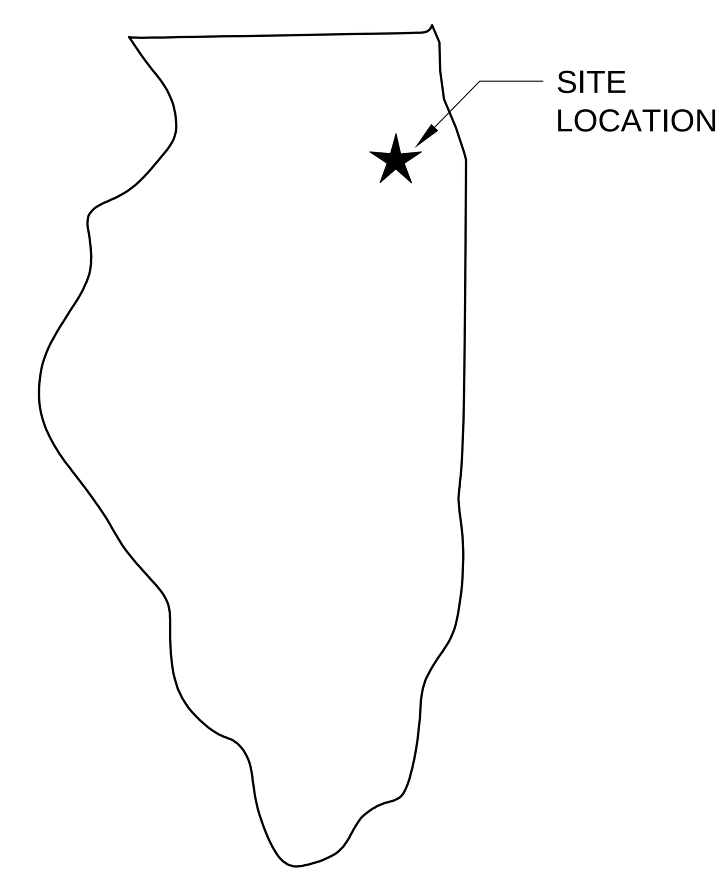
List Source: TestAmerica Savannah
List Creation: 06/09/09 12:34 PM

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	

SHEETS

SOUTH ASH POND 2 LINER REPLACEMENT
WILL COUNTY GENERATING STATION
MIDWEST GENERATION
ROMEOVILLE, WILL COUNTY, ILLINOIS

LIST OF DRAWINGS



ILLINOIS

PREPARED FOR:

MIDWEST GENERATION, LLC
528 E. 135TH STREET
ROMEOVILLE, IL 60446

APRIL 2013

REVISION:	DATE:	APP'D BY:
0. ISSUED FOR PERMIT	12/20/12	HMS
1. ISSUED FOR BID	04/19/13	HMS
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NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2113.1
DRAWN BY: RLH 12/19/12
CHECKED BY: RJB 12/19/12
APPROVED BY: HMS 12/20/12
DRAWING NO: D21131TS-01
REFERENCE: .

TITLE SHEET

SOUTH ASH POND 2 LINER REPLACEMENT
WILL COUNTY GENERATING STATION
MIDWEST GENERATION
ROMEOVILLE, WILL COUNTY, ILLINOIS

SHEET NO. TS

Apr 19, 2013 11:09am PLOTTED BY: rhopkins SAVED BY: rhopkins
Y:\ACADdata\Projects\21\2113\21131_Will Co\BID_CON\D21131TS-01.dwg TS-01
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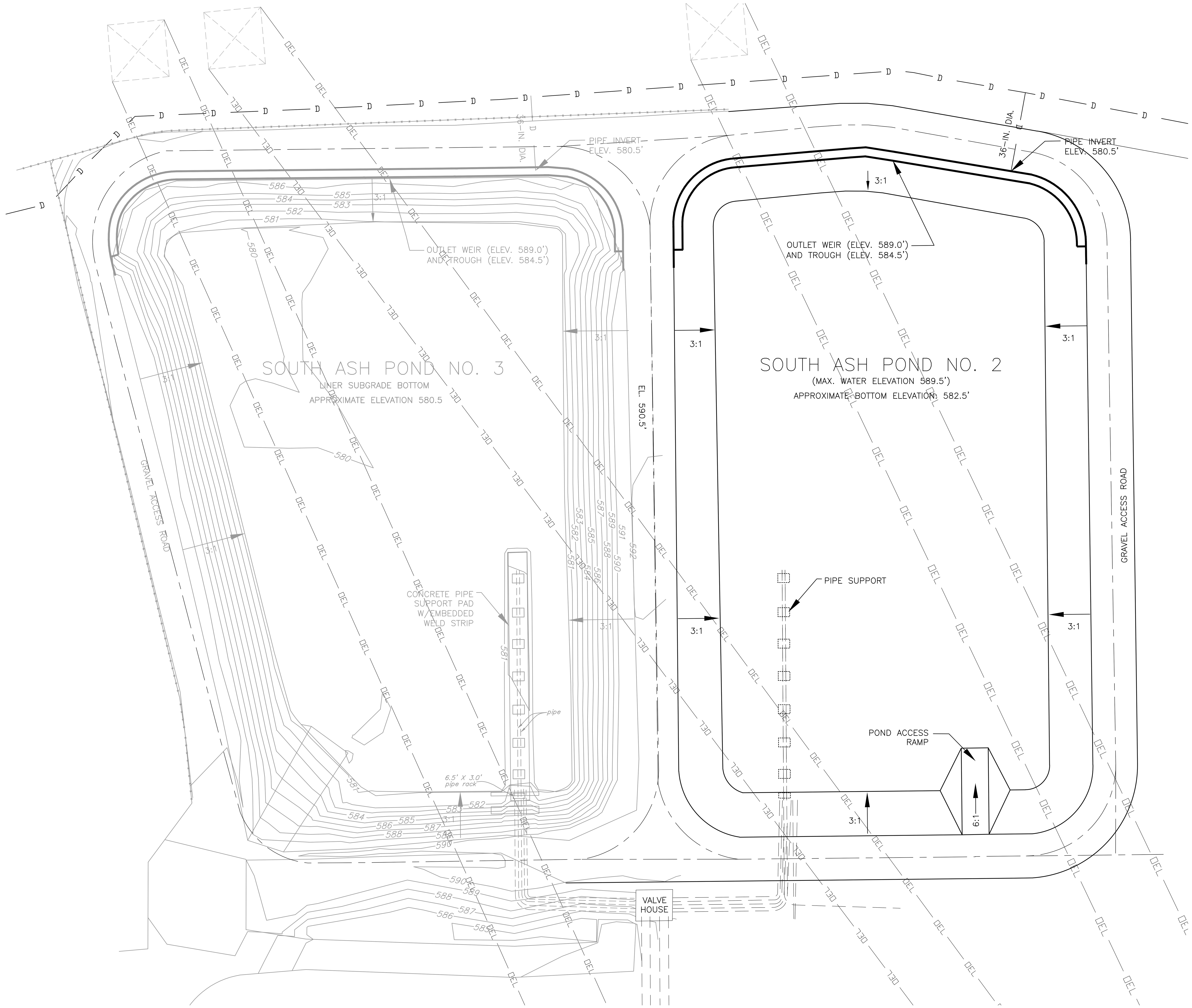
XREFS:



— — — —	ABOVEGROUND INLET PIPE
—— D ——	UNDERGROUND DISCHARGE PIPING
—— OEL ——	OVERHEAD ELECTRIC LINE

CONTRACTOR NOTES:
1. CONTRACTOR SHALL NOT DISTURB OPERATIONS OF ASH POND 3 WHEN WORKING ON ASH POND 2.

N

0 15 30 60

SCALE IN FEET
(APPROXIMATE)

SOURCE NOTES:
1. THIS DRAWING WAS DEVELOPED FROM DRAWING NO. 869D1-C11 REV. 7, BY HARZA ENGINEERING COMPANY, CHICAGO, ILLINOIS, DATED AUG. 1979, PROVIDED BY MIDWEST GENERATION.
2. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. PIPING AND OTHER UTILITY LOCATIONS ARE APPROXIMATE.

REVISION:		DATE:	APP'D BY:
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1.	ISSUED FOR BID	04/19/13	HMS
0.	ISSUED FOR PERMIT	12/20/12	HMS

NATURAL RESOURCE TECHNOLOGY

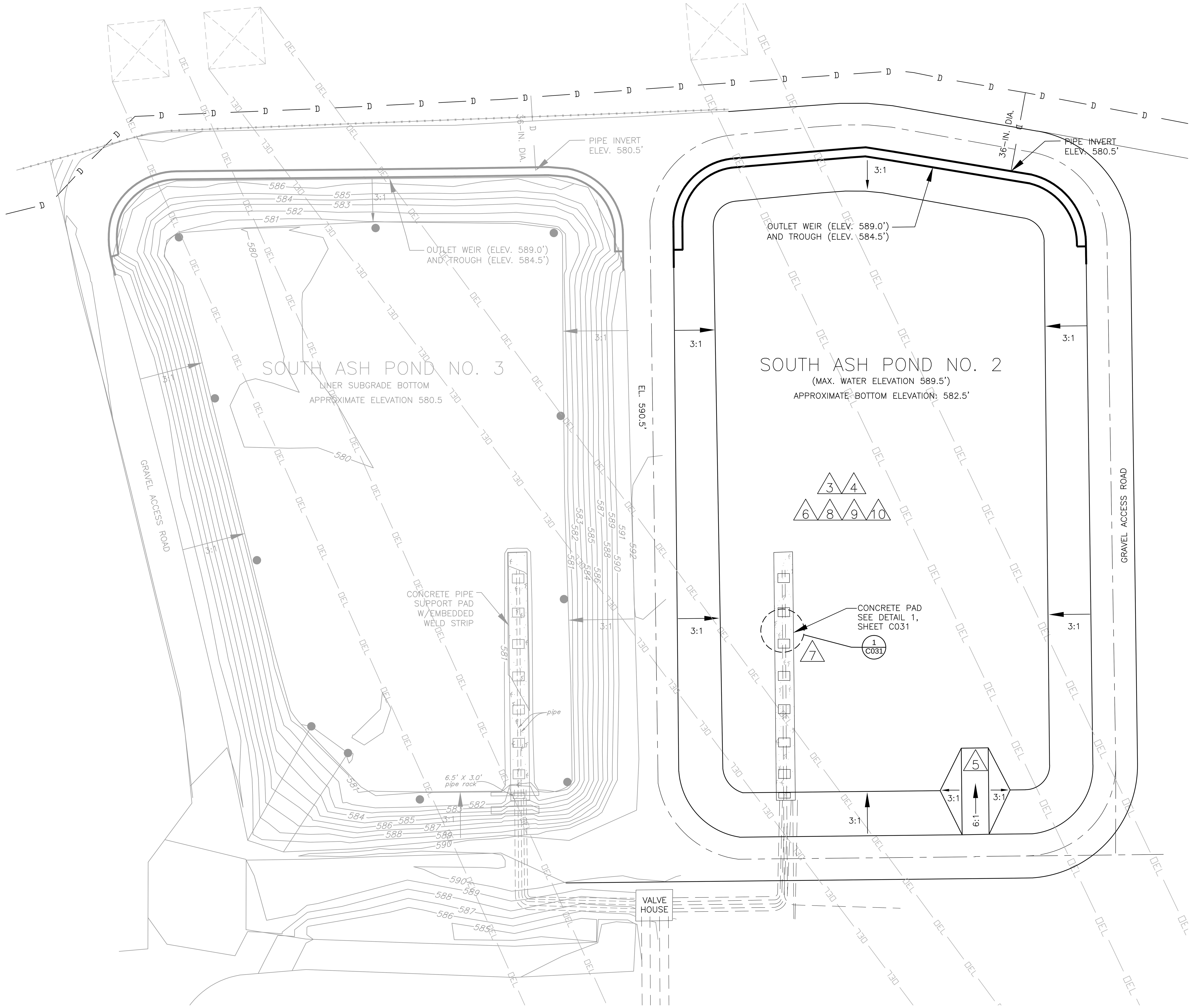
PROJECT NO. 2113.1
DRAWN BY: RLH 12/19/12
CHECKED BY: RJB 12/19/12
APPROVED BY: HMS 12/20/12

PRE-CONSTRUCTION SITE CONDITIONS

SOUTH ASH POND 2 LINER REPLACEMENT
WILL COUNTY GENERATING STATION
MIDWEST GENERATION
ROMEOVILLE, WILL COUNTY, ILLINOIS

DRAWING NO: D21131C010-01
REFERENCE: .

SHEET NO. C010



585	EXISTING CONTOUR
	ABOVEGROUND INLET PIPE
	EXISTING FENCE
D	UNDERGROUND DISCHARGE PIPING
OEL	OVERHEAD ELECTRIC LINE
	MARKER POST LOCATION
	CONCRETE

CONTRACTOR NOTES:

1. CONTRACTOR SHALL STORE ALL GEOSYNTHETICS AND SUBGRADE MATERIALS IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
2. CONTRACTOR SHALL STORE AND STAGE EQUIPMENT AT LOCATION APPROVED BY MIDWEST GENERATION.
3. PROTECT ALL CONCRETE AND UTILITY STRUCTURES THROUGHOUT PROJECT DURATION.
4. CONTRACTOR SHALL REMOVE ALL VEGETATION, ROCKS, AND OTHER DEBRIS GREATER THAN 1 INCHE IN SIZE FROM POND SUBGRADE AND DISPOSE OF IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
5. CONTRACTOR SHALL CLEAN OFF THE RAMP CONCRETE SURFACE TO THE EXTENT PRACTICAL TO REMOVE ROCKS THAT MAY POSE A HAZARD TO GEOMEMBRANE, AS APPROVED BY GEOMEMBRANE INSTALLER, ENGINEER AND/OR MWG.
6. CONTRACTOR SHALL REMOVE ENTIRE LAYER OF EXISTING POZ-O-PAC LINER FROM THE BASE OF THE ASH POND AND 6 INCHES OF EXISTING FILL MATERIAL BELOW THE POZ-O-PAC, EXCLUDING AREA AROUND PIPE SUPPORTS, AS NEEDED TO ACHIEVE FINAL SUBGRADE ELEVATION 581 FT. LOWER LAYER OF POZ-O-PAC SHALL REMAIN IN PLACE.
7. CONTRACTOR SHALL CONSTRUCT CONCRETE PAD IN ACCORDANCE WITH THE CONTRACT DOCUMENTS (SEE DETAIL 1 ON SHEET C031).
8. CONTRACTOR SHALL PLACE 16 OZ/SY NONWOVEN GEOTEXTILE OVER THE PREPARED SUBGRADE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
9. SUBGRADE SHALL BE APPROVED BY MWG AND/OR ENGINEER PRIOR TO INSTALLATION OF GEOMEMBRANE.
10. CONTRACTOR SHALL PROVIDE MEANS TO PROTECT SUBGRADE FROM EROSION, STORM WATER, AND HEAVY EQUIPMENT TRAFFIC. DAMAGE TO SUBGRADE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

N

0 15 30 60

SCALE IN FEET

(APPROXIMATE)

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM DRAWING NO. 869D1-C11 REV. 7, BY HARZA ENGINEERING COMPANY, CHICAGO, ILLINOIS, DATED AUG. 1979, PROVIDED BY MIDWEST GENERATION.
2. ALSO FROM DRAWING NO. 309-1053-T BY RUETTIGER, TONELLI & ASSOCIATES, INC., JOLIET, ILLINOIS, DATED OCTOBER 5, 2009.
3. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. PIPING AND OTHER UTILITY LOCATIONS ARE APPROXIMATE.

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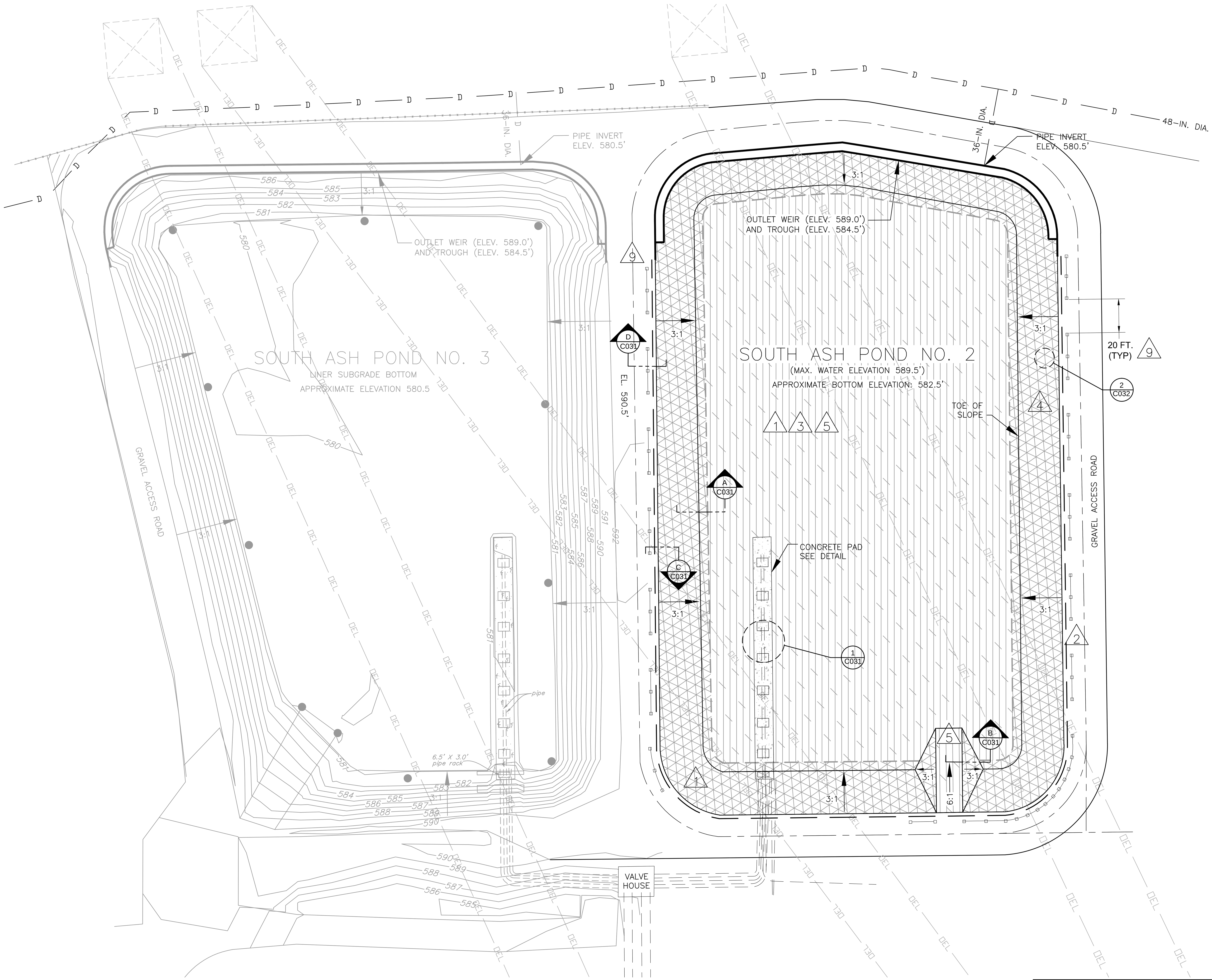
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2113.1	LINER SUBGRADE PREPARATION
DRAWN BY: RLH 12/19/12	SOUTH ASH POND 2 LINER REPLACEMENT WILL COUNTY GENERATING STATION MIDWEST GENERATION ROMEOVILLE, WILL COUNTY, ILLINOIS
CHECKED BY: RJB 12/19/12	
APPROVED BY: HMS 12/20/12	DRAWING NO: D21131C020-01 REFERENCE: .
	SHEET NO. C020



— — —	ABOVEGROUND INLET PIPE
— D —	UNDERGROUND DISCHARGE PIPE
— DEL —	OVERHEAD ELECTRIC LINE
—— ——	ANCHOR TRENCH
—□—□—	GUARD RAIL
●	MARKER POST LOCATION
	CONCRETE
	WARNING LAYER
	GEOCELL

CONTRACTOR NOTES:

1. CONTRACTOR SHALL INSTALL 60 MIL HDPE, WHITE, TEXTURED GEOMEMBRANE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS PRIOR TO PLACEMENT OF THE CUSHION AND WARNING LAYERS. CONTRACTOR SHALL PROVIDE AND FOLLOW AN APPROVED GEOMEMBRANE LAYOUT PLAN.
2. GEOMEMBRANE SHALL BE ANCHORED INTO 2.5 FEET DEEP TRENCHES ALONG TOP OF POND BANK, AS SHOWN ON SHEET C031. CONTRACTOR SHALL ADVISE MWG AND/OR ENGINEER IF PROPOSED LOCATION FOR ANCHOR TRENCH IS NOT POSSIBLE.
3. CONTRACTOR SHALL PLACE 16 OZ/SY NONWOVEN GEOTEXTILE OVER THE GEOMEMBRANE FOLLOWING ENGINEER APPROVAL AND PASSING QUALITY CONTROL RESULTS IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS (SEE SHEET C031).
4. GEOCELL SHALL BE INSTALLED ALONG SIDE SLOPES IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS AND MANUFACTURER'S RECOMMENDATIONS (SEE SHEET C032). NO FOOT OR VEHICULAR TRAFFIC IS ALLOWED ON THE GEOCELL PRIOR TO INFILL.
5. CUSHION MATERIAL AND WARNING LAYER MATERIAL SHALL BE PLACED AT THE BASE OF POND IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS (SEE SHEET C031).
6. RESTORE AREAS DISTURBED BY EQUIPMENT AND MATERIAL LAYDOWN.
7. CONTRACTOR SHALL PROVIDE SURVEY DOCUMENTATION OF THE ITEMS LISTED IN THE TECHNICAL SPECIFICATIONS.
8. CONTRACTOR SHALL PERFORM A LEAK LOCATION SURVEY IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS FOLLOWING PLACEMENT OF GEOCELL, CUSHION, AND WARNING LAYERS.
9. CONTRACTOR SHALL INSTALL GUARDRAILS ALONG TOP OF SLOPE EVERY 20 FEET AS SHOWN (SEE DETAIL ON SHEET C031) AND IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS/INSTRUCTIONS AS APPROVED BY MWG AND/OR ENGINEER.

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0 15 30 60

SCALE IN FEET
(APPROXIMATE)

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM DRAWING NO. 869D1-C11 REV. 7, BY HARZA ENGINEERING COMPANY, CHICAGO, ILLINOIS, DATED AUG. 1979, PROVIDED BY MIDWEST GENERATION.
2. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. PIPING AND OTHER UTILITY LOCATIONS ARE APPROXIMATE.

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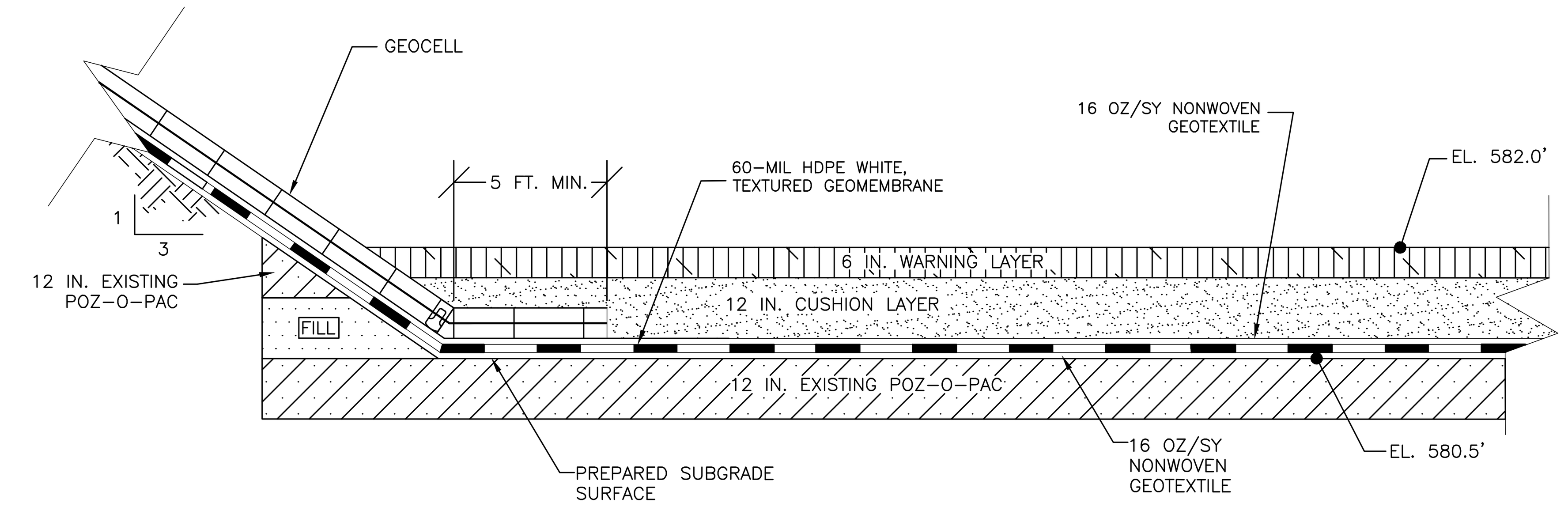
REVISION:		DATE:	APP'D BY:

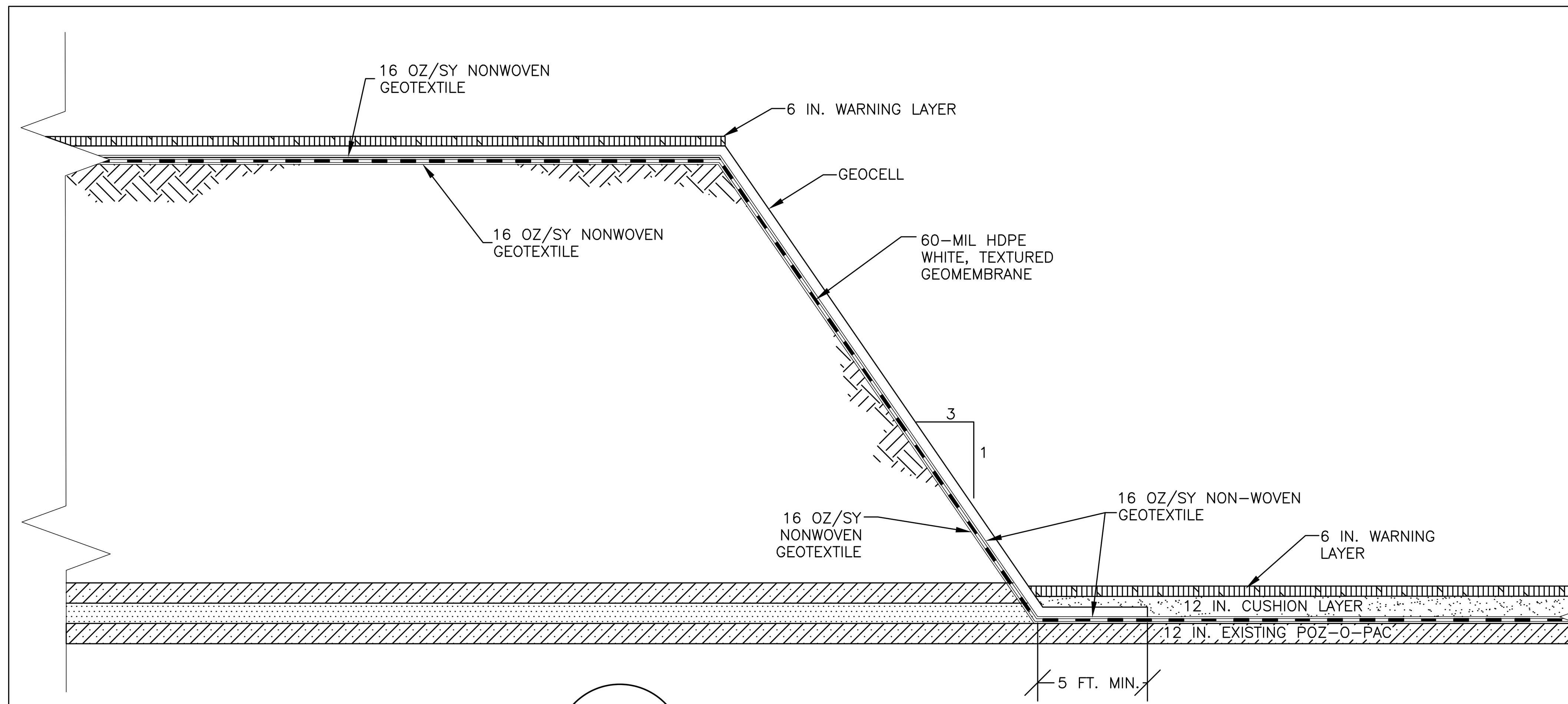
NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2113.1	GEOCELL AND WARNING LAYER PLAN
DRAWN BY: RLH 12/19/12	SOUTH ASH POND 2 LINER REPLACEMENT WILL COUNTY GENERATING STATION MIDWEST GENERATION ROMEOVILLE, WILL COUNTY, ILLINOIS
CHECKED BY: RJB 12/19/12	
APPROVED BY: HMS 12/20/12	DRAWING NO: D21131C030-01 REFERENCE: .
	SHEET NO. C030

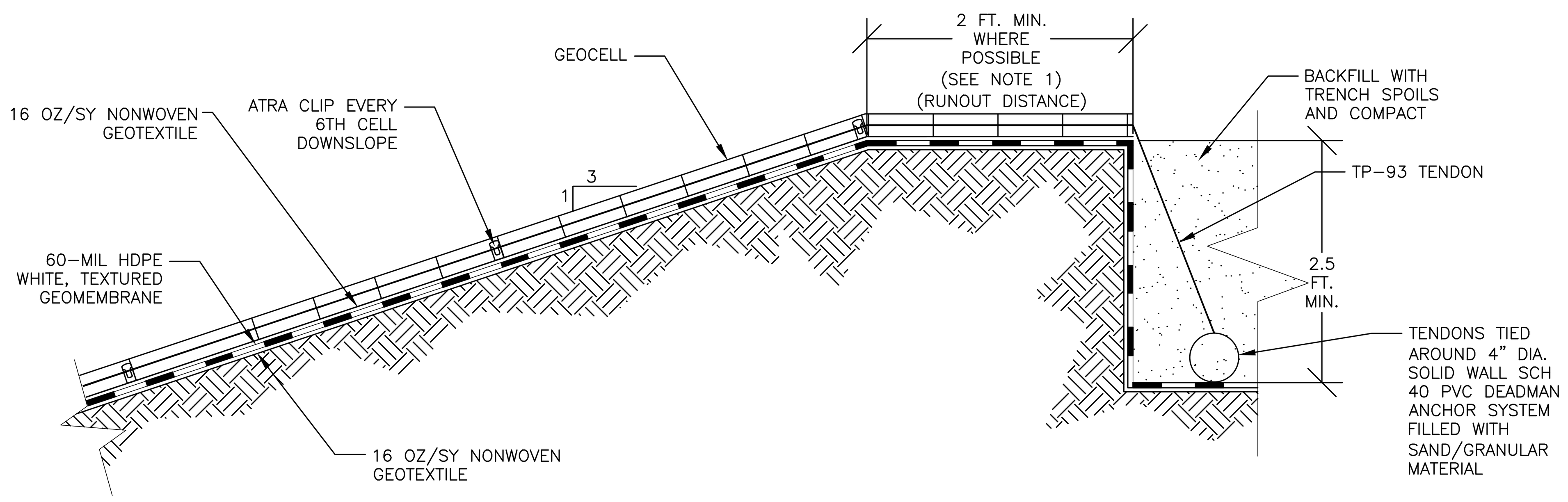


NOTE:
1. GEOMEMBRANE SEAMS SHALL BE PLACED MINIMUM 5 FT. FROM TOE OF SLOPE.

A
C030
SLOPE TRANSITION SECTION
NOT TO SCALE

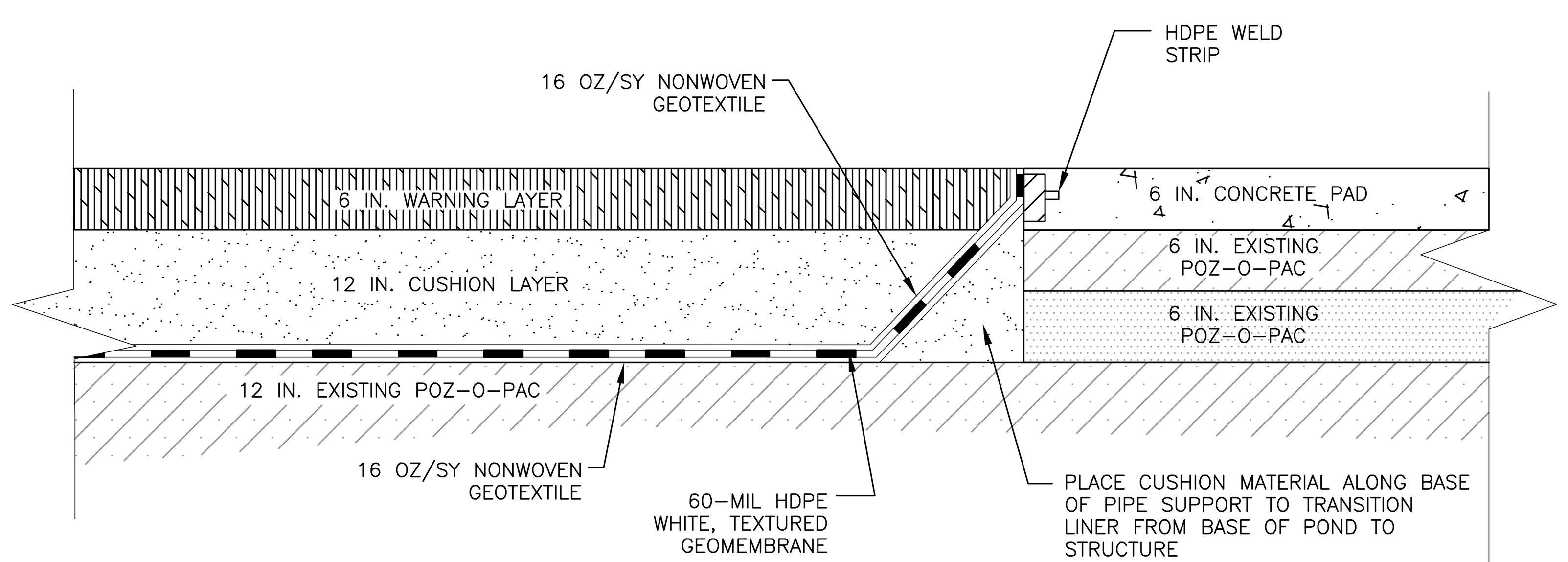


B
C030
RAMP SECTION
NOT TO SCALE

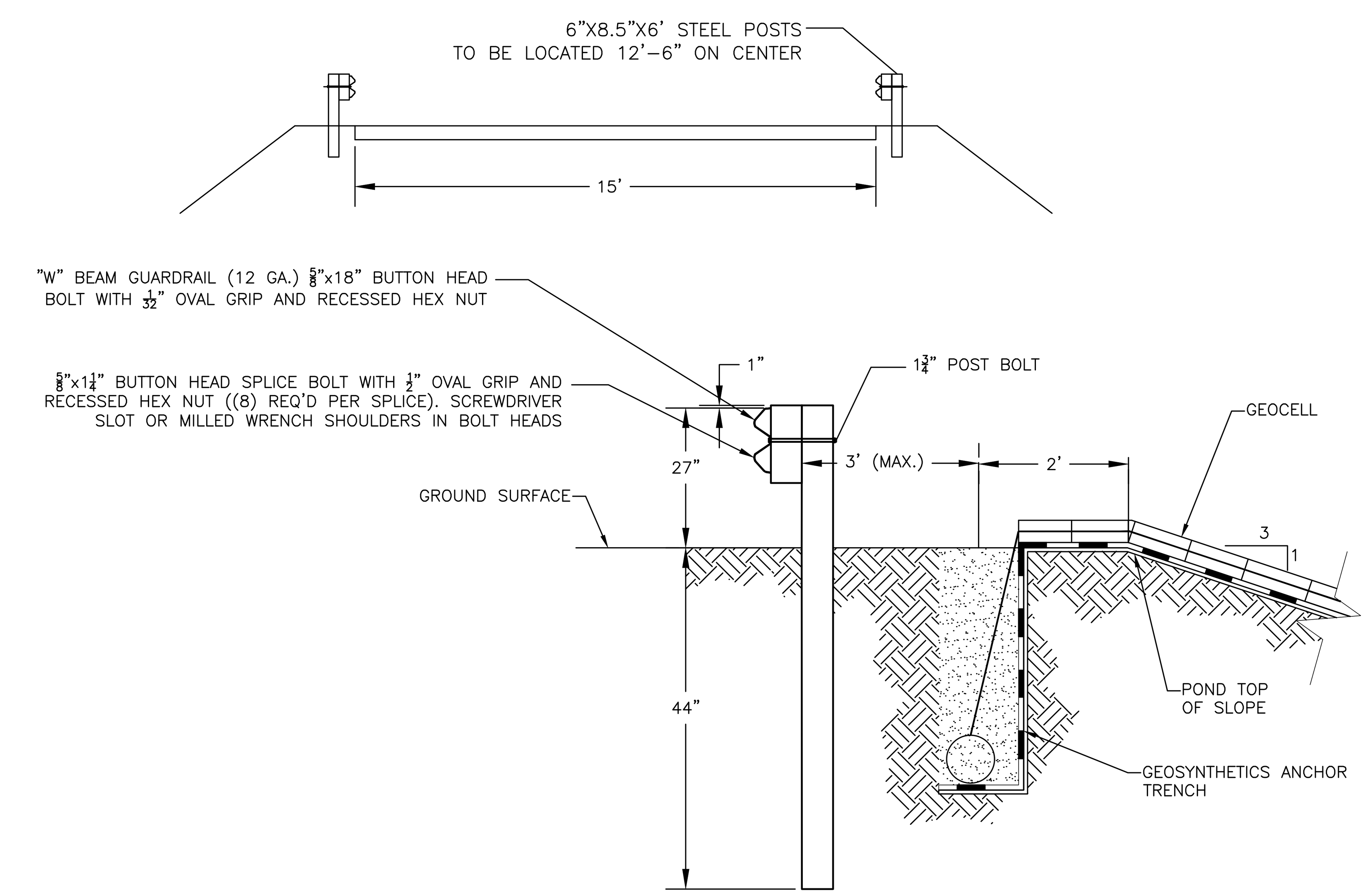


NOTE:
1. GEOCELL HORIZONTAL RUNOUT SHALL BE BACKFILLED WITH CUSHION MATERIAL AFTER LEAK LOCATION SURVEY IS COMPLETED.

C
C030
ANCHOR TRENCH DETAIL
NOT TO SCALE



1
C020
C030
CONCRETE PAD DETAIL
NOT TO SCALE



D
C030
GUARDRAIL DETAIL
NOT TO SCALE

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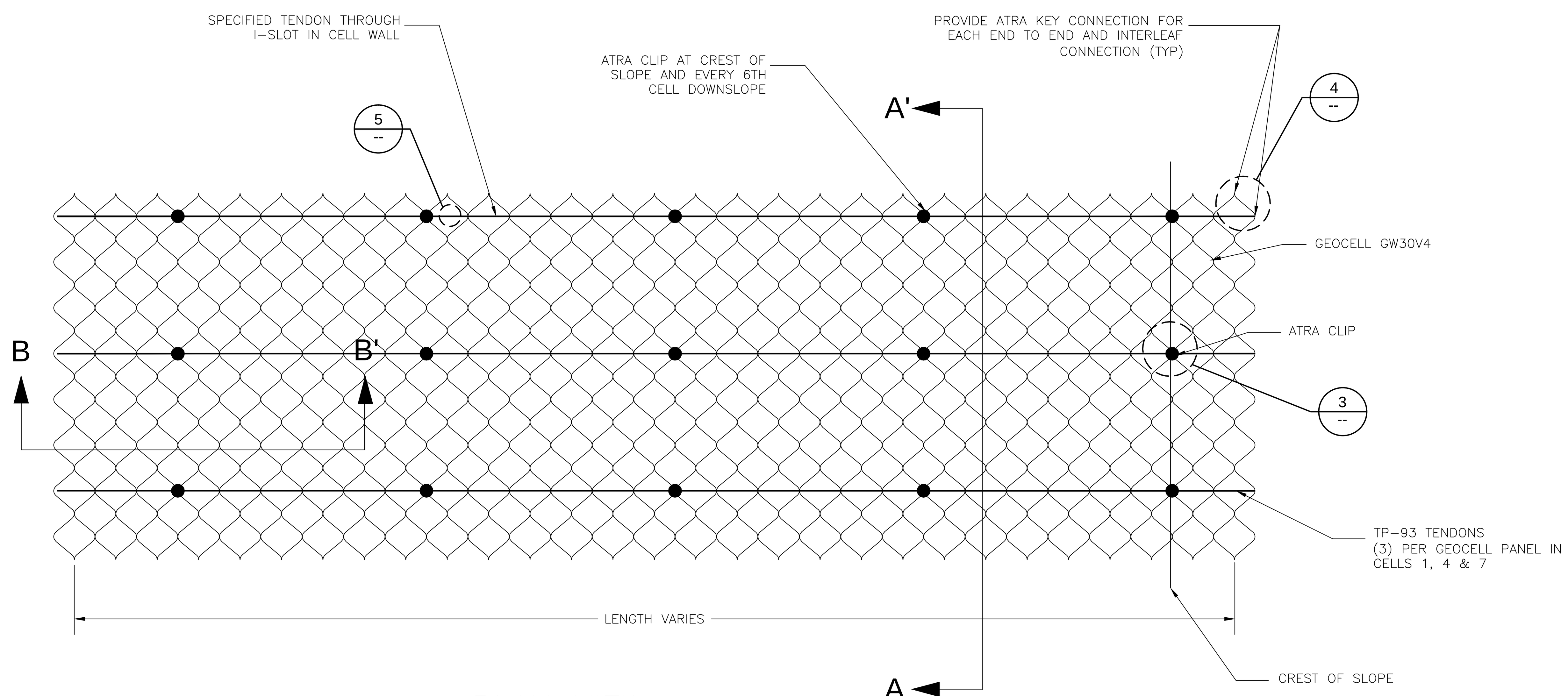
NATURAL RESOURCE TECHNOLOGY

PROJECT NO.	2113.1
DRAWN BY:	RLH 12/19/12
CHECKED BY:	RJB 12/19/12
APPROVED BY:	HMS 12/20/12

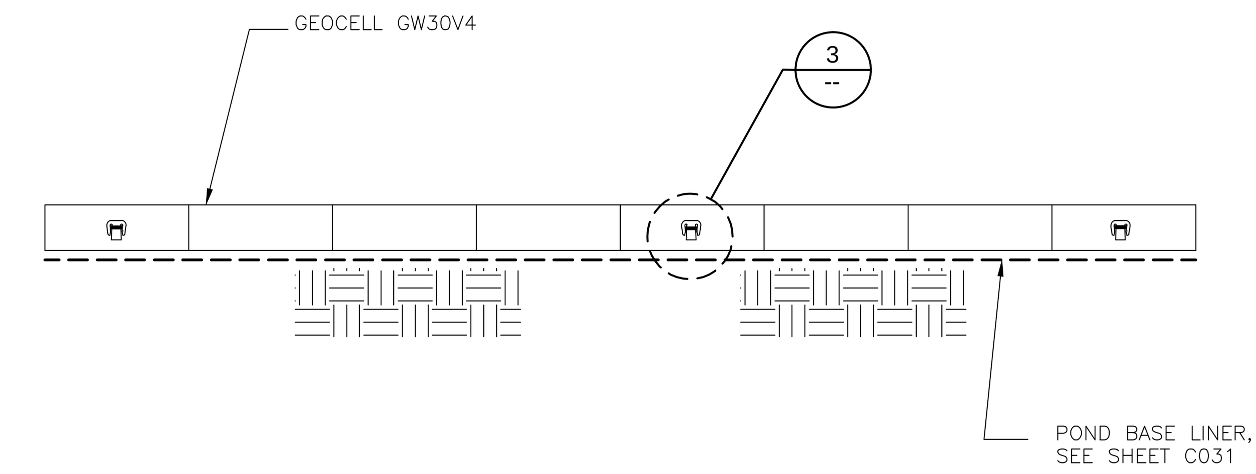
DETAILS AND SECTIONS

SOUTH ASH POND 2 LINER REPLACEMENT
WILL COUNTY GENERATING STATION
MIDWEST GENERATION
ROMEOVILLE, WILL COUNTY, ILLINOIS

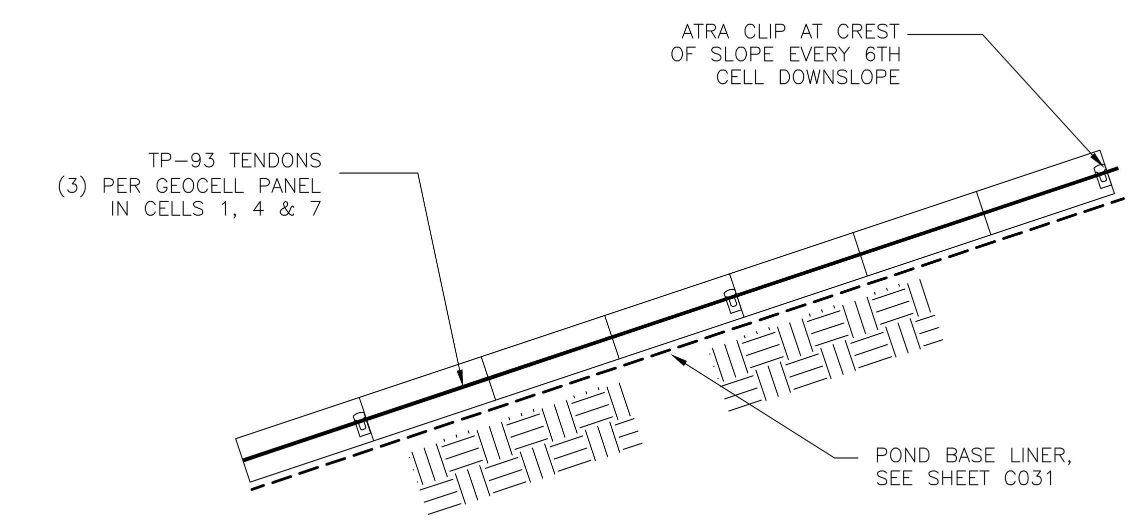
DRAWING NO: D21131C031-01
REFERENCE: .
SHEET NO.
C031



PLAN VIEW



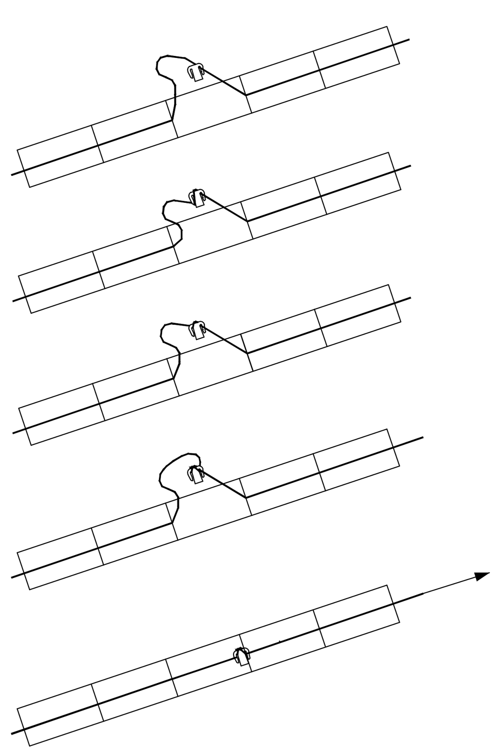
SECTION A–A'



SECTION B–B'

2 / C030 GEOCELL PANEL AND CONNECTIONS DETAIL

NOT TO SCALE



STEPS:

1. PLACE THE TENDON UNDER THE ARM OF THE ATRA CLIP.
2. DIAGONALLY CROSS THE TENDON OVER THE TOP OF THE ATRA CLIP.
3. PLACE THE TENDON UNDER THE OTHER ARM AND PULL TIGHT TO REMOVE SLACK.
4. DIAGONALLY CROSS THE TENDON BACK OVER THE TOP OF THE ATRA CLIP AND PLACE TENDON UNDER THE FIRST ARM.
5. PULL THE TENDON TIGHT TO REMOVE SLACK.
6. ATRA CLIP SHALL BE TIGHT AGAINST THE UPPER CELL WALL AFTER SECURING.
7. PULL TENDON TIGHT AT LOCATION OF NEXT ATRA CLIP.

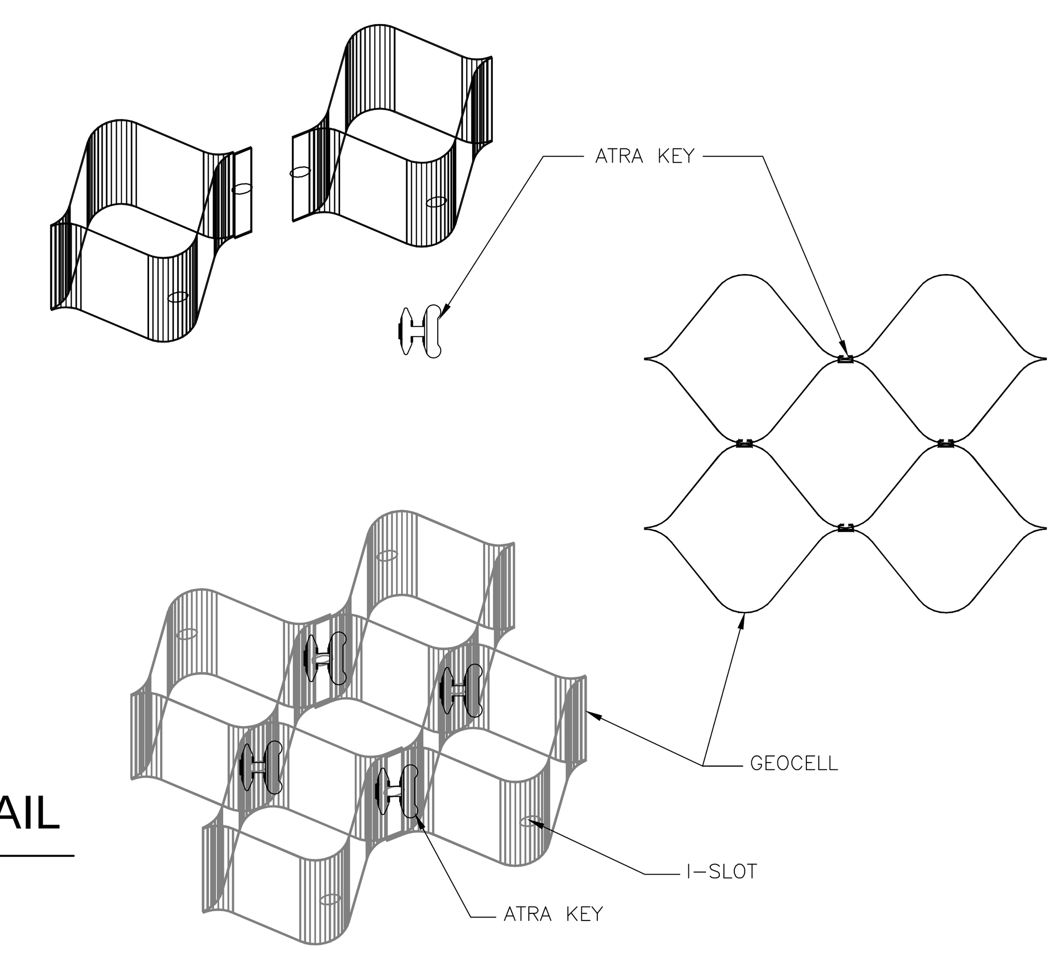
3 / -- ATRA® CLIP INSTALLATION DETAIL

NOT TO SCALE

ATRA KEY® CONNECTION DETAILS

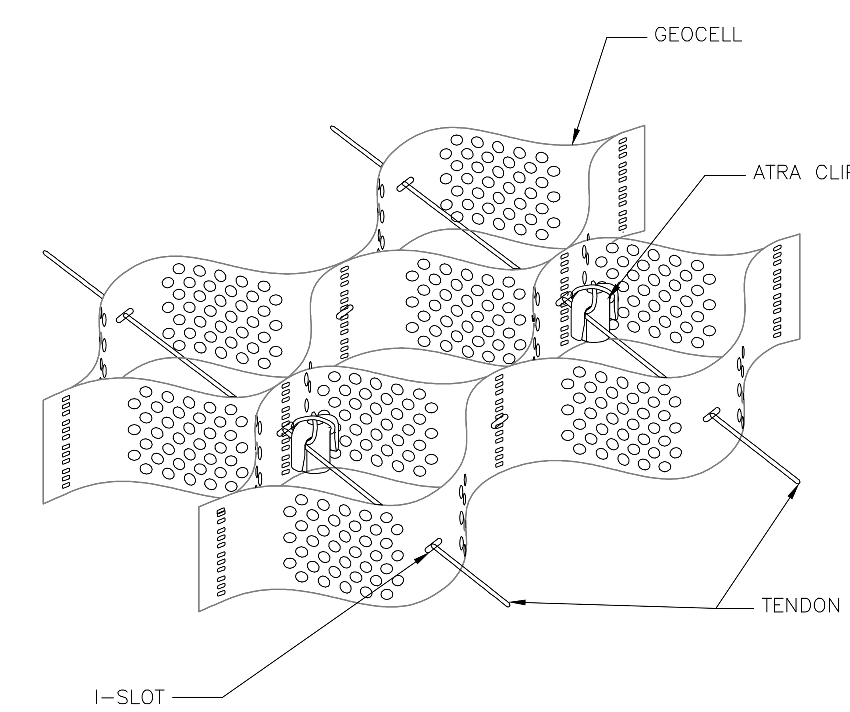
GEOCELL CONNECTION NOTES:

1. THE TOP EDGES OF ADJACENT CELL WALLS SHALL BE FLUSH WHEN CONNECTING.
2. ALIGN THE I-SLOTS FOR INTERLEAF AND END TO END CONNECTIONS.
3. THE GEOCELL PANELS SHALL BE CONNECTED WITH ATRA KEYS AT EACH INTERLEAF AND END TO END CONNECTION.



4 / -- GEOCELL SIDE AND END CONNECTION DETAIL

NOT TO SCALE



5 / -- TENDON DETAIL

NOT TO SCALE

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NATURAL RESOURCE TECHNOLOGY

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CHECKED BY: RJB 12/13/12
APPROVED BY: HMS 12/20/12

GEOCELL DETAILS AND SECTIONS

SOUTH ASH POND 2 LINER REPLACEMENT
WILL COUNTY GENERATING STATION
MIDWEST GENERATION
ROMEOVILLE, WILL COUNTY, ILLINOIS

DRAWING NO: D21131C032-01
REFERENCE: .
SHEET NO. C032

Apr 19, 2013 1:53pm PLOTTED BY: rhopkins SAVED BY: rhopkins
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XREFS:

ATTACHMENT 2
CCR CHEMICAL CONSTITUENTS ANALYSIS

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-206556-1
Client Project/Site: Will County Ash Sample

For:
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Attn: Richard Gnat

Diana Mockler

Authorized for release by:
10/20/2021 3:53:29 PM

Diana Mockler, Project Manager I
(219)252-7570
Diana.Mockler@Eurofinset.com

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

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

1 2 3 4 5 6 7 8 9 10 11 12

Table of Contents

Job ID: 500-206556-1

Laboratory: Eurofins TestAmerica, Chicago

Narrative

Job Narrative
500-206556-1

Comments
No additional comments.

Receipt
The sample was received on 10/11/2021 1:00 PM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 15.5º C.

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

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

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL CHI
7471A	Mercury (CVAA)	SW846	TAL CHI
9056A	Anions, Ion Chromatography	SW846	TAL CHI
Moisture	Percent Moisture	EPA	TAL CHI
SM 4500 Cl- E	Chloride, Total	SM	TAL CHI
SM 4500 F C	Fluoride	SM	TAL CHI
300_Prep	Anions, Ion Chromatography, 10% Wt/Vol	MCAWW	TAL CHI
3050B	Preparation, Metals	SW846	TAL CHI
7471A	Preparation, Mercury	SW846	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

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

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

Laboratory References:

TAL CHI = Eurofins TestAmerica, Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-206556-1	Pond 2S CCR	Solid	10/11/21 11:30	10/11/21 13:00

Client: KPRG and Associates, Inc. Job ID: 500-206556-1
Project/Site: Will County Ash Sample

Client Sample ID: Pond 2S CCR **Lab Sample ID: 500-206556-1**
Date Collected: 10/11/21 11:30 **Matrix: Solid**
Date Received: 10/11/21 13:00

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.7		1.7		mg/Kg		10/19/21 09:55	10/19/21 20:46	1
Arsenic	**1.3**		0.87		mg/Kg		10/19/21 09:55	10/19/21 20:46	1
Barium	**2200**		4.3		mg/Kg		10/19/21 09:55	10/20/21 13:33	5
Beryllium	**1.4**		0.35		mg/Kg		10/19/21 09:55	10/19/21 20:46	1
Boron	**110**		4.3		mg/Kg		10/19/21 09:55	10/19/21 20:46	1
Cadmium	<0.17		0.17		mg/Kg		10/19/21 09:55	10/19/21 20:46	1
Calcium	**78000**		87		mg/Kg		10/19/21 09:55	10/20/21 13:33	5
Chromium	**7.8**		0.87		mg/Kg		10/19/21 09:55	10/19/21 20:46	1
Cobalt	**8.7**		2.2		mg/Kg		10/19/21 09:55	10/20/21 13:33	5
Lead	**3.9**		0.43		mg/Kg		10/19/21 09:55	10/19/21 20:46	1
Lithium	**20**		0.87		mg/Kg		10/19/21 09:55	10/19/21 20:46	1
Molybdenum	**1.5**		0.87		mg/Kg		10/19/21 09:55	10/19/21 20:46	1
Selenium	<4.3		4.3		mg/Kg		10/19/21 09:55	10/20/21 13:33	5
Thallium	**1.2**		0.87		mg/Kg		10/19/21 09:55	10/19/21 20:46	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.016		0.016		mg/Kg		10/14/21 16:30	10/15/21 09:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**110**		9.8		mg/Kg		10/18/21 11:20	10/18/21 21:21	5
Chloride	**41**		19		mg/Kg		10/19/21 10:35	10/19/21 13:34	1
Fluoride	<0.99		0.99		mg/Kg		10/19/21 08:55	10/19/21 15:08	1

Client: KPRG and Associates, Inc.
Project/Site: Will County Ash Sample

Job ID: 500-206556-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

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

QC Association Summary

Metals

Prep Batch: 623515

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-206556-1	Pond 2S CCR	Total/NA	Solid	7471A	
MB 500-623515/12-A	Method Blank	Total/NA	Solid	7471A	
LCS 500-623515/13-A	Lab Control Sample	Total/NA	Solid	7471A	

Analysis Batch: 623708

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-206556-1	Pond 2S CCR	Total/NA	Solid	7471A	623515
MB 500-623515/12-A	Method Blank	Total/NA	Solid	7471A	623515
LCS 500-623515/13-A	Lab Control Sample	Total/NA	Solid	7471A	623515

Prep Batch: 624269

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-206556-1	Pond 2S CCR	Total/NA	Solid	3050B	
MB 500-624269/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 500-624269/2-A	Lab Control Sample	Total/NA	Solid	3050B	
LCS 500-624269/2-A ^2	Lab Control Sample	Total/NA	Solid	3050B	

Analysis Batch: 624447

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-206556-1	Pond 2S CCR	Total/NA	Solid	6010B	624269
MB 500-624269/1-A	Method Blank	Total/NA	Solid	6010B	624269
LCS 500-624269/2-A	Lab Control Sample	Total/NA	Solid	6010B	624269

Analysis Batch: 624556

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-206556-1	Pond 2S CCR	Total/NA	Solid	6010B	624269
MB 500-624269/1-A	Method Blank	Total/NA	Solid	6010B	624269
LCS 500-624269/2-A ^2	Lab Control Sample	Total/NA	Solid	6010B	624269

General Chemistry

Analysis Batch: 623031

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-206556-1	Pond 2S CCR	Total/NA	Solid	Moisture	

Prep Batch: 623871

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-206556-1	Pond 2S CCR	Total/NA	Solid	300_Prep	
500-206556-1 MS	Pond 2S CCR	Total/NA	Solid	300_Prep	
500-206556-1 MSD	Pond 2S CCR	Total/NA	Solid	300_Prep	

Analysis Batch: 624089

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-206556-1	Pond 2S CCR	Total/NA	Solid	9056A	623871
500-206556-1 MS	Pond 2S CCR	Total/NA	Solid	9056A	623871
500-206556-1 MSD	Pond 2S CCR	Total/NA	Solid	9056A	623871

Prep Batch: 624255

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-206556-1	Pond 2S CCR	Total/NA	Solid	300_Prep	
MB 500-624255/1-A	Method Blank	Total/NA	Solid	300_Prep	

General Chemistry (Continued)

Prep Batch: 624255 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 500-624255/2-A	Lab Control Sample	Total/NA	Solid	300_Prep	
500-206556-1 MS	Pond 2S CCR	Total/NA	Solid	300_Prep	
500-206556-1 MSD	Pond 2S CCR	Total/NA	Solid	300_Prep	

Prep Batch: 624276

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-206556-1	Pond 2S CCR	Total/NA	Solid	300_Prep	
MB 500-624276/1-A	Method Blank	Total/NA	Solid	300_Prep	
LCS 500-624276/2-A	Lab Control Sample	Total/NA	Solid	300_Prep	
500-206556-1 MS	Pond 2S CCR	Total/NA	Solid	300_Prep	
500-206556-1 MSD	Pond 2S CCR	Total/NA	Solid	300_Prep	

Analysis Batch: 624306

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-206556-1	Pond 2S CCR	Total/NA	Solid	SM 4500 Cl- E	624276
MB 500-624276/1-A	Method Blank	Total/NA	Solid	SM 4500 Cl- E	624276
LCS 500-624276/2-A	Lab Control Sample	Total/NA	Solid	SM 4500 Cl- E	624276
500-206556-1 MS	Pond 2S CCR	Total/NA	Solid	SM 4500 Cl- E	624276
500-206556-1 MSD	Pond 2S CCR	Total/NA	Solid	SM 4500 Cl- E	624276

Analysis Batch: 624342

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-206556-1	Pond 2S CCR	Total/NA	Solid	SM 4500 F C	624255
MB 500-624255/1-A	Method Blank	Total/NA	Solid	SM 4500 F C	624255
LCS 500-624255/2-A	Lab Control Sample	Total/NA	Solid	SM 4500 F C	624255
500-206556-1 MS	Pond 2S CCR	Total/NA	Solid	SM 4500 F C	624255
500-206556-1 MSD	Pond 2S CCR	Total/NA	Solid	SM 4500 F C	624255

Client: KPRG and Associates, Inc. Job ID: 500-206556-1
Project/Site: Will County Ash Sample

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 500-624269/1-A **Client Sample ID: Method Blank**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 624447 **Prep Batch: 624269**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<2.0		2.0		mg/Kg		10/19/21 09:55	10/19/21 19:42	1
Arsenic	<1.0		1.0		mg/Kg		10/19/21 09:55	10/19/21 19:42	1
Barium	<1.0		1.0		mg/Kg		10/19/21 09:55	10/19/21 19:42	1
Boron	<5.0		5.0		mg/Kg		10/19/21 09:55	10/19/21 19:42	1
Cadmium	<0.20		0.20		mg/Kg		10/19/21 09:55	10/19/21 19:42	1
Chromium	<1.0		1.0		mg/Kg		10/19/21 09:55	10/19/21 19:42	1
Lead	<0.50		0.50		mg/Kg		10/19/21 09:55	10/19/21 19:42	1
Lithium	<1.0		1.0		mg/Kg		10/19/21 09:55	10/19/21 19:42	1
Molybdenum	<1.0		1.0		mg/Kg		10/19/21 09:55	10/19/21 19:42	1
Thallium	<1.0		1.0		mg/Kg		10/19/21 09:55	10/19/21 19:42	1

Lab Sample ID: MB 500-624269/1-A **Client Sample ID: Method Blank**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 624556 **Prep Batch: 624269**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	<1.0		1.0		mg/Kg		10/19/21 09:55	10/20/21 13:23	1
Calcium	<20		20		mg/Kg		10/19/21 09:55	10/20/21 13:23	1
Cobalt	<0.50		0.50		mg/Kg		10/19/21 09:55	10/20/21 13:23	1
Selenium	<1.0		1.0		mg/Kg		10/19/21 09:55	10/20/21 13:23	1

Lab Sample ID: LCS 500-624269/2-A **Client Sample ID: Lab Control Sample**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 624447 **Prep Batch: 624269**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	50.0	44.6		mg/Kg		89	80 - 120
Arsenic	10.0	8.65		mg/Kg		87	80 - 120
Barium	200	191		mg/Kg		95	80 - 120
Boron	100	81.6		mg/Kg		82	80 - 120
Cadmium	5.00	4.43		mg/Kg		89	80 - 120
Chromium	20.0	19.0		mg/Kg		95	80 - 120
Lead	10.0	9.00		mg/Kg		90	80 - 120
Lithium	50.0	49.3		mg/Kg		99	80 - 120
Molybdenum	100	98.1		mg/Kg		98	80 - 120
Thallium	10.0	8.76		mg/Kg		88	80 - 120

Lab Sample ID: LCS 500-624269/2-A ^2 **Client Sample ID: Lab Control Sample**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 624556 **Prep Batch: 624269**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	200	194		mg/Kg		97	80 - 120
Calcium	1000	930		mg/Kg		93	80 - 120
Cobalt	50.0	46.1		mg/Kg		92	80 - 120
Selenium	10.0	8.16		mg/Kg		82	80 - 120

Client: KPRG and Associates, Inc.
Project/Site: Will County Ash Sample

Job ID: 500-206556-1

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 500-623515/12-A
Matrix: Solid
Analysis Batch: 623708

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 623515

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.017		0.017		mg/Kg		10/14/21 16:30	10/15/21 08:30	1

Lab Sample ID: LCS 500-623515/13-A
Matrix: Solid
Analysis Batch: 623708

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 623515

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.167	0.151		mg/Kg		91	80 - 120

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: 500-206556-1 MS
Matrix: Solid
Analysis Batch: 624089

Client Sample ID: Pond 2S CCR
Prep Type: Total/NA
Prep Batch: 623871

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	110		24.5	198	4	mg/Kg		349	75 - 125

Lab Sample ID: 500-206556-1 MSD
Matrix: Solid
Analysis Batch: 624089

Client Sample ID: Pond 2S CCR
Prep Type: Total/NA
Prep Batch: 623871

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	110		24.6	192	4	mg/Kg		321	75 - 125	3	20

Method: SM 4500 Cl- E - Chloride, Total

Lab Sample ID: MB 500-624276/1-A
Matrix: Solid
Analysis Batch: 624306

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 624276

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<20		20		mg/Kg		10/19/21 10:35	10/19/21 13:34	1

Lab Sample ID: LCS 500-624276/2-A
Matrix: Solid
Analysis Batch: 624306

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 624276

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	200	197		mg/Kg		98	85 - 115

Lab Sample ID: 500-206556-1 MS
Matrix: Solid
Analysis Batch: 624306

Client Sample ID: Pond 2S CCR
Prep Type: Total/NA
Prep Batch: 624276

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	41		193	226		mg/Kg		96	75 - 125

Method: SM 4500 Cl- E - Chloride, Total (Continued)

Lab Sample ID: 500-206556-1 MSD
Matrix: Solid
Analysis Batch: 624306

Client Sample ID: Pond 2S CCR
Prep Type: Total/NA
Prep Batch: 624276

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	41		193	225		mg/Kg		95	75 - 125	0	20

Method: SM 4500 F C - Fluoride

Lab Sample ID: MB 500-624255/1-A
Matrix: Solid
Analysis Batch: 624342

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 624255

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<1.0		1.0		mg/Kg		10/19/21 08:55	10/19/21 15:00	1

Lab Sample ID: LCS 500-624255/2-A
Matrix: Solid
Analysis Batch: 624342

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 624255

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	100	93.7		mg/Kg		94	80 - 120

Lab Sample ID: 500-206556-1 MS
Matrix: Solid
Analysis Batch: 624342

Client Sample ID: Pond 2S CCR
Prep Type: Total/NA
Prep Batch: 624255

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	<0.99		49.5	40.7		mg/Kg		81	75 - 125

Lab Sample ID: 500-206556-1 MSD
Matrix: Solid
Analysis Batch: 624342

Client Sample ID: Pond 2S CCR
Prep Type: Total/NA
Prep Batch: 624255

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	<0.99		49.6	39.9		mg/Kg		79	75 - 125	2	20

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park IL 60484
Phone 708-534-5200 Fax 708-534-5211

Chain of Custody Record

eurofins

Client Information	Sampler: M. Ress	Lab PM: Mockler Diana J	Carrier Tracking No(s)	COC No: 500-95707-42336 1
Client Contact: Cory Higgins	Phone: 630.602.7240	E-Mail: Diana Mockler@Eurofinset com	State of Origin	Page: Page 1 of 1
Company: KPRG and Associates Inc	PWSID	**Analysis Requested**		Job #: 500-206556

Address: 414 Plaza Drive Suite 106	Due Date Requested	
City: Westmont	TAT Requested (days):	
State Zip: IL 60559	Compliance Project: Δ Yes Δ No	
Phone: 779-279-2321(Tel)	PO #: 4502041043	500-206556 COC
Email: coryh@KPRGinc com	WO #	
Project Name: Ash Sample	Project #: 50011609	
Site: Illinois	SSOW#	

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

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 904.0	Ra226Ra228_GFPC - Combined Rad 226/228	4500_F_C 6010B 7471A, 9056A, Moisture SM4500_Cl_E	Total Number of containers	Special Instructions/Note
			Preservation Code				N	N	N		
1-Pond 2S CCR	10/11/21	11:30	C	Solid			X	X	X		• See attached list
2-Pond 2S CCR	↓	11:35	C	↓			↓	↓	↓		
3-Pond 2S CCR	↓	11:40	C								
											• CCR appendix 3&4
											• Rush turn-around
											• Contact Josh Davenport w/ questions 262-781-0475

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

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

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements ~~Rush turn-around~~

Empty Kit Relinquished by	Date	Time	Method of Shipment:

Relinquished by: Michael Ress	Date/Time: 10/11/21 13:00	Company: KPRG	Received by: [signature]	Date/Time: 10/11/21 @ 1300	Company: ETA
Relinquished by:	Date/Time	Company	Received by:	Date/Time	Company
Relinquished by:	Date/Time	Company	Received by:	Date/Time	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 1.5

Table 1 Ash Parameter List

Parameter
Antimony
Arsenic
Barium
Beryllium
Boron
Cadmium
Chloride
Chromium
Cobalt
Combined Radium 226 + 228 (pCi/L)
Fluoride
Lead
Lithium
Mercury
Molybdenum
pH (standard units)
Selenium
Sulfate
Thallium
Calcium

1 2 3 4 5 6 7 8 9 10 11 12

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc. Job Number: 500-206556-1

Login Number: 206556 **List Source: Eurofins TestAmerica, Chicago**
List Number: 1
Creator: Scott, Sherri L

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	Received same day of collection; chilling process has begun.
Cooler Temperature is recorded.	True	15.5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Will County Ash Sample

Job ID: 500-206556-1

Client Sample ID: Pond 2S CCR
Date Collected: 10/11/21 11:30
Date Received: 10/11/21 13:00

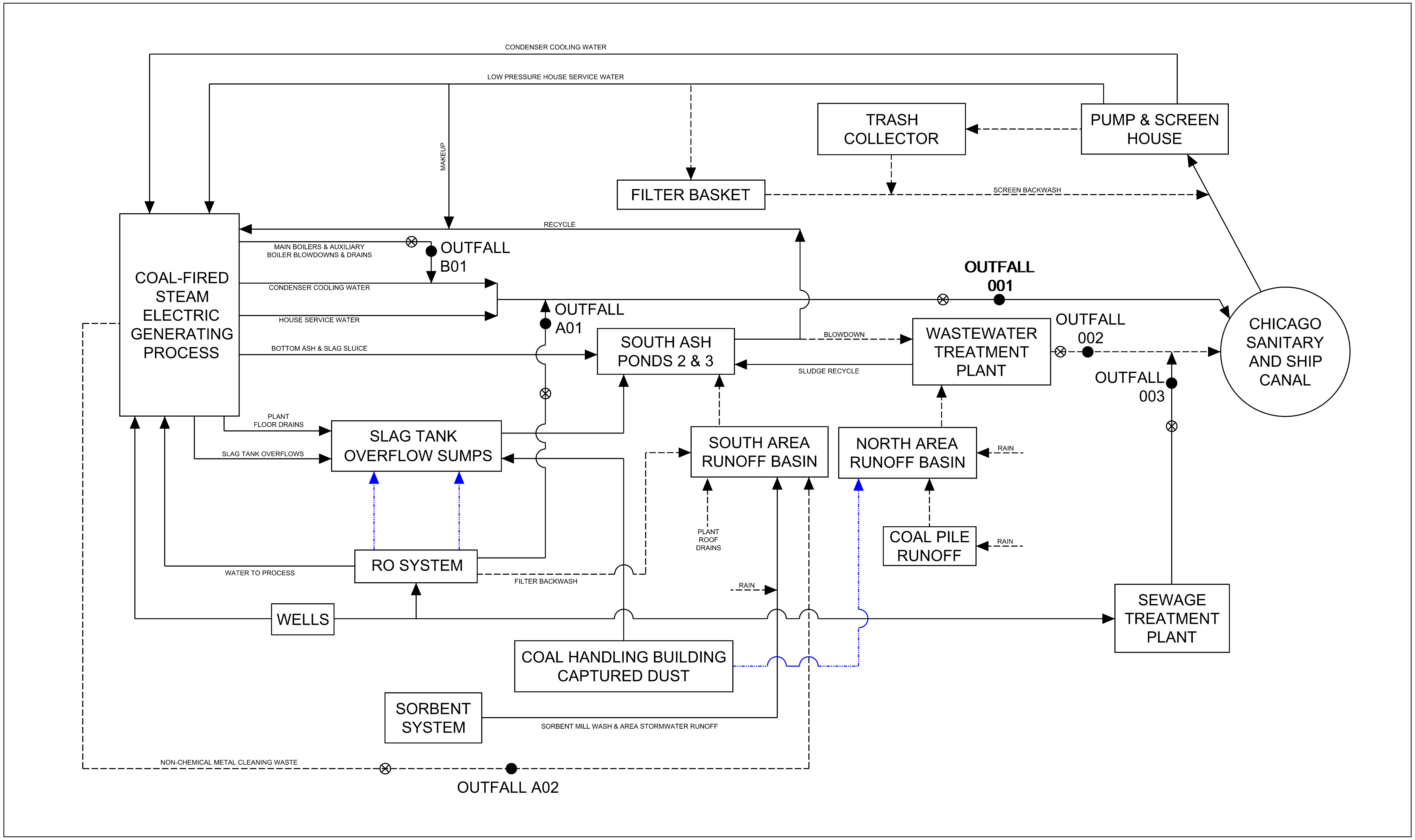
Lab Sample ID: 500-206556-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			624269	10/19/21 09:55	BDE	TAL CHI
Total/NA	Analysis	6010B		1	624447	10/19/21 20:46	DAJ	TAL CHI
Total/NA	Prep	3050B			624269	10/19/21 09:55	BDE	TAL CHI
Total/NA	Analysis	6010B		5	624556	10/20/21 13:33	JJB	TAL CHI
Total/NA	Prep	7471A			623515	10/14/21 16:30	MJG	TAL CHI
Total/NA	Analysis	7471A		1	623708	10/15/21 09:31	MJG	TAL CHI
Total/NA	Prep	300_Prep			623871	10/18/21 11:20	EAT	TAL CHI
Total/NA	Analysis	9056A		5	624089	10/18/21 21:21	EAT	TAL CHI
Total/NA	Analysis	Moisture		1	623031	10/12/21 09:09	LWN	TAL CHI
Total/NA	Prep	300_Prep			624276	10/19/21 10:35	RES	TAL CHI
Total/NA	Analysis	SM 4500 Cl- E		1	624306	10/19/21 13:34	RES	TAL CHI
Total/NA	Prep	300_Prep			624255	10/19/21 08:55	EAT	TAL CHI
Total/NA	Analysis	SM 4500 F C		1	624342	10/19/21 15:08	EAT	TAL CHI

Laboratory References:

TAL CHI = Eurofins TestAmerica, Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

ATTACHMENT 3
CHEMICAL CONSTITUENTS ANALYSIS OF OTHER WASTE STREAMS



HOLD INFORMATION

NO.	DESCRIPTION

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUB-CONTRACTOR(S)) PERFORMING THE WORK.

RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	11-25-2020	FOR USE

ISSUE PURPOSE: FOR USE
SPECIFICATION: ---
PROJECT NO.: 12661-099

CAD FILE NAME: WC-CSK-PFD-001.DGN
PREPARED BY: J. CHAVEZ
REVIEWED BY: T. DEHLIN
APPROVED BY: T. DEHLIN

ANY MODIFICATION OR ADDITION TO THIS DRAWING BY AN ORGANIZATION OTHER THAN SARGENT & LUNDY, IS NOT THE RESPONSIBILITY OF SARGENT & LUNDY.

Sargent & Lundy LLC

SARGENT & LUNDY LLC
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

MWG

PROJECT

MIDWEST GENERATION, LLC
WILL COUNTY
GENERATING STATION
UNIT 4

DRAWING TITLE

EXISTING WATER BLOCK FLOW DIAGRAM

DRAWING NUMBER	REVISION
WC-CSK-PFD-001	0

SHEET 1 OF 1

LEGEND

——	TYPICAL
- - -	INTERMITTENT
·····	ALTERNATE
●	OUTFALL NUMBER
⊗	SAMPLING POINT

NOTES

1. THIS DRAWING WAS DEVELOPED USING MIDWEST GENERATION, LLC DRAWING "GENERAL FLOW DIAGRAM WITH NPDES OUTFALLS, NPDES PERMIT NO. IL0002208," PREPARED BY APTIM ENVIRONMENTAL & INFRASTRUCTURE, LLC (DATED OCTOBER 2018), WHICH WAS USED WITH PERMISSION FROM MIDWEST GENERATION, LLC. SARGENT & LUNDY HAS NOT INDEPENDENTLY VERIFIED THE INFORMATION SHOWN ON THIS DRAWING.
2. SCOPED AREAS ON THIS DRAWING REPRESENT CHANGES TO THE ORIGINAL WATER BLOCK FLOW DIAGRAM (SEE NOTE 1) BASED ON INPUT FROM MIDWEST GENERATION, LLC.

ATTACHMENT 4
LOCATION STANDARDS DEMONSTRATION

Geosyntec consultants

1420 Kensington Road, Suite 103
Oak Brook, Illinois 60523
Phone: 630.203.3340
Fax: 630.203.3341
www.geosyntec.com

PLACEMENT ABOVE THE UPPERMOST AQUIFER LOCATION RESTRICTIONS
SOUTH ASH PONDS 2S AND 3S
WILL COUNTY STATION
OCTOBER 2018

Pursuant to Code of Federal Regulations Title 40, Part 257, Subpart D (40 CFR), Section 257.62, Geosyntec Consultants (Geosyntec) prepared this report to document compliance with location restrictions related to placement above the uppermost aquifer for the existing South Ash Pond 2S and South Ash Pond 3S (the Ponds) at the Will County Station (Site) in Romeoville, Illinois.

The work presented in this report was performed under the direction of Mr. Jesse Varsho, P.G., P.E., of Geosyntec. Ms. Jane Soule, P.E., reviewed this report in accordance with Geosyntec's senior review policy.

1. Placement

South Ash Pond 2S and South Ash Pond 3S are not separated from the upper limit of the uppermost aquifer by a minimum of five (5) feet.

2. Limitations and Certification

This report was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of civil engineering. The contents of this report are based solely on the observations of the conditions observed by Geosyntec personnel and information provided to Geosyntec by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.

Jesse Varsho, P.E.
Illinois Professional Engineer No. 062.067766
License Expires: 11/30/19

Geosyntec consultants

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Oak Brook, Illinois 60523
Phone: 630.203.3340
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www.geosyntec.com

WETLANDS LOCATION RESTRICTIONS
SOUTH ASH PONDS 2S AND 3S
WILL COUNTY STATION
OCTOBER 2018

Pursuant to Code of Federal Regulations Title 40, Part 257, Subpart D (40 CFR), Section 257.61, Geosyntec Consultants (Geosyntec) prepared this report to document compliance with location restrictions related to wetlands for the existing South Ash Pond 2S and South Ash Pond 3S (the Ponds) at the Will County Station (Site) in Romeoville, Illinois.

The work presented in this report was performed under the direction of Mr. Jesse Varsho, P.G., P.E., of Geosyntec in accordance with §257.61. Ms. Jane Soule, P.E., reviewed this report in accordance with Geosyntec's senior review policy.

1. Wetlands Location Restriction Determination

South Ash Pond 2S and South Ash Pond 3S are not located in mapped wetlands included in the National Wetlands Inventory – Version 2 presented by the U.S. Fish and Wildlife Service (USFW) [USFW, 2018]. Therefore, the locations of the Ponds are in compliance with the requirements outlined in §257.61(a).

2. Limitations and Certification

This report was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of civil engineering. The contents of this report are based solely on the observations of the conditions observed by Geosyntec personnel and information provided to Geosyntec by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.

Jesse Varsho, P.E.
Illinois Professional Engineer No. 062.067766
License Expires: 11/30/19

3. References

USFS, 2018. "National Wetlands Inventory, Version 2," https://www.fws.gov/wetlands/data/Mapper.html, updated 1 May 2018, accessed 28 August 2018.

Geosyntec consultants

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FAULT AREAS LOCATION RESTRICTIONS
SOUTH ASH PONDS 2S AND 3S
WILL COUNTY STATION
OCTOBER 2018

Pursuant to Code of Federal Regulations Title 40, Part 257, Subpart D (40 CFR), Section 257.62, Geosyntec Consultants (Geosyntec) prepared this report to document compliance with location restrictions related to fault areas for the existing South Ash Pond 2S and South Ash Pond 3S (the Ponds) at the Will County Station (Site) in Romeoville, Illinois.

The work presented in this report was performed under the direction of Mr. Jesse Varsho, P.G., P.E., of Geosyntec in accordance with §257.62. Ms. Jane Soule, P.E., reviewed this report in accordance with Geosyntec's senior review policy.

1. Fault Areas Location Restriction Determination

South Ash Pond 2S and South Ash Pond 3S are not located within 200 feet (60 meters) of a mapped Holocene-aged fault, as mapped by the United States Geological Survey (USGS) Quaternary Fault Database [USGS, 2018]. Therefore, the locations of the Ponds are in compliance with the requirements outlined in §257.62(a).

2. Limitations and Certification

This report was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of civil engineering. The contents of this report are based solely on the observations of the conditions observed by Geosyntec personnel and information provided to Geosyntec by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.

Jesse Varsho, P.E.
Illinois Professional Engineer No. 062.067766
License Expires: 11/30/19

3. References

USGS, 2018. "Quaternary Fault and Fold Database," https://earthquake.usgs.gov/hazards/qfaults/, accessed 28 August 2018.

Geosyntec consultants

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SEISMIC IMPACT ZONES LOCATION RESTRICTIONS
SOUTH ASH PONDS 2S AND 3S
WILL COUNTY STATION
OCTOBER 2018

Pursuant to Code of Federal Regulations Title 40, Part 257, Subpart D (40 CFR), Section 257.63, Geosyntec Consultants (Geosyntec) prepared this report to document compliance with location restrictions related to seismic impact areas for the existing South Ash Pond 2S and South Ash Pond 3S (the Ponds) at the Will County Station (Site) in Romeoville, Illinois.

The work presented in this report was performed under the direction of Mr. Jesse Varsho, P.G., P.E., of Geosyntec in accordance with §257.63. Ms. Jane Soule, P.E., reviewed this report in accordance with Geosyntec's senior review policy.

1. Seismic Impact Zones Restriction Determination

South Ash Pond 2S and South Ash Pond 3S are not located within a seismic impact zone as defined in §257.53 and as mapped by the United States Geological Survey (USGS) [USGS, 2014]. Therefore, the locations of the Ponds are in compliance with the requirements outlined in §257.63(a).

2. Limitations and Certification

This report was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of civil engineering. The contents of this report are based solely on the observations of the conditions observed by Geosyntec personnel and information provided to Geosyntec by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.

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Illinois Professional Engineer No. 062.067766
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3. References

USGS, 2014. "2014 U.S. Geological Survey National Seismic Hazard Maps, PGA 2% in 50 Years," https://earthquake.usgs.gov/hazards/hazmaps/conterminous/index.php#2014, accessed 28 August 2018.

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UNSTABLE AREAS LOCATION RESTRICTIONS
SOUTH ASH PONDS 2S AND 3S
WILL COUNTY STATION
OCTOBER 2018

Pursuant to Code of Federal Regulations Title 40, Part 257, Subpart D (40 CFR), Section 257.64, Geosyntec Consultants (Geosyntec) prepared this report to document compliance with location restrictions related to unstable areas for the existing South Ash Pond 2S and South Ash Pond 3S (the Ponds) at the Will County Station (Site) in Romeoville, Illinois.

The work presented in this report was performed under the direction of Mr. Jesse Varsho, P.G., P.E., of Geosyntec in accordance with §257.64. Ms. Jane Soule, P.E., reviewed this report in accordance with Geosyntec's senior review policy.

1. Unstable Areas Restriction Determination

South Ash Pond 2S and South Ash Pond 3S are not located in unstable areas based on a review of subsurface investigations at the site [Patrick, 2011], published liquefaction maps [ISGS, 2008] and a site visit by Geosyntec. Therefore, the locations of the Ponds are in compliance with the requirements outlined in §257.64(a).

2. Limitations and Certification

This report was prepared in accordance with current practices and the standard of care exercised contents of this report are based solely on the observations of the conditions observed by Geosyntec personnel and information provided to Geosyntec by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.

Jesse Varsho, P.E.
Illinois Professional Engineer No. 062.067766
License Expires: 11/30/19

3. References

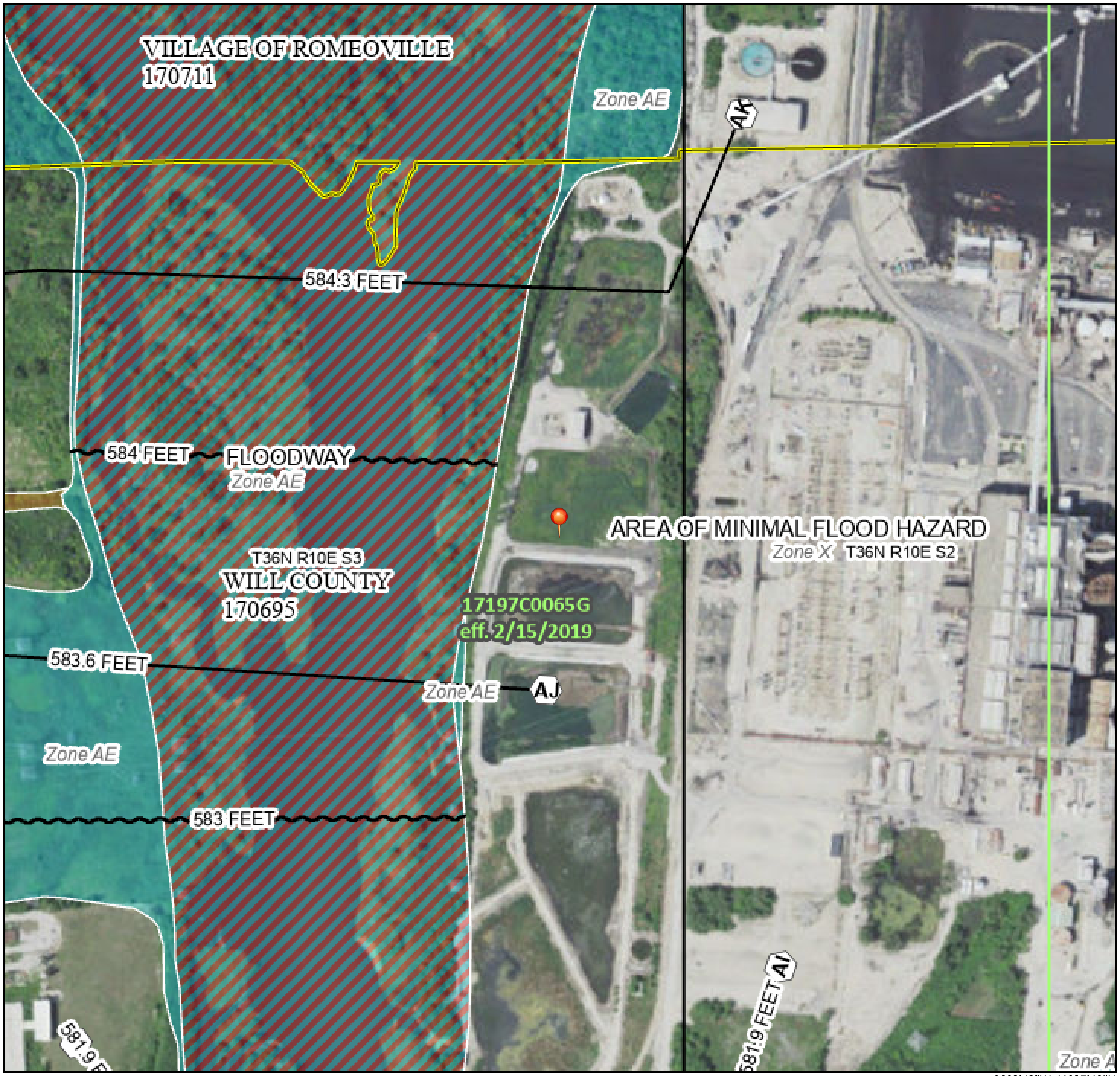
Illinois State Geological Survey (ISGS), 2008. "Illinois USGS I-2789 Map," accessed as GIS shape file, downloaded from http://isgs.illinois.edu/earthquake-consortium/digital-maps, 26 September 2018.

Patrick Engineering, 2011. "Hydrogeologic Assessment Report, Will County Generating Station, Romeoville, Illinois," Patrick Project Number 21053.070, February.

National Flood Hazard Layer FIRMette

FEMA

88°4'20"W 41°38'16"N



88°3'43"W 41°37'49"N

Feet 1:6,000

0 250 500 1,000 1,500 2,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/22/2021 at 4:38 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

ATTACHMENT 5
PERMANENT MARKERS

Photo documentation –Ash Pond 2S Signage. Will County Generating Station, Romeoville, IL.

1. Ash Pond 2S Posted IEPA ID Sign

Photo documentation –Ash Pond 3S Signage. Will County Generating Station, Romeoville, IL.

1. Ash Pond 3S Posted IEPA ID Sign

ATTACHMENT 6
INCISED/SLOPE PROTECTION DOCUMENTATION

Attachment 6: Photo documentation – Slope Protection, Will County Station

1. Slope protection Pond 3S south

2. Slope protection near Pond 3S south

3. Slope protection near Pond 3S west

4. Slope protection near Pond 2S west

Attachment 6: Photo documentation – Slope Protection, Will County Station

5. Slope protection on east side of Ponds 2S and 3S

ATTACHMENT 7
EMERGENCY ACTION PLAN

EMERGENCY ACTION PLAN
ASH PONDS 1N, 1S, 2S, AND 3S
WILL COUNTY STATION
OCTOBER 2021

The Emergency Action Plan (EAP) was initially prepared by Civil & Environmental Consultants, Inc. (CEC) pursuant to 40 CFR 257.73(a)(3) for Pond 2S and Pond 3S at the Midwest Generation, LLC (MWG) Will County Station (Station) in Romeoville, Illinois. This EAP has been revised to comply with 35 Ill. Adm. Code Part 845, Subpart E, §845.520(b)(3) by revising the code references and including Ponds 1N and Ponds 1S. This EAP encompasses Ponds 1N, 1S, 2S, and 3S (the Ponds) at the Station. Previous assessments performed in accordance with §257.73(a)(2) have identified Pond 2S and Pond 3S as significant hazard potential Coal Combustion Residual (CCR) surface impoundments and a previous assessment performed in accordance with 845.440 classified Pond 1N and Pond 1S as Class 2 CCR surface impoundments. As a result, this written EAP has been prepared to address the potential failure of the Ponds. The EAP is presented as follows:

Section 1.0: §845.520(b)(1) Definition of the events or circumstances involving the CCR surface impoundments that represent a safety emergency, along with a description of the procedures that will be followed to detect a safety emergency in a timely manner;

Section 2.0: §845.520(b)(2) Definition of the responsible persons, their respective responsibilities, and notification procedures in the event of a safety emergency involving the CCR surface impoundments;

Section 3.0: §845.520(b)(3) Contact information of emergency responders;

Section 4.0: §845.520(b)(4) Provide maps which delineate the downstream areas which would be affected in the event of a pond failure and a physical description of the CCR surface impoundments;

Section 5.0: §845.520(b)(5) Include provisions for an annual face-to-face meeting or exercise between representatives of the Will County Station and the local emergency responders; and

Section 6.0: §845.520(e) The owner or operator of the CCR surface impoundments must obtain a certification from a qualified professional engineer stating that the written EAP, and any subsequent amendment of the EAP, meets the requirements of Section 845.520.

1.0 DEFINITION OF THE EVENTS THAT REPRESENT A SAFETY EMERGENCY

In accordance with Section 845.520(b)(1), the following tables define the events and/or circumstances involving Ponds 1N, 1S, 2S, and 3S that represent a safety emergency, along with a description of the procedures that will be followed to detect a safety emergency in a timely manner.

The information provided in the Tables 1 through 4 provides a listing of problems which may occur at the Ponds, how to make a rapid evaluation of the problem, and what action should be taken in response to the problem. This section presents only generalized information to aid in first response to a given problem. Suspected problems should be reported as soon as possible, as discussed in Section 2.0, and assistance from a qualified engineer should be obtained if necessary.

The problems outlined in this Section are related to above grade, earthen type embankment dams similar in construction to Ponds 1N, 1S, 2S, and 3S. The problems discussed herein include:

- Table 1: Seepage
- Table 2: Sliding
- Table 3: Cracking
- Table 4: Animal Burrows and Holes

For each problem, the indicators are discussed followed by evaluation techniques and then by action items for each problem.

2.0 RESPONSIBLE PERSONS, RESPECTIVE RESPONSIBILITIES, AND NOTIFICATION PROCEDURES

The EAP must be implemented once events or circumstances involving the CCR unit that represent a safety emergency are detected, including conditions identified during periodic structural stability assessments, annual inspections, and inspections by a qualified person. In accordance with §845.520(b)(2), the following sections define responsible persons, their respective responsibilities, and notification procedures in the event of a safety emergency involving Ponds 1N, 1S, 2S, and 3S. Contact information is provided in Table 5.

2.1 Responsible Persons and Responsibilities

Appropriate parties will be notified based on the nature and severity of the incident as determined by the Station Environmental Specialist or Chemical Specialist. If failure is imminent or has occurred, notification and mitigation procedures are a top priority, particularly for a potentially hazardous situation. The Station Environmental Specialist or Chemical Specialist, in conjunction with the Station Director, is responsible for this determination.

2.2 Notification Sequence

The following notification procedures shall be used by employees in the event of a safety emergency with the Ponds.

(1) Notify the Shift Supervisor and Environmental Specialist, Chemical Specialist, or alternate.

(2) If unsafe conditions exist, the employee should evacuate the area.

(3) Only the Environmental Specialist, Chemical Specialist or designated alternate shall have any official communication with non-employees and regulatory agencies, and only the Communications Director shall have any contact with the media.

The Environmental Specialist, Chemical Specialist, or designated alternate should follow these procedures in the event of a safety emergency involving Ponds 1N, 1S, 2S, and 3S:

(1) Organize appropriately trained Station personnel and/or other employees or contractors as necessary to assist with the safety emergency.

(2) After consultation with appropriately trained Station personnel, contact the proper civil authorities (e.g., fire, police, etc.) if necessary. Notify the appropriate agencies where there has been a reportable release of material(s) into the environment. See Table 5, attached for contact information. Notify MWG Corporate via the Intelex online notification system within 24 hours in the event of a reportable release. A reportable release is a Material Release defined as a spill or leak that materialized in the waterway. A Non-Material Release is a spill or leak that did not come into contact with the waterway.

(3) Be prepared to evacuate the potential inundation area at any time during the safety emergency response.

(4) If the emergency is beyond the Facility's response capabilities, contact one or more emergency response contractors as necessary.

(5) Corrective actions should only be performed by properly trained individuals.

2.3 Emergency Responders Contact Information

In accordance with §845.520(b)(3), Table 5, provides contact information of emergency responders. The Station Environmental Specialist, Chemical Specialist, or alternate will determine who to notify, including any affected residents and/or businesses, in the case of an imminent or actual CCR surface impoundment dam failure. The Station Environmental Specialist, Chemical Specialist, or alternate will ensure proper notifications are made.

Appropriate contractors will be utilized to assist the Station Environmental Specialist, Chemical Specialist, or alternate with mitigated actions being undertaken in order to minimize the impact of an event that has occurred. Contact information for contractors and consultants are provided in Table 5.

3.0 SITE MAP AND A SITE MAP DELINEATING THE DOWNSTREAM AREA

In accordance with §845.520(b)(4), the following section provides a physical description of Ponds 1N, 1S, 2S, and 3S. A Site Map showing Ponds 1N, 1S, 2S, and 3S is provided as Figure 1. Drawings depicting the locations of, and the downstream areas affected by, a potential failure of Ponds 2S and 3S were prepared by Geosyntec in October 16, 2016 and are provided in Appendix A. Drawings depicting the locations of, and the downstream areas affected by, a potential failure of Ponds 1N and 1S were prepared by CEC in September 2021 and are provided in Appendix B.

3.1 Basin Locations and Descriptions

The Site is bound between the Des Plaines River on the west and the Chicago Sanitary and Ship Canal on the east. The Ponds are located along the eastern bank of the Des Plaines River and west of the substation area and the Main Power Block Building.

From our observations and review of construction and engineering documentation provided by MWG, the Ponds were constructed with elevated earthen berms or embankments. Run-on is limited to precipitation contained within the earthen berm. Physical characteristics of the Ponds are provided in Table 6.

3.2 Delineation of Downstream Areas

The potential impacts from the failure of Pond 2S and 3S were evaluated and reported by Geosyntec in the Hazard Potential Classification Assessment (HPCA), dated October 2016. A copy of the HPCA is contained on the CCR Rule Compliance Data and Information web site (http://www.nrg.com/legal/coal-combustion-residuals/).

Results of the HPCA indicate that both Ponds 2S and 3S are classified as significant hazard potential CCR surface impoundments. The evaluation reports no loss of life resulting from failure of the Ponds 2S and 3S. However, potential failure during flood conditions could results in offsite economic or environmental impacts. Inundation Maps are provided in Appendix A.

The potential impacts from the failure of Ponds 1N and 1S were evaluated and reported by CEC in a separate HPCA, dated September 2021. A copy of the HPCA is contained on the Illinois CCR Rule Compliance Data and Information web site. (https://midwestgenerationllc.com/illinois-ccr-rule-compliance-data-and-information/).

Results of the HPCA indicate that both Ponds 1N and 1S are classified as Class 2 CCR surface impoundments. The evaluation reports no loss of life resulting from the failure of Ponds 1N and 1S. However, potential failure during flood conditions could result in offsite economic or environmental impacts. Inundation Maps are provided in Appendix B.

4.0 ANNUAL FACE-TO-FACE MEETING

In accordance with §845.520(b)(5), a face-to-face meeting or an exercise between representatives of Will County Station and the local emergency responders shall be offered and, if accepted, held on an annual basis. The purpose of the annual meeting is to review the EAP to assure that contacts, addresses, telephone numbers, etc. are current. The annual meeting will be held whether or not an incident occurred in the previous year.

In the event an incident occurs, the annual meeting date may be moved up in order to discuss the incident closer to the date of occurrence. If no incidents have occurred, the annual meeting will be held to inform local emergency responders on the contents of the EAP and changes from the previous year. Documentation of the annual face to face meeting will be recorded and placed in the operating record for the Station.

Pursuant to §845.520(d), the EAP requires modification whenever there is a change in conditions that would substantially affect the EAP in effect. Changes to the plan shall be made as appropriate, and a copy of the changes will be kept at the station, with the revised EAP placed in the facility's operating record. The written EAP must be evaluated, at a minimum, every five years to ensure the EAP is accurate with §845.520.

5.0 LIMITATIONS AND CERTIFICATION

The Pond 2S and the Pond 3S Emergency Action Plan (EAP) included as part of this operating permit application was initially prepared by Civil & Environmental Consultants, Inc. in April 2017 and was reviewed by KPRG for compliance with 35 Ill. Adm. Code 845.520(b). KPRG's review of the EAP is based solely on the observations of the conditions observed by KPRG personnel and information provided to KPRG by Midwest Generation. This review neither accepts nor rejects the safety emergencies identified by CEC. The safety emergencies identified along with the responses are the product of CEC. KPRG has not altered the safety emergencies or the responses associated with each emergency. As part of the review process, the contact list included as part of the original Emergency Action Plan required being updated as well as adding Pond 1N and Pond 1S. As such, the Emergency Action Plan complies with 35 Ill. Adm. Code 845.520(b).

Signature: ______________________

Name: Joshua D. Davenport, P.E.

Date of Certification: 10/29/2021

Illinois Professional Engineer No.: 062.061945

License Expires: 11/30/2021

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062-061945
LICENSED
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS

TABLES

Table 1: Ponds 1N, 1S, 2S, and 3S
Event Definition, Evaluation and Action: <u>Seepage</u>

Definition	**Evaluation**	**Action**
1A: Wet area on downstream embankment slope or other area downstream of the embankment, with very little or no surface water or very minor seeps.	1B: Condition may be caused by infiltration of rain water, which is not serious; or may be the start of a serious seepage problem, which would be indicated by a quick change to one of the conditions below.	1C: No immediate action required. Note the location for future comparison.
2A: Same wet area as above, with moderate seeps of clear or relatively clear water and the rate of flow not increasing.	2B: Measure the flow periodically and note changes in clarity.	2C: No immediate action required. Note the location, flow rate, and clarity for future comparison. During reservoir flood stages, the seepage area should be watched for changes.
3A: Same wet area as above, with moderate seeps of clear or relatively clear water and rate of flow increasing.	3B: Measure the flow periodically and note changes in clarity. Inspect downstream area for new seeps.	3C: Contact a qualified engineer for immediate inspection (see Table 5). Observe the condition constantly for further changes in flow rate or clarity, unless notified otherwise by the engineer.
4A: Piping (seepage with the removal of materials from the foundation or embankment), moderate to active flows of cloudy to muddy water.	4B: If the water is cloudy to muddy, and the rate of flow is increasing, this condition could lead to failure of the dam. If, along the piping, there is an upstream swirl (whirlpool) caused by water entering through the abutments of embankment, failure is imminent.	4C: Immediate action is necessary. Notify the appropriate agencies (see Table 5).
5A: Boils (soil particles deposited around a water exit forming a cone, varying from a few inches in diameter spaced 2 to 3 feet apart to isolated locations several feet in diameter in the floodplain downstream of the dam) may show the types of flow as noted above.	5B: Evaluation of the problem is the same as noted above for the various flow conditions, i.e., clear and constant, clear and increasing, and cloudy or muddy and increasing.	5C: Actions to be taken are essentially the same as those noted above.

Table 2: Ponds 1N, 1S, 2S, and 3S
Event Definition, Evaluation and Action: Sliding

Indicator	Evaluation	Action
1A: Movement of a portion of the embankment, either the upstream or downstream slope, toward the toe of the dam.	1B: Various degrees of severity of a slide require different responses. The first condition is that the slide does not pass through the crest and does not extend into the embankment for more than 5 ft., measured perpendicular to the slope	1C: For this condition, a qualified engineer should be consulted (see Table 5) before repairs are initiated to determine the cause of the slide and to recommend modifications to prevent future slides. The downstream side of the dam should be watched for the emergence of water, either through the slide or opposite the slide. If water is noted discharging, the area should be treated as a seepage location and monitored as noted above.
2A: Slide passes is the second condition.	2B: In this condition, the slide passes through the crest and that the reservoir elevation is more than 10 ft. below the lowered crest.	2C: Use the same actions as noted above, and notify the appropriate MWG personnel of the situation so they may be prepared to act if the condition worsens (see Table 5).
3A: Slide passes is also the third condition.	3B: In this condition, the slide passes through the crest and that the reservoir elevation is less than 10 ft. below the lowered crest.	3C: This condition is critical, and failure of the dam should be considered imminent. Notify the appropriate agencies (see Table 5).

Table 3: Ponds 1N, 1S, 2S, and 3S
Event Definition, Evaluation and Action: <u>Cracking</u>

Indicator	Evaluation	Action
1A: Cracks in the embankment can occur either in the longitudinal (along the length of the dam) or transverse (across the dam from upstream to downstream directions).	1B: Some cracking of the surface soils may occur when they become dry. This cracking is to be expected, and no further action is required.	1C: No further action is required.
2A: Longitudinal cracking can indicate the beginning of a slide or be an uneven settlement of the embankment.	2B: Monitor the crack for future changes, and contact a qualified engineer for assistance in the evaluation of the crack and recommended repairs.	2C: Contact a qualified engineer for assistance and recommendations (see Table 5).
3A: Transverse cracking can indicate uneven settlement or the loss of support below the crack. Such cracks usually occur over an outlet conduit, near the abutments, or in the taller portion of the embankment.	3B: Monitor the crack for future changes, and contact a qualified engineer for assistance in the evaluation of the crack and recommended repairs.	3C: Contact a qualified engineer for assistance and recommendations (see Table 5).

Table 4: Ponds 1N, 1S, 2S, and 3S
Event Definition, Evaluation and Action: Animal Burrows and Holes

Definition	Evaluation	Action
1A: Holes in the embankment, varying in size from about one inch in diameter to one foot in diameter caused by animals.	1B: If the holes do not penetrate through the embankment, the situation is usually not serious. Some animal holes will have soil pushed out around the hole in a circular fashion, which may look like a boil (crayfish or crawdad). Watch for the movement of water and soil particles from these holes to determine whether they are boils.	1C: Backfill as deeply as possible with impervious material. If rodents become a nuisance, an effective rodent control program, as approved by the Illinois Department of Natural Resources District Wildlife Biologist, should be implemented.

Table 5: Midwest Generation Will County Station CCR Surface Impoundment EAP Notification List
September 2021

Plant Contacts:

Name	**Title**	**Contact Info**
Mr. DeAndre Cooley	Environmental Specialist Class K WWT Operator	(O) 815-207-5489 (C) 779-279-2321
Mr. Harrison Estepp	Chemical Specialist	(O) 815-207-5416 (C) 773-617-7515
Mr. Philip Raush	Station Director	(O) 815-372-4512 (C) 815-715-8532
Mr. Karl Kulpinski	Operations Manager	(O) 815-372-4515 (C) 815-315-2825
Mr. Don Fawcett	Maintenance Manager	(O) 815-372-4357 (C) 815-671-1060

Corporate Support:

Name	**Title**	**Contact Info**
Sharene Shealey	Director, Environmental	(C) 724-255-3220
Jill Buckley	Environmental Manager	(C) 724-448-9732
Tony Shea	Director - Environmental Compliance	(O) 609-524-4923 (C) 609-651-6478
David Schrader	Stations Communications Director (point of public contact)	(O) 267-295-5768 (C) 267-294-2860

Emergency Response Agencies:

Agency	Address	Contact Info
National Response Center (NRC) – US Army Corp of Engineers	Lockport Lock and Dam, Lockport, IL, Illinois River, Chicago Sanitary and Ship Canal 291.1 LDB	Phone: 800-424-8802 Emergency: 815-838-0536
Illinois Department of Natural Resources, Office of Water Resources	One Natural Resources Way, 2nd Floor Springfield, IL 62702-1271	8:30 a.m.-5:00 p.m. 217-785-3334
Illinois Emergency Management Agency (IEMA)	110 East Adams Springfield, IL 62701	800-782-7860
Illinois Environmental Protection Agency (IEPA)	Bureau of Water 1021 North Grand Avenue East Springfield, IL 62794	217-782-3637
Will County Emergency Management Agency Operations Center	302 N. Chicago Street Joliet, IL 60432	Phone: 815-740-8351 24-hour: 815-740-0911
Will County ETSB: Dispatches to Fire, Police and Emergency Medical services	302 N. Chicago Street Joliet, IL 60432	Emergency: 9-1-1 Non-Emergency: 815-740-8376
Lockport Township Police Department	1212 S. Farrell Road Lockport, IL 60441	Emergency: 9-1-1 Non-Emergency: 815-838-2131 Front Desk: 815-838-2132
Lockport Township Fire Department	19623 W. Renwick Road Lockport, IL 60441	Emergency: 9-1-1 Non-Emergency: 815-838-3287

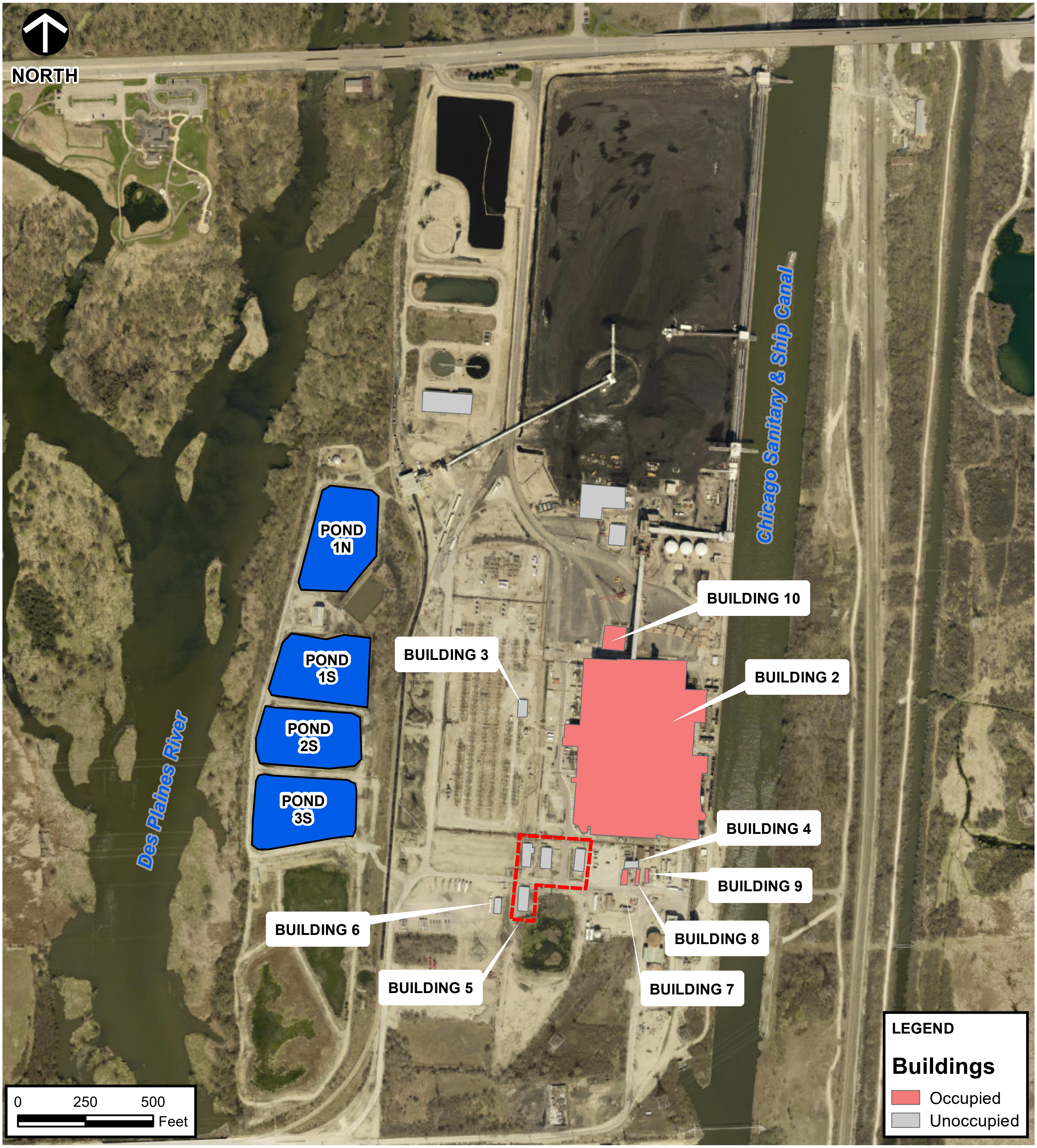
Environmental Response Contractors/Consultants:

Contractor/Consultant	Address	Contact Info
Civil & Environmental Consultants, Inc.	555 Butterfield Road, Suite 300 Lombard, IL 60148	630-963-6026
SET Environmental	450 Sumac Road Wheeling, IL 60090	847 850-1056 877-437-7455 (24-hr)

Table 6: Basin Characteristics

	Pond 1N	Pond 1S	Pond 2S	Pond 3S
Estimated Capacity (acre-feet)	14.06	12.63	13.2	15.1
Estimated Maximum Basin Depth (feet)	8	8	8	8.5

FIGURES



SOURCE: ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD_IMAGERY. LAST ACCESSED: 9/23/2021
IMAGE DATE: 04/20/2019

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MIDWEST GENERATION, LLC
HAZARD POTENTIAL
CLASSIFICATION ASSESSMENT
POND 1N AND POND 1S
WILL COUNTY, IL

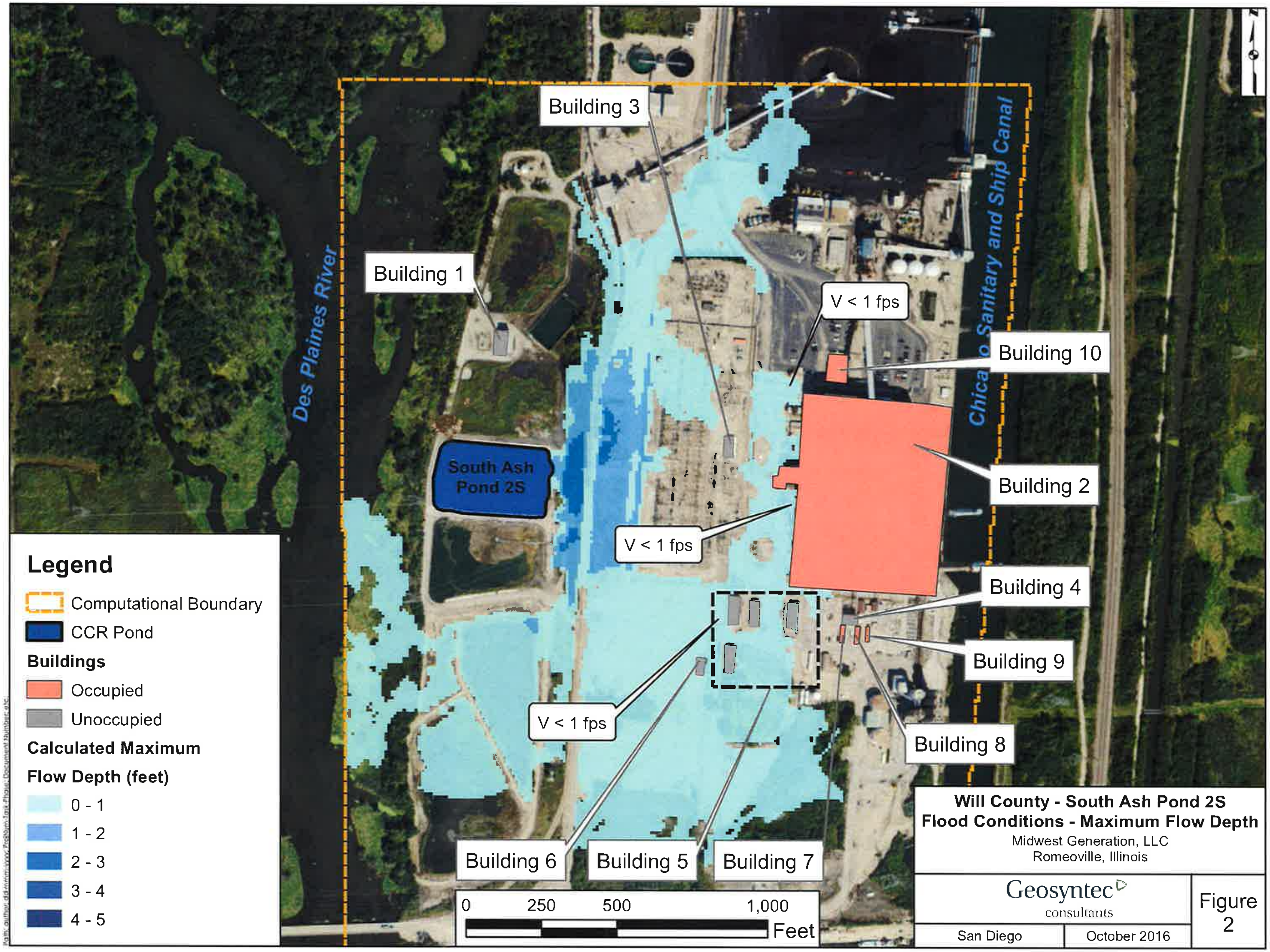
SITE MAP

DRAWN BY: CJG	CHECKED BY: CJG	APPROVED BY: MDG*	FIGURE NO: 1
DATE: SEPTEMBER 23, 2021	DWG SCALE: 1 " = 500 '	PROJECT NO: 312-192	

Signature on File *

APPENDIX A

GEOSYNTEC HPCA INUNDATION MAPS

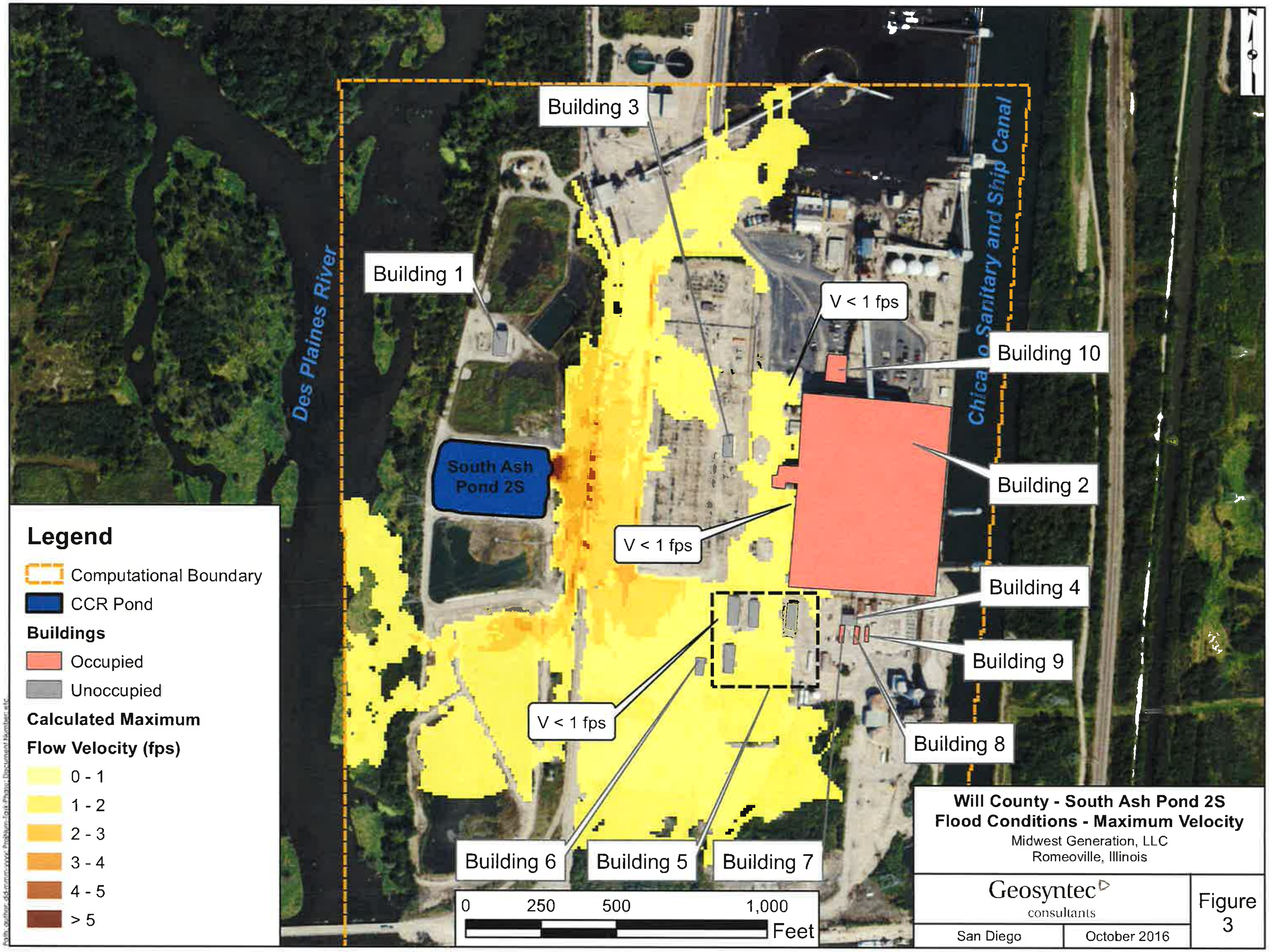


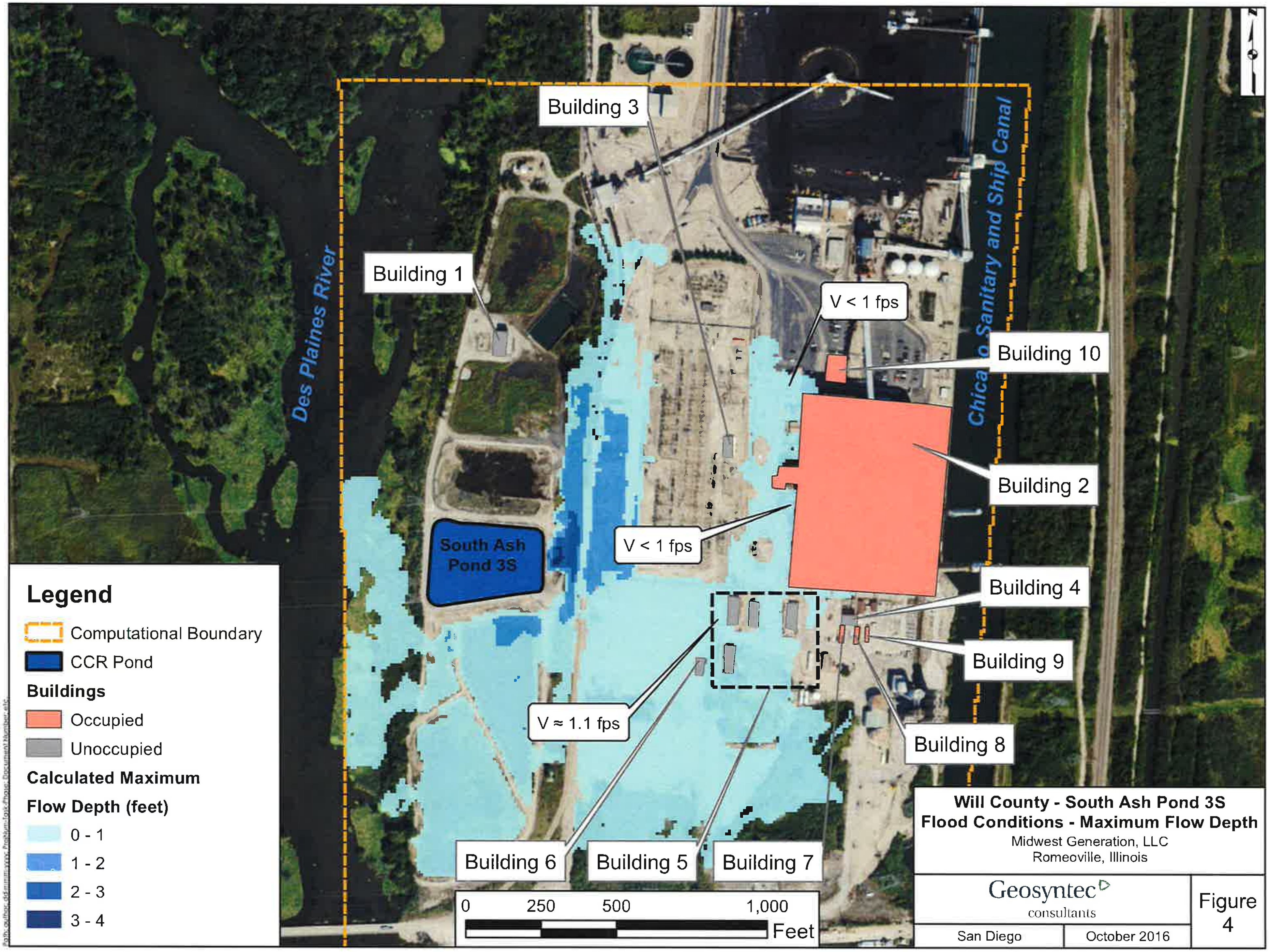
Will County - South Ash Pond 2S
Flood Conditions - Maximum Flow Depth
Midwest Generation, LLC
Romeoville, Illinois

Geosyntec consultants

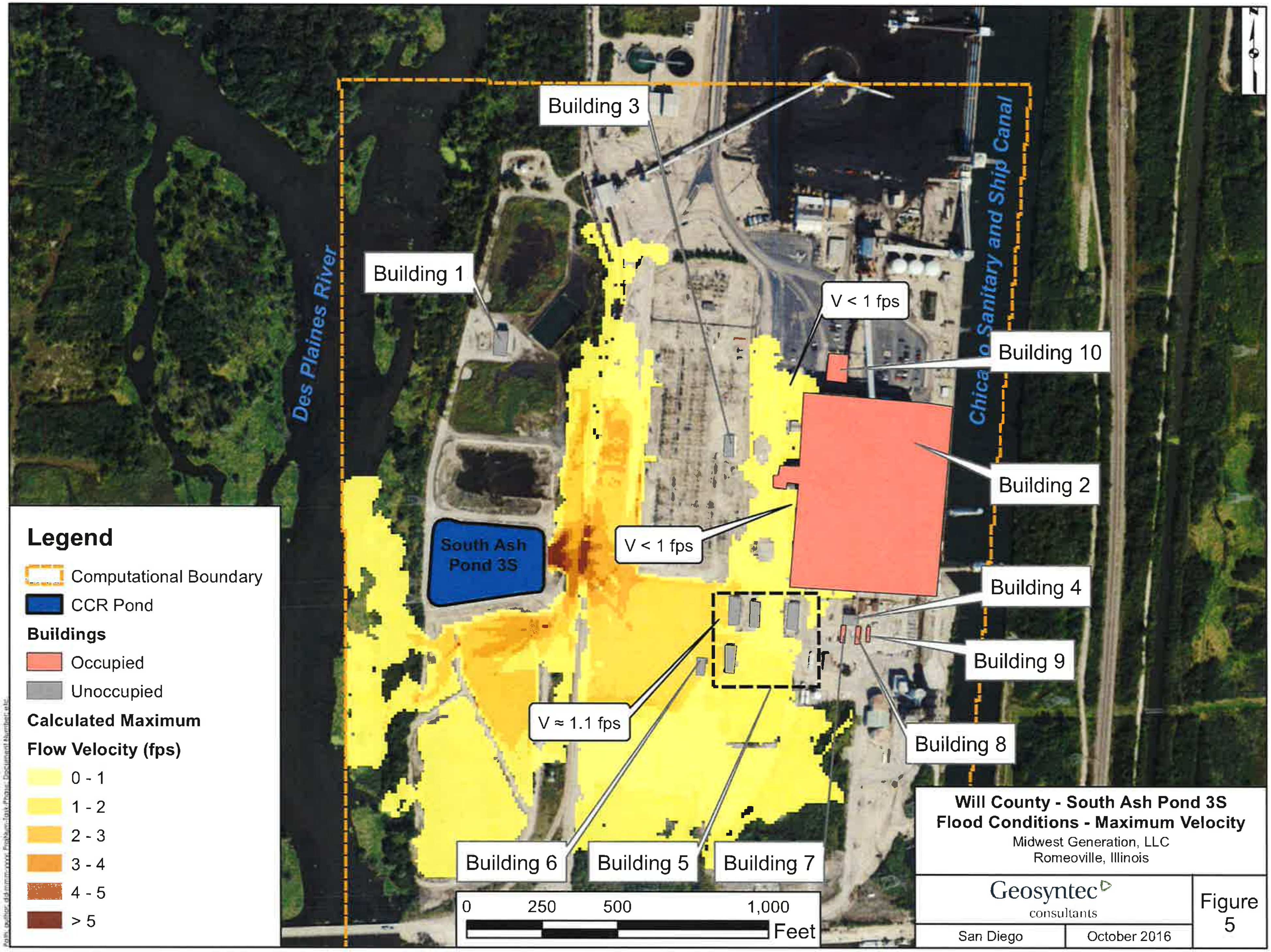
San Diego | October 2016

Figure 2


Building 3
Building 1
V < 1 fps
Building 10
Building 2
V < 1 fps
Building 4
Building 9
V < 1 fps
Building 8
Building 6
Building 5
Building 7
Des Plaines River
Chicago Sanitary and Ship Canal
South Ash Pond 2S
Legend
Computational Boundary
CCR Pond
Buildings
Occupied
Unoccupied
Calculated Maximum
Flow Velocity (fps)
0 - 1
1 - 2
2 - 3
3 - 4
4 - 5
> 5
0
250
500
1,000
Feet
Will County - South Ash Pond 2S
Flood Conditions - Maximum Velocity
Midwest Generation, LLC
Romeoville, Illinois
Geosyntec
consultants
San Diego
October 2016
Figure
3



Building 3
Building 1
Des Plaines River
Chicago Sanitary and Ship Canal
V < 1 fps
Building 10
Building 2
V < 1 fps
South Ash Pond 3S
Building 4
Building 9
V ≈ 1.1 fps
Building 8
Building 6
Building 5
Building 7
Legend
Computational Boundary
CCR Pond
Buildings
Occupied
Unoccupied
Calculated Maximum
Flow Depth (feet)
0 - 1
1 - 2
2 - 3
3 - 4
0
250
500
1,000
Feet
Will County - South Ash Pond 3S
Flood Conditions - Maximum Flow Depth
Midwest Generation, LLC
Romeoville, Illinois
Geosyntec
consultants
San Diego
October 2016
Figure
4



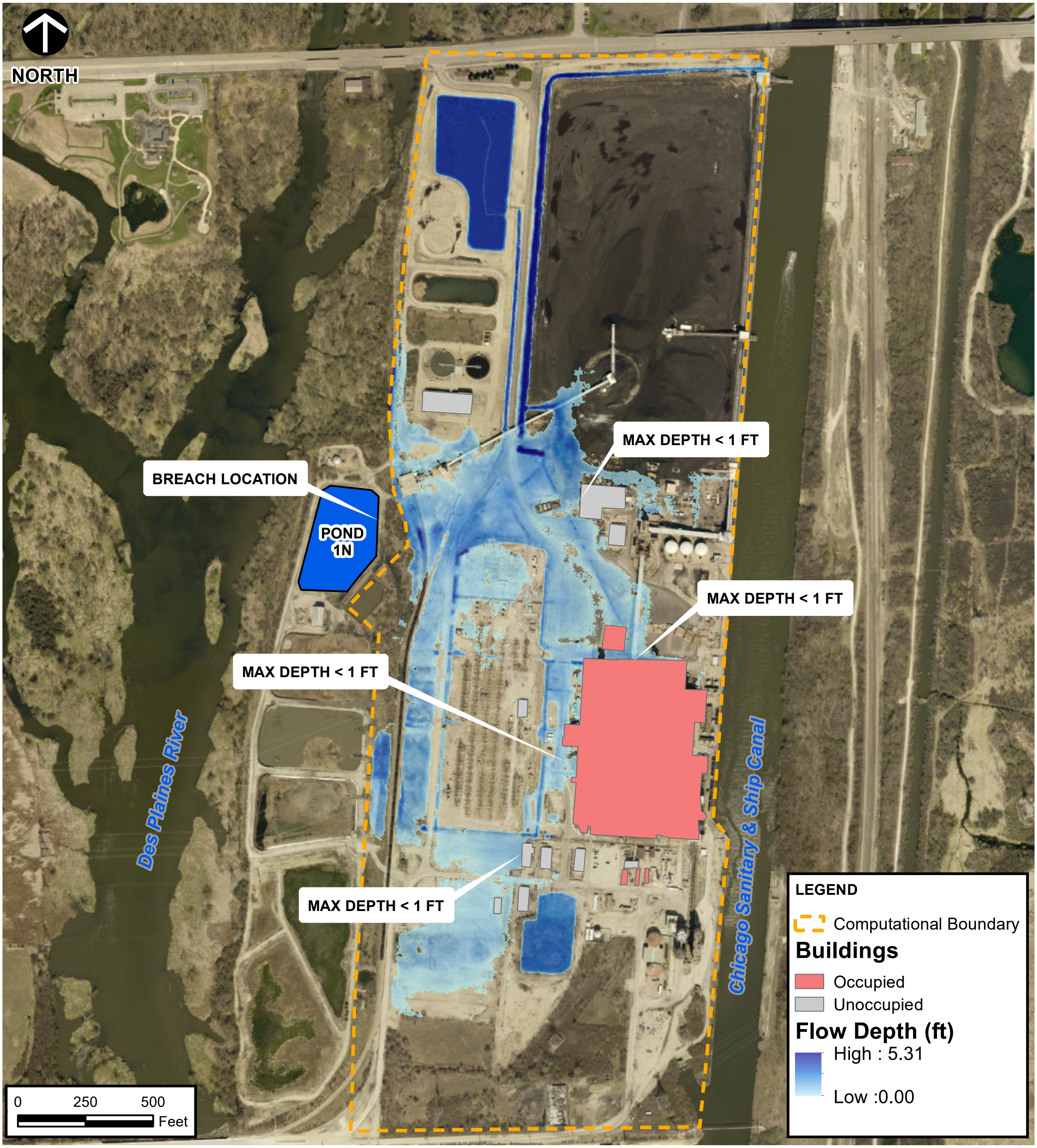
Will County - South Ash Pond 3S
Flood Conditions - Maximum Velocity
Midwest Generation, LLC
Romeoville, Illinois

Geosyntec consultants

San Diego	October 2016	Figure 5

APPENDIX B

CEC HPCA INUNDATION MAPS



SOURCE: ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD_IMAGERY. LAST ACCESSED: 9/23/2021
IMAGE DATE: 04/20/2019

CEC

Civil & Environmental Consultants, Inc.

1230 East Diehl Road, Suite 200 - Naperville, IL 60563

630-963-6026 - 800-759-5614

www.cecinc.com

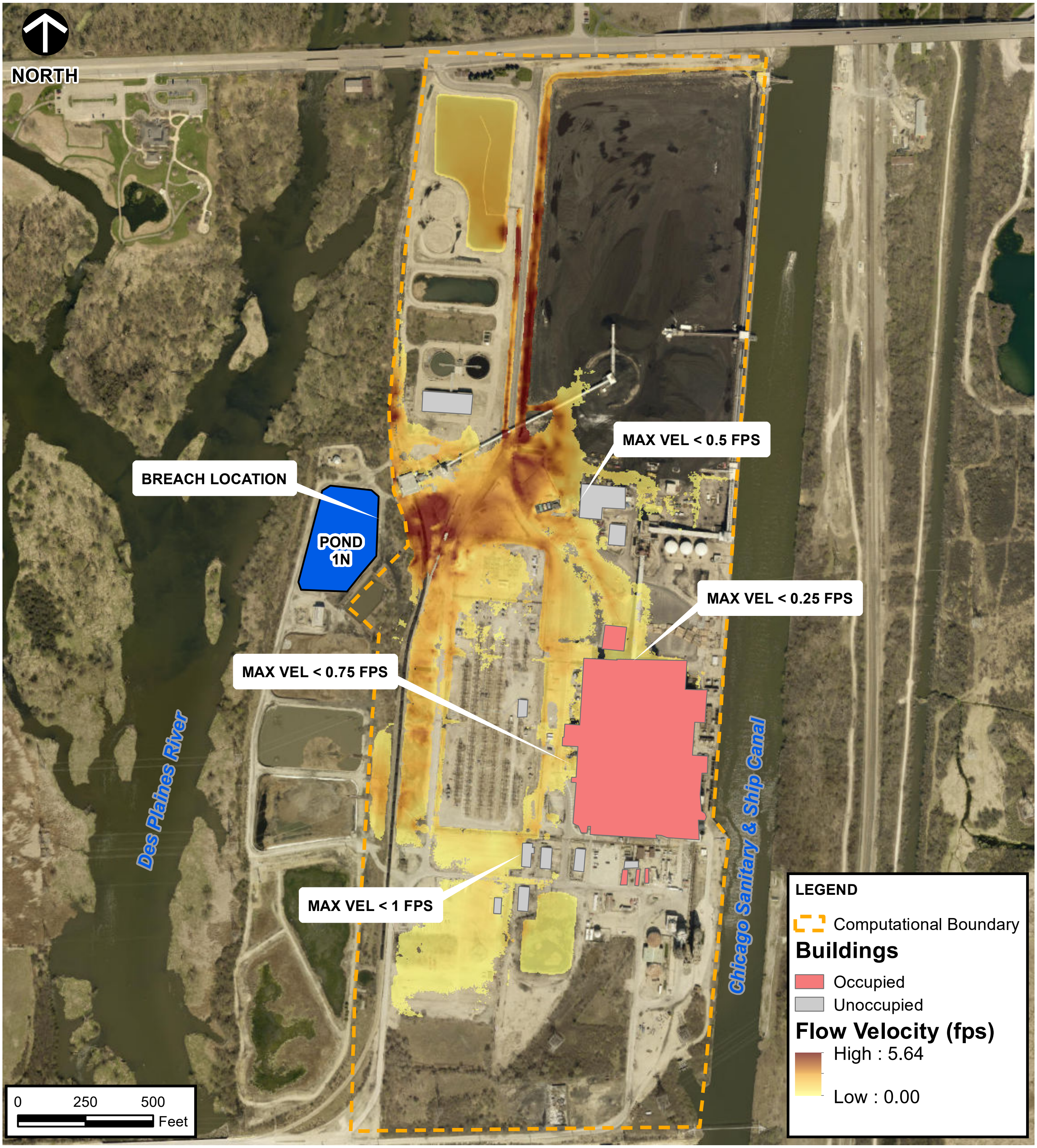
MIDWEST GENERATION, LLC
HAZARD POTENTIAL
CLASSIFICATION ASSESSMENT
POND 1N AND POND 1S
WILL COUNTY, IL

POND 1N MAXIMUM FLOW DEPTH

DRAWN BY:	CJG	CHECKED BY:	CJG	APPROVED BY:	MDG*	FIGURE NO:	2
DATE:	SEPTEMBER 23, 2021	DWG SCALE:	1 " = 500 '	PROJECT NO:	312-192		

Signature on File *

\\SHONIGFORD\Share\301-739 - CYSC\GIS\312-192 WR01 1N Depth Map.mxd - 9/23/2021 - 8:50:19 AM (shonigford)



SOURCE: ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD_IMAGERY. LAST ACCESSED: 9/23/2021
IMAGE DATE: 04/20/2019

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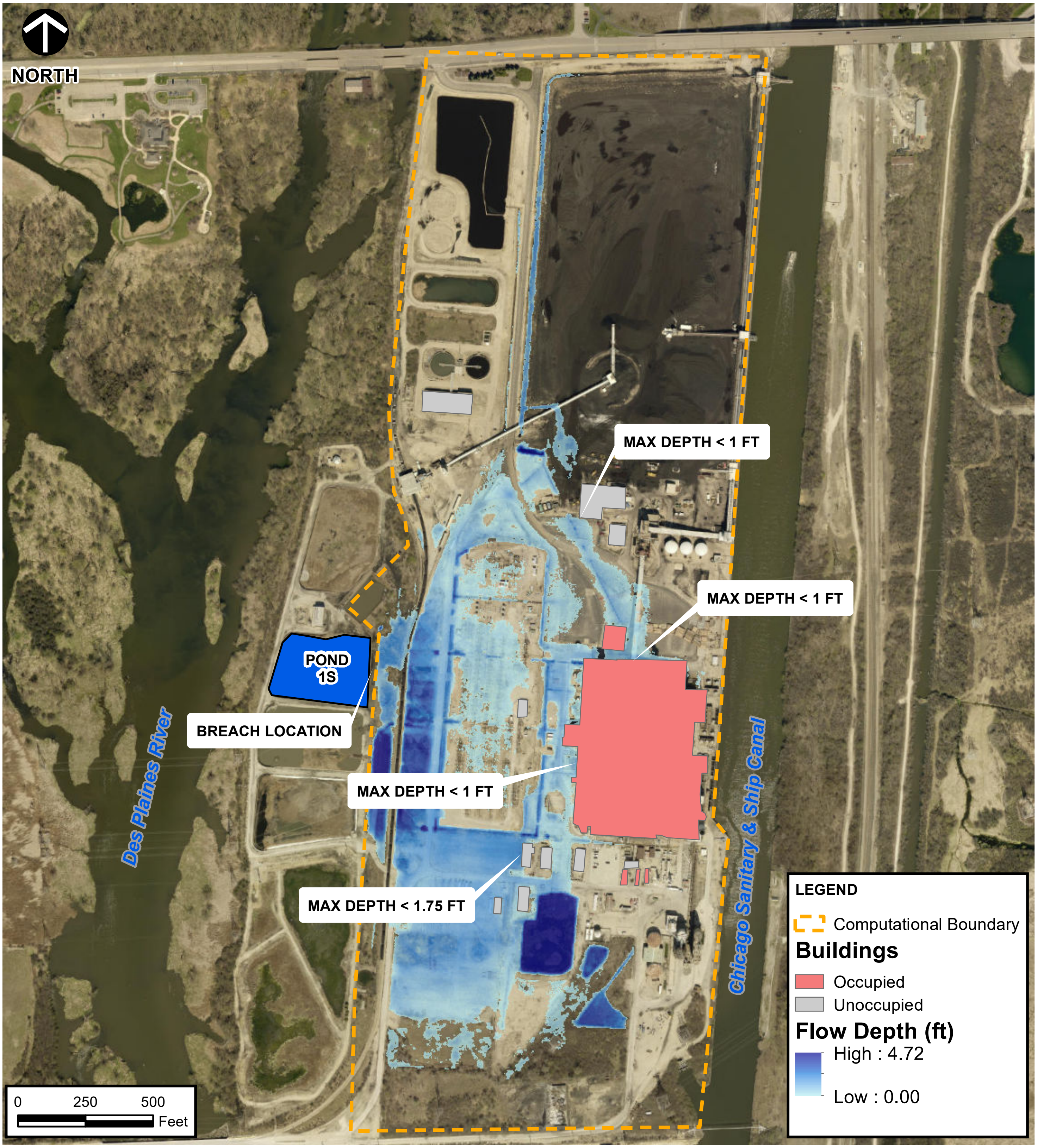
MIDWEST GENERATION, LLC
HAZARD POTENTIAL
CLASSIFICATION ASSESSMENT
POND 1N AND POND 1S
WILL COUNTY, IL

POND 1N MAXIMUM VELOCITY

DRAWN BY:	CJG	CHECKED BY:	CJG	APPROVED BY:	MDG*	FIGURE NO:	3
DATE:	SEPTEMBER 23, 2021	DWG SCALE:	1 " = 500 '	PROJECT NO:	312-192		

Signature on File *



SOURCE: ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD_IMAGERY. LAST ACCESSED: 9/23/2021
IMAGE DATE: MM/DD/YYYY

\\SHONIGFORD\Share\312-192\GIS\312-192_WR01_1S_Depth_Map.mxd - 9/23/2021 - 8:55:29 AM (shonigford)

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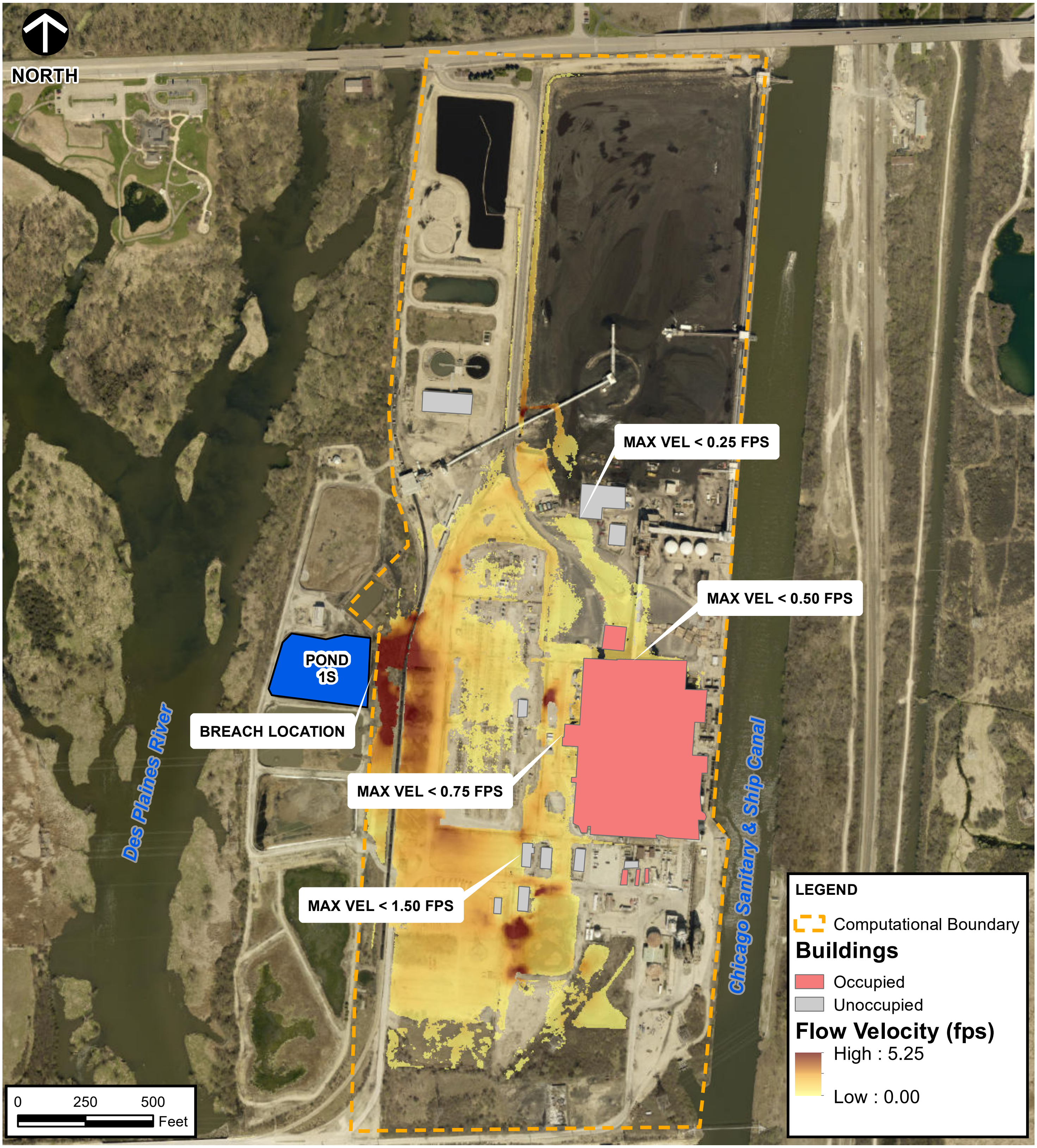
MIDWEST GENERATION, LLC
HAZARD POTENTIAL
CLASSIFICATION ASSESSMENT
POND 1N AND POND 1S
WILL COUNTY, IL

POND 1S MAXIMUM FLOW DEPTH

DRAWN BY:	CJG	CHECKED BY:	CJG	APPROVED BY:	MDG*	FIGURE NO:	4
DATE:	SEPTEMBER 23, 2021	DWG SCALE:	1 " = 500 '	PROJECT NO:	312-192		

Signature on File *



SOURCE: ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD_IMAGERY. LAST ACCESSED: 9/23/2021
IMAGE DATE: MM/DD/YYYY

\\SHONIGFORD\Share\312-192\GIS\312-192_WR01_1S_Velocity_Map.mxd - 9/23/2021 - 8:56:29 AM (shonigford)

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630-963-6026 - 800-759-5614
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MIDWEST GENERATION, LLC
HAZARD POTENTIAL
CLASSIFICATION ASSESSMENT
POND 1N AND POND 1S
WILL COUNTY, IL

POND 1S MAXIMUM VELOCITY

DRAWN BY:	CJG	CHECKED BY:	CJG	APPROVED BY:	MDG*	FIGURE NO:	5
DATE:	SEPTEMBER 23, 2021	DWG SCALE:	1 " = 500 '	PROJECT NO:	312-192		

Signature on File *

ATTACHMENT 8
FUGITIVE DUST CONTROL PLAN

CCR COMPLIANCE
FUGITIVE DUST CONTROL PLAN

Midwest Generation, LLC
Will County Generating Station
529 East 135th Street
Romeoville, Illinois

PREPARED BY: KPRG and Associates, Inc.
14665 W. Lisbon Road, Suite 1A
Brookfield, Wisconsin 53005

October 22, 2021

TABLE OF CONTENTS

SECTION/DESCRIPTION **PAGE**

APPENDICES

1.0 INTRODUCTION

On April 15, 2021, the Illinois Environmental Protection Agency adopted a new Part 845 of its waste disposal regulations creating statewide standards for the disposal of coal combustion residuals (CCR) in surface impoundments, created by the generation of electricity by coal-fired power plants. Part 845 specifically requires that “the owner or operator of a CCR surface impoundment, or any lateral expansion of a CCR surface impoundment, must adopt measures that will effectively minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from CCR surface impoundments, roads, and other CCR management and material handling activities”. As a result, each regulated facility must develop a CCR fugitive dust control plan that complies with 35 Ill. Adm. Code 845.500(b).

This site specific Fugitive Dust Control Plan (Plan) has been developed to comply with the requirements specified in Section 845.500. In general, the Plan identifies the potential CCR fugitive dust sources and describes the control measures that will be implemented to minimize CCR fugitive dust emissions. The Plan also includes a procedure for the periodic assessment of the Plan’s effectiveness, documentation of any Plan amendments deemed necessary to assure continued compliance, a record of any citizen complaints received pertaining to CCR fugitive dust emissions, and an outline of the required reporting and recordkeeping requirements in 35 Ill. Adm. Code 845.500.

2.0 SITE INFORMATION

2.1 Owner/Operator and Address:

Midwest Generation, LLC
Will County Generating Station
529 East 135th Street
Romeoville, Illinois

2.2 Owner Representative/Responsible Person Contact Information:

Mr. Philip Raush
Station Manager
815-372-4512

2.3 Location and Description of Facility Operations

The Midwest Generation Will County Generating Station is located at 529 East 135th Street, Romeoville, Will County, Illinois. The facility is a coal-fired electric power generating station currently occupying approximately 200 acres. There is currently one coal-fired operating unit, Unit 4. Electrical power is transmitted from the site to the area grid through overhead transmission power lines.

The general vicinity primarily includes industrial facilities, residential development, agricultural areas, and parklands.

3.0 POTENTIAL FUGITIVE DUST SOURCES

Potential fugitive dust sources associated with the bottom ash and slag and fly ash systems have been identified at the facility; however, some of these are regulated by the facility's operating permit and are adequately addressed within the required fugitive dust operating program. The potential CCR fugitive dust sources generally include exterior ash distribution systems, temporary ash storage locations, ash bulk loading/unloading operations and ash truck transportation routes. Fugitive dust could potentially be generated from these sources as a result of equipment malfunctions, wind erosion, housekeeping issues and/or the nature of the operation. Specifically, these identified sources were further evaluated to determine the probability of CCR fugitive dust being generated and to determine the level of emission controls that are warranted to mitigate fugitive dust emissions. The findings of the evaluation are individually discussed in the following sections.

3.1 Bottom Ash and Slag Distribution System

Collected bottom ash and slag in the boilers is transported as a liquid mixture through an enclosed piping system to Ash Pond 2S. Ash Pond 3S is currently not in service. Some of this piping is located inside a building; however, a portion is situated above ground and in the outside environment. Although not an anticipated occurrence, a breach in the exterior piping could result in the accidental release of bottom ash and slag and potential fugitive dust emissions if the material were to accumulate and dry out.

3.2 Ash Pond 2S and Ash Pond 3S

After settling occurs, water from Ash Pond 2S is ultimately discharged through a regulated NPDES outfall. Both of these ponds are normally filled with water; however, dredging occasionally may be required to remove the settled material from Ash Pond 2S as part of its operation. Ash Pond 3S will remain filled with water until closure is initiated. When dredging is necessary, because either Ash Pond 2S is full and removal is required or closure is initiated for Ash Pond 3S, the specific pond will be dewatered and the dredged material is allowed to dry. When the material is suitable for transport, it is loaded into open top trucks, covered and sent off site to a licensed landfill. Potential fugitive dust emissions could occur if dry bottom ash and slag residual is exposed or loaded during excessive windy and dry weather conditions.

3.3 Ash Pond 1N and Ash Pond 1S

Ash Pond 1N and Ash Pond 1S are inactive surface impoundments and no longer receive bottom ash or slag. The bottom ash/slag material remains within each pond. Standing water is not present and excessive precipitation that enters each pond will drain out of the pond into the outlet trough. The bottom ash/slag is substantially vegetated with minimal amounts of ash exposed. Some ash does have the potential to become airborne especially during excessively dry and windy conditions.

3.3 Fly Ash Handling Equipment

Collected fly ash in the precipitator hoppers is initially transported in a closed vacuum piping system to a cyclone and bag filter where it is mechanically separated from the air stream within an enclosed building. Fly ash is then sent to the fly ash silos through exterior piping. At the silos, the fly ash is drop loaded into trucks through a drop chute. The loading of fly ash occurs within a partially enclosed structure. After the trucks containing fly ash have been loaded, they proceed to a nearby platform to allow the truck driver to secure the truck and to broom sweep any residual fly ash remaining on the truck. This entire process is covered by the fugitive dust operating program for the facility.

3.4 Concrete Storage Pad

A grade-level concrete pad within a retaining wall having a windscreen is used for the temporary storage of residual bottom ash and slag and fly ash generated as a result of routine ash-related maintenance activities. The staged material is allowed to partially dry within the structure until it is suitable for off-site removal. The material is loaded into open top trucks, covered and sent off site to a licensed landfill. Dry material that is exposed during excessive windy and dry weather conditions has the potential for becoming fugitive dust emissions.

3.5 Ash Transport Roadways

Both gravel covered and asphalt paved roads within the facility are used by trucks hauling both bottom ash and slag and fly ash to an off-site licensed landfill as well as by other vehicles entering and exiting the facility. Fugitive CCR dust emissions could occur during transit if ash material is not properly cleaned from the trucks or if there is a release of ash material from the vehicle due to a malfunction or accident.

These potential fugitive dust sources are identified on the Site Diagram included in Appendix A.

4.0 DESCRIPTION OF CONTROL MEASURES

4.1 Purpose

The purpose of developing appropriate control measures is to minimize and reduce the emissions of CCR fugitive dust from the identified potential emission sources. The control measures and work practices implemented at the facility are described in the following sections.

4.2 Bottom Ash and Slag Distribution System

Bottom ash and slag is in a liquid mixture within a closed system until the point of discharge at Ash Pond 2S. A significant portion of the piping system is contained within a building, which eliminates dust emissions to the outside environment. An assessment of the exterior distribution system will be performed on a quarterly basis to verify the integrity of the system or when a breach in the system is detected. If a leak is noted, resulting in the release of bottom ash and slag, the affected area will be restored to original conditions and repair of the pipe will be performed as soon as feasible. The ash will be sent off site to a licensed landfill.

4.3 Ash Pond 2S and Ash Pond 3S

During normal operations, Ash Pond 2S is filled with water thereby suppressing any potential fugitive dust emissions. Ash Pond 3S was previously filled with water when it was operational and remains filled with water despite being out of service. Infrequently, Ash Pond 2S will need to be dewatered and the sediment removed off site to a licensed landfill. When Ash Pond 3S closure is initiated, it will be dewatered and the sediment removed off site to a licensed landfill. While the bottom ash and slag residue is drying, there is the potential for this material to become airborne especially during excessively dry and windy conditions. Loading of this material under these conditions also has the potential for generating fugitive dust. Dewatered ponds will be assessed on a quarterly basis or more frequently during excessively dry and windy conditions. To minimize fugitive dust emissions from exposed dry bottom ash and slag, the height of the staged material will be minimized and the material piles will be either sprayed with water or covered. Loading activities also will be limited during such occasions. Haul trucks are covered with tarps once they have been loaded.

4.4 Ash Pond 1N and Ash Pond 1S

Ash Pond 1N and Ash Pond 1S are inactive surface impoundments and no longer receive bottom ash or slag. The bottom ash/slag material remains within each pond. Precipitation that falls on the bottom ash/slag prevents it from drying out and becoming airborne. Standing water is not present and excessive precipitation that enters each pond will drain out of the pond into the outlet trough. The bottom ash/slag is substantially vegetated with minimal amounts of ash exposed. Some ash does have the potential to become airborne especially during excessively dry and windy conditions. Each pond will be assessed at least quarterly or more frequent during excessively dry and windy conditions. To minimize fugitive dust emissions from exposed dry bottom ash and slag, the material will be sprayed with water, as needed.

4.5 Fly Ash Handling Equipment

Fly ash from the mechanical separators is sent to the silos within enclosed piping. At the silos, the fly ash is drop loaded into a tank truck through a drop chute. This loading mechanism minimizes the potential for fly ash to become airborne during the loading process. The loading of trucks also occurs within a partial enclosure. At the completion of loading, the truck moves a short distance to an elevated truck stand where it is broom swept to remove any accumulated fly ash. Accumulated ash is promptly transferred to the fly ash concrete storage pad.

This process is covered by the facility's fugitive dust operating program. Under the program, the facility must maintain control measures, including enclosures, covers and dust collection devices. Additionally, the facility is required to conduct weekly inspections of the process to confirm compliance. A record of the inspections is maintained at the facility.

4.6 Concrete Storage Pad

The concrete pad only periodically contains bottom ash and slag, fly ash and other ash-related materials generated from routine maintenance activities. Typically these materials are in a wet state but are allowed to partially dry to facilitate removal. When sufficiently dry, the material is promptly removed to an off-site licensed landfill. The concrete pad will be assessed on a quarterly basis or more frequently during excessively dry and windy conditions. To minimize fugitive dust emissions from exposed dry bottom ash and slag, fly ash, and other ash-related materials, the height of the staged material will be minimized and the material piles will be either sprayed with water or covered.

4.7 Ash Transport Roadways

Truck drivers are instructed on the proper procedure for cleaning trucks and a vehicle speed limit is enforced at the facility. Ash material that may not have been adequately removed from the trucks has the potential to become airborne and ultimately be deposited on haul roads. To minimize fugitive dust emissions, these roads will be assessed on a quarterly basis and any observed accumulated ash material will be promptly cleaned up and collected for off-site removal to a licensed landfill.

5.0 PLAN ASSESSMENTS/AMENDMENTS

To assure that the work practices being implemented adequately control the dust from the identified potential fugitive dust emission sources at the facility, routine assessments and record keeping are performed. These procedures include the following:

5.1 Fugitive CCR Dust Assessments

Pursuant to 845.500(b)(3), assessments of the potential CCR fugitive dust emission sources identified within this Plan will be conducted to assess the effectiveness of this Plan. The assessment will include observation of ash removal from ponds, temporary storage and transport activities at the facility to confirm the adequacy of the control measures. The assessments will be conducted on a quarterly basis by an individual designated by the contact identified in Section 2.2 of this Plan. Observations made during each assessment will be recorded on a form similar to the one included in Appendix B; however, the station may create their own form.

If the results of the assessment determine that ash-related equipment has malfunctioned or the integrity of the equipment has been compromised, the necessary repairs or replacement will be performed as soon as feasible. If the assessment finds that this Plan does not effectively minimize the CCR from becoming airborne, this Plan will be amended to include additional control measures.

5.2 Plan Amendments

This Fugitive Dust Plan will be reviewed whenever there is a change in conditions that would substantially affect the written Plan currently in place. A record of the reviews and any modifications or amendments made to the Plan currently in place will be kept on a form similar to the one included in Appendix C; however, the station may create their own form. The amended Plan will be reviewed by a Registered Professional Engineer and, if deemed acceptable, will be recertified.

5.3 Citizen Complaints

Any written or verbal complaints received from a citizen involving alleged CCR fugitive dust emission events at the facility will be recorded by an individual designated by the contact identified in Section 2.2 of this Plan. The complaints will be recorded on a form similar to the one included in Appendix D; however, the station may create their own form. Upon receipt of the complaint, an investigation of the alleged source of the fugitive dust emissions will be performed and the results of that investigation recorded on the form. If the fugitive dust emission event is confirmed, any necessary repairs or changes in operation required to mitigate the fugitive dust emissions will be implemented as soon as practicable.

6.0 FUGITIVE DUST PLAN REPORTING/RECORDKEEPING REQUIREMENTS

This section outlines the Plan reports that must be prepared and records that must be maintained to meet the requirements specified in 35 Ill. Adm. Code Section 845.500. These requirements include the following:

- Place the Plan in the facility's operating record and publicly accessible internet site. If the Plan is amended, replace the initial Plan with the amended Plan. Only the most recent amended Plan will be maintained in the facility's operating record and internet site.

- Prepare an annual CCR Fugitive Dust Control Report and submit to the IEPA as part of the annual consolidated report required by 845.550. The annual report will include:
  - A description of the actions taken to control CCR fugitive dust,
  - A record of all citizen complaints, and
  - A summary of any corrective measures taken.
  - Placement of this report in the operating record and publicly accessible internet site.

- Provide notification to the IEPA and, if applicable, the Tribal authority when the Plan and reports are placed in the facility's operating record and publicly accessible internet site.

- Submit quarterly reports to IEPA within 14 days from the end of the quarter of all complaints received in that quarter. The quarterly reports will include:
  - The date of the complaint,
  - The date of the incident,
  - The name and contact information of the complainant, and
  - All actions taken to assess and resolve the complaint.

7.0 PROFESSIONAL ENGINEER CERTIFICATION

The undersigned Registered Professional Engineer is familiar with the requirements of 845.500 and has visited and examined the facility or has supervised examination of the facility by appropriately qualified personnel. The undersigned Registered Professional Engineer attests that this CCR Fugitive Dust Control Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and meets the requirements of 845.500, and that this Plan is adequate for the facility. This certification was prepared as required by 845.500(b)(7).

Engineer: Joshua D. Davenport

Signature: ______________________

Date: 10/22/21

Company: KPRG and Associates, Inc.

Registration State: Illinois

Registration Number: 062.061945

License Expiration Date: November 30, 2021

Professional Engineer Stamp:

JOSHUA D. DAVENPORT
062-061945
LICENSED
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS

APPENDIX A

SITE DIAGRAM
POTENTIAL FUGITIVE DUST SOURCES

W:\projects\midwest generation\attorney-client privilege\fugitive dust plans\will county dust map.dwg

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG

KPRG and Associates, inc.

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

SITE DIAGRAM/FUGITIVE DUST SOURCES

WILL COUNTY GENERATING STATION
ROMEOVILLE, ILLINOIS

Scale: 1" = 500'

Date: October 21, 2021

KPRG Project No. 15315

APPENDIX A

APPENDIX B

ASSESSMENT RECORD

APPENDIX B

WILL COUNTY STATION

EXAMPLE ASSESSMENT RECORD

Date	Inspector	Unit Inspected	Maintenance/Cleanup Required (yes/no)	Response Action Performed (completion date)	Inspector Signature

APPENDIX C

PLAN REVIEW AND AMENDMENT RECORD

APPENDIX C

WILL COUNTY STATION

EXAMPLE CCR PLAN REVIEW/AMENDMENT RECORD

Date of Review	Reason for Review	Section Amended	P.E. Certification (Name/Date)

APPENDIX D

CITIZEN COMPLAINT LOG

APPENDIX D

WILL COUNTY STATION

EXAMPLE CITIZEN COMPLAINT LOG

Date	Time	Citizen Information (Name, Address, Phone No., Email)	Summary of Complaint	Action Taken	Recorded By

ATTACHMENT 9
GROUNDWATER MONITORING INFORMATION

Attachment 9-1 – Local Well Stratigraphy Information

ID	Well_Count	Well_ID	From	To	Original Logged Description	Grouped As_ToUseToDefine_K_intervals	Base of Model	Notes	Ignored
1		121974178000	0	18	fill, clay	FILL			
2	1	121974178000	18	120	limestone	Carbonates			
3		121974178000	120	200	soft green shale	shale	x	Assumed base of model	
4		121974178000	200	300	limestone mix shale streaks	Carbonates and Shale			x
5		121974281000	0	62	limestone	Carbonates			
6		121974281000	62	71	limestone w/shale layers	Carbonates and Shale			
7		121974281000	71	77	limestone	Carbonates			
8		121974281000	77	79	limestone - shale mix	Carbonates and Shale			
9		121974281000	79	128	limestone	Carbonates			
10	2	121974281000	128	216	shale	shale	x	Assumed base of model	
11		121974281000	216	233	limestone-shale mix	Carbonates and Shale			x
12		121974281000	233	312	shale	shale			x
13		121974281000	312	497	limestone	Carbonates			x
14		121974281000	497	505	limestone with shale streaks	Carbonates and Shale			x
15		121974281000	505	536	limestone	Carbonates			x
16		121974281000	536	540	limestone with shale layers	Carbonates and Shale			x
17		121973091600	0	3	sand & gravel	sand and gravel			
18	3	121973091600	3	140	rock	Carbonates			
19		121973091600	140	160	shale	shale	x		
20		121973467500	0	15	clay & gravel	clay, sand, gravel			
21	4	121973467500	15	145	rock	Carbonates			
22		121973467500	145	180	shale	shale	x		
23		121972436300	0	1	drift	sand			
24		121972436300	1	145	lime	Carbonates			
25		121972436300	145	239	shale & lime - Maquoketa	shale	x		
26		121972436300	239	330	shale w/lime	Carbonates and Shale			x
27		121972436300	330	433	lime & shale - Galena	sandstone			x
28		121972436300	433	676	lime	carbonates			x
29		121972436300	676	690	sand w/lime - St. Peter	sandstone			x
30		121972436300	690	780	sand w/ lime & shale	sandstone			x
31		121972436300	780	798	sand & lime	sandstone			x
32	5	121972436300	798	860	lime - Knox	sandstone			x
33		121972436300	860	913	lime & dolomite sand	carbonates			x
34		121972436300	913	1009	lime	carbonates			x
35		121972436300	1009	1100	lime w/sand	carbonates			x
36		121972436300	1100	1176	gray lime	carbonates			x
37		121972436300	1176	1190	lime	carbonates			x
38		121972436300	1190	1300	lime w/sand - Franconia	carbonates			x
39		121972436300	1300	1350	sand w/lime - Ironton	sandstone			x
40		121972436300	1350	1477	sand	sandstone			x
41		121972436300	1477	1510	lime - Eau Claire	carbonates			x
42		121972438900	0	88	drift	sand			
43		121972438900	88	153	lime	Carbonates			
44		121972438900	153	218	sandy lime	Carbonates			
45		121972438900	218	611	lime & shale	shale	x		
46	6	121972438900	611	683	lime - St. Peter @665'	sandstone			x
47		121972438900	683	835	sand - Knox @ 790'	sandstone			x
48		121972438900	835	889	lime & shale	carbonates			x
49		121972438900	889	1199	lime	carbonates			x
50		121972438900	1199	1465	sand w/lime - Franconia, Ironton @ 1290'	sandstone			x
51		121972438900	1465	1503	lime - Eau Claire @ 1485'	carbonates			x
52		121970352400	0	15	sandy clay	clay, sand			
53	7	121970352400	15	39	gravel	sand and gravel			
54		121970352400	39	42	broken limestone	Carbonates			
55		121970352400	42	115	limestone	Carbonates			
56		121970127500	0	135	No Record				
57		121970127500	135	315	Maquoketa	shale	x		
58		121970127500	315	665	Galena	sandstone			x
59	8	121970127500	665	790	St Peter	sandstone			x
60		121970127500	790	1185	Knox	sandstone			x
61		121970127500	1185	1300	Franconia	sandstone			x
62		121970127500	1300	1475	Ironton	sandstone			x
63		121970127500	1475	1536	Eau Claire	sandstone			x
64		121970025300	0	156	limestone	Carbonates			
65		121970025300	156	317	Maquoketa	shale	x		
66		121970025300	317	660	Galena	sandstone			x
67	9	121970025300	660	944	St Peter	sandstone			x
68		121970025300	944	1197	Knox	sandstone			x
69		121970025300	1197	1300	Franconia	sandstone			x
70		121970025300	1300	1497	Ironton	sandstone			x
71		121970025300	1497	1509	Eau Claire	sandstone			x
72	10	121970184300	0	42	overburden	topsoil			
73		121970184300	42	160	rock formation	Carbonates			
74		121972479600	0	5	clay	clay			
75	11	121972479600	5	55	limestone	Carbonates			
76		121972479600	55	100	shale	shale	x	We could ignore this 45 feet of "shale" if we think it is wrong	
77		121972479600	100	145	limestone	Carbonates			x
78	12	121972583600	0	50	till	overburden			
79		121972583600	50	60	limestone	Carbonates			
80		121970127600	124	310	Maquoketa	shale	x		
81		121970127600	310	670	Galena	sandstone			x
82		121970127600	670	830	St Peter	sandstone			x
83	13	121970127600	830	1180	Knox	sandstone			x
84		121970127600	1180	1290	Franconia	sandstone			x
85		121970127600	1290	1485	Ironton	sandstone			x
86		121970127600	1485	1535	Eau Claire	sandstone			x
87		121974644100	0	3	Topsoil	topsoil			
88	13	121974644100	3	20	clay-shale	clay			
89		121974644100	20	49	dolomite	carbonates			
90		121974634900	0	1	Sugar Run-Romeo Trans	carbonates			
91		121974634900	1	21.6	Romeo Dolomite	carbonates			
92	14	121974634900	21.6	23.1	Romeo-Markgraf Trans	carbonates			
93		121974634900	23.1	43.7	Markgraf Trans	carbonates			
94		121974634900	43.7	44.9	Markgraf-Brandon Bridge Trans	carbonates			
95		121974634900	44.9	53	Brandon Bridge Dolomite	carbonates			
96		121974482200	0	0.42	Asphalt 5"				
97		121974482200	0.42	1.25	Brown sand & gravel, damp (base) 10"	sand and gravel			
98	15	121974482200	1.25	4	Fill	fill			
99		121974482200	4	5	Brown limestone weathered	Carbonates			
100		121974482200	5	15	Brown limestone	Carbonates			
101		121974655800	0	0.5	black loam	loam			
102	16	121974655800	0.5	1.42	yellow clayey silt & broken rock	silt and clay			
103		121974655800	1.42	11.42	white limestone	Carbonates			
104		121974655900	0	0.5	black loam	loam			
105	17	121974655900	0.5	1	yellow clayey silt & broken rock	silt and clay			
106		121974655900	1	11.25	white limestone	Carbonates			

107	18	121974653200	0	1	soft black clayey loam with some pieces of rock	loam			
108		121974653200	1	3.5	large pieces of rock with some clay	clay, sand, gravel			
109		121974653200	3.5	8	silty hard gray clay with some rock fragments and gra	clay, sand, gravel			
110		121974653200	8	18.83	silty hard gray clay with some small to very large rock	clay, sand, gravel			
111		121974653200	18.83	19.17	white limestone	Carbonates			
112		121974653200	19.17	24.5	silty hard gray clay with some small to very large rock	clay, sand, gravel			
113		121974653200	24.5	35	hard green shale with some seams of clay	shale			x
114		121974653200	35	36	greenish white limestone with some seams of clay	Carbonates			
115	19	121974655100	0	0.5	black loam	loam			
116		121974655100	0.5	4.83	yellow clayey silt & broken rock	silt and clay			
117		121974655100	4.83	15	white limestone	Carbonates			
118		121974655100	15	23.5	shale & disintegrated rock	shale			x
119	20	121974654900	0	0.67	soft black clay loam with some pieces of rock	loam			
120		121974654900	0.67	5.42	very large pieces of yellow limestone	Carbonates			
121		121974654900	5.42	49.25	white limestone	Carbonates			
122		121974654900	49.25	54.25	very hard white-green & pink limestone	Carbonates			
123	21	121974652500	0	0.5	black loam	loam			
124		121974652500	0.5	1	yellow clayey silt and broken rock	silt and clay			
125		121974652500	1	5.67	white limestone	Carbonates			
126		121974652500	5.67	6	gray sandy silt	sand			
127		121974652500	6	11	white limestone	Carbonates			
128	22	121974650200	0	12	Silty clay sinkhole filling	fill			
129		121974650200	12	24.2	dolomite	carbonates			
130	23	121974648700	0	2.5	Weathered brown dolomite and clay	carbonates			
131		121974648700	2.5	5.5	dolomite	carbonates			
132		121974648700	5.5	8.6	Shale	shale			x
133		121974648700	8.6	31.3	dolomite	carbonates			
134	24	121974622200	0	1.6	Sugar Run-Romeo Trans	carbonates			
135		121974622200	1.6	23.6	Romeo Dolomite	carbonates			
136		121974622200	23.6	25	Romeo-Markgraf Trans	carbonates			
137		121974622200	25	46.6	Markgraf Dolomite	carbonates			
138		121974622200	46.6	47.9	Markgraf-Brandon Bridge Trans	carbonates			
139		121974622200	47.9	57.4	Brandon Bridge Dolomite	carbonates			
140	25	121974281100	0	57	limestone	carbonates			
141		121974281100	57	76	limestone with shale layers	Carbonates and Shale			
142		121974281100	76	127	limestone	Carbonates			
143		121974281100	127	130	shale	shale	x		
144	26	121972552500	0	60	overburden	overburden			
145		121972552500	60	120	rock formation	Carbonates			
146	27	121973976800	0	12	gravel	sand and gravel			
147		121973976800	12	110	limestone	Carbonates			
148		121973976800	110	120	limestone & shale	Carbonates and Shale			
149	28	121974053100	0	8	soil rock & clay	topsoil			
150		121974053100	8	141	limestone, flowing well	Carbonates			
151	29	121973630100	0	3	soil/clay/fill	fill			
152		121973630100	3	15	dolomite	dolomite			
153	30	121973629800	0	1	crushed limestone roadbase	fill			
154		121973629800	1	8	clay	clay			
155		121973629800	8	25	dolomite	carbonates			
156	31	121974691400	0	18	clay	clay			
157		121974691400	18	51	clay with fine gravel layers	clay, sand, gravel			
158		121974691400	51	54	coarse caving gravel	sand and gravel			
159		121974691400	54	92	clay with sand layers	clay, sand			
160		121974691400	92	98	clay	clay			
161		121974691400	98	111	limestone with fractures	Carbonates			
162		121974691400	111	131	shale	shale	x		
163		121974691400	131	240	limestone	Carbonates			x
164	32	121974121000	0	4	clay	clay			
165		121974121000	4	18	coarse gravel	sand and gravel			
166		121974121000	18	50	fine gravel	sand and gravel			
167		121974121000	50	147	limestone	Carbonates			
168		121974121000	147	155	limestone & shale mix (hard)	Carbonates and Shale			
169		121974121000	155	220	limestone	Carbonates			
170	33	121973735700	0	25	clay & boulders	clay			
171		121973735700	25	74	sand & fine gravel	sand and gravel			
172		121973735700	74	125	white limestone	Carbonates			
173		121973735700	125	150	hard gray shale	shale	x		
174		121973735700	150	205	brown & white limestone	Carbonates			x
175	34	MW-01	0	5	Fill: Black coal cinders, fine gravel, cobbles, crushed r	Fill			
176		MW-01	5	9	Gravel, weathered, limestone, silt	sand and gravel			
177		MW-01	9	19	Weathered limestone bedrock	Carbonates			
178	35	MW-02	0	7	Fill: Black coal ash, brown gravely clay, sand, gray silty	Fill			
179		MW-02	7	8.5	Fill: Rubble	Fill			
180		MW-02	8.5	12	Black coal cinders, coal dust, clay fill	Fill			
181		MW-02	12	22	Weathered limestone bedrock	Carbonates			
182	36	MW-03	0	7.5	FILL: Black coal ash, gravel, coarse sand, crushed rock	Fill			
183		MW-03	7.5	10	GC: Gray gravel, silt	sand and gravel			
184		MW-03	10	19.5	Weathered limestone bedrock	Carbonates			
185	37	MW-04	0	6	FILL: Brown fine sand, black ash, crushed rock, fine to	Fill			
186		MW-04	6	9	Gray silt, weathered limestone, moist to dry	Carbonates			
187		MW-04	9	20	Limestone bedrock, weathered	Carbonates			
188	38	MW-05	0	8	FILL: Brown silty clay, fine gravel, coarse gravel, crush	Fill			
189		MW-05	8	9	GC: Brown gravel, clay, silty, wet	clay, sand, gravel			
190		MW-05	9	20	Weathered limestone bedrock	Carbonates			
191	39	MW-06	0	8	FILL: Crushed stone, brown medium sand, black coal	Fill			
192		MW-06	8	10.5	CL: Gray silty clay, coarse to fine gravel, trace coarsM	clay, sand, gravel			
193		MW-06	10.5	18	Weathered limestone bedrock	Carbonates			
194	40	MW-07	0	3.5	FILL: Crushed stone, gravel, silt, sand	Fill			
195		MW-07	3.5	7	FILL: Rock rubble, dry	Fill			
196		MW-07	7	8.5	GC: Brown gravel, silt, coarse sand, saturated	sand and gravel			
197		MW-07	8.5	18	Weathered limestone bedrock	Carbonates			
198	41	MW-08	0	0.5	CL: Dark brown clayey silt, dry	Silt and Clay			
199		MW-08	0.5	5.5	FILL: Coarse gravel, crushed rock, dry	Fill			
200		MW-08	5.5	7	FILL: Crushed rock, silty gravel	Fill			
201		MW-08	7	19	Weathered limestone bedrock	Carbonates			

202		MW-09	0	5	FILL: Crushed rock, coarse sand, some silt	Fill			
203		MW-09	5	6	FILL: Some brown silty clay	Fill			
204	42	MW-09	6	10.5	GC: Gray silty clay, fine and coarse gravel, some coars	clay, sand, gravel			
205		MW-09	10.5	11.5	GC: Clayey gravel	clay, sand, gravel			
206		MW-09	11.5	19	Weathered limestone bedrock	Carbonates			
207		MW-10	0	10	FILL: Crushed Limestone, silt, gravel	Fill			
208	43	MW-10	10	12	GC: Weathered limestone, clay, sand, gravel	clay, sand, gravel			
209		MW-10	12	20	Weathered limestone bedrock	Carbonates			
210		MW-11	0	1	Roadway of sand and gravel	sand and gravel			
211		MW-11	1	2	Sand and Gravel, Dark brown, fine to medium, silty, d	sand and gravel			
212	44	MW-11	2	3	Clay, brown, with sand and gravel, slightly moist	clay, sand, gravel			
213		MW-11	3	7.5	Gravel, limestone/dolomite, dry to slightly moist	sand and gravel			
214		MW-11	7.5	13	Clay, dark brown and black, silty, some sand and grav	clay, sand, gravel			
215		MW-11	13	22	Weathered Bedrock, dolomite	Carbonates			
216		MW-12	0	1	Roadway of sand and gravel	Fill			
217		MW-12	1	2	Sand, Black, Brown, fine to medium, silty, dry	sand			
218		MW-12	2	4	Clay with Gravel, slightly moist	clay, sand, gravel			
219		MW-12	4	4	Gravel layer	sand and gravel			
220	45	MW-12	4	7	Clay with Gravel, slightly moist	clay, sand, gravel			
221		MW-12	7	11.5	Silty Sand, fine to medium, black, moist	sand			
222		MW-12	11.5	12	Silty sand, tan to white, fine to medium, wet	sand			
223		MW-12	12	13.5	Silty Sand, brown, medium to coarse, wet	sand			
224		MW-12	13.5	15.5	Silt and clay, dark gray, trace sand and gravel, very so	silt and clay			
225		MW-12	15.5	20	Clay, white, light greenish gray, orange mottled, mois	clay			

<u>Attachment 9-2 – Boring Logs</u>

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-1-Wi** SHEET **1** OF **1**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Will County Station**

LOGGED BY **MPG**
GROUND ELEVATION **589.8**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 50 LL / Unconfined Compressive Strength (TSF) 1 2 3 4 5	NOTES & TEST RESULTS
589.8	0.0		Black coal cinders, fine gravel, cobbles, crushed rock FILL				
				SS-1 1.0-2.5 7"R	5 10 14		qu=NT
							Bentonite seal 2.0'-8.0'. Stickup protective cover installed.
				SS-2 3.5-5.0 10"R	4 9 15		qu=NT
584.8	5.0		Gravel, weathered limestone, silt				
583.8	6.0		▽ Saturated	SS-3 6.0-7.5 12"R	7 21 19		qu=NT
							Sand pack 8.0'-19.0'
			Weathered limestone bedrock	SS-4 8.5-10.0	50/4"		Set screen (slot 0.010") 9.0'-19.0'
579.8	10.0		End of Boring at 10.0'				
570.8	19.0						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/22/10** ENDED **10/25/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **6.0**
▽
▼

PATRICK ENGINEERING INC.	BORING NUMBER **B-MW-2-Wi** SHEET **1** OF **1**
	CLIENT **Midwest Generation**
	PROJECT & NO. **21053.070**
	LOCATION **Will County Station**

LOGGED BY **MPG**
GROUND ELEVATION **590.6**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ 10 20 30 40 50 LL △ / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
590.6	0.0		Black coal ash, brown gravely clay, sand, gray silty clay FILL				
				SS-1 1.0-2.5			Bentonite seal 2.0'-10.0'. Stickup protective cover installed.
				SS-2 3.5-5.0 6"R	9 13 10		qu=NT
			Rubble	SS-3 6.0-7.5 18"R	6 7 9		qu=NT
582.1	8.5		Black coal cinders, coal dust, clay fill	SS-4 8.5-10.0 16"R	5 7 7		qu=NT
580.6	10.0		∇ Wet				Sand pack 10.0'-22.0'
				SS-5 11.0-12.5	9 50/0"		qu=NT
578.6	12.0		Weathered limestone bedrock				
			End of Boring at 12.0'				Set screen (slot 0.010") 12.0'-22.0' Cored bedrock to 22.0'
568.6	22.0						

DRILLING CONTRACTOR	**Groff Testing**
DRILLING METHOD	**4.25" I.D. HSA**
DRILLING EQUIPMENT	**CME 550 ATV**
DRILLING STARTED **10/21/10**	ENDED **10/22/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
∇ 10.0

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-3-Wi** SHEET **1** OF **1**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Will County Station**

LOGGED BY **MPG**
GROUND ELEVATION **590.5**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ Water Content ○ LL △ (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✱ (1 2 3 4 5)	NOTES & TEST RESULTS
590.5	0.0		Black coal ash, gravel, coarse sand, crushed rock, limestone, rubble FILL				
				SS-1 1.0-2.5 15"R	10 10 12		qu=NT
							Bentonite seal 2.0'-6.5'. Stickup protective cover installed.
			Dry	SS-2 3.5-5.0 13"R	6 10 18		qu=NT
				SS-3 6.0-7.5 14"R	7 15 21		qu=NT
583.5	7.0		▼				Sand pack 6.5'-19.5'
583.0	7.5						Set screen (slot 0.010") 7.0'-17.0'
582.5	8.0		∇ Gray gravel, silt GC Wet				
				SS-4 8.5-10.0 4"R	3 50/0"		qu=NT
580.5	10.0		Weathered limestone bedrock End of Boring at 10.0'				Cored bedrock to 19.5'
571.0	19.5						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/20/10** ENDED **10/24/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
∇ **8.0**
▼ **7.0**
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-4-Wi** SHEET 1 OF 1
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Will County Station**

LOGGED BY **MPG**
GROUND ELEVATION **591.2**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 50 LL / Unconfined Compressive Strength (TSF) 1 2 3 4 5	NOTES & TEST RESULTS
591.2	0.0		Brown fine sand, black ash, crushed rock, fine to coarse gravel, ddry FILL				
				SS-1 1.0-2.5 14"R	9 14 17		qu=NT
							Bentonite seal 2.0'-8.5'. Stickup protective cover installed.
				SS-2 3.5-5.0 6"R	16 50/3"		qu=NT
585.2	6.0		Gray silt, weathered limestone, moist to wet	SS-3 6.0-7.5 16"R	4 23 27		qu=NT
582.2	9.0		Saturated	SS-4 8.5-10.0 1"R	50/2"		qu=NT Sand pack 8.5'-19.5' Set screen (slot 0.010") 9.5'-19.5'
			Limestone bedrock, weathered				
571.2	20.0		End of Boring at 20.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/18/10** ENDED **10/19/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **9.0**

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-5-Wi** SHEET **1** OF **1**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Will County Station**

LOGGED BY **MPG**
GROUND ELEVATION **589.6**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content: PL □ 10 20 ○ 30 40 △ LL 50 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
589.6	0.0		Brown silty clay, fine gravel, coarse gravel, crushed limestone FILL				
				SS-1 1.0-2.5 14"R	4 6 10		qu=NT Bentonite seal 2.0'-8.0'. Stickup protective cover installed.
			Dry	SS-2 3.5-5.0 14"R	7 10 21		qu=NT
				SS-3 6.0-7.5 10"R	10 11 15		qu=NT
581.6	8.0						
581.1	8.5		∇ Brown gravel, clay, silt, wet GC				Sand pack 8.0'-19.0'
580.6	9.0		Weathered limestone bedrock	SS-4 8.5-10.0 4"R	8 50/0"		qu=NT Set screen (slot 0.010") 9.0'-19.0'
569.6	20.0		End of Boring at 20.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/20/10** ENDED **10/20/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
∇ 8.5
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-6-Wi** SHEET **1** OF **1**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Will County Station**

LOGGED BY **MPG**
GROUND ELEVATION **589.8**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ ○ △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
589.8	0.0		Crushed stone, brown medium sand, black coal cinders, dry FILL				
				SS-1 1.0-2.5 10"R	7 11 8		qu=NT
				SS-2 3.5-5.0 10"R	6 14 13		Bentonite seal 3.0'-8.0'. Stickup protective cover installed. qu=NT
				SS-3 6.0-7.5 11"R	4 7 16		qu=NT
581.8	8.0		Gray silty clay, coarse to fine gravel, trace coarse sand, wet CL				
580.8	9.0	▽		SS-4 8.5-10.0 12"R	7 9 18		Set screen (slot 0.010") 8.0'-18.0' Sand pack 8.0'-18.0' qu=NT
579.3	10.5		Weathered limestone bedrock				Set up NX core barrel & cored bedrock to 18.0'
571.8	18.0		End of Boring at 18.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/12/10** ENDED **10/12/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ 9.0
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-7-WI** SHEET **1** OF **1**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Will County Station**

LOGGED BY **MPG**
GROUND ELEVATION **589.6**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL ☐ Water Content ○ LL △ (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
589.6	0.0		Crushed stone, gravel, silt, sand FILL				
				SS-1 1.0-2.5 10"R	7 7 4		qu=NT
			Rock rubble, dry				Bentonite seal 3.0'-6.0'. Stickup protective cover installed.
				SS-2 3.5-5.0 10"R	6 11 12		qu=NT
				SS-3 6.0-7.5 6"R	11 5 5		qu=NT Sand pack 6.0'-18.0'
582.6	7.0		Brown gravel, silt, coarse sand, saturated GC				Set screen (slot 0.010") 7.5'-17.5'
581.6	8.0	▽					
581.1	8.5		Weathered limestone bedrock	SS-4 8.5-10.0 0"R	50/2"		qu=NT Cored bedrock 9.0'-18.0'
571.6	18.0		End of Boring at 18.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/22/10** ENDED **10/22/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ 8.0
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-8-Wi** SHEET **1** OF **1**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Will County Station**

LOGGED BY **MPG**
GROUND ELEVATION **589.6**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - ○ - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
589.6	0.0		Dark brown clayey silt, dry CL				
589.1	0.5		Coarse gravel, crushed rock, dry FILL	SS-1 1.0-2.5 6"R	4 7 9		qu=NT
				SS-2 3.5-5.0 10"R	5 13 10		Bentonite seal 3.0'-6.0'. Stickup protective cover installed. qu=NT
			Crushed rock, silty gravel	SS-3 6.0-7.5 10"R	7 19 22		qu=NT
582.6	7.0		Moist				Sand pack 7.0'-19.0'
			Weathered limestone bedrock	SS-4 8.5-10.0 4"R	10 50/1"		qu=NT Set screen (slot 0.010") 9.0'-19.0'
570.6	19.0		End of Boring at 19.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/19/10** ENDED **10/19/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
∇
▼
▼

PATRICK ENGINEERING INC.	BORING NUMBER **B-MW-9-Wi** SHEET 1 OF 1
	CLIENT **Midwest Generation**
	PROJECT & NO. **21053.070**
	LOCATION **Will County Station**

LOGGED BY **MPG**
GROUND ELEVATION **589.8**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ Water Content ○ LL △ (10 20 30 40 50) Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
589.8	0.0		Crushed rock, coarse sand, some silt FILL				
				SS-1 1.0-2.5 14"R	4 7 9		qu=NT
				SS-2 3.5-5.0 16"R	3 11 6		Bentonite seal 3.0'-8.0'. Stickup protective cover installed. qu=NT
			Some brown silty clay				
583.8	6.0		Gray silty clay, fine and coarse gravel, some coarse sand GC	SS-3 6.0-7.5 16"R	4 11 13		qu=NT
							Sand pack 8.0'-19.0'
			Moist	SS-4 8.5-10.0 17"R	4 10 11		qu=NT Set screen (slot 0.010") 9.0'-19.0'
			Clayey gravel				
578.3	11.5		Weather limestone bedrock	SS-5 11.0-12.5 12"R	5 5 50/3"		qu=NT Cored bedrock to 22.0'
570.8	19.0		End of Boring at 19.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/19/10** ENDED **10/19/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **11.5'**
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-10-Wi** SHEET **1** OF **1**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Will County Station**

LOGGED BY **MPG**
GROUND ELEVATION **591.3**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 50 LL / Unconfined Compressive Strength (TSF) 1 2 3 4 5	NOTES & TEST RESULTS
591.3	0.0		Crushed limestone, silt, gravel FILL				
				SS-1 1.0-2.5 4"R	7 10 12		Bentonite seal 2.0'-8.0'. Flush mount protective cover installed. qu=NT
				SS-2 3.5-5.0 14"R	13 18 8		
				SS-3 6.0-7.5 4"R	18 50/5"		qu=NT
				SS-4 8.5-10.0 4"R	13 17 50/1"		Sand pack 8.0'-20.0' qu=NT
581.3	10.0		Weathered limestone, clay, sand, gravel GC				
				SS-5 11.0-12.5 0"R	17 50/0"		Set screen (slot 0.010") (slot 0.010") 10.0'-20.0' qu=NT -21.0'
579.3	12.0		Weathered limestone bedrock				
571.3	20.0		End of Boring at 20.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/21/10** ENDED **10/21/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ 10.0

KPRG

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

GEOLOGIC LOG OF MW-11

Midwest Generation, LLC
Will County Station
Romeoville, Illinois

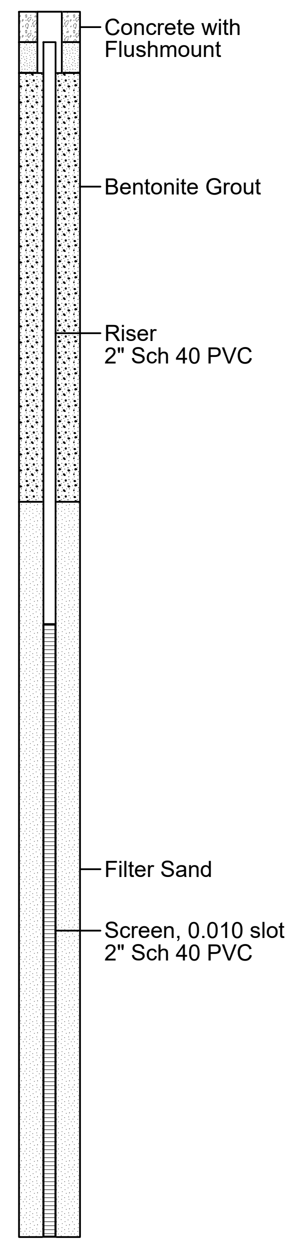
Project No. 12313

Date Started	: 09/14/15
Date Well Set	: 09/14/15
Drilling Tools	: 8 1/4 HSA
Reaming Tools	: None
Drill Rig	: Deitrich D-120
Driller Name/Co	: J. Luna / Earth Solutions

Total Boring Depth	: 28.0 feet
Well Bottom Depth	: 20.0 feet
Surface Elev.	: 591.09 feet above MSL
TOC Elev.	: 590.69 feet above MSL
Groundwater Elev.	: xxx feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	:
Coordinate E	:
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 591.09	DESCRIPTION	% RQD	% Recovery
0	591	Roadway of Sand and Gravel, dry.		
1	590	SAND and GRAVEL, Dark Brown, fine to medium, silty, dry		
2	589	CLAY, brown, with sand and gravel, slightly moist.		
3	588	GRAVEL, limestone/dolomite, dry to slightly moist.		
4	587			
5	586	- some sand		
6	585			
7	584			
8	583	CLAY, dark brown and black, slity, some sand and gravel, moist.		
9	582			
10	581			
11	580			
12	579			
13	578	Weathered Bedrock, dolomite.		
14	577			
15	576			
16	575			
17	574			
18	573			
19	572			
20	571			
21	570			
22				

Well Diagram:



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ENVIRONMENTAL CONSULTATION & REMEDIATION
KPRG and Associates, Inc.

GEOLOGIC LOG OF MW-11

Midwest Generation, LLC
Will County Station
Romeoville, Illinois

Project No. 12313

Date Started	: 09/14/15
Date Well Set	: 09/14/15
Drilling Tools	: 8 1/4 HSA
Reaming Tools	: None
Drill Rig	: Deitrich D-120
Driller Name/Co	: J. Luna / Earth Solutions

Total Boring Depth	: 28.0 feet
Well Bottom Depth	: 20.0 feet
Surface Elev.	: 591.09 feet above MSL
TOC Elev.	: 590.69 feet above MSL
Groundwater Elev.	: xxx feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	:
Coordinate E	:
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 591.09	DESCRIPTION	% RQD	% Recovery	Well Diagram:
22	569				
23	568				
24	567				
25	566				
26	565				
27	564				
28	563	End of Boring at 28 feet.			
29	562				
30	561				
31	560				
32	559				
33	558				
34	557				
35	556				
36	555				
37	554				
38	553				
39	552				
40	551				
41	550				
42	549				
43	548				
44					

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ENVIRONMENTAL CONSULTATION & REMEDIATION
KPRG and Associates, Inc.

GEOLOGIC LOG OF MW-12

Midwest Generation, LLC
Will County Station
Romeoville, Illinois

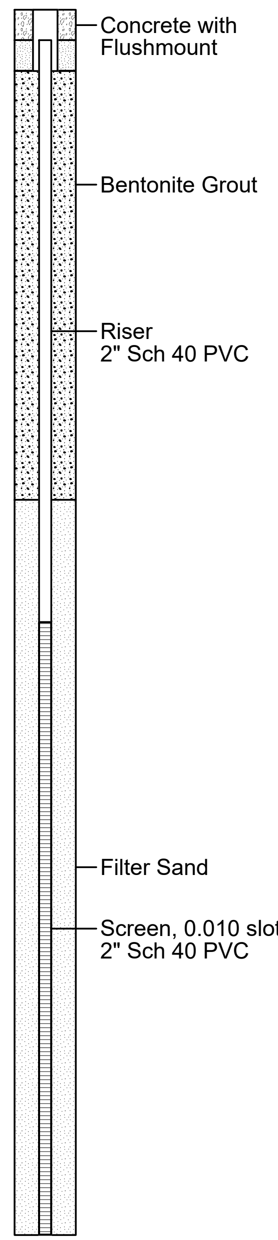
Project No. 12313

Date Started	: 09/15/15
Date Well Set	: 09/15/15
Drilling Tools	: 8 1/4 HSA
Reaming Tools	: None
Drill Rig	: Deitrich D-120
Driller Name/Co	: J. Luna / Earth Solutions

Total Boring Depth	: 20.0 feet
Well Bottom Depth	: 20.0 feet
Surface Elev.	: 591.23 feet above MSL
TOC Elev.	: 590.81 feet above MSL
Groundwater Elev.	: xxx feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	:
Coordinate E	:
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 591.23	DESCRIPTION	% RQD	% Recovery
0	591	Roadway of Sand and Gravel, dry.		
1	590	SAND, Black, Brown, fine to medium, silty, dry		
2	589	CLAY, with GRAVEL, slightly moist.		
3	588			
4	587	- gravel layer		
5	586			
6	585			
7	584	SILTY SAND, fine to medium, black, moist.		
8	583			
9	582			
10	581			
11	580	SILTY SAND, tan to white, fine to medium, wet.		
12	579	SILTY SAND, brown, medium to coarse, wet.		
13	578			
14	577	SILT and CLAY, dark gray, trace sand and gravel, very soft wet.		
15	576			
16	575	CLAY, white, light greenish gray, orange mottled, moist.		
17	574			
18	573			
19	572			
20	571			
21	570	End of Boring at 20 feet.		
22				

Well Diagram:



Attachment 9-3 – Historical CCA Groundwater Data

Attachment 9-3. Historical Groundwater Data - Midwest Generation LLC, Will County Station, Romeoville, IL

Sample: MW-01	Date	12/13/2010		3/28/2011		6/15/2011		9/15/2011		12/8/2011		3/16/2012		6/20/2012		9/24/2012		12/18/2012		3/5/2013		5/23/2013	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND^	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	0.0063	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	0.0010	ND	0.0010	ND	0.0050	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Barium	2.0	0.0025	0.050	0.0025	0.041	0.0025	0.046	0.0025	0.038	0.0025	0.033	0.0025	0.033	0.0025	0.039	0.0025	0.035	0.0025	0.034	0.0025	0.034	0.0025	0.035
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	0.25	1.8	0.050	1.6	0.050	1.8	0.050	1.7	0.050	1.6	0.25	1.5	0.50	2.1	0.25	1.9	0.50	1.9	0.50	1.9	0.50	2.4
Cadmium	0.005	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	10	110	10	210	10	110	10	120	10	140	10	190	10	170	10	120	10	160	10	220	10	190
Chromium	0.1	0.0050	ND	0.0050	ND	0.025	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	0.035	0.0050	ND
Cobalt	1.0	0.0010	0.0011	0.0010	ND	0.0050	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	0.0017	0.0010	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.010	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0026	0.0020	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.71	0.10	0.65	0.10	0.53	0.10	0.77	0.10	0.73	0.10	0.69	0.10	0.77	0.10	0.86	0.10	0.86 ^	0.10	0.77 ^	0.10	0.94
Iron	5.0	0.10	ND	0.10	ND	0.50	ND	0.10	0.11	0.10	0.11	0.10	ND	0.10	0.23	0.10	0.33	0.10	0.20	0.10	0.42	0.10	0.46
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0025	0.20	0.0025	0.15	0.013	0.22	0.0025	0.16	0.0025	0.17	0.0025	0.16	0.0025	0.16	0.0025	0.15	0.0025	0.18	0.0025	0.17	0.0025	0.13
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	0.0020	0.0046	0.0020	0.0038	0.010	ND	0.0020	0.0029	0.0020	0.0040	0.0020	0.0042	0.0020	0.0041	0.0020	0.0043	0.0020	0.0052	0.0020	0.054	0.0020	0.0069
Nitrogen/Nitrate	10.0	0.10	ND	0.10	1.1	0.10	0.73	0.10	0.33	0.10	1.4	0.10	2.2	0.10	0.61	0.10	0.25	0.10	1.5	0.10	1.6	0.10	ND
Nitrogen/Nitrate, Nitr	NA	0.10	ND	0.10	1.1	0.10	0.73	0.10	0.37	0.10	1.4	0.20	2.2	0.10	0.61	0.10	0.25	0.10	1.5	0.10	1.6	0.10	ND
Nitrogen/Nitrite	NA	0.020	ND	0.020	ND	0.020	ND	0.020	0.042	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.004	ND	0.004	ND	0.0040	ND
Selenium	0.05	0.0025	ND	0.0025	ND	0.013	ND	0.0025	0.0053	0.0025	0.0025	0.0025	0.0033	0.0025	0.0040	0.0025	ND	0.0025	ND	0.0025	0.0042	0.0025	ND
Silver	0.05	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	100	530	100	390	100	280	50	320	100	270	100	430	100	390	100	390	100	290	100	310	100	460
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	10	1100	10	1100	10	1100	10	760	10	770	10	910	10	950	10	790	10	880	10	930	10	1100
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	5.0	0.020	ND	0.020	ND	0.10	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	0.040	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0005	ND	0.0005	ND	0.00050	ND
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0025	ND	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	7.89	NA	8.05	NA	7.28	NA	7.57	NA	7.16	NA	7.84	NA	7.55	NA	7.70	NA	7.79	NA	8.41	NA	7.56
Temperature	NA	NA	16.28	NA	10.74	NA	14.96	NA	21.42	NA	14.57	NA	12.34	NA	18.50	NA	22.35	NA	14.65	NA	9.90	NA	14.40
Conductivity	NA	NA	1.70	NA	1.76	NA	1.55	NA	1.01	NA	1.00	NA	1.06	NA	1.24	NA	1.15	NA	1.14	NA	1.16	NA	1.25
Dissolved Oxygen	NA	NA	NM	NA	0.34	NA	0.07	NA	0.06	NA	0.06	NA	0.11	NA	0.13	NA	0.09	NA	0.06	NA	0.20	NA	0.50
ORP	NA	NA	NM	NA	-174.1	NA	49.2	NA	-306	NA	-108	NA	-63	NA	-98	NA	-128	NA	-103	NA	-112.3	NA	-157.5

Sample: MW-01	8/14/2013		10/29/2013		2/20/2014		5/20/2014		8/13/2014		10/21/2014		2/4/2015		4/30/2015		7/27/2015		11/9/2015		2/18/2016	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.0010	ND	0.0010	0.0011	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Barium	0.0025	0.090	0.0025	0.10	0.0025	0.085	0.0025	0.054	0.0025	0.064	0.0025	0.077	0.0025	0.066	0.0025	0.069	0.0025	0.076	0.0025	0.078	0.0025	0.075
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND^	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	0.50	2.3	0.10	2.6	0.25	2.4	0.50	2.5	0.10	1.2	0.050	0.96	1.0	ND	0.25	0.81	0.050	0.91	0.050	0.73	0.050	0.80
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	120	10	160	10	120	10	87	2.0	35	2.0	29	2.0	30	2.0	28	2.0	33	2.0	26	2.0	27
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	0.0016	0.0010	0.0022	0.0010	0.0017	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.10	0.50	0.10	0.41	0.10	0.39	0.10	0.48	0.10	0.50	0.10	0.52	0.10	0.59	0.10	0.59	0.10	0.66	0.10	0.80	0.10	0.73
Iron	0.10	0.72	0.10	1.2	0.10	0.34	0.10	0.46	0.10	0.19	0.10	0.16	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	0.22	0.0025	0.28	0.0025	0.30	0.0025	0.26	0.0025	0.24	0.0025	0.17	0.0025	0.079	0.0025	0.011	0.0025	0.15	0.0025	0.088	0.0025	0.0087
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.0020	0.0047	0.0020	0.0055	0.0020	0.0058	0.0020	0.0050	0.0020	0.0025	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0021
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	0.27	0.10	0.25	0.10	0.19	0.10	0.15	0.10	0.37
Nitrogen/Nitrate, Nitr	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	0.27	0.10	0.25	0.10	0.19	0.10	0.15	0.10	0.37
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0028	0.0025	0.0051	0.0025	0.0053 ^	0.0025	0.0027	0.0025	0.0028	0.0025	0.0032
Silver	0.00050	ND ^	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	130	540	100	430	100	390	100	230	25	91	25	150	25	99	50	100	25	120	25	110	50	120
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	10	1300	10	1300	10	1300	10	890	10	600	10	600	10	570	10	510	10	570	10	470	10	530
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00059	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0013	0.0025	ND
pH	NA	7.18	NA	7.04	NA	8.96	NA	7.19	NA	6.91	NA	7.12	NA	7.41	NA	7.36	NA	7.44	NA	7.25	NA	7.17
Temperature	NA	16.82	NA	16.20	NA	11.29	NA	17.77	NA	20.79	NA	17.29	NA	12.62	NA	12.63	NA	21.71	NA	17.51	NA	10.73
Conductivity	NA	1.51	NA	1.53	NA	1.27	NA	1.50	NA	0.95	NA	0.90	NA	0.64	NA	0.697	NA	0.858	NA	0.687	NA	0.53
Dissolved Oxygen	NA	0.26	NA	0.57	NA	1.11	NA	0.42	NA	0.50	NA	0.45	NA	1.07	NA	2.32	NA	1.39	NA	0.62	NA	2.08
ORP	NA	-81.4	NA	-132.6	NA	-180.6	NA	-9.7	NA	-60.4	NA	-64.4	NA	-8.3	NA	31.7	NA	-122.9	NA	-0.6	NA	-43.8

Sample: MW-01	5/26/2016		8/11/2016		10/27/2016		2/2/2017		5/10/2017		9/8/2017		11/15/2017		2/28/2018		5/2/2018		7/24/2018		10/4/2018	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND ^	0.0030	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.0010	ND	0.0010	ND	0.0010	ND	0.0020	ND	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Barium	0.0025	0.075	0.0025	0.10	0.0025	0.095	0.0025	0.082	0.0025	0.078	0.0025	0.087	0.0025	0.089	0.0025	0.089	0.0025	0.079	0.0025	0.096	0.0025	0.092
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND^	0.0010	ND	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	0.050	0.74	0.25	0.87	0.050	0.76	0.50	0.69	0.25	1.1	0.05	0.73	0.05	0.74	0.05	0.74	0.05	0.75	0.25	0.9	0.05	0.7
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	2.0	25	2.0	26	2.0	24	2.0	33	2.0	50	2	27	2	26	2	26	2	29	2	29	2	28
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	0.10	0.72	0.10	0.82	0.10	0.89	0.10	0.79	0.10	0.59	0.1	0.90 F1	0.1	0.93	0.1	0.93	0.1	0.85	0.1	0.89	0.1	1
Iron	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.0082	0.0025	0.075 B	0.0025	0.074	0.0025	0.025	0.0025	0.032	0.0025	0.043	0.0025	0.0081	0.0025	0.0081	0.0025	ND	0.0025	0.065	0.0025	0.043
Mercury	0.00020	ND	0.00020	0.00020	0.00020	ND	0.00020	ND ^	0.00020	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0023	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen/Nitrate	0.10	0.40	0.10	0.12	0.10	ND	0.10	0.58	0.10	ND	0.1	0.26	0.1	0.27	0.1	0.27	0.1	0.4	0.1	0.37	0.1	0.3
Nitrogen/Nitrate, Nitr	0.10	0.40	0.10	0.12	0.10	ND	0.10	0.58	0.10	ND	0.1	0.26	0.1	0.27	0.1	0.27	0.1	0.4	0.1	0.37	0.1	0.3
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	0.0039	0.0025	0.0026	0.0025	ND	0.0050	ND	0.0025	ND	0.0025	0.0028	0.0025	ND	0.0025	ND	0.0025	0.0029	0.0025	ND	0.0025	ND
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	25	110	25	80	20	97	25	90	50	140	25	110	25	110	25	110	25	110	25	94	20	82
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	530	10	510	10	480	10	590	10	650	10	530	10	590	10	590	10	540	10	570	10	520
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND ^	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	0.0012	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00072	0.0025	ND	0.0025	ND	0.0025	0.0011
pH	NA	7.12	NA	7.07	NA	7.45	NA	7.22	NA	7.67	NA	7.12	NA	6.97	NA	7.15	NA	7.46	NA	6.93	NA	7.5
Temperature	NA	20.50	NA	23.50	NA	15.04	NA	11.20	NA	13.67	NA	18.70	NA	14.16	NA	11.57	NA	15.40	NA	20.76	NA	16.65
Conductivity	NA	0.80	NA	0.82	NA	0.64	NA	0.64	NA	0.69	NA	0.07	NA	0.64	NA	0.57	NA	0.631	NA	0.698	NA	0.629
Dissolved Oxygen	NA	2.02	NA	1.51	NA	2.53	NA	1.10	NA	2.86	NA	0.51	NA	2.73	NA	2.16	NA	2.18	NA	3.26	NA	3.18
ORP	NA	-18.5	NA	-126.9	NA	-62.6	NA	-5.5	NA	148.7	NA	19.2	NA	-85.3	NA	-23.3	NA	-31.6	NA	-91.1	NA	-57.2

Sample: MW-01	2/19/2019		5/28/2019		8/21/2019		12/6/2019		2/19/2020		5/26/2020		8/5/2020		11/3/2020		2/23/2021		5/24/2021	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Barium	0.0025	0.082	0.0025	0.081	0.0025	0.13	0.0025	0.11	0.0025	0.093	0.0025	0.08	0.0025	0.097	0.0025	0.1	0.0025	0.095	0.0025	0.096
Beryllium	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND ^	0.001	ND
Boron	0.05	0.57	0.05	0.9	0.05	1.7	0.05	2.5	0.05	2.7	0.05	2.1	0.25	2.7	0.5	2.9	0.25	2.4	0.5	2.2
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	2	59	2	64	2	31	2	25	2	21	2	35	2	16	2	23	2	25	2	18
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.005	ND
Fluoride	0.1	0.82	0.1	0.78	0.1	0.78	0.1	0.78	0.1	0.73	0.1	0.71	0.1	0.73	0.1	0.7	0.1	0.58	0.1	0.61
Iron	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	ND	0.0025	0.057	0.0025	0.13	0.0025	0.11	0.0025	0.079	0.0025	0.067	0.0025	0.1	0.0025	0.058	0.0025	0.017	0.0025	0.037
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	ND	0.002	0.0031	0.002	0.0048	0.002	0.0045	0.002	0.0041	0.002	0.0041	0.002	0.0042	0.002	0.0041	0.002	0.0032	0.002	0.0042
Nitrogen/Nitrate	0.1	0.51	0.1	0.12	0.1	0.69	0.1	1.4	0.1	0.8	0.1	0.16	0.1	0.13	0.1	ND	0.1	0.22	0.1	0.4
Nitrogen/Nitrate, Nitr	0.1	0.51	0.1	0.12	0.1	0.69	0.1	1.4	0.1	0.8	0.1	0.16	0.1	0.13	0.1	ND	0.1	0.22	0.1	0.4
Nitrogen/Nitrite	0.02	ND	0.02	ND	0.02	ND	0.02	ND H3	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	0.0028	0.0025	ND	0.0025	ND	0.0025	0.0027	0.0025	0.0061	0.0025	0.0025	0.0025	0.0026	0.0025	0.0068	0.0025	0.017	0.0025	0.013
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND F1	0.0005	ND
Sulfate	20	100	20	160	20	270	20	340	20	ND	20	300	100	300	50	260	100	270	100	350
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	590	10	780	10	950	10	1000	10	1000	10	910	30	950	30	2800	10	860 H	10	1100
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.02	NA	7.12	NA	6.91	NA	6.93	NA	6.91	NA	6.88	NA	6.58	NA	6.60	NA	6.89	NA	6.86
Temperature	NA	11.60	NA	12.40	NA	16.00	NA	14.90	NA	11.71	NA	13.30	NA	15.90	NA	16.70	NA	12.80	NA	13.90
Conductivity	NA	0.944	NA	1.070	NA	0.146	NA	1.669	NA	1.007	NA	1.289	NA	1.414	NA	0.270	NA	1.492	NA	1.503
Dissolved Oxygen	NA	0.45	NA	0.29	NA	0.34	NA	0.73	NA	2.79	NA	0.59	NA	NM	NA	0.31	NA	0.63	NA	0.18
ORP	NA	88.5	NA	233.1	NA	34.3	NA	26.3	NA	145.0	NA	74.8	NA	83.4	NA	-23.5	NA	33.9	NA	174.0

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater.
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
NA - Not Applicable
ND - Not Detected

NM - Not Measured
NR - Not Required
NS - Not Sampled

Temperature °C degrees Celcius
Conductivity ms/cm[c] millisiemens/centimeters
Dissolved Oxygen mg/L milligrams/liter
Oxygen Reduction Potential (ORP) mV millivolts

^ - Denotes instrument related QC exceeds the control limits
F1 - MS and/or MSD Recovery outside of limits
F2 - MS/MSD RPD exceeds control limits
H - Prepped/analyzed beyond the holding time

Attachment 9-3. Historical Groundwater Data - Midwest Generation LLC, Will County Station, Romeoville, IL

Sample: MW-02	Date	12/13/2010		3/28/2011		6/15/2011		9/15/2011		12/8/2011		3/16/2012		6/20/2012		9/24/2012	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND^	0.0030	ND	0.015	ND	0.0030	0.0073	0.0030	0.017	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	0.0010	0.0052	0.0010	0.0032	0.0050	ND	0.0010	0.0080	0.0010	0.0058	0.0010	0.0048	0.0010	0.0044	0.0010	0.0071
Barium	2.0	0.0025	0.061	0.0025	0.068	0.013	0.068	0.0025	0.048	0.0025	0.048	0.0025	0.058	0.0025	0.062	0.0025	0.050
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	0.25	1.8	0.25	1.7	0.050	2.3	0.050	2.3	0.050	1.7	0.25	1.7	0.50	2.0	0.25	2.2
Cadmium	0.005	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	10	110	10	250	10	180	10	110	10	120	10	140	10	150	10	110
Chromium	0.1	0.0050	ND	0.0050	ND	0.025	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	0.0010	ND	0.0010	ND	0.0050	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.010	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.62	0.10	0.50	0.10	0.42	0.10	0.59	0.10	0.59	0.10	0.46	0.10	0.55	0.10	0.71
Iron	5.0	0.10	ND	0.10	ND	0.50	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0025	0.032	0.0025	0.032	0.013	0.043	0.0025	0.036	0.0025	0.031	0.0025	0.031	0.0025	0.038	0.0025	0.029
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	0.0020	ND	0.0020	ND	0.010	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Nitrogen/Nitrate	10.0	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	NA	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	NA	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Selenium	0.05	0.0025	ND	0.0025	ND	0.013	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.05	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	100	430	100	280	50	400	50	330	50	220	50	330	100	340	50	280
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	10	870	10	970	10	900	10	720	10	650	10	810	10	850	10	690
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zinc	5.0	0.020	ND	0.020	ND	0.10	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
pH	6.5 - 9.0	NA	8.62	NA	8.62	NA	8.00	NA	8.11	NA	7.80	NA	8.34	NA	8.23	NA	8.33
Temperature	NA	NA	16.29	NA	13.56	NA	15.90	NA	18.05	NA	16.14	NA	14.74	NA	16.59	NA	19.10
Conductivity	NA	NA	1.37	NA	1.64	NA	1.54	NA	0.96	NA	0.83	NA	0.95	NA	1.12	NA	0.91
Dissolved Oxygen	NA	NA	NM	NA	0.19	NA	0.07	NA	0.06	NA	0.06	NA	0.02	NA	0.03	NA	0.14
ORP	NA	NA	NM	NA	-154.9	NA	63	NA	-309	NA	-147	NA	-104	NA	-160	NA	-156

Sample: MW-02	12/18/2012		3/5/2013		5/23/2013		8/14/2013		10/28/2013		2/20/2014		5/20/2014		8/13/2014		10/20/2014	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.0010	0.0046	0.0010	0.0037	0.0010	0.0051	0.0010	0.0059	0.0010	0.0091	0.0010	0.0071	0.0010	0.0053	0.0010	0.0096	0.0010	0.013
Barium	0.0025	0.051	0.0025	0.057	0.0025	0.071	0.0025	0.075	0.0025	0.079	0.0025	0.080	0.0025	0.077	0.0025	0.089	0.0025	0.10
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND^	0.0010	ND	0.0010	ND	0.0010	ND
Boron	0.50	1.8	0.50	1.7	0.50	1.9	0.50	2.2	0.10	2.4	0.25	2.4	0.50	2.8	0.25	3.0	0.50	3.6
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	130	10	190	10	200	10	170	10	180	10	170	10	130	10	100	10	97
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.10	0.60 ^	0.10	0.48 ^	0.10	0.47	0.10	0.45	0.10	0.47	0.10	0.44	0.10	0.39	0.10	0.41	0.10	0.39
Iron	0.10	ND	0.10	ND	0.10	ND	0.10	0.14	0.10	0.33	0.10	ND	0.10	ND	0.10	0.29	0.10	0.64
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	0.033	0.0025	0.029	0.0025	0.041	0.0025	0.041	0.0025	0.043	0.0025	0.044	0.0025	0.024	0.0025	0.074	0.0025	0.083
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0021	0.0020	0.0024	0.0020	0.0024	0.0020	0.0023	0.0020	0.0026	0.0020	0.0029
Nitrogen/Nitrate	0.10	ND	0.10	0.11	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	0.16	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	0.10	ND	0.10	0.11	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	0.16	0.10	ND	0.10	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.004	ND	0.004	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND ^	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	50	250	50	260	50	250	100	300	100	280	100	210	100	300	100	340	100	510
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	10	710	10	740	10	890	10	900	10	950	10	1000	10	1000	10	1100	10	1200
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.0005	ND	0.0005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00083	0.0025	ND
pH	NA	8.40	NA	7.79	NA	8.00	NA	7.93	NA	8.06	NA	8.97	NA	7.74	NA	7.59	NA	6.94
Temperature	NA	15.58	NA	12.00	NA	15.53	NA	16.36	NA	15.02	NA	11.56	NA	17.35	NA	18.69	NA	17.11
Conductivity	NA	0.88	NA	0.97	NA	1.06	NA	1.10	NA	1.06	NA	1.02	NA	1.31	NA	1.38	NA	1.63
Dissolved Oxygen	NA	0.06	NA	3.81	NA	0.52	NA	0.19	NA	0.54	NA	1.31	NA	0.72	NA	0.38	NA	0.31
ORP	NA	-106	NA	189.8	NA	-117.5	NA	-160.5	NA	-172.5	NA	-161.4	NA	-28.3	NA	-107.9	NA	-135.2

Sample: MW-02	2/4/2015		5/1/2015		7/28/2015		11/10/2015		2/17/2016		5/25/2016		8/11/2016		10/27/2016		2/2/2017	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND ^
Arsenic	0.0010	0.0095	0.0010	0.0076	0.0010	0.013	0.0010	0.018	0.0010	0.0072	0.0010	0.0088	0.0010	0.018	0.0010	0.017	0.0020	0.0075
Barium	0.0025	0.092	0.0025	0.096	0.0025	0.093	0.0025	0.098	0.0025	0.092	0.0025	0.088	0.0025	0.090	0.0025	0.093	0.0025	0.078
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND^	0.0010	ND
Boron	1.0	3.8	0.25	3.8	0.50	4.0	0.50	4.4	0.050	4.3	0.050	3.9	0.25	4.1	0.50	4.9	0.50	4.3
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	130	10	110	10	90	10	110	10	80	2.0	64	2.0	72	2.0	71	2.0	56
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.10	0.41	0.10	0.38	0.10	0.38	0.10	0.40	0.10	0.38	0.10	0.32	0.10	0.34	0.10	0.36	0.10	0.40
Iron	0.10	0.17	0.10	ND	0.10	0.58	0.10	0.78	0.10	ND	0.10	0.21	0.10	1.0	0.10	1.0	0.10	0.15
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	0.064	0.0025	0.055	0.0025	0.085	0.0025	0.068	0.0025	0.080	0.0025	0.061	0.0025	0.083 B	0.0025	0.092	0.0025	0.079
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND ^
Nickel	0.0020	0.0029	0.0020	0.0032	0.0020	0.0029	0.0020	0.0031	0.0020	0.0048	0.0020	0.0032	0.0020	0.0038	0.0020	0.0038	0.0020	0.0029
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	0.13	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	0.13	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0050	ND
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	100	400	100	460	100	610	100	600	200	710	250	650	250	510	250	670	100	590
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	10	1200	10	1200	10	1300	10	1000	10	1300	10	1300	10	1500	10	1500	10	1400
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND ^
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00072	0.0025	ND	0.0025	ND	0.0025	0.00055	0.0025	ND	0.0025	ND
pH	NA	8.14	NA	8.00	NA	7.94	NA	8.06	NA	7.63	NA	7.50	NA	7.60	NA	7.86	NA	7.76
Temperature	NA	14.26	NA	18.64	NA	19.83	NA	15.84	NA	8.11	NA	18.77	NA	26.04	NA	14.23	NA	11.16
Conductivity	NA	1.37	NA	1.581	NA	1.718	NA	1.495	NA	1.05	NA	1.70	NA	1.97	NA	1.54	NA	1.42
Dissolved Oxygen	NA	0.90	NA	1.60	NA	0.75	NA	0.49	NA	1.68	NA	1.30	NA	2.33	NA	2.28	NA	0.84
ORP	NA	-126.8	NA	-116.1	NA	-112.8	NA	-143.6	NA	-96.1	NA	-81.0	NA	-136.7	NA	-148.3	NA	-47.6

Sample: MW-02	5/10/2017		9/8/2017		11/15/2017		2/28/2018		5/2/2018		7/24/2018		10/4/2018		2/19/2019		5/28/2019	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.0010	0.0025	0.001	0.016	0.001	0.012	0.001	0.012	0.001	0.0053	0.001	0.011	0.001	0.012	0.001	0.0078	0.001	0.0078
Barium	0.0025	0.075	0.0025	0.075	0.0025	0.076	0.0025	0.076	0.0025	0.074	0.0025	0.072	0.0025	0.073	0.0025	0.068	0.0025	0.058
Beryllium	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	0.50	3.6	0.5	5.0	1	5.1	1	5.1	0.5	5.1	0.5	4.9	1	5.4	1	4.1	1	3.8
Cadmium	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	2.0	44	2	64	2	57	2	57	2	57	2	43	2	62	2	39	2	22
Chromium	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.010	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	0.10	0.18	0.1	0.34	0.1	0.34	0.1	0.34	0.1	0.34	0.1	0.31	0.1	0.38	0.1	0.32	0.1	0.24
Iron	0.10	0.42	0.1	0.8	0.1	0.67	0.1	0.67	0.1	ND	0.1	0.64	0.1	0.83	0.1	0.17	0.1	ND
Lead	0.00050	0.0012	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.21	0.0025	0.071	0.0025	0.074	0.0025	0.074	0.0025	0.026	0.0025	0.066	0.0025	0.069	0.0025	0.055	0.0025	0.029
Mercury	0.00020	ND	0.0002	0.00028	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.0020	0.0085	0.002	0.0028	0.002	0.0028	0.002	0.0028	0.002	0.0031	0.002	0.0028	0.002	0.0028	0.002	0.0026	0.002	ND
Nitrogen/Nitrate	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.1	0.1	ND	0.1	ND	0.1	ND	0.1	0.17
Nitrogen/Nitrate, Nitr	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.1	0.1	ND	0.1	ND	0.1	ND	0.1	0.17
Nitrogen/Nitrite	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0040	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	0.026	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0029	0.0025	ND	0.0025	ND
Silver	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	250	470	250	870	250	670	250	670	200	1100	100	650	100	640	100	580	100	460
Thallium	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	1300	10	1400	10	1400	10	1400	10	1400	10	1400	10	1400	10	1300	10	1200
Vanadium	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.00050	0.00057	0.0005	ND	0.0005	0.00063	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	0.00513	0.0025	0.001	0.0025	ND	0.0025	ND	0.0025	0.0014	0.0025	ND	0.0025	ND
pH	NA	8.26	NA	7.66	NA	7.48	NA	7.43	NA	7.82	NA	6.99	NA	7.93	NA	7.61	NA	7.66
Temperature	NA	14.08	NA	16.90	NA	13.59	NA	12.82	NA	18.11	NA	21.65	NA	17.93	NA	14.90	NA	14.10
Conductivity	NA	1.35	NA	1.55	NA	1.43	NA	1.29	NA	1.516	NA	1.554	NA	1.459	NA	1.785	NA	1.590
Dissolved Oxygen	NA	2.48	NA	0.28	NA	2.98	NA	0.98	NA	2.06	NA	1.95	NA	1.19	NA	0.07	NA	0.41
ORP	NA	-17.1	NA	-144.0	NA	-119.8	NA	-87.5	NA	-62.3	NA	-105.7	NA	-107.4	NA	-110.5	NA	10.1

Sample: MW-02	8/21/2019		12/6/2019		2/27/2020		5/22/2020		8/5/2020		11/3/2020		2/25/2021		5/24/2021	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	0.0094	0.001	0.012	0.001	0.0097	0.001	0.0073	0.001	0.01	0.001	0.0095	0.001	0.0082	0.001	0.0079
Barium	0.0025	0.053	0.0025	0.073	0.0025	0.058	0.0025	0.058	0.0025	0.059	0.0025	0.056	0.0025	0.058	0.0025	0.059
Beryllium	0.001	ND ^	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND	0.001	ND^	0.001	ND ^	0.001	ND
Boron	1	5.7	1	5.4	1	4.4	1	4.4	0.5	5.4	1	5.1	1	5.4	1	5.2
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	2	27	2	62	2	25	2	16	2	17	2	21	2	27	2	24
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.005	ND
Fluoride	0.1	0.33	0.1	0.38	0.1	0.34	0.1	0.32	0.1	0.38	0.1	0.41	0.1	0.4	0.1	0.4
Iron	0.1	0.27	0.1	0.83	0.1	0.13	0.1	0.13	0.1	0.32	0.1	0.28	0.1	0.1	0.1	0.1
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.04	0.0025	0.069	0.0025	0.048	0.0025	0.038	0.0025	0.055	0.0025	0.044	0.0025	0.053	0.0025	0.029
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	0.002	0.002	0.0028	0.002	0.0023	0.002	ND	0.002	ND	0.002	ND	0.002	0.0021	0.002	0.0023
Nitrogen/Nitrate	0.1	ND	0.1	ND	0.1	ND	0.1	0.1	0.1	ND	0.1	ND	0.1	0.15	0.1	ND
Nitrogen/Nitrate, Nitr	0.1	ND	0.1	ND	0.1	ND	0.1	0.1	0.1	ND	0.1	ND	0.1	0.15	0.1	ND
Nitrogen/Nitrite	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	0.0029	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0051	0.0025	0.0025	0.0025	ND
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	100	440	100	640	100	ND	100	450	100	450	50	440	100	520	130	550
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	1000	10	1400	10	1000	10	980	30	980	30	1000	10	1100	10	1100
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	0.0014	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.73	NA	7.93	NA	7.57	NA	7.62	NA	7.32	NA	7.41	NA	7.88	NA	7.77
Temperature	NA	16.70	NA	17.93	NA	13.65	NA	14.10	NA	16.00	NA	17.40	NA	13.90	NA	15.30
Conductivity	NA	0.175	NA	1.459	NA	1.059	NA	1.570	NA	1.422	NA	1.500	NA	1.512	NA	1.495
Dissolved Oxygen	NA	0.24	NA	1.19	NA	3.33	NA	0.82	NA	NM	NA	0.35	NA	0.13	NA	0.57
ORP	NA	-135.1	NA	-107.4	NA	-105.6	NA	-60.4	NA	-111.5	NA	-181.9	NA	-113.0	NA	140.2

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater.
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
NA - Not Applicable
ND - Not Detected

NM - Not Measured
NR - Not Required
NS - Not Sampled

Temperature °C degrees Celcius
Conductivity ms/cm^c millisiemens/centimeters
Dissolved Oxygen mg/L milligrams/liter
Oxygen Reduction Potential (ORP) mV millivolts

^ - Denotes instrument related QC exceeds the control limits
F1 - MS and/or MSD Recovery outside of limits
F2 - MS/MSD RPD exceeds control limits
H - Prepped/analyzed beyond the holding time

Attachment 9-3. Historical Groundwater Data - Midwest Generation LLC, Will County Station, Romeoville, IL

Sample: MW-03	Date	12/13/2010		3/28/2011		6/15/2011		9/15/2011		12/8/2011		3/16/2012		6/20/2012	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND^	0.0030	ND	0.015	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	0.0010	0.0020	0.0010	0.0024	0.0050	ND	0.0010	0.0025	0.0010	0.0018	0.0010	0.0017	0.0010	0.0020
Barium	2.0	0.0025	0.084	0.0025	0.086	0.013	0.071	0.0025	0.079	0.0025	0.083	0.0025	0.075	0.0025	0.12
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	0.25	2.7	0.25	2.4	0.050	2.6	0.050	3.3	0.050	2.8	0.25	2.7	0.50	3.1
Cadmium	0.005	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	2.0	54	10	250	10	100	10	130	10	100	10	95	10	88
Chromium	0.1	0.0050	ND	0.0050	ND	0.025	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	0.0010	ND	0.0010	0.0022	0.0050	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.010	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.50	0.10	0.37	0.10	0.36	0.10	0.45	0.10	0.39	0.10	0.38	0.10	0.36
Iron	5.0	0.10	0.37	0.10	0.57	0.50	ND	0.10	0.26	0.10	0.19	0.10	0.20	0.10	0.34
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0025	0.34	0.0025	0.31	0.013	0.34	0.0025	0.26	0.0025	0.29	0.0025	0.27	0.0025	0.37
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	0.0020	0.0054	0.0020	0.0037	0.010	ND	0.0020	0.0061	0.0020	0.0053	0.0020	0.0052	0.0020	0.0051
Nitrogen/Nitrate	10.0	0.10	ND	0.10	ND	0.10	0.81	0.10	ND	0.10	0.54	0.10	ND	0.10	0.18
Nitrogen/Nitrate, Nitr	NA	0.10	ND	0.10	ND	0.10	0.81	0.10	ND	0.10	0.54	0.10	ND	0.10	0.18
Nitrogen/Nitrite	NA	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Selenium	0.05	0.0025	ND	0.0025	ND	0.013	ND	0.0025	0.0033	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.05	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	100	330	50	270	50	240	100	250	100	280	100	320	100	500
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	10	940	10	1000	10	990	10	1000	10	930	10	1000	10	1400
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zinc	5.0	0.020	ND	0.020	ND	0.10	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
pH	6.5 - 9.0	NA	7.21	NA	7.72	NA	7.01	NA	7.18	NA	6.55	NA	7.24	NA	6.79
Temperature	NA	NA	12.84	NA	9.89	NA	14.19	NA	15.69	NA	13.57	NA	11.65	NA	15.47
Conductivity	NA	NA	1.52	NA	1.69	NA	1.46	NA	1.24	NA	1.14	NA	1.06	NA	1.48
Dissolved Oxygen	NA	NA	NM	NA	0.18	NA	3.15	NA	0.02	NA	0.06	NA	0.02	NA	0.03
ORP	NA	NA	NM	NA	-157.3	NA	115.5	NA	-285	NA	-113	NA	-31	NA	-50

Sample: MW-03	Date	9/24/2012		12/18/2012		3/5/2013		5/22/2013		8/14/2013		10/28/2013		2/13/2014	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	0.0010	0.0026	0.0010	0.0019	0.0010	0.0017	0.0010	0.0019	0.0010	0.0023	0.0010	0.0018	0.0010	ND
Barium	2.0	0.0025	0.085	0.0025	0.079	0.0025	0.085	0.0025	0.095	0.0025	0.083	0.0025	0.083	0.0025	0.095
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND^
Boron	2.0	0.25	3.9	0.50	3.4	0.50	3.2	0.50	3.7	0.50	3.6	0.10	3.5	0.50	3.2
Cadmium	0.005	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	10	96	10	100	10	87	10	110	10	100	10	110	2.0	69
Chromium	0.1	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	0.0011	0.0010	0.0014	0.0010	0.0016	0.0010	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.45	0.10	0.44 ^	0.10	0.38 ^	0.10	0.41	0.10	0.42	0.10	0.49	0.10	0.41
Iron	5.0	0.10	0.21	0.10	0.20	0.10	0.20	0.10	0.21	0.10	0.26	0.10	ND	0.10	ND
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0025	0.24	0.0025	0.25	0.0025	0.29	0.0025	0.22	0.0025	0.19	0.0025	0.16	0.0025	0.45
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	0.0020	0.0069	0.0020	0.0079	0.0020	0.0061	0.0020	0.0088	0.0020	0.010	0.0020	0.011	0.0020	0.0058
Nitrogen/Nitrate	10.0	0.10	ND	0.10	ND	0.10	0.21	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	NA	0.10	ND^	0.10	ND	0.10	0.21	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	NA	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	NR	NR	0.004	ND	0.004	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.05	0.0025	0.0040	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0049
Silver	0.05	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND ^	0.00050	ND	0.00050	ND
Sulfate	400.0	100	440	100	480	100	390	100	610	100	530	100	540	100	560
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	10	1100	10	1100	10	1100	10	1200	10	1200	10	1100	10	1200
Vanadium	0.049	NR	NR	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	5.0	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	NR	NR	0.0005	ND	0.0005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	11.705	NR	NR	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	7.12	NA	7.21	NA	7.88	NA	7.21	NA	7.20	NA	7.24	NA	7.03
Temperature	NA	NA	17.33	NA	13.40	NA	9.50	NA	16.15	NA	16.84	NA	14.53	NA	9.92
Conductivity	NA	NA	1.38	NA	1.25	NA	1.18	NA	1.39	NA	1.37	NA	1.22	NA	1.03
Dissolved Oxygen	NA	NA	0.02	NA	0.15	NA	3.93	NA	0.58	NA	0.43	NA	0.51	NA	0.81
ORP	NA	NA	-34	NA	-57	NA	60.1	NA	-65.3	NA	-66.4	NA	-138.6	NA	434.5

Sample: MW-03	Date	5/21/2014		8/12/2014		10/20/2014		2/4/2015		5/1/2015		7/28/2015		11/10/2015	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	0.0010	ND	0.0010	0.0021	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Barium	2.0	0.0025	0.071	0.0025	0.064	0.0025	0.077	0.0025	0.094	0.0025	0.093	0.0025	0.081	0.0025	0.11
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	0.50	3.3	0.25	3.5	0.50	3.6	1.0	2.9	0.25	2.9	0.50	4.1	0.50	3.0
Cadmium	0.005	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	2.0	62	10	91	2.0	57	2.0	43	2.0	33	2.0	59	10	33
Chromium	0.1	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	0.0010	ND	0.0010	0.0011	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	0.0013	0.0010	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.43	0.10	0.56	0.10	0.51	0.10	0.38	0.10	0.38	0.10	0.44	0.10	0.39
Iron	5.0	0.10	ND	0.10	0.13	0.10	ND	0.10	0.18	0.10	0.12	0.10	0.13	0.10	ND
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0025	0.25	0.0025	0.16	0.0025	0.29	0.0025	0.47	0.0025	0.43	0.0025	0.28	0.0025	0.42
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	0.0020	0.0061	0.0020	0.010	0.0020	0.0073	0.0020	0.0055	0.0020	0.0047	0.0020	0.0086	0.0020	0.0049
Nitrogen/Nitrate	10.0	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	NA	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	NA	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.05	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0025	0.0025	ND	0.0025	ND	0.0025	0.0043
Silver	0.05	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	100	560	100	570	100	570	100	320	100	250	100	520	50	280
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	10	1200	10	1100	10	1100	10	1100	10	990	10	1100	10	950
Vanadium	0.049	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	5.0	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND
BETX	11.705	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0014
pH	6.5 - 9.0	NA	7.21	NA	7.39	NA	6.06	NA	7.11	NA	7.07	NA	7.63	NA	6.81
Temperature	NA	NA	15.74	NA	16.79	NA	14.39	NA	10.34	NA	11.15	NA	18.62	NA	13.54
Conductivity	NA	NA	1.43	NA	1.40	NA	1.48	NA	1.11	NA	1.139	NA	1.472	NA	1.155
Dissolved Oxygen	NA	NA	0.73	NA	1.45	NA	0.43	NA	1.81	NA	2.99	NA	1.13	NA	1.08
ORP	NA	NA	18.4	NA	-90.3	NA	47.7	NA	7.2	NA	-18.3	NA	-124.6	NA	-6.0

Sample: MW-03	Date	2/17/2016		5/25/2016		8/11/2016		10/27/2016		2/1/2017		5/11/2017		9/8/2017	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND ^	0.0030	ND	0.003	ND
Arsenic	0.010	0.0010	0.0011	0.0010	ND	0.0010	ND	0.0010	ND	0.0020	ND	0.0010	0.0070	0.001	0.0014
Barium	2.0	0.0025	0.079	0.0025	0.088	0.0025	0.11	0.0025	0.11	0.0025	0.083	0.0025	0.067	0.0025	0.11
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND^	0.0010	ND	0.0010	ND	0.001	ND
Boron	2.0	0.050	3.0	0.050	2.9	0.25	3.1	0.50	3.3 F1	0.25	3.0	0.50	4.1	0.25	1.3
Cadmium	0.005	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND
Chloride	200.0	2.0	28	2.0	27	2.0	27	2.0	22	2.0	20	2.0	43	10	98
Chromium	0.1	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND
Cobalt	1.0	0.0010	ND	0.0010	ND	0.0010	0.0011	0.0010	ND	0.0010	ND	0.0010	ND	0.001	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.01	ND
Fluoride	4.0	0.10	0.41	0.10	0.41	0.10	0.36	0.10	0.38	0.10	0.34	0.10	0.27	0.1	0.39
Iron	5.0	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.1	0.12
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND
Manganese	0.15	0.0025	0.33	0.0025	0.35	0.0025	0.41 B	0.0025	0.49	0.0025	0.33	0.0025	0.033	0.0025	0.49
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND ^	0.00020	ND	0.0002	ND
Nickel	0.1	0.0020	0.0073	0.0020	0.0061	0.0020	0.0073	0.0020	0.0064	0.0020	0.0068	0.0020	0.0021	0.002	0.0062
Nitrogen/Nitrate	10.0	0.10	ND	0.10	ND	0.10	0.30	0.10	ND	0.10	0.82	0.10	0.20	0.1	ND
Nitrogen/Nitrate, Nitr	NA	0.10	ND	0.10	ND	0.10	0.30	0.10	ND	0.10	0.82	0.10	0.20	0.1	ND
Nitrogen/Nitrite	NA	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.02	ND
Perchlorate	0.0049	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.004	ND
Selenium	0.05	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND F1	0.0050	ND	0.0025	ND	0.0025	ND
Silver	0.05	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND
Sulfate	400.0	100	400	100	370	100	230	50	240	100	310	100	510	50	190
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND
Total Dissolved Soli	1,200	10	980	10	960	10	930	10	910	10	940	10	1100	10	940
Vanadium	0.049	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND
Zinc	5.0	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND ^	0.020	ND	0.02	ND
Benzene	0.005	0.0005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND
BETX	11.705	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	7.10	NA	7.02	NA	6.90	NA	6.97	NA	7.18	NA	8.12	NA	6.82
Temperature	NA	NA	9.00	NA	20.09	NA	20.43	NA	13.88	NA	7.94	NA	12.14	NA	15.80
Conductivity	NA	NA	0.84	NA	1.26	NA	1.26	NA	1.05	NA	0.97	NA	1.07	NA	1.07
Dissolved Oxygen	NA	NA	1.27	NA	2.02	NA	1.32	NA	2.10	NA	2.23	NA	2.05	NA	0.18
ORP	NA	NA	44.1	NA	-74.2	NA	-95.1	NA	-82.0	NA	-70.7	NA	-60.1	NA	-2.9

Sample: MW-03	Date	11/16/2017		2/28/2018		5/2/2018		7/24/2018		10/4/2018		2/20/2019		5/29/2019	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.010	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Barium	2.0	0.0025	0.11	0.0025	0.11	0.0025	0.09	0.0025	0.096	0.0025	0.11	0.0025	0.086	0.0025	0.086
Beryllium	0.004	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	2.0	0.5	2.8	0.5	2.8	0.05	2.3	0.5	3.3	0.5	2.5	0.5	2.4	0.5	2.9
Cadmium	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	200.0	2	16	2	16	2	16	2	20	2	22	2	35	2	19
Chromium	0.1	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	1.0	0.001	0.0011	0.001	0.0011	0.001	ND	0.001	0.0011	0.001	ND	0.001	ND	0.001	ND
Copper	0.65	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.2	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	4.0	0.1	0.39	0.1	0.39	0.1	0.39	0.1	0.36	0.1	0.38	0.1	0.36	0.1	0.29
Iron	5.0	0.1	ND	0.1	ND	0.1	ND	0.1	0.12	0.1	0.16	0.1	ND	0.1	ND
Lead	0.0075	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.15	0.0025	0.46	0.0025	0.46	0.0025	0.35	0.0025	0.35	0.0025	0.54	0.0025	0.31	0.0025	0.26
Mercury	0.002	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	0.002	0.0054	0.002	0.0054	0.002	0.0052	0.002	0.0065	0.002	0.0043	0.002	0.0059	0.002	0.0058
Nitrogen/Nitrate	10.0	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.26	0.1	0.58
Nitrogen/Nitrate, Nitr	NA	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.26	0.1	0.58
Nitrogen/Nitrite	NA	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0049	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.05	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.05	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	400.0	50	210	50	210	100	270	100	280	50	120	50	300	50	290
Thallium	0.002	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	1,200	10	930	10	930	10	880	10	940	10	820	10	880	10	970
Vanadium	0.049	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	5.0	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	11.705	0.0025	0.00071	0.0025	0.0013	0.0025	ND	0.0025	ND	0.0025	0.0011	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	6.63	NA	7.10	NA	7.29	NA	6.60	NA	7.09	NA	6.86	NA	7.15
Temperature	NA	NA	11.45	NA	11.87	NA	16.66	NA	20.11	NA	15.47	NA	11.00	NA	12.00
Conductivity	NA	NA	0.93	NA	0.903	NA	0.099	NA	1.072	NA	0.962	NA	1.380	NA	1.330
Dissolved Oxygen	NA	NA	2.69	NA	3.13	NA	1.60	NA	3.95	NA	2.22	NA	0.12	NA	0.20
ORP	NA	NA	-41.2	NA	-44.2	NA	-21.0	NA	-66.1	NA	-56.6	NA	109.6	NA	-2.1

Sample: MW-03	Date	8/21/2019		12/6/2019		2/27/2020		5/26/2020		8/7/2020		11/4/2020		3/1/2021		5/24/2021	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.010	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	0.0017	0.001	ND	0.001	ND	0.001	ND
Barium	2.0	0.0025	0.086	0.0025	0.089	0.0025	0.088	0.0025	0.07	0.0025	0.077	0.0025	0.088	0.0025	0.097	0.0025	0.11
Beryllium	0.004	0.001	ND ^	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND
Boron	2.0	0.5	2.9	0.5	3.2	0.5	2.6	0.5	3.1	0.5	4.2	1	3.2	0.5	3.6	0.5	3.0
Cadmium	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	200.0	2	41	2	12	2	14	2	17	2	21	2	40	2	17	2	19
Chromium	0.1	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	1.0	0.001	0.0014	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.65	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.2	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	0.0067	0.005	ND
Fluoride	4.0	0.1	0.38	0.1	0.49	0.1	0.4	0.1	0.32	0.1	0.38	0.1	0.45	0.1	0.3	0.1	0.32
Iron	5.0	0.1	0.14	0.1	ND	0.1	ND	0.1	0.11	0.1	0.18	0.1	0.13	0.1	ND	0.1	ND
Lead	0.0075	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.15	0.0025	0.35	0.0025	0.24	0.0025	0.27	0.0025	0.2	0.0025	0.21	0.0025	0.27	0.0025	0.27	0.0025	0.35
Mercury	0.002	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	0.002	0.0078	0.002	0.0047	0.002	0.0047	0.002	0.0052	0.002	0.0062	0.002	0.009	0.002	0.0056	0.002	0.0051
Nitrogen/Nitrate	10.0	0.1	ND	0.1	ND	0.1	ND	0.1	0.21	0.1	ND	0.1	ND	0.1	ND	0.1	0.32
Nitrogen/Nitrate, Nitr	NA	0.1	ND	0.1	ND	0.1	ND	0.1	0.21	0.1	ND	0.1	ND	0.1	ND	0.1	0.32
Nitrogen/Nitrite	NA	0.02	ND	0.02	ND H3	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0049	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.05	0.0025	ND	0.0025	ND ^	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0056
Silver	0.05	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	400.0	50	360	50	260	50	ND	50	310	100	360	50	330	100	340	130	270
Thallium	0.002	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	1,200	10	960	10	710	10	770	10	700	30	870	60	940	10	1000	10	870
Vanadium	0.049	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	5.0	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	11.705	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	7.15	NA	7.05	NA	6.83	NA	7.15	NA	6.78	NA	7.14	NA	7.19	NA	6.91
Temperature	NA	NA	15.20	NA	13.40	NA	10.12	NA	12.00	NA	14.80	NA	15.00	NA	10.60	NA	12.50
Conductivity	NA	NA	0.218	NA	1.226	NA	0.743	NA	1.235	NA	1.341	NA	1.330	NA	1.425	NA	1.249
Dissolved Oxygen	NA	NA	0.31	NA	0.81	NA	3.01	NA	0.59	NA	NM	NA	0.25	NA	-0.01	NA	0.10
ORP	NA	NA	-23.6	NA	-29.8	NA	-80.1	NA	-36.8	NA	-58.4	NA	-75.9	NA	-69.3	NA	138.6

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater.
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
NA - Not Applicable
ND - Not Detected

NM - Not Measured
NR - Not Required
NS - Not Sampled

Temperature	°C	degrees Celcius
Conductivity	ms/cm^c	millisiemens/centimeters
Dissolved Oxygen	mg/L	milligrams/liter
Oxygen Reduction Potential (ORP)	mV	millivolts

^ - Denotes instrument related QC exceeds the control limits
F1 - MS and/or MSD Recovery outside of limits
F2 - MS/MSD RPD exceeds control limits
H - Prepped/analyzed beyond the holding time

Sample: MW-04	Date	12/13/2010		3/28/2011		6/15/2011		9/15/2011		12/8/2011		3/16/2012		6/20/2012		9/24/2012	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND^	0.0030	ND	0.015	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	0.0010	0.0027	0.0010	0.0016	0.0050	ND	0.0010	0.0041	0.0010	0.0016	0.0010	0.0015	0.0010	0.0028	0.0010	0.0044
Barium	2.0	0.0025	0.068	0.0025	0.062	0.013	0.050	0.0025	0.050	0.0025	0.043	0.0025	0.036	0.0025	0.041	0.0025	0.041
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	0.25	3.7	0.25	3.3	0.050	3.6	0.050	4.3	0.050	3.0	0.25	4.0	0.50	5.3	0.25	6.2
Cadmium	0.005	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	10	120	10	190	10	120	10	170	10	150	10	150	10	140	10	170
Chromium	0.1	0.0050	ND	0.0050	ND	0.025	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	0.0010	0.0011	0.0010	ND	0.0050	ND	0.0010	0.0012	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.010	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.52	0.10	0.49	0.10	0.48	0.10	0.53	0.10	0.55	0.10	0.50	0.10	0.62	0.10	0.68
Iron	5.0	0.10	0.83	0.10	0.78	0.50	0.70	0.10	1.2	0.10	0.64	0.10	0.53	0.10	0.95	0.10	0.83
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0025	0.52	0.0025	0.58	0.013	0.70	0.0025	1.0	0.0025	0.62	0.0025	0.60	0.0025	0.70	0.0025	0.99
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	0.0020	0.0048	0.0020	0.0041	0.010	ND	0.0020	0.0051	0.0020	0.0047	0.0020	0.0048	0.0020	0.0047	0.0020	0.0046
Nitrogen/Nitrate	10.0	0.10	ND	0.10	ND	0.10	0.19	0.10	ND	0.10	0.37	0.10	0.45	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	NA	0.10	ND	0.10	ND	0.10	0.19	0.10	ND	0.10	0.37	0.10	0.45	0.10	ND	0.10	ND^
Nitrogen/Nitrite	NA	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Selenium	0.05	0.0025	ND	0.0025	0.0033	0.013	ND	0.0025	ND	0.0025	0.0086	0.0025	0.0067	0.0025	ND	0.0025	0.0026
Silver	0.05	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	250	1500	500	1500	250	1600	1000	4800	500	1600	500	2000	500	2800	500	3200
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	10	2500	10	2600	10	2800	25	6000	13	3100	13	3700	25	4300	17	4400
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zinc	5.0	0.020	ND	0.020	ND	0.10	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
pH	6.5 - 9.0	NA	7.37	NA	7.66	NA	7.23	NA	7.21	NA	6.58	NA	7.27	NA	7.10	NA	7.29
Temperature	NA	NA	14.22	NA	10.18	NA	13.86	NA	16.26	NA	13.65	NA	11.77	NA	16.18	NA	17.98
Conductivity	NA	NA	3.51	NA	3.39	NA	3.51	NA	5.26	NA	2.99	NA	3.22	NA	4.11	NA	4.73
Dissolved Oxygen	NA	NA	NM	NA	0.73	NA	2.72	NA	0.03	NA	0.11	NA	0.16	NA	0.03	NA	0.03
ORP	NA	NA	NM	NA	-235.2	NA	44.8	NA	-269	NA	-104	NA	-41	NA	-76	NA	-66

Sample: MW-04	Date	12/18/2012		3/5/2013		5/22/2013		8/14/2013		10/28/2013		2/13/2014		5/21/2014		8/13/2014	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	0.0020	0.0033	0.0010	0.0010	0.0010	0.0013	0.0010	0.0032	0.0010	0.0054	0.0010	0.0010	0.0010	ND	0.0010	0.0010
Barium	2.0	0.0050	0.037	0.0025	0.033	0.0025	0.034	0.0025	0.033	0.0025	0.037	0.0025	0.034	0.0025	0.030	0.0025	0.034
Beryllium	0.004	0.0020	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND^	0.0010	ND	0.0010	ND
Boron	2.0	0.10	5.2	0.50	4.5	0.50	3.8	0.50	5.1	0.10	5.6	0.50	4.6	0.50	4.2	0.25	4.8
Cadmium	0.005	0.0010	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	10	170	10	150	10	110	10	120	10	89	10	110	10	85	2.0	67
Chromium	0.1	0.010	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	0.0020	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	0.0014	0.0010	0.0012	0.0010	ND	0.0010	0.0013
Copper	0.65	0.0040	ND	0.0020	ND	0.0020	0.0023	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.63 ^	0.10	0.56 ^	0.10	0.60	0.10	0.66	0.10	0.47	0.10	0.43	0.10	0.43	0.10	0.47
Iron	5.0	0.20	1.2	0.10	0.20	0.10	ND	0.10	0.66	0.10	0.92	0.10	0.64	0.10	ND	0.10	0.26
Lead	0.0075	0.0010	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0050	0.62	0.0025	0.47	0.0025	0.44	0.0025	0.58	0.0025	0.65	0.0025	0.72	0.0025	0.49	0.0025	0.88
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	0.00066	0.00020	ND	0.00020	ND
Nickel	0.1	0.0040	0.0050	0.0020	0.0047	0.0020	0.0044	0.0020	0.0043	0.0020	0.0055	0.0020	0.0053	0.0020	0.0045	0.0020	0.0058
Nitrogen/Nitrate	10.0	0.10	ND	0.10	0.69	0.10	0.42	0.10	ND	0.10	ND	0.10	ND	0.10	0.39	0.10	ND
Nitrogen/Nitrate, Nitr	NA	0.10	ND	0.10	0.69	0.10	0.42	0.10	ND	0.10	ND	0.10	ND	0.10	0.39	0.10	ND
Nitrogen/Nitrite	NA	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	0.02	ND	0.004	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.05	0.0050	ND	0.0025	0.015	0.0025	0.0087	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0090	0.0025	0.0055
Silver	0.05	0.0010	ND	0.00050	ND	0.00050	ND	0.00050	ND ^	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	500	2200	500	2000	500	1500	500	2200	250	1300	250	1400	250	1100	250	1200
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	17	4000	17	3600	13	2900	25	3500	13	2400	13	2800	10	2500	10	2200
Vanadium	0.049	0.01	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	5.0	0.040	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	0.0005	ND	0.0005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	11.705	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	7.34	NA	6.61	NA	7.07	NA	7.15	NA	6.74	NA	7.03	NA	6.96	NA	6.75
Temperature	NA	NA	14.14	NA	9.60	NA	13.54	NA	17.54	NA	16.62	NA	10.22	NA	19.98	NA	18.18
Conductivity	NA	NA	3.85	NA	3.28	NA	2.44	NA	3.58	NA	2.84	NA	1.42	NA	3.06	NA	2.41
Dissolved Oxygen	NA	NA	0.06	NA	1.88	NA	1.07	NA	0.34	NA	0.36	NA	0.81	NA	1.66	NA	0.43
ORP	NA	NA	-79	NA	87.2	NA	-3.9	NA	-38.2	NA	-127.7	NA	-1.6	NA	-0.8	NA	3.6

Sample: MW-04	Date	10/20/2014		2/4/2015		5/1/2015		7/28/2015		11/11/2015		2/17/2016		5/25/2016		8/11/2016	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	0.0010	0.0011	0.0010	0.0013	0.0010	ND	0.0010	ND	0.0010	0.0019	0.0010	0.0013	0.0010	ND	0.0010	ND
Barium	2.0	0.0025	0.037	0.0025	0.031	0.0025	0.031	0.0025	0.038	0.0025	0.039	0.0025	0.038	0.0025	0.034	0.0025	0.038
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	0.50	4.5	1.0	3.9	0.25	4.0	0.50	5.4	0.50	5.0	0.050	4.9	0.050	4.3	0.25	4.8
Cadmium	0.005	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	10	82	10	120	10	110	10	97	2.0	46	10	84	2.0	73	2.0	54
Chromium	0.1	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	0.0010	0.0011	0.0010	ND	0.0010	ND	0.0010	0.0011	0.0010	0.0013	0.0010	0.0012	0.0010	ND	0.0010	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.54	0.10	0.52	0.10	0.47	0.10	0.56	0.10	0.43	0.10	0.52	0.10	0.50	0.10	0.46
Iron	5.0	0.10	0.27	0.10	0.28	0.10	ND	0.10	0.16	0.10	0.51	0.10	0.11	0.10	0.12	0.10	0.28
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0025	0.64	0.0025	0.52	0.0025	0.45	0.0025	0.77	0.0025	0.62	0.0025	0.70	0.0025	0.45	0.0025	0.57 B
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	0.00025
Nickel	0.1	0.0020	0.0065	0.0020	0.0043	0.0020	0.0057	0.0020	0.0053	0.0020	0.0070	0.0020	0.0079	0.0020	0.0047	0.0020	0.0057
Nitrogen/Nitrate	10.0	0.10	0.15	0.10	0.17	0.10	0.53	0.10	0.11	0.10	ND	0.10	0.34	0.10	0.25	0.10	ND
Nitrogen/Nitrate, Nitr	NA	0.10	0.15	0.10	0.17	0.10	0.53	0.10	0.11	0.10	ND	0.10	0.34	0.10	0.25	0.10	ND
Nitrogen/Nitrite	NA	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.05	0.0025	0.010	0.0025	0.0087	0.0025	0.020	0.0025	0.0046	0.0025	0.0081	0.0025	0.0077	0.0025	0.012	0.0025	0.0042
Silver	0.05	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	250	1600	250	1100	250	860	500	1600	250	870	500	1800	500	1300	250	880
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	10	2600	10	2600	10	2300	17	3200	10	1900	13	3200	13	2700	10	2200
Vanadium	0.049	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	5.0	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.00050	ND	0.00050	ND
BETX	11.705	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00050
pH	6.5 - 9.0	NA	5.87	NA	7.13	NA	7.15	NA	7.29	NA	6.65	NA	7.05	NA	6.85	NA	6.78
Temperature	NA	NA	16.64	NA	8.13	NA	13.74	NA	20.17	NA	16.27	NA	10.03	NA	18.45	NA	21.76
Conductivity	NA	NA	3.07	NA	2.21	NA	2.364	NA	3.852	NA	2.183	NA	2.46	NA	3.10	NA	2.74
Dissolved Oxygen	NA	NA	0.44	NA	2.01	NA	1.83	NA	0.90	NA	1.12	NA	0.95	NA	1.81	NA	1.68
ORP	NA	NA	3.1	NA	16.7	NA	9.3	NA	-73.4	NA	-33.0	NA	-18.7	NA	-10.3	NA	-116.2

Sample: MW-04	Date	10/27/2016		2/1/2017		5/11/2017		9/8/2017		11/16/2017		2/28/2018		5/2/2018		7/24/2018	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND	0.0030	ND ^	0.0030	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.010	0.0010	ND	0.0020	ND	0.0010	ND	0.001	0.0012	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Barium	2.0	0.0025	0.044	0.0025	0.035	0.0025	0.043	0.0025	0.036	0.0025	0.039	0.0025	0.039	0.0025	0.034	0.0025	0.043
Beryllium	0.004	0.0010	ND^	0.0010	ND	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	2.0	0.50	6.1	0.50	5.0	0.50	5.0	0.5	5.4	1	5.5	1	5.5	0.05	4.0	0.5	6.0
Cadmium	0.005	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	200.0	2.0	72	2.0	57	2.0	46	2	31	2	37	2	37	2	33	2	32
Chromium	0.1	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	1.0	0.0010	0.0011	0.0010	0.0010	0.0010	0.0014	0.001	ND	0.001	0.0012	0.001	0.0012	0.001	ND	0.001	0.0013
Copper	0.65	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.2	0.010	0.035	0.010	ND	0.010	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	4.0	0.10	0.50	0.10	0.43	0.10	0.33	0.1	0.46	0.1	0.48	0.1	0.48	0.1	0.45	0.1	0.46
Iron	5.0	0.10	0.16	0.10	0.11	0.10	0.28	0.1	0.21	0.1	0.17	0.1	0.17	0.1	ND	0.1	0.4
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.15	0.0025	0.64	0.0025	0.57	0.0025	0.70	0.0025	0.54	0.0025	0.51	0.0025	0.51	0.0025	0.38	0.0025	0.62
Mercury	0.002	0.00020	ND	0.00020	ND ^	0.00020	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	0.0020	0.0058	0.0020	0.0046	0.0020	0.0047	0.002	0.0039	0.002	0.005	0.002	0.005	0.002	0.0035	0.002	0.0043
Nitrogen/Nitrate	10.0	0.10	ND	0.10	0.86	0.10	ND	0.1	ND	0.1	0.19	0.1	0.19	0.1	0.42	0.1	ND
Nitrogen/Nitrate, Nitr	NA	0.10	ND	0.10	0.86	0.10	ND	0.1	ND	0.1	0.19	0.1	0.19	0.1	0.42	0.1	ND
Nitrogen/Nitrite	NA	0.020	ND	0.020	ND	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0049	0.0040	ND	0.0040	ND	0.0040	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.05	0.0025	ND	0.0050	0.011	0.0025	0.0026	0.0025	ND	0.0025	0.0056	0.0025	0.0056	0.0025	0.0071	0.0025	ND
Silver	0.05	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND ^	0.0005	ND ^	0.0005	ND	0.0005	ND
Sulfate	400.0	500	1400	500	1200	500	1300	250	830	250	1100	250	1100	250	1100	250	1300
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	1,200	10	2800	10	2700	10	2800	10	2000	10	2200	10	2200	10	2200	10	2600
Vanadium	0.049	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	5.0	0.020	ND	0.020	ND ^	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.005	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	11.705	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00099	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	7.01	NA	6.87	NA	7.67	NA	6.86	NA	6.63	NA	6.81	NA	7.25	NA	6.43
Temperature	NA	NA	14.80	NA	8.85	NA	12.24	NA	17.50	NA	13.78	NA	11.33	NA	16.13	NA	18.56
Conductivity	NA	NA	2.67	NA	2.29	NA	2.45	NA	2.00	NA	2.03	NA	1.607	NA	2.111	NA	2.389
Dissolved Oxygen	NA	NA	3.02	NA	2.13	NA	3.44	NA	0.39	NA	1.54	NA	2.35	NA	1.08	NA	2.79
ORP	NA	NA	-6.4	NA	-27.0	NA	-7.8	NA	1.5	NA	-79.4	NA	-16.8	NA	-35.3	NA	-68.7

Sample: MW-04	Date	10/3/2018		2/20/2019		5/29/2019		8/21/2019		12/5/2019		2/27/2020		5/26/2020		8/7/2020	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.010	0.001	ND	0.001	ND	0.001	ND	0.001	0.0014	0.001	0.0013	0.001	0.0012	0.001	ND	0.001	0.0022
Barium	2.0	0.0025	0.042	0.0025	0.052	0.0025	0.045	0.0025	0.054	0.0025	0.047	0.0025	0.039	0.0025	0.04	0.0025	0.041
Beryllium	0.004	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND
Boron	2.0	0.5	4.4	0.5	3.4	0.5	3.3	0.5	5.9	0.5	6.4	0.5	4.5	0.5	5.8	1	6.8
Cadmium	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	200.0	2	28	2	70	2	37	2	28	2	22	2	18	2	15	2	15
Chromium	0.1	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	1.0	0.001	0.0011	0.001	0.0012	0.001	ND	0.001	0.0015	0.001	ND	0.001	ND	0.001	0.0011	0.001	ND
Copper	0.65	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	0.0025	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.2	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	4.0	0.1	0.42	0.1	0.38	0.1	0.39	0.1	0.44	0.1	0.51	0.1	0.41	0.1	0.43	0.1	0.47
Iron	5.0	0.1	0.35	0.1	0.19	0.1	0.24	0.1	0.91	0.1	0.31	0.1	0.26	0.1	0.52	0.1	0.85
Lead	0.0075	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.15	0.0025	0.55	0.0025	0.59	0.0025	0.55	0.0025	0.69	0.0025	0.5	0.0025	0.48	0.0025	0.52	0.0025	0.52
Mercury	0.002	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	0.002	0.0041	0.002	0.0045	0.002	0.004	0.002	0.0063	0.002	0.0041	0.002	0.0031	0.002	0.0038	0.002	0.0034
Nitrogen/Nitrate	10.0	0.1	ND	0.1	0.93	0.1	ND	0.1	ND	0.1	0.52	0.1	0.32	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nitr	NA	0.1	ND	0.1	0.93	0.1	ND ^	0.1	ND	0.1	0.52	0.1	0.32	0.1	ND	0.1	ND
Nitrogen/Nitrite	NA	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0049	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.05	0.0025	ND	0.0025	0.014	0.0025	0.0094	0.0025	ND	0.0025	0.009	0.0025	0.0066	0.0025	ND	0.0025	ND
Silver	0.05	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	400.0	250	410	250	920	250	650	250	1100	250	1200	250	1100	250	1100	250	970
Thallium	0.002	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	1,200	10	1600	10	2100	10	2000	10	2200	10	2400	10	2200	10	2200	150	1900
Vanadium	0.049	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	5.0	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	11.705	0.0025	0.0015	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	6.96	NA	6.68	NA	6.91	NA	7.04	NA	6.86	NA	6.56	NA	6.84	NA	6.86
Temperature	NA	NA	21.53	NA	10.70	NA	11.70	NA	15.00	NA	13.80	NA	10.01	NA	11.70	NA	15.10
Conductivity	NA	NA	1.921	NA	2.653	NA	2.260	NA	0.224	NA	3.025	NA	1.628	NA	2.851	NA	2.365
Dissolved Oxygen	NA	NA	1.79	NA	0.03	NA	0.29	NA	0.37	NA	0.68	NA	2.79	NA	0.66	NA	NM
ORP	NA	NA	-4.4	NA	60.2	NA	7.7	NA	-46.3	NA	15.0	NA	-74.9	NA	-14.8	NA	-58.6

Sample: MW-04	Date	11/4/2020		2/22/2021		5/24/2021	
Parameter	Standards	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.010	0.001	0.0017	0.001	0.0011	0.001	ND
Barium	2.0	0.0025	0.037	0.0025	0.04	0.0025	0.044
Beryllium	0.004	0.001	ND ^	0.001	ND ^	0.001	ND
Boron	2.0	1	5.5	1	5.3	1	5.1
Cadmium	0.005	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	200.0	2	20	2	16	2	24
Chromium	0.1	0.005	ND	0.005	ND	0.005	ND
Cobalt	1.0	0.001	0.0012	0.001	0.0018	0.001	0.0017
Copper	0.65	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.2	0.01	ND	0.005	ND	0.005	ND
Fluoride	4.0	0.1	0.44	0.1	0.37	0.1	0.37
Iron	5.0	0.1	0.72	0.1	0.43	0.1	0.58
Lead	0.0075	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.15	0.0025	0.56	0.0025	0.76	0.0025	0.74
Mercury	0.002	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	0.002	0.0057	0.002	0.0054	0.002	0.0065
Nitrogen/Nitrate	10.0	0.1	ND	0.1	0.35	0.1	ND
Nitrogen/Nitrate, Nitr	NA	0.1	ND	0.1	0.35	0.1	ND
Nitrogen/Nitrite	NA	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0049	0.004	ND	0.004	ND	0.004	ND
Selenium	0.05	0.0025	0.0089	0.0025	0.013	0.0025	ND
Silver	0.05	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	400.0	100	630	100	860	130	990
Thallium	0.002	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	1,200	150	1800	10	1900 H	10	2000
Vanadium	0.049	0.005	ND	0.005	ND	0.005	ND
Zinc	5.0	0.02	ND	0.02	ND	0.02	ND
Benzene	0.005	0.0005	ND	0.0005	ND	0.0005	ND
BETX	11.705	0.0025	ND	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	6.69	NA	6.84	NA	6.9
Temperature	NA	NA	16.00	NA	11.20	NA	14.30
Conductivity	NA	NA	2.000	NA	2.299	NA	2.400
Dissolved Oxygen	NA	NA	0.19	NA	6.03	NA	1.28
ORP	NA	NA	-71.0	NA	-12.0	NA	133.8

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater.
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
NA - Not Applicable
ND - Not Detected

NM - Not Measured
NR - Not Required
NS - Not Sampled

Temperature °C degrees Celcius
Conductivity ms/cm^c millisiemens/centimeters
Dissolved Oxygen mg/L milligrams/liter
Oxygen Reduction Potential (ORP) mV millivolts

^ - Denotes instrument related QC exceeds the control limits
F1 - MS and/or MSD Recovery outside of limits
F2 - MS/MSD RPD exceeds control limits
H - Prepped/analyzed beyond the holding time

Attachment 9-3. Historical Groundwater Data - Midwest Generation LLC, Will County Station, Romeoville, IL

Sample: MW-05	Date	12/13/2010		3/28/2011		6/15/2011		9/15/2011		12/8/2011		3/16/2012		6/20/2012		9/24/2012		12/18/2012	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND^	0.0030	ND	0.015	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	0.0010	0.0066	0.0010	0.0048	0.0050	ND	0.0010	0.0025	0.0010	0.0065	0.0010	0.0065	0.0010	0.0073	0.0010	0.0023	0.0010	0.0058
Barium	2.0	0.0025	0.051	0.0025	0.060	0.013	0.067	0.0025	0.070	0.0025	0.061	0.0025	0.053	0.0025	0.040	0.0025	0.073	0.0025	0.045
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	0.25	2.6	0.25	2.7	0.050	3.2	0.050	4.0	0.050	3.2	0.25	2.9	0.50	2.3	0.25	3.8	0.50	2.5
Cadmium	0.005	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	10	110	10	150	10	140	10	150	10	130	10	170	10	150	10	160	10	150
Chromium	0.1	0.0050	ND	0.0050	ND	0.025	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	0.0010	ND	0.0010	ND	0.0050	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.010	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.41	0.10	0.40	0.10	0.46	0.10	0.49	0.10	0.38	0.10	0.42	0.10	0.59	0.10	0.44	0.10	0.47 ^
Iron	5.0	0.10	ND	0.10	ND	0.50	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0025	0.0079	0.0025	0.0067	0.013	0.055	0.0025	0.13	0.0025	0.038	0.0025	0.032	0.0025	0.014	0.0025	0.073	0.0025	0.023
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	0.0020	ND	0.0020	ND	0.010	ND	0.0020	0.0021	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0025	0.0020	0.0020
Nitrogen/Nitrate	10.0	0.10	0.27	0.10	1.6	0.10	1.1	0.10	0.11	0.10	1.0	0.10	0.11	0.10	0.24	0.10	0.11	0.10	ND
Nitrogen/Nitrate, Nitr	NA	0.10	0.27	0.10	1.9	0.10	0.97	0.10	0.11	0.10	1.2	0.10	0.25	0.10	0.27	0.10	0.11	0.10	1.2
Nitrogen/Nitrite	NA	0.020	ND	0.10	0.31	0.020	0.13	0.020	ND	0.020	0.17	0.020	0.14	0.020	0.031	0.020	ND	0.20	1.2
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.004	ND
Selenium	0.05	0.0025	0.017	0.0025	0.014	0.013	0.016	0.0025	0.0080	0.0025	0.010	0.0025	0.0059	0.0025	ND	0.0025	0.017	0.0025	0.0079
Silver	0.05	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	100	580	100	570	100	540	130	690	100	500	100	370	100	410	100	540	100	280
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	10	1000	10	1300	10	1400	10	1500	10	1000	10	1000	10	750	10	1100	10	820
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0050	0.034
Zinc	5.0	0.020	ND	0.020	ND	0.10	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0005	ND
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0025	ND
pH	6.5 - 9.0	NA	9.58	NA	9.51	NA	7.44	NA	7.38	NA	8.20	NA	9.30	NA	9.41	NA	7.54	NA	9.37
Temperature	NA	NA	12.79	NA	7.95	NA	14.62	NA	17.22	NA	13.19	NA	10.98	NA	16.59	NA	19.67	NA	13.41
Conductivity	NA	NA	1.66	NA	1.93	NA	1.97	NA	1.78	NA	1.10	NA	1.02	NA	1.01	NA	1.44	NA	1.05
Dissolved Oxygen	NA	NA	NM	NA	3.81	NA	3.22	NA	0.51	NA	0.39	NA	0.21	NA	0.22	NA	0.66	NA	0.19
ORP	NA	NA	NM	NA	-156.4	NA	173.2	NA	-196	NA	-46	NA	47	NA	-1	NA	66	NA	8

Date	3/5/2013		6/5/2013		8/14/2013		10/28/2013		2/13/2014		5/21/2014		8/12/2014		10/20/2014		2/3/2015	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.0010	0.0069	0.0010	0.0020	0.0010	0.0025	0.0010	0.0021	0.0010	0.0017	0.0010	0.0015	0.0010	0.0031	0.0010	0.0014	0.0010	0.0028
Barium	0.0025	0.050	0.0025	0.11	0.0025	0.042	0.0025	0.078	0.0025	0.056	0.0025	0.075	0.0025	0.066	0.0025	0.061	0.0025	0.048
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND^	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	0.50	2.6	0.50	3.6	0.50	3.5	0.10	4.1	0.50	2.7	0.50	2.9	0.25	2.7	0.50	4.7	1.0	2.4
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	140	10	110	10	120	10	130	10	130	10	160	10	170	10	81	10	200
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.10	0.42 ^	0.10	0.30	0.10	0.50	0.10	0.36	0.10	0.43	0.10	0.28	0.10	0.52	0.10	0.35	0.10	0.50
Iron	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	0.036	0.0025	0.15	0.0025	0.060	0.0025	0.11	0.0025	0.053	0.0025	0.11	0.0025	0.062	0.0025	0.20	0.0025	0.046
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.0020	0.0022	0.0020	0.0025	0.0020	0.0039	0.0020	0.0028	0.0020	0.0024	0.0020	0.0020	0.0020	0.0031	0.0020	0.0049	0.0020	ND
Nitrogen/Nitrate	0.10	0.56	0.10	0.69	0.10	ND	0.10	0.27	0.10	0.24	0.10	0.72	0.10	ND	0.10	0.12	0.10	1.3
Nitrogen/Nitrate, Nitr	0.10	1.3	0.10	0.75	0.10	ND	0.10	0.59	0.10	0.80	0.10	0.97	0.10	ND	0.10	0.12	0.10	1.6
Nitrogen/Nitrite	0.10	0.74	0.020	0.059	0.020	ND	0.10	0.32	0.10	0.56	0.040	0.25	0.020	0.098	0.020	ND	0.040	0.34
Perchlorate	0.004	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	0.010	0.0025	0.026	0.0025	ND	0.0025	0.17	0.0025	0.024	0.0025	0.013	0.0025	0.0051	0.0025	0.010	0.0025	0.0058
Silver	0.00050	ND	0.00050	ND	0.00050	ND ^	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	100	320	250	650	100	500	130	560	100	690	250	1700	250	610	250	840	100	430
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	10	940	10	1600	10	1100	10	1300	10	1400	10	1600	10	1400	10	2100	10	1100
Vanadium	0.0050	0.025	0.0050	0.010	0.0050	0.0054	0.0050	0.013	0.0050	0.012	0.0050	0.018	0.0050	0.013	0.0050	0.010	0.0050	0.019
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.0005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.43	NA	7.00	NA	7.88	NA	6.75	NA	8.45	NA	7.07	NA	7.36	NA	6.87	NA	9.70
Temperature	NA	8.10	NA	14.77	NA	16.72	NA	17.04	NA	9.59	NA	16.68	NA	16.80	NA	18.46	NA	8.29
Conductivity	NA	1.02	NA	1.66	NA	1.28	NA	1.55	NA	0.81	NA	1.92	NA	1.60	NA	2.59	NA	1.13
Dissolved Oxygen	NA	4.84	NA	0.56	NA	0.15	NA	0.92	NA	0.78	NA	0.46	NA	0.35	NA	0.81	NA	2.40
ORP	NA	205.5	NA	-11.3	NA	20.8	NA	-73.8	NA	89.4	NA	87.6	NA	-24.6	NA	58.1	NA	-53.5

Date	5/1/2015		7/28/2015		11/11/2015		2/18/2016		5/26/2016		8/10/2016		10/26/2016		2/1/2017		5/11/2017	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND ^	0.0030	ND
Arsenic	0.0010	0.0019	0.0010	0.0011	0.0010	0.0014	0.0010	0.0015	0.0010	0.0024	0.0010	0.0050	0.0010	0.0060	0.0020	ND	0.0010	0.0035
Barium	0.0025	0.072	0.0025	0.063	0.0025	0.078	0.0025	0.054	0.0025	0.059	0.0025	0.071	0.0025	0.033	0.0025	0.050	0.0025	0.039
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND^	0.0010	ND	0.0010	ND
Boron	0.25	3.7	0.50	5.3	0.50	5.9	0.050	4.1	0.050	3.7	0.25	4.1	0.50	3.9	0.50	4.2	0.50	3.5
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	180	10	100	10	110	10	120	10	96	10	110	10	120	2.0	54	10	86
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.10	0.31	0.10	0.38	0.10	0.31	0.10	0.31	0.10	0.32	0.10	0.46	0.10	0.72	0.10	0.36	0.10	0.40
Iron	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	0.092	0.0025	0.13	0.0025	0.17	0.0025	0.11	0.0025	0.075	0.0025	0.14 B	0.0025	0.019	0.0025	0.072	0.0025	0.052
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND ^	0.00020	ND
Nickel	0.0020	0.0023	0.0020	0.0034	0.0020	0.0026	0.0020	0.0053	0.0020	0.0030	0.0020	0.0030	0.0020	0.0021	0.0020	0.0030	0.0020	ND
Nitrogen/Nitrate	0.10	1.1	0.10	0.48	0.10	ND	0.10	0.61	0.10	0.51	0.10	ND	0.10	ND	0.10	0.75	0.10	ND
Nitrogen/Nitrate, Nitr	0.10	1.2	0.10	0.48	0.10	ND	0.10	0.65	0.10	0.66	0.10	0.13	0.10	ND	0.10	0.75	0.10	ND
Nitrogen/Nitrite	0.020	0.099	0.020	ND	0.020	ND	0.020	0.040	0.020	0.15	0.020	0.048	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	0.020	0.0025	0.021	0.0025	0.035	0.0025	0.017	0.0025	0.027	0.0025	0.012	0.0025	ND	0.0050	0.027	0.0025	0.0034
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	100	480	250	770	250	780	250	730	250	600	130	530	100	360	100	500	100	470
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	10	1600	10	2000	10	1900	10	1700	10	1500	10	1200	10	820	10	1600	10	1000
Vanadium	0.0050	0.012	0.0050	0.011	0.0050	0.016	0.0050	0.010	0.0050	0.013	0.0050	0.022	0.0050	0.030	0.0050	0.0083	0.0050	0.0099
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND ^	0.020	ND
Benzene	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	0.0025	ND	0.0025	ND	0.0025	0.0015	0.0025	ND	0.0025	0.00068	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.29	NA	7.13	NA	7.24	NA	6.99	NA	6.73	NA	8.62	NA	9.08	NA	6.81	NA	7.86
Temperature	NA	12.11	NA	20.61	NA	15.77	NA	8.54	NA	15.42	NA	24.37	NA	13.90	NA	9.44	NA	13.04
Conductivity	NA	1.691	NA	2.467	NA	2.016	NA	1.17	NA	1.69	NA	1.57	NA	1.09	NA	1.44	NA	1.24
Dissolved Oxygen	NA	1.53	NA	1.41	NA	1.17	NA	1.42	NA	2.12	NA	0.85	NA	2.24	NA	2.90	NA	1.62
ORP	NA	31.4	NA	-50.4	NA	46.1	NA	21.7	NA	91.9	NA	-207.6	NA	-76.7	NA	-10.3	NA	-34.8

Date	9/8/2017		11/16/2017		2/28/2018		5/2/2018		7/25/2018		10/3/2018		2/20/2019		5/29/2019		8/21/2019	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	0.0035	0.001	0.0051	0.001	0.0018	0.001	ND	0.001	0.0056	0.001	0.0024	0.001	0.0031	0.001	0.0034	0.001	0.0047
Barium	0.0025	0.039	0.0025	0.049	0.0025	0.065	0.0025	0.054	0.0025	0.03	0.0025	0.049	0.0025	0.029	0.0025	0.028	0.0025	0.036
Beryllium	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^
Boron	0.5	3.5	0.5	4.3	1	4.8	0.05	3.4	0.5	4.2	1	5.2	1	3.6	1	3.5	1	4.2
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	86	10	82	2	47	2	33	2	70	2	61	2	78	2	76	2	48
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	0.1	0.4	0.1	0.57	0.1	0.45	0.1	0.38	0.1	0.69	0.1	0.57	0.1	0.59	0.1	0.64	0.1	0.78
Iron	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.052	0.0025	0.039	0.0025	0.096	0.0025	0.071	0.0025	0.023	0.0025	0.083	0.0025	0.04	0.0025	0.027	0.0025	0.046
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	ND	0.002	0.002	0.002	0.0034	0.002	0.0028	0.002	0.0022	0.002	0.0023	0.002	ND	0.002	0.002	0.002	0.0024
Nitrogen/Nitrate	0.1	ND	0.1	ND	0.1	0.13	0.1	0.41	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nitr	0.1	ND	0.1	ND	0.1	0.13	0.1	0.41	0.1	ND	0.1	ND	0.1	ND	0.1	ND ^	0.1	ND
Nitrogen/Nitrite	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	0.038	0.02	0.021	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	0.0034	0.0025	0.0054	0.0025	0.014	0.0025	0.025	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0026	0.0025	0.0025
Silver	0.0005	ND	0.0005	ND	0.0005	ND ^	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	100	470	100	470	100	640	100	580	100	460	100	420	100	420	100	390	100	450
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	1000	10	1000	10	1500	10	1400	10	960	10	1000	10	890	10	1000	10	950
Vanadium	0.005	0.0099	0.005	0.011	0.005	0.011	0.005	0.0065	0.005	ND	0.005	ND	0.005	0.0066	0.005	0.015	0.005	0.0073
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	0.0016	0.0025	ND	0.0025	ND	0.0025	0.0012	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.86	NA	9.4	NA	6.7	NA	7.23	NA	7.33	NA	7.07	NA	9.04	NA	8.45	NA	8.64
Temperature	NA	13.04	NA	17.40	NA	11.71	NA	17.08	NA	19.00	NA	18.05	NA	10.40	NA	11.80	NA	16.20
Conductivity	NA	1.24	NA	1.12	NA	1.35	NA	1.371	NA	1.070	NA	1.380	NA	1.301	NA	1.360	NA	0.193
Dissolved Oxygen	NA	1.62	NA	1.19	NA	2.53	NA	2.66	NA	2.19	NA	3.00	NA	0.10	NA	0.22	NA	0.43
ORP	NA	-34.8	NA	6.6	NA	-32.4	NA	-13.7	NA	-89.1	NA	100.6	NA	59.3	NA	-9.7	NA	-78.8

Date	12/6/2019		2/27/2020		5/22/2020		8/6/2020		11/4/2020		2/23/2021		5/24/2021	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	0.0027	0.001	0.002	0.001	0.0025	0.001	0.006	0.001	0.0016	0.001	ND	0.001	ND
Barium	0.0025	0.078	0.0025	0.049	0.0025	0.029	0.0025	0.025	0.0025	0.077	0.0025	0.038	0.0025	0.049
Beryllium	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND ^	0.001	ND
Boron	1	4.8	1	3.3	1	4.1	0.5	5.1	1	5.1	1	5.6	1	4.9
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	2	31	2	29	2	72	2	49	2	32	2	10	2	29
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.005	ND
Fluoride	0.1	0.43	0.1	0.48	0.1	0.56	0.1	0.77	0.1	0.34	0.1	0.56	0.1	0.52
Iron	0.1	0.17	0.1	0.17	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.15	0.0025	0.12	0.0025	0.035	0.0025	0.014	0.0025	0.21	0.0025	0.044	0.0025	0.043
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	0.0023	0.002	0.0022	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen/Nitrate	0.1	ND	0.1	0.25	0.1	0.43	0.1	ND	0.1	0.15	0.1	0.15	0.1	0.39
Nitrogen/Nitrate, Nitr	0.1	ND	0.1	0.25	0.1	0.43	0.1	ND	0.1	0.15	0.1	0.15	0.1	0.39
Nitrogen/Nitrite	0.02	ND H3	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	0.011	0.0025	0.018 F1	0.0025	0.0029	0.0025	ND	0.0025	0.083	0.0025	0.037	0.0025	0.048
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	100	470	100	ND	100	410	100	420	50	410	100	380	150	440
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	1200	10	1100	10	850	30	750	60	1200	10	830 H	10	1000
Vanadium	0.005	ND	0.005	0.0057	0.005	0.015	0.005	0.014	0.005	0.013	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	6.95	NA	6.75	NA	7.39	NA	9.02	NA	7.06	NA	7.29	NA	7.07
Temperature	NA	13.50	NA	9.76	NA	11.40	NA	15.40	NA	16.30	NA	10.70	NA	12.70
Conductivity	NA	1.814	NA	1.097	NA	1.593	NA	1.123	NA	1.480	NA	1.269	NA	1.488
Dissolved Oxygen	NA	0.72	NA	3.98	NA	0.80	NA	NM	NA	0.46	NA	2.97	NA	1.87
ORP	NA	-2.6	NA	-66.0	NA	-11.1	NA	-55.6	NA	-42.1	NA	-11.0	NA	156.3

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater.
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
NA - Not Applicable
ND - Not Detected

NM - Not Measured
NR - Not Required
NS - Not Sampled

Temperature °C degrees Celcius
Conductivity ms/cm[c] millisiemens/centimeters
Dissolved Oxygen mg/L milligrams/liter
Oxygen Reduction Potential (ORP) mV millivolts

^ - Denotes instrument related QC exceeds the control limits
F1 - MS and/or MSD Recovery outside of limits
F2 - MS/MSD RPD exceeds control limits
H - Prepped/analyzed beyond the holding time

Attachment 9-3. Historical Groundwater Data - Midwest Generation LLC, Will County Station, Romeoville, IL

Sample: MW-06	Date	12/13/2010		3/28/2011		6/15/2011		9/15/2011		12/8/2011		3/16/2012		6/20/2012		9/24/2012		12/18/2012	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND^	0.0030	ND	0.015	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	0.0010	0.0018	0.0010	0.0018	0.0050	ND	0.0010	0.0031	0.0010	0.0022	0.0010	0.0022	0.0010	0.0021	0.0010	0.0026	0.0010	0.0020
Barium	2.0	0.0025	0.050	0.0025	0.040	0.013	0.045	0.0025	0.041	0.0025	0.053	0.0025	0.044	0.0025	0.046	0.0025	0.054	0.0025	0.051
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	0.25	2.7	0.25	2.5	0.050	2.4	0.050	3.0	0.050	2.5	0.25	2.5	0.50	2.9	0.25	3.0	0.50	3.0
Cadmium	0.005	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	10	120	10	210	10	150	10	120	10	120	10	110	10	92	10	110	10	110
Chromium	0.1	0.0050	ND	0.0050	ND	0.025	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	0.0010	ND	0.0010	ND	0.0050	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.010	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.85	0.10	0.88	0.10	0.79	0.10	0.97	0.10	0.77	0.10	0.68	0.10	0.81	0.10	ND	0.10	0.71 ^
Iron	5.0	0.10	ND	0.10	ND	0.50	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0025	0.073	0.0025	0.051	0.013	0.047	0.0025	0.024	0.0025	0.038	0.0025	0.029	0.0025	0.033	0.0025	0.038	0.0025	0.034
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	0.0020	ND	0.0020	ND	0.010	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0022
Nitrogen/Nitrate	10.0	0.10	ND	0.10	ND	0.10	0.26	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	NA	0.10	ND	0.10	ND	0.10	0.10	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND^	0.10	ND ^
Nitrogen/Nitrite	NA	0.020	ND	0.020	0.048	0.020	0.16	0.020	ND	0.020	ND	0.020	ND	0.020	0.052	0.020	0.026	0.020	ND
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.004	ND
Selenium	0.05	0.0025	0.0062	0.0025	0.0028	0.013	ND	0.0025	0.011	0.0025	ND	0.0025	ND	0.0025	0.0034	0.0025	0.014	0.0025	0.0057
Silver	0.05	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	100	500	100	540	100	570	100	420	100	440	100	380	100	450	100	550	100	360
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	10	990	10	1100	10	1200	10	870	10	880	10	900	10	770	10	890	10	820
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0050	ND
Zinc	5.0	0.020	ND	0.020	ND	0.10	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0005	ND
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0025	ND
pH	6.5 - 9.0	NA	8.89	NA	9.65	NA	9.27	NA	9.44	NA	8.82	NA	9.39	NA	9.07	NA	9.17	NA	9.18
Temperature	NA	NA	14.59	NA	10.01	NA	13.63	NA	16.28	NA	14.24	NA	10.74	NA	18.03	NA	18.96	NA	14.00
Conductivity	NA	NA	1.64	NA	1.63	NA	1.69	NA	1.11	NA	1.05	NA	0.92	NA	1.04	NA	1.21	NA	0.99
Dissolved Oxygen	NA	NA	NM	NA	0.54	NA	0.12	NA	0.06	NA	0.13	NA	3.47	NA	3.06	NA	0.01	NA	0.36
ORP	NA	NA	NM	NA	-239.1	NA	54.4	NA	-305	NA	-241	NA	-50	NA	-106	NA	-134	NA	-174

Sample: MW-06	3/5/2013		5/22/2013		8/14/2013		10/28/2013		2/13/2014		5/20/2014		8/12/2014		10/20/2014	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.0010	0.0019	0.0010	0.0014	0.0010	0.0022	0.0010	0.0031	0.0010	ND	0.0010	ND	0.0010	0.0018	0.0010	0.0017
Barium	0.0025	0.044	0.0025	0.057	0.0025	0.053	0.0025	0.063	0.0025	0.052	0.0025	0.045	0.0025	0.039	0.0025	0.066
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND^	0.0010	ND	0.0010	ND	0.0010	ND
Boron	0.50	2.7	0.50	2.8	0.50	2.9	0.10	3.7	0.50	3.0	0.50	2.9	0.25	2.8	0.50	3.4
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	130	10	110	10	91	10	76	2.0	55	10	120	10	120	10	81
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.10	0.71 ^	0.10	0.65	0.10	0.57	0.10	0.57	0.10	0.45	0.10	0.42	0.10	0.96	0.10	0.56
Iron	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	0.11	0.10	ND	0.10	ND	0.10	ND
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	0.030	0.0025	0.082	0.0025	0.023	0.0025	0.083	0.0025	0.099	0.0025	0.056	0.0025	0.028	0.0025	0.11
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0020	0.0020	0.0020	0.0020	ND	0.0020	ND	0.0020	0.0020
Nitrogen/Nitrate	0.10	0.63	0.10	0.10	0.10	ND	0.10	ND	0.10	ND	0.10	0.72	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	0.10	0.82	0.10	0.20	0.10	ND	0.10	ND	0.10	ND	0.10	0.91	0.10	0.16	0.10	ND
Nitrogen/Nitrite	0.040	0.19	0.020	0.099	0.020	ND	0.020	ND	0.020	ND	0.020	0.19	0.10	0.29	0.020	ND
Perchlorate	0.004	ND ^	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	0.0075	0.0025	0.0071	0.0025	0.0040	0.0025	ND	0.0025	0.0041	0.0025	0.0057	0.0025	0.0036	0.0025	0.0036
Silver	0.00050	ND	0.00050	ND	0.00050	ND ^	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	100	370	100	360	100	400	100	310	100	270	100	320	100	200	100	420
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	10	840	10	880	10	860	10	790	10	780	10	840	10	660	10	800
Vanadium	0.0050	0.011	0.0050	ND	0.0050	0.0087	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	0.014	0.0050	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.0005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	8.22	NA	8.41	NA	9.13	NA	8.50	NA	8.27	NA	8.52	NA	8.16	NA	7.26
Temperature	NA	10.00	NA	15.89	NA	18.56	NA	15.76	NA	9.46	NA	16.13	NA	16.21	NA	18.31
Conductivity	NA	0.97	NA	1.19	NA	1.04	NA	0.96	NA	0.57	NA	1.08	NA	1.00	NA	1.20
Dissolved Oxygen	NA	3.48	NA	0.37	NA	0.37	NA	0.23	NA	1.19	NA	0.32	NA	0.62	NA	0.66
ORP	NA	175.2	NA	-14.3	NA	-16.6	NA	-173.8	NA	35.4	NA	-94.2	NA	-3.7	NA	-94.0

Sample: MW-06	2/3/2015		4/30/2015		7/28/2015		11/10/2015		2/18/2016		5/26/2016		8/11/2016		10/26/2016		2/1/2017	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND ^
Arsenic	0.0010	0.0028	0.0010	0.0010	0.0010	ND	0.0010	0.0017	0.0010	ND	0.0010	0.0022	0.0010	0.0029	0.0010	0.0031	0.0020	ND
Barium	0.0025	0.071	0.0025	0.072	0.0025	0.061	0.0025	0.044	0.0025	0.062	0.0025	0.075	0.0025	0.087	0.0025	0.084	0.0025	0.056
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND^	0.0010	ND
Boron	1.0	3.2	0.25	3.0	0.50	3.6	0.50	3.4	0.050	2.4	0.050	2.9	0.25	3.6	0.50	3.9	0.25	2.9
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND ^
Chloride	2.0	49	10	160	10	120	10	110	10	150	10	83	2.0	61	2.0	73	10	90
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.10	0.37	0.10	0.38	0.10	0.45	0.10	0.63	0.10	0.45	0.10	0.38	0.10	0.34	0.10	0.39	0.10	0.41
Iron	0.10	0.17	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	0.11	0.10	0.15	0.10	ND
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	0.12	0.0025	0.068	0.0025	0.066	0.0025	0.037	0.0025	0.051	0.0025	0.089	0.0025	0.13 B	0.0025	0.13	0.0025	0.062
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND ^
Nickel	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0022	0.0020	ND	0.0020	0.0024	0.0020	0.0039	0.0020	ND
Nitrogen/Nitrate	0.10	ND	0.10	0.23	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	0.14
Nitrogen/Nitrate, Nitr	0.10	ND	0.10	0.30	0.10	ND	0.10	ND	0.10	0.14	0.10	ND	0.10	ND	0.10	ND	0.10	0.18
Nitrogen/Nitrite	0.020	ND	0.020	0.067	0.020	0.077	0.020	0.032	0.020	0.047	0.020	ND	0.020	ND	0.020	ND	0.020	0.039
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0048	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0028	0.0050	ND
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND ^
Sulfate	50	310	50	350	100	330	50	360	50	290	100	350	100	360	50	320	50	260
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	10	770	10	780	10	800	10	660	10	720	10	780	10	810	10	750	10	750
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	0.0058	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND ^
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	0.0005	0.0005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0028	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	8.38	NA	8.08	NA	8.60	NA	8.63	NA	8.58	NA	7.79	NA	7.74	NA	8.16	NA	7.88
Temperature	NA	8.28	NA	10.95	NA	25.89	NA	17.67	NA	7.76	NA	16.74	NA	20.61	NA	13.77	NA	10.00
Conductivity	NA	0.77	NA	0.935	NA	1.289	NA	0.978	NA	0.63	NA	0.99	NA	1.10	NA	0.94	NA	0.80
Dissolved Oxygen	NA	1.69	NA	1.90	NA	0.88	NA	1.67	NA	1.57	NA	4.37	NA	2.23	NA	1.84	NA	3.40
ORP	NA	-142.5	NA	-61.3	NA	-132.5	NA	-101.6	NA	-33.1	NA	-67.5	NA	-125.1	NA	-78.4	NA	-78.4

Sample: MW-06	5/11/2017		9/7/2017		11/16/2017		2/28/2018		5/3/2018		7/25/2018		10/3/2018		2/20/2019	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.0010	0.0011	0.001	0.0027	0.001	0.0024	0.001	0.0024	0.001	0.0022	0.001	0.0034	0.001	0.0032	0.001	0.002
Barium	0.0025	0.055	0.0025	0.078	0.0025	0.076	0.0025	0.076	0.0025	0.078	0.0025	0.086	0.0025	0.085	0.0025	0.076
Beryllium	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	0.50	3.0 F1	0.5	3.6	0.5	3.7	0.5	3.7	0.05	3.0	0.5	3.7	0.95	7.1	0.95	2.9
Cadmium	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	89	2	66	2	55	2	55	2	53	2	48	2	47	2	53
Chromium	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.010	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	0.10	0.30	0.1	0.39	0.1	0.37	0.1	0.37	0.1	0.27	0.1	0.29	0.1	0.32	0.1	0.26
Iron	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.2	0.1	0.23	0.1	0.15
Lead	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.049	0.0025	0.087	0.0025	0.13	0.0025	0.13	0.0025	0.12	0.0025	0.13	0.0025	0.12	0.0025	0.12
Mercury	0.00020	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.0020	ND	0.002	ND	0.002	0.002	0.002	0.002	0.002	ND	0.002	ND	0.002	ND	0.002	0.0021
Nitrogen/Nitrate	0.10	0.60	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nitr	0.10	0.75	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrite	0.040	0.15	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0040	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	0.0047	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.00050	ND	0.0005	ND	0.0005	ND ^	0.0005	ND ^	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	50	280	50	350	100	280	100	280	100	340	100	230	100	210	100	250
Thallium	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	650	10	700	10	800	10	800	10	720	10	760	10	740	10	730
Vanadium	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.00050	ND	0.0005	ND	0.0005	0.00058	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	0.00278	0.0025	0.0012	0.0025	0.00054	0.0025	ND	0.0025	0.0025	0.0025	ND
pH	NA	8.68	NA	8.2	NA	7.59	NA	7.3	NA	6.91	NA	7.47	NA	7.83	NA	7.8
Temperature	NA	14.88	NA	17.40	NA	12.60	NA	13.06	NA	14.41	NA	18.43	NA	19.92	NA	10.70
Conductivity	NA	0.83	NA	0.91	NA	0.84	NA	0.864	NA	0.082	NA	0.842	NA	0.910	NA	1.120
Dissolved Oxygen	NA	2.82	NA	0.71	NA	1.91	NA	2.04	NA	2.53	NA	1.81	NA	6.47	NA	0.10
ORP	NA	-81.3	NA	-39.9	NA	-108.1	NA	-52.5	NA	33.4	NA	-88.6	NA	-43.3	NA	-97.1

Sample: MW-06	5/29/2019		8/21/2019		12/6/2019		2/19/2020		5/22/2020		8/5/2020		11/3/2020		2/23/2021		5/24/2021	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	0.0018	0.001	0.0032	0.001	0.0028	0.001	0.002	0.001	ND	0.001	0.0028	0.001	0.0022	0.001	0.001	0.001	ND
Barium	0.0025	0.1	0.0025	0.082	0.0025	0.087	0.0025	0.08	0.0025	0.072	0.0025	0.084	0.0025	0.083	0.0025	0.073	0.0025	0.078
Beryllium	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND ^	0.001	ND
Boron	0.95	3.8	0.95	3.2	0.95	7.3	0.95	3.1	0.95	3.2	0.25	3.1	0.5	3.4	0.5	2.8	0.5	2.5
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	2	37	2	39	2	30	2	25	2	58	2	50	2	42	2	31	2	46
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.005	ND
Fluoride	0.1	0.21	0.1	0.28	0.1	0.33	0.1	0.29	0.1	0.3	0.1	0.31	0.1	0.35	0.1	0.33	0.1	0.32
Iron	0.1	ND	0.1	0.3	0.1	0.12	0.1	0.15	0.1	ND	0.1	0.24	0.1	0.47	0.1	0.33	0.1	0.1
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.11	0.0025	0.14	0.0025	0.13	0.0025	0.14	0.0025	0.14	0.0025	0.18	0.0025	0.23	0.0025	0.24	0.0025	0.24
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen/Nitrate	0.1	0.31	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nitr	0.1	0.31	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrite	0.02	ND	0.02	ND	0.02	ND H3	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	0.045	0.0025	ND	0.0025	0.004	0.0025	0.012	0.0025	0.011	0.0025	ND	0.0025	0.004	0.0025	0.0086	0.0025	ND
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	100	410	100	230	100	250	100	ND	100	280	100	200	25	160	25	150	100	150
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	1200	10	720	10	760	10	740	10	710	30	640	30	710	10	580 H	10	620
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.51	NA	7.83	NA	7.91	NA	7.81	NA	7.47	NA	7.58	NA	7.29	NA	7.79	NA	7.65
Temperature	NA	11.60	NA	16.10	NA	14.10	NA	10.17	NA	11.20	NA	15.60	NA	16.50	NA	10.70	NA	12.90
Conductivity	NA	1.590	NA	1.070	NA	1.029	NA	0.722	NA	1.170	NA	1.037	NA	1.090	NA	1.000	NA	1.000
Dissolved Oxygen	NA	0.31	NA	0.36	NA	0.91	NA	1.89	NA	0.68	NA	NM	NA	0.18	NA	0.16	NA	0.23
ORP	NA	-15.8	NA	-137.3	NA	-90.8	NA	-82.1	NA	-37.6	NA	-106.4	NA	-185.7	NA	-72.6	NA	104.4

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater.
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
NA - Not Applicable
ND - Not Detected

NM - Not Measured
NR - Not Required
NS - Not Sampled

Temperature °C degrees Celcius
Conductivity ms/cm[c] millisiemens/centimeters
Dissolved Oxygen mg/L milligrams/liter
Oxygen Reduction Potential (ORP) mV millivolts

^ - Denotes instrument related QC exceeds the control limits
F1 - MS and/or MSD Recovery outside of limits
F2 - MS/MSD RPD exceeds control limits
H - Prepped/analyzed beyond the holding time

Attachment 9-3. Historical Groundwater Data - Midwest Generation LLC, Will County Station, Romeoville, IL

Sample: MW-07	Date	12/13/2010		3/28/2011		6/15/2011		9/15/2011		12/8/2011		3/16/2012		6/20/2012		9/24/2012	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND^	0.0030	ND	0.015	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	0.0010	0.0040	0.0010	0.0037	0.0050	ND	0.0010	0.0042	0.0010	0.0042	0.0010	0.0041	0.0010	0.0039	0.0010	0.0049
Barium	2.0	0.0025	0.045	0.0025	0.067	0.013	0.076	0.0025	0.082	0.0025	0.082	0.0025	0.069	0.0025	0.057	0.0025	0.086
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	0.25	4.7	1.0	5.0	1.0	5.7	0.25	3.4	0.050	5.0	0.25	5.1	0.50	5.6	0.25	5.5
Cadmium	0.005	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	10	160	10	140	10	140	10	160	10	150	10	130	10	120	10	150
Chromium	0.1	0.0050	ND	0.0050	ND	0.025	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	0.0010	ND	0.0010	ND	0.0050	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.010	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	0.016	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.96	0.10	0.77	0.10	0.71	0.10	0.82	0.10	0.86	0.10	0.76	0.10	0.83	0.10	ND
Iron	5.0	0.10	0.23	0.10	0.18	0.50	ND	0.10	0.37	0.10	0.50	0.10	0.57	0.10	0.60	0.10	0.51
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0025	0.12	0.0025	0.11	0.013	0.15	0.0025	0.18	0.0025	0.20	0.0025	0.20	0.0025	0.19	0.0025	0.19
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	0.0020	0.0029	0.0020	0.0023	0.010	ND	0.0020	0.0024	0.0020	0.0021	0.0020	ND	0.0020	0.0020	0.0020	ND
Nitrogen/Nitrate	10.0	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	NA	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND^
Nitrogen/Nitrite	NA	0.020	ND	0.020	0.077	0.020	0.035	0.020	0.050	0.020	0.043	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Selenium	0.05	0.0025	ND	0.0025	ND	0.013	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.05	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	100	610	250	650	200	1000	100	710	130	710	100	770	100	670	100	600
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	10	1300	10	1500	10	1600	10	1400	10	1300	10	1400	10	1300	10	1200
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zinc	5.0	0.020	ND	0.020	ND	0.10	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
pH	6.5 - 9.0	NA	8.61	NA	8.79	NA	8.13	NA	7.91	NA	7.69	NA	8.16	NA	7.92	NA	8.02
Temperature	NA	NA	14.84	NA	11.80	NA	14.23	NA	15.96	NA	15.17	NA	14.21	NA	15.67	NA	17.28
Conductivity	NA	NA	1.96	NA	2.12	NA	2.08	NA	1.61	NA	1.55	NA	1.43	NA	1.44	NA	1.46
Dissolved Oxygen	NA	NA	NM	NA	0.43	NA	0.08	NA	0.05	NA	2.54	NA	0.02	NA	0.41	NA	0.20
ORP	NA	NA	NM	NA	-277.2	NA	-135.2	NA	-301	NA	-210	NA	-189	NA	-161	NA	-171

Sample: MW-07	12/18/2012		3/5/2013		5/22/2013		8/15/2013		10/29/2013		2/20/2014		5/20/2014		8/12/2014	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.0010	0.0034	0.0010	0.0033	0.0010	0.0031	0.0010	0.0032	0.0010	0.0035	0.0010	0.0030	0.0010	0.0022	0.0010	0.0035
Barium	0.0025	0.044	0.0025	0.041	0.0025	0.048	0.0025	0.067	0.0025	0.040	0.0025	0.064	0.0025	0.074	0.0025	0.062
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND^	0.0010	ND	0.0010	ND
Boron	0.50	5.1	0.50	4.3	0.50	2.6	0.50	3.5	0.10	3.0	0.50	4.0	0.50	4.8	0.50	3.9
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	140	10	140	10	190	10	180	10	180	10	210	10	190	10	200
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	0.017	0.010	ND	0.010	0.014	0.010	0.013	0.010	0.012	0.010	0.019	0.010	0.029	0.010	0.021
Fluoride	0.10	0.89 ^	0.10	0.92 ^	0.10	0.97	0.10	0.96	0.10	0.96	0.10	0.81	0.10	0.73	0.10	0.97
Iron	0.10	0.62	0.10	0.47	0.10	0.21	0.10	0.36	0.10	0.21	0.10	0.36	0.10	0.53	0.10	0.44
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	0.19	0.0025	0.15	0.0025	0.043	0.0025	0.064	0.0025	0.049	0.0025	0.16	0.0025	0.12	0.0025	0.10
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.0020	ND	0.0020	ND	0.0020	0.0036	0.0020	0.0038	0.0020	0.0042	0.0020	0.0032	0.0020	0.0027	0.0020	0.0037
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	0.10	ND ^	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.004	ND	0.004	ND ^	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	ND	0.0025	0.0068	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0066	0.0025	ND	0.0025	ND
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND ^	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	100	480	100	400	100	390	100	460	100	530	130	380	100	540	100	570
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	10	1200	10	1000	10	1100	10	1100	10	1200	10	1300	10	1300	10	1300
Vanadium	0.0050	ND	0.0050	0.0055	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.0005	ND	0.0005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.75	NA	8.08	NA	8.14	NA	8.43	NA	8.07	NA	8.18	NA	8.22	NA	8.26
Temperature	NA	14.37	NA	12.00	NA	14.25	NA	15.62	NA	13.06	NA	11.16	NA	16.71	NA	14.78
Conductivity	NA	1.33	NA	1.20	NA	1.13	NA	1.21	NA	1.20	NA	1.20	NA	1.50	NA	1.24
Dissolved Oxygen	NA	0.15	NA	0.17	NA	0.36	NA	0.10	NA	0.41	NA	0.94	NA	0.57	NA	0.28
ORP	NA	-150	NA	-219.9	NA	-155.1	NA	-204.2	NA	-168.1	NA	-118.7	NA	-76.6	NA	-126.7

Sample: MW-07	10/21/2014		2/3/2015		4/30/2015		7/27/2015		11/9/2015		2/17/2016		5/24/2016		8/9/2016	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.0010	0.0031	0.0010	0.0027	0.0010	0.0029	0.0010	0.0020	0.0010	0.0027	0.0010	0.0023	0.0010	0.0024	0.0010	0.0028
Barium	0.0025	0.072	0.0025	0.042	0.0025	0.048	0.0025	0.037	0.0025	0.035	0.0025	0.046	0.0025	0.046	0.0025	0.048
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	0.50	5.1	1.0	3.0	0.25	3.3	0.25	3.1	0.50	2.9	0.050	3.8	0.050	2.9	0.25	2.8
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	190	10	170	10	160	10	170	10	160	10	150	10	140	10	150
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	0.016	0.010	ND	0.010	ND	0.010	0.034	0.010	ND	0.010	0.037	0.010	0.017 F1,2
Fluoride	0.10	0.84	0.10	0.91	0.10	0.85	0.10	0.90	0.10	0.96	0.10	0.79	0.10	0.75	0.10	0.86
Iron	0.10	0.55	0.10	0.16	0.10	0.22	0.10	0.19	0.10	0.19	0.10	0.17	0.10	0.21	0.10	0.28
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	0.12	0.0025	0.031	0.0025	0.044	0.0025	0.024	0.0025	0.025	0.0025	0.040	0.0025	0.035	0.0025	0.044 B
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.0020	0.0034	0.0020	0.0036	0.0020	0.0033	0.0020	0.0034	0.0020	0.0035	0.0020	0.0040	0.0020	0.0034	0.0020	0.0035
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	0.0046	0.0025	ND	0.0025	0.0039	0.0025	ND	0.0025	0.012	0.0025	0.0039	0.0025	0.0028	0.0025	0.0027
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	130	680	100	400	100	440	100	420	100	420	200	700	100	530	100	350
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	10	1500	10	1100	10	1200	10	950	10	960	10	1300	10	1100	10	940
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.00050	ND	0.00050	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0018	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.88	NA	8.68	NA	8.53	NA	8.75	NA	7.11	NA	8.36	NA	7.89	NA	7.60
Temperature	NA	14.85	NA	8.76	NA	12.23	NA	20.84	NA	14.48	NA	10.48	NA	15.41	NA	17.85
Conductivity	NA	1.60	NA	1.10	NA	1.32	NA	1.49	NA	1.21	NA	1.00	NA	1.37	NA	1.30
Dissolved Oxygen	NA	0.39	NA	1.50	NA	2.30	NA	2.23	NA	2.36	NA	0.91	NA	1.53	NA	1.20
ORP	NA	-151.3	NA	-154.5	NA	-134.3	NA	-163.1	NA	-69.7	NA	-123.3	NA	-126.9	NA	-108.9

Sample: MW-07	10/25/2016		1/31/2017		5/9/2017		9/7/2017		11/14/2017		2/27/2018		5/1/2018		7/25/2018	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND ^	0.0030	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.0010	0.0025	0.0020	0.0033	0.0010	0.0024	0.001	0.0031	0.001	0.0047	0.001	0.0047	0.001	0.0014	0.001	0.002
Barium	0.0025	0.046	0.0025	0.045	0.0025	0.061	0.0025	0.057	0.0025	0.08	0.0025	0.08	0.0025	0.05	0.0025	0.04
Beryllium	0.0010	ND^	0.0010	ND	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	0.50	3.2	0.50	3.7	0.50	4.3	0.5	3.4	1	8.0	1	8.0	0.05	3.3	0.5	2.9
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	130	10	130	10	150	10	160	10	180	10	180	10	130	10	150
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.001	ND	0.001	0.0013	0.001	0.0013	0.001	ND	0.001	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.010	0.021	0.010	0.011	0.010	0.025	0.01	0.028	0.01	ND	0.01	ND	0.01	0.017	0.01	0.024
Fluoride	0.10	0.87	0.10	0.72	0.10	0.39	0.1	0.71	0.1	0.33	0.1	0.33	0.1	0.69	0.1	0.77
Iron	0.10	0.31	0.10	0.28	0.10	0.39	0.1	0.37	0.1	1.5	0.1	1.5	0.1	0.17	0.1	0.12
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.061	0.0025	0.081	0.0025	0.10	0.0025	0.087	0.0025	0.42	0.0025	0.42	0.0025	0.038	0.0025	0.013
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.0020	0.0035	0.0020	0.0030	0.0020	0.0023	0.002	0.0028	0.002	0.0022	0.002	0.0022	0.002	0.0024	0.002	0.0029
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nitr	0.10	ND	0.10	ND	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	0.0061	0.0050	ND	0.0025	0.0029	0.0025	0.026	0.0025	0.0038	0.0025	0.0038	0.0025	0.0085	0.0025	ND
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	100	510	100	500	250	540	100	540	250	890	250	890	100	590	100	360
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	1200	10	1500	10	1500	10	1200	10	2200	10	2200	10	1200	10	950
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.020	ND	0.020	ND ^	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	0.0006	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00508	0.0025	0.0014	0.0025	ND	0.0025	ND
pH	NA	8.20	NA	7.73	NA	7.51	NA	7.75	NA	6.98	NA	7.75	NA	7.37	NA	7.06
Temperature	NA	13.94	NA	9.87	NA	11.32	NA	14.90	NA	13.21	NA	12.94	NA	17.02	NA	16.51
Conductivity	NA	1.27	NA	1.27	NA	1.19	NA	1.27	NA	2.08	NA	1.199	NA	1.264	NA	1.159
Dissolved Oxygen	NA	1.16	NA	2.37	NA	5.98	NA	0.33	NA	2.20	NA	1.81	NA	2.02	NA	2.47
ORP	NA	-86.1	NA	-70.7	NA	-73.9	NA	-112.2	NA	-109.8	NA	-102.3	NA	-3.1	NA	-134.3

Sample: MW-07	10/2/2018		2/19/2019		5/28/2019		8/21/2019		12/6/2019		2/18/2020	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	0.002	0.001	0.0018	0.001	0.0019	0.001	0.0029	0.001	0.0029	0.001	0.0021
Barium	0.0025	0.036	0.0025	0.069	0.0025	0.045	0.0025	0.079	0.0025	0.057	0.0025	0.047
Beryllium	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND ^
Boron	0.25	2.6	0.25	3.5	0.25	3.0	0.25	4.3	0.25	ND	0.25	5.7
Cadmium	0.0005	ND	0.0005	0.0005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	160	10	140	10	100	10	120	10	72	10	65
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	0.011	0.01	0.03	0.01	0.018	0.01	ND	0.01	ND
Fluoride	0.1	0.82	0.1	0.56	0.1	0.68	0.1	0.63	0.1	0.49	0.1	0.47
Iron	0.1	ND	0.1	0.48	0.1	0.13	0.1	0.58	0.1	0.59	0.1	0.42
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.012	0.0025	0.22	0.0025	0.068	0.0025	0.19	0.0025	0.43	0.0025	0.48
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	0.0026	0.002	0.003	0.002	0.0025	0.002	0.0036	0.002	0.0026	0.002	0.0023
Nitrogen/Nitrate	0.1	0.22	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.15
Nitrogen/Nitrate, Nitr	0.1	0.22	0.1	ND	0.1	ND ^	0.1	ND	0.1	ND	0.1	0.15
Nitrogen/Nitrite	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND H3	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	0.0095	0.0025	0.0032	0.0025	0.0032	0.0025	0.0057	0.0025	0.0032	0.0025	0.012
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	100	340	100	600	100	460	100	600	100	820	100	770
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	970	10	1500	10	1300	10	1400	10	1800	10	1500
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	0.02	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	0.0052	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.81	NA	7.58	NA	8.65	NA	7.54	NA	6.97	NA	8.42
Temperature	NA	14.85	NA	11.70	NA	11.50	NA	14.00	NA	13.70	NA	11.50
Conductivity	NA	1.206	NA	1.785	NA	1.490	NA	1.415	NA	2.383	NA	2.520
Dissolved Oxygen	NA	2.20	NA	0.02	NA	0.48	NA	NM	NA	0.89	NA	0.17
ORP	NA	-116.2	NA	-90.7	NA	-65.3	NA	-191.7	NA	-76.0	NA	-3.9

Sample: MW-07	5/26/2020		8/6/2020		11/3/2020		3/1/2021		5/24/2021	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	ND	0.001	0.0026	0.001	0.0025	0.001	0.0021	0.001	0.0014
Barium	0.0025	0.039	0.0025	0.071	0.0025	0.079	0.0025	0.084	0.0025	0.062
Beryllium	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND
Boron	0.25	4.4	0.5	3.8	1	4.5	1	4.1	1	3.7
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	130	10	140	10	160	10	140	10	110
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	0.012	0.005	0.017	0.005	0.02
Fluoride	0.1	0.61	0.1	0.67	0.1	0.68	0.1	0.56	0.1	0.69
Iron	0.1	0.42	0.1	0.87	0.1	1.4	0.1	1.3	0.1	0.46
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.45	0.0025	0.14	0.0025	0.23	0.0025	0.31	0.0025	0.2
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	0.0026	0.002	0.0026	0.002	0.0028	0.002	0.0027	0.002	0.0023
Nitrogen/Nitrate	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nitr	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrite	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	0.0089	0.0025	0.0098	0.0025	0.0079
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	100	620	100	540	100	540	100	680	100	530
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	1400	60	1200	60	1300	10	1500	10	1100
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.08	NA	7.28	NA	7.08	NA	7.21	NA	8.38
Temperature	NA	11.90	NA	13.70	NA	14.90	NA	11.30	NA	12.50
Conductivity	NA	1.617	NA	1.535	NA	1.866	NA	1.894	NA	1.507
Dissolved Oxygen	NA	0.68	NA	NM	NA	1.70	NA	0.01	NA	0.29
ORP	NA	-25.4	NA	-109.7	NA	-132.8	NA	-118.3	NA	53.7

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater.
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
NA - Not Applicable
ND - Not Detected

NM - Not Measured
NR - Not Required
NS - Not Sampled

Temperature	°C	degrees Celcius
Conductivity	ms/cm[c]	millisiemens/centimeters
Dissolved Oxygen	mg/L	milligrams/liter
Oxygen Reduction Potential (ORP)	mV	millivolts

^ - Denotes instrument related QC exceeds the control limits
F1 - MS and/or MSD Recovery outside of limits
F2 - MS/MSD RPD exceeds control limits
H - Prepped/analyzed beyond the holding time

Attachment 9-3. Historical Groundwater Data - Midwest Generation LLC, Will County Station, Romeoville, IL

Sample: MW-08	Date	12/13/2010		3/28/2011		6/15/2011		9/15/2011		12/8/2011		3/16/2012		6/20/2012		9/24/2012		12/18/2012		3/5/2013		5/23/2013	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND^	0.0030	ND	0.015	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	0.0010	0.0067	0.0010	0.0059	0.0050	0.0082	0.0010	0.014	0.0010	0.012	0.0010	0.0066	0.0010	0.013	0.0010	0.018	0.0010	0.0088	0.0010	0.0088	0.0010	0.0072
Barium	2.0	0.0025	0.069	0.0025	0.089	0.013	0.085	0.0025	0.099	0.0025	0.078	0.0025	0.066	0.0025	0.074	0.0025	0.090	0.0025	0.079	0.0025	0.069	0.0025	0.079
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	0.25	1.7	0.25	1.3	0.050	1.7	0.050	2.3	0.050	1.9	0.25	1.5	0.50	2.0	0.25	2.6	0.50	2.1	0.50	1.8	0.50	1.9
Cadmium	0.005	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	10	93	10	270	10	200	10	160	10	130	10	160	10	160	10	150	10	150	10	150	10	190
Chromium	0.1	0.0050	ND	0.0050	ND	0.025	ND	0.0050	ND	0.0050	ND	0.010	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	0.0010	ND	0.0010	ND	0.0050	ND	0.0010	ND	0.0010	ND	0.0020	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.010	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0021
Cyanide	0.2	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.61	0.10	0.55	0.10	0.57	0.10	0.64	0.10	0.61	0.10	0.52	0.10	0.60	0.10	0.65	0.10	0.58 ^	0.10	0.55 ^	0.10	0.55
Iron	5.0	0.10	0.48	0.10	0.38	0.50	0.76	0.10	0.46	0.10	0.68	0.20	ND	0.10	0.58	0.10	0.66	0.10	0.50	0.10	0.43	0.10	0.68
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0025	0.33	0.0025	0.44	0.013	0.47	0.0025	0.45	0.0025	0.40	0.0050	ND	0.0025	0.36	0.0025	0.41	0.0025	0.43	0.0025	0.33	0.0025	0.47
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	0.0020	ND	0.0020	ND	0.010	ND	0.0020	0.0034	0.0020	0.0020	0.0040	ND	0.0020	0.0022	0.0020	0.0035	0.0020	0.0033	0.0020	0.0031	0.0020	ND
Nitrogen/Nitrate	10.0	0.10	ND	0.10	0.22	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	0.23	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	NA	0.10	ND	0.10	0.22	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND^	0.10	0.23	0.10	ND	0.10	ND
Nitrogen/Nitrite	NA	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.004	ND	0.004	ND ^	0.0040	ND
Selenium	0.05	0.0025	ND	0.0025	ND	0.013	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.05	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	100	440	100	440	100	420	100	600	100	330	50	330	100	370	100	630	100	380	100	360	100	270
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	10	930	10	1200	10	1100	10	1300	10	980	10	910	10	1000	10	1200	10	1200	10	1000	10	1100
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	5.0	0.020	ND	0.020	ND	0.10	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0005	ND	0.0005	ND	0.00050	ND
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0025	ND	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	7.65	NA	8.17	NA	7.47	NA	7.30	NA	6.99	NA	7.61	NA	7.36	NA	7.31	NA	7.43	NA	7.87	NA	7.19
Temperature	NA	NA	12.82	NA	9.51	NA	13.28	NA	16.18	NA	14.05	NA	12.16	NA	15.28	NA	17.41	NA	13.82	NA	9.50	NA	13.12
Conductivity	NA	NA	1.43	NA	1.96	NA	1.76	NA	1.50	NA	1.13	NA	1.02	NA	1.23	NA	1.49	NA	1.27	NA	1.11	NA	1.09
Dissolved Oxygen	NA	NA	NM	NA	0.51	NA	0.50	NA	0.76	NA	0.32	NA	1.15	NA	0.66	NA	0.94	NA	0.29	NA	1.35	NA	0.20
ORP	NA	NA	NM	NA	-254.6	NA	-62.2	NA	-207	NA	-139	NA	-54	NA	-105	NA	-60	NA	-80	NA	-94.1	NA	-111.3

Date	8/15/2013		10/28/2013		2/20/2014		5/20/2014		8/12/2014		10/21/2014		2/3/2015		4/30/2015		7/27/2015		11/9/2015		2/16/2016	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.0010	0.016	0.0010	0.0069	0.0010	0.0077	0.0010	0.0036	0.0010	0.014	0.0010	0.0082	0.0010	0.0036	0.0010	0.0047	0.0010	0.0064	0.0010	0.0040	0.0010	0.0024
Barium	0.0025	0.084	0.0025	0.14	0.0025	0.086	0.0025	0.076	0.0025	0.078	0.0025	0.087	0.0025	0.081	0.0025	0.083	0.0025	0.066	0.0025	0.086	0.0025	0.060
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND^	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	0.50	2.4	0.10	3.2	0.25	2.0	0.50	2.5	0.25	2.4	0.50	2.8	1.0	2.3	0.25	2.3	0.25	2.8	0.50	4.0	0.050	2.8
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	170	10	150	10	180	10	160	10	170	10	180	10	170	10	150	10	170	10	170	10	140
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.10	0.64	0.10	0.45	0.10	0.46	0.10	0.43	0.10	0.74	0.10	0.56	0.10	0.51	0.10	0.54	0.10	0.68	0.10	0.52	0.10	0.52
Iron	0.10	1.3	0.10	ND	0.10	0.72	0.10	0.43	0.10	1.0	0.10	1.0	0.10	0.19	0.10	0.22	0.10	0.46	0.10	0.11	0.10	0.12
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	0.31	0.0025	0.42	0.0025	0.39	0.0025	0.35	0.0025	0.30	0.0025	0.44	0.0025	0.31	0.0025	0.28	0.0025	0.31	0.0025	0.25	0.0025	0.24
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.0020	0.0032	0.0020	0.0043	0.0020	0.0037	0.0020	0.0030	0.0020	0.0040	0.0020	0.0048	0.0020	0.0036	0.0020	0.0037	0.0020	0.0041	0.0020	0.0052	0.0020	0.0065
Nitrogen/Nitrate	0.10	ND	0.10	0.17	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	0.10	ND	0.10	0.17	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	ND	0.0025	0.015	0.0025	0.0034	0.0025	0.0032	0.0025	ND	0.0025	0.0032	0.0025	0.0083	0.0025	0.010	0.0025	ND	0.0025	0.0065	0.0025	0.0049
Silver	0.00050	ND ^	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	100	440	130	650	130	330	100	450	100	430	200	730	100	530	100	520	100	650	200	800	250	750
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	10	1100	10	1600	10	1300	10	1400	10	1200	10	1500	10	1400	10	1400	10	1200	10	1600	10	1600
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0019	0.0025	ND
pH	NA	7.46	NA	6.87	NA	8.18	NA	7.04	NA	7.09	NA	7.03	NA	7.24	NA	7.23	NA	7.36	NA	6.88	NA	7.10
Temperature	NA	18.25	NA	15.59	NA	9.15	NA	17.97	NA	16.04	NA	14.76	NA	9.43	NA	12.42	NA	17.57	NA	16.00	NA	7.88
Conductivity	NA	1.35	NA	1.73	NA	1.26	NA	1.70	NA	1.49	NA	2.00	NA	1.46	NA	1.587	NA	1.657	NA	1.958	NA	1.23
Dissolved Oxygen	NA	0.30	NA	0.64	NA	1.20	NA	0.44	NA	0.69	NA	0.68	NA	2.26	NA	5.61	NA	1.23	NA	1.81	NA	1.63
ORP	NA	-114.8	NA	-145.3	NA	-86.8	NA	87.7	NA	-53.3	NA	-52.9	NA	10.7	NA	14.8	NA	-124.4	NA	19.0	NA	19.4

Date	5/24/2016		8/9/2016		10/25/2016		1/31/2017		5/9/2017		9/6/2017		11/14/2017		2/27/2018		5/1/2018		7/25/2018		10/2/2018	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND ^	0.0030	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.0010	0.0049	0.0010	0.0095	0.0010	0.0064	0.0020	ND	0.0010	ND	0.001	0.012	0.001	0.0063	0.001	0.0063	0.001	ND	0.001	0.0067	0.001	0.011
Barium	0.0025	0.064	0.0025	0.062	0.0025	0.063	0.0025	0.052	0.0025	0.059	0.0025	0.065	0.0025	0.084	0.0025	0.084	0.0025	0.06	0.0025	0.068	0.0025	0.064
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND^	0.0010	ND	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	0.050	2.3	0.25	2.6	0.50	4.1	0.50	2.5	0.25	1.7	0.25	3.0	1	4.5	1	4.5	0.05	2.4	0.5	3.0	0.25	2.7
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	140	10	150	10	130	10	110	10	100	10	140	10	120	10	120	10	100	10	130	10	140
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	0.0012	0.0010	ND	0.0010	ND	0.001	ND	0.001	0.002	0.001	0.002	0.001	ND	0.001	ND	0.001	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	0.10	0.52	0.10	0.70	0.10	0.54	0.10	0.46	0.10	0.34	0.1	0.71	0.1	0.52	0.1	0.52	0.1	0.5	0.1	0.63	0.1	0.74
Iron	0.10	0.38	0.10	0.54	0.10	1.1	0.10	ND	0.10	0.20	0.1	1.1	0.1	1.6	0.1	1.6	0.1	ND	0.1	1.2	0.1	1.2
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.36	0.0025	0.27 B	0.0025	0.62	0.0025	0.096	0.0025	0.24	0.0025	0.32	0.0025	0.63	0.0025	0.63	0.0025	0.15	0.0025	0.3	0.0025	0.23
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND ^	0.00020	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.0020	0.0035	0.0020	0.0045	0.0020	0.010	0.0020	0.0035	0.0020	ND	0.002	0.0037	0.002	0.007	0.002	0.007	0.002	0.0034	0.002	0.0042	0.002	0.0035
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.11
Nitrogen/Nitrate, Nitr	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.11
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0050	0.012	0.0025	0.0069	0.0025	0.011	0.0025	ND	0.0025	ND	0.0025	0.0051	0.0025	ND	0.0025	0.0025
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	100	580	130	520	250	680	100	450	50	210	100	600	250	830	250	830	100	660	250	470	100	510
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	1400	10	1300	10	1700	10	1500	10	920	10	1200	10	2000	10	2000	10	1300	10	1300	10	1200
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND ^	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00095	0.0025	0.00091	0.0025	ND	0.0025	ND	0.0025	0.00502
pH	NA	6.85	NA	7.13	NA	7.06	NA	7.02	NA	7.15	NA	7.08	NA	6.83	NA	7.05	NA	7.04	NA	6.39	NA	7.31
Temperature	NA	16.06	NA	21.11	NA	15.60	NA	8.97	NA	11.75	NA	16.40	NA	12.12	NA	110.84	NA	16.09	NA	19.51	NA	17.44
Conductivity	NA	1.61	NA	1.63	NA	1.95	NA	1.37	NA	1.08	NA	1.40	NA	1.84	NA	1.03	NA	1.324	NA	1.434	NA	1.496
Dissolved Oxygen	NA	1.61	NA	1.25	NA	0.79	NA	2.71	NA	3.97	NA	0.39	NA	2.13	NA	4.01	NA	1.97	NA	2.66	NA	2.40
ORP	NA	-43.1	NA	-114.0	NA	-63.0	NA	-25.9	NA	-43.2	NA	-52.7	NA	-77.3	NA	-8.3	NA	11.04	NA	-46.30	NA	-36.30

Date	2/19/2019		5/29/2019		8/21/2019		12/6/2019		2/18/2020		5/26/2020		8/6/2020		11/3/2020		3/1/2021		5/25/2021	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	0.0018	0.001	0.0032	0.001	0.0083	0.001	0.0069	0.001	0.006	0.001	0.003	0.001	0.011	0.001	0.002	0.001	ND	0.001	0.0057
Barium	0.0025	0.077	0.0025	0.069	0.0025	0.064	0.0025	0.082	0.0025	0.075	0.0025	0.086	0.0025	0.081	0.0025	0.067	0.0025	0.063	0.0025	0.089
Beryllium	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND
Boron	0.25	1.5	0.25	1.0	0.25	2.5	0.25	2.6	0.25	2.4	0.25	1.1	0.25	2.8	0.5	3.0	0.25	1.6	0.5	2.5
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	64	10	27	10	130	10	50	10	150	10	200	10	180	10	210	10	180	40	300
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	0.001	0.001	ND	0.001	ND	0.001	0.0012	0.001	0.0011	0.001	0.0011	0.001	ND	0.001	0.0012	0.001	ND	0.001	0.0012
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	0.0058	0.005	0.087 H
Fluoride	0.1	0.47	0.1	0.48	0.1	0.67	0.1	0.58	0.1	0.54	0.1	0.48	0.1	0.63	0.1	0.61	0.1	0.46	0.1	0.49
Iron	0.1	0.52	0.1	1.3	0.1	1.4 F1	0.1	2.1	0.1	1.9	0.1	2.0	0.1	2.0	0.1	0.51	0.1	0.22	0.1	2.3
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.3	0.0025	0.28	0.0025	0.23	0.0025	0.45	0.0025	0.44	0.0025	0.45	0.0025	0.36	0.0025	0.38	0.0025	0.21	0.0025	0.52
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	0.0022 F1	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	0.0024	0.002	ND	0.002	0.0032	0.002	0.0038	0.002	0.0036	0.002	ND	0.002	0.0037	0.002	0.0057	0.002	0.0021	0.002	0.004
Nitrogen/Nitrate	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nitr	0.1	ND	0.1	ND ^	0.1	ND	0.1	ND	0.1	ND F2	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrite	0.02	ND	0.02	0.02	0.02	ND	0.02	ND H3	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	0.011	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0044	0.0025	ND	0.0025	ND	0.0025	0.0034	0.0025	0.032	0.0025	ND
Silver	0.0005	ND	0.0005	ND	0.0005	ND ^	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	100	290	100	80	100	530	100	500	100	ND	100	150	100	560	100	620	100	250	100	540
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	1100	10	630	10	1100	10	1200	10	1100	10	1000	60	1300	150	1800	10	1200	10	1600
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	6.9	NA	6.99	NA	7.23	NA	6.98	NA	7.08	NA	6.86	NA	6.92	NA	6.83	NA	7.03	NA	6.9
Temperature	NA	9.60	NA	11.70	NA	15.30	NA	13.10	NA	10.20	NA	11.70	NA	15.00	NA	16.00	NA	9.10	NA	12.10
Conductivity	NA	1.558	NA	0.980	NA	0.165	NA	1.806	NA	1.717	NA	1.509	NA	1.826	NA	2.530	NA	1.682	NA	2.430
Dissolved Oxygen	NA	0.89	NA	0.37	NA	0.23	NA	0.93	NA	0.70	NA	0.66	NA	NM	NA	1.90	NA	2.30	NA	0.19
ORP	NA	-22.20	NA	-58.90	NA	-97.60	NA	-69.20	NA	-67.90	NA	-57.80	NA	-85.30	NA	-60.10	NA	-23.50	NA	73.90

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater.
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
NA - Not Applicable
ND - Not Detected

NM - Not Measured
NR - Not Required
NS - Not Sampled

Temperature °C degrees Celcius
Conductivity ms/cm^c millisiemens/centimeters
Dissolved Oxygen mg/L milligrams/liter
Oxygen Reduction Potential (ORP) mV millivolts

^ - Denotes instrument related QC exceeds the control limits
F1 - MS and/or MSD Recovery outside of limits
F2 - MS/MSD RPD exceeds control limits
H - Prepped/analyzed beyond the holding time

Attachment 9-3. Historical Groundwater Data - Midwest Generation LLC, Will County Station, Romeoville, IL

Sample: MW-09	Date	12/13/2010		3/28/2011		6/15/2011		9/15/2011		12/8/2011		3/16/2012		6/20/2012		9/24/2012		12/18/2012	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND^	0.0030	ND	0.015	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	0.0010	0.0059	0.0010	0.0049	0.0050	0.0052	0.0010	0.0065	0.0010	0.0078	0.0010	0.0053	0.0010	0.0056	0.0010	0.0068	0.0010	0.0060
Barium	2.0	0.0025	0.025	0.0025	0.031	0.013	0.025	0.0025	0.023	0.0025	0.017	0.0025	0.023	0.0025	0.022	0.0025	0.026	0.0025	0.020
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	0.25	2.2	0.25	1.4	0.050	1.7	0.050	2.0	0.050	1.9	0.25	1.4	1.0	1.8	0.25	2.0	0.50	1.7
Cadmium	0.005	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	10	100	10	280	10	230	10	190	10	140	10	200	10	160	10	160	10	130
Chromium	0.1	0.0050	ND	0.0050	ND	0.025	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	0.0010	ND	0.0010	ND	0.0050	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.010	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	0.018	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.33	0.10	0.36	0.10	0.28	0.10	0.28	0.10	0.38	0.10	0.39	0.10	0.32	0.10	0.41	0.10	0.42 ^
Iron	5.0	0.10	ND	0.10	ND	0.50	ND	0.10	ND	0.10	ND^	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0025	ND	0.0025	ND	0.013	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0036	0.0025	ND
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	0.0020	ND	0.0020	ND	0.010	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0022	0.0020	0.0023
Nitrogen/Nitrate	10.0	0.10	ND	0.20	2.4	0.10	1.1	0.10	ND	0.10	1.9	0.10	3.2	0.10	ND	0.10	ND	0.10	4.1
Nitrogen/Nitrate, Nit	NA	0.10	ND	0.10	3.6	0.10	0.94	0.10	0.18	0.10	2.0	0.50	3.3	0.10	ND	0.10	ND^	0.10	4.6
Nitrogen/Nitrite	NA	0.10	0.44	0.20	1.2	0.020	0.16	0.040	0.22	0.020	0.15	0.020	0.12	0.020	0.027	0.020	0.023	0.10	0.55
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.004	ND
Selenium	0.05	0.0025	0.0036	0.0025	0.0042	0.013	ND	0.0025	0.0045	0.0025	0.0031	0.0025	ND	0.0025	0.0026	0.0025	0.0031	0.0025	0.0039
Silver	0.05	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	100	410	100	320	100	410	50	400	50	270	50	340	100	340	100	380	50	310
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	10	800	10	1000	10	940	10	850	10	660	10	820	10	880	10	800	10	780
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0050	0.031
Zinc	5.0	0.020	ND	0.020	ND	0.10	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0005	ND
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0025	ND
pH	6.5 - 9.0	NA	10.88	NA	10.87	NA	10.44	NA	10.27	NA	9.55	NA	10.56	NA	10.31	NA	10.23	NA	10.42
Temperature	NA	NA	15.09	NA	11.33	NA	14.55	NA	16.79	NA	15.70	NA	13.35	NA	15.35	NA	18.14	NA	14.68
Conductivity	NA	NA	1.33	NA	1.75	NA	1.52	NA	1.12	NA	0.90	NA	1.00	NA	1.06	NA	1.09	NA	0.90
Dissolved Oxygen	NA	NA	NM	NA	0.27	NA	0.07	NA	0.03	NA	0.05	NA	0.30	NA	0.03	NA	0.06	NA	0.11
ORP	NA	NA	NM	NA	-289.3	NA	79.8	NA	-341	NA	-118	NA	-12	NA	-70	NA	-112	NA	-200

Sample: MW-09	Date	3/5/2013		5/23/2013		8/15/2013		10/29/2013		2/13/2014		5/20/2014		8/12/2014		10/21/2014		2/3/2015	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	0.0010	0.0051	0.0010	0.0047	0.0010	0.0050	0.0010	0.0066	0.0010	0.0029	0.0010	0.0029	0.0010	0.0043	0.0010	0.0046	0.0010	0.0038
Barium	2.0	0.0025	0.016	0.0025	0.025	0.0025	0.026	0.0025	0.023	0.0025	0.022	0.0025	0.028	0.0025	0.027	0.0025	0.026	0.0025	0.033
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND^	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	0.50	1.5	0.50	1.7	0.50	1.8	0.10	2.2	0.50	1.4	0.50	1.5	0.25	1.7	0.50	1.9	1.0	1.4
Cadmium	0.005	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	10	140	10	160	10	170	10	110	10	270	10	250	10	210	10	200	10	200
Chromium	0.1	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.43 ^	0.10	0.32	0.10	0.47	0.10	0.48	0.10	0.44	0.10	0.41	0.10	0.61	0.10	0.55	0.10	0.44
Iron	5.0	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0025	ND	0.0025	ND	0.0025	0.0043	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0025	0.0025	0.0026
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	0.0020	0.0022	0.0020	ND	0.0020	0.0024	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0025	0.0020	0.0024	0.0020	0.0020
Nitrogen/Nitrate	10.0	0.10	6.2	0.10	0.40	0.10	ND	0.10	1.6	0.10	2.3	0.10	1.0	0.10	ND	0.10	ND	0.10	2.2
Nitrogen/Nitrate, Nit	NA	1.0	6.8	0.10	1.4	0.10	0.44	0.50	2.2	0.50	2.9	0.10	1.5	0.10	0.20	0.10	ND	0.20	2.4
Nitrogen/Nitrite	NA	0.10	0.65	0.20	1.0	0.10	0.49	0.10	0.65	0.10	0.59	0.10	0.48	0.10	0.43	0.020	0.078	0.040	0.21
Perchlorate	0.0049	0.004	ND ^	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.05	0.0025	0.0029	0.0025	0.0027	0.0025	0.0034	0.0025	0.0053	0.0025	0.0032	0.0025	0.0026	0.0025	0.0031	0.0025	0.0035	0.0025	ND
Silver	0.05	0.00050	ND	0.00050	ND	0.00050	ND ^	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	50	250	50	320	50	310	50	310	50	220	100	380	100	310	100	430	50	300
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	10	600	10	690	10	700	10	680	10	780	10	880	10	870	10	820	10	810
Vanadium	0.049	0.0050	0.024	0.0050	0.029	0.0050	0.023	0.0050	0.034	0.0050	0.017	0.0050	0.017	0.0050	0.015	0.0050	0.015	0.0050	0.011
Zinc	5.0	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	0.0005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	11.705	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	10.39	NA	9.93	NA	9.86	NA	10.01	NA	9.69	NA	9.71	NA	9.26	NA	8.73	NA	9.48
Temperature	NA	NA	11.10	NA	13.62	NA	16.90	NA	16.28	NA	11.58	NA	16.41	NA	16.36	NA	15.98	NA	5.11
Conductivity	NA	NA	0.76	NA	0.83	NA	0.93	NA	0.85	NA	0.85	NA	1.25	NA	1.12	NA	1.19	NA	0.83
Dissolved Oxygen	NA	NA	0.52	NA	0.25	NA	0.48	NA	0.56	NA	0.94	NA	0.43	NA	0.52	NA	0.48	NA	4.87
ORP	NA	NA	-36	NA	-107.1	NA	-91.6	NA	-182.7	NA	195.4	NA	-22.8	NA	27.4	NA	-10.8	NA	-42.0

Sample: MW-09	Date	4/30/2015		7/27/2015		11/11/2015		2/16/2016		5/24/2016		8/9/2016		10/25/2016		1/31/2017		5/9/2017	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND ^	0.0030	ND
Arsenic	0.010	0.0010	0.0044	0.0010	0.0032	0.0010	0.0057	0.0010	0.0041	0.0010	0.0039	0.0010	0.0049	0.0010	0.0078	0.0020	0.0050	0.0010	0.0038
Barium	2.0	0.0025	0.032	0.0025	0.026	0.0025	0.030	0.0025	0.019	0.0025	0.024	0.0025	0.030	0.0025	0.023	0.0025	0.025	0.0025	0.038
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND^	0.0010	ND	0.0010	ND
Boron	2.0	0.25	1.5	0.25	2.0	0.50	2.1	0.050	1.9	0.050	1.4	0.25	1.8	0.50	2.6	0.25	1.7	0.25	1.6
Cadmium	0.005	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	10	310	10	230	10	190	10	160	10	170	10	150	10	130	10	250	10	360
Chromium	0.1	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.47	0.10	0.51	0.10	0.57	0.10	0.53	0.10	0.45	0.10	0.51	0.10	0.79	0.10	0.56	0.10	0.43
Iron	5.0	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0025	ND	0.0025	0.0044	0.0025	0.0032	0.0025	0.0025	0.0025	0.0044	0.0025	0.0050	0.0025	0.0035	0.0025	0.0032	0.0025	0.0050
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND ^	0.00020	ND
Nickel	0.1	0.0020	ND	0.0020	0.0020	0.0020	0.0023	0.0020	0.0024	0.0020	ND	0.0020	0.0028	0.0020	0.0023	0.0020	ND	0.0020	ND
Nitrogen/Nitrate	10.0	0.10	2.7	0.10	0.32	0.10	ND	0.10	0.37	0.10	0.55	0.10	ND	0.10	0.70	0.10	0.11	0.10	ND
Nitrogen/Nitrate, Nit	NA	0.20	2.9	0.10	0.43	0.10	ND	0.10	0.39	0.10	0.59	0.10	ND	0.10	0.70	0.10	0.11	0.10	ND
Nitrogen/Nitrite	NA	0.040	0.25	0.020	0.11	0.020	ND	0.020	0.022	0.020	0.040	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.05	0.0025	0.0025	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0026	0.0025	ND	0.0050	ND	0.0025	ND
Silver	0.05	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	50	270	50	290	100	400	50	240	50	240	50	260	50	240	50	170	50	200
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	10	930	10	760	10	760	10	660	10	670	10	750	10	640	10	800	10	960
Vanadium	0.049	0.0050	0.010	0.0050	0.0063	0.0050	0.0080	0.0050	0.011	0.0050	0.0069	0.0050	0.0091	0.0050	0.028	0.0050	0.014	0.0050	0.0094
Zinc	5.0	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND ^	0.020	ND
Benzene	0.005	0.00050	ND	0.00050	ND	0.0005	0.00057	0.0005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	11.705	0.0025	ND	0.0025	ND	0.0025	0.00287	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	9.49	NA	9.50	NA	9.12	NA	9.10	NA	8.79	NA	8.35	NA	9.16	NA	8.59	NA	8.58
Temperature	NA	NA	13.72	NA	20.11	NA	13.45	NA	9.62	NA	16.98	NA	21.67	NA	15.36	NA	9.23	NA	13.61
Conductivity	NA	NA	1.224	NA	1.197	NA	0.996	NA	0.65	NA	0.97	NA	1.14	NA	0.88	NA	0.88	NA	1.10
Dissolved Oxygen	NA	NA	1.93	NA	0.62	NA	0.76	NA	1.99	NA	2.42	NA	1.45	NA	1.74	NA	1.74	NA	3.23
ORP	NA	NA	-53.3	NA	-153.7	NA	39.7	NA	-66.2	NA	-83.9	NA	-151.8	NA	-89.2	NA	-90.1	NA	-72.5

Sample: MW-09	Date	9/6/2017		11/14/2017		2/27/2018		5/1/2018		7/25/2018		10/2/2018		2/19/2019		5/29/2019		8/21/2019	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.010	0.001	0.0048	0.001	0.0049	0.001	0.0049	0.001	0.0041	0.001	0.0047	0.001	0.006	0.001	0.0033	0.001	0.0034	0.001	0.0039
Barium	2.0	0.0025	0.036	0.0025	0.034	0.0025	0.034	0.0025	0.031	0.0025	0.035	0.0025	0.033	0.0025	0.034	0.0025	0.031	0.0025	0.027
Beryllium	0.004	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^
Boron	2.0	0.25	1.9	0.25	1.9	0.25	1.9	0.05	1.7	0.5	2.2	0.5	2.3	0.5	1.1	0.5	1.1	0.5	1.6
Cadmium	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	200.0	10	320	10	270	10	270	10	200	10	200	10	190F1	10	350	10	270	10	230
Chromium	0.1	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	1.0	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.65	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.2	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	4.0	0.1	0.52	0.1	0.5	0.1	0.5	0.1	0.52	0.1	0.5	0.1	0.54	0.1	0.26	0.1	0.29	0.1	0.36
Iron	5.0	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.0075	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.15	0.0025	0.0076	0.0025	0.0053	0.0025	0.0053	0.0025	0.0051	0.0025	0.0071	0.0025	0.0069	0.0025	0.0044	0.0025	0.0059	0.0025	0.0066
Mercury	0.002	0.0002	ND F1 F2	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.0022	0.002	0.002	0.002	0.0024	0.002	0.0025	0.002	0.0029
Nitrogen/Nitrate	10.0	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	2.8	0.1	0.96	0.1	ND
Nitrogen/Nitrate, Nit	NA	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	2.9	0.1	1.1	0.1	ND
Nitrogen/Nitrite	NA	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	0.063	0.02	0.14	0.02	ND
Perchlorate	0.0049	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.05	0.0025	0.0071	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.05	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND ^
Sulfate	400.0	50	240	50	280	50	280	100	350	100	290	100	260	100	150	100	160	100	200
Thallium	0.002	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	1,200	10	920	10	930	10	930	10	860	10	850	10	810	10	870	10	830	10	710
Vanadium	0.049	0.005	ND	0.005	0.0055	0.005	0.0055	0.005	0.0087	0.005	ND	0.005	ND	0.005	0.0054	0.005	ND	0.005	ND
Zinc	5.0	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	11.705	0.0025	ND	0.0025	0.0014	0.0025	0.0013	0.0025	ND	0.0025	ND	0.0025	0.0128	0.0025	ND	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	8.98	NA	8.1	NA	8.11	NA	7.81	NA	7.05	NA	8.09	NA	8.29	NA	8.9	NA	8.87
Temperature	NA	NA	17.10	NA	13.31	NA	12.05	NA	16.36	NA	25.16	NA	17.73	NA	11.4	NA	11.9	NA	15.5
Conductivity	NA	NA	1.27	NA	1.12	NA	0.95	NA	1.031	NA	1.203	NA	1.136	NA	1.541	NA	1.34	NA	9.14
Dissolved Oxygen	NA	NA	0.14	NA	2.63	NA	0.90	NA	1.39	NA	4.04	NA	1.88	NA	2.52	NA	0.31	NA	NM
ORP	NA	NA	-45.8	NA	-122.7	NA	-59.8	NA	-9.6	NA	-97.6	NA	-103.1	NA	-37.9	NA	129.4	NA	-189.2

Sample: MW-09	Date	12/6/2019		2/18/2020		5/26/2020		8/6/2020		11/3/2020		3/1/2021		5/25/2021	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.010	0.001	0.0055	0.001	0.003	0.001	0.0021	0.001	0.0047	0.001	0.0056	0.001	0.0037	0.001	0.0037
Barium	2.0	0.0025	0.025	0.0025	0.04	0.0025	0.037	0.0025	0.036	0.0025	0.03	0.0025	0.043	0.0025	0.053
Beryllium	0.004	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	2.0	0.5	1.9	0.5	1.3	0.5	1.3	0.25	1.8	0.5	2.0	0.25	1.3	0.25	1.4
Cadmium	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	200.0	10	150	10	340	10	310	10	280	10	250	40	310	40	380
Chromium	0.1	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	1.0	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.65	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.2	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	0.0064	0.005	ND
Fluoride	4.0	0.1	0.46	0.1	0.34	0.1	0.32	0.1	0.45	0.1	0.52	0.1	0.37	0.1	0.36
Iron	5.0	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.0075	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.15	0.0025	0.0074	0.0025	0.011	0.0025	0.011	0.0025	0.011	0.0025	0.0097	0.0025	0.014	0.0025	0.017
Mercury	0.002	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	0.002	0.0023	0.002	ND	0.002	0.0021	0.002	0.0026	0.002	0.0026	0.002	0.0022	0.002	0.0027
Nitrogen/Nitrate	10.0	0.1	ND	0.1	0.32	0.1	ND	0.1	ND	0.1	ND	0.1	0.18	0.1	ND
Nitrogen/Nitrate, Nit	NA	0.1	ND	0.1	0.4	0.1	ND	0.1	ND	0.1	ND	0.1	0.23	0.1	ND
Nitrogen/Nitrite	NA	0.02	ND H3	0.02	0.076	0.02	ND	0.02	ND	0.02	ND	0.02	0.054	0.02	ND
Perchlorate	0.0049	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.05	0.0025	ND ^	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.05	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	0.0005	0.0005	ND	0.0005	ND
Sulfate	400.0	100	190	100	150	100	140	25	190	25	180	25	170	25	190
Thallium	0.002	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	0.002	0.002	ND	0.002	ND
Total Dissolved Soli	1,200	10	620	10	810	10	800	30	760	30	760	10	860	10	930
Vanadium	0.049	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	0.005	0.005	ND	0.005	ND
Zinc	5.0	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	0.02	0.02	ND	0.02	ND
Benzene	0.005	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	11.705	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	8.65	NA	8.44	NA	8.66	NA	8.03	NA	8.64	NA	8.02	NA	8.74
Temperature	NA	NA	14.8	NA	11.6	NA	12.4	NA	15.3	NA	17.1	NA	11.2	NA	12.8
Conductivity	NA	NA	1.161	NA	1.519	NA	1.377	NA	1.346	NA	1.433	NA	1.481	NA	1.678
Dissolved Oxygen	NA	NA	0.72	NA	0.81	NA	0.62	NA	NM	NA	1.6	NA	0.06	NA	0.18
ORP	NA	NA	-64.6	NA	-5.1	NA	-48.6	NA	-89.4	NA	-134.8	NA	-61.3	NA	76.7

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater.
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
NA - Not Applicable
ND - Not Detected

NM - Not Measured
NR - Not Required
NS - Not Sampled

Temperature °C degrees Celcius
Conductivity ms/cm^c millisiemens/centimeters
Dissolved Oxygen mg/L milligrams/liter
Oxygen Reduction Potential (ORP) mV millivolts

^ - Denotes instrument related QC exceeds the control limits
F1 - MS and/or MSD Recovery outside of limits
F2 - MS/MSD RPD exceeds control limits
H - Prepped/analyzed beyond the holding time

Attachment 9-3. Historical Groundwater Data - Midwest Generation LLC, Will County Station, Romeoville, IL

Sample: MW-10	Date	12/13/2010		3/28/2011		6/15/2011		9/15/2011		12/8/2011		3/16/2012	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	0.0030	ND^	0.0030	ND	0.015	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	0.0010	0.0041	0.0010	0.0046	0.0050	ND	0.0010	0.0088	0.0010	0.0083	0.0010	0.0056
Barium	2.0	0.0025	0.098	0.0025	0.091	0.013	0.091	0.0025	0.11	0.0025	0.11	0.0025	0.10
Beryllium	0.004	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	0.25	2.1	0.25	1.8	0.050	2.2	0.050	2.8	0.050	2.5	0.25	2.1
Cadmium	0.005	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	10	92	10	130	10	150	10	120	10	120	10	100
Chromium	0.1	0.0050	ND	0.0050	ND	0.025	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	0.0010	ND	0.0010	ND	0.0050	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.65	0.0020	ND	0.0020	ND	0.010	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	0.010	ND	0.010	ND	0.010	0.010	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	0.10	0.66	0.10	0.64	0.10	0.65	0.10	0.67	0.10	0.59	0.10	0.52
Iron	5.0	0.10	0.32	0.10	0.46	0.50	0.63	0.10	0.60	0.10	0.71	0.10	0.61
Lead	0.0075	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	0.0025	0.25	0.0025	0.22	0.013	0.25	0.0025	0.27	0.0025	0.29	0.0025	0.25
Mercury	0.002	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	0.0020	ND	0.0020	ND	0.010	ND	0.0020	ND	0.0020	ND	0.0020	ND
Nitrogen/Nitrate	10.0	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	NA	0.10	ND^	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	NA	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Selenium	0.05	0.0025	ND	0.0025	ND	0.013	ND	0.0025	0.0032	0.0025	ND	0.0025	ND
Silver	0.05	0.00050	ND	0.00050	ND	0.0025	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	100	370	100	370	100	350	100	420	100	290	50	330
Thallium	0.002	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	10	990	10	960	10	990	10	1000	10	1100	10	990
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zinc	5.0	0.020	ND	0.020	ND	0.10	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
pH	6.5 - 9.0	NA	7.61	NA	8.14	NA	7.53	NA	7.45	NA	7.10	NA	7.59
Temperature	NA	NA	15.01	NA	10.51	NA	13.34	NA	16.84	NA	14.72	NA	11.27
Conductivity	NA	NA	1.53	NA	1.47	NA	1.51	NA	1.32	NA	1.29	NA	1.06
Dissolved Oxygen	NA	NA	NM	NA	0.42	NA	0.08	NA	0.05	NA	0.09	NA	0.02
ORP	NA	NA	NM	NA	-208	NA	-88.7	NA	-241	NA	-177	NA	-119

Parameter	6/20/2012		9/24/2012		12/18/2012		3/5/2013		5/22/2013		8/15/2013	
	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.0010	0.0058	0.0010	0.0098	0.0010	0.0085	0.0010	0.0072	0.0010	0.0077	0.0010	0.0040
Barium	0.0025	0.10	0.0025	0.097	0.0025	0.11	0.0025	0.098	0.0025	0.10	0.0025	0.082
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	0.50	2.1	0.25	3.2	0.50	2.7	0.50	2.7	0.50	2.7	0.50	2.3
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	120	10	140	10	140	10	130	10	140	10	130
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.10	0.58	0.10	0.72	0.10	0.59 ^	0.10	0.57 ^	0.10	0.66	0.10	0.73
Iron	0.10	0.58	0.10	0.77	0.10	0.91	0.10	0.93	0.10	1.1	0.10	0.48
Lead	0.00050	ND	0.00050	ND	0.00050	0.00050	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	0.26	0.0025	0.23	0.0025	0.29	0.0025	0.29	0.0025	0.24	0.0025	0.14
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.0020	ND	0.0020	0.0022	0.0020	0.0023	0.0020	0.0027	0.0020	0.0020	0.0020	0.0020
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	0.10	ND	0.10	ND^	0.10	ND ^	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	NR	NR	NR	NR	0.004	ND	0.004	ND ^	0.0040	ND	0.0040	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0059	0.0025	ND	0.0025	ND
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND ^
Sulfate	100	350	100	380	100	270	100	350	50	350	100	300
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	10	1000	10	970	10	1100	10	1000	10	1100	10	900
Vanadium	NR	NR	NR	NR	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	NR	NR	NR	NR	0.0005	ND	0.0005	ND	0.00050	ND	0.00050	ND
BETX	NR	NR	NR	NR	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.39	NA	7.60	NA	7.47	NA	7.54	NA	7.53	NA	7.38
Temperature	NA	16.14	NA	18.45	NA	14.44	NA	10.50	NA	13.44	NA	16.41
Conductivity	NA	1.26	NA	1.30	NA	1.32	NA	1.18	NA	1.21	NA	1.09
Dissolved Oxygen	NA	0.03	NA	0.01	NA	0.36	NA	0.20	NA	0.30	NA	0.15
ORP	NA	-124	NA	-126	NA	-120	NA	-117.4	NA	-97.8	NA	-112.1

Parameter	10/28/2013		2/20/2014		5/20/2014		8/13/2014		10/20/2014		2/3/2015	
	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.0010	0.012	0.0010	0.0027	0.0010	0.0012	0.0010	0.0033	0.0010	0.0090	0.0010	0.012
Barium	0.0025	0.10	0.0025	0.094	0.0025	0.071	0.0025	0.071	0.0025	0.10	0.0025	0.12
Beryllium	0.0010	ND	0.0010	ND^	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	0.10	3.8	0.25	2.5	0.50	2.2	0.25	2.1	0.50	3.3	1.0	3.3
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	140	10	140	10	140	10	140	10	140	10	110
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.10	0.73	0.10	0.64	0.10	0.74	0.10	0.99	0.10	0.75	0.10	0.58
Iron	0.10	0.79	0.10	0.36	0.10	0.28	0.10	0.45	0.10	1.0	0.10	1.5
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	0.22	0.0025	0.18	0.0025	0.12	0.0025	0.12	0.0025	0.25	0.0025	0.38
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.0020	0.0030	0.0020	0.0023	0.0020	ND	0.0020	0.0024	0.0020	0.0033	0.0020	0.0027
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	50	330	50	290	100	270	100	260	100	380	50	260
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	10	920	10	1000	10	940	10	880	10	1100	10	1100
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.27	NA	9.18	NA	7.54	NA	7.54	NA	6.84	NA	7.32
Temperature	NA	16.70	NA	10.54	NA	15.30	NA	16.39	NA	18.21	NA	10.10
Conductivity	NA	1.25	NA	1.03	NA	1.13	NA	1.11	NA	1.46	NA	1.17
Dissolved Oxygen	NA	0.23	NA	1.50	NA	0.46	NA	0.29	NA	2.15	NA	0.79
ORP	NA	-165.8	NA	-187.5	NA	-68.3	NA	-77.9	NA	-159.3	NA	-98.60

Parameter	4/30/2015		7/27/2015		11/10/2015		2/16/2016		5/25/2016		8/10/2016		10/26/2016	
	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.0010	0.014	0.0010	0.0065	0.0010	0.017	0.0010	0.0075	0.0010	0.0099	0.0010	0.011	0.0010	0.025
Barium	0.0025	0.10	0.0025	0.084	0.0025	0.11	0.0025	0.092	0.0025	0.089	0.0025	0.10	0.0025	0.14
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND^
Boron	0.25	3.6	0.25	3.1	0.50	4.4	0.050	3.6	0.050	3.8	0.25	3.7	0.50	3.5
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	130	10	140	10	140	10	130	10	120	10	120	2.0	73
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.10	0.67	0.10	0.77	0.10	0.77	0.10	0.75	0.10	0.74	0.10	0.76	0.10	0.52
Iron	0.10	1.4	0.10	1.1	0.10	1.3	0.10	1.1	0.10	1.2	0.10	0.92	0.10	2.6
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	0.29	0.0025	0.19	0.0025	0.26	0.0025	0.25	0.0025	0.20	0.0025	0.25 B	0.0025	0.43
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	0.00035	0.00020	ND	0.00020	ND
Nickel	0.0020	0.0036	0.0020	0.0025	0.0020	0.0030	0.0020	0.0049	0.0020	0.0032	0.0020	0.0037	0.0020	0.0023
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nitr	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	0.0036	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0029
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	50	260	50	350	50	330	50	270	50	270	50	240	50	240
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	10	1000	10	970	10	990	10	1000	10	920	10	1000	10	980
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	0.0025	ND	0.0025	ND	0.0025	0.0019	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.43	NA	7.73	NA	7.34	NA	7.29	NA	7.26	NA	7.22	NA	7.30
Temperature	NA	10.95	NA	18.29	NA	15.44	NA	8.85	NA	16.52	NA	21.72	NA	12.27
Conductivity	NA	1.93	NA	1.31	NA	1.25	NA	0.87	NA	1.26	NA	1.40	NA	1.17
Dissolved Oxygen	NA	1.57	NA	0.85	NA	0.58	NA	0.67	NA	0.97	NA	1.43	NA	2.21
ORP	NA	-115.0	NA	-141.9	NA	-68.9	NA	-60.3	NA	-123.3	NA	-73.2	NA	-87.5

Parameter	2/2/2017		5/10/2017		9/7/2017		11/15/2017		2/27/2018		5/1/2018		7/25/2018	
	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND ^	0.0030	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.0020	0.013	0.0010	0.0081	0.001	0.0073	0.001	0.013	0.001	0.013	0.001	0.0077	0.001	0.0072
Barium	0.0025	0.10	0.0025	0.098	0.0025	0.081	0.0025	0.11	0.0025	0.11	0.0025	0.096	0.0025	0.086
Beryllium	0.0010	ND	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	0.25	3.2	0.50	3.0	0.25	2.6	0.5	4.1	0.5	4.1	0.05	2.9	0.5	3.0
Cadmium	0.00050	ND ^	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	86	10	100	10	120	10	120	10	120	10	120	10	130
Chromium	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.0010	ND	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.010	ND	0.010	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	0.10	0.52	0.10	0.44	0.1	0.77	0.1	0.76	0.1	0.76	0.1	0.64	0.1	0.76
Iron	0.10	1.9	0.10	1.5	0.1	0.91	0.1	1.7	0.1	1.7	0.1	1.6	0.1	1.3
Lead	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.32	0.0025	0.21	0.0025	0.15	0.0025	0.24	0.0025	0.24	0.0025	0.21	0.0025	0.15
Mercury	0.00020	ND ^	0.00020	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.0020	0.0023	0.0020	0.0022	0.002	0.0024	0.002	0.0029	0.002	0.0029	0.002	0.0027	0.002	0.0029
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nitr	0.10	ND	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0040	ND	0.0040	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0050	ND	0.0025	ND	0.0025	0.0051 F1	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.00050	ND ^	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	50	180	50	280	100	300	50	260	50	260	50	300	100	240
Thallium	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	1000	10	1000	10	860	10	1000	10	1000	10	950	10	930
Vanadium	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.020	ND ^	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0014	0.0025	0.00063	0.0025	ND	0.0025	ND
pH	NA	7.16	NA	7.83	NA	7.37	NA	7.10	NA	7.03	NA	7.31	NA	7.39
Temperature	NA	10.19	NA	15.58	NA	16.70	NA	13.79	NA	10.82	NA	16.60	NA	27.53
Conductivity	NA	1.04	NA	1.08	NA	1.11	NA	1.14	NA	0.985	NA	1.156	NA	0.006
Dissolved Oxygen	NA	0.79	NA	1.68	NA	0.30	NA	2.19	NA	1.52	NA	1.35	NA	7.21
ORP	NA	-65.6	NA	-92.4	NA	-96.8	NA	-113.2	NA	-56.1	NA	-45.9	NA	-138.2

Parameter	10/3/2018		2/20/2019		5/29/2019		8/21/2019		12/5/2019	
	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	0.0058	0.001	0.0029	0.001	0.0059	0.001	0.0076	0.001	0.011
Barium	0.0025	0.067	0.0025	0.079	0.0025	0.071	0.0025	0.07	0.0025	0.089
Beryllium	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND
Boron	0.5	2.6	0.5	2.5	0.5	1.9	0.5	2.3	0.5	3.5
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	150	10	130	10	140	10	150	10	120
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	0.1	0.91	0.1	0.76	0.1	0.81	0.1	0.9	0.1	0.92
Iron	0.1	0.85	0.1	0.43	0.1	0.93	0.1	1.2	0.1	1.3
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.12	0.0025	0.14	0.0025	0.13	0.0025	0.13	0.0025	0.21
Mercury	0.0002	ND	0.0002	ND	0.0002	ND F2	0.0002	ND	0.0002	ND
Nickel	0.002	ND	0.002	0.0028	0.002	0.0025	0.002	0.0026	0.002	0.0029
Nitrogen/Nitrate	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nitr	0.1	ND	0.1	ND	0.1	0.10 ^	0.1	ND	0.1	ND ^
Nitrogen/Nitrite	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND ^	0.0005	ND
Sulfate	100	310	100	260	100	250	100	280	100	220
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	850	10	920	10	970	10	800	10	890
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	0.0013	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.60	NA	7.16	NA	7.53	NA	7.58	NA	7.21
Temperature	NA	20.65	NA	11.40	NA	11.50	NA	15.10	NA	14.30
Conductivity	NA	1.139	NA	1.386	NA	1.320	NA	0.182	NA	1.503
Dissolved Oxygen	NA	1.49	NA	0.63	NA	0.22	NA	0.34	NA	0.84
ORP	NA	-105.4	NA	-78.3	NA	-116.4	NA	-130.4	NA	-94.6

Parameter	2/18/2020		5/27/2020		8/6/2020		11/3/2020		2/25/2021		5/25/2021	
	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	0.016	0.001	0.0056	0.001	0.008	0.001	0.011	0.001	0.0074	0.001	0.011
Barium	0.0025	0.11	0.0025	0.076	0.0025	0.084	0.0025	0.088	0.0025	0.13	0.0025	0.14
Beryllium	0.001	ND ^	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND ^	0.001	ND
Boron	0.5	3.7	0.5	2.4	0.25	3.0	0.5	3.8	0.5	2.9	0.5	3.2
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	160	10	160	10	140	10	140	10	150	10	150
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.005	0.0058
Fluoride	0.1	0.76	0.1	0.9	0.1	0.91	0.1	0.91	0.1	0.59	0.1	0.7
Iron	0.1	1.8	0.1	1.2	0.1	1.2	0.1	1.4	0.1	1.5	0.1	1.6
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	0.00066	0.0005	ND
Manganese	0.0025	0.25	0.0025	0.14	0.0025	0.17	0.0025	0.25	0.0025	0.26	0.0025	0.29
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	0.0023	0.002	0.0025	0.002	0.0027	0.002	0.0026	0.002	0.0023	0.002	0.0054
Nitrogen/Nitrate	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.13	0.1	0.19
Nitrogen/Nitrate, Nitr	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.13	0.1	0.19
Nitrogen/Nitrite	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	0.012	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	100	ND	100	280	100	240	25	170	25	190 F1	25	160
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	1000	10	870 F1	30	860	30	890	10	950	10	940
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.05	NA	7.29	NA	7.50	NA	7.02	NA	7.20	NA	7.16
Temperature	NA	10.80	NA	11.60	NA	14.90	NA	16.10	NA	10.20	NA	12.90
Conductivity	NA	1.641	NA	1.300	NA	1.348	NA	1.420	NA	1.485	NA	1.601
Dissolved Oxygen	NA	0.17	NA	0.63	NA	NM	NA	0.16	NA	2.12	NA	0.16
ORP	NA	-106.0	NA	-110.6	NA	-128.7	NA	-149.2	NA	-49.9	NA	-29.7

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater.
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
NA - Not Applicable
ND - Not Detected

NM - Not Measured
NR - Not Required
NS - Not Sampled

Temperature °C degrees Celcius
Conductivity ms/cm[c] millisiemens/centimeters
Dissolved Oxygen mg/L milligrams/liter
Oxygen Reduction Potential (ORP) mV millivolts

^ - Denotes instrument related QC exceeds the control limits
F1 - MS and/or MSD Recovery outside of limits
F2 - MS/MSD RPD exceeds control limits
H - Prepped/analyzed beyond the holding time

Attachment 9-4 – IL PE Stamp

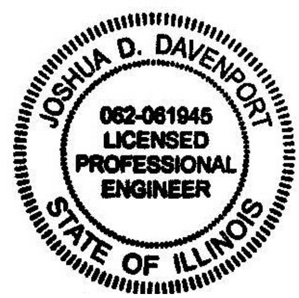
CERTIFICATION
35 Ill. Adm. Code 845.630

In accordance with Section 35 Ill. Adm. Code 845.630(g), I hereby certify based on review of the information contained within the Initial Operating Permit Application for Will County Station dated October 29, 2021, the groundwater monitoring system has been designed and constructed to satisfy the requirements of 35 Ill. Adm. Code 845.630. For this site the minimum number of wells required is deemed sufficient based on the following: 1) The number of wells, placement and screened intervals are based on a hydrogeologic assessment performed for the site; 2) hydrogeologic considerations included aquifer characteristics affecting flow velocity and physical transport processes; 3) available historical groundwater flow data indicate consistent flow conditions over time; 4) Illinois Environmental Protection Agency (IEPA) approved the overall hydrogeologic assessment as part of a larger study.

Certified by: __________________________

Date: 10/29/21

Joshua Davenport, P.E.
Professional Engineer Registration No.: ____________________
KPRG and Associates, Inc.



Attachment 9-5 – CCR Compliance Statistical Approach

KPRG

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

ILLINOIS STATE CCR RULE COMPLIANCE STATISTICAL APPROACH FOR GROUNDWATER DATA EVALUATION

Midwest Generation, LLC
Will County Generating Station
529 E. Romeo Rd.
Romeoville, Illinois

PREPARED BY: KPRG and Associates, Inc.
14665 West Lisbon Road, Suite 1A
Brookfield, WI 53005

August 31, 2021

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SECTION/DESCRIPTION **PAGE**

1.0 INTRODUCTION

On April 21, 2021, the Illinois Pollution Control Board (IPCB) and Illinois Environmental Protection Agency (Illinois EPA) enacted a final rule regulating coal combustion residuals (CCR) as part of Ill. Adm. Code Title 35, Part 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (State CCR Rule). The State CCR Rule specifically requires that the owner or operator of a CCR unit must develop an Operating Permit that will specify a sampling and analysis program that includes procedures and techniques for sample collection, sample preservation and shipment, analytical procedures, chain of custody (COC) control, and quality assurance and quality control. As a result, each regulated facility must develop a program that meets the State CCR Rule. At the Will County facility, ponds 1N, 1S, 2S and 3S require monitoring under the State CCR Rule. The monitoring well networks around these ponds consist of the following wells:

- Combined Ponds 1N and 1S monitoring network - upgradient wells MW-01 through MW-04, and downgradient wells MW-07, MW-08 and wells MW-13 through MW-15.

- Combined Ponds 2S and 3S monitoring network - upgradient wells MW-05 and MW-06 and downgradient wells MW-09 thru MW-12.

The well locations are shown on Figure 1.

Section 845.640(f) of the State CCR Rule requires the development of the statistical approach that will be used for assessing the data and determining whether a statistically significant increase over background concentrations in groundwater has occurred at identified downgradient monitoring points. Potential statistical methods that can be applied to the data are listed in Section 845.640(f) and performance standards are provided in 845.640(g).

This narrative of the statistical approach that will be used for the Will County facility's groundwater monitoring data is intended to fulfill certification requirements under Section 845.640(f)(2). The professional engineer's certification of this statistical approach is provided in Section 4.0 of this document.

2.0 STATISTICAL METHOD SELECTION and BACKGROUND DATA EVALUATION

Section 845.640(f)(1) identifies five statistical data evaluation methods that can be used for assessing site groundwater data. Relative to the subject site, the prediction interval procedure identified in 845.640(f)(1)(C) will be used. This approach is robust and conforms to varying data distributions and facilitates various non-detect frequencies. U.S. EPA identifies this method as preferred over establishment of tolerance intervals (Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance, March 2009 [Unified Guidance]).

Total recoverable metals groundwater data has been collected for this site at the wells associated with the Ponds 2S and 3S monitoring well locations since 2015 as part of Federal CCR Rule requirements. Under the Federal CCR Rule, the initial eight rounds of quarterly data generated were used to develop a representative background concentration with which to develop applicable prediction limits for subsequent statistical downgradient monitoring well data comparisons. Since additional data has been generated since the initial eight rounds of groundwater monitoring under the Federal CCR Rule, the full, currently available data set through the second quarter 2021 will be evaluated for potential use in developing a representative background dataset. If appending this additional data to the original eight rounds of background sampling is determined to be not statistically appropriate, then the background calculations will be reverted to using the initial eight rounds of background data for subsequent calculations. The established, representative background concentration for the upgradient well locations will be used to develop prediction limits for the regulated unit for each constituent listed in Section 845.600(a) and (b) as provided in Table 1.

Statistical evaluations will be performed with the assistance of the Sanitas™ software package.

2.1 Outlier Testing

The background dataset will be first checked for potential outliers for each constituent. Potential causes of outliers can be, but are not limited to:

- Changes in sampling technique;
- Changes in analytical methods;
- Data transcription errors;
- Unnatural localized event such as a spill; or
- Natural but extreme variations in constituent concentration.

The Unified Guidance does not recommend removing an outlier from the data set unless it can be shown that the outlier is not caused by extreme natural variation. If the outlier can be traced to other than natural causes, the data set will be adjusted appropriately.

2.2 Spatial Variability

If more than one background well is being used for the monitored unit, an evaluation of spatial variability will be performed to determine whether the mean concentration of a constituent varies statistically between the background points. This is generally accomplished by performing an

Analysis of Variance (ANOVA). If statistically significant spatial variation is determined to be present, the background points will not be combined between the wells. If the spatial variability is determined to be natural, an intrawell data evaluation approach may be considered for both upgradient and downgradient wells.

2.3 Temporal Variability

Temporal variability in groundwater data from a specific monitoring point occurs when a consistent fluctuation of constituent concentrations occurs over time. The most common example is seasonal variation. If such a variation is noted in the data, the dataset should be corrected to account for the trend; however, any such corrections must be applied judiciously and would be completed in accordance with the Unified Guidance recommended procedures.

2.4 Trend Testing

As discussed above, it is intended to expand the initial background dataset collected under the Federal CCR Rule which consisted of eight rounds of quarterly sampling, with any additional data collected for a specific well since that time to facilitate a larger background data set upon which to develop subsequent interwell, and if necessary intrawell, prediction limits. The expanded background dataset for each upgradient well, for each constituent listed in Table 1, will undergo trend analysis to determine if there may be a potential statistically significant trend in the data. Linear regression will be the primary trend analysis tool, however, other methods such Sen's Slope Estimator may also be used. If a statistically significant trend is identified in the larger combined background dataset, the new data cannot be added to the initial background dataset, and only the original eight rounds of data can be used for that well in background development and associated subsequent calculations.

2.5 Test of Normality

The main underlying assumption in parametric data evaluations, such as establishing prediction limits, is that the underlying data distribution is normal. A quick approximation can be made by calculating the Coefficient of Variance (CV) which is the quotient of the standard deviation divided by the sample mean. In general, if this quotient is greater than 1, the underlying data distribution is probably not normal. The new Unified Guidance is more conservative and suggests that if this quotient is greater than 0.5, the dataset may not be normal and a more robust distribution evaluation should be performed. Therefore, for any CV value greater than 0.5 for a specific dataset, normality will be evaluated using the Shapiro-Wilk Test with an alpha (α) value of 0.05 (or 95%).

If the dataset does not pass this initial test, the data will undergo a log transformation and the test will be repeated for the natural log values of the dataset. If it is determined that this dataset is log-normal, statistical evaluations will be completed on those values and the result converted back to the standard value. If the underlying distribution is also determined not to be log-normal, the Unified Guidance provides for a number of other data transformations that can be performed to evaluate whether those underlying distributions may be normal at which point the entire dataset would be transformed for subsequent calculations.

If a normal underlying distribution can not be determined, non-parametric statistical evaluations will need to be considered which do not rely on a specific underlying distribution.

2.6 Non-Detects

It is not uncommon in environmental datasets to have parameters being detected at low concentrations during one sampling event and being not detected in other sampling events. Having a consistent approach to the handling of non-detect values is an important part of the statistical evaluation process. The handling of non-detect values will be accomplished as follows:

- 100 Percent Non-Detects – Assumed that the constituent is not present and no statistical evaluations will be performed. The upper prediction limit will be set at the Reporting Limit (RL) established by the analytical laboratory.

- 50 Percent or Greater Non-Detects – A non-parametric evaluation will be performed where the confidence interval will be constructed using the highest detected concentration as the upper prediction limit.

- 15 to 50 Percent Non-Detects – Aitchison's Adjustment will be used with subsequent parametric or non-parametric evaluations, as appropriate, based on underlying distributions.

- 0 to 15 Percent Non-Detects - The non-detect values will be replaced with RL/2 and the dataset will be evaluated for distribution normality with subsequent parametric or non-parametric evaluations, as appropriate, based on underlying distributions.

2.7 Prediction Limit Calculation for Normally Distributed Data

For datasets where the distribution or underlying transformed distribution is normal, a parametric statistical approach will be used for establishing the prediction limit at the required 95% statistical confidence. In accordance with Unified Guidance, the following equation will be used:

$$95\%\ Prediction\ Limit = \bar{x} + t_{1-0.05/m,n-1} s \sqrt{1 + \frac{1}{n}}$$

Where:

$\bar{x}$ = the sample mean of the detected or adjusted results
S = sample standard deviation of the detected or adjusted results
$t_{1-0.05/m,n-1}$ = the students t-coefficient for degrees of freedom (n-1) and confidence level (1-0.05/m)
n = the number of samples
m = the number of future samples

The number of future sampling events (*m*) will be set at 2 which will account for one sampling event and a confirmation resampling. This will assist in limiting the potential number of false positives. An acceptable site-wide false positive (SWFP) rate of 10% or less is acceptable under the Unified Guidance.

2.8 Prediction Limit Calculation for Non-Normally Distributed Data

If the dataset distribution or underlying distribution is determined not to be normal, a non-parametric approach will need to be used for the establishment of the prediction limit. The non-parametric evaluation will use the highest detected concentration as the upper prediction limit for the specific constituent.

3.0 GROUNDWATER MONITORING

The State CCR Rule does not distinguish between detection monitoring or assessment monitoring as was defined under the Federal CCR Rule. To meet the requirements set forth in Section 845.650(b), a minimum of eight rounds of groundwater data need to be collected for establishing background. As noted above, if more than eight rounds of data are available, then the larger dataset will be evaluated to determine whether the background dataset can be expanded to provide a more robust statistical assessment. At that point, statistical evaluation of the background dataset will be performed to establish the upper prediction limits for each Section 845.600(a) and (b) constituent. It is noted that in the case of pH, a lower prediction limit will also be established since this parameter has an established upper and lower value range for compliance.

Site specific Groundwater Protection Standards (GWPSs) will be developed in accordance with Section 845.600(a)(2) as follows:

- If the constituent has an established State standard listed in Section 845.600(a)(1) and the standard is greater than the calculated background upper prediction limit, then the standard will serve as the GWPS. If the background upper prediction limit is greater than the standard, the upper prediction limit will serve as the GWPS.

- If the constituent does not have an established standard (i.e., calcium and turbidity) then the calculated upper prediction limit will serve as the GWPS.

Once the proposed GWPSs are determined and approved by Illinois EPA, subsequent downgradient well concentrations will be compared against the upper prediction limit (and lower prediction limit in the case of pH), and the GWPSs. If an exceedance of the GWPS is identified during a quarterly sampling event, an immediate resampling of the specific well(s) will be completed for those specific parameters. If the exceedance is confirmed by the resampling, the Illinois EPA will be notified of the exceedance(s) and the notification will be placed in the facilities operating record in accordance with 845.800(d)(16). It is noted that there are some constituents that historically may have had no detections (i.e., 100% non-detects). In this case, in accordance with the Unified Guidance, if there is a detection of such a constituent, then the Double Quantification Rule will be applied. Under this rule, a confirmed exceedance is registered if any well-constituent pair in the 100% non-detect group exhibits quantified measurements (i.e., at or above the Reporting Limit in two consecutive sample and resample events.

If an exceedance of the GWPS is recorded and reported to Illinois EPA, an Alternate Source Demonstration (ASD) may be completed within 60-days of the confirmed exceedance in accordance with Section 845.650(e) and submitted to the Illinois EPA as well as placing the ASD on the facility's publically accessible CCR website. Illinois EPA will review and approve or disapprove the ASD.

If it is decided not to complete an ASD or if Illinois EPA does not concur with and approve the ASD, a characterization of the nature and extent of the potential release must be completed in accordance with Section 845.650(d)(1) as well as meeting the requirements of Sections 845.660, 845.670 and 845.680.

4.0 CERTIFICATION

In accordance with Section 845.640(f)(2) of the State CCR Rule, I hereby certify based on a review of the information contained within this Illinois State CCR Rule Compliance Statistical Approach for Groundwater Data Evaluation dated August 31, 2021, the statistical procedures developed and selected for evaluation of groundwater data associated with the Midwest Generation Will County Station CCR Units are adequate and appropriate for evaluating the groundwater data.

Certified by: ______________________

Date: 8/31/21

Joshua Davenport, P.E.

Professional Engineer Registration No. 062-061945

KPRG and Associates, Inc.

JOSHUA D. DAVENPORT
062-061945
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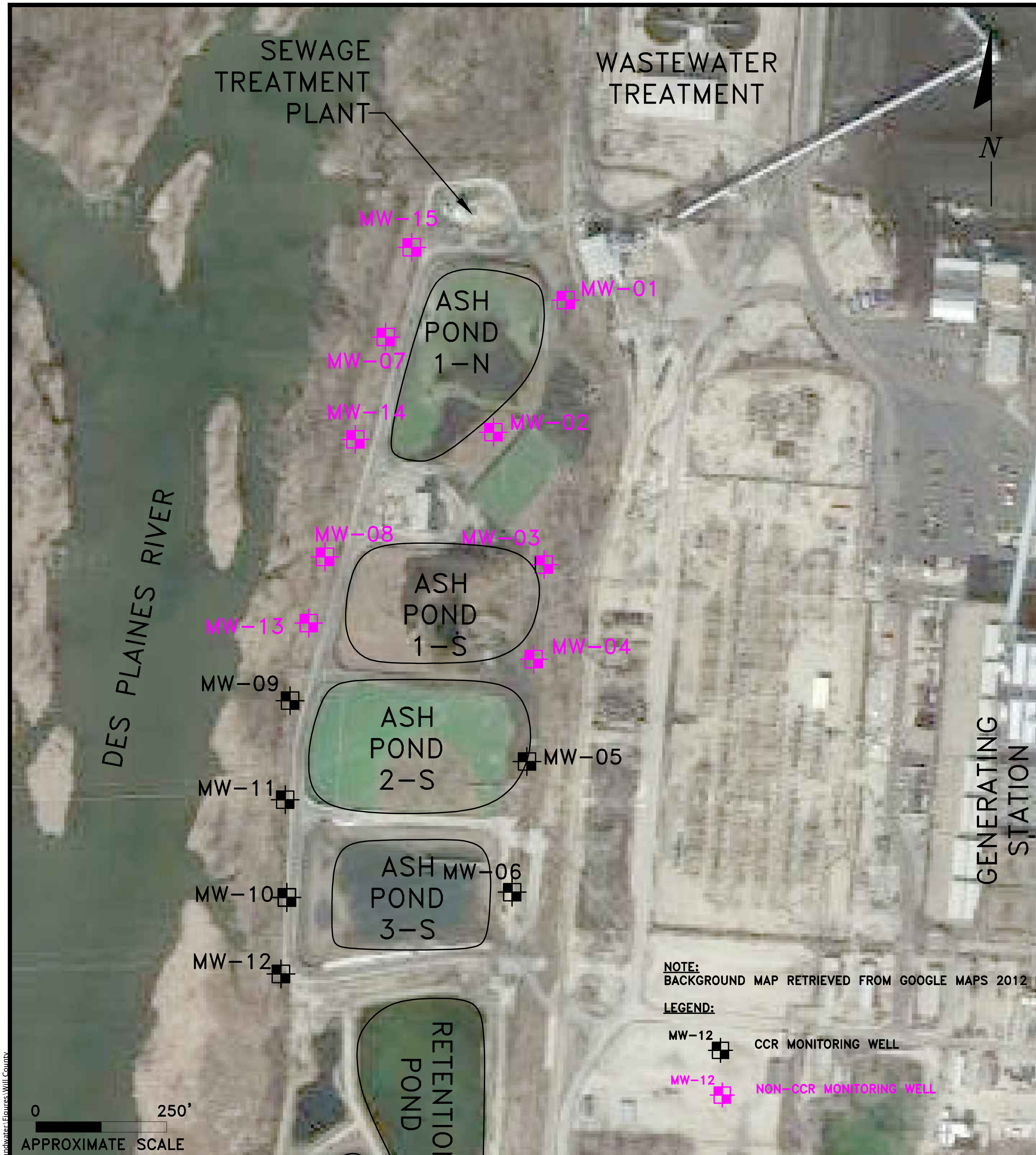
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS

FIGURE



ENVIRONMENTAL CONSULTATION & REMEDIATION

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CCR MONITORING WELL LOCATIONS

WILL COUNTY STATION
ROMEOVILLE, ILLINOIS

Scale: 1" = 250'

Date: August 27, 2021

KPRG Project No. 19520.3

FIGURE 1

W:\Projects\Midwest Generation\12313 Ash Pond Groundwater\Figures\Will County

TABLE

Table 1. Section 845.600 Groundwater Monitoring Parameter List

Parameter	Section 845.600 Standards
Antimony	0.006
Arsenic	0.01
Barium	2
Beryllium	0.004
Boron	2.0
Cadmium	0.005
Chloride	200
Chromium	0.1
Cobalt	0.006
Combined Radium 226 + 228 (pCi/L)	5.0
Fluoride	4.0
Lead	0.0075
Lithium	0.04
Mercury	0.002
Molybdenum	0.10
pH (standard units)	6.5-9.0
Selenium	0.05
Sulfate	400
Thallium	0.002
Total Dissolved Solids	1200
Calcium	NE
Turbidity	NE

All vaues in mg/l unless otherwise specified.
NE- Not Established

Attachment 9-6 – Statistical Evaluation Summary

ATTACHMENT 9-6

BACKGROUND STATISTICAL EVALUATION SUMMARY
STATE RULE CCR GROUNDWATER MONITORING
WILL COUNTY GENERATING STATION

The newly enacted Ill. Adm. Code Title 35, Part 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (State CCR Rule) requires development of proposed Groundwater Protection Standards (GWPSs) for inclusion within the Operating Permit for the regulated surface impoundments at the facility. Upon Illinois Environmental Protection Agency (EPA) review, concurrence and approval of these site-specific proposed GWPSs, subsequent quarterly downgradient groundwater monitoring data will be compared against these standards to determine whether standard quarterly monitoring is to continue or whether additional evaluations need to occur to in accordance with Section 845.650(d), 845.650(e), 845.660 and 845.670. The overall statistical approach to be used for the development of the proposed GWPSs is provided in Attachment 9-5 of the Operating Permit.

The proposed site-specific GWPSs for the Will County Generating Station Pond 2S and Pond 3S are summarized in Table 9-7 in Section 9 of this Operating Permit. The background Prediction Limit values presented in that table were developed, where possible, by combining or “pooling” as many background data points as possible from the two background monitoring wells. This includes evaluating whether the initial eight rounds of data generated as part of Federal CCR Rule compliance that was completed between 2015 and 2017 can be combined with subsequent available data from ongoing groundwater monitoring since that time at a specific upgradient monitoring well location, and whether datasets from individual upgradient monitoring points can also be combined or “pooled”. Ten rounds of turbidity measurements were collected this calendar year (2021) since this was a new state requirement that was not part of the federal CCR Rule. The following general decision process was followed to determine whether background data from within a well and/or between upgradient wells can be pooled for background calculations:

- If the combined dataset (original eight rounds of data plus any subsequent data generated since the initial background sampling) at a specific well location (intrawell evaluation) for a specific parameter does not show a statistically significant trend, the data for that specific parameter at that well location can be pooled. If a statistically significant trend in the data is noted to exist, only the original eight rounds of background sampling can be used for subsequent calculations. If there is more than one background monitoring well, and one of the combined datasets for a specific parameter shows a statistically significant trend but the other does not, then the specific parameter data for the well that did not indicate a trend can potentially be used for subsequent evaluations.

- If there is more than one background monitoring well, then datasets for individual parameters between the wells (interwell evaluation) must pass an analysis of variance to determine whether there may be a statistically significant variation between the two datasets. If no statistically significant variance is noted between the two background monitoring points, and the individual parameter data passes the intrawell trend evaluation noted above, then the datasets for that parameter can be pooled between the wells to establish a larger background dataset. If there is a statistically significant variation noted between the two background monitoring points, then the specific parameter datasets from those wells cannot be combined.

- If it is determined that datasets from background monitoring points cannot be combined, then a decision needs to be made as to which monitoring point will be used for a specific parameter for background calculations. At this point some professional judgement needs to be used by considering the number of data points within each dataset, any potential statistical outliers, any statistical seasonality/temporal variance, the distribution and/or underlying distribution of that data, number of detects versus non-detects, etc.

With the above decision process in mind, the various statistical evaluations performed are summarized below. The evaluations were performed with the assistance of the Sanitas® statistical software package.

Outlier Testing

Outlier tests were performed for all monitoring wells in the proposed State CCR monitoring well network for all data available since the start of Federal CCR monitoring. Wells MW-05 and MW-06 are the designated background wells. No statistically significant outliers were noted in these background wells with the exception of turbidity which had an outlier value at well location MW-06.

Since the outlier cannot be attributed to either lab error, transcription error or field sampling error, the outlier value was not removed from the dataset at this time but may be considered during subsequent data evaluations. A statistical run summary which includes the specific statistical method used for each parameter for each well is provided at the end of this discussion.

Seasonality/Temporal Variability Testing

Seasonality/temporal variability tests were performed for all monitoring wells in the proposed State CCR monitoring well network for all data available since the start of Federal CCR monitoring. Wells MW-05 and MW-06 are the designated background monitoring wells. No statistically significant seasonal/temporal variations were noted in these wells for any of the parameters. A statistical run summary which includes the specific statistical method used for each parameter for each well is provided at the end of this discussion. The turbidity database to date is insufficient to evaluate potential seasonal/temporal variability at this time.

Trend Analysis

To determine whether data generated since the initial eight rounds of background groundwater sampling since the enactment of the Federal Rule can potentially be pooled at a specific background monitoring well location (MW-05 and MW-06), trend analysis for each constituent at each upgradient well location was performed. The results are summarized as flows:

- MW-05 – Statistically significant trends were noted for chloride, sulfate, and total dissolved solids (TDS).
- MW-06 – Statistically significant trends were noted for calcium, chloride, fluoride, molybdenum, pH, and sulfate.

A statistical run summary which includes the specific statistical method used for each parameter for each well is provided at the end of this discussion.

Spatial Variability Testing

Spatial variability testing was conducted to determine if data generated at different spatial locations (MW-05 and MW-06) exhibited values that differ across locations. The following observations are made:

- Upgradient wells MW-05 and MW-06 all parameter values pooled – No statistically significant variance between the full datasets for arsenic, chloride, combined radium, lead, lithium, and pH.

It is noted that antimony, beryllium, cadmium, chromium, cobalt, mercury, and thallium had no detections at any of the two background well locations during any sampling event, therefore, although an analysis of variance cannot be formally completed, these data sets can be pooled since there is no variation in the reporting limits.

Statistical run summaries which include the specific statistical method used for each parameter for each of the dataset comparisons are provided at the end of this discussion.

Test of Normality

The Shapiro-Wilk Normality Test with an alpha (α) value of 0.05 (or 95%) was used to evaluate the distribution of the background datasets for each constituent at each background well location and the distribution of pooled datasets. A Test of Ladders was also run to evaluate other potential underlying transformational distributions in the case that the non-transformed dataset was found not to be normally distributed. The statistical runs are provided for the various combinations of upgradient wells by parameter at the end of this discussion.

Prediction Limits

Based on the various statistical evaluations discussed above, the following background data sets were used for background prediction limit calculations:

- Background wells MW-05 and MW-06 all parameter values pooled for antimony, arsenic, beryllium, cadmium, chromium, cobalt, radium combined, lead, lithium, mercury and thallium. Relative to arsenic, radium combined and lithium, there were no statistically significant trends within the wells for the combined data observations and there was no statistically significant variance noted between the datasets. Relative to the other parameters, all values at both background well locations were non-detects with no differences in detection limits.

- Background well MW-05 all parameter values were pooled for calcium, fluoride, molybdenum, pH, and selenium. For each of these parameter datasets, there were no individual statistically significant trends within the well.
- Background well MW-06 all parameter values were pooled for TDS. This parameter did not indicate statistically significant trends within this well.
- Background wells MW-05 and MW-06 the first eight rounds of data generated were pooled for chloride. There were no statistically significant data trends noted for MW-05 and MW-06 in the first eight rounds of data generated, nor detection of spatial variability.
- Background well MW-05 the first eight rounds of data generated were pooled for sulfate. There was not a statistically significant data trend noted for this parameter in this well, nor were any outliers identified. Spatial variability for sulfate between MW-05 and MW-06 was detected and both MW-05 and MW-06 were identified as normal via the Shapiro-Wilkes normality. Sulfate concentrations were typically greater for MW-05 than MW-06, therefore the initial eight rounds of sulfate data for MW-05 data was pooled because the data provided a more conservative estimate. This well was also used for turbidity background calculation since it could not be pooled with well MW-06 due to statistically significant spatial variation between these datasets, and all other factors being equal (i.e., no statistically significant trends for both and normal datasets for both), there was a statistical outlier for turbidity noted at well MW-06 and not at MW-05.
- Background well MW-06 the first eight rounds of data generated were pooled for barium and boron. Both barium and boron did not display a statistically significant data trend for MW-05 and MW-06. Spatial variability for barium and boron between MW-05 and MW-06 was detected. Barium was not identified as an outlier for MW-05 and MW-06 and was identified as normal via the Shapiro-Wilkes normality test for both wells. Barium concentrations were typically greater for MW-06 than MW-05, therefore MW-06 barium data was pooled because the data provided a more conservative estimate. Boron was identified as an outlier for MW-05 but was not identified as an outlier for MW-06, therefore the first eight rounds of data generated were pooled for boron.

The calculated prediction limits under the various background dataset selection scenarios are summarized in Table 9-7 in Section 9 of this permit application. A prediction limit statistical run summary which includes the specific statistical method used for each parameter for each well scenario noted above are provided at the end of this discussion.

Outlier Analysis - Will Co - UG Wells All Values

Will County Generating Station   Client: NRG   Data: Will County   Printed 10/7/2021, 1:07 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony (mg/L)	MW-05 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.003	0	unknown	ShapiroWilk
Antimony (mg/L)	MW-06 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.003	0	unknown	ShapiroWilk
Arsenic (mg/L)	MW-05 (bg)	No	n/a	n/a	EPA 1989	0.05	11	0.002845	0.001254	normal	ShapiroWilk
Arsenic (mg/L)	MW-06 (bg)	No	n/a	n/a	EPA 1989	0.05	11	0.0024	0.0008579	normal	ShapiroWilk
Barium (mg/L)	MW-05 (bg)	No	n/a	n/a	EPA 1989	0.05	11	0.05418	0.01173	normal	ShapiroWilk
Barium (mg/L)	MW-06 (bg)	No	n/a	n/a	EPA 1989	0.05	11	0.06991	0.01106	normal	ShapiroWilk
Beryllium (mg/L)	MW-05 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.001	0	unknown	ShapiroWilk
Beryllium (mg/L)	MW-06 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.001	0	unknown	ShapiroWilk
Boron (mg/L)	MW-05 (bg)	No	n/a	n/a	EPA 1989	0.05	17	4.418	0.672	ln(x)	ShapiroWilk
Boron (mg/L)	MW-06 (bg)	No	n/a	n/a	EPA 1989	0.05	18	3.333	0.5087	normal	ShapiroWilk
Cadmium (mg/L)	MW-05 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.0005	0	unknown	ShapiroWilk
Cadmium (mg/L)	MW-06 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.0005	0	unknown	ShapiroWilk
Calcium (mg/L)	MW-05 (bg)	No	n/a	n/a	EPA 1989	0.05	17	138.6	65.45	normal	ShapiroWilk
Calcium (mg/L)	MW-06 (bg)	No	n/a	n/a	EPA 1989	0.05	17	87.06	17.11	normal	ShapiroWilk
Chloride (mg/L)	MW-05 (bg)	No	n/a	n/a	NP (nrm)	NaN	17	75.18	34.69	unknown	ShapiroWilk
Chloride (mg/L)	MW-06 (bg)	No	n/a	n/a	EPA 1989	0.05	17	67.41	29.07	ln(x)	ShapiroWilk
Chromium (mg/L)	MW-05 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.005	0	unknown	ShapiroWilk
Chromium (mg/L)	MW-06 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.005	0	unknown	ShapiroWilk
Cobalt (mg/L)	MW-05 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.001	0	unknown	ShapiroWilk
Cobalt (mg/L)	MW-06 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.001	0	unknown	ShapiroWilk
Combined Radium 226 + 228 (pCi/L)	MW-05 (bg)	No	n/a	n/a	NP (nrm)	NaN	10	0.3777	0.2022	unknown	ShapiroWilk
Combined Radium 226 + 228 (pCi/L)	MW-06 (bg)	No	n/a	n/a	NP (nrm)	NaN	10	0.3516	0.265	unknown	ShapiroWilk
Fluoride (mg/L)	MW-05 (bg)	No	n/a	n/a	EPA 1989	0.05	17	0.4647	0.133	normal	ShapiroWilk
Fluoride (mg/L)	MW-06 (bg)	No	n/a	n/a	EPA 1989	0.05	17	0.3635	0.08185	normal	ShapiroWilk
Lead (mg/L)	MW-05 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.0005	0	unknown	ShapiroWilk
Lead (mg/L)	MW-06 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.000...	0.0000...	unknown	ShapiroWilk
Lithium (mg/L)	MW-05 (bg)	No	n/a	n/a	NP (nrm)	NaN	11	0.013	0.003768	unknown	ShapiroWilk
Lithium (mg/L)	MW-06 (bg)	No	n/a	n/a	EPA 1989	0.05	11	0.01355	0.002296	ln(x)	ShapiroWilk
Mercury (mg/L)	MW-05 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.0002	0	unknown	ShapiroWilk
Mercury (mg/L)	MW-06 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.0002	0	unknown	ShapiroWilk
Molybdenum (mg/L)	MW-05 (bg)	No	n/a	n/a	EPA 1989	0.05	11	0.08764	0.02731	normal	ShapiroWilk
Molybdenum (mg/L)	MW-06 (bg)	No	n/a	n/a	Dixon`s	0.05	11	0.04564	0.01344	normal	ShapiroWilk
pH (n/a)	MW-05 (bg)	No	n/a	n/a	NP (nrm)	NaN	17	7.603	0.9035	unknown	ShapiroWilk
pH (n/a)	MW-06 (bg)	No	n/a	n/a	EPA 1989	0.05	18	7.858	0.477	normal	ShapiroWilk
Selenium (mg/L)	MW-05 (bg)	No	n/a	n/a	EPA 1989	0.05	11	0.01537	0.01377	ln(x)	ShapiroWilk
Selenium (mg/L)	MW-06 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.002718	0.0004936	unknown	ShapiroWilk
Sulfate (mg/L)	MW-05 (bg)	No	n/a	n/a	EPA 1989	0.05	17	514.1	130.2	normal	ShapiroWilk
Sulfate (mg/L)	MW-06 (bg)	No	n/a	n/a	EPA 1989	0.05	18	283.3	86.57	ln(x)	ShapiroWilk
Thallium (mg/L)	MW-05 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.002	0	unknown	ShapiroWilk
Thallium (mg/L)	MW-06 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	11	0.002	0	unknown	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-05 (bg)	No	n/a	n/a	EPA 1989	0.05	17	1219	303.4	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-06 (bg)	No	n/a	n/a	EPA 1989	0.05	18	736.1	95.56	normal	ShapiroWilk

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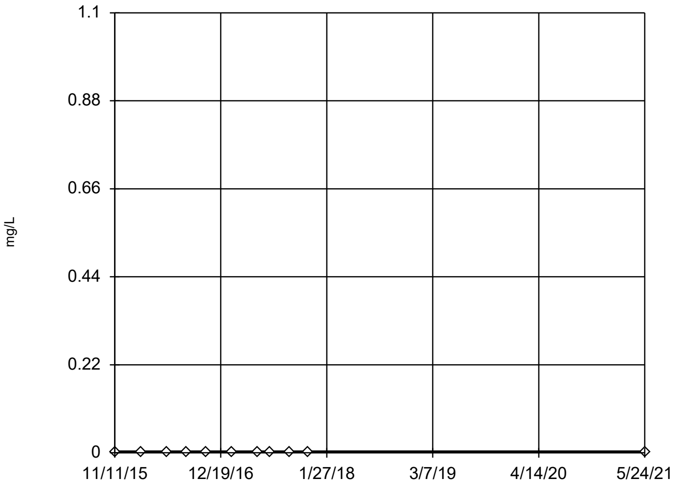
Tukey's Outlier Screening

MW-05 (bg)



n = 11

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Antimony Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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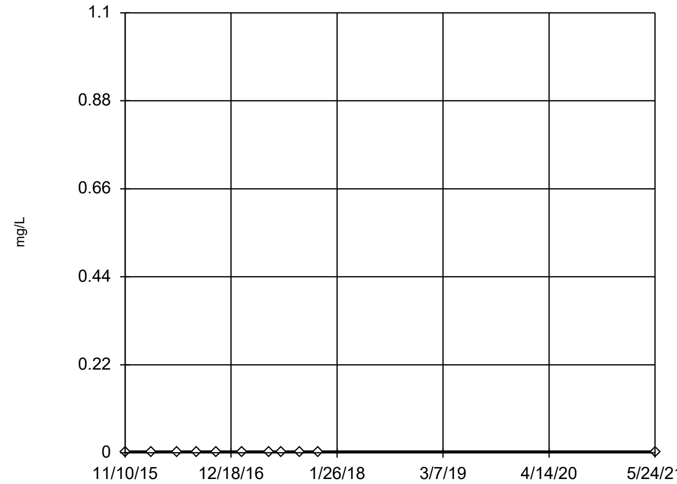
Tukey's Outlier Screening

MW-06 (bg)



n = 11

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Antimony Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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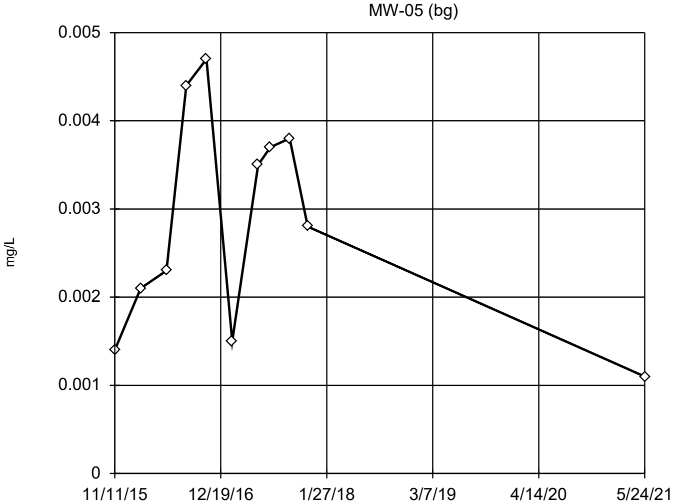
EPA Screening (suspected outliers for Dixon's Test)

MW-05 (bg)



n = 11

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.002845, std. dev. 0.001254, critical Tn 2.234

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9389
Critical = 0.876
The distribution was found to be normally distributed.

Constituent: Arsenic Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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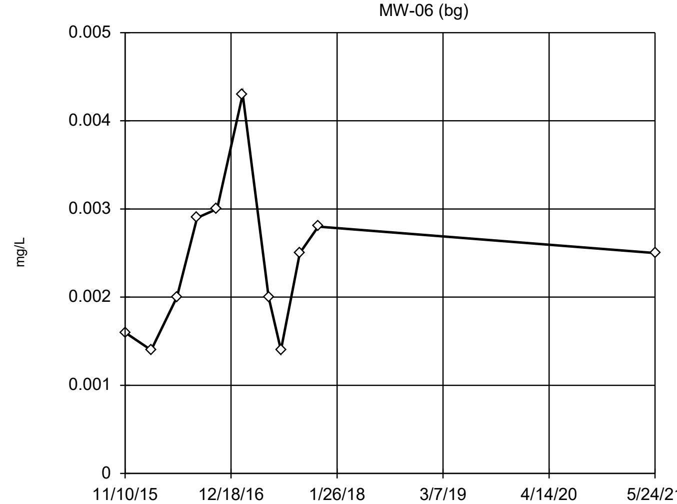
EPA Screening (suspected outliers for Dixon's Test)

MW-06 (bg)



n = 11

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.0024, std. dev. 0.0008579, critical Tn 2.234

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9168
Critical = 0.876
The distribution was found to be normally distributed.

Constituent: Arsenic Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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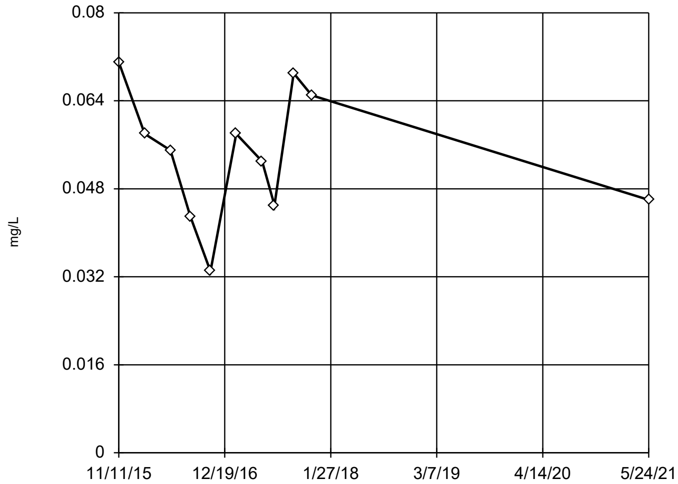
EPA Screening (suspected outliers for Dixon's Test)

MW-05 (bg)



n = 11

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 0.05418, std. dev. 0.01173, critical Tn 2.234

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9677 Critical = 0.876 The distribution was found to be normally distributed.

Constituent: Barium Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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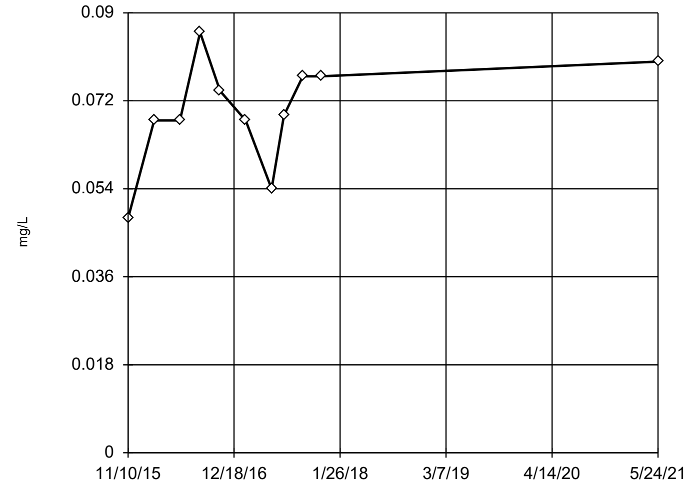
EPA Screening (suspected outliers for Dixon's Test)

MW-06 (bg)



n = 11

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 0.06991, std. dev. 0.01106, critical Tn 2.234

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9254 Critical = 0.876 The distribution was found to be normally distributed.

Constituent: Barium Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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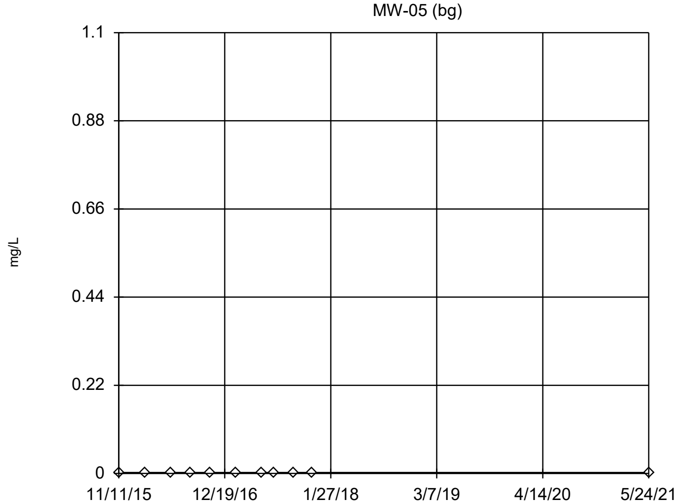
Tukey's Outlier Screening

MW-05 (bg)



n = 11

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Beryllium Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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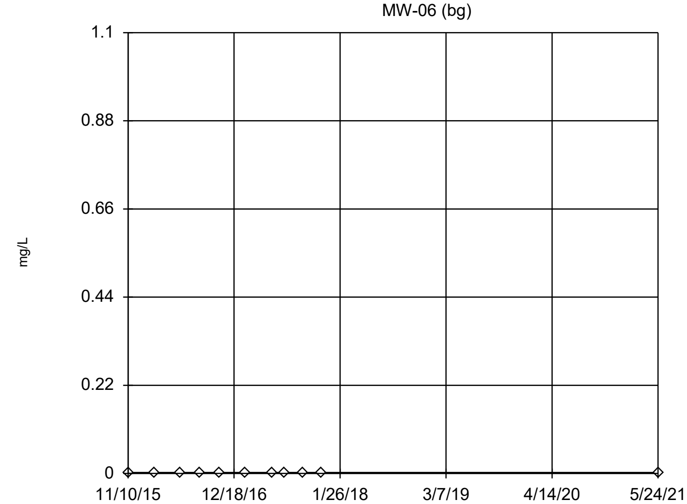
Tukey's Outlier Screening

MW-06 (bg)



n = 11

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Beryllium Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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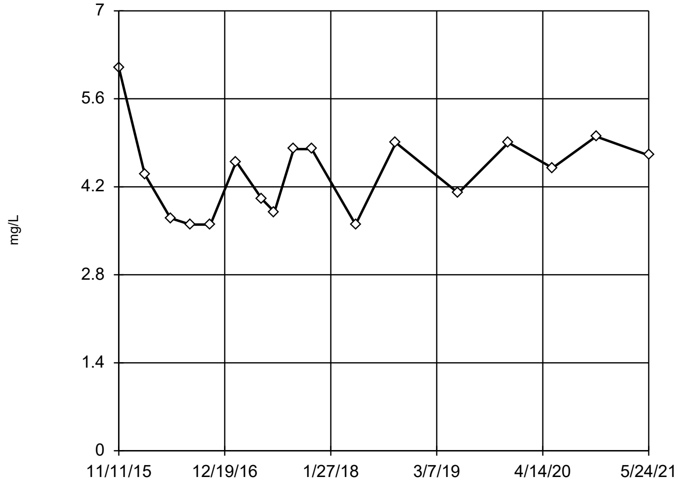
EPA Screening (suspected outliers for Dixon's Test)

MW-05 (bg)



n = 17

Dixon's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 4.418, std. dev.
0.672, critical Tn 2.475

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9213
Critical = 0.91 (after
natural log transforma-
tion)
The distribution was found
to be log-normal.

Constituent: Boron Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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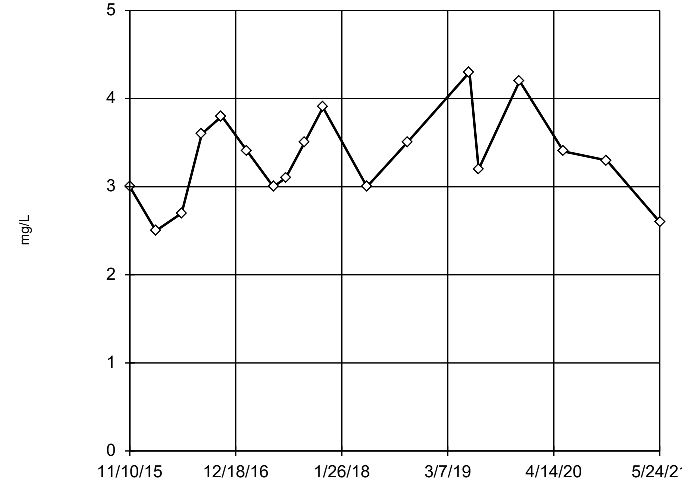
EPA Screening (suspected outliers for Dixon's Test)

MW-06 (bg)



n = 18

Dixon's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 3.333, std. dev.
0.5087, critical Tn 2.504

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9725
Critical = 0.914
The distribution was found
to be normally distrib-
uted.

Constituent: Boron Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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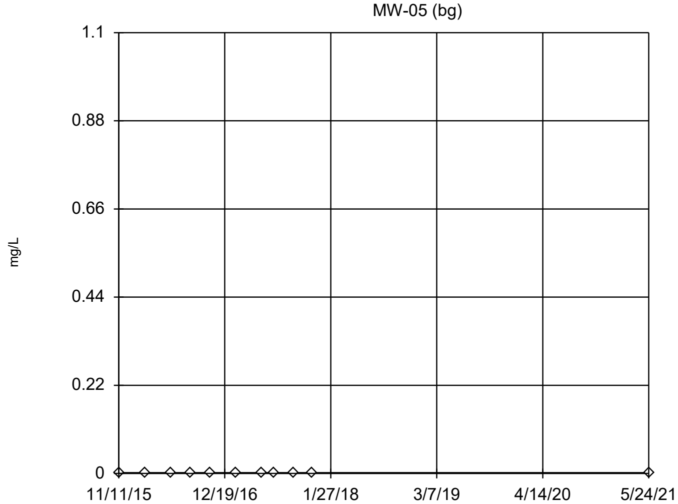
Tukey's Outlier Screening

MW-05 (bg)



n = 11

No outliers found.
Tukey's method used in
lieu of parametric test
because the Shapiro Wilk
normality test failed
at the 0.1 alpha level.

Data were square root
transformed to achieve
best W statistic (graph
shown in original units).

The results were invalid-
ated, because the lower
and upper quartiles are
equal.

Constituent: Cadmium Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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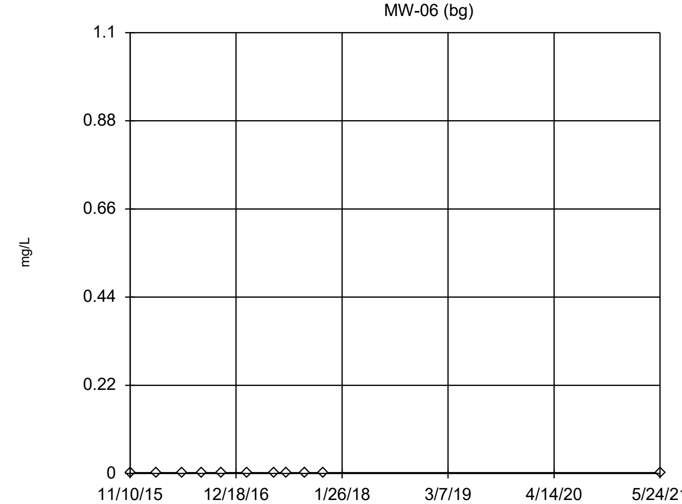
Tukey's Outlier Screening

MW-06 (bg)



n = 11

No outliers found.
Tukey's method used in
lieu of parametric test
because the Shapiro Wilk
normality test failed
at the 0.1 alpha level.

Data were square root
transformed to achieve
best W statistic (graph
shown in original units).

The results were invalid-
ated, because the lower
and upper quartiles are
equal.

Constituent: Cadmium Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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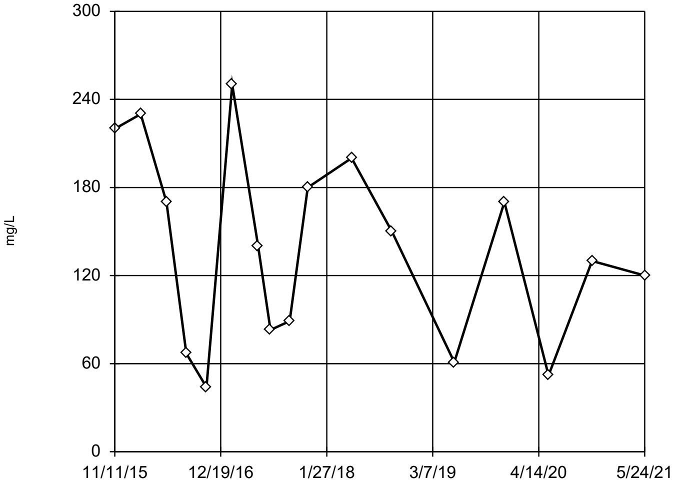
EPA Screening (suspected outliers for Dixon's Test)

MW-05 (bg)



n = 17

Dixon's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 138.6, std. dev.
65.45, critical Tn 2.475

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9526
Critical = 0.91
The distribution was found
to be normally distrib-
uted.

Constituent: Calcium Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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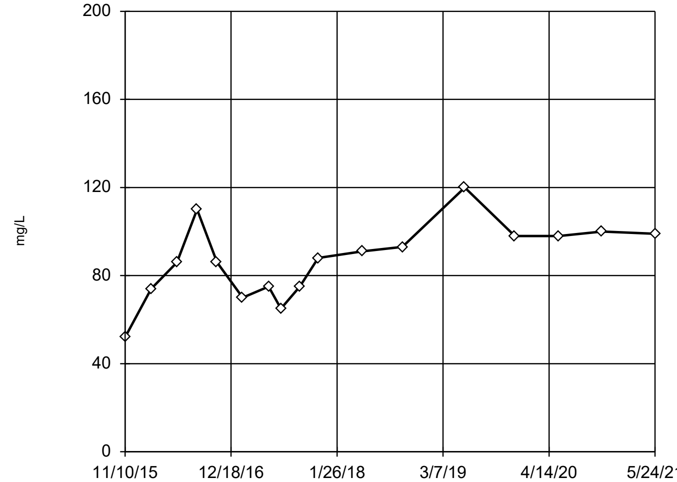
EPA Screening (suspected outliers for Dixon's Test)

MW-06 (bg)



n = 17

Dixon's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 87.06, std. dev.
17.11, critical Tn 2.475

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9829
Critical = 0.91
The distribution was found
to be normally distrib-
uted.

Constituent: Calcium Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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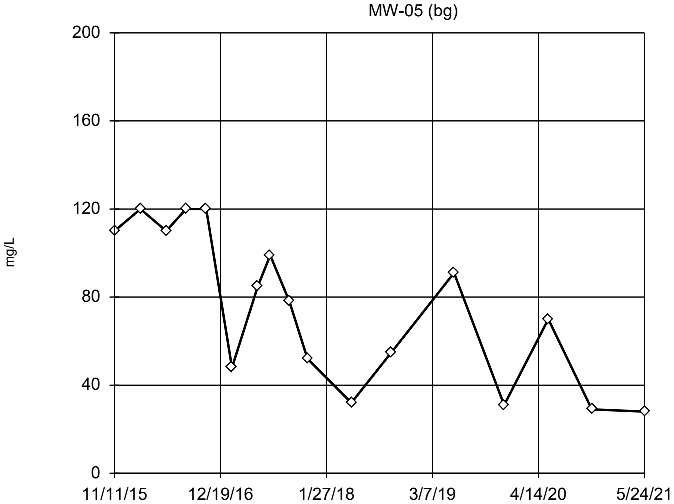
Tukey's Outlier Screening

MW-05 (bg)



n = 17

No outliers found.
Tukey's method used in
lieu of parametric test
because the Shapiro Wilk
normality test failed
at the 0.1 alpha level.

Ladder of Powers trans-
formations did not im-
prove normality; analy-
sis run on raw data.

High cutoff = 320, low
cutoff = -170, based on
IQR multiplier of 3.

Constituent: Chloride Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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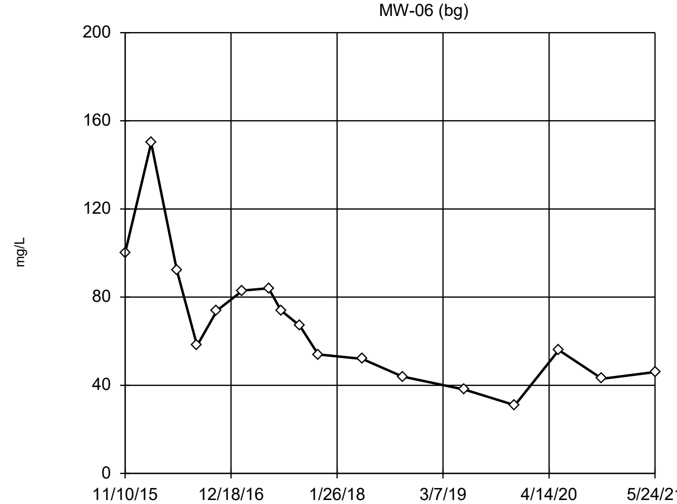
EPA Screening (suspected outliers for Dixon's Test)

MW-06 (bg)



n = 17

Dixon's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 67.41, std. dev.
29.07, critical Tn 2.475

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9846
Critical = 0.91 (after
natural log transforma-
tion)
The distribution was found
to be log-normal.

Constituent: Chloride Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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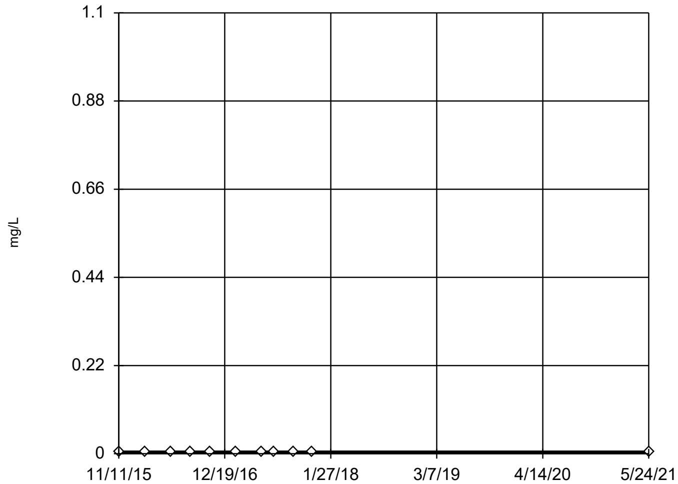
Tukey's Outlier Screening

MW-05 (bg)



n = 11

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Chromium Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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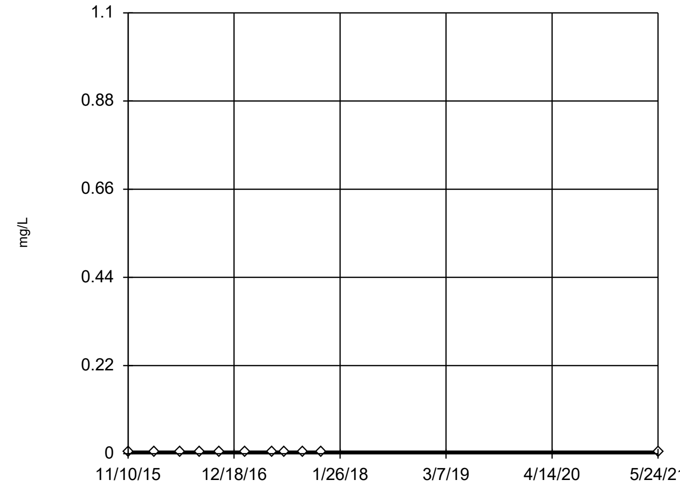
Tukey's Outlier Screening

MW-06 (bg)



n = 11

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Chromium Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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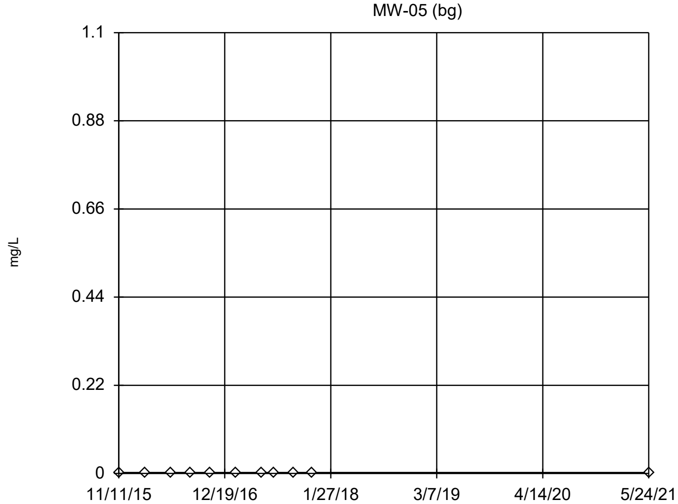
Tukey's Outlier Screening

MW-05 (bg)



n = 11

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Cobalt Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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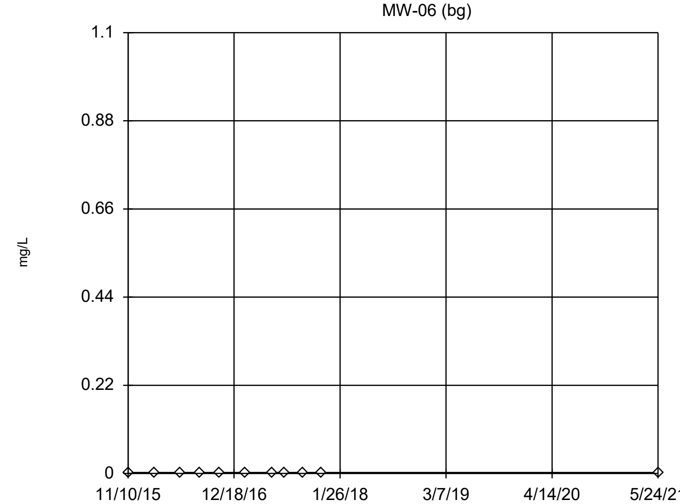
Tukey's Outlier Screening

MW-06 (bg)



n = 11

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Cobalt Analysis Run 10/7/2021 1:04 PM

Will County Generating Station Client: NRG Data: Will County

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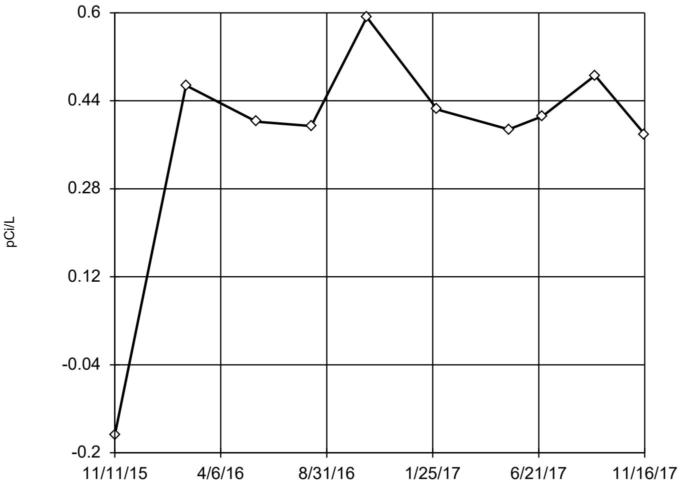
Tukey's Outlier Screening

MW-05 (bg)



n = 10

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.685, low cutoff = -0.3073, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228   Analysis Run 10/7/2021 1:04 PM

Will County Generating Station   Client: NRG   Data: Will County

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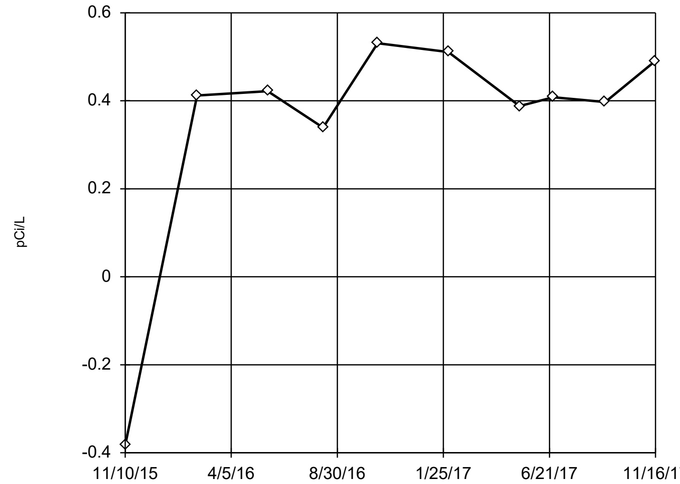
Tukey's Outlier Screening

MW-06 (bg)



n = 10

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were x^5 transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.6394, low cutoff = -0.585, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228   Analysis Run 10/7/2021 1:04 PM

Will County Generating Station   Client: NRG   Data: Will County

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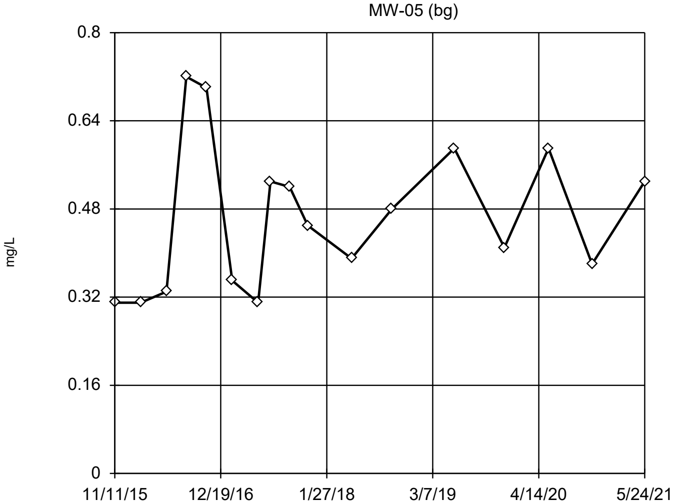
EPA Screening (suspected outliers for Dixon's Test)

MW-05 (bg)



n = 17

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.4647, std. dev. 0.133, critical Tn 2.475

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9202
Critical = 0.91
The distribution was found to be normally distributed.

Constituent: Fluoride   Analysis Run 10/7/2021 1:05 PM

Will County Generating Station   Client: NRG   Data: Will County

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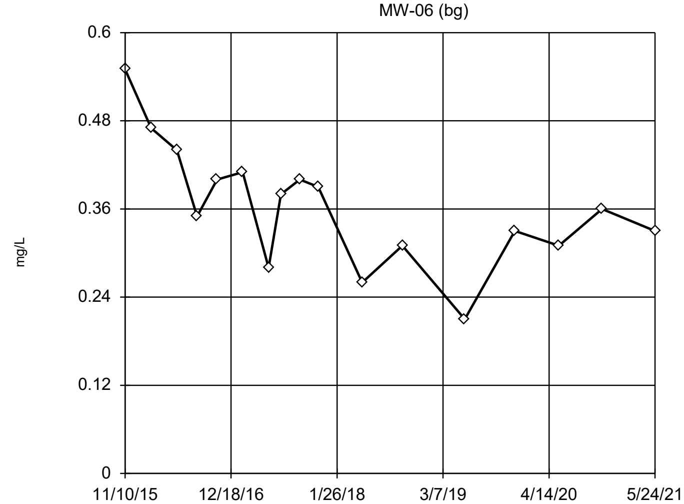
EPA Screening (suspected outliers for Dixon's Test)

MW-06 (bg)



n = 17

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.3635, std. dev. 0.08185, critical Tn 2.475

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9858
Critical = 0.91
The distribution was found to be normally distributed.

Constituent: Fluoride   Analysis Run 10/7/2021 1:05 PM

Will County Generating Station   Client: NRG   Data: Will County

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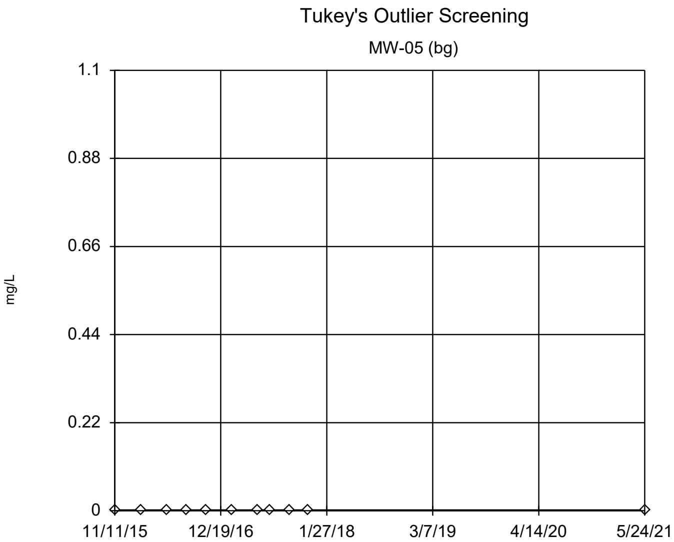

n = 11

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Lead Analysis Run 10/7/2021 1:05 PM

Will County Generating Station Client: NRG Data: Will County

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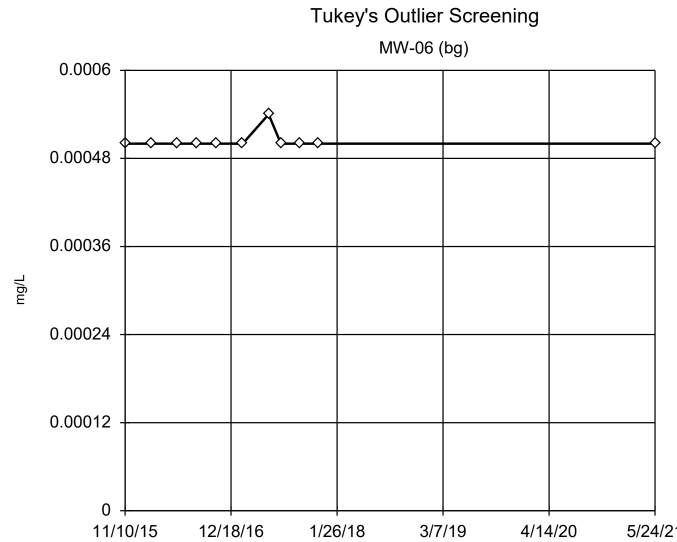

n = 11

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Lead Analysis Run 10/7/2021 1:05 PM

Will County Generating Station Client: NRG Data: Will County

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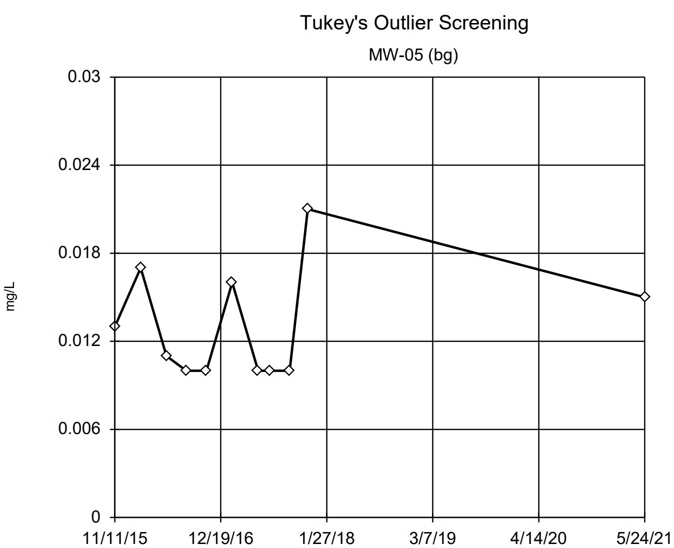

n = 11

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.06554, low cutoff = 0.002441, based on IQR multiplier of 3.

Constituent: Lithium Analysis Run 10/7/2021 1:05 PM

Will County Generating Station Client: NRG Data: Will County

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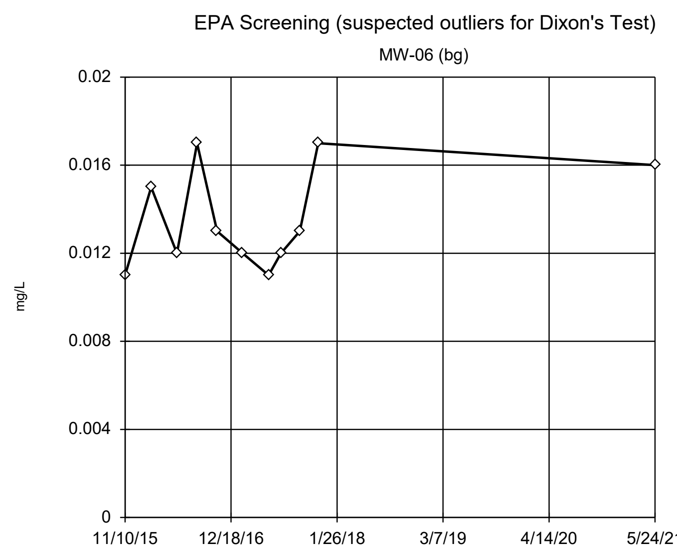

n = 11

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 0.01355, std. dev. 0.002296, critical Tn 2.234

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.8795 Critical = 0.876 (after natural log transformation) The distribution was found to be log-normal.

Constituent: Lithium Analysis Run 10/7/2021 1:05 PM

Will County Generating Station Client: NRG Data: Will County

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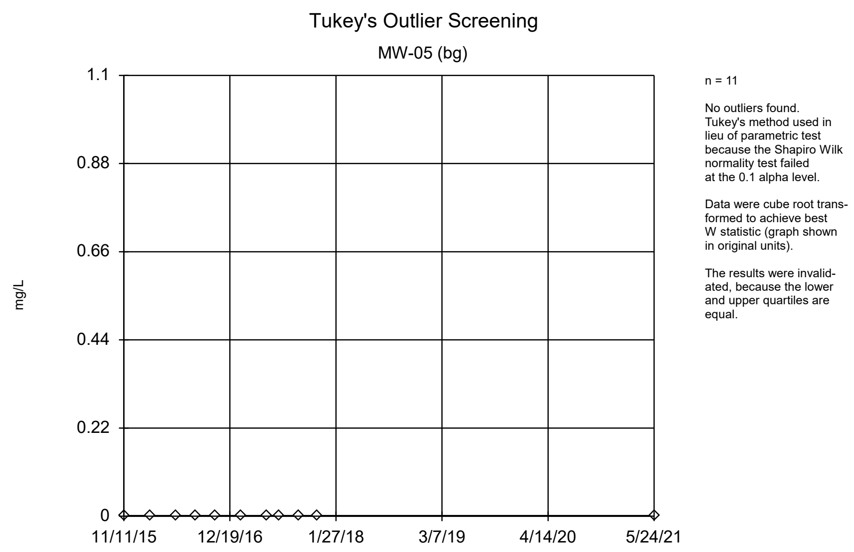
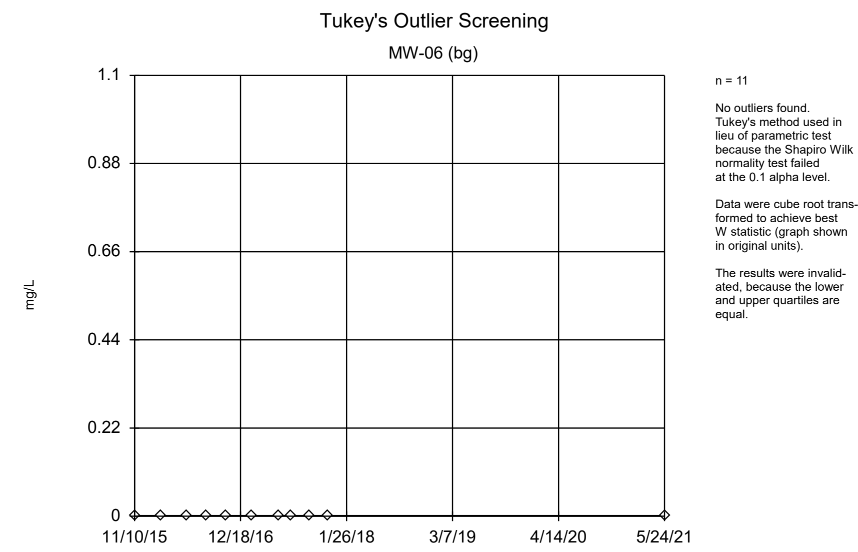


Constituent: Mercury Analysis Run 10/7/2021 1:05 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG



Constituent: Mercury Analysis Run 10/7/2021 1:05 PM
Will County Generating Station Client: NRG Data: Will County

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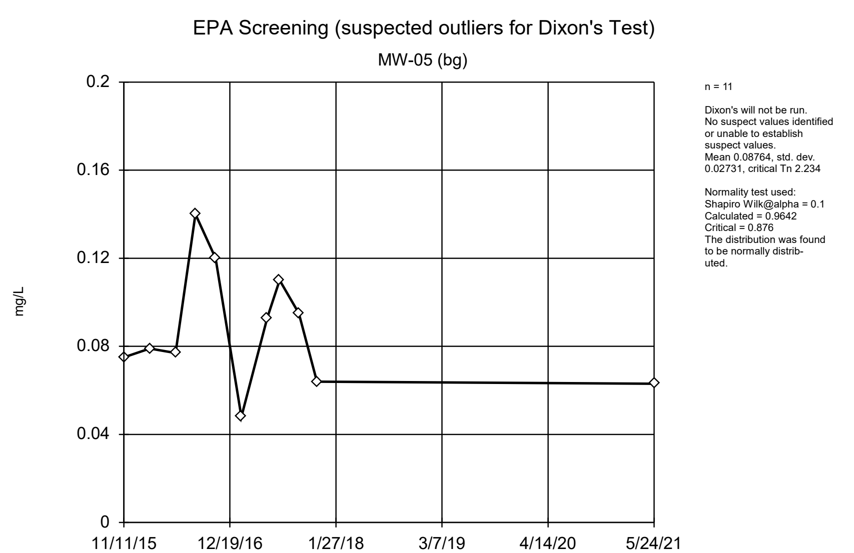

Constituent: Molybdenum Analysis Run 10/7/2021 1:05 PM
Will County Generating Station Client: NRG Data: Will County

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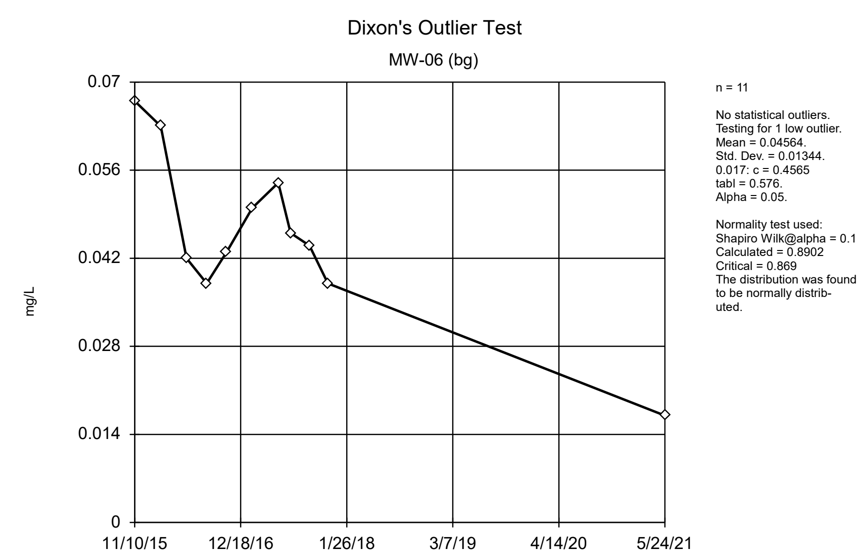
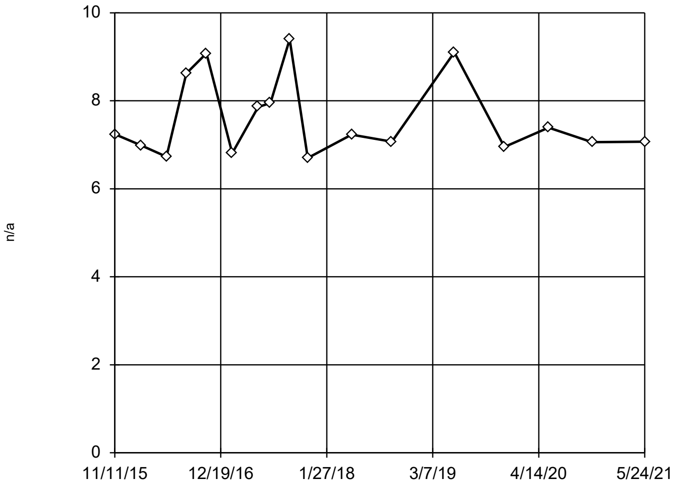


Constituent: Molybdenum Analysis Run 10/7/2021 1:05 PM
Will County Generating Station Client: NRG Data: Will County

Tukey's Outlier Screening

MW-05 (bg)



n = 17

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

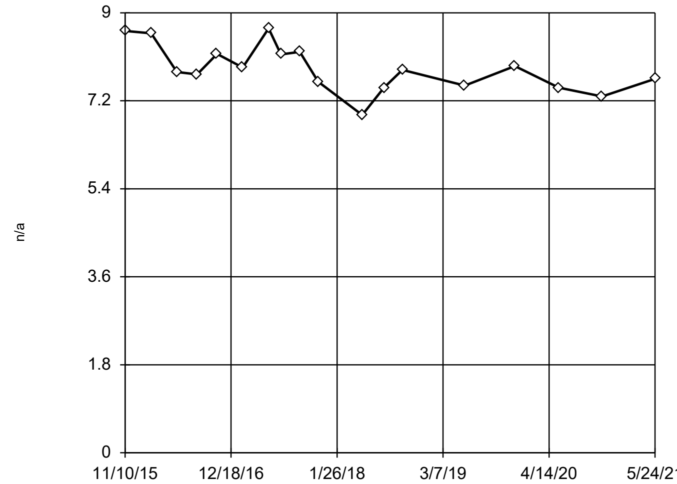
High cutoff = 13.87, low cutoff = 4.16, based on IQR multiplier of 3.

Constituent: pH Analysis Run 10/7/2021 1:05 PM

Will County Generating Station Client: NRG Data: Will County

EPA Screening (suspected outliers for Dixon's Test)

MW-06 (bg)



n = 18

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 7.858, std. dev. 0.477, critical Tn 2.504

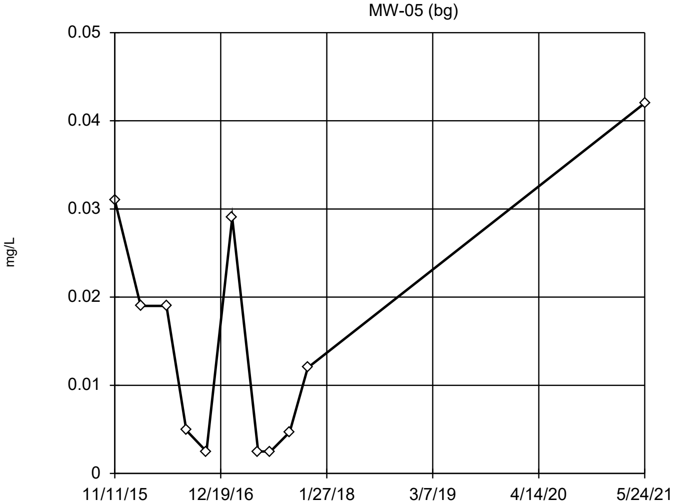
Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9647 Critical = 0.914 The distribution was found to be normally distributed.

Constituent: pH Analysis Run 10/7/2021 1:05 PM

Will County Generating Station Client: NRG Data: Will County

EPA Screening (suspected outliers for Dixon's Test)

MW-05 (bg)



n = 11

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 0.01537, std. dev. 0.01377, critical Tn 2.234

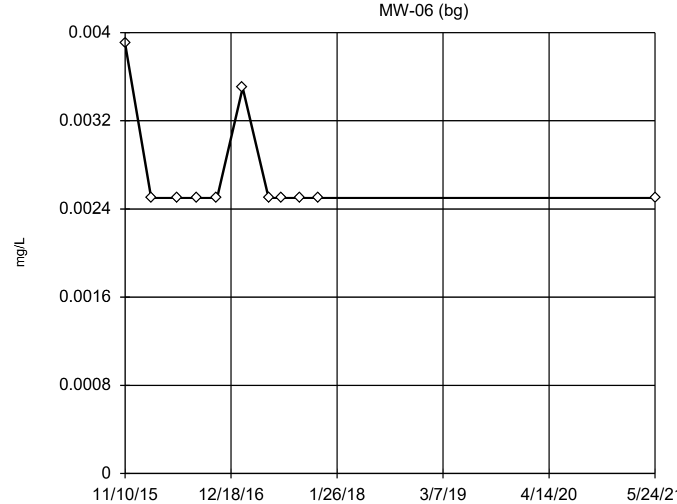
Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.8762 Critical = 0.876 (after natural log transformation) The distribution was found to be log-normal.

Constituent: Selenium Analysis Run 10/7/2021 1:05 PM

Will County Generating Station Client: NRG Data: Will County

Tukey's Outlier Screening

MW-06 (bg)



n = 11

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Selenium Analysis Run 10/7/2021 1:05 PM

Will County Generating Station Client: NRG Data: Will County

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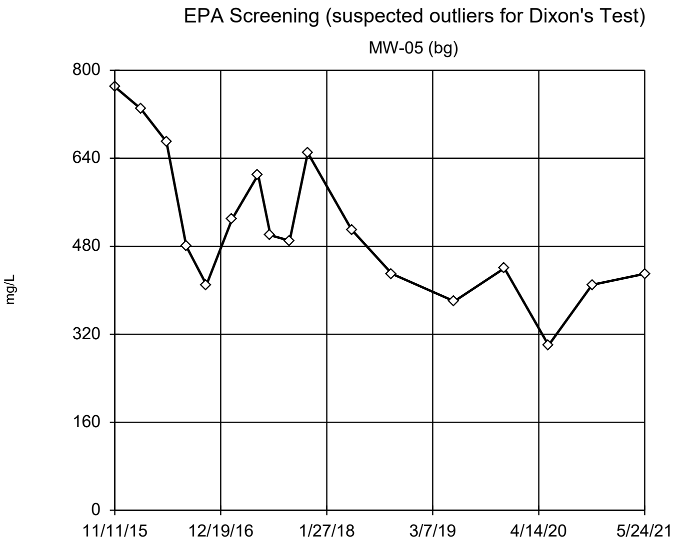


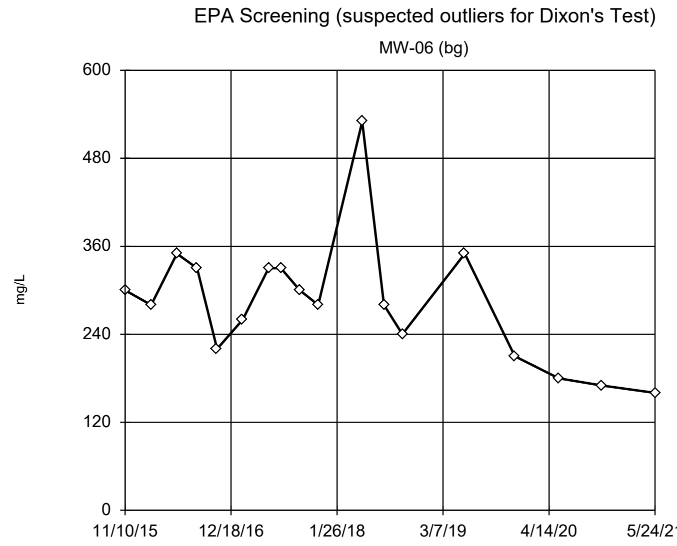
n = 17

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 514.1, std. dev. 130.2, critical Tn 2.475

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9438
Critical = 0.91
The distribution was found to be normally distributed.

Constituent: Sulfate Analysis Run 10/7/2021 1:05 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG



n = 18

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 283.3, std. dev. 86.57, critical Tn 2.504

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9536
Critical = 0.914 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Sulfate Analysis Run 10/7/2021 1:05 PM
Will County Generating Station Client: NRG Data: Will County

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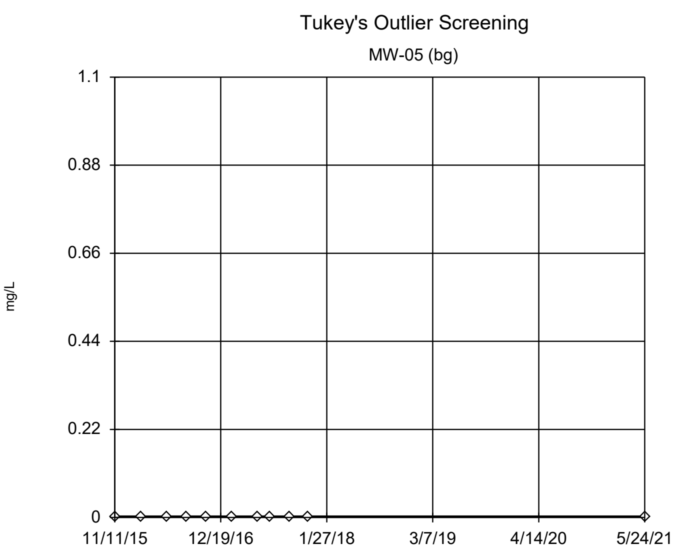

n = 11

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium Analysis Run 10/7/2021 1:05 PM
Will County Generating Station Client: NRG Data: Will County

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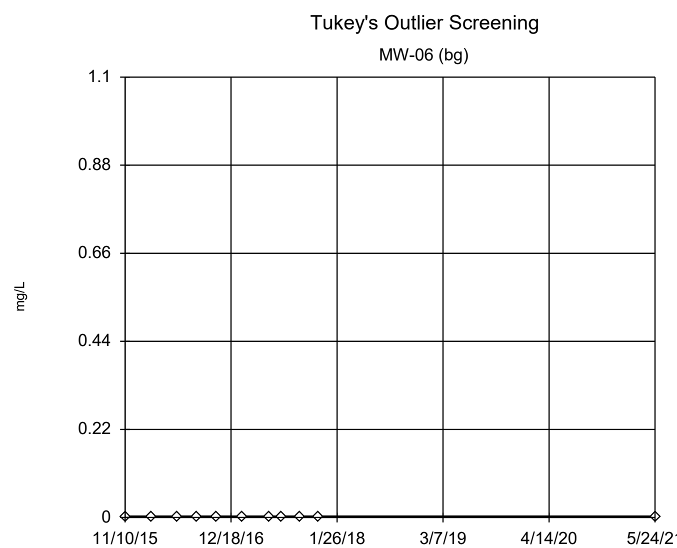


n = 11

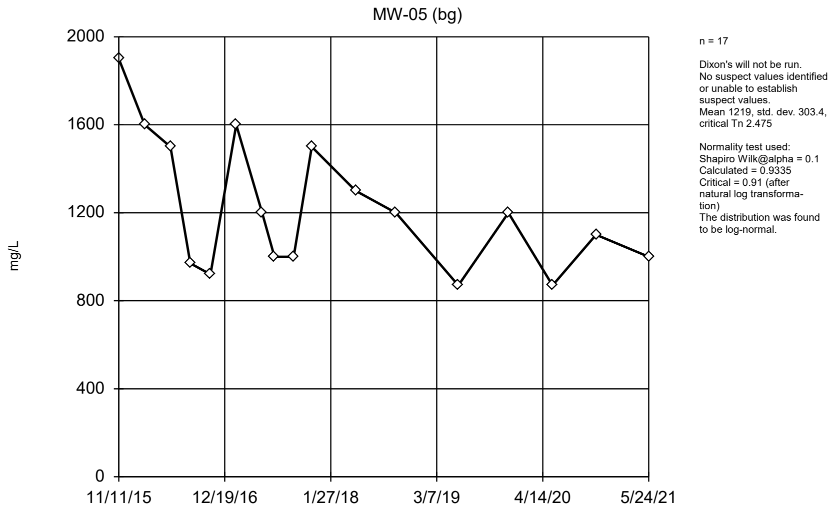
No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium Analysis Run 10/7/2021 1:05 PM
Will County Generating Station Client: NRG Data: Will County

EPA Screening (suspected outliers for Dixon's Test)

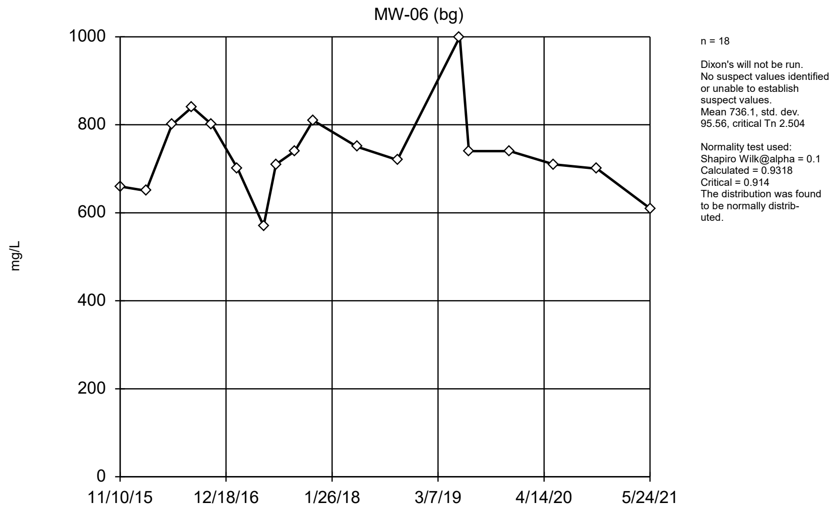


Constituent: Total Dissolved Solids   Analysis Run 10/7/2021 1:05 PM

Will County Generating Station   Client: NRG   Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

EPA Screening (suspected outliers for Dixon's Test)



Constituent: Total Dissolved Solids   Analysis Run 10/7/2021 1:05 PM

Will County Generating Station   Client: NRG   Data: Will County

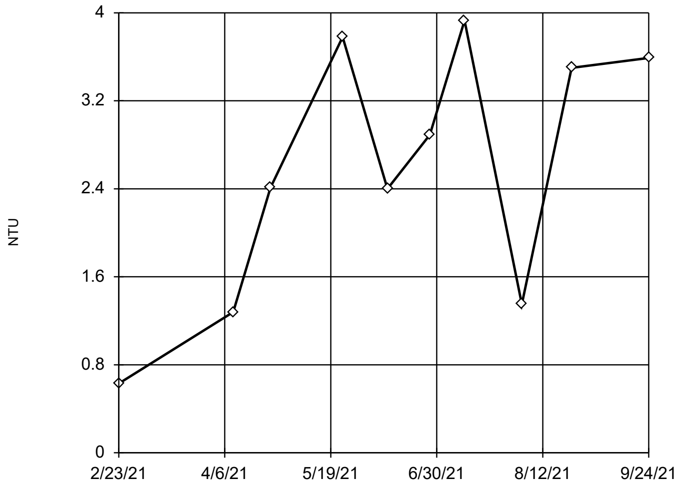
Outlier Analysis - Will Co - UG Wells - Turbidity

Will County Generating Station   Client: NRG   Data: Will County   Printed 10/7/2021, 11:33 AM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Turbidity (NTU)	MW-05 (bg)	No	n/a	n/a	EPA 1989	0.05	10	2.576	1.169	normal	ShapiroWilk
Turbidity (NTU)	**MW-06 (bg)**	**Yes**	**0.31**	**2/23/2021**	**Dixon`s**	**0.05**	**10**	**5.985**	**4.284**	**ln(x)**	**ShapiroWilk**

EPA Screening (suspected outliers for Dixon's Test)

MW-05 (bg)



n = 10

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 2.576, std. dev. 1.169, critical Tn 2.176

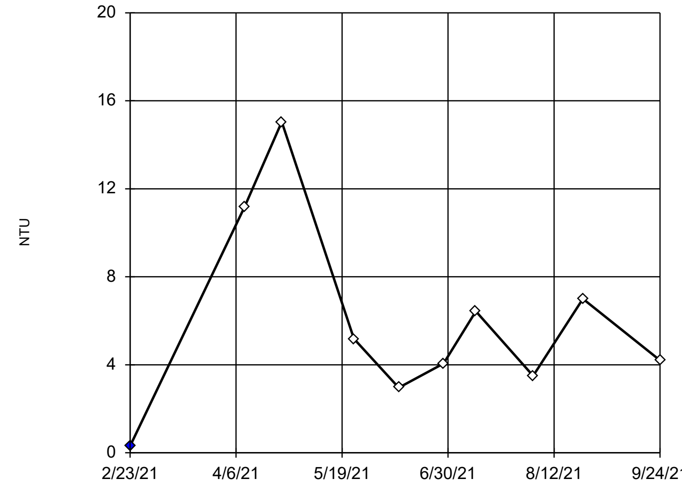
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.913
Critical = 0.869
The distribution was found to be normally distributed.

Constituent: Turbidity   Analysis Run 10/7/2021 11:32 AM

Will County Generating Station   Client: NRG   Data: Will County

Dixon's Outlier Test

MW-06 (bg)



n = 10

Statistical outlier is drawn as solid.
Testing for 1 low outlier.
Mean = 5.985.
Std. Dev. = 4.284.
-1.171: c = 0.6295
tabl = 0.477.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9402
Critical = 0.859 (after natural log transformation)
The distribution, after removal of suspect value, was found to be lognormal.

Constituent: Turbidity   Analysis Run 10/7/2021 11:32 AM

Will County Generating Station   Client: NRG   Data: Will County

Seasonality Will County 2S3S All Wells

Will County Generating Station   Client: NRG   Data: Will County   Printed 8/6/2021, 4:46 PM

Constituent	Well	Sig.	K.-W.	Chi-Sq.	df	N	Alpha
Antimony (mg/L)	MW-05 (bg)	No	0	0	0	11	0.05
Antimony (mg/L)	MW-06 (bg)	No	0	0	0	11	0.05
Antimony (mg/L)	MW-10	No	0	0	0	11	0.05
Antimony (mg/L)	MW-11	No	0	0	0	11	0.05
Antimony (mg/L)	MW-12	No	0	0	0	11	0.05
Arsenic (mg/L)	MW-05 (bg)	No	0	0	0	11	0.05
Arsenic (mg/L)	MW-06 (bg)	No	0	0	0	11	0.05
Arsenic (mg/L)	MW-10	No	0	0	0	11	0.05
Arsenic (mg/L)	MW-11	No	0	0	0	11	0.05
Arsenic (mg/L)	MW-12	No	0	0	0	11	0.05
Barium (mg/L)	MW-05 (bg)	No	0	0	0	11	0.05
Barium (mg/L)	MW-06 (bg)	No	0	0	0	11	0.05
Barium (mg/L)	MW-10	No	0	0	0	11	0.05
Barium (mg/L)	MW-11	No	0	0	0	11	0.05
Barium (mg/L)	MW-12	No	0	0	0	11	0.05
Beryllium (mg/L)	MW-05 (bg)	No	0	0	0	11	0.05
Beryllium (mg/L)	MW-06 (bg)	No	0	0	0	11	0.05
Beryllium (mg/L)	MW-10	No	0	0	0	11	0.05
Beryllium (mg/L)	MW-11	No	0	0	0	11	0.05
Beryllium (mg/L)	MW-12	No	0	0	0	11	0.05
Boron (mg/L)	MW-05 (bg)	No	0	0	0	17	0.05
Boron (mg/L)	MW-06 (bg)	No	0	0	0	18	0.05
Boron (mg/L)	MW-10	No	0	0	0	17	0.05
Boron (mg/L)	MW-11	No	0	0	0	17	0.05
Boron (mg/L)	MW-12	No	0	0	0	17	0.05
Cadmium (mg/L)	MW-05 (bg)	No	0	0	0	11	0.05
Cadmium (mg/L)	MW-06 (bg)	No	0	0	0	11	0.05
Cadmium (mg/L)	MW-10	No	0	0	0	11	0.05
Cadmium (mg/L)	MW-11	No	0	0	0	11	0.05
Cadmium (mg/L)	MW-12	No	0	0	0	11	0.05
Calcium (mg/L)	MW-05 (bg)	No	0	0	0	17	0.05
Calcium (mg/L)	MW-06 (bg)	No	0	0	0	17	0.05
Calcium (mg/L)	MW-10	No	0	0	0	17	0.05
Calcium (mg/L)	MW-11	No	0	0	0	17	0.05
Calcium (mg/L)	MW-12	No	0	0	0	17	0.05
Chloride (mg/L)	MW-05 (bg)	No	0	0	0	17	0.05
Chloride (mg/L)	MW-06 (bg)	No	0	0	0	17	0.05
Chloride (mg/L)	MW-10	No	0	0	0	17	0.05
Chloride (mg/L)	MW-11	No	0	0	0	17	0.05
Chloride (mg/L)	MW-12	No	0	0	0	17	0.05
Chromium (mg/L)	MW-05 (bg)	No	0	0	0	11	0.05
Chromium (mg/L)	MW-06 (bg)	No	0	0	0	11	0.05
Chromium (mg/L)	MW-10	No	0	0	0	11	0.05
Chromium (mg/L)	MW-11	No	0	0	0	11	0.05
Chromium (mg/L)	MW-12	No	0	0	0	11	0.05
Cobalt (mg/L)	MW-05 (bg)	No	0	0	0	11	0.05
Cobalt (mg/L)	MW-06 (bg)	No	0	0	0	11	0.05
Cobalt (mg/L)	MW-10	No	0	0	0	11	0.05
Cobalt (mg/L)	MW-11	No	0	0	0	11	0.05
Cobalt (mg/L)	MW-12	No	0	0	0	11	0.05

Seasonality Will County 2S3S All Wells

Will County Generating Station Client: NRG Data: Will County Printed 8/6/2021, 4:46 PM

Constituent	Well	Sig.	K.-W.	Chi-Sq.	df	N	Alpha
Combined Radium 226 + 228 (pCi/L)	MW-05 (bg)	No	0	0	0	10	0.05
Combined Radium 226 + 228 (pCi/L)	MW-06 (bg)	No	0	0	0	10	0.05
Combined Radium 226 + 228 (pCi/L)	MW-10	No	0	0	0	10	0.05
Combined Radium 226 + 228 (pCi/L)	MW-11	No	0	0	0	10	0.05
Combined Radium 226 + 228 (pCi/L)	MW-12	No	0	0	0	10	0.05
Fluoride (mg/L)	MW-05 (bg)	No	0	0	0	17	0.05
Fluoride (mg/L)	MW-06 (bg)	No	0	0	0	17	0.05
Fluoride (mg/L)	MW-10	No	0	0	0	17	0.05
Fluoride (mg/L)	MW-11	No	0	0	0	17	0.05
Fluoride (mg/L)	MW-12	No	0	0	0	17	0.05
Lead (mg/L)	MW-05 (bg)	No	0	0	0	11	0.05
Lead (mg/L)	MW-06 (bg)	No	0	0	0	11	0.05
Lead (mg/L)	MW-10	No	0	0	0	11	0.05
Lead (mg/L)	MW-11	No	0	0	0	11	0.05
Lead (mg/L)	MW-12	No	0	0	0	11	0.05
Lithium (mg/L)	MW-05 (bg)	No	0	0	0	11	0.05
Lithium (mg/L)	MW-06 (bg)	No	0	0	0	11	0.05
Lithium (mg/L)	MW-10	No	0	0	0	11	0.05
Lithium (mg/L)	MW-11	No	0	0	0	11	0.05
Lithium (mg/L)	MW-12	No	0	0	0	11	0.05
Mercury (mg/L)	MW-05 (bg)	No	0	0	0	11	0.05
Mercury (mg/L)	MW-06 (bg)	No	0	0	0	11	0.05
Mercury (mg/L)	MW-10	No	0	0	0	11	0.05
Mercury (mg/L)	MW-11	No	0	0	0	11	0.05
Mercury (mg/L)	MW-12	No	0	0	0	11	0.05
Molybdenum (mg/L)	MW-05 (bg)	No	0	0	0	11	0.05
Molybdenum (mg/L)	MW-06 (bg)	No	0	0	0	11	0.05
Molybdenum (mg/L)	MW-10	No	0	0	0	11	0.05
Molybdenum (mg/L)	MW-11	No	0	0	0	11	0.05
Molybdenum (mg/L)	MW-12	No	0	0	0	11	0.05
pH (n/a)	MW-05 (bg)	No	0	0	0	17	0.05
pH (n/a)	MW-06 (bg)	No	0	0	0	18	0.05
pH (n/a)	MW-10	No	0	0	0	17	0.05
pH (n/a)	MW-11	No	0	0	0	17	0.05
pH (n/a)	MW-12	No	0	0	0	17	0.05
Selenium (mg/L)	MW-05 (bg)	No	0	0	0	11	0.05
Selenium (mg/L)	MW-06 (bg)	No	0	0	0	11	0.05
Selenium (mg/L)	MW-10	No	0	0	0	11	0.05
Selenium (mg/L)	MW-11	No	0	0	0	11	0.05
Selenium (mg/L)	MW-12	No	0	0	0	11	0.05
Sulfate (mg/L)	MW-05 (bg)	No	0	0	0	17	0.05
Sulfate (mg/L)	MW-06 (bg)	No	0	0	0	18	0.05
Sulfate (mg/L)	MW-10	No	0	0	0	17	0.05
Sulfate (mg/L)	MW-11	No	0	0	0	17	0.05
Sulfate (mg/L)	MW-12	No	0	0	0	17	0.05
Thallium (mg/L)	MW-05 (bg)	No	0	0	0	11	0.05
Thallium (mg/L)	MW-06 (bg)	No	0	0	0	11	0.05
Thallium (mg/L)	MW-10	No	0	0	0	11	0.05
Thallium (mg/L)	MW-11	No	0	0	0	11	0.05
Thallium (mg/L)	MW-12	No	0	0	0	11	0.05

Seasonality Will County 2S3S All Wells

Will County Generating Station   Client: NRG   Data: Will County   Printed 8/6/2021, 4:46 PM

Constituent	Well	Sig.	K.-W.	Chi-Sq.	df	N	Alpha
Total Dissolved Solids (mg/L)	MW-05 (bg)	No	0	0	0	17	0.05
Total Dissolved Solids (mg/L)	MW-06 (bg)	No	0	0	0	18	0.05
Total Dissolved Solids (mg/L)	MW-10	No	0	0	0	17	0.05
Total Dissolved Solids (mg/L)	MW-11	No	0	0	0	17	0.05
Total Dissolved Solids (mg/L)	MW-12	No	0	0	0	17	0.05

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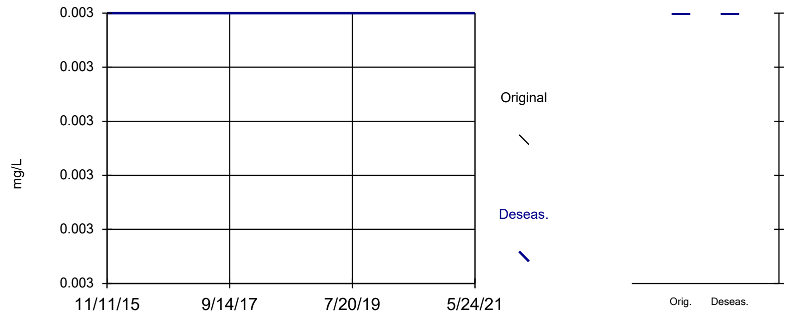
Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Antimony Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

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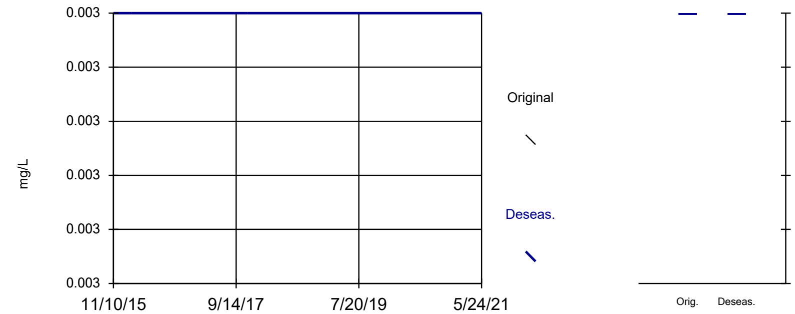
Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Antimony Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

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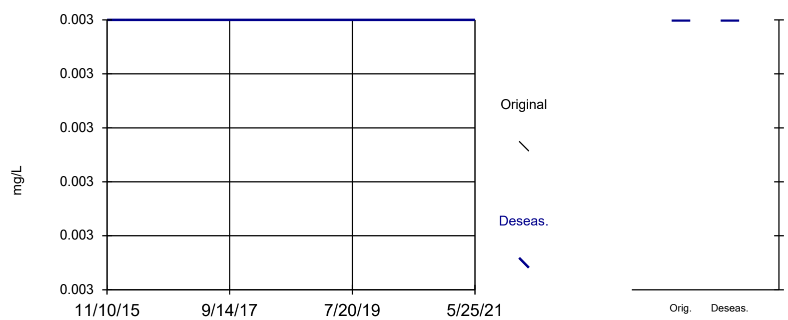
Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

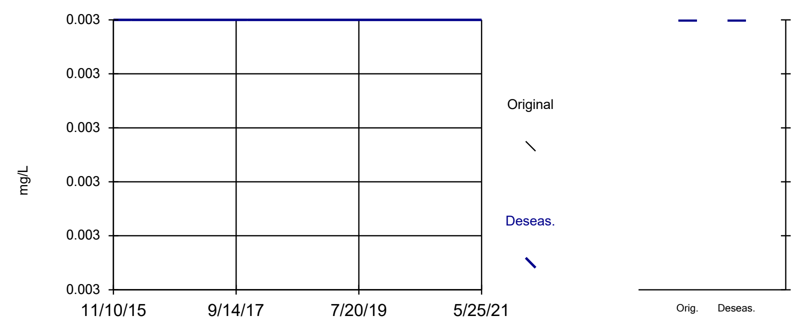


Constituent: Antimony Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

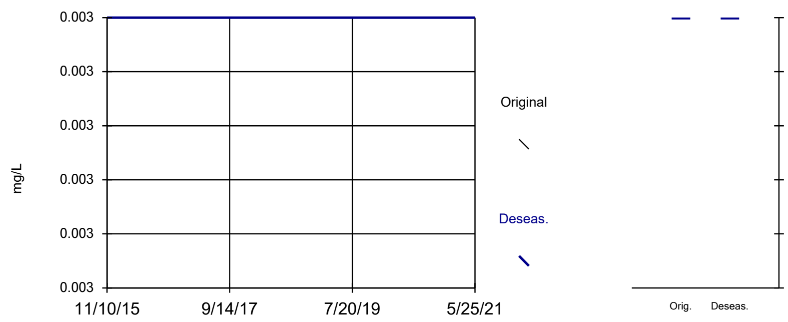


Constituent: Antimony Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

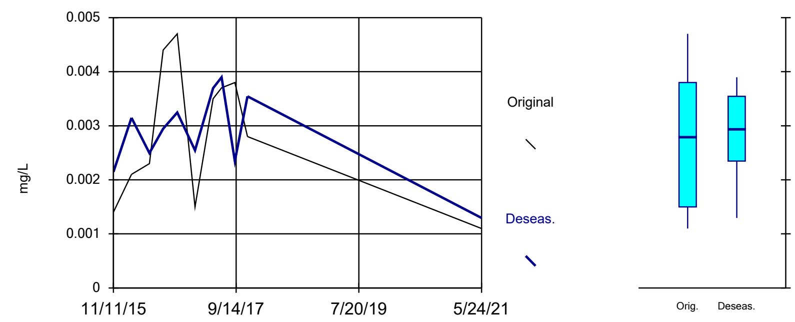


Constituent: Antimony Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

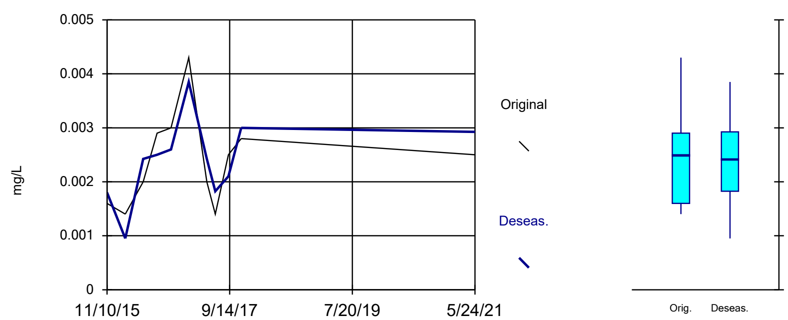


Constituent: Arsenic Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

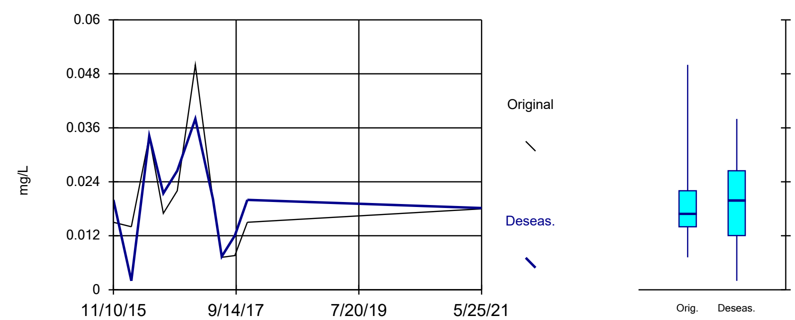


Constituent: Arsenic Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

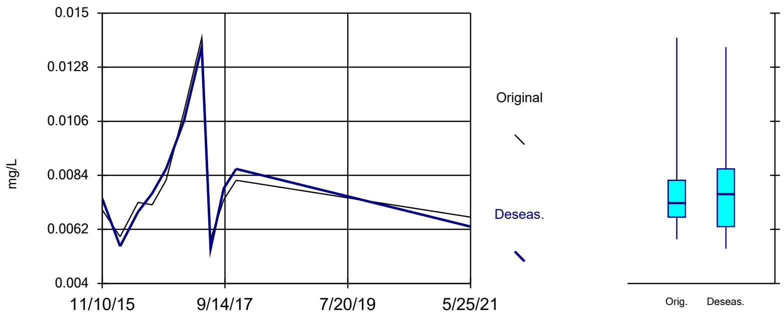


Constituent: Arsenic Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



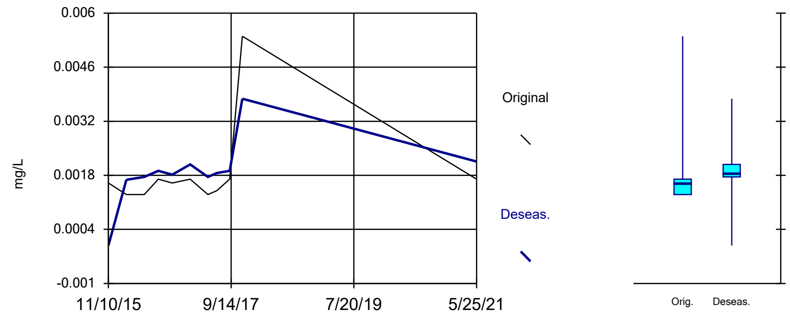
Constituent: Arsenic Analysis Run 8/6/2021 4:39 PM

Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



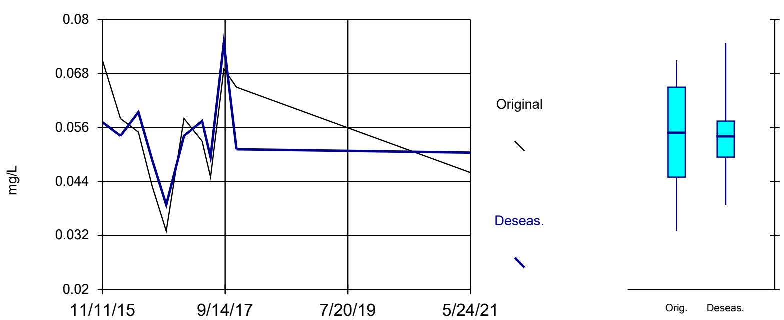
Constituent: Arsenic Analysis Run 8/6/2021 4:39 PM

Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



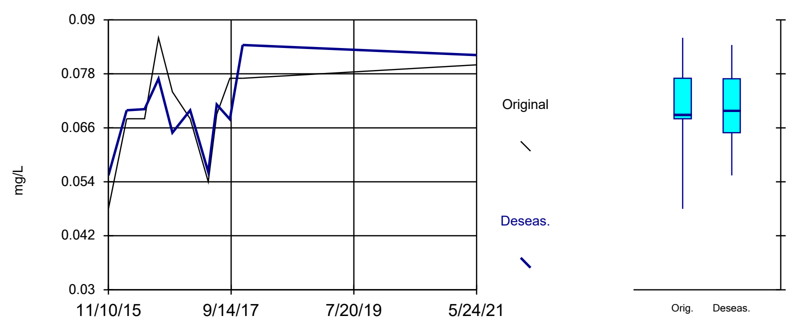
Constituent: Barium Analysis Run 8/6/2021 4:39 PM

Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



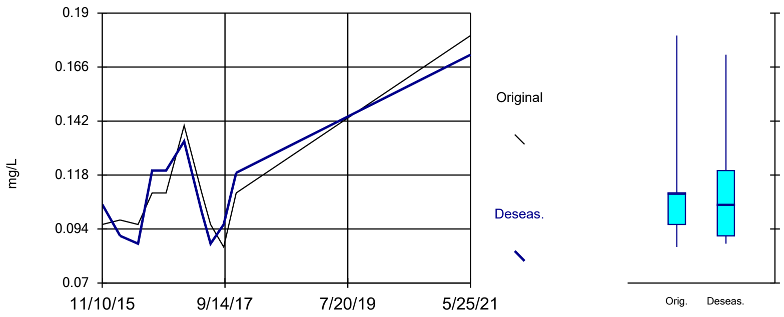
Constituent: Barium Analysis Run 8/6/2021 4:39 PM

Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

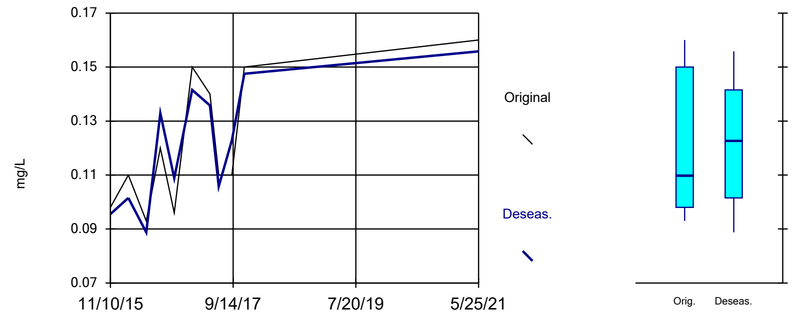


Constituent: Barium Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

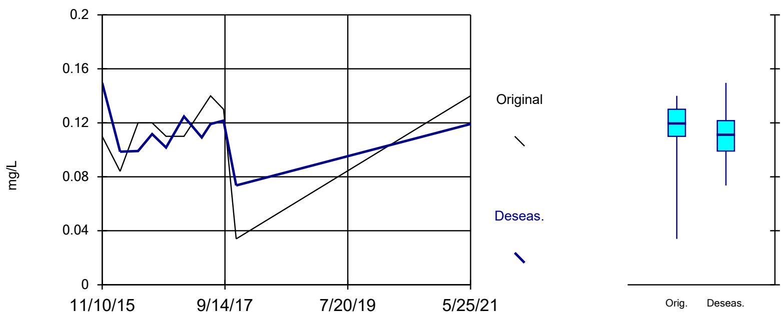


Constituent: Barium Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

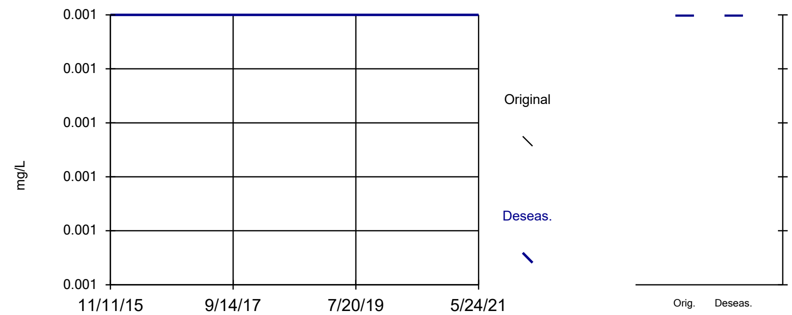


Constituent: Barium Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

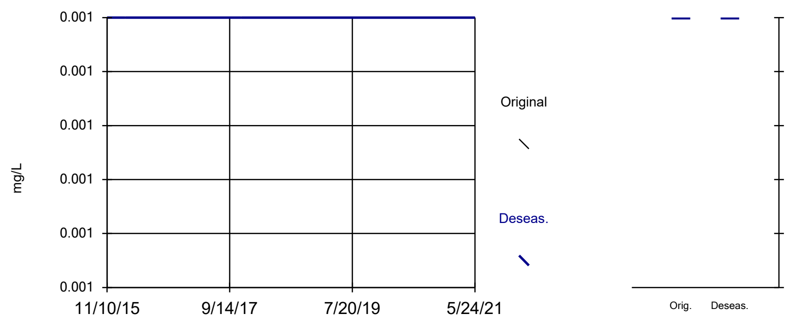
Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Beryllium Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

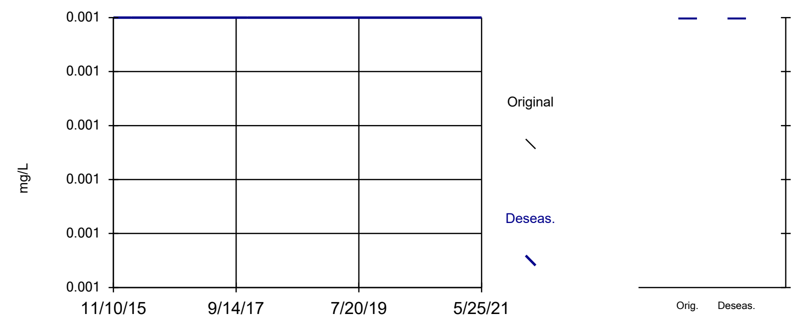


Constituent: Beryllium Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

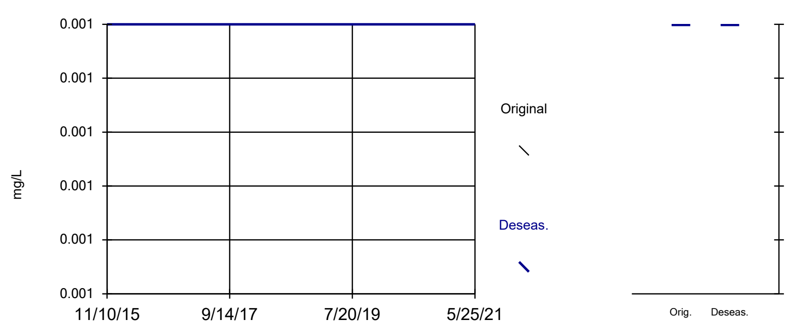


Constituent: Beryllium Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

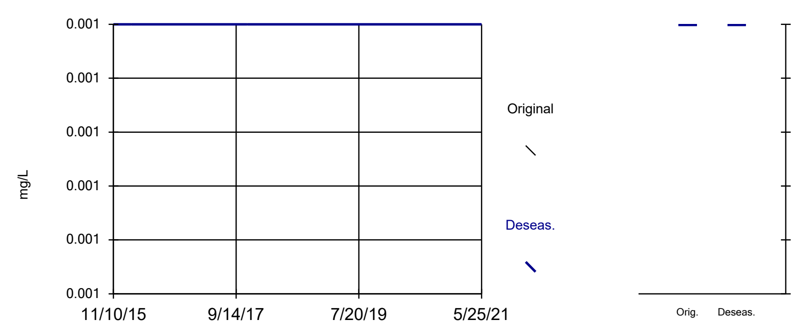


Constituent: Beryllium Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

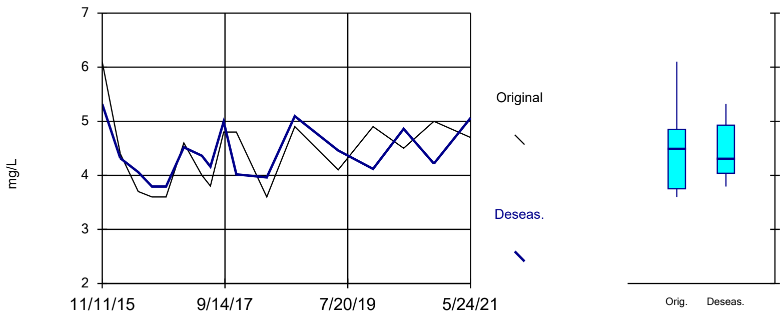


Constituent: Beryllium Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

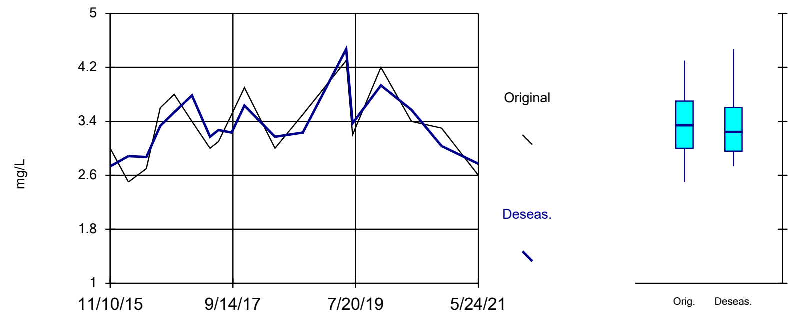


Constituent: Boron Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

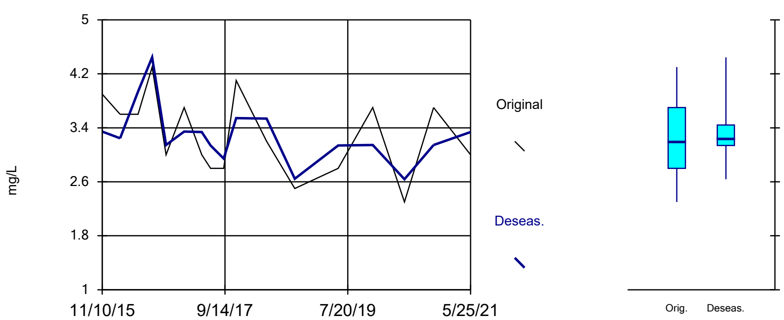


Constituent: Boron Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

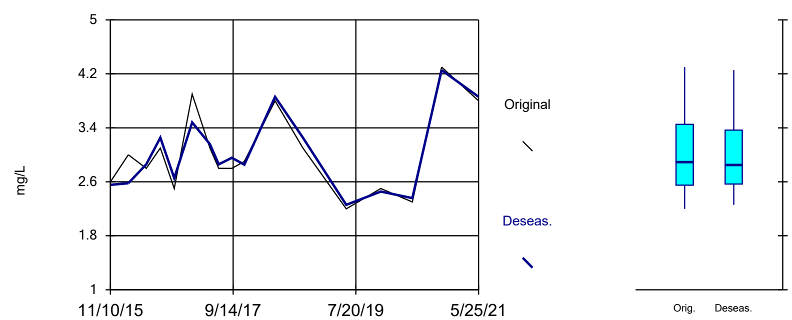


Constituent: Boron Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

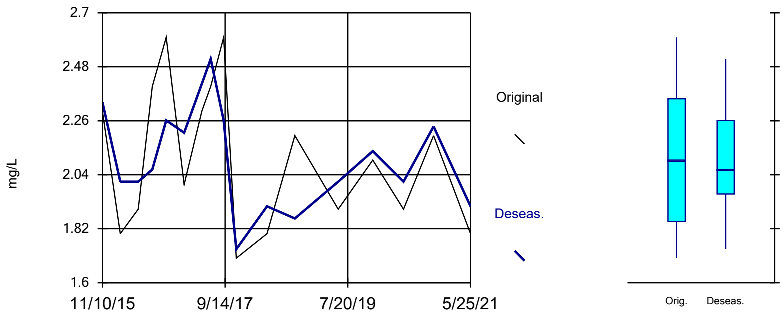
Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Boron Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

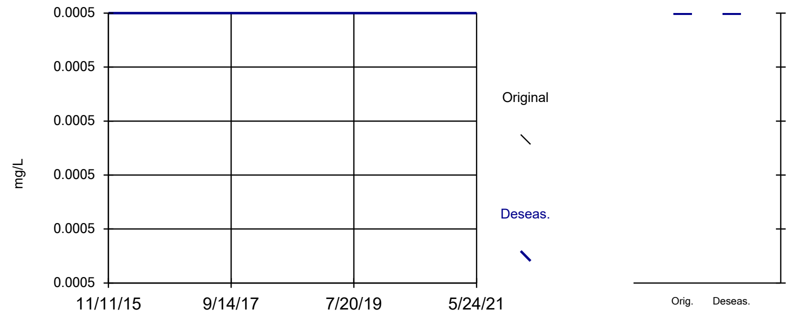


Constituent: Boron Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

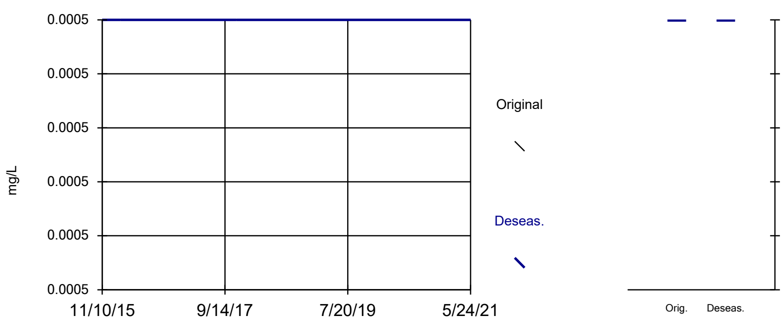


Constituent: Cadmium Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

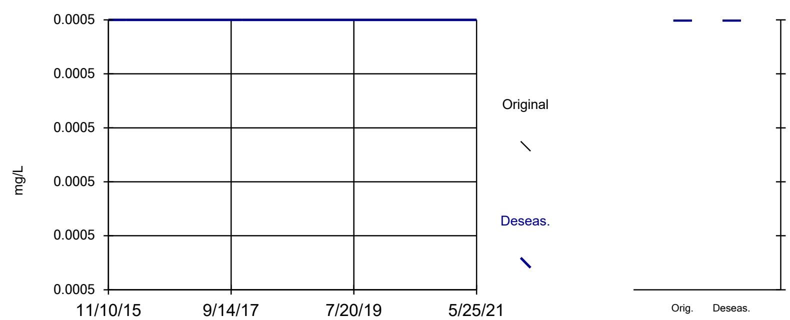


Constituent: Cadmium Analysis Run 8/6/2021 4:39 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

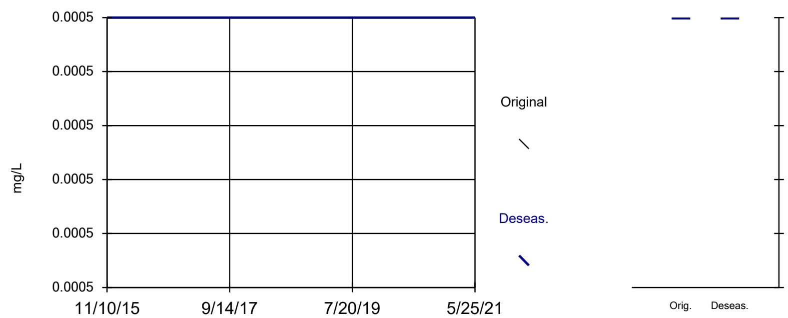


Constituent: Cadmium Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

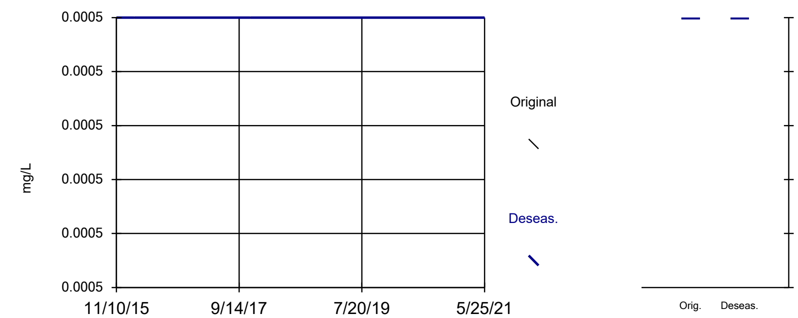


Constituent: Cadmium Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

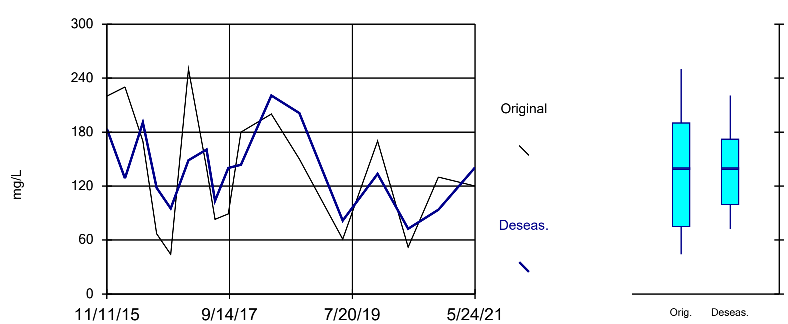


Constituent: Cadmium Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

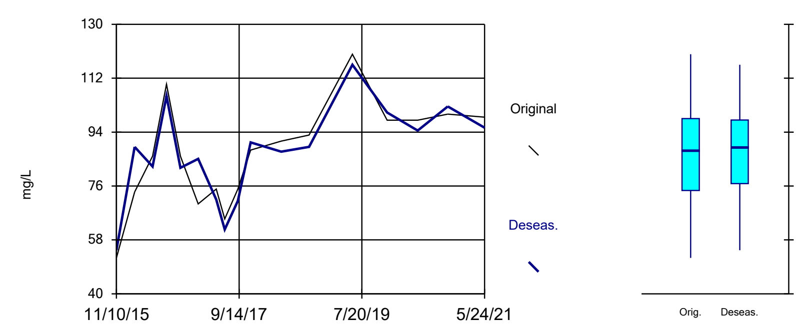


Constituent: Calcium Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

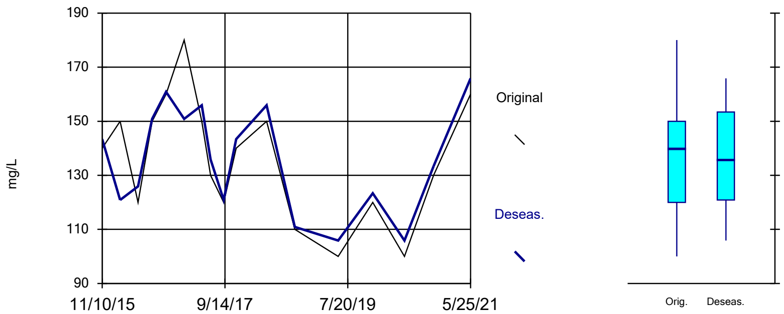


Constituent: Calcium Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



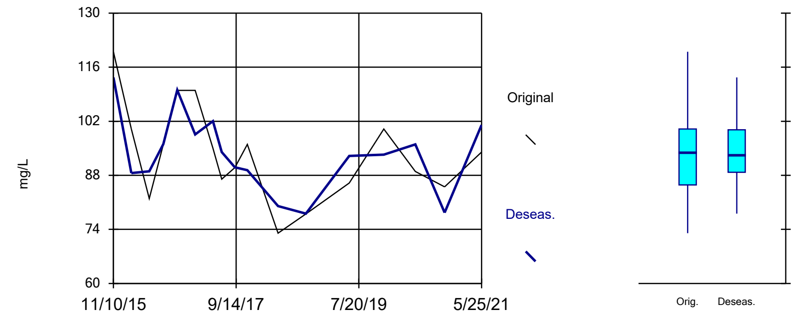
Constituent: Calcium Analysis Run 8/6/2021 4:40 PM

Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



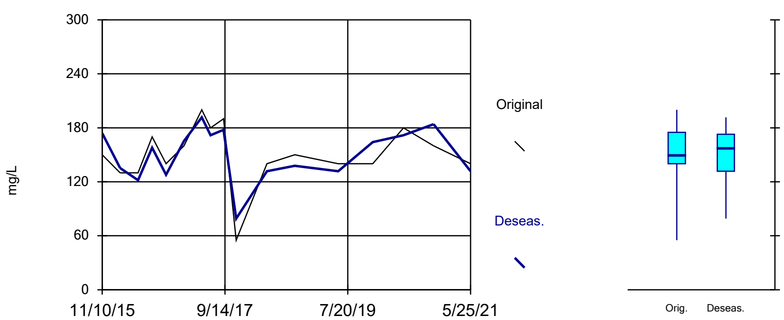
Constituent: Calcium Analysis Run 8/6/2021 4:40 PM

Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



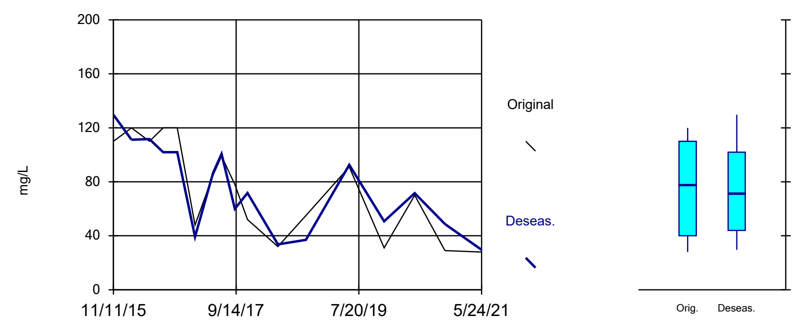
Constituent: Calcium Analysis Run 8/6/2021 4:40 PM

Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



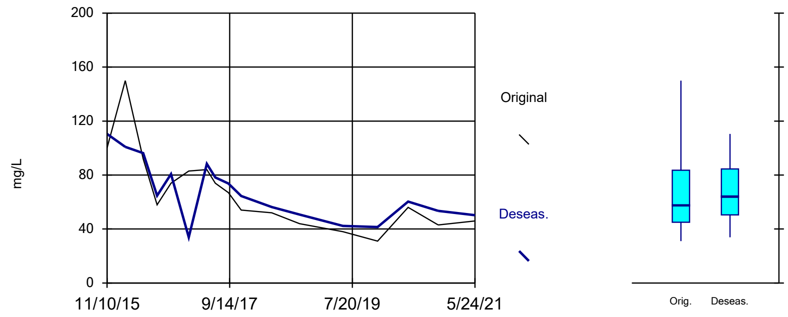
Constituent: Chloride Analysis Run 8/6/2021 4:40 PM

Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

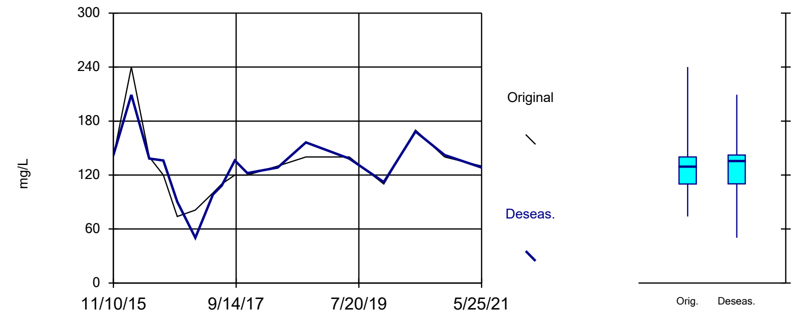


Constituent: Chloride Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

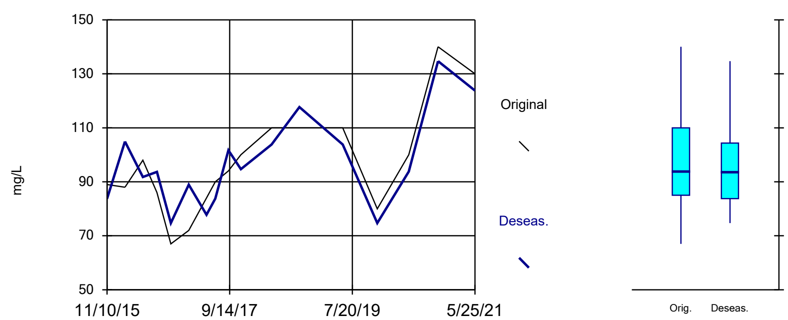


Constituent: Chloride Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

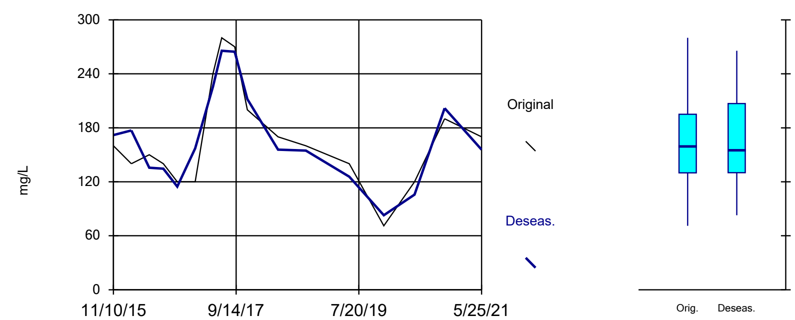


Constituent: Chloride Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

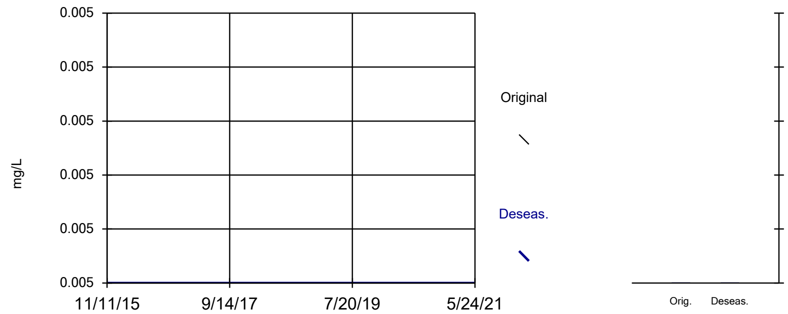


Constituent: Chloride Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

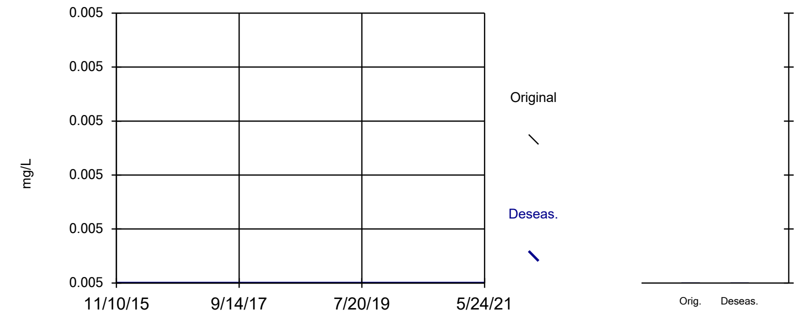


Constituent: Chromium Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

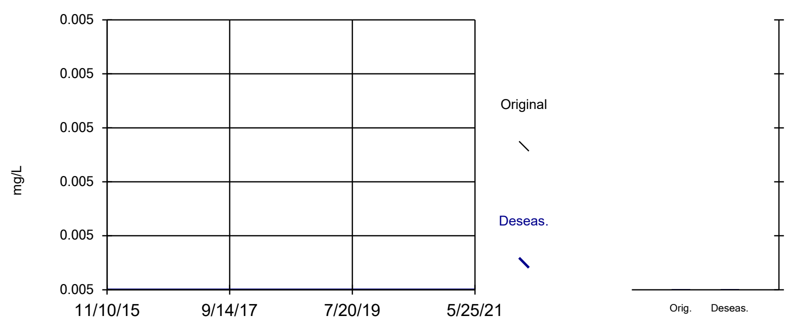


Constituent: Chromium Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

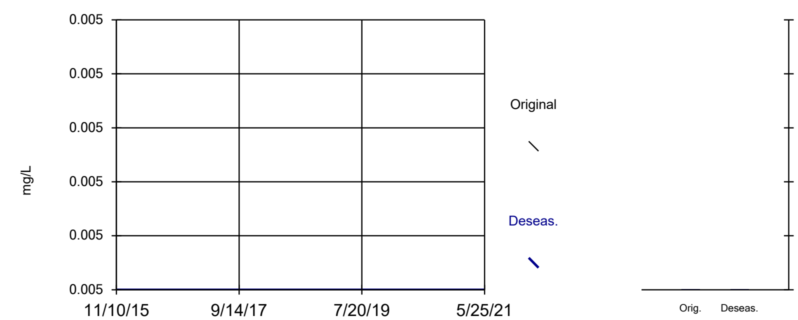


Constituent: Chromium Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

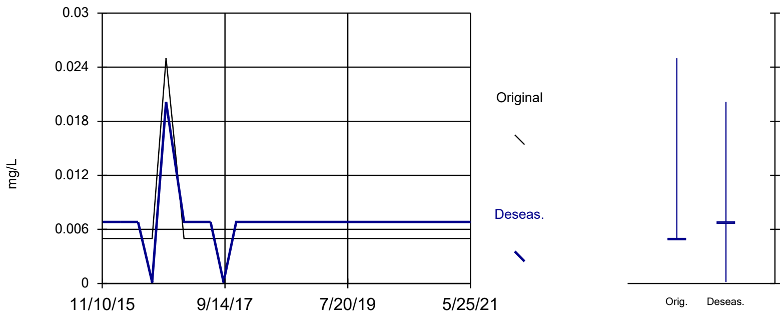


Constituent: Chromium Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

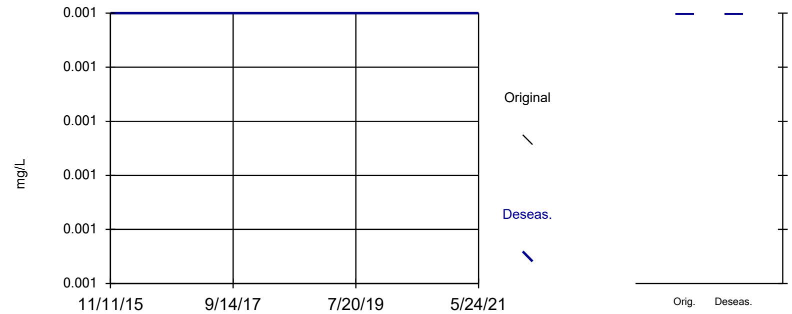


Constituent: Chromium Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

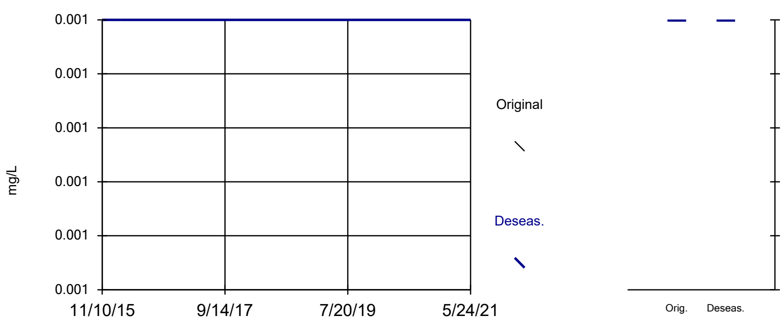


Constituent: Cobalt Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

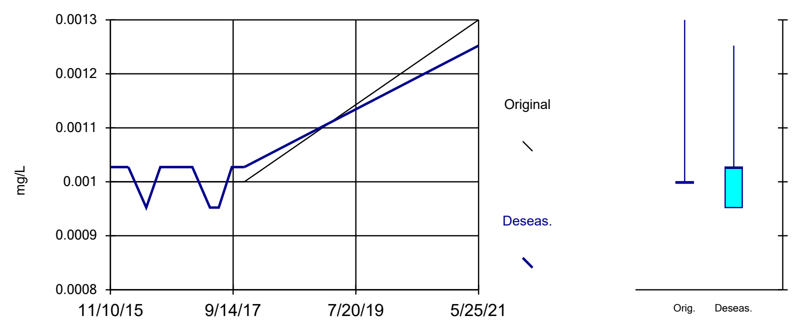


Constituent: Cobalt Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

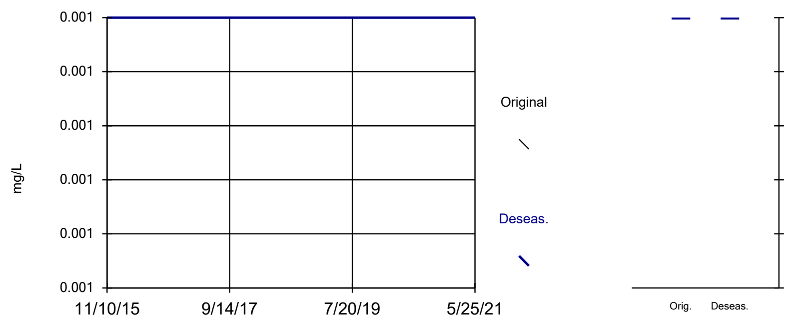


Constituent: Cobalt Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

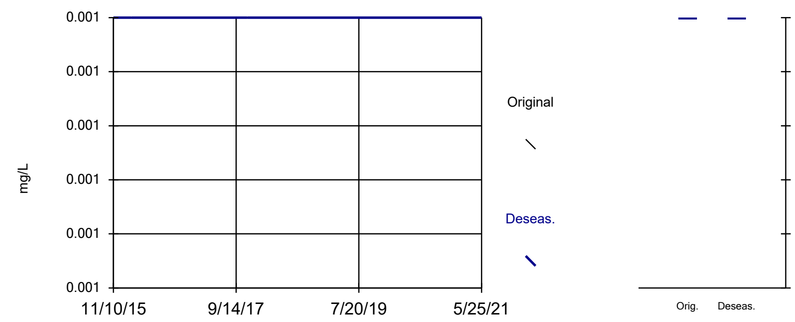


Constituent: Cobalt   Analysis Run 8/6/2021 4:40 PM
Will County Generating Station   Client: NRG   Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

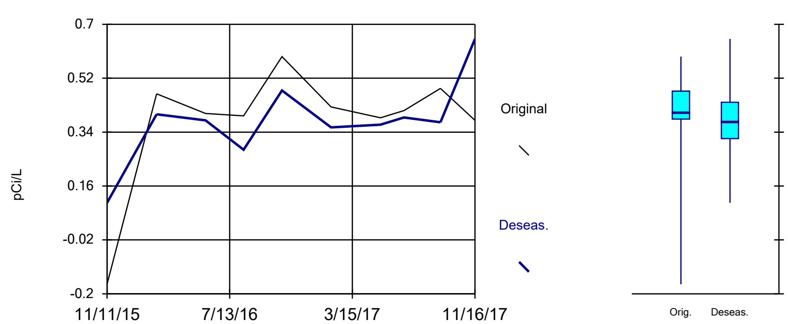


Constituent: Cobalt   Analysis Run 8/6/2021 4:40 PM
Will County Generating Station   Client: NRG   Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

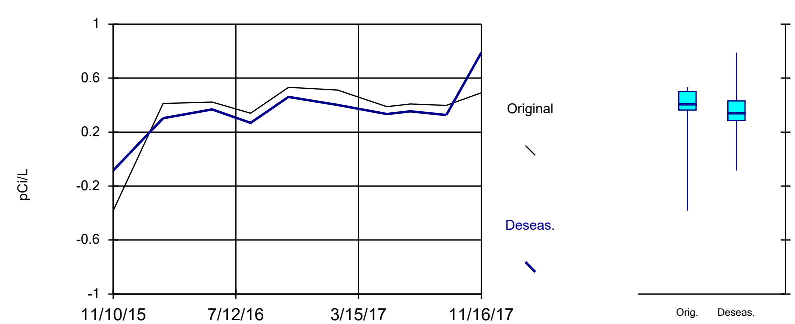


Constituent: Combined Radium 226 + 228   Analysis Run 8/6/2021 4:40 PM
Will County Generating Station   Client: NRG   Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

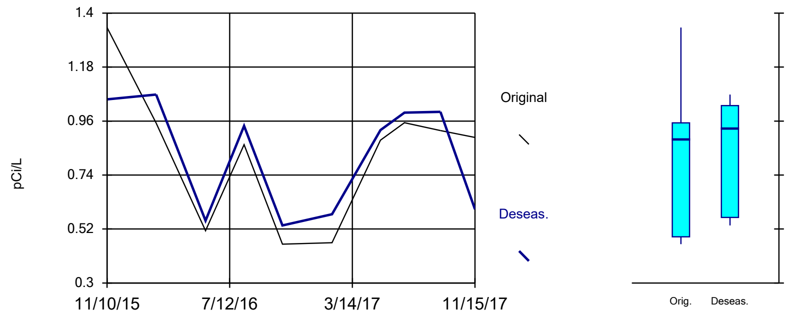


Constituent: Combined Radium 226 + 228   Analysis Run 8/6/2021 4:40 PM
Will County Generating Station   Client: NRG   Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

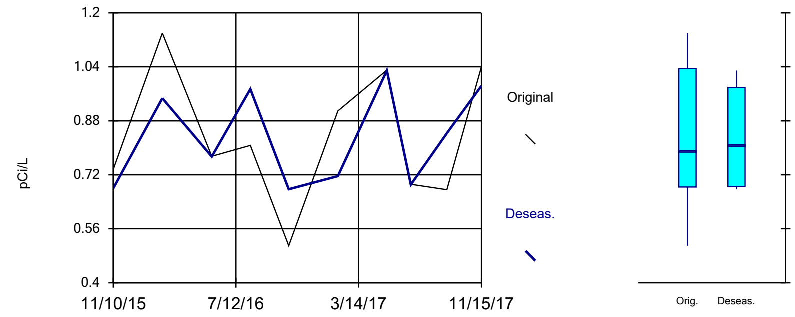


Constituent: Combined Radium 226 + 228 Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

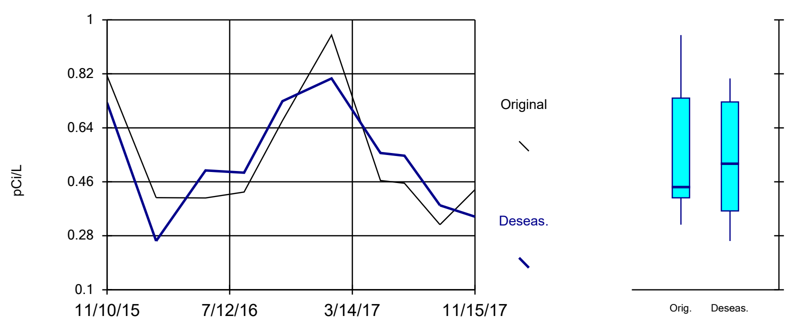


Constituent: Combined Radium 226 + 228 Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

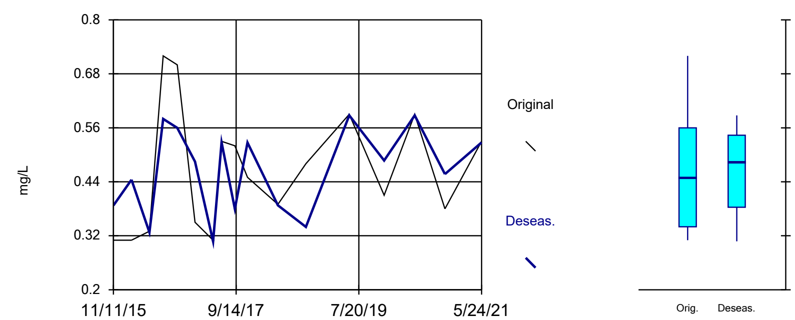


Constituent: Combined Radium 226 + 228 Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

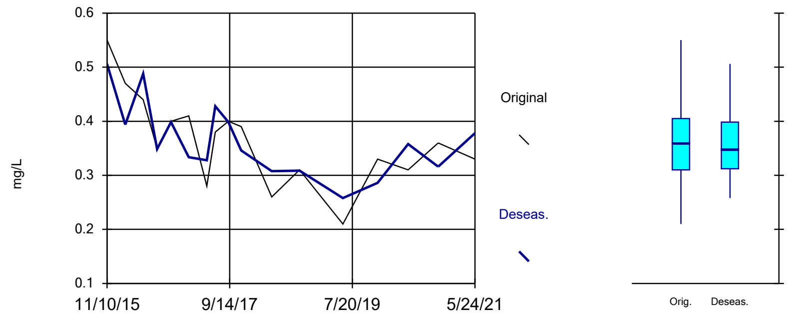


Constituent: Fluoride Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



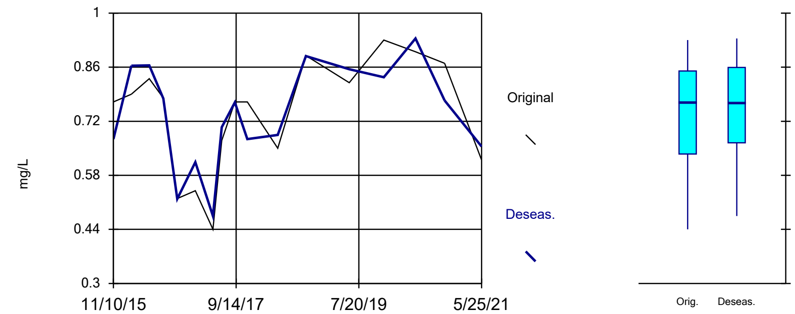
Constituent: Fluoride   Analysis Run 8/6/2021 4:40 PM

Will County Generating Station   Client: NRG   Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



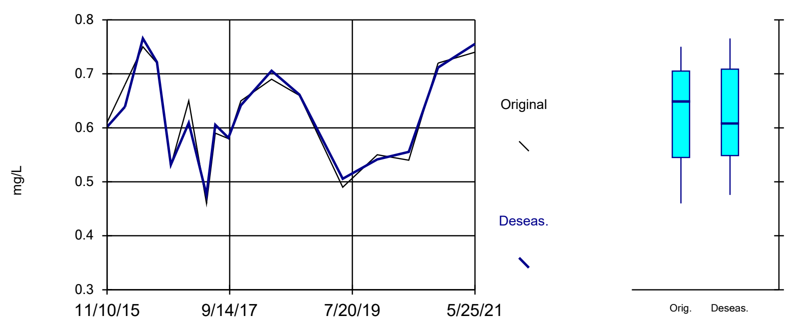
Constituent: Fluoride   Analysis Run 8/6/2021 4:40 PM

Will County Generating Station   Client: NRG   Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



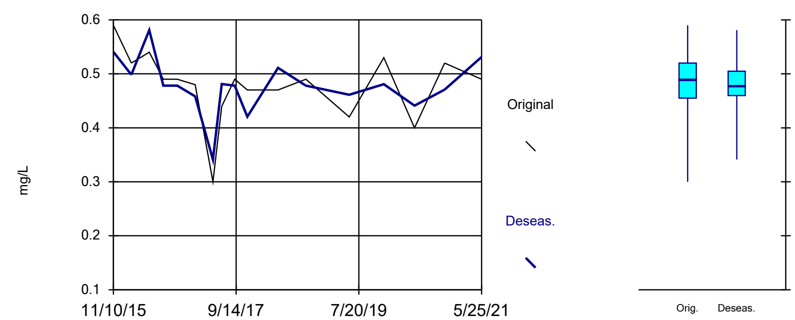
Constituent: Fluoride   Analysis Run 8/6/2021 4:40 PM

Will County Generating Station   Client: NRG   Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



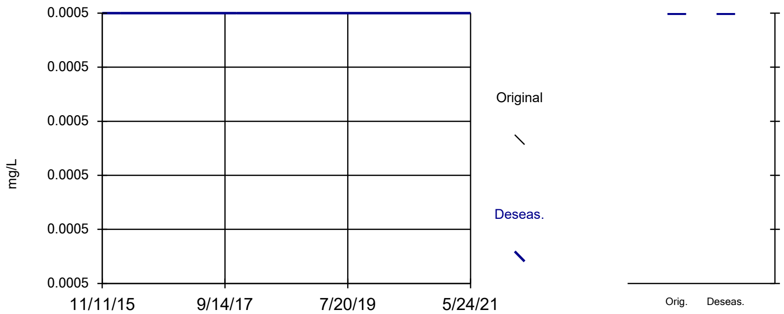
Constituent: Fluoride   Analysis Run 8/6/2021 4:40 PM

Will County Generating Station   Client: NRG   Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

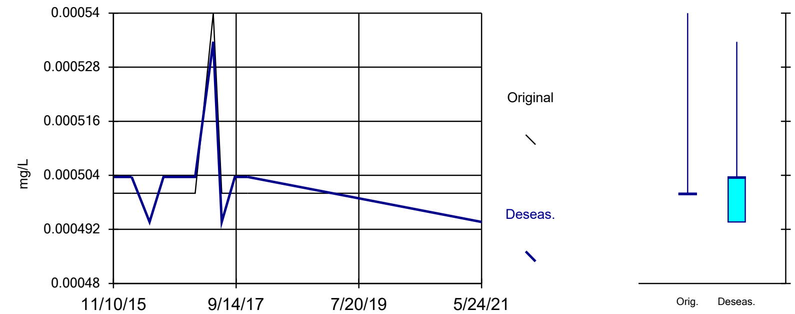


Constituent: Lead Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

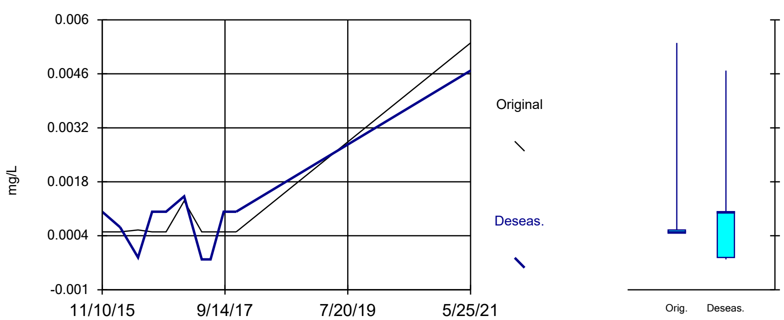


Constituent: Lead Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

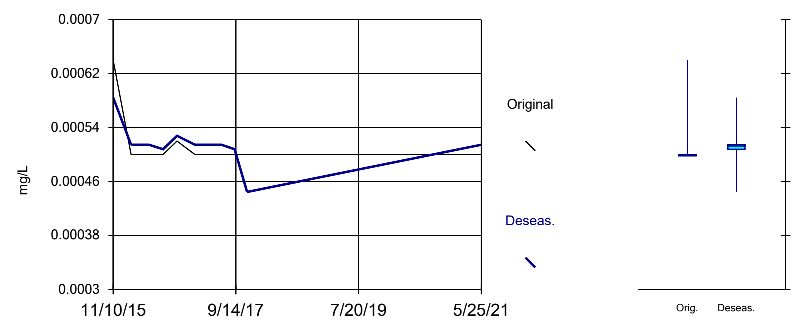


Constituent: Lead Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

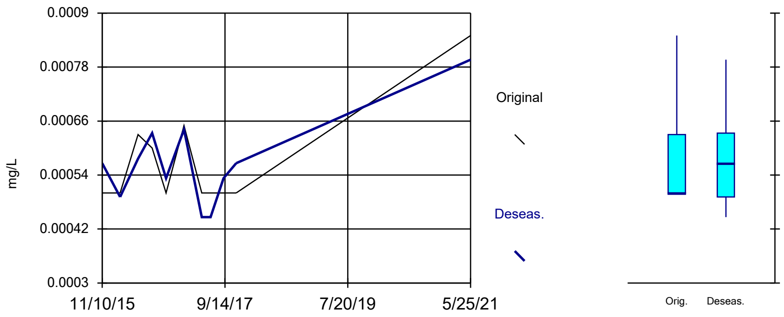
Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Lead Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Seasonality: MW-12

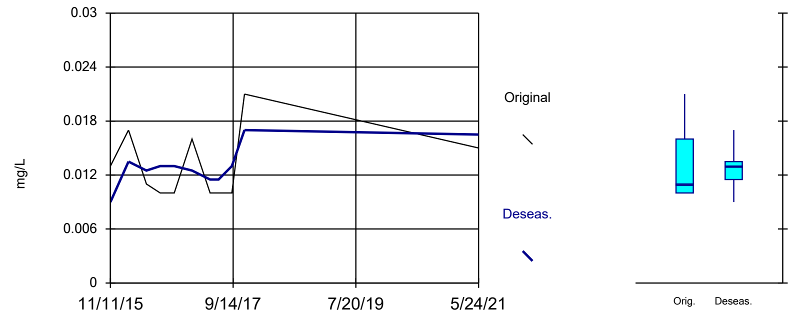
Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Lead Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Seasonality: MW-05 (bg)

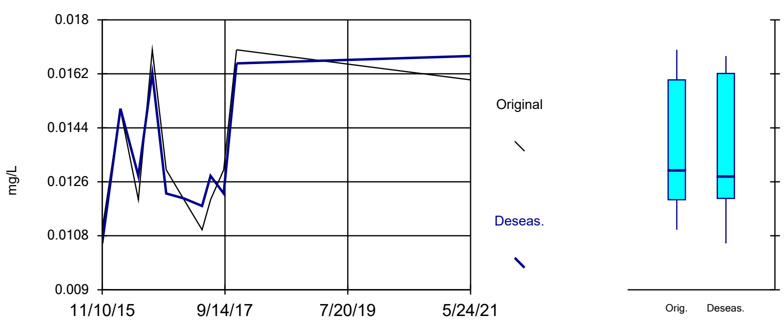
Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Lithium Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Seasonality: MW-06 (bg)

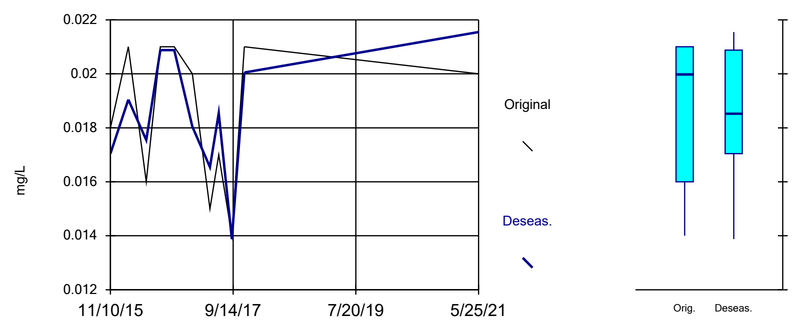
Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Lithium Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

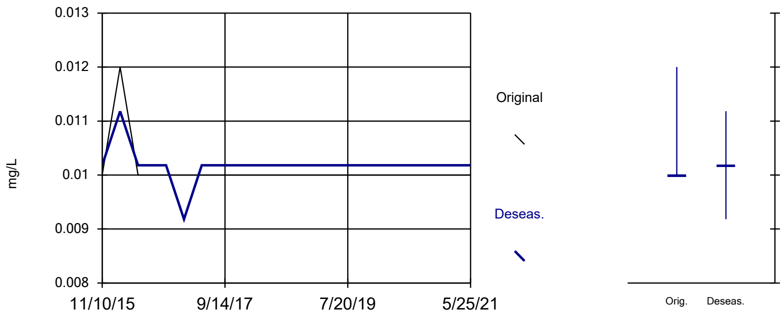


Constituent: Lithium Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

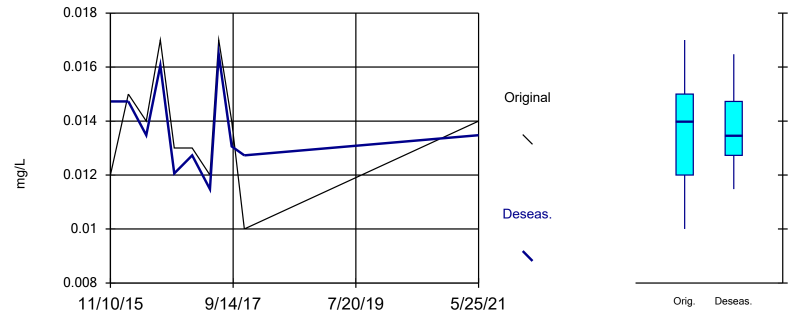


Constituent: Lithium Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

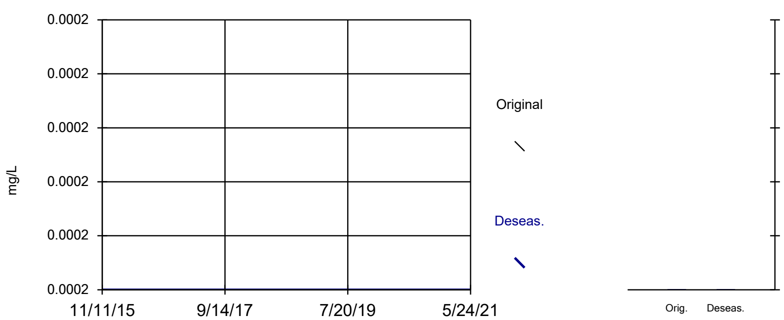


Constituent: Lithium Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

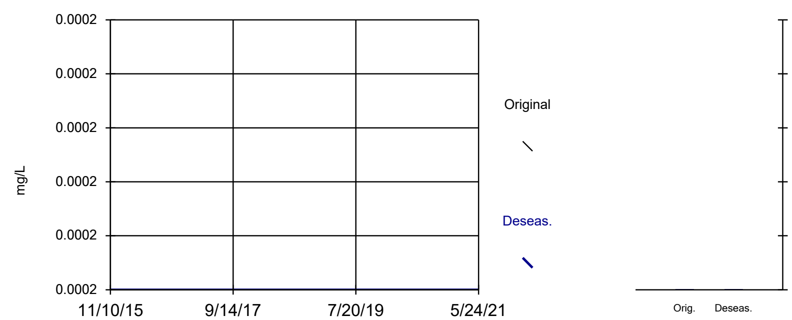


Constituent: Mercury Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

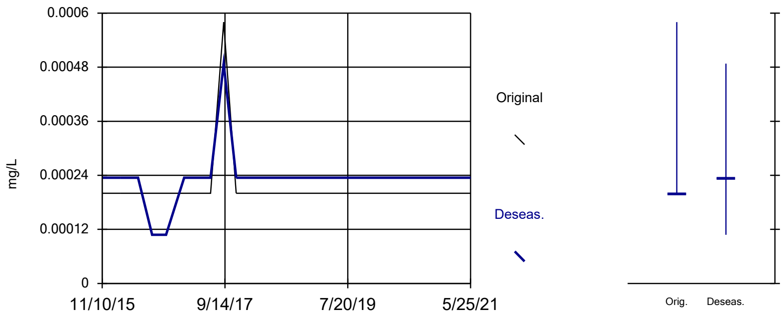
Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Mercury Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

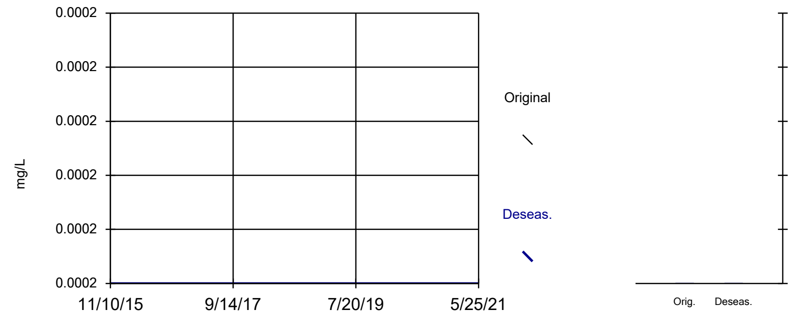


Constituent: Mercury Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

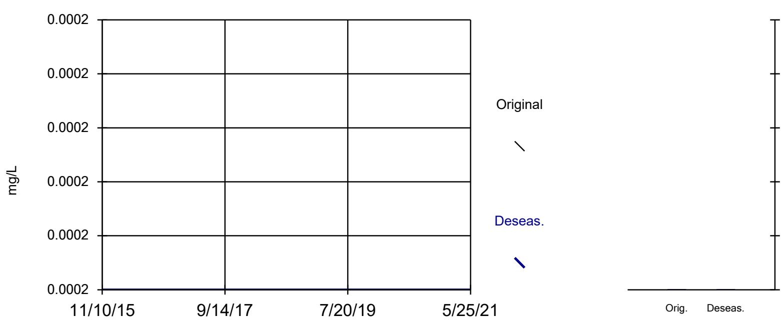


Constituent: Mercury Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

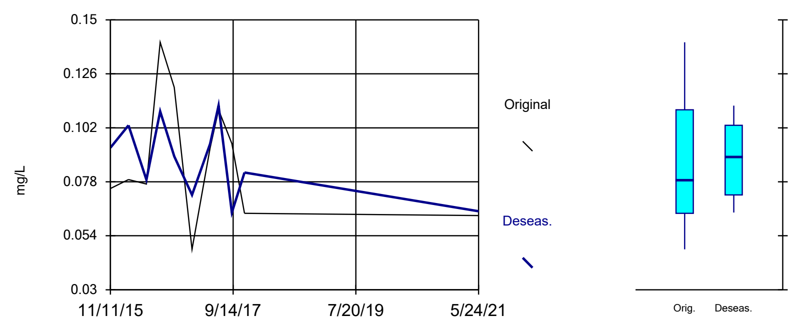


Constituent: Mercury Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

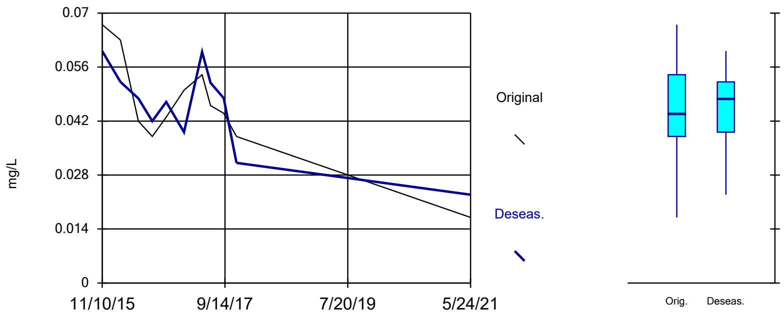


Constituent: Molybdenum Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

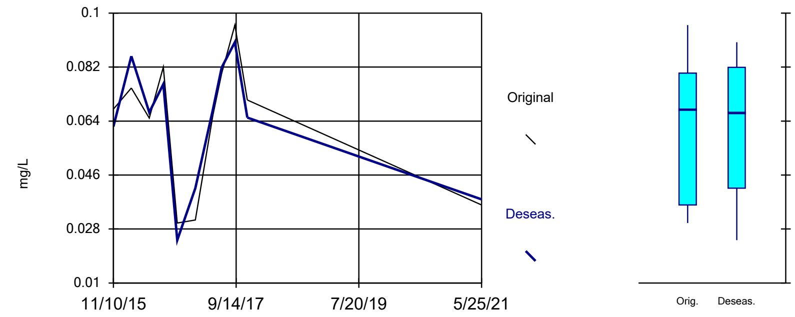


Constituent: Molybdenum Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

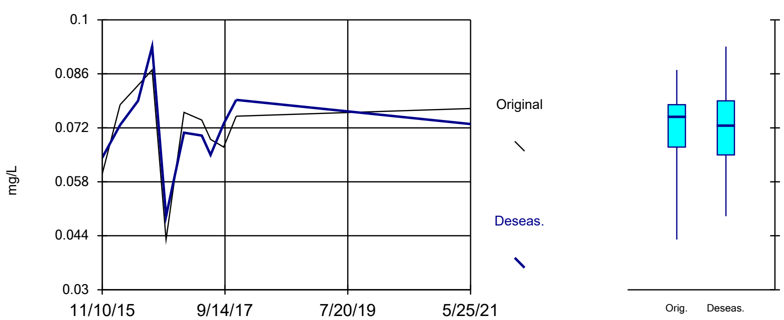


Constituent: Molybdenum Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

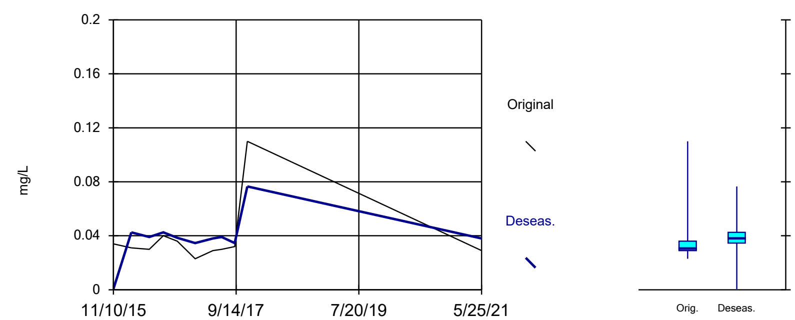


Constituent: Molybdenum Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

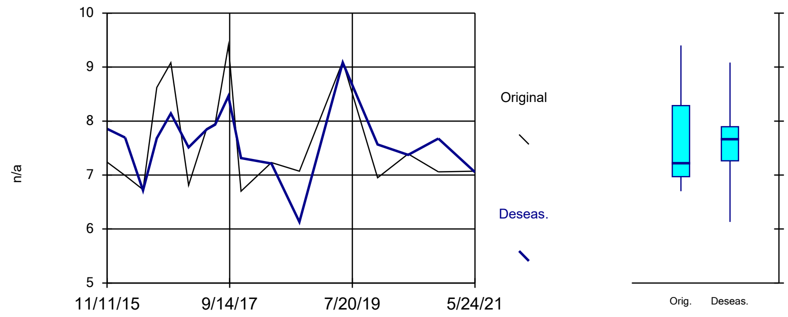


Constituent: Molybdenum Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

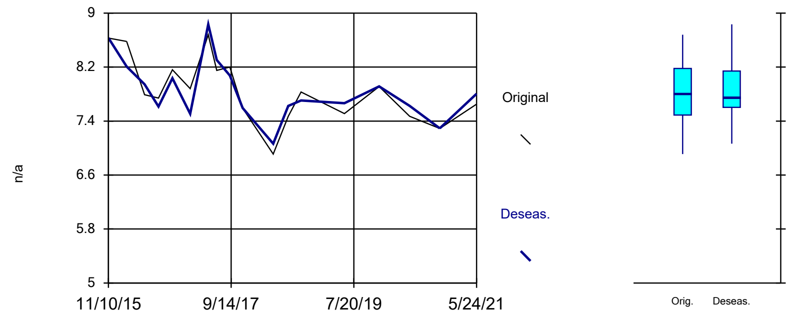


Constituent: pH Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

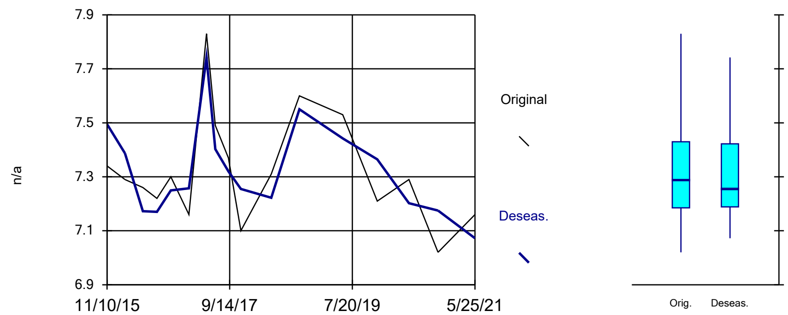


Constituent: pH Analysis Run 8/6/2021 4:40 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

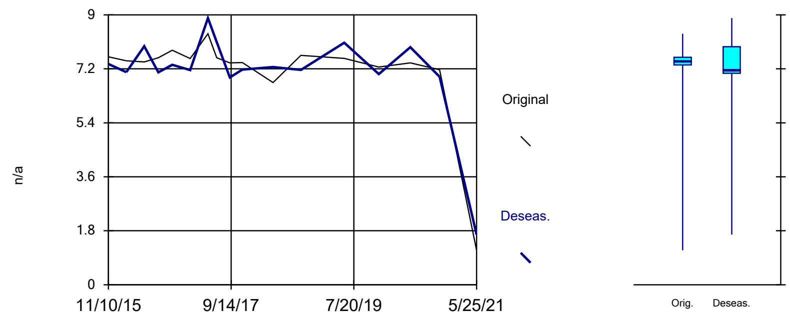


Constituent: pH Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

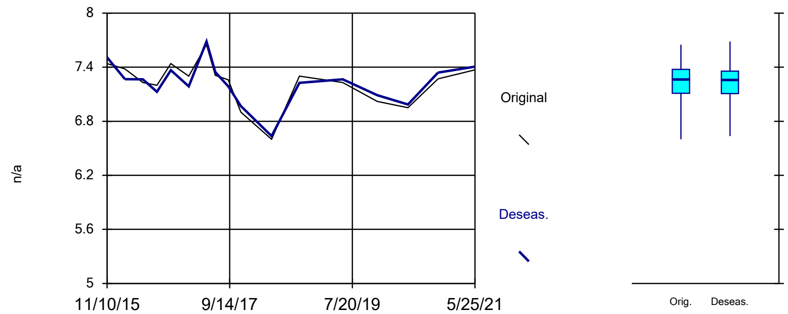


Constituent: pH Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

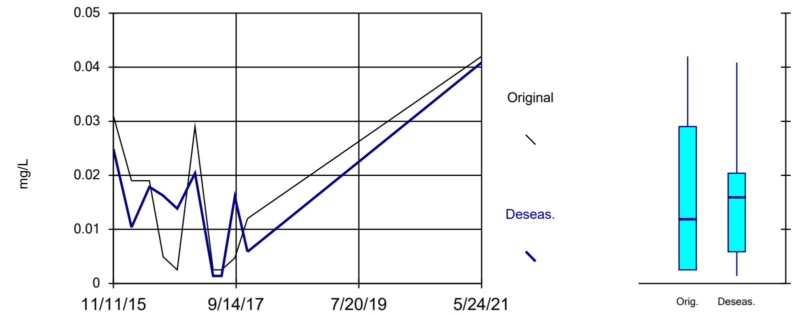


Constituent: pH Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

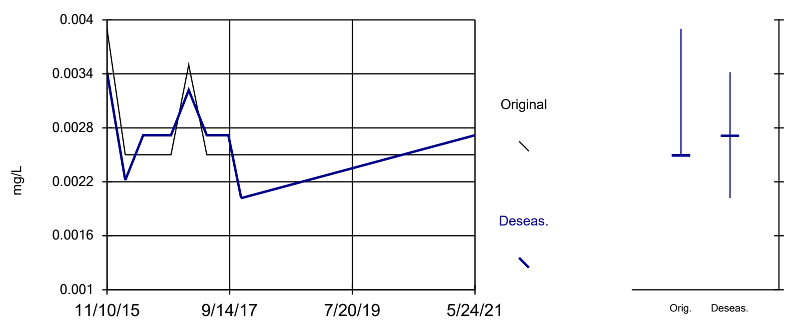


Constituent: Selenium Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

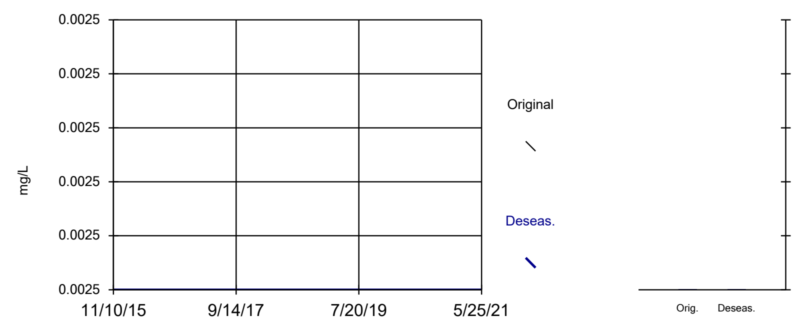


Constituent: Selenium Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Selenium Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

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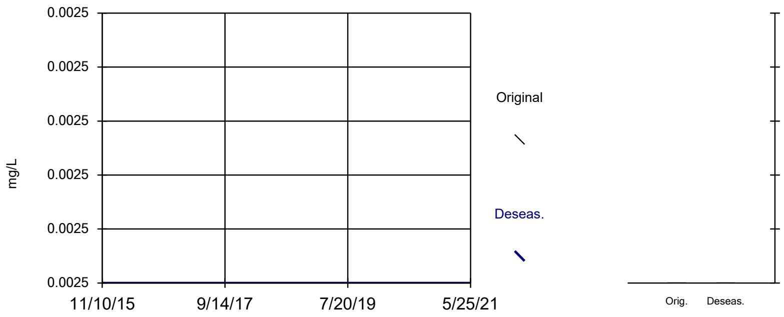
Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Selenium Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

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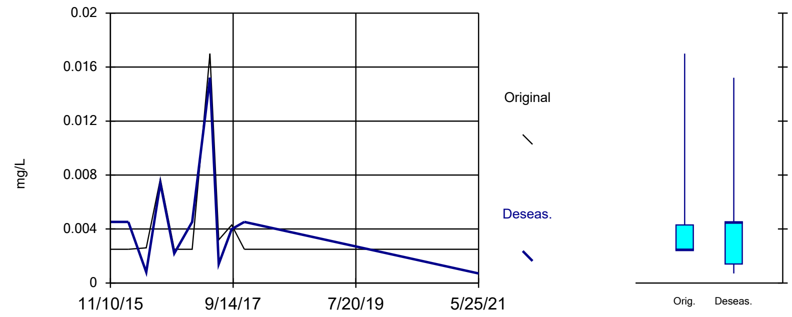
Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Selenium Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

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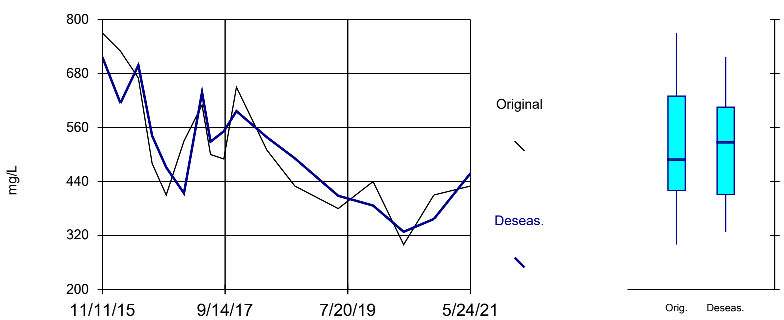
Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

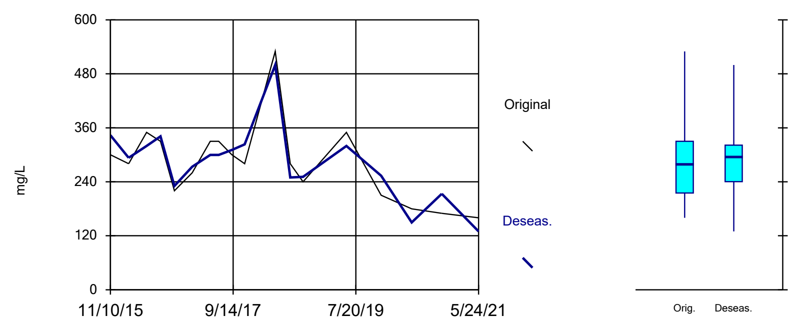


Constituent: Sulfate Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Sulfate Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

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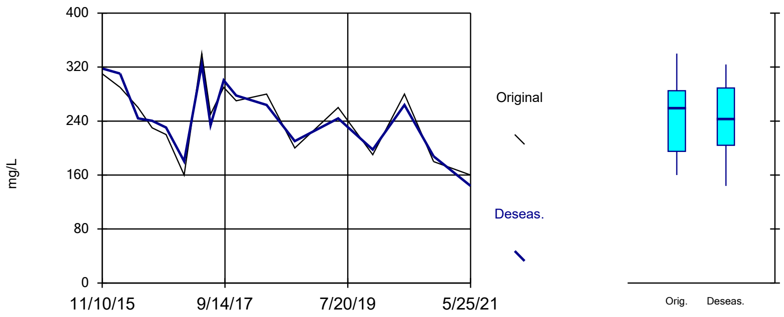
Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

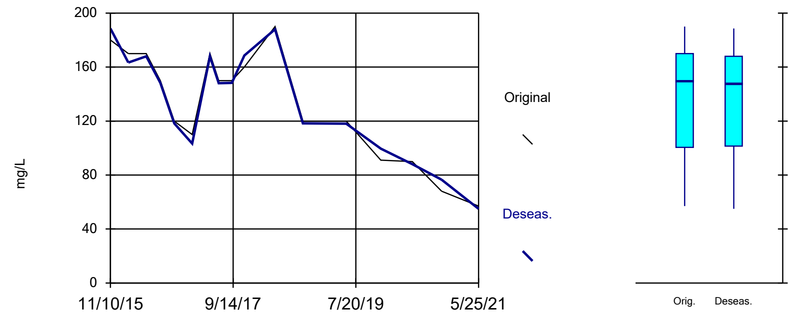


Constituent: Sulfate Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

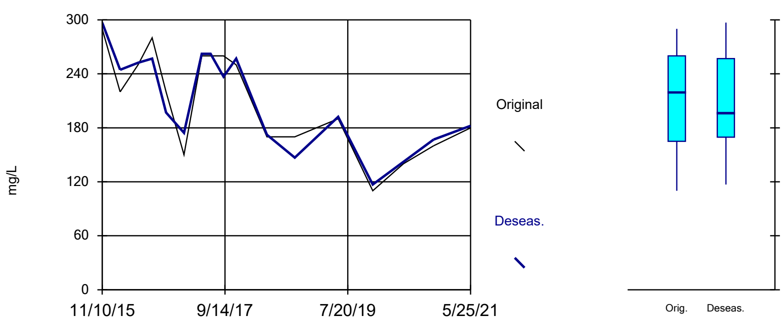


Constituent: Sulfate Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Sulfate Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

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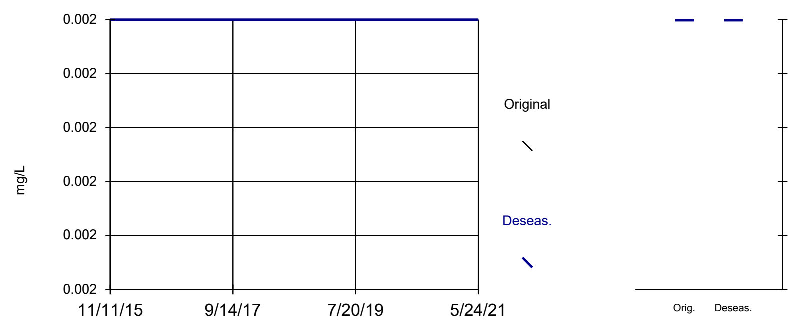
Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Thallium Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

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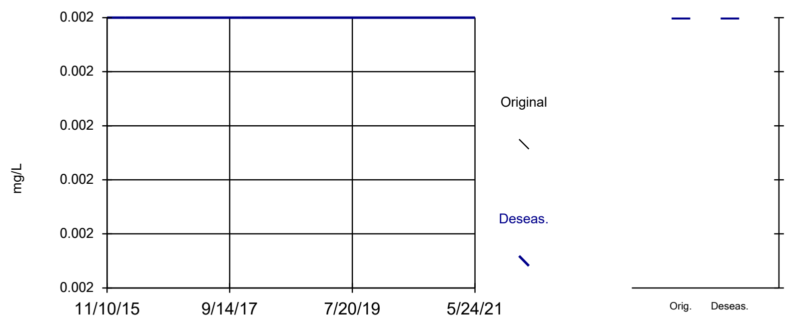
Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

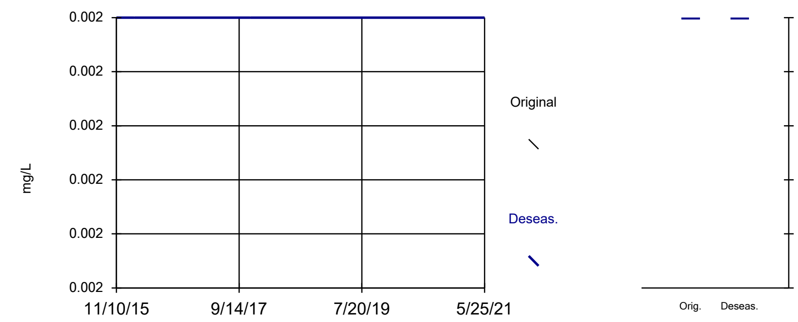


Constituent: Thallium Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

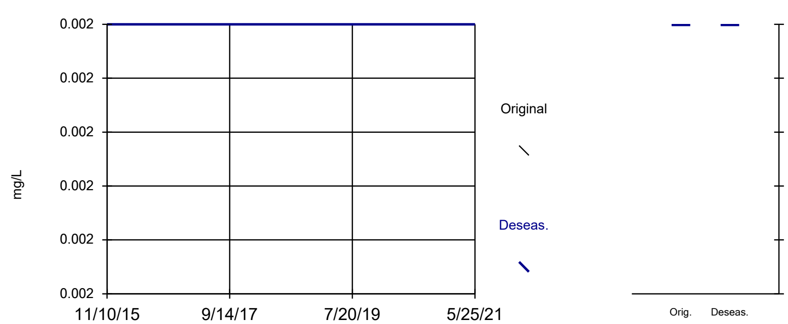


Constituent: Thallium Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-11

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

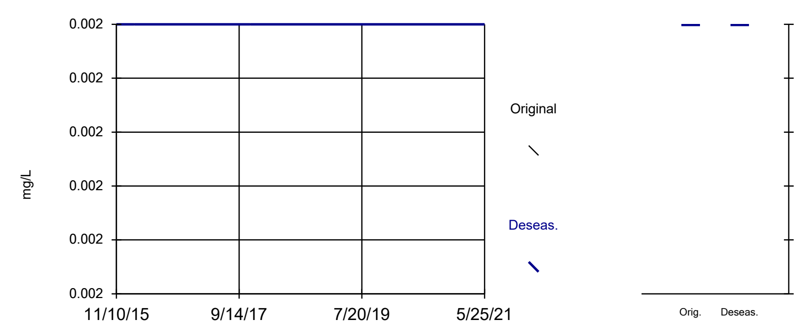


Constituent: Thallium Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-12

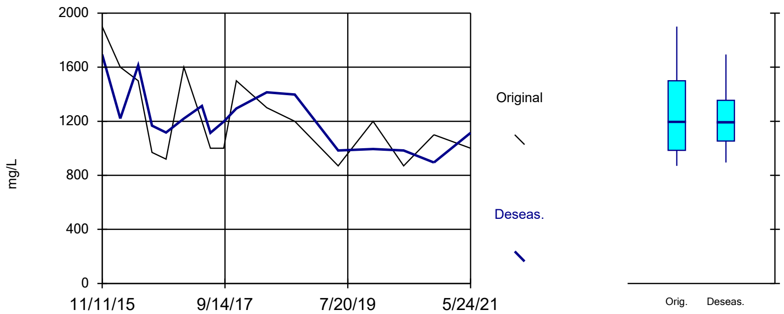
Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Thallium Analysis Run 8/6/2021 4:41 PM
Will County Generating Station Client: NRG Data: Will County

Seasonality: MW-05 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Total Dissolved Solids   Analysis Run 8/6/2021 4:41 PM
Will County Generating Station   Client: NRG   Data: Will County

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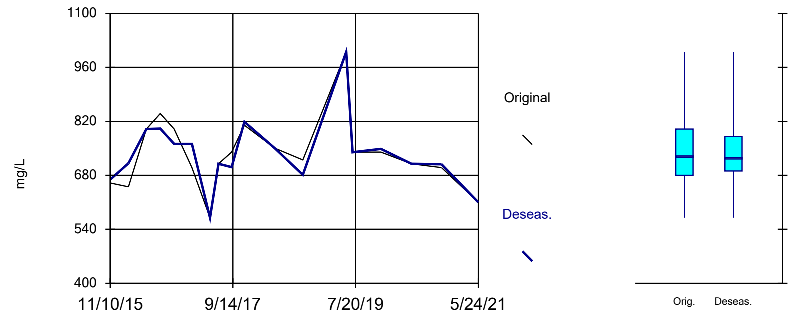
Seasonality: MW-06 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

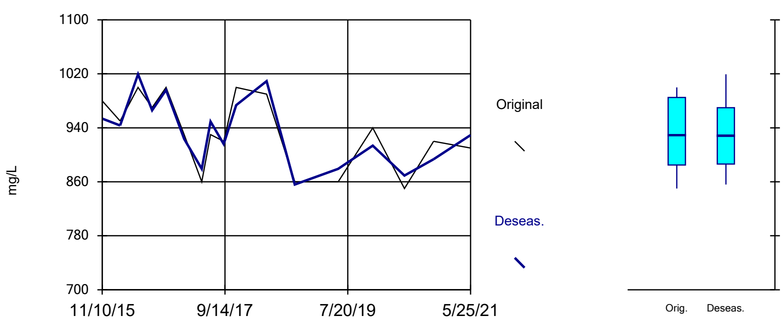


Constituent: Total Dissolved Solids   Analysis Run 8/6/2021 4:41 PM
Will County Generating Station   Client: NRG   Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-10

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Total Dissolved Solids   Analysis Run 8/6/2021 4:41 PM
Will County Generating Station   Client: NRG   Data: Will County

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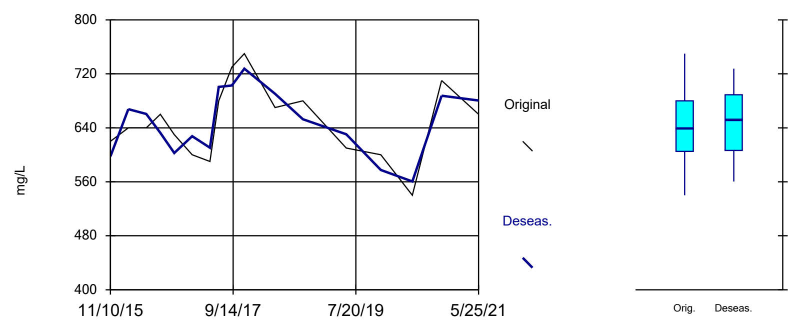
Seasonality: MW-11

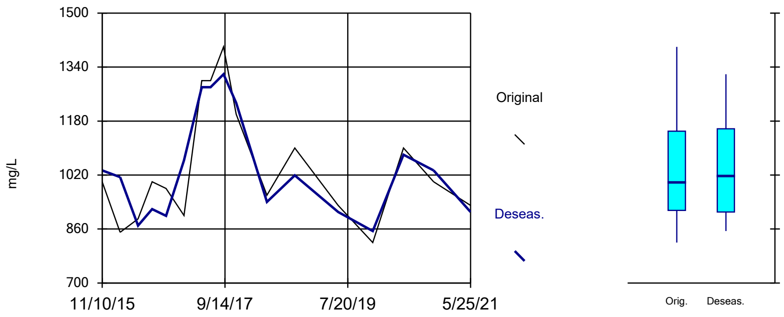
Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Total Dissolved Solids   Analysis Run 8/6/2021 4:41 PM
Will County Generating Station   Client: NRG   Data: Will County

Seasonality: MW-12

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



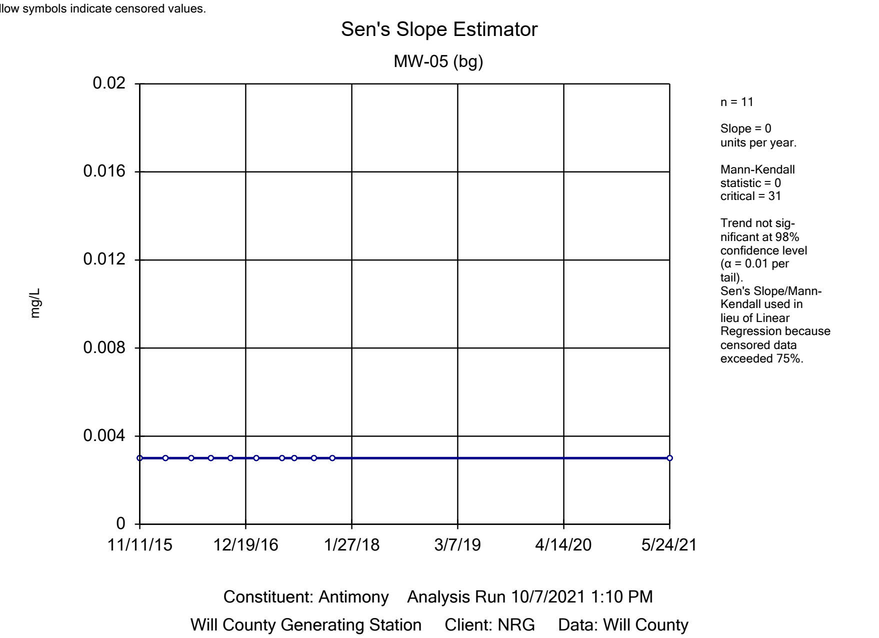
Constituent: Total Dissolved Solids   Analysis Run 8/6/2021 4:41 PM

Will County Generating Station   Client: NRG   Data: Will County

Trend Test Will Co UG Wells All Values

Will County Generating Station   Client: NRG   Data: Will County   Printed 10/7/2021, 1:13 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Antimony (mg/L)	MW-05 (bg)	0	0	31	No	11	100	n/a	n/a	0.02	NP (NDs)
Antimony (mg/L)	MW-06 (bg)	0	0	31	No	11	100	n/a	n/a	0.02	NP (NDs)
Arsenic (mg/L)	MW-05 (bg)	-0.00...	-0.8035	2.398	No	11	0	Yes	no	0.02	Param.
Arsenic (mg/L)	MW-06 (bg)	0.000...	0.5016	2.398	No	11	0	Yes	no	0.02	Param.
Barium (mg/L)	MW-05 (bg)	-0.00...	-0.6231	2.398	No	11	0	Yes	no	0.02	Param.
Barium (mg/L)	MW-06 (bg)	0.003139	1.402	2.398	No	11	0	Yes	no	0.02	Param.
Beryllium (mg/L)	MW-05 (bg)	0	0	31	No	11	100	n/a	n/a	0.02	NP (NDs)
Beryllium (mg/L)	MW-06 (bg)	0	0	31	No	11	100	n/a	n/a	0.02	NP (NDs)
Boron (mg/L)	MW-05 (bg)	0.0708	0.7101	2.249	No	17	0	Yes	no	0.02	Param.
Boron (mg/L)	MW-06 (bg)	0.06023	0.8175	2.235	No	18	0	Yes	no	0.02	Param.
Cadmium (mg/L)	MW-05 (bg)	0	0	31	No	11	100	n/a	n/a	0.02	NP (NDs)
Cadmium (mg/L)	MW-06 (bg)	0	0	31	No	11	100	n/a	n/a	0.02	NP (NDs)
Calcium (mg/L)	MW-05 (bg)	-11.96	-1.275	2.249	No	17	0	Yes	no	0.02	Param.
Calcium (mg/L)	**MW-06 (bg)**	**6.084**	**2.972**	**2.249**	**Yes**	**17**	**0**	**Yes**	**no**	**0.02**	**Param.**
Chloride (mg/L)	**MW-05 (bg)**	**-15.28**	**-4.449**	**-2.249**	**Yes**	**17**	**0**	**Yes**	**no**	**0.02**	**Param.**
Chloride (mg/L)	**MW-06 (bg)**	**-12.53**	**-4.239**	**-2.249**	**Yes**	**17**	**0**	**Yes**	**no**	**0.02**	**Param.**
Chromium (mg/L)	MW-05 (bg)	0	0	31	No	11	100	n/a	n/a	0.02	NP (NDs)
Chromium (mg/L)	MW-06 (bg)	0	0	31	No	11	100	n/a	n/a	0.02	NP (NDs)
Cobalt (mg/L)	MW-05 (bg)	0	0	31	No	11	100	n/a	n/a	0.02	NP (NDs)
Cobalt (mg/L)	MW-06 (bg)	0	0	31	No	11	100	n/a	n/a	0.02	NP (NDs)
Combined Radium 226 + 228 (pCi/L)	MW-05 (bg)	0.1402	1.51	2.449	No	10	50	Yes	no	0.02	Param.
Combined Radium 226 + 228 (pCi/L)	MW-06 (bg)	0.222	1.961	2.449	No	10	50	Yes	no	0.02	Param.
Fluoride (mg/L)	MW-05 (bg)	0.0148	0.7516	2.249	No	17	0	Yes	no	0.02	Param.
Fluoride (mg/L)	**MW-06 (bg)**	**-0.02907**	**-2.966**	**-2.249**	**Yes**	**17**	**0**	**Yes**	**no**	**0.02**	**Param.**
Lead (mg/L)	MW-05 (bg)	0	0	31	No	11	100	n/a	n/a	0.02	NP (NDs)
Lead (mg/L)	MW-06 (bg)	0	2	31	No	11	90.91	n/a	n/a	0.02	NP (NDs)
Lithium (mg/L)	MW-05 (bg)	0.000...	0.5927	2.398	No	11	45.45	Yes	no	0.02	Param.
Lithium (mg/L)	MW-06 (bg)	0.000...	1.225	2.398	No	11	0	Yes	no	0.02	Param.
Mercury (mg/L)	MW-05 (bg)	0	0	31	No	11	100	n/a	n/a	0.02	NP (NDs)
Mercury (mg/L)	MW-06 (bg)	0	0	31	No	11	100	n/a	n/a	0.02	NP (NDs)
Molybdenum (mg/L)	MW-05 (bg)	-0.00...	-0.8624	2.398	No	11	0	Yes	no	0.02	Param.
Molybdenum (mg/L)	**MW-06 (bg)**	**-0.00...**	**-4.253**	**-2.398**	**Yes**	**11**	**0**	**Yes**	**no**	**0.02**	**Param.**
pH (n/a)	MW-05 (bg)	-0.07357	-0.5452	2.249	No	17	0	Yes	no	0.02	Param.
pH (n/a)	**MW-06 (bg)**	**-0.1709**	**-2.97**	**-2.235**	**Yes**	**18**	**0**	**Yes**	**no**	**0.02**	**Param.**
Selenium (mg/L)	MW-05 (bg)	0.003607	1.273	2.398	No	11	27.27	Yes	no	0.02	Param.
Selenium (mg/L)	MW-06 (bg)	0	-11	-31	No	11	81.82	n/a	n/a	0.02	NP (NDs)
Sulfate (mg/L)	**MW-05 (bg)**	**-55.33**	**-4.105**	**-2.249**	**Yes**	**17**	**0**	**Yes**	**no**	**0.02**	**Param.**
Sulfate (mg/L)	**MW-06 (bg)**	**-0.1066**	**-2.963**	**-2.235**	**Yes**	**18**	**0**	**Yes**	**natura...**	**0.02**	**Param.**
Thallium (mg/L)	MW-05 (bg)	0	0	31	No	11	100	n/a	n/a	0.02	NP (NDs)
Thallium (mg/L)	MW-06 (bg)	0	0	31	No	11	100	n/a	n/a	0.02	NP (NDs)
Total Dissolved Solids (mg/L)	**MW-05 (bg)**	**-96.69**	**-2.522**	**-2.249**	**Yes**	**17**	**0**	**Yes**	**no**	**0.02**	**Param.**
Total Dissolved Solids (mg/L)	MW-06 (bg)	-1.47	-0.1041	2.235	No	18	0	Yes	no	0.02	Param.



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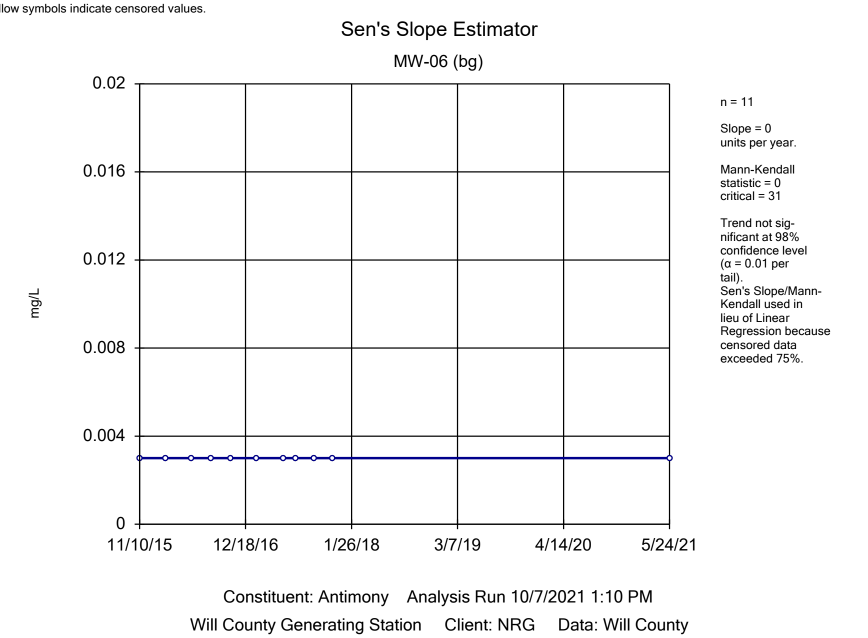
Hollow symbols indicate censored values.



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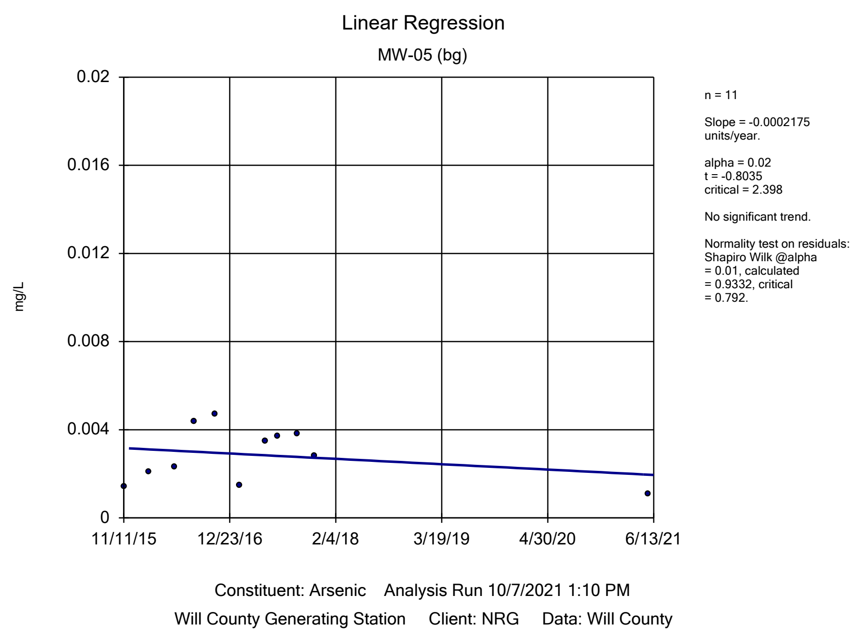

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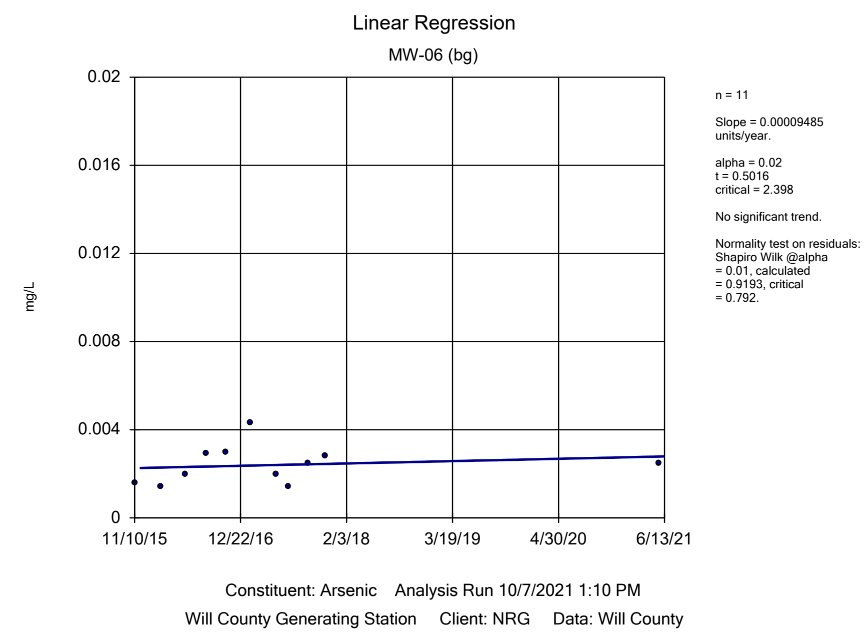

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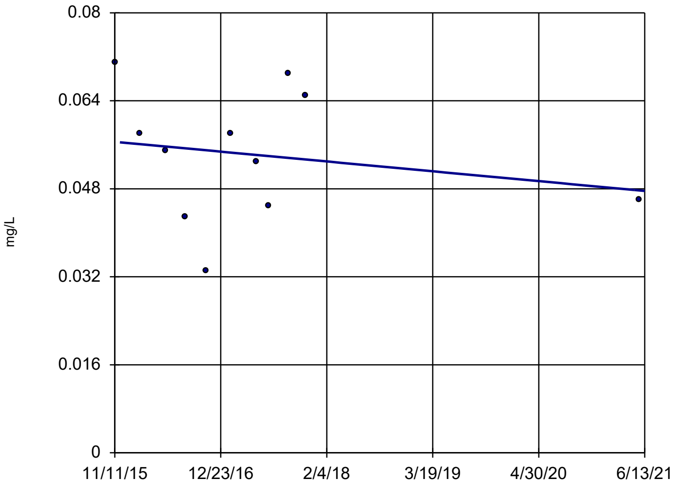
Linear Regression

MW-05 (bg)



n = 11

Slope = -0.001599 units/year.

alpha = 0.02
t = -0.6231
critical = 2.398

No significant trend.

Normality test on residuals: Shapiro Wilk @alpha = 0.01, calculated = 0.9519, critical = 0.792.

Constituent: Barium   Analysis Run 10/7/2021 1:10 PM

Will County Generating Station   Client: NRG   Data: Will County

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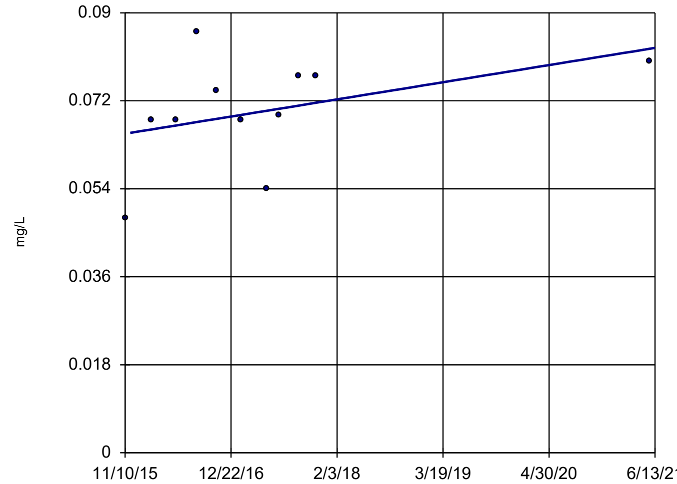
Linear Regression

MW-06 (bg)



n = 11

Slope = 0.003139 units/year.

alpha = 0.02
t = 1.402
critical = 2.398

No significant trend.

Normality test on residuals: Shapiro Wilk @alpha = 0.01, calculated = 0.9157, critical = 0.792.

Constituent: Barium   Analysis Run 10/7/2021 1:10 PM

Will County Generating Station   Client: NRG   Data: Will County

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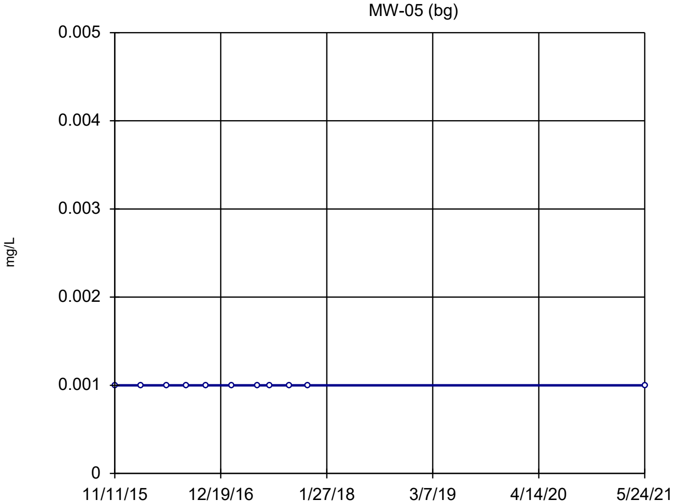
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-05 (bg)



n = 11

Slope = 0 units per year.

Mann-Kendall statistic = 0
critical = 31

Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.

Constituent: Beryllium   Analysis Run 10/7/2021 1:10 PM

Will County Generating Station   Client: NRG   Data: Will County

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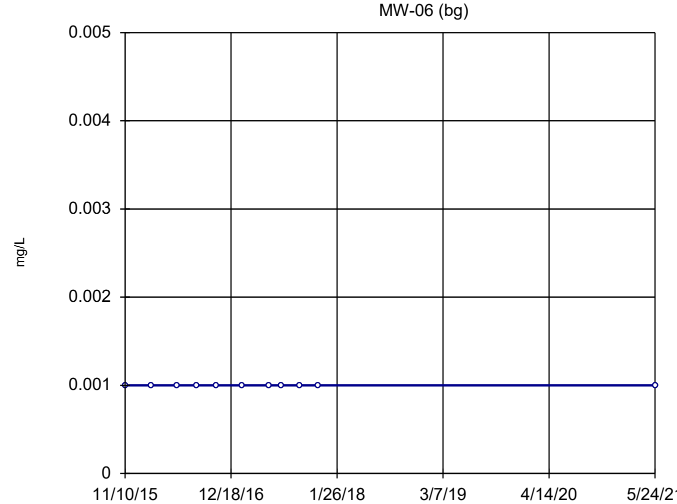
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-06 (bg)



n = 11

Slope = 0 units per year.

Mann-Kendall statistic = 0
critical = 31

Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.

Constituent: Beryllium   Analysis Run 10/7/2021 1:10 PM

Will County Generating Station   Client: NRG   Data: Will County

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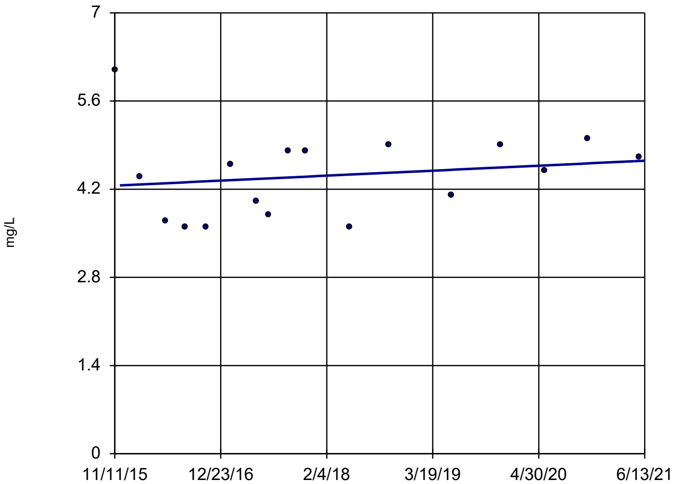
Linear Regression

MW-05 (bg)



n = 17

Slope = 0.0708
units/year.

alpha = 0.02
t = 0.7101
critical = 2.249

No significant trend.

Normality test on residuals:
Shapiro Wilk @alpha
= 0.01, calculated
= 0.8773, critical
= 0.851.

Constituent: Boron Analysis Run 10/7/2021 1:10 PM

Will County Generating Station Client: NRG Data: Will County

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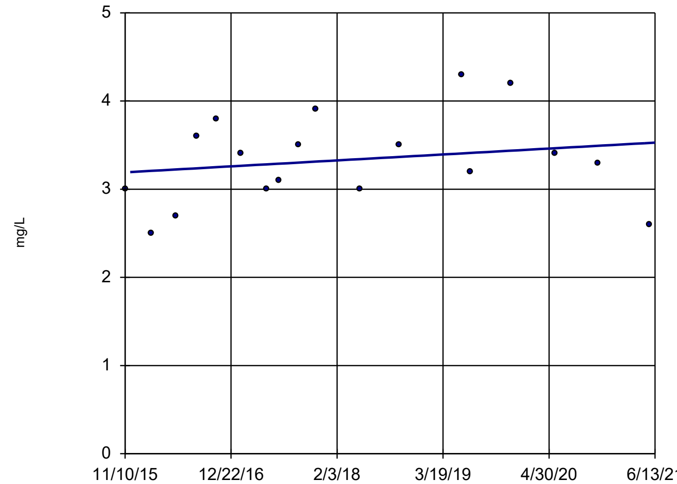
Linear Regression

MW-06 (bg)



n = 18

Slope = 0.06023
units/year.

alpha = 0.02
t = 0.8175
critical = 2.235

No significant trend.

Normality test on residuals:
Shapiro Wilk @alpha
= 0.01, calculated
= 0.9747, critical
= 0.858.

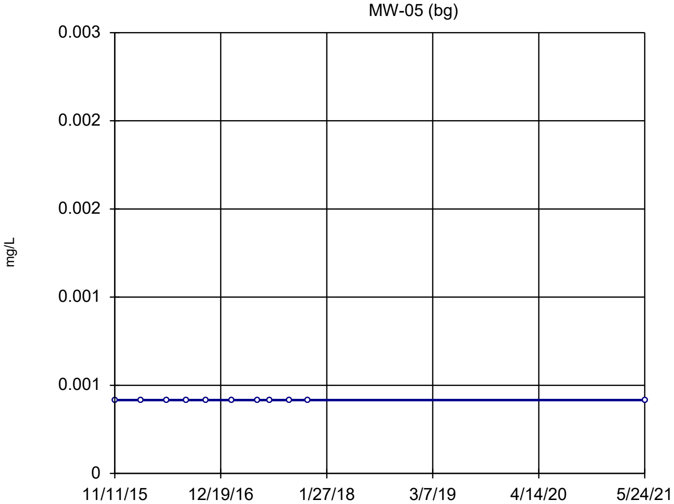
Constituent: Boron Analysis Run 10/7/2021 1:10 PM

Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-05 (bg)



n = 11

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 31

Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.

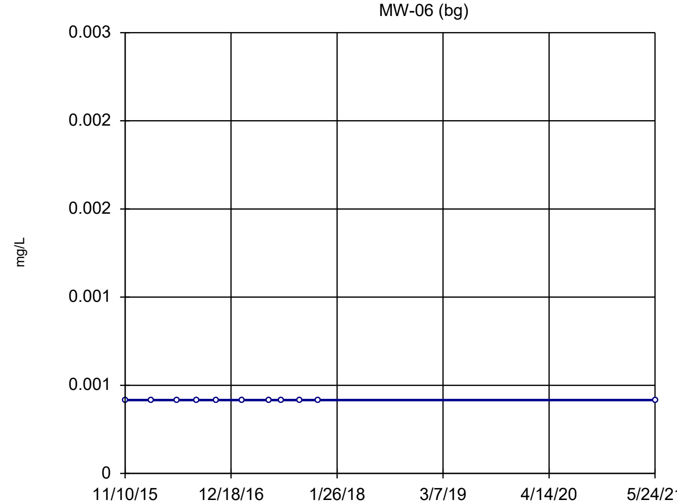
Constituent: Cadmium Analysis Run 10/7/2021 1:10 PM

Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-06 (bg)



n = 11

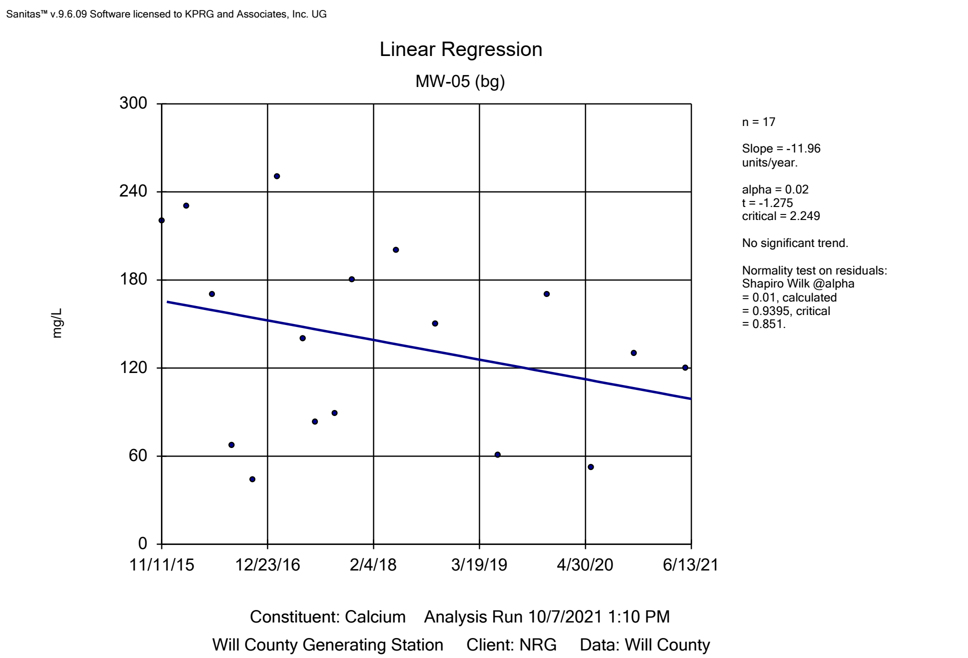
Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 31

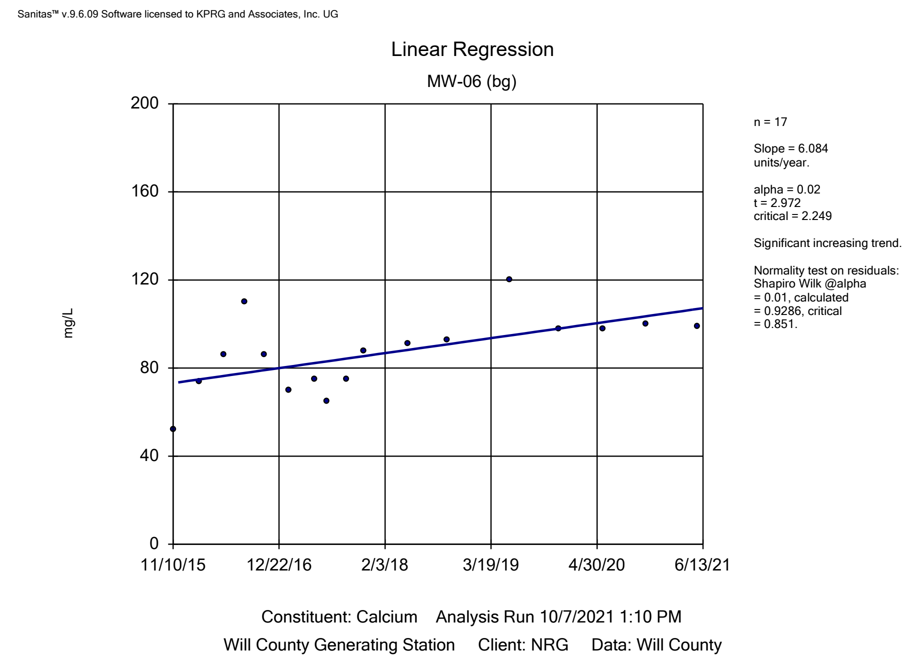
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.

Constituent: Cadmium Analysis Run 10/7/2021 1:10 PM

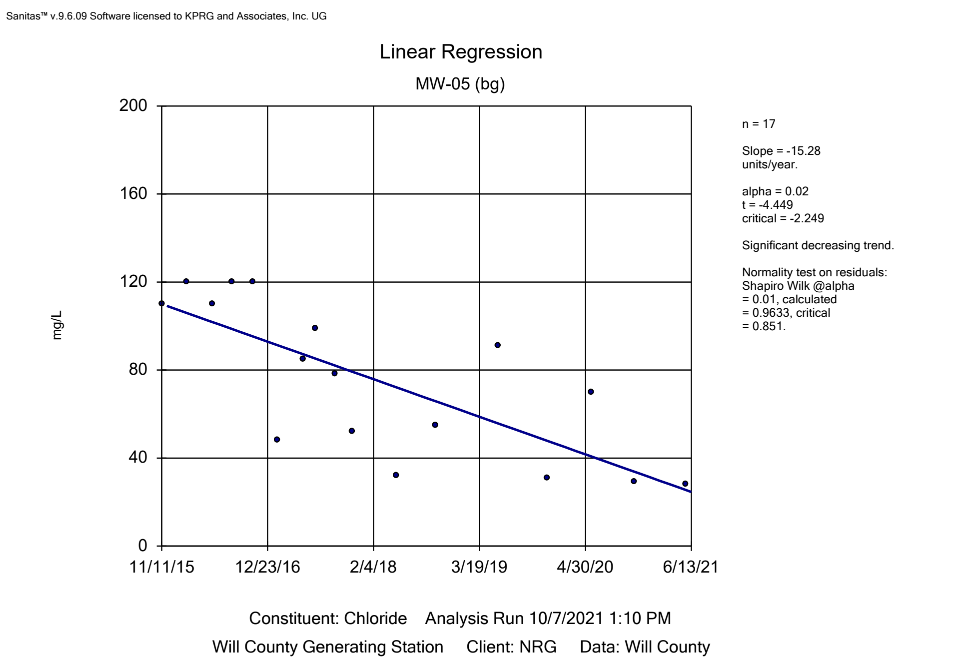
Will County Generating Station Client: NRG Data: Will County



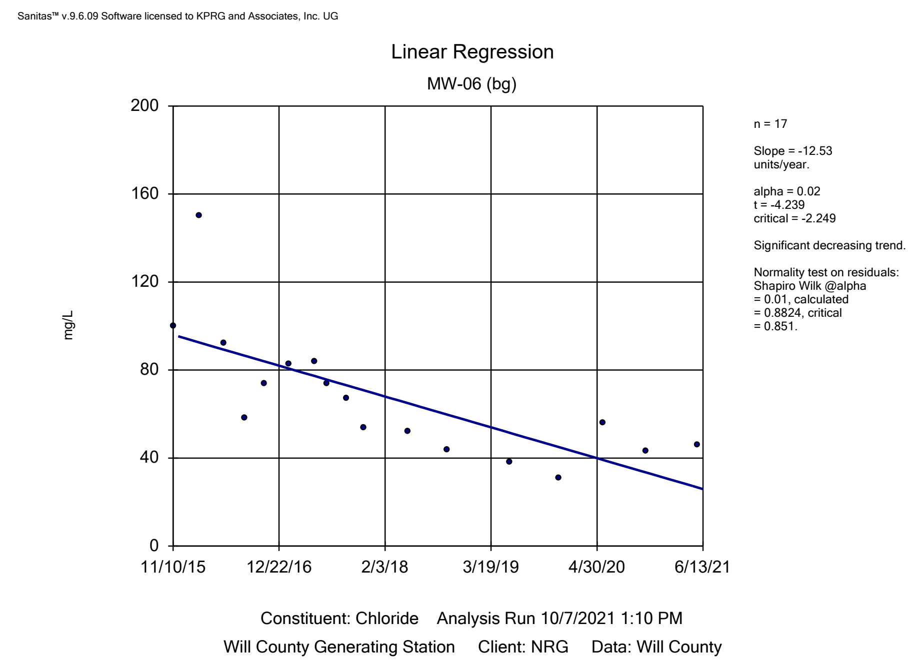
Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression
MW-05 (bg)
mg/L
300
240
180
120
60
0
11/11/15
12/23/16
2/4/18
3/19/19
4/30/20
6/13/21
n = 17
Slope = -11.96 units/year.
alpha = 0.02
t = -1.275
critical = 2.249
No significant trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.01, calculated = 0.9395, critical = 0.851.
Constituent: Calcium Analysis Run 10/7/2021 1:10 PM
Will County Generating Station Client: NRG Data: Will County



Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression
MW-06 (bg)
mg/L
200
160
120
80
40
0
11/10/15
12/22/16
2/3/18
3/19/19
4/30/20
6/13/21
n = 17
Slope = 6.084 units/year.
alpha = 0.02
t = 2.972
critical = 2.249
Significant increasing trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.01, calculated = 0.9286, critical = 0.851.
Constituent: Calcium Analysis Run 10/7/2021 1:10 PM
Will County Generating Station Client: NRG Data: Will County

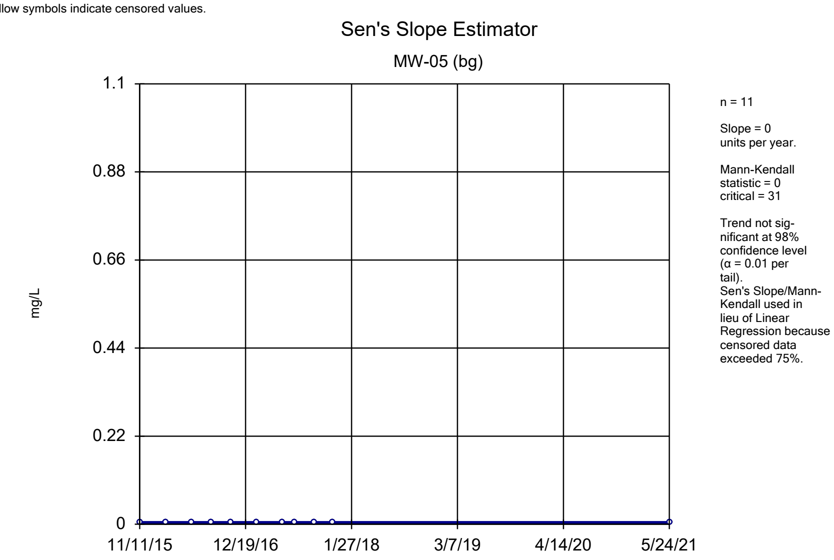


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression
MW-05 (bg)
mg/L
200
160
120
80
40
0
11/11/15
12/23/16
2/4/18
3/19/19
4/30/20
6/13/21
n = 17
Slope = -15.28 units/year.
alpha = 0.02
t = -4.449
critical = -2.249
Significant decreasing trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.01, calculated = 0.9633, critical = 0.851.
Constituent: Chloride Analysis Run 10/7/2021 1:10 PM
Will County Generating Station Client: NRG Data: Will County



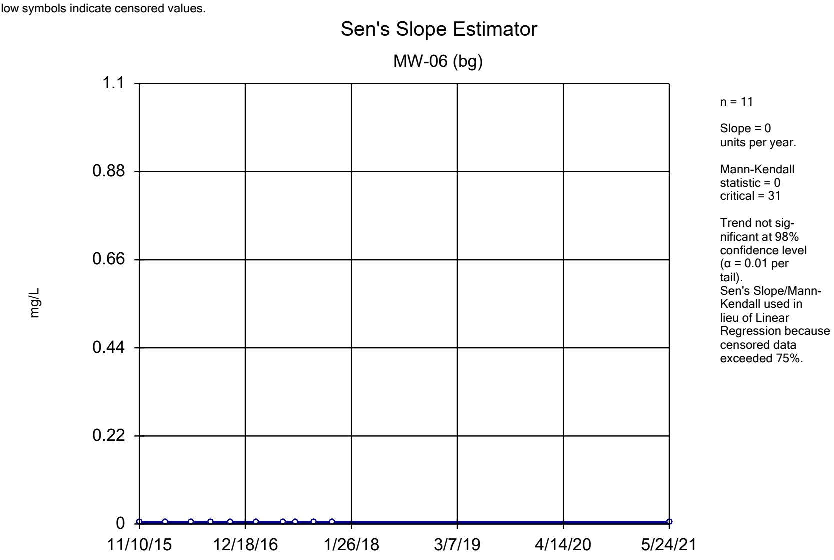
Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression
MW-06 (bg)
mg/L
200
160
120
80
40
0
11/10/15
12/22/16
2/3/18
3/19/19
4/30/20
6/13/21
n = 17
Slope = -12.53 units/year.
alpha = 0.02
t = -4.239
critical = -2.249
Significant decreasing trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.01, calculated = 0.8824, critical = 0.851.
Constituent: Chloride Analysis Run 10/7/2021 1:10 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.



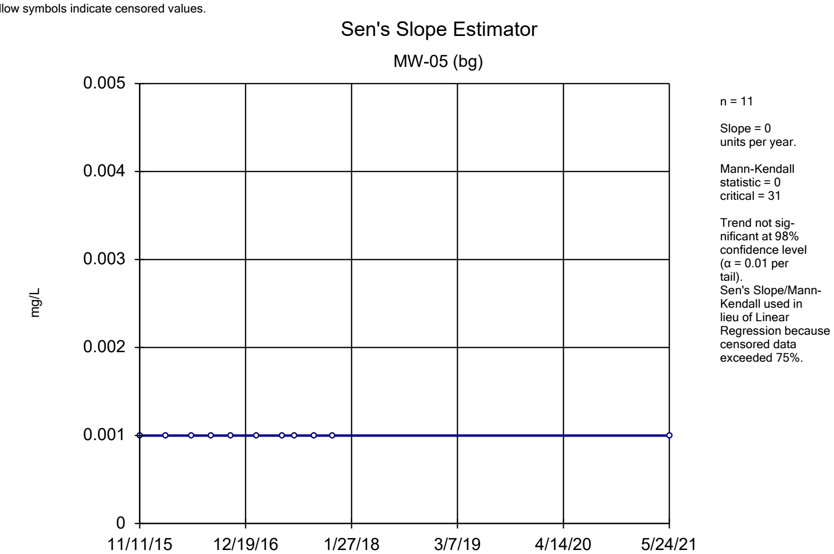
Constituent: Chromium Analysis Run 10/7/2021 1:10 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.



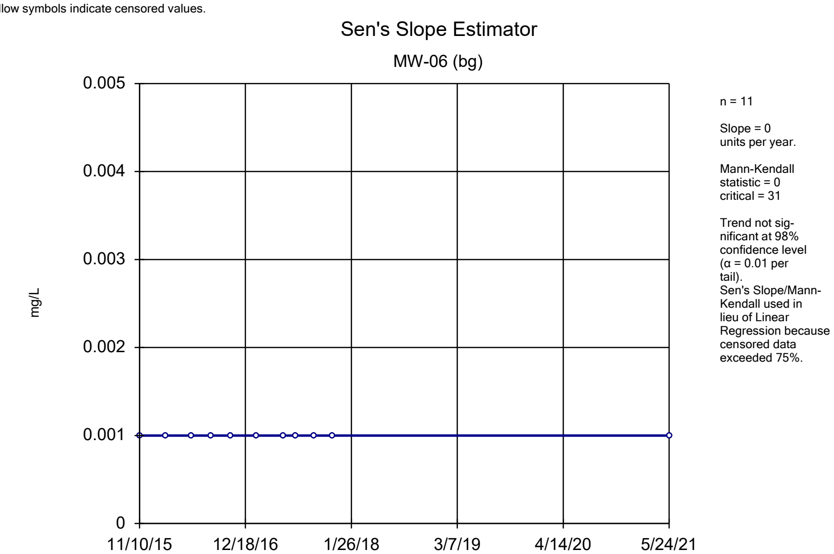
Constituent: Chromium Analysis Run 10/7/2021 1:10 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.

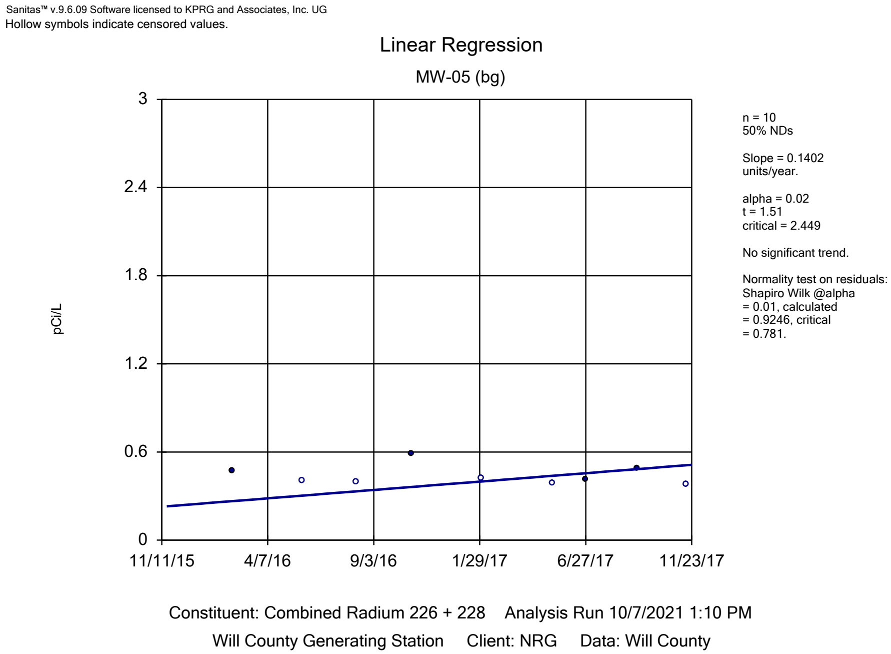


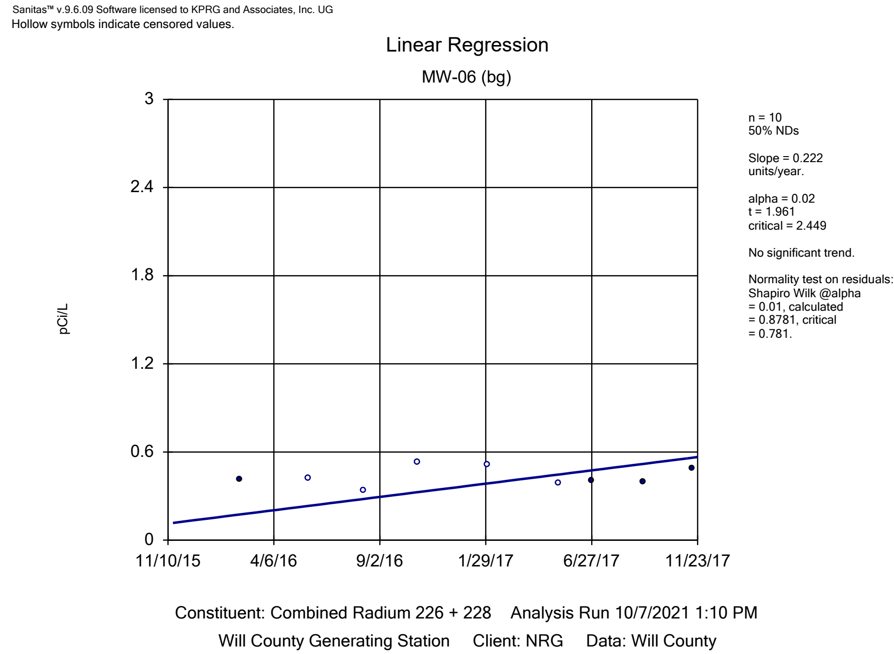
Constituent: Cobalt Analysis Run 10/7/2021 1:10 PM
Will County Generating Station Client: NRG Data: Will County

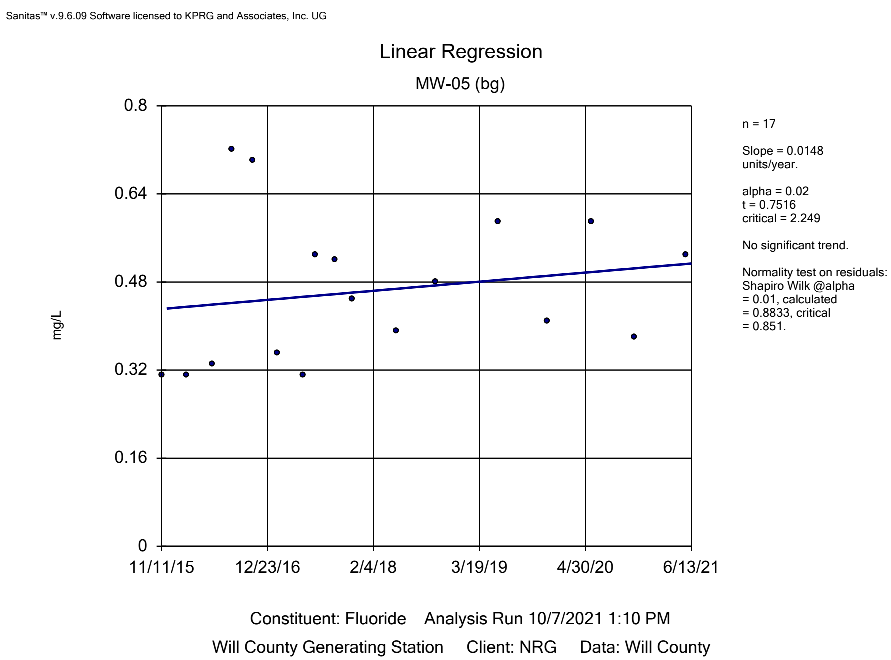
Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.

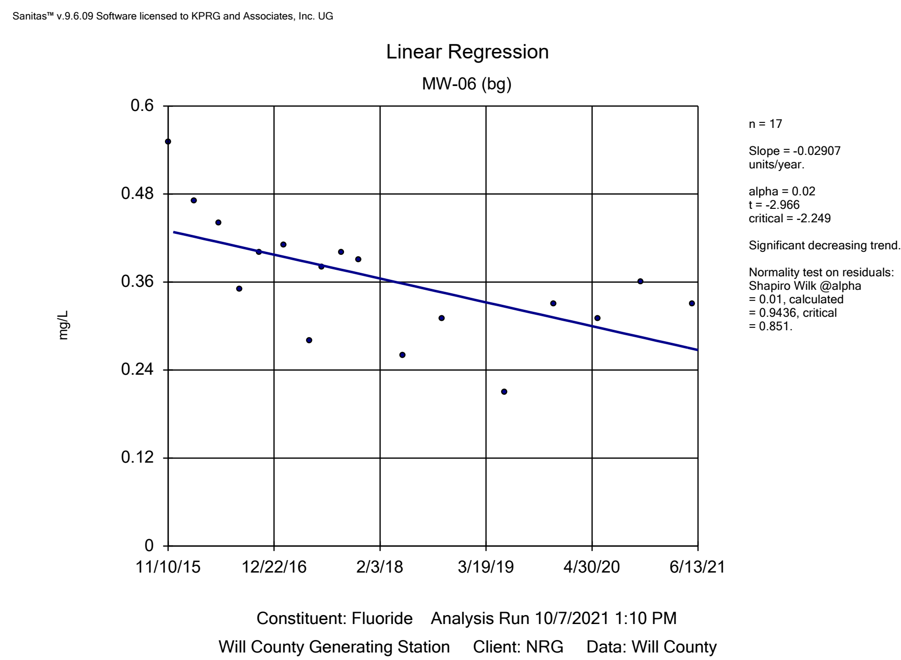


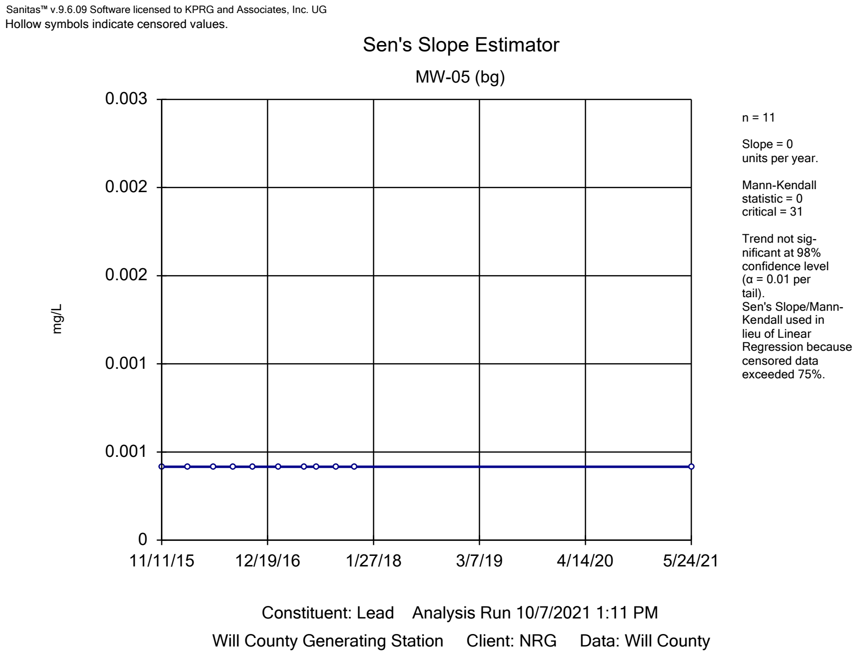
Constituent: Cobalt Analysis Run 10/7/2021 1:10 PM
Will County Generating Station Client: NRG Data: Will County

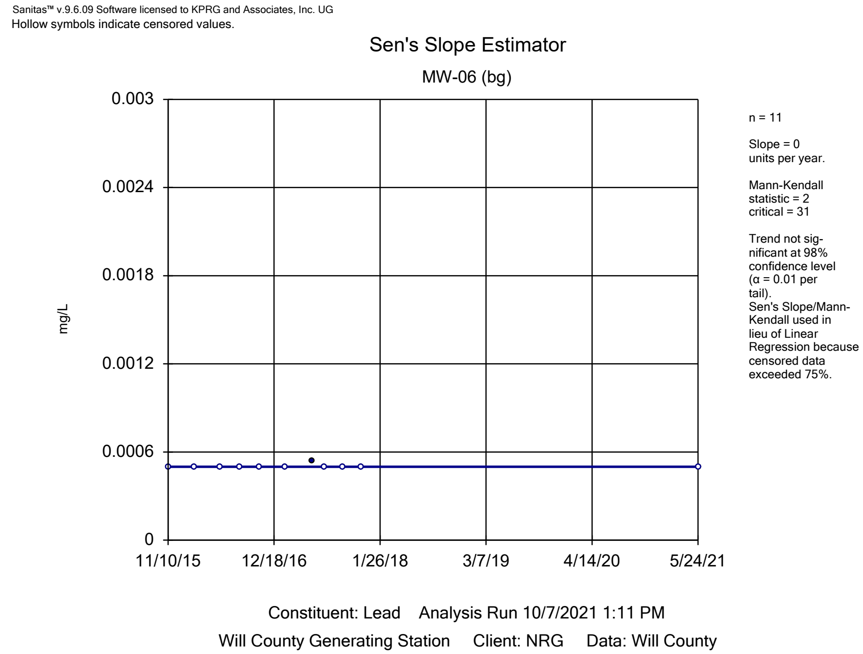

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Linear Regression
MW-05 (bg)
pCi/L
3
2.4
1.8
1.2
0.6
0
11/11/15
4/7/16
9/3/16
1/29/17
6/27/17
11/23/17
n = 10
50% NDs
Slope = 0.1402
units/year.
alpha = 0.02
t = 1.51
critical = 2.449
No significant trend.
Normality test on residuals:
Shapiro Wilk @alpha
= 0.01, calculated
= 0.9246, critical
= 0.781.
Constituent: Combined Radium 226 + 228 Analysis Run 10/7/2021 1:10 PM
Will County Generating Station Client: NRG Data: Will County

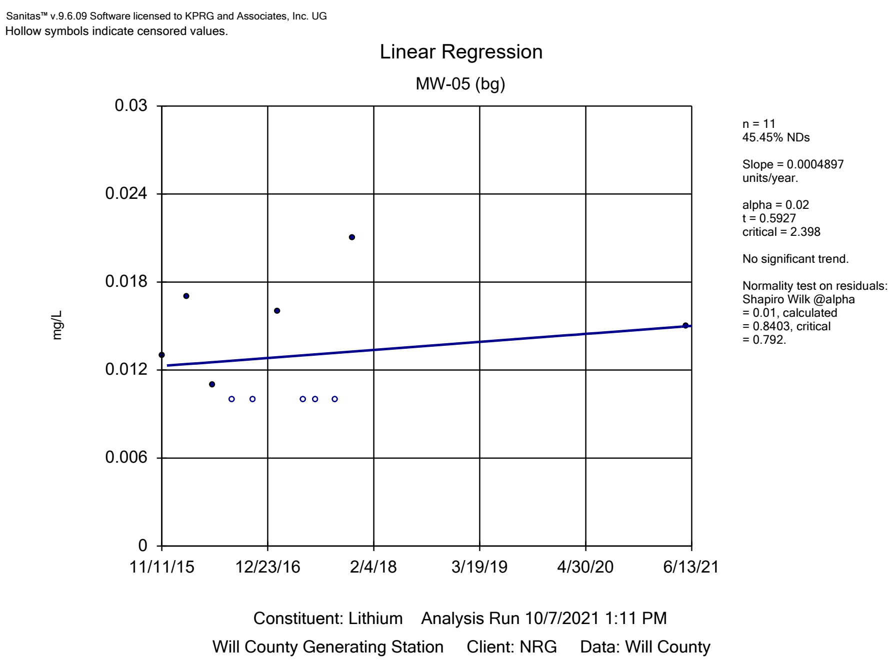

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Linear Regression
MW-06 (bg)
pCi/L
3
2.4
1.8
1.2
0.6
0
11/10/15
4/6/16
9/2/16
1/29/17
6/27/17
11/23/17
n = 10
50% NDs
Slope = 0.222
units/year.
alpha = 0.02
t = 1.961
critical = 2.449
No significant trend.
Normality test on residuals:
Shapiro Wilk @alpha
= 0.01, calculated
= 0.8781, critical
= 0.781.
Constituent: Combined Radium 226 + 228 Analysis Run 10/7/2021 1:10 PM
Will County Generating Station Client: NRG Data: Will County

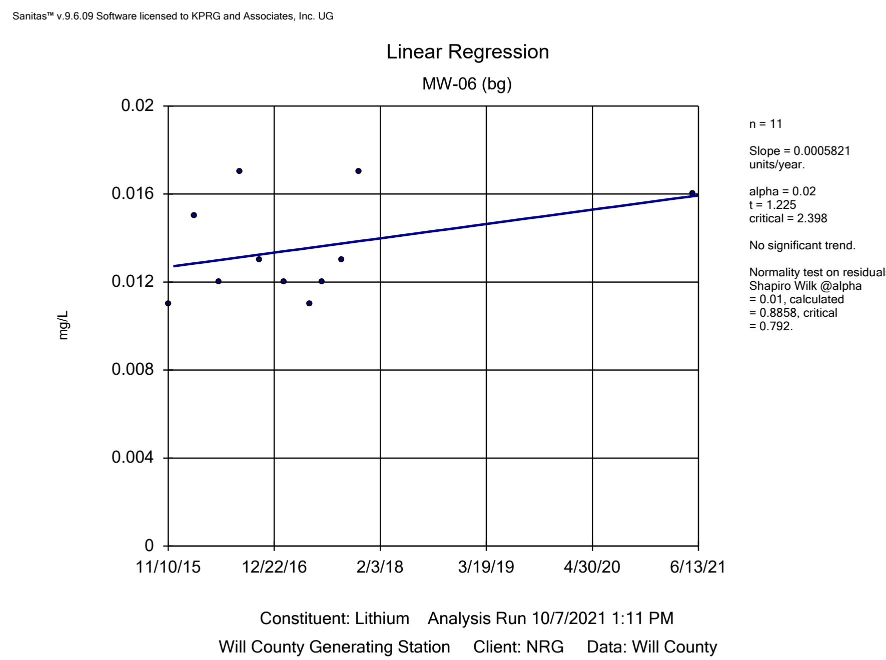

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression
MW-05 (bg)
mg/L
0.8
0.64
0.48
0.32
0.16
0
11/11/15
12/23/16
2/4/18
3/19/19
4/30/20
6/13/21
n = 17
Slope = 0.0148
units/year.
alpha = 0.02
t = 0.7516
critical = 2.249
No significant trend.
Normality test on residuals:
Shapiro Wilk @alpha
= 0.01, calculated
= 0.8833, critical
= 0.851.
Constituent: Fluoride Analysis Run 10/7/2021 1:10 PM
Will County Generating Station Client: NRG Data: Will County


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression
MW-06 (bg)
mg/L
0.6
0.48
0.36
0.24
0.12
0
11/10/15
12/22/16
2/3/18
3/19/19
4/30/20
6/13/21
n = 17
Slope = -0.02907
units/year.
alpha = 0.02
t = -2.966
critical = -2.249
Significant decreasing trend.
Normality test on residuals:
Shapiro Wilk @alpha
= 0.01, calculated
= 0.9436, critical
= 0.851.
Constituent: Fluoride Analysis Run 10/7/2021 1:10 PM
Will County Generating Station Client: NRG Data: Will County


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Sen's Slope Estimator
MW-05 (bg)
n = 11
Slope = 0
units per year.
Mann-Kendall
statistic = 0
critical = 31
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.
mg/L
Constituent: Lead Analysis Run 10/7/2021 1:11 PM
Will County Generating Station Client: NRG Data: Will County


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Sen's Slope Estimator
MW-06 (bg)
n = 11
Slope = 0
units per year.
Mann-Kendall
statistic = 2
critical = 31
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.
mg/L
Constituent: Lead Analysis Run 10/7/2021 1:11 PM
Will County Generating Station Client: NRG Data: Will County

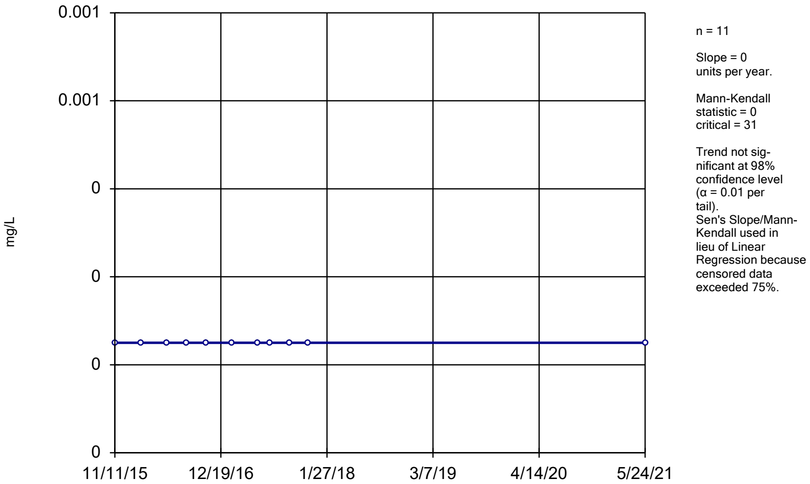

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Linear Regression
MW-05 (bg)
n = 11
45.45% NDs
Slope = 0.0004897
units/year.
alpha = 0.02
t = 0.5927
critical = 2.398
No significant trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.01, calculated = 0.8403, critical = 0.792.
mg/L
Constituent: Lithium Analysis Run 10/7/2021 1:11 PM
Will County Generating Station Client: NRG Data: Will County


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression
MW-06 (bg)
n = 11
Slope = 0.0005821
units/year.
alpha = 0.02
t = 1.225
critical = 2.398
No significant trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.01, calculated = 0.8858, critical = 0.792.
mg/L
Constituent: Lithium Analysis Run 10/7/2021 1:11 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-05 (bg)

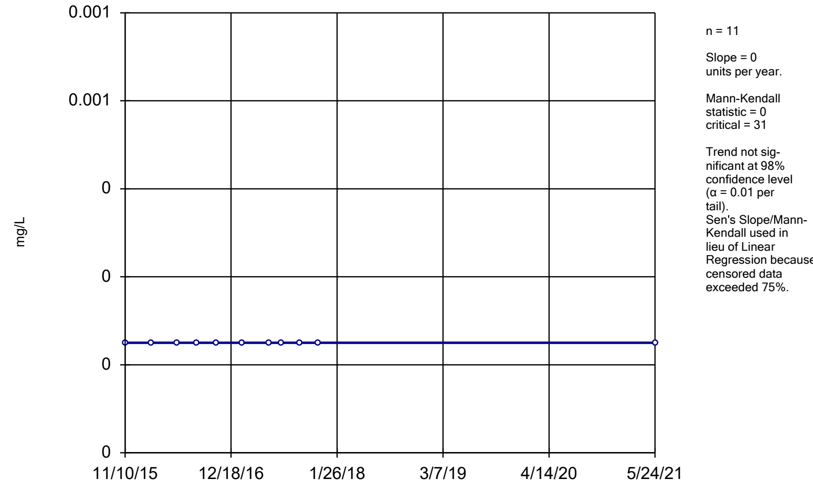


Constituent: Mercury Analysis Run 10/7/2021 1:11 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-06 (bg)

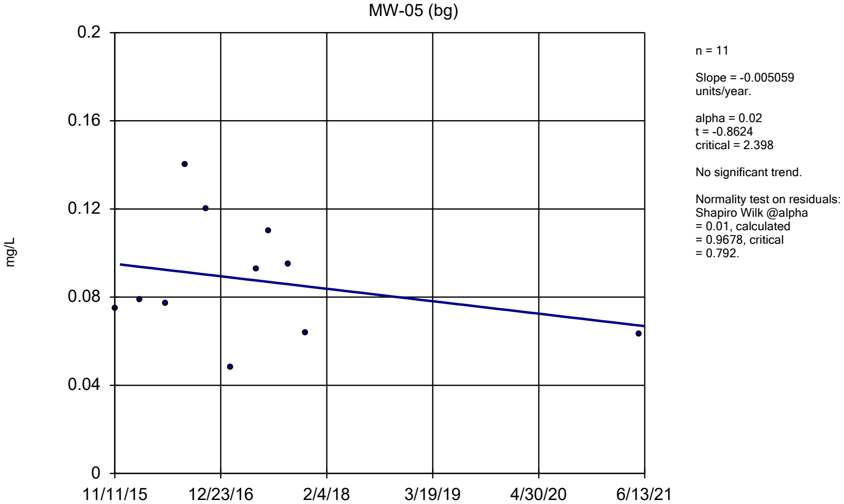


Constituent: Mercury Analysis Run 10/7/2021 1:11 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Linear Regression

MW-05 (bg)

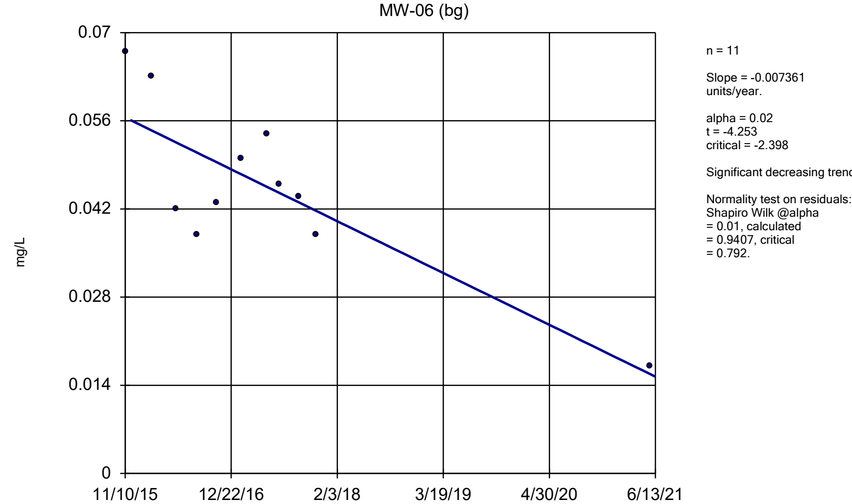


Constituent: Molybdenum Analysis Run 10/7/2021 1:11 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Linear Regression

MW-06 (bg)

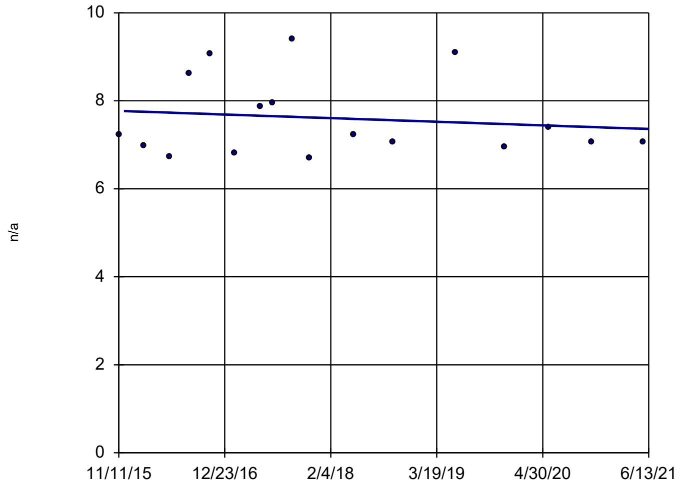


Constituent: Molybdenum Analysis Run 10/7/2021 1:11 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Linear Regression

MW-05 (bg)



n = 17

Slope = -0.07357
units/year.

alpha = 0.02
t = -0.5452
critical = 2.249

No significant trend.

Normality test on residuals:
Shapiro Wilk @alpha
= 0.01, calculated
= 0.8706, critical
= 0.851.

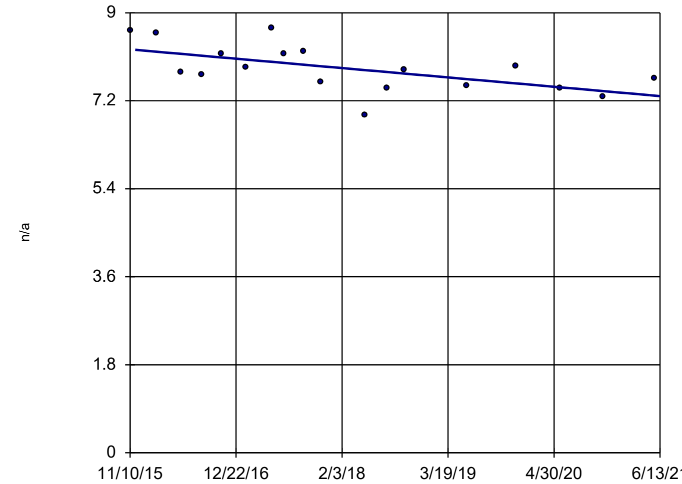
Constituent: pH Analysis Run 10/7/2021 1:11 PM

Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Linear Regression

MW-06 (bg)



n = 18

Slope = -0.1709
units/year.

alpha = 0.02
t = -2.97
critical = -2.235

Significant decreasing trend.

Normality test on residuals:
Shapiro Wilk @alpha
= 0.01, calculated
= 0.9635, critical
= 0.858.

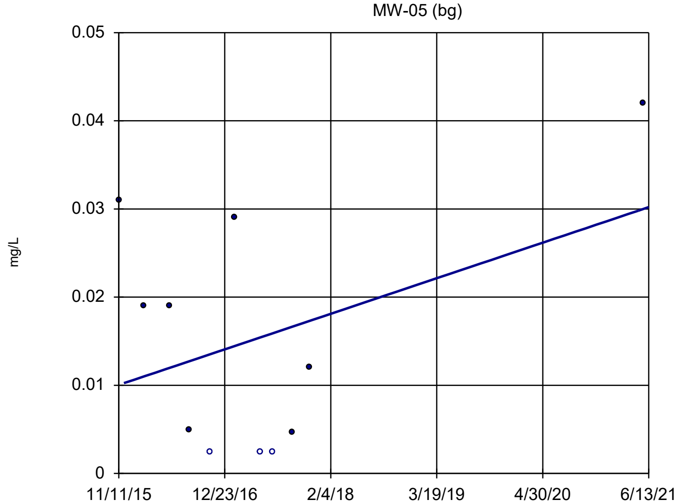
Constituent: pH Analysis Run 10/7/2021 1:11 PM

Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.

Linear Regression

MW-05 (bg)



n = 11
27.27% NDs

Slope = 0.003607
units/year.

alpha = 0.02
t = 1.273
critical = 2.398

No significant trend.

Normality test on residuals:
Shapiro Wilk @alpha
= 0.01, calculated
= 0.8752, critical
= 0.792.

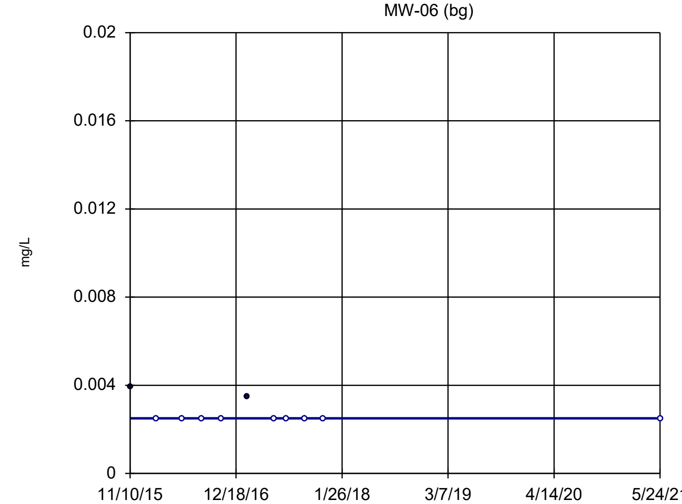
Constituent: Selenium Analysis Run 10/7/2021 1:11 PM

Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-06 (bg)



n = 11

Slope = 0
units per year.

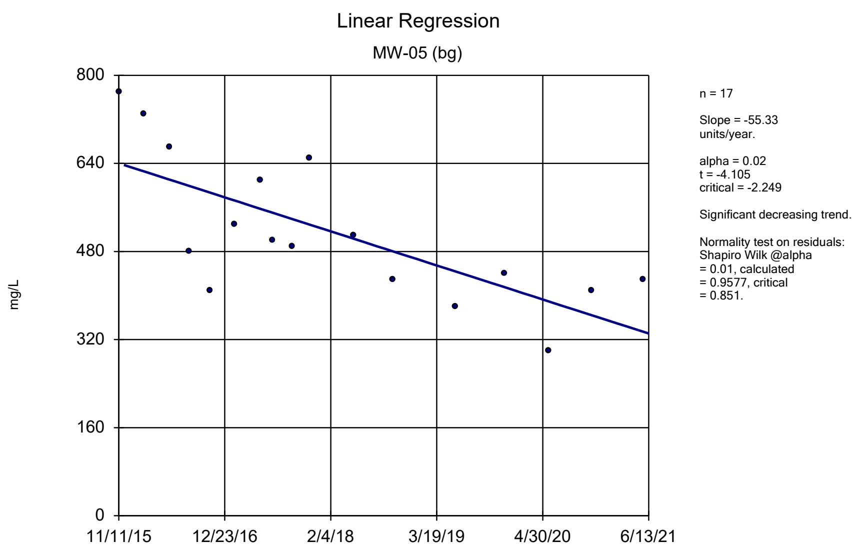
Mann-Kendall
statistic = -11
critical = -31

Trend not sig-
nificant at 98%
confidence level
(α = 0.01 per
tail).
Sen's Slope/Mann-
Kendall used in
lieu of Linear
Regression because
censored data
exceeded 75%.

Constituent: Selenium Analysis Run 10/7/2021 1:11 PM

Will County Generating Station Client: NRG Data: Will County

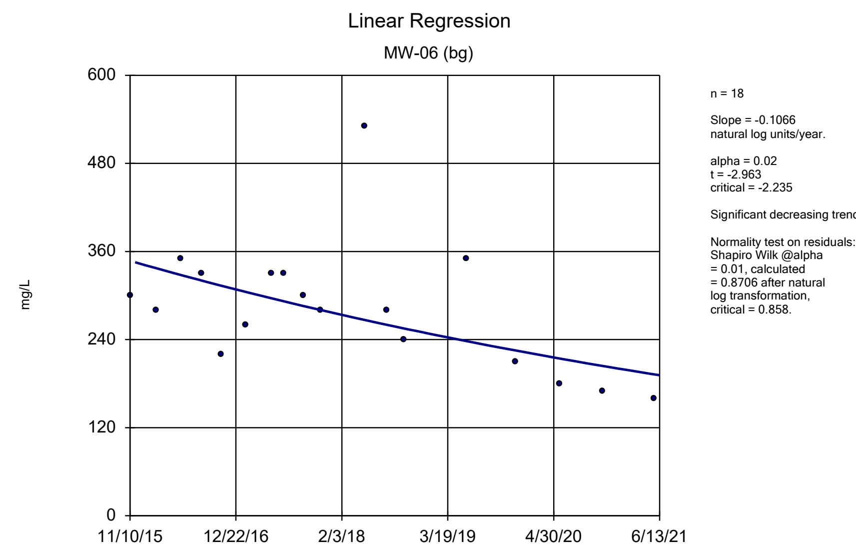
Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG



Constituent: Sulfate Analysis Run 10/7/2021 1:11 PM

Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

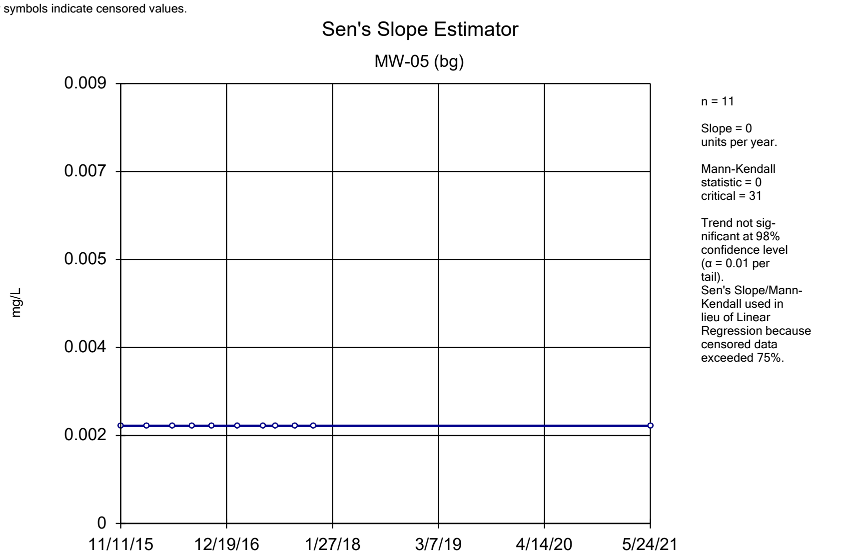


Constituent: Sulfate Analysis Run 10/7/2021 1:11 PM

Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Hollow symbols indicate censored values.

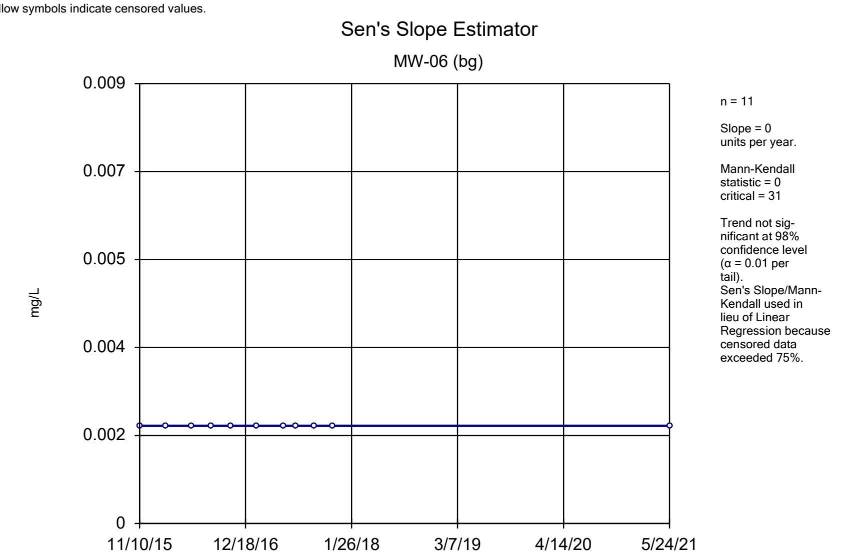


Constituent: Thallium Analysis Run 10/7/2021 1:11 PM

Will County Generating Station Client: NRG Data: Will County

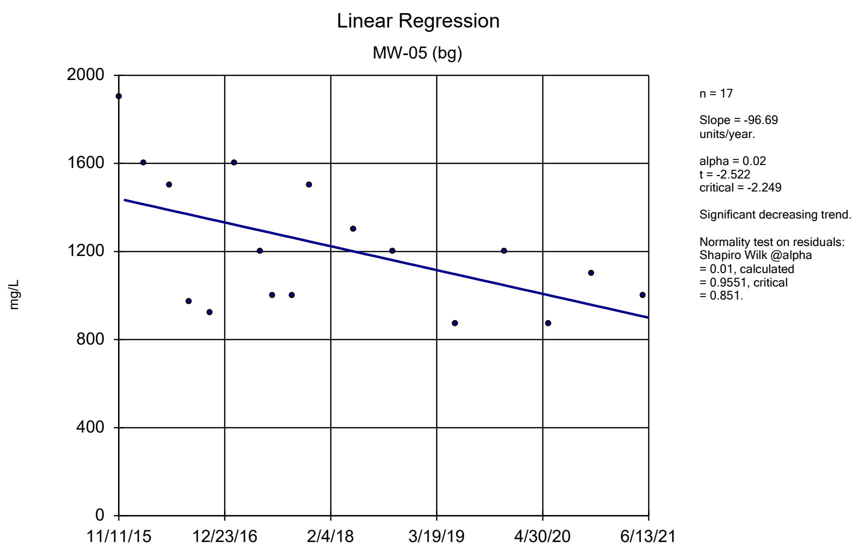
Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Hollow symbols indicate censored values.



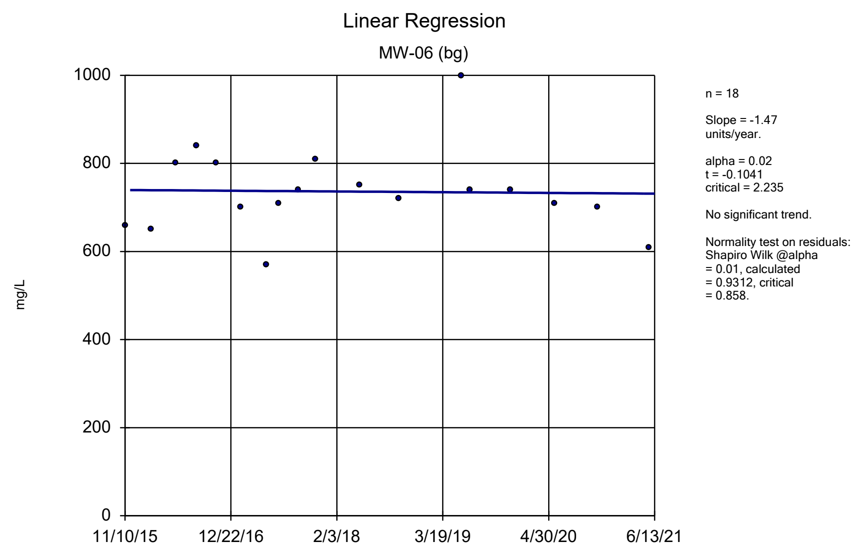
Constituent: Thallium Analysis Run 10/7/2021 1:11 PM

Will County Generating Station Client: NRG Data: Will County



Constituent: Total Dissolved Solids Analysis Run 10/7/2021 1:11 PM
Will County Generating Station Client: NRG Data: Will County

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG



Constituent: Total Dissolved Solids Analysis Run 10/7/2021 1:11 PM
Will County Generating Station Client: NRG Data: Will County

Trend Test Will Co UG Wells Turbidity

Will County Generating Station   Client: NRG   Data: Will County   Printed 10/7/2021, 11:38 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Turbidity (NTU)	MW-05 (bg)	4.104	2.274	2.449	No	10	0	Yes	no	0.02	Param.
Turbidity (NTU)	MW-06 (bg)	-3.67	-0.4362	2.449	No	10	0	Yes	no	0.02	Param.

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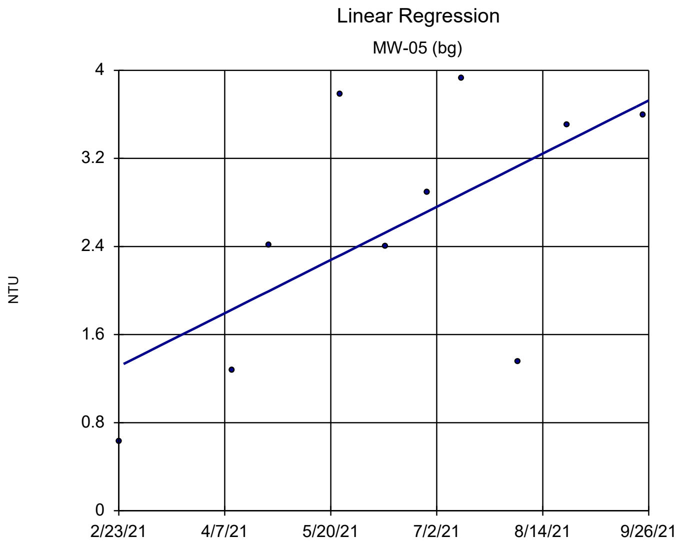

n = 10

Slope = 4.104 units/year.

alpha = 0.02
t = 2.274
critical = 2.449

No significant trend.

Normality test on residuals: Shapiro Wilk @alpha = 0.01, calculated = 0.9693, critical = 0.781.

Constituent: Turbidity Analysis Run 10/7/2021 11:37 AM

Will County Generating Station Client: NRG Data: Will County

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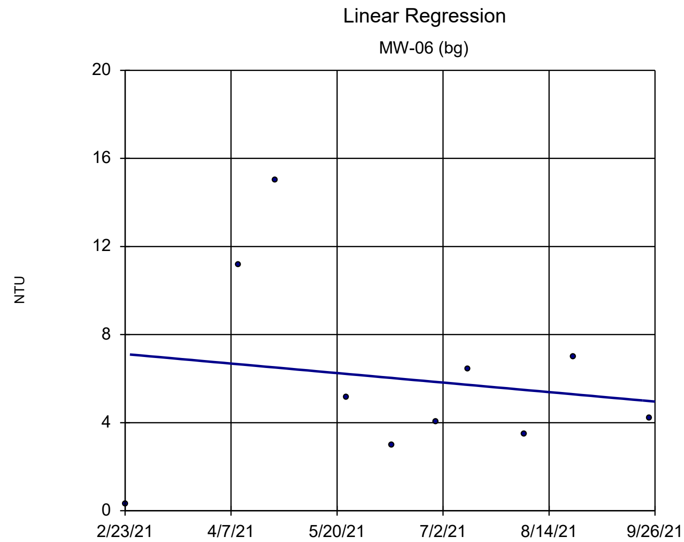


n = 10

Slope = -3.67 units/year.

alpha = 0.02
t = -0.4362
critical = 2.449

No significant trend.

Normality test on residuals: Shapiro Wilk @alpha = 0.01, calculated = 0.955, critical = 0.781.

Constituent: Turbidity Analysis Run 10/7/2021 11:37 AM

Will County Generating Station Client: NRG Data: Will County

Will Co 2S 3S MW-5 and MW-6 Analysis of Variance

Will County Generating Station   Client: NRG   Data: Will County   Printed 8/6/2021, 5:09 PM

Constituent	Well	Calc.	Crit.	Sig.	Alpha	Transform	ANOVA Sig.	Alpha	Method
Arsenic (mg/L)	n/a	n/a	n/a	n/a	n/a	No	No	0.05	Param.
Barium (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	Param.
Boron (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	Param.
Calcium (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	NP (eq. var.)
Chloride (mg/L)	n/a	n/a	n/a	n/a	n/a	No	No	0.05	Param.
Combined Radium 226 + 228 (pCi/L)	n/a	n/a	n/a	n/a	n/a	x^2	No	0.05	Param.
Fluoride (mg/L)	n/a	n/a	n/a	n/a	n/a	sqrt(x)	Yes	0.05	Param.
Lead (mg/L)	n/a	n/a	n/a	n/a	n/a	No	No	0.05	NP (NDs)
Lithium (mg/L)	n/a	n/a	n/a	n/a	n/a	No	No	0.05	NP (normality)
Molybdenum (mg/L)	n/a	n/a	n/a	n/a	n/a	sqrt(x)	Yes	0.05	Param.
pH (n/a)	n/a	n/a	n/a	n/a	n/a	No	No	0.05	NP (normality)
Selenium (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	NP (eq. var.)
Sulfate (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	Param.
Total Dissolved Solids (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	NP (eq. var.)

Parametric ANOVA

Constituent: Arsenic   Analysis Run 8/6/2021 5:09 PM

Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 5/24/2021 the parametric analysis of variance test indicates NO VARIATION at the 5% significance level. Because the calculated F statistic is less than or equal to the tabulated F statistic, the hypothesis of a single homogeneous population is accepted.

Calculated F statistic = 0.9454

Tabulated F statistic = 4.35 with 1 and 20 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.09915	1	0.09915	8.492
Error Within Groups	0.3853	33	0.01168	
Total	0.4844	34		

The Shapiro Wilk normality test on the residuals passed on the raw data. Alpha = 0.05, calculated = 0.9691, critical = 0.911. Levene's Equality of Variance test passed. Calculated = 3.22, tabulated = 4.35.

Parametric ANOVA

Constituent: Barium Analysis Run 8/6/2021 5:09 PM
Will County Generating Station Client: NRG Data: Will County

For observations made between 11/10/2015 and 5/24/2021 the parametric analysis of variance test indicates VARIATION at the 5% significance level. Because the calculated F statistic is greater than the tabulated F statistic, the hypothesis of a single homogeneous population is rejected.

Calculated F statistic = 10.47

Tabulated F statistic = 4.35 with 1 and 20 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.09915	1	0.09915	8.492
Error Within Groups	0.3853	33	0.01168	
Total	0.4844	34		

The Shapiro Wilk normality test on the residuals passed on the raw data. Alpha = 0.05, calculated = 0.9564, critical = 0.911. Levene's Equality of Variance test passed. Calculated = 0.1616, tabulated = 4.35.

Parametric ANOVA

Constituent: Boron   Analysis Run 8/6/2021 5:09 PM

Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 5/24/2021 the parametric analysis of variance test indicates VARIATION at the 5% significance level. Because the calculated F statistic is greater than the tabulated F statistic, the hypothesis of a single homogeneous population is rejected.

Calculated F statistic = 29.18

Tabulated F statistic = 4.143 with 1 and 33 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.09915	1	0.09915	8.492
Error Within Groups	0.3853	33	0.01168	
Total	0.4844	34		

The Shapiro Wilk normality test on the residuals passed on the raw data. Alpha = 0.05, calculated = 0.9509, critical = 0.934. Levene's Equality of Variance test passed. Calculated = 1.336, tabulated = 4.143.

Non-Parametric ANOVA

Constituent: Calcium   Analysis Run 8/6/2021 5:09 PM
Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 5/24/2021, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 4.346

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 4.342
Adjusted Kruskal-Wallis statistic (H') = 4.346

Parametric ANOVA

Constituent: Chloride   Analysis Run 8/6/2021 5:09 PM

Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 5/24/2021 the parametric analysis of variance test indicates NO VARIATION at the 5% significance level. Because the calculated F statistic is less than or equal to the tabulated F statistic, the hypothesis of a single homogeneous population is accepted.

Calculated F statistic = 0.5003

Tabulated F statistic = 4.152 with 1 and 32 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.09915	1	0.09915	8.492
Error Within Groups	0.3853	33	0.01168	
Total	0.4844	34		

The Shapiro Wilk normality test on the residuals passed on the raw data. Alpha = 0.05, calculated = 0.9604, critical = 0.933. Levene's Equality of Variance test passed. Calculated = 2.069, tabulated = 4.152.

Parametric ANOVA

Constituent: Combined Radium 226 + 228   Analysis Run 8/6/2021 5:09 PM
Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 11/16/2017 the parametric analysis of variance test (after square transformation) indicates NO VARIATION at the 5% significance level. Because the calculated F statistic is less than or equal to the tabulated F statistic, the hypothesis of a single homogeneous population is accepted.

Calculated F statistic = 0.05612

Tabulated F statistic = 4.41 with 1 and 18 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.09915	1	0.09915	8.492
Error Within Groups	0.3853	33	0.01168	
Total	0.4844	34		

The Shapiro Wilk normality test on the residuals passed after square transformation. Alpha = 0.05, calculated = 0.9231, critical = 0.905. Levene's Equality of Variance test passed. Calculated = 0.1805, tabulated = 4.41.

Parametric ANOVA

Constituent: Fluoride   Analysis Run 8/6/2021 5:09 PM
Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 5/24/2021 the parametric analysis of variance test (after square root transformation) indicates VARIATION at the 5% significance level. Because the calculated F statistic is greater than the tabulated F statistic, the hypothesis of a single homogeneous population is rejected.

Calculated F statistic = 7.069

Tabulated F statistic = 4.152 with 1 and 32 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.09915	1	0.09915	8.492
Error Within Groups	0.3853	33	0.01168	
Total	0.4844	34		

The Shapiro Wilk normality test on the residuals passed after square root transformation. Alpha = 0.05, calculated = 0.9705, critical = 0.933. Levene's Equality of Variance test passed. Calculated = 3.548, tabulated = 4.152.

Non-Parametric ANOVA

Constituent: Lead   Analysis Run 8/6/2021 5:09 PM
Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 5/24/2021, the non-parametric analysis of variance test indicates NO DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 1

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.1304
Adjusted Kruskal-Wallis statistic (H') = 1

Non-Parametric ANOVA

Constituent: Lithium   Analysis Run 8/6/2021 5:09 PM
Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 5/24/2021, the non-parametric analysis of variance test indicates NO DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 1.2

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 7 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 1.174
Adjusted Kruskal-Wallis statistic (H') = 1.2

Parametric ANOVA

Constituent: Molybdenum   Analysis Run 8/6/2021 5:09 PM
Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 5/24/2021 the parametric analysis of variance test (after square root transformation) indicates VARIATION at the 5% significance level. Because the calculated F statistic is greater than the tabulated F statistic, the hypothesis of a single homogeneous population is rejected.

Calculated F statistic = 22.59

Tabulated F statistic = 4.35 with 1 and 20 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.09915	1	0.09915	8.492
Error Within Groups	0.3853	33	0.01168	
Total	0.4844	34		

The Shapiro Wilk normality test on the residuals passed after square root transformation. Alpha = 0.05, calculated = 0.9771, critical = 0.911. Levene's Equality of Variance test passed. Calculated = 1.775, tabulated = 4.35.

Non-Parametric ANOVA

Constituent: pH   Analysis Run 8/6/2021 5:09 PM

Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 5/24/2021, the non-parametric analysis of variance test indicates NO DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 2.946

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 2.946
Adjusted Kruskal-Wallis statistic (H') = 2.946

Non-Parametric ANOVA

Constituent: Selenium   Analysis Run 8/6/2021 5:09 PM

Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 5/24/2021, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 8.65

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 7.248
Adjusted Kruskal-Wallis statistic (H') = 8.65

Parametric ANOVA

Constituent: Sulfate Analysis Run 8/6/2021 5:09 PM
Will County Generating Station Client: NRG Data: Will County

For observations made between 11/10/2015 and 5/24/2021 the parametric analysis of variance test indicates VARIATION at the 5% significance level. Because the calculated F statistic is greater than the tabulated F statistic, the hypothesis of a single homogeneous population is rejected.

Calculated F statistic = 38.53

Tabulated F statistic = 4.143 with 1 and 33 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.09915	1	0.09915	8.492
Error Within Groups	0.3853	33	0.01168	
Total	0.4844	34		

The Shapiro Wilk normality test on the residuals passed on the raw data. Alpha = 0.05, calculated = 0.9485, critical = 0.934. Levene's Equality of Variance test passed. Calculated = 3.301, tabulated = 4.143.

Non-Parametric ANOVA

Constituent: Total Dissolved Solids   Analysis Run 8/6/2021 5:09 PM
Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 5/24/2021, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 23.78

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 9 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 23.7
Adjusted Kruskal-Wallis statistic (H') = 23.78

Will Co 2S 3S MW-5 and MW-6 8 rounds (initial 8 rounds of data) Analysis of Variance

Will County Generating Station   Client: NRG   Data: Will County   Printed 8/7/2021, 11:47 AM

Constituent	Well	Calc.	Crit.	Sig.	Alpha	Transform	ANOVA Sig.	Alpha	Method
Arsenic (mg/L)	n/a	n/a	n/a	n/a	n/a	No	No	0.05	Param.
Barium (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	Param.
Boron (mg/L)	n/a	n/a	n/a	n/a	n/a	sqrt(x)	Yes	0.05	Param.
Calcium (mg/L)	n/a	n/a	n/a	n/a	n/a	No	No	0.05	NP (eq. var.)
Chloride (mg/L)	n/a	n/a	n/a	n/a	n/a	No	No	0.05	Param.
Combined Radium 226 + 228 (pCi/L)	n/a	n/a	n/a	n/a	n/a	x^2	No	0.05	Param.
Fluoride (mg/L)	n/a	n/a	n/a	n/a	n/a	No	No	0.05	NP (eq. var.)
Lead (mg/L)	n/a	n/a	n/a	n/a	n/a	No	No	0.05	NP (NDs)
Lithium (mg/L)	n/a	n/a	n/a	n/a	n/a	No	No	0.05	NP (eq. var.)
Molybdenum (mg/L)	n/a	n/a	n/a	n/a	n/a	sqrt(x)	Yes	0.05	Param.
pH (n/a)	n/a	n/a	n/a	n/a	n/a	x^3	No	0.05	Param.
Selenium (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	NP (eq. var.)
Sulfate (mg/L)	n/a	n/a	n/a	n/a	n/a	x^(1/3)	Yes	0.05	Param.
Total Dissolved Solids (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	NP (eq. var.)

Parametric ANOVA

Constituent: Arsenic   Analysis Run 8/7/2021 11:47 AM

Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 6/27/2017 the parametric analysis of variance test indicates NO VARIATION at the 5% significance level. Because the calculated F statistic is less than or equal to the tabulated F statistic, the hypothesis of a single homogeneous population is accepted.

Calculated F statistic = 1.163

Tabulated F statistic = 4.6 with 1 and 14 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.07756	1	0.07756	10.04
Error Within Groups	0.1081	14	0.007721	
Total	0.1857	15		

The Shapiro Wilk normality test on the residuals passed on the raw data. Alpha = 0.05, calculated = 0.9291, critical = 0.887. Levene's Equality of Variance test passed. Calculated = 1.63, tabulated = 4.6.

Parametric ANOVA

Constituent: Barium Analysis Run 8/7/2021 11:47 AM
Will County Generating Station Client: NRG Data: Will County

For observations made between 11/10/2015 and 6/27/2017 the parametric analysis of variance test indicates VARIATION at the 5% significance level. Because the calculated F statistic is greater than the tabulated F statistic, the hypothesis of a single homogeneous population is rejected.

Calculated F statistic = 6.588

Tabulated F statistic = 4.6 with 1 and 14 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.07756	1	0.07756	10.04
Error Within Groups	0.1081	14	0.007721	
Total	0.1857	15		

The Shapiro Wilk normality test on the residuals passed on the raw data. Alpha = 0.05, calculated = 0.9302, critical = 0.887. Levene's Equality of Variance test passed. Calculated = 0.04837, tabulated = 4.6.

Parametric ANOVA

Constituent: Boron Analysis Run 8/7/2021 11:47 AM
Will County Generating Station Client: NRG Data: Will County

For observations made between 11/10/2015 and 6/27/2017 the parametric analysis of variance test (after square root transformation) indicates VARIATION at the 5% significance level. Because the calculated F statistic is greater than the tabulated F statistic, the hypothesis of a single homogeneous population is rejected.

Calculated F statistic = 11.83

Tabulated F statistic = 4.6 with 1 and 14 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.07756	1	0.07756	10.04
Error Within Groups	0.1081	14	0.007721	
Total	0.1857	15		

The Shapiro Wilk normality test on the residuals passed after square root transformation. Alpha = 0.05, calculated = 0.8964, critical = 0.887. Levene's Equality of Variance test passed. Calculated = 0.8638, tabulated = 4.6.

Non-Parametric ANOVA

Constituent: Calcium   Analysis Run 8/7/2021 11:47 AM
Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 6/27/2017, the non-parametric analysis of variance test indicates NO DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 2.485

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 2.482
Adjusted Kruskal-Wallis statistic (H') = 2.485

Parametric ANOVA

Constituent: Chloride   Analysis Run 8/7/2021 11:47 AM
Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 6/27/2017 the parametric analysis of variance test indicates NO VARIATION at the 5% significance level. Because the calculated F statistic is less than or equal to the tabulated F statistic, the hypothesis of a single homogeneous population is accepted.

Calculated F statistic = 0.8546

Tabulated F statistic = 4.6 with 1 and 14 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.07756	1	0.07756	10.04
Error Within Groups	0.1081	14	0.007721	
Total	0.1857	15		

The Shapiro Wilk normality test on the residuals passed on the raw data. Alpha = 0.05, calculated = 0.9503, critical = 0.887. Levene's Equality of Variance test passed. Calculated = 0.001547, tabulated = 4.6.

Parametric ANOVA

Constituent: Combined Radium 226 + 228   Analysis Run 8/7/2021 11:47 AM
Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 6/27/2017 the parametric analysis of variance test (after square transformation) indicates NO VARIATION at the 5% significance level. Because the calculated F statistic is less than or equal to the tabulated F statistic, the hypothesis of a single homogeneous population is accepted.

Calculated F statistic = 0.03347

Tabulated F statistic = 4.6 with 1 and 14 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.07756	1	0.07756	10.04
Error Within Groups	0.1081	14	0.007721	
Total	0.1857	15		

The Shapiro Wilk normality test on the residuals passed after square transformation. Alpha = 0.05, calculated = 0.9097, critical = 0.887. Levene's Equality of Variance test passed. Calculated = 0.1646, tabulated = 4.6.

Non-Parametric ANOVA

Constituent: Fluoride   Analysis Run 8/7/2021 11:47 AM

Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 6/27/2017, the non-parametric analysis of variance test indicates NO DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 0.1361

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.1351
Adjusted Kruskal-Wallis statistic (H') = 0.1361

Non-Parametric ANOVA

Constituent: Lead   Analysis Run 8/7/2021 11:47 AM

Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 6/27/2017, the non-parametric analysis of variance test indicates NO DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 1

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.1765
Adjusted Kruskal-Wallis statistic (H') = 1

Non-Parametric ANOVA

Constituent: Lithium   Analysis Run 8/7/2021 11:47 AM

Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 6/27/2017, the non-parametric analysis of variance test indicates NO DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 1.375

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 5 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.

Kruskal-Wallis statistic (H) = 1.335

Adjusted Kruskal-Wallis statistic (H') = 1.375

Parametric ANOVA

Constituent: Molybdenum   Analysis Run 8/7/2021 11:47 AM
Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 6/27/2017 the parametric analysis of variance test (after square root transformation) indicates VARIATION at the 5% significance level. Because the calculated F statistic is greater than the tabulated F statistic, the hypothesis of a single homogeneous population is rejected.

Calculated F statistic = 16.59

Tabulated F statistic = 4.6 with 1 and 14 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.07756	1	0.07756	10.04
Error Within Groups	0.1081	14	0.007721	
Total	0.1857	15		

The Shapiro Wilk normality test on the residuals passed after square root transformation. Alpha = 0.05, calculated = 0.9629, critical = 0.887. Levene's Equality of Variance test passed. Calculated = 3.759, tabulated = 4.6.

Parametric ANOVA

Constituent: pH Analysis Run 8/7/2021 11:47 AM

Will County Generating Station Client: NRG Data: Will County

For observations made between 11/10/2015 and 6/27/2017 the parametric analysis of variance test (after cube transformation) indicates NO VARIATION at the 5% significance level. Because the calculated F statistic is less than or equal to the tabulated F statistic, the hypothesis of a single homogeneous population is accepted.

Calculated F statistic = 2.001

Tabulated F statistic = 4.6 with 1 and 14 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.07756	1	0.07756	10.04
Error Within Groups	0.1081	14	0.007721	
Total	0.1857	15		

The Shapiro Wilk normality test on the residuals passed after cube transformation. Alpha = 0.05, calculated = 0.9444, critical = 0.887. Levene's Equality of Variance test passed. Calculated = 3.904, tabulated = 4.6.

Non-Parametric ANOVA

Constituent: Selenium   Analysis Run 8/7/2021 11:47 AM
Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 6/27/2017, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 3.877

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 3.188
Adjusted Kruskal-Wallis statistic (H') = 3.877

Parametric ANOVA

Constituent: Sulfate   Analysis Run 8/7/2021 11:47 AM
Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 6/27/2017 the parametric analysis of variance test (after cube root transformation) indicates VARIATION at the 5% significance level. Because the calculated F statistic is greater than the tabulated F statistic, the hypothesis of a single homogeneous population is rejected.

Calculated F statistic = 44.68

Tabulated F statistic = 4.6 with 1 and 14 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.07756	1	0.07756	10.04
Error Within Groups	0.1081	14	0.007721	
Total	0.1857	15		

The Shapiro Wilk normality test on the residuals passed after cube root transformation. Alpha = 0.05, calculated = 0.9825, critical = 0.887. Levene's Equality of Variance test passed. Calculated = 4.5, tabulated = 4.6.

Non-Parametric ANOVA

Constituent: Total Dissolved Solids   Analysis Run 8/7/2021 11:47 AM
Will County Generating Station   Client: NRG   Data: Will County

For observations made between 11/10/2015 and 6/27/2017, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 11.33

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 11.29
Adjusted Kruskal-Wallis statistic (H') = 11.33

ANOVA Will Co UG Wells - Turbidity

Will County Generating Station   Client: NRG   Data: Will County   Printed 10/7/2021, 11:37 AM

Constituent	Well	Calc.	Crit.	Sig.	Alpha	Transform	ANOVA Sig.	Alpha	Method
Turbidity (NTU)	n/a	n/a	n/a	n/a	n/a	sqrt(x)	Yes	0.05	Param.

Parametric ANOVA

Constituent: Turbidity   Analysis Run 10/7/2021 11:37 AM
Will County Generating Station   Client: NRG   Data: Will County

For observations made between 2/23/2021 and 9/24/2021 the parametric analysis of variance test (after square root transformation) indicates VARIATION at the 5% significance level. Because the calculated F statistic is greater than the tabulated F statistic, the hypothesis of a single homogeneous population is rejected.

Calculated F statistic = 5.38

Tabulated F statistic = 4.41 with 1 and 18 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	2.671	1	2.671	5.38
Error Within Groups	8.938	18	0.4966	
Total	11.61	19		

The Shapiro Wilk normality test on the residuals passed after square root transformation. Alpha = 0.05, calculated = 0.9469, critical = 0.905. Levene's Equality of Variance test passed. Calculated = 2.631, tabulated = 4.41.

Shapiro-Wilk Normality Test

Constituent: Antimony Analysis Run 8/6/2021 4:50 PM

Will County Generating Station Client: NRG Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-06 (bg) (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-09 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-10 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-11 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-12 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
Pooled Background (bg) (n = 22, alpha = 0.05)				
	no	-1	0.911	No

Shapiro-Wilk Normality Test

Constituent: Antimony   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 22, alpha = 0.05) cont.				
	square root	-1	0.911	No
	square	-1	0.911	No
	cube root	0	0.911	No
	cube	-1	0.911	No
	natural log	0	0.911	No
	x^4	-1	0.911	No
	x^5	-1	0.911	No
	x^6	-1	0.911	No

Shapiro-Wilk Normality Test

Constituent: Arsenic   Analysis Run 8/6/2021 4:50 PM
Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 11, alpha = 0.05)				
	no	0.9389	0.85	Yes
	square root	0.9376	0.85	Yes
	square	0.9159	0.85	Yes
	cube root	0.9348	0.85	Yes
	cube	0.8734	0.85	Yes
	natural log	0.9255	0.85	Yes
	x^4	0.8245	0.85	No
	x^5	0.7759	0.85	No
	x^6	0.731	0.85	No
MW-06 (bg) (n = 11, alpha = 0.05)				
	no	0.9168	0.85	Yes
	square root	0.9403	0.85	Yes
	square	0.8252	0.85	No
	cube root	0.9443	0.85	Yes
	cube	0.7076	0.85	No
	natural log	0.9467	0.85	Yes
	x^4	0.6008	0.85	No
	x^5	0.5196	0.85	No
	x^6	0.4627	0.85	No
MW-09 (n = 11, alpha = 0.05)				
	no	0.8736	0.85	Yes
	square root	0.809	0.85	No
	square	0.9165	0.85	Yes
	cube root	0.7826	0.85	No
	cube	0.8727	0.85	Yes
	natural log	0.7258	0.85	No
	x^4	0.8026	0.85	No
	x^5	0.7363	0.85	No
	x^6	0.6807	0.85	No
MW-10 (n = 11, alpha = 0.05)				
	no	0.8289	0.85	No
	square root	0.9087	0.85	Yes
	square	0.653	0.85	No
	cube root	0.9272	0.85	Yes
	cube	0.533	0.85	No
	natural log	0.9458	0.85	Yes
	x^4	0.4626	0.85	No
	x^5	0.4207	0.85	No
	x^6	0.3948	0.85	No
MW-11 (n = 11, alpha = 0.05)				
	no	0.7927	0.85	No
	square root	0.8347	0.85	No
	square	0.7065	0.85	No
	cube root	0.8481	0.85	No
	cube	0.6276	0.85	No
	natural log	0.8732	0.85	Yes
	x^4	0.5622	0.85	No
	x^5	0.5108	0.85	No
	x^6	0.4716	0.85	No
MW-12 (n = 11, alpha = 0.05)				
	no	0.4743	0.85	No
	square root	0.5311	0.85	No
	square	0.4011	0.85	No
	cube root	0.553	0.85	No
	cube	0.3671	0.85	No
	natural log	0.6004	0.85	No
	x^4	0.3532	0.85	No
	x^5	0.3479	0.85	No
	x^6	0.3461	0.85	No
Pooled Background (bg) (n = 22, alpha = 0.05)				
	no	0.9427	0.911	Yes

Shapiro-Wilk Normality Test

Constituent: Arsenic   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 22, alpha = 0.05) cont.				
	square root	0.958	0.911	Yes
	square	0.881	0.911	No
	cube root	0.96	0.911	Yes
	cube	0.8034	0.911	No
	natural log	0.9589	0.911	Yes
	x^4	0.7304	0.911	No
	x^5	0.669	0.911	No
	x^6	0.619	0.911	No

Shapiro-Wilk Normality Test

Constituent: Barium   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 11, alpha = 0.05)				
	no	0.9677	0.85	Yes
	square root	0.9612	0.85	Yes
	square	0.963	0.85	Yes
	cube root	0.9576	0.85	Yes
	cube	0.9412	0.85	Yes
	natural log	0.9479	0.85	Yes
	x^4	0.9099	0.85	Yes
	x^5	0.8748	0.85	Yes
	x^6	0.8397	0.85	No
MW-06 (bg) (n = 11, alpha = 0.05)				
	no	0.9254	0.85	Yes
	square root	0.9075	0.85	Yes
	square	0.951	0.85	Yes
	cube root	0.9008	0.85	Yes
	cube	0.9617	0.85	Yes
	natural log	0.8867	0.85	Yes
	x^4	0.958	0.85	Yes
	x^5	0.9422	0.85	Yes
	x^6	0.9173	0.85	Yes
MW-09 (n = 11, alpha = 0.05)				
	no	0.6824	0.85	No
	square root	0.7851	0.85	No
	square	0.5172	0.85	No
	cube root	0.8184	0.85	No
	cube	0.426	0.85	No
	natural log	0.8779	0.85	Yes
	x^4	0.3824	0.85	No
	x^5	0.3623	0.85	No
	x^6	0.3531	0.85	No
MW-10 (n = 11, alpha = 0.05)				
	no	0.7592	0.85	No
	square root	0.795	0.85	No
	square	0.6863	0.85	No
	cube root	0.8065	0.85	No
	cube	0.6178	0.85	No
	natural log	0.8287	0.85	No
	x^4	0.5583	0.85	No
	x^5	0.5095	0.85	No
	x^6	0.4708	0.85	No
MW-11 (n = 11, alpha = 0.05)				
	no	0.8882	0.85	Yes
	square root	0.8952	0.85	Yes
	square	0.8718	0.85	Yes
	cube root	0.8974	0.85	Yes
	cube	0.8533	0.85	Yes
	natural log	0.9013	0.85	Yes
	x^4	0.8339	0.85	No
	x^5	0.8145	0.85	No
	x^6	0.7955	0.85	No
MW-12 (n = 11, alpha = 0.05)				
	no	0.8021	0.85	No
	square root	0.7311	0.85	No
	square	0.9032	0.85	Yes
	cube root	0.7058	0.85	No
	cube	0.9448	0.85	Yes
	natural log	0.6546	0.85	No
	x^4	0.9476	0.85	Yes
	x^5	0.9313	0.85	Yes
	x^6	0.9068	0.85	Yes
Pooled Background (bg) (n = 22, alpha = 0.05)				
	no	0.9709	0.911	Yes

Shapiro-Wilk Normality Test

Constituent: Barium   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 22, alpha = 0.05) cont.				
	square root	0.9598	0.911	Yes
	square	0.9735	0.911	Yes
	cube root	0.9545	0.911	Yes
	cube	0.9558	0.911	Yes
	natural log	0.9411	0.911	Yes
	x^4	0.9242	0.911	Yes
	x^5	0.8832	0.911	No
	x^6	0.8367	0.911	No

Shapiro-Wilk Normality Test

Constituent: Beryllium   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-06 (bg) (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-09 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-10 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-11 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-12 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
Pooled Background (bg) (n = 22, alpha = 0.05)				
	no	-1	0.911	No

Shapiro-Wilk Normality Test

Constituent: Beryllium   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 22, alpha = 0.05) cont.				
	square root	0	0.911	No
	square	-1	0.911	No
	cube root	0	0.911	No
	cube	-1	0.911	No
	natural log	0	0.911	No
	x^4	-1	0.911	No
	x^5	-1	0.911	No
	x^6	-1	0.911	No

Shapiro-Wilk Normality Test

Constituent: Boron   Analysis Run 8/6/2021 4:50 PM
Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 17, alpha = 0.05)				
	no	0.9077	0.892	Yes
	square root	0.9165	0.892	Yes
	square	0.877	0.892	No
	cube root	0.9185	0.892	Yes
	cube	0.8297	0.892	No
	natural log	0.9213	0.892	Yes
	x^4	0.7692	0.892	No
	x^5	0.7017	0.892	No
	x^6	0.6335	0.892	No
MW-06 (bg) (n = 18, alpha = 0.05)				
	no	0.9725	0.897	Yes
	square root	0.9761	0.897	Yes
	square	0.9557	0.897	Yes
	cube root	0.9766	0.897	Yes
	cube	0.928	0.897	Yes
	natural log	0.9763	0.897	Yes
	x^4	0.8923	0.897	No
	x^5	0.852	0.897	No
	x^6	0.8098	0.897	No
MW-09 (n = 17, alpha = 0.05)				
	no	0.9774	0.892	Yes
	square root	0.9831	0.892	Yes
	square	0.9462	0.892	Yes
	cube root	0.9835	0.892	Yes
	cube	0.8931	0.892	Yes
	natural log	0.9818	0.892	Yes
	x^4	0.8259	0.892	No
	x^5	0.753	0.892	No
	x^6	0.681	0.892	No
MW-10 (n = 17, alpha = 0.05)				
	no	0.9545	0.892	Yes
	square root	0.9547	0.892	Yes
	square	0.9466	0.892	Yes
	cube root	0.9542	0.892	Yes
	cube	0.9303	0.892	Yes
	natural log	0.9522	0.892	Yes
	x^4	0.9074	0.892	Yes
	x^5	0.8794	0.892	No
	x^6	0.8478	0.892	No
MW-11 (n = 17, alpha = 0.05)				
	no	0.9208	0.892	Yes
	square root	0.9371	0.892	Yes
	square	0.8804	0.892	No
	cube root	0.9418	0.892	Yes
	cube	0.834	0.892	No
	natural log	0.95	0.892	Yes
	x^4	0.786	0.892	No
	x^5	0.7393	0.892	No
	x^6	0.6955	0.892	No
MW-12 (n = 17, alpha = 0.05)				
	no	0.9292	0.892	Yes
	square root	0.9327	0.892	Yes
	square	0.9191	0.892	Yes
	cube root	0.9336	0.892	Yes
	cube	0.9046	0.892	Yes
	natural log	0.935	0.892	Yes
	x^4	0.8862	0.892	No
	x^5	0.8645	0.892	No
	x^6	0.84	0.892	No
Pooled Background (bg) (n = 35, alpha = 0.05)				
	no	0.966	0.934	Yes

Shapiro-Wilk Normality Test

Constituent: Boron Analysis Run 8/6/2021 4:50 PM

Will County Generating Station Client: NRG Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 35, alpha = 0.05) cont.				
	square root	0.9774	0.934	Yes
	square	0.9214	0.934	No
	cube root	0.9795	0.934	Yes
	cube	0.8515	0.934	No
	natural log	0.9813	0.934	Yes
	x^4	0.7643	0.934	No
	x^5	0.67	0.934	No
	x^6	0.5785	0.934	No

Shapiro-Wilk Normality Test

Constituent: Cadmium   Analysis Run 8/6/2021 4:50 PM
Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-06 (bg) (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-09 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-10 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-11 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-12 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
Pooled Background (bg) (n = 22, alpha = 0.05)				
	no	-1	0.911	No

Shapiro-Wilk Normality Test

Constituent: Cadmium   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 22, alpha = 0.05) cont.				
	square root	0	0.911	No
	square	-1	0.911	No
	cube root	0	0.911	No
	cube	-1	0.911	No
	natural log	-1	0.911	No
	x^4	-1	0.911	No
	x^5	-1	0.911	No
	x^6	-1	0.911	No

Shapiro-Wilk Normality Test

Constituent: Calcium   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 17, alpha = 0.05)				
	no	0.9526	0.892	Yes
	square root	0.9499	0.892	Yes
	square	0.9153	0.892	Yes
	cube root	0.9452	0.892	Yes
	cube	0.8482	0.892	No
	natural log	0.9301	0.892	Yes
	x^4	0.7773	0.892	No
	x^5	0.7138	0.892	No
	x^6	0.6599	0.892	No
MW-06 (bg) (n = 17, alpha = 0.05)				
	no	0.9829	0.892	Yes
	square root	0.9752	0.892	Yes
	square	0.9755	0.892	Yes
	cube root	0.9708	0.892	Yes
	cube	0.943	0.892	Yes
	natural log	0.9593	0.892	Yes
	x^4	0.8935	0.892	Yes
	x^5	0.8347	0.892	No
	x^6	0.7728	0.892	No
MW-09 (n = 17, alpha = 0.05)				
	no	0.5946	0.892	No
	square root	0.7075	0.892	No
	square	0.4237	0.892	No
	cube root	0.7458	0.892	No
	cube	0.334	0.892	No
	natural log	0.8181	0.892	No
	x^4	0.293	0.892	No
	x^5	0.2752	0.892	No
	x^6	0.2676	0.892	No
MW-10 (n = 17, alpha = 0.05)				
	no	0.9612	0.892	Yes
	square root	0.9586	0.892	Yes
	square	0.9555	0.892	Yes
	cube root	0.957	0.892	Yes
	cube	0.9357	0.892	Yes
	natural log	0.9526	0.892	Yes
	x^4	0.9032	0.892	Yes
	x^5	0.8606	0.892	No
	x^6	0.8113	0.892	No
MW-11 (n = 17, alpha = 0.05)				
	no	0.9729	0.892	Yes
	square root	0.9808	0.892	Yes
	square	0.9492	0.892	Yes
	cube root	0.9827	0.892	Yes
	cube	0.9166	0.892	Yes
	natural log	0.9857	0.892	Yes
	x^4	0.8775	0.892	No
	x^5	0.8345	0.892	No
	x^6	0.7899	0.892	No
MW-12 (n = 17, alpha = 0.05)				
	no	0.8692	0.892	No
	square root	0.7975	0.892	No
	square	0.9404	0.892	Yes
	cube root	0.7692	0.892	No
	cube	0.9367	0.892	Yes
	natural log	0.7087	0.892	No
	x^4	0.9009	0.892	Yes
	x^5	0.8573	0.892	No
	x^6	0.8144	0.892	No
Pooled Background (bg) (n = 34, alpha = 0.05)				
	no	0.8817	0.933	No

Shapiro-Wilk Normality Test

Constituent: Calcium   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 34, alpha = 0.05) cont.				
	square root	0.9321	0.933	No
	square	0.7648	0.933	No
	cube root	0.9456	0.933	Yes
	cube	0.6598	0.933	No
	natural log	0.9659	0.933	Yes
	x^4	0.5775	0.933	No
	x^5	0.5149	0.933	No
	x^6	0.4669	0.933	No

Shapiro-Wilk Normality Test

Constituent: Chloride   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 17, alpha = 0.05)				
	no	0.8967	0.892	Yes
	square root	0.8917	0.892	No
	square	0.879	0.892	No
	cube root	0.8875	0.892	No
	cube	0.8429	0.892	No
	natural log	0.8753	0.892	No
	x^4	0.8041	0.892	No
	x^5	0.7687	0.892	No
	x^6	0.7378	0.892	No
MW-06 (bg) (n = 17, alpha = 0.05)				
	no	0.8905	0.892	No
	square root	0.951	0.892	Yes
	square	0.7228	0.892	No
	cube root	0.9654	0.892	Yes
	cube	0.5613	0.892	No
	natural log	0.9846	0.892	Yes
	x^4	0.4461	0.892	No
	x^5	0.3738	0.892	No
	x^6	0.3303	0.892	No
MW-09 (n = 17, alpha = 0.05)				
	no	0.9247	0.892	Yes
	square root	0.9278	0.892	Yes
	square	0.907	0.892	Yes
	cube root	0.9278	0.892	Yes
	cube	0.879	0.892	No
	natural log	0.9263	0.892	Yes
	x^4	0.8459	0.892	No
	x^5	0.8115	0.892	No
	x^6	0.7777	0.892	No
MW-10 (n = 17, alpha = 0.05)				
	no	0.855	0.892	No
	square root	0.9042	0.892	Yes
	square	0.7151	0.892	No
	cube root	0.9156	0.892	Yes
	cube	0.575	0.892	No
	natural log	0.9296	0.892	Yes
	x^4	0.4681	0.892	No
	x^5	0.3957	0.892	No
	x^6	0.3489	0.892	No
MW-11 (n = 17, alpha = 0.05)				
	no	0.9518	0.892	Yes
	square root	0.9686	0.892	Yes
	square	0.9017	0.892	Yes
	cube root	0.9727	0.892	Yes
	cube	0.8378	0.892	No
	natural log	0.9787	0.892	Yes
	x^4	0.7693	0.892	No
	x^5	0.7033	0.892	No
	x^6	0.6438	0.892	No
MW-12 (n = 17, alpha = 0.05)				
	no	0.9286	0.892	Yes
	square root	0.9524	0.892	Yes
	square	0.8434	0.892	No
	cube root	0.955	0.892	Yes
	cube	0.7524	0.892	No
	natural log	0.9506	0.892	Yes
	x^4	0.6767	0.892	No
	x^5	0.6184	0.892	No
	x^6	0.5746	0.892	No
Pooled Background (bg) (n = 34, alpha = 0.05)				
	no	0.9446	0.933	Yes

Shapiro-Wilk Normality Test

Constituent: Chloride   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 34, alpha = 0.05) cont.				
	square root	0.9601	0.933	Yes
	square	0.8667	0.933	No
	cube root	0.9608	0.933	Yes
	cube	0.756	0.933	No
	natural log	0.9556	0.933	Yes
	x^4	0.6419	0.933	No
	x^5	0.5401	0.933	No
	x^6	0.4562	0.933	No

Shapiro-Wilk Normality Test

Constituent: Chromium   Analysis Run 8/6/2021 4:50 PM
Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-06 (bg) (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-09 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-10 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-11 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-12 (n = 11, alpha = 0.05)				
	no	0.3451	0.85	No
	square root	0.3451	0.85	No
	square	0.3451	0.85	No
	cube root	0.3451	0.85	No
	cube	0.3451	0.85	No
	natural log	0.3451	0.85	No
	x^4	0.3451	0.85	No
	x^5	0.3451	0.85	No
	x^6	0.3451	0.85	No
Pooled Background (bg) (n = 22, alpha = 0.05)				
	no	-1	0.911	No

Shapiro-Wilk Normality Test

Constituent: Chromium   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 22, alpha = 0.05) cont.				
	square root	0	0.911	No
	square	-1	0.911	No
	cube root	0	0.911	No
	cube	-1	0.911	No
	natural log	0	0.911	No
	x^4	-1	0.911	No
	x^5	-1	0.911	No
	x^6	-1	0.911	No

Shapiro-Wilk Normality Test

Constituent: Cobalt Analysis Run 8/6/2021 4:50 PM

Will County Generating Station Client: NRG Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-06 (bg) (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-09 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-10 (n = 11, alpha = 0.05)				
	no	0.3451	0.85	No
	square root	0.3451	0.85	No
	square	0.3451	0.85	No
	cube root	0.3451	0.85	No
	cube	0.3451	0.85	No
	natural log	0.3451	0.85	No
	x^4	0.3451	0.85	No
	x^5	0.3451	0.85	No
	x^6	0.3451	0.85	No
MW-11 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-12 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
Pooled Background (bg) (n = 22, alpha = 0.05)				
	no	-1	0.911	No

Shapiro-Wilk Normality Test

Constituent: Cobalt   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 22, alpha = 0.05) cont.				
	square root	0	0.911	No
	square	-1	0.911	No
	cube root	0	0.911	No
	cube	-1	0.911	No
	natural log	0	0.911	No
	x^4	-1	0.911	No
	x^5	-1	0.911	No
	x^6	-1	0.911	No

Shapiro-Wilk Normality Test

Constituent: Combined Radium 226 + 228   Analysis Run 8/6/2021 4:50 PM
Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 10, alpha = 0.05)				
	no	0.6595	0.842	No
	square	0.9075	0.842	Yes
	cube root	0.4448	0.842	No
	cube	0.8698	0.842	Yes
	x^4	0.7781	0.842	No
	x^5	0.7027	0.842	No
	x^6	0.6345	0.842	No
MW-06 (bg) (n = 10, alpha = 0.05)				
	no	0.5819	0.842	No
	square	0.8879	0.842	Yes
	cube root	0.4354	0.842	No
	cube	0.8997	0.842	Yes
	x^4	0.8395	0.842	No
	x^5	0.9266	0.842	Yes
	x^6	0.7934	0.842	No
MW-09 (n = 10, alpha = 0.05)				
	no	0.7597	0.842	No
	square	0.907	0.842	Yes
	cube root	0.4873	0.842	No
	cube	0.8885	0.842	Yes
	x^4	0.8197	0.842	No
	x^5	0.7863	0.842	No
	x^6	0.7512	0.842	No
MW-10 (n = 10, alpha = 0.05)				
	no	0.8702	0.842	Yes
	square root	0.8615	0.842	Yes
	square	0.8431	0.842	Yes
	cube root	0.8559	0.842	Yes
	cube	0.764	0.842	No
	natural log	0.8419	0.842	No
	x^4	0.6678	0.842	No
	x^5	0.583	0.842	No
	x^6	0.5184	0.842	No
MW-11 (n = 10, alpha = 0.05)				
	no	0.9651	0.842	Yes
	square root	0.9672	0.842	Yes
	square	0.9441	0.842	Yes
	cube root	0.9663	0.842	Yes
	cube	0.9101	0.842	Yes
	natural log	0.9619	0.842	Yes
	x^4	0.8715	0.842	Yes
	x^5	0.8331	0.842	No
	x^6	0.7968	0.842	No
MW-12 (n = 10, alpha = 0.05)				
	no	0.8181	0.842	No
	square root	0.85	0.842	Yes
	square	0.7543	0.842	No
	cube root	0.8602	0.842	Yes
	cube	0.6969	0.842	No
	natural log	0.8795	0.842	Yes
	x^4	0.6477	0.842	No
	x^5	0.6059	0.842	No
	x^6	0.5705	0.842	No
Pooled Background (bg) (n = 20, alpha = 0.05)				
	no	0.6157	0.905	No
	square	0.9208	0.905	Yes
	cube root	0.4322	0.905	No
	cube	0.9261	0.905	Yes
	x^4	0.8212	0.905	No
	x^5	0.8247	0.905	No
	x^6	0.6936	0.905	No

Shapiro-Wilk Normality Test

Constituent: Fluoride Analysis Run 8/6/2021 4:50 PM
Will County Generating Station Client: NRG Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 17, alpha = 0.05)				
	no	0.9202	0.892	Yes
	square root	0.9299	0.892	Yes
	square	0.8836	0.892	No
	cube root	0.9318	0.892	Yes
	cube	0.8295	0.892	No
	natural log	0.9335	0.892	Yes
	x^4	0.7674	0.892	No
	x^5	0.7059	0.892	No
	x^6	0.6503	0.892	No
MW-06 (bg) (n = 17, alpha = 0.05)				
	no	0.9858	0.892	Yes
	square root	0.9914	0.892	Yes
	square	0.9406	0.892	Yes
	cube root	0.9904	0.892	Yes
	cube	0.864	0.892	No
	natural log	0.984	0.892	Yes
	x^4	0.7745	0.892	No
	x^5	0.6865	0.892	No
	x^6	0.6078	0.892	No
MW-09 (n = 17, alpha = 0.05)				
	no	0.8827	0.892	No
	square root	0.8982	0.892	Yes
	square	0.8009	0.892	No
	cube root	0.8994	0.892	Yes
	cube	0.6816	0.892	No
	natural log	0.8959	0.892	Yes
	x^4	0.5656	0.892	No
	x^5	0.4732	0.892	No
	x^6	0.4066	0.892	No
MW-10 (n = 17, alpha = 0.05)				
	no	0.9294	0.892	Yes
	square root	0.9131	0.892	Yes
	square	0.9511	0.892	Yes
	cube root	0.9068	0.892	Yes
	cube	0.9591	0.892	Yes
	natural log	0.893	0.892	Yes
	x^4	0.9555	0.892	Yes
	x^5	0.943	0.892	Yes
	x^6	0.9243	0.892	Yes
MW-11 (n = 17, alpha = 0.05)				
	no	0.9553	0.892	Yes
	square root	0.9514	0.892	Yes
	square	0.9581	0.892	Yes
	cube root	0.9497	0.892	Yes
	cube	0.9549	0.892	Yes
	natural log	0.9457	0.892	Yes
	x^4	0.9469	0.892	Yes
	x^5	0.935	0.892	Yes
	x^6	0.9202	0.892	Yes
MW-12 (n = 17, alpha = 0.05)				
	no	0.9036	0.892	Yes
	square root	0.8734	0.892	No
	square	0.9449	0.892	Yes
	cube root	0.8621	0.892	No
	cube	0.9598	0.892	Yes
	natural log	0.8377	0.892	No
	x^4	0.9514	0.892	Yes
	x^5	0.9256	0.892	Yes
	x^6	0.8881	0.892	No
Pooled Background (bg) (n = 34, alpha = 0.05)				
	no	0.9327	0.933	No

Shapiro-Wilk Normality Test

Constituent: Fluoride   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 34, alpha = 0.05) cont.				
	square root	0.9614	0.933	Yes
	square	0.851	0.933	No
	cube root	0.9684	0.933	Yes
	cube	0.7559	0.933	No
	natural log	0.9778	0.933	Yes
	x^4	0.6634	0.933	No
	x^5	0.5823	0.933	No
	x^6	0.5152	0.933	No

Shapiro-Wilk Normality Test

Constituent: Lead   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-06 (bg) (n = 11, alpha = 0.05)				
	no	0.3451	0.85	No
	square root	0.3451	0.85	No
	square	0.3451	0.85	No
	cube root	0.3451	0.85	No
	cube	0.3451	0.85	No
	natural log	0.3451	0.85	No
	x^4	0.3451	0.85	No
	x^5	0.3451	0.85	No
	x^6	-1	0.85	No
MW-09 (n = 11, alpha = 0.05)				
	no	0.5192	0.85	No
	square root	0.5543	0.85	No
	square	0.4564	0.85	No
	cube root	0.566	0.85	No
	cube	0.4106	0.85	No
	natural log	0.589	0.85	No
	x^4	0.3815	0.85	No
	x^5	0.3646	0.85	No
	x^6	0.3553	0.85	No
MW-10 (n = 11, alpha = 0.05)				
	no	0.4216	0.85	No
	square root	0.464	0.85	No
	square	0.3692	0.85	No
	cube root	0.4788	0.85	No
	cube	0.3514	0.85	No
	natural log	0.5064	0.85	No
	x^4	0.3467	0.85	No
	x^5	0.3455	0.85	No
	x^6	0.3452	0.85	No
MW-11 (n = 11, alpha = 0.05)				
	no	0.4092	0.85	No
	square root	0.4125	0.85	No
	square	0.403	0.85	No
	cube root	0.4136	0.85	No
	cube	0.397	0.85	No
	natural log	0.4157	0.85	No
	x^4	0.3914	0.85	No
	x^5	0.3862	0.85	No
	x^6	-1	0.85	No
MW-12 (n = 11, alpha = 0.05)				
	no	0.6785	0.85	No
	square root	0.6914	0.85	No
	square	0.6461	0.85	No
	cube root	0.6952	0.85	No
	cube	0.6074	0.85	No
	natural log	0.7018	0.85	No
	x^4	0.5664	0.85	No
	x^5	0.5267	0.85	No
	x^6	0.4908	0.85	No
Pooled Background (bg) (n = 22, alpha = 0.05)				
	no	0.2207	0.911	No

Shapiro-Wilk Normality Test

Constituent: Lead   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 22, alpha = 0.05) cont.				
	square root	0.2207	0.911	No
	square	0.2207	0.911	No
	cube root	0.2207	0.911	No
	cube	0.2207	0.911	No
	natural log	0.2207	0.911	No
	x^4	0.2207	0.911	No
	x^5	0.2207	0.911	No
	x^6	-1	0.911	No

Shapiro-Wilk Normality Test

Constituent: Lithium   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 11, alpha = 0.05)				
	no	0.8154	0.85	No
	square root	0.8231	0.85	No
	square	0.7869	0.85	No
	cube root	0.8247	0.85	No
	cube	0.7421	0.85	No
	natural log	0.8266	0.85	No
	x^4	0.6872	0.85	No
	x^5	0.6298	0.85	No
	x^6	0.5762	0.85	No
MW-06 (bg) (n = 11, alpha = 0.05)				
	no	0.8646	0.85	Yes
	square root	0.8724	0.85	Yes
	square	0.8472	0.85	No
	cube root	0.8749	0.85	Yes
	cube	0.8283	0.85	No
	natural log	0.8795	0.85	Yes
	x^4	0.8088	0.85	No
	x^5	0.7892	0.85	No
	x^6	0.7701	0.85	No
MW-09 (n = 11, alpha = 0.05)				
	no	0.3451	0.85	No
	square root	0.3451	0.85	No
	square	0.3451	0.85	No
	cube root	0.3451	0.85	No
	cube	0.3451	0.85	No
	natural log	0.3451	0.85	No
	x^4	0.3451	0.85	No
	x^5	0.3451	0.85	No
	x^6	0.3451	0.85	No
MW-10 (n = 11, alpha = 0.05)				
	no	0.8493	0.85	No
	square root	0.8479	0.85	No
	square	0.8499	0.85	No
	cube root	0.8473	0.85	No
	cube	0.8482	0.85	No
	natural log	0.8457	0.85	No
	x^4	0.8446	0.85	No
	x^5	0.8398	0.85	No
	x^6	0.834	0.85	No
MW-11 (n = 11, alpha = 0.05)				
	no	0.3451	0.85	No
	square root	0.3451	0.85	No
	square	0.3451	0.85	No
	cube root	0.3451	0.85	No
	cube	0.3451	0.85	No
	natural log	0.3451	0.85	No
	x^4	0.3451	0.85	No
	x^5	0.3451	0.85	No
	x^6	0.3451	0.85	No
MW-12 (n = 11, alpha = 0.05)				
	no	0.9471	0.85	Yes
	square root	0.9502	0.85	Yes
	square	0.9293	0.85	Yes
	cube root	0.9503	0.85	Yes
	cube	0.8998	0.85	Yes
	natural log	0.9489	0.85	Yes
	x^4	0.8634	0.85	Yes
	x^5	0.8242	0.85	No
	x^6	0.7851	0.85	No
Pooled Background (bg) (n = 22, alpha = 0.05)				
	no	0.8943	0.911	No

Shapiro-Wilk Normality Test

Constituent: Lithium Analysis Run 8/6/2021 4:50 PM
Will County Generating Station Client: NRG Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 22, alpha = 0.05) cont.				
	square root	0.9071	0.911	No
	square	0.8538	0.911	No
	cube root	0.9104	0.911	No
	cube	0.7949	0.911	No
	natural log	0.9154	0.911	Yes
	x^4	0.7227	0.911	No
	x^5	0.6449	0.911	No
	x^6	0.5695	0.911	No

Shapiro-Wilk Normality Test

Constituent: Mercury   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-06 (bg) (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-09 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-10 (n = 11, alpha = 0.05)				
	no	0.3451	0.85	No
	square root	0.3451	0.85	No
	square	0.3451	0.85	No
	cube root	0.3451	0.85	No
	cube	0.3451	0.85	No
	natural log	0.3451	0.85	No
	x^4	0.3451	0.85	No
	x^5	0.3451	0.85	No
	x^6	-1	0.85	No
MW-11 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-12 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	-1	0.85	No
	square	-1	0.85	No
	cube root	0	0.85	No
	cube	-1	0.85	No
	natural log	-1	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
Pooled Background (bg) (n = 22, alpha = 0.05)				
	no	-1	0.911	No

Shapiro-Wilk Normality Test

Constituent: Mercury Analysis Run 8/6/2021 4:50 PM

Will County Generating Station Client: NRG Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 22, alpha = 0.05) cont.				
	square root	-1	0.911	No
	square	-1	0.911	No
	cube root	0	0.911	No
	cube	-1	0.911	No
	natural log	0	0.911	No
	x^4	-1	0.911	No
	x^5	-1	0.911	No
	x^6	-1	0.911	No

Shapiro-Wilk Normality Test

Constituent: Molybdenum Analysis Run 8/6/2021 4:50 PM
Will County Generating Station Client: NRG Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 11, alpha = 0.05)				
	no	0.9642	0.85	Yes
	square root	0.9802	0.85	Yes
	square	0.9069	0.85	Yes
	cube root	0.9831	0.85	Yes
	cube	0.8334	0.85	No
	natural log	0.9845	0.85	Yes
	x^4	0.7589	0.85	No
	x^5	0.6912	0.85	No
	x^6	0.6327	0.85	No
MW-06 (bg) (n = 11, alpha = 0.05)				
	no	0.9424	0.85	Yes
	square root	0.901	0.85	Yes
	square	0.9406	0.85	Yes
	cube root	0.8804	0.85	Yes
	cube	0.8796	0.85	Yes
	natural log	0.8309	0.85	No
	x^4	0.8103	0.85	No
	x^5	0.7499	0.85	No
	x^6	0.7006	0.85	No
MW-09 (n = 11, alpha = 0.05)				
	no	0.9318	0.85	Yes
	square root	0.8953	0.85	Yes
	square	0.9055	0.85	Yes
	cube root	0.8747	0.85	Yes
	cube	0.8216	0.85	No
	natural log	0.8228	0.85	No
	x^4	0.7393	0.85	No
	x^5	0.6743	0.85	No
	x^6	0.6258	0.85	No
MW-10 (n = 11, alpha = 0.05)				
	no	0.8922	0.85	Yes
	square root	0.8604	0.85	Yes
	square	0.931	0.85	Yes
	cube root	0.8489	0.85	No
	cube	0.9241	0.85	Yes
	natural log	0.8252	0.85	No
	x^4	0.8775	0.85	Yes
	x^5	0.8108	0.85	No
	x^6	0.7409	0.85	No
MW-11 (n = 11, alpha = 0.05)				
	no	0.8931	0.85	Yes
	square root	0.8589	0.85	Yes
	square	0.9459	0.85	Yes
	cube root	0.8466	0.85	No
	cube	0.9757	0.85	Yes
	natural log	0.8208	0.85	No
	x^4	0.9841	0.85	Yes
	x^5	0.9757	0.85	Yes
	x^6	0.9556	0.85	Yes
MW-12 (n = 11, alpha = 0.05)				
	no	0.5149	0.85	No
	square root	0.5876	0.85	No
	square	0.4202	0.85	No
	cube root	0.6153	0.85	No
	cube	0.3755	0.85	No
	natural log	0.6746	0.85	No
	x^4	0.3568	0.85	No
	x^5	0.3494	0.85	No
	x^6	0.3467	0.85	No
Pooled Background (bg) (n = 22, alpha = 0.05)				
	no	0.9379	0.911	Yes

Shapiro-Wilk Normality Test

Constituent: Molybdenum   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 22, alpha = 0.05) cont.				
	square root	0.9728	0.911	Yes
	square	0.8147	0.911	No
	cube root	0.9753	0.911	Yes
	cube	0.6902	0.911	No
	natural log	0.9606	0.911	Yes
	x^4	0.5881	0.911	No
	x^5	0.5094	0.911	No
	x^6	0.4498	0.911	No

Shapiro-Wilk Normality Test

Constituent: pH Analysis Run 8/6/2021 4:50 PM

Will County Generating Station Client: NRG Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 17, alpha = 0.05)				
	no	0.8288	0.892	No
	square root	0.8375	0.892	No
	square	0.8107	0.892	No
	cube root	0.8404	0.892	No
	cube	0.7923	0.892	No
	natural log	0.846	0.892	No
	x^4	0.7738	0.892	No
	x^5	0.7555	0.892	No
	x^6	0.7375	0.892	No
MW-06 (bg) (n = 18, alpha = 0.05)				
	no	0.9647	0.897	Yes
	square root	0.9666	0.897	Yes
	square	0.9591	0.897	Yes
	cube root	0.9671	0.897	Yes
	cube	0.9512	0.897	Yes
	natural log	0.9679	0.897	Yes
	x^4	0.9414	0.897	Yes
	x^5	0.93	0.897	Yes
	x^6	0.9172	0.897	Yes
MW-09 (n = 17, alpha = 0.05)				
	no	0.9245	0.892	Yes
	square root	0.9208	0.892	Yes
	square	0.9314	0.892	Yes
	cube root	0.9194	0.892	Yes
	cube	0.9373	0.892	Yes
	natural log	0.9168	0.892	Yes
	x^4	0.9422	0.892	Yes
	x^5	0.946	0.892	Yes
	x^6	0.9489	0.892	Yes
MW-10 (n = 17, alpha = 0.05)				
	no	0.9317	0.892	Yes
	square root	0.9356	0.892	Yes
	square	0.9237	0.892	Yes
	cube root	0.9368	0.892	Yes
	cube	0.9151	0.892	Yes
	natural log	0.9393	0.892	Yes
	x^4	0.9061	0.892	Yes
	x^5	0.8967	0.892	Yes
	x^6	0.8868	0.892	No
MW-11 (n = 17, alpha = 0.05)				
	no	0.4431	0.892	No
	square root	0.3871	0.892	No
	square	0.5718	0.892	No
	cube root	0.3707	0.892	No
	cube	0.6907	0.892	No
	natural log	0.3422	0.892	No
	x^4	0.7776	0.892	No
	x^5	0.8296	0.892	No
	x^6	0.8524	0.892	No
MW-12 (n = 17, alpha = 0.05)				
	no	0.9174	0.892	Yes
	square root	0.9124	0.892	Yes
	square	0.9265	0.892	Yes
	cube root	0.9107	0.892	Yes
	cube	0.9346	0.892	Yes
	natural log	0.9073	0.892	Yes
	x^4	0.9416	0.892	Yes
	x^5	0.9474	0.892	Yes
	x^6	0.9521	0.892	Yes
Pooled Background (bg) (n = 35, alpha = 0.05)				
	no	0.9452	0.934	Yes

Shapiro-Wilk Normality Test

Constituent: pH   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 35, alpha = 0.05) cont.				
	square root	0.9511	0.934	Yes
	square	0.9308	0.934	No
	cube root	0.9528	0.934	Yes
	cube	0.913	0.934	No
	natural log	0.956	0.934	Yes
	x^4	0.8923	0.934	No
	x^5	0.8691	0.934	No
	x^6	0.8439	0.934	No

Shapiro-Wilk Normality Test

Constituent: Selenium   Analysis Run 8/6/2021 4:50 PM
Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 11, alpha = 0.05)				
	no	0.8681	0.85	Yes
	square root	0.8888	0.85	Yes
	square	0.7652	0.85	No
	cube root	0.8882	0.85	Yes
	cube	0.6557	0.85	No
	natural log	0.8762	0.85	Yes
	x^4	0.57	0.85	No
	x^5	0.5071	0.85	No
	x^6	0.4616	0.85	No
MW-06 (bg) (n = 11, alpha = 0.05)				
	no	0.5109	0.85	No
	square root	0.51	0.85	No
	square	0.5119	0.85	No
	cube root	0.5097	0.85	No
	cube	0.5117	0.85	No
	natural log	0.509	0.85	No
	x^4	0.5101	0.85	No
	x^5	0.507	0.85	No
	x^6	0.5024	0.85	No
MW-09 (n = 11, alpha = 0.05)				
	no	0.3451	0.85	No
	square root	0.3451	0.85	No
	square	0.3451	0.85	No
	cube root	0.3451	0.85	No
	cube	0.3451	0.85	No
	natural log	0.3451	0.85	No
	x^4	0.3451	0.85	No
	x^5	0.3451	0.85	No
	x^6	0.3451	0.85	No
MW-10 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	-1	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-11 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	-1	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-12 (n = 11, alpha = 0.05)				
	no	0.548	0.85	No
	square root	0.6057	0.85	No
	square	0.4489	0.85	No
	cube root	0.6239	0.85	No
	cube	0.3926	0.85	No
	natural log	0.6564	0.85	No
	x^4	0.3662	0.85	No
	x^5	0.3545	0.85	No
	x^6	0.3493	0.85	No
Pooled Background (bg) (n = 22, alpha = 0.05)				
	no	0.6444	0.911	No

Shapiro-Wilk Normality Test

Constituent: Selenium   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 22, alpha = 0.05) cont.				
	square root	0.6883	0.911	No
	square	0.5415	0.911	No
	cube root	0.7003	0.911	No
	cube	0.4518	0.911	No
	natural log	0.7195	0.911	No
	x^4	0.3854	0.911	No
	x^5	0.3379	0.911	No
	x^6	0.3044	0.911	No

Shapiro-Wilk Normality Test

Constituent: Sulfate Analysis Run 8/6/2021 4:50 PM

Will County Generating Station Client: NRG Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 17, alpha = 0.05)				
	no	0.9438	0.892	Yes
	square root	0.9599	0.892	Yes
	square	0.8965	0.892	Yes
	cube root	0.9636	0.892	Yes
	cube	0.8409	0.892	No
	natural log	0.968	0.892	Yes
	x^4	0.7858	0.892	No
	x^5	0.7351	0.892	No
	x^6	0.6899	0.892	No
MW-06 (bg) (n = 18, alpha = 0.05)				
	no	0.9054	0.897	Yes
	square root	0.9411	0.897	Yes
	square	0.7771	0.897	No
	cube root	0.9478	0.897	Yes
	cube	0.6243	0.897	No
	natural log	0.9536	0.897	Yes
	x^4	0.4975	0.897	No
	x^5	0.409	0.897	No
	x^6	0.3517	0.897	No
MW-09 (n = 18, alpha = 0.05)				
	no	0.8868	0.897	No
	square root	0.9273	0.897	Yes
	square	0.7765	0.897	No
	cube root	0.9374	0.897	Yes
	cube	0.6642	0.897	No
	natural log	0.9516	0.897	Yes
	x^4	0.5746	0.897	No
	x^5	0.5111	0.897	No
	x^6	0.4679	0.897	No
MW-10 (n = 17, alpha = 0.05)				
	no	0.9565	0.892	Yes
	square root	0.9472	0.892	Yes
	square	0.9613	0.892	Yes
	cube root	0.9431	0.892	Yes
	cube	0.9467	0.892	Yes
	natural log	0.9337	0.892	Yes
	x^4	0.9145	0.892	Yes
	x^5	0.8688	0.892	No
	x^6	0.815	0.892	No
MW-11 (n = 17, alpha = 0.05)				
	no	0.9379	0.892	Yes
	square root	0.9203	0.892	Yes
	square	0.9475	0.892	Yes
	cube root	0.9121	0.892	Yes
	cube	0.9345	0.892	Yes
	natural log	0.8923	0.892	Yes
	x^4	0.9102	0.892	Yes
	x^5	0.8805	0.892	No
	x^6	0.8481	0.892	No
MW-12 (n = 17, alpha = 0.05)				
	no	0.9406	0.892	Yes
	square root	0.9384	0.892	Yes
	square	0.9322	0.892	Yes
	cube root	0.9363	0.892	Yes
	cube	0.914	0.892	Yes
	natural log	0.93	0.892	Yes
	x^4	0.8914	0.892	No
	x^5	0.8665	0.892	No
	x^6	0.8403	0.892	No
Pooled Background (bg) (n = 35, alpha = 0.05)				
	no	0.9459	0.934	Yes

Shapiro-Wilk Normality Test

Constituent: Sulfate Analysis Run 8/6/2021 4:50 PM
Will County Generating Station Client: NRG Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 35, alpha = 0.05) cont.				
	square root	0.971	0.934	Yes
	square	0.8555	0.934	No
	cube root	0.9748	0.934	Yes
	cube	0.7498	0.934	No
	natural log	0.975	0.934	Yes
	x^4	0.6551	0.934	No
	x^5	0.5786	0.934	No
	x^6	0.5189	0.934	No

Shapiro-Wilk Normality Test

Constituent: Thallium   Analysis Run 8/6/2021 4:50 PM
Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	-1	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-06 (bg) (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	-1	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-09 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	-1	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-10 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	-1	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-11 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	-1	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
MW-12 (n = 11, alpha = 0.05)				
	no	-1	0.85	No
	square root	0	0.85	No
	square	-1	0.85	No
	cube root	-1	0.85	No
	cube	-1	0.85	No
	natural log	0	0.85	No
	x^4	-1	0.85	No
	x^5	-1	0.85	No
	x^6	-1	0.85	No
Pooled Background (bg) (n = 22, alpha = 0.05)				
	no	-1	0.911	No

Shapiro-Wilk Normality Test

Constituent: Thallium   Analysis Run 8/6/2021 4:50 PM

Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 22, alpha = 0.05) cont.				
	square root	0	0.911	No
	square	-1	0.911	No
	cube root	0	0.911	No
	cube	-1	0.911	No
	natural log	0	0.911	No
	x^4	-1	0.911	No
	x^5	-1	0.911	No
	x^6	-1	0.911	No

Shapiro-Wilk Normality Test

Constituent: Total Dissolved Solids Analysis Run 8/6/2021 4:50 PM
Will County Generating Station Client: NRG Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 17, alpha = 0.05)				
	no	0.9078	0.892	Yes
	square root	0.9227	0.892	Yes
	square	0.8665	0.892	No
	cube root	0.9268	0.892	Yes
	cube	0.8125	0.892	No
	natural log	0.9335	0.892	Yes
	x^4	0.7506	0.892	No
	x^5	0.686	0.892	No
	x^6	0.6233	0.892	No
MW-06 (bg) (n = 18, alpha = 0.05)				
	no	0.9318	0.897	Yes
	square root	0.949	0.897	Yes
	square	0.8834	0.897	No
	cube root	0.9536	0.897	Yes
	cube	0.8207	0.897	No
	natural log	0.9609	0.897	Yes
	x^4	0.7504	0.897	No
	x^5	0.679	0.897	No
	x^6	0.6115	0.897	No
MW-09 (n = 17, alpha = 0.05)				
	no	0.9352	0.892	Yes
	square root	0.9371	0.892	Yes
	square	0.9274	0.892	Yes
	cube root	0.9375	0.892	Yes
	cube	0.9153	0.892	Yes
	natural log	0.9377	0.892	Yes
	x^4	0.9002	0.892	Yes
	x^5	0.8832	0.892	No
	x^6	0.8651	0.892	No
MW-10 (n = 17, alpha = 0.05)				
	no	0.9056	0.892	Yes
	square root	0.9038	0.892	Yes
	square	0.9085	0.892	Yes
	cube root	0.9031	0.892	Yes
	cube	0.9105	0.892	Yes
	natural log	0.9017	0.892	Yes
	x^4	0.9115	0.892	Yes
	x^5	0.9116	0.892	Yes
	x^6	0.9108	0.892	Yes
MW-11 (n = 17, alpha = 0.05)				
	no	0.9849	0.892	Yes
	square root	0.9856	0.892	Yes
	square	0.9798	0.892	Yes
	cube root	0.9855	0.892	Yes
	cube	0.9699	0.892	Yes
	natural log	0.9848	0.892	Yes
	x^4	0.9559	0.892	Yes
	x^5	0.9386	0.892	Yes
	x^6	0.9186	0.892	Yes
MW-12 (n = 17, alpha = 0.05)				
	no	0.9054	0.892	Yes
	square root	0.9201	0.892	Yes
	square	0.8725	0.892	No
	cube root	0.9246	0.892	Yes
	cube	0.8364	0.892	No
	natural log	0.9331	0.892	Yes
	x^4	0.799	0.892	No
	x^5	0.7618	0.892	No
	x^6	0.7258	0.892	No
Pooled Background (bg) (n = 35, alpha = 0.05)				
	no	0.8741	0.934	No

Shapiro-Wilk Normality Test

Constituent: Total Dissolved Solids   Analysis Run 8/6/2021 4:50 PM
Will County Generating Station   Client: NRG   Data: Will County

Well	Transformation	Calculated	Critical	Normal
Pooled Background (bg) (n = 35, alpha = 0.05) cont.				
	square root	0.9089	0.934	No
	square	0.7893	0.934	No
	cube root	0.9189	0.934	No
	cube	0.6966	0.934	No
	natural log	0.9363	0.934	Yes
	x^4	0.608	0.934	No
	x^5	0.5298	0.934	No
	x^6	0.4639	0.934	No

Shapiro-Wilk Normality Test

Constituent: Turbidity Analysis Run 10/7/2021 11:34 AM

Will County Generating Station Client: NRG Data: Will County

Well	Transformation	Calculated	Critical	Normal
MW-05 (bg) (n = 10, alpha = 0.05)				
	no	0.913	0.842	Yes
	square root	0.8941	0.842	Yes
	square	0.9115	0.842	Yes
	cube root	0.8834	0.842	Yes
	cube	0.8892	0.842	Yes
	natural log	0.8541	0.842	Yes
	x^4	0.8639	0.842	Yes
	x^5	0.841	0.842	No
	x^6	0.8213	0.842	No
MW-06 (bg) (n = 10, alpha = 0.05)				
	no	0.9061	0.842	Yes
	square root	0.9625	0.842	Yes
	square	0.714	0.842	No
	cube root	0.943	0.842	Yes
	cube	0.5964	0.842	No
	natural log	0.827	0.842	No
	x^4	0.5263	0.842	No
	x^5	0.481	0.842	No
	x^6	0.4501	0.842	No
Pooled Background (bg) (n = 20, alpha = 0.05)				
	no	0.8075	0.905	No
	square root	0.9428	0.905	Yes
	square	0.5482	0.905	No
	cube root	0.9622	0.905	Yes
	cube	0.419	0.905	No
	natural log	0.9324	0.905	Yes
	x^4	0.3548	0.905	No
	x^5	0.3183	0.905	No
	x^6	0.295	0.905	No

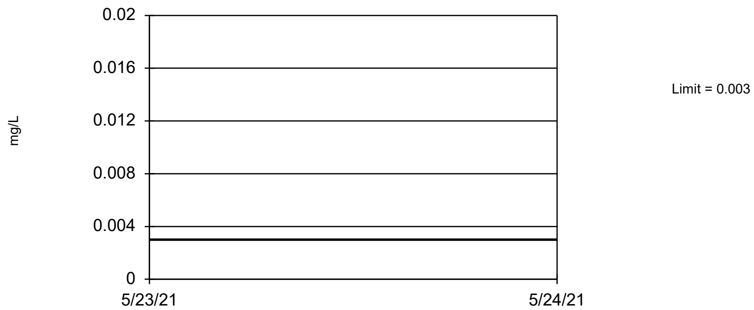
Will Co Interwell Prediction Limit MW-5 and MW-6 all dates

Will County Generating Station   Client: NRG   Data: Will County   Printed 8/13/2021, 4:06 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony (mg/L)	n/a	0.003	n/a	n/a	4 future	n/a	22	100	n/a	0.003355	NP (NDs) 1 of 2
Arsenic (mg/L)	n/a	0.005338	n/a	n/a	4 future	n/a	22	0	No	0.000...	Param 1 of 2
Beryllium (mg/L)	n/a	0.001	n/a	n/a	4 future	n/a	22	100	n/a	0.003355	NP (NDs) 1 of 2
Cadmium (mg/L)	n/a	0.0005	n/a	n/a	4 future	n/a	22	100	n/a	0.003355	NP (NDs) 1 of 2
Chromium (mg/L)	n/a	0.005	n/a	n/a	4 future	n/a	22	100	n/a	0.003355	NP (NDs) 1 of 2
Cobalt (mg/L)	n/a	0.001	n/a	n/a	4 future	n/a	22	100	n/a	0.003355	NP (NDs) 1 of 2
Combined Radium 226 + 228 (pCi/L)	n/a	0.6013	n/a	n/a	4 future	n/a	20	50	x^2	0.000...	Param 1 of 2
Lead (mg/L)	n/a	0.00054	n/a	n/a	4 future	n/a	22	95.45	n/a	0.003355	NP (NDs) 1 of 2
Lithium (mg/L)	n/a	0.01971	n/a	n/a	4 future	n/a	22	22.73	ln(x)	0.000...	Param 1 of 2
Mercury (mg/L)	n/a	0.0002	n/a	n/a	4 future	n/a	22	100	n/a	0.003355	NP (NDs) 1 of 2
Thallium (mg/L)	n/a	0.002	n/a	n/a	4 future	n/a	22	100	n/a	0.003355	NP (NDs) 1 of 2

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 22) were censored; limit is most recent reporting limit. Annual per-constituent alpha = 0.05235. Individual comparison alpha = 0.003355 (1 of 2). Assumes 4 future values. Seasonality was not detected with 95% confidence.

Constituent: Antimony Analysis Run 8/13/2021 4:04 PM

Will County Generating Station Client: NRG Data: Will County

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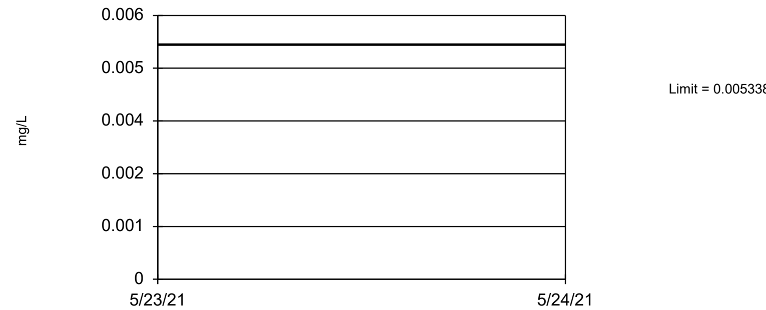
Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.002623, Std. Dev.=0.001073, n=22. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9427, critical = 0.911. Kappa = 2.53 (c=22, w=4, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.0002993. Assumes 4 future values.

Constituent: Arsenic Analysis Run 8/13/2021 4:04 PM

Will County Generating Station Client: NRG Data: Will County

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Prediction Limit

Interwell Non-parametric

Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 22) were censored; limit is most recent reporting limit. Annual per-constituent alpha = 0.05235. Individual comparison alpha = 0.003355 (1 of 2). Assumes 4 future values. Seasonality was not detected with 95% confidence.

Constituent: Beryllium Analysis Run 8/13/2021 4:04 PM

Will County Generating Station Client: NRG Data: Will County

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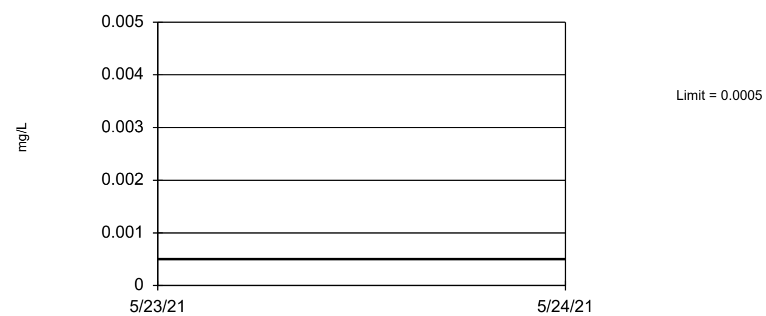
Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 22) were censored; limit is most recent reporting limit. Annual per-constituent alpha = 0.05235. Individual comparison alpha = 0.003355 (1 of 2). Assumes 4 future values. Seasonality was not detected with 95% confidence.

Constituent: Cadmium Analysis Run 8/13/2021 4:04 PM

Will County Generating Station Client: NRG Data: Will County

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Prediction Limit

Interwell Non-parametric

Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 22) were censored; limit is most recent reporting limit. Annual per-constituent alpha = 0.05235. Individual comparison alpha = 0.003355 (1 of 2). Assumes 4 future values. Seasonality was not detected with 95% confidence.

Constituent: Chromium Analysis Run 8/13/2021 4:04 PM

Will County Generating Station Client: NRG Data: Will County

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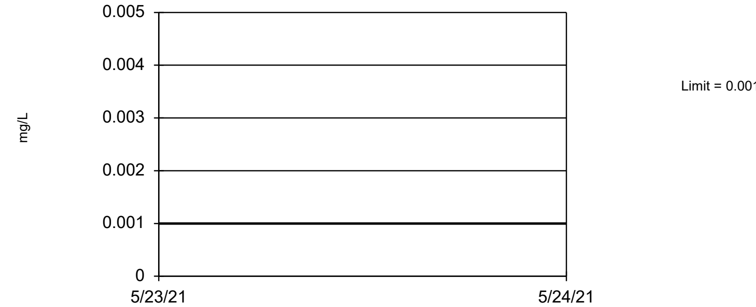
Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 22) were censored; limit is most recent reporting limit. Annual per-constituent alpha = 0.05235. Individual comparison alpha = 0.003355 (1 of 2). Assumes 4 future values. Seasonality was not detected with 95% confidence.

Constituent: Cobalt Analysis Run 8/13/2021 4:04 PM

Will County Generating Station Client: NRG Data: Will County

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Prediction Limit

Interwell Parametric

Background Data Summary (based on square transformation) (after Kaplan-Meier Adjustment): Mean=0.1415, Std. Dev.=0.08557, n=20, 50% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9208, critical = 0.905. Kappa = 2.571 (c=22, w=4, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.0002993. Assumes 4 future values.

Constituent: Combined Radium 226 + 228 Analysis Run 8/13/2021 4:04 PM

Will County Generating Station Client: NRG Data: Will County

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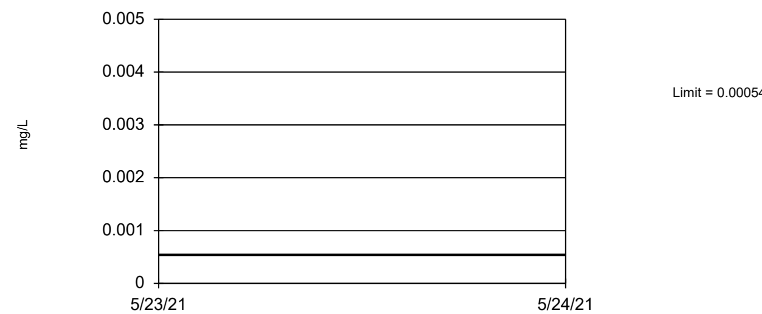
Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 22 background values. 95.45% NDs. Annual per-constituent alpha = 0.05235. Individual comparison alpha = 0.003355 (1 of 2). Assumes 4 future values. Seasonality was not detected with 95% confidence.

Constituent: Lead Analysis Run 8/13/2021 4:04 PM

Will County Generating Station Client: NRG Data: Will County

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Prediction Limit

Interwell Parametric

Background Data Summary (based on natural log transformation) (after Kaplan-Meier Adjustment): Mean=-4.466, Std. Dev.=0.2133, n=22, 22.73% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9154, critical = 0.911. Kappa = 2.53 (c=22, w=4, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.0002993. Assumes 4 future values.

Constituent: Lithium Analysis Run 8/13/2021 4:04 PM

Will County Generating Station Client: NRG Data: Will County

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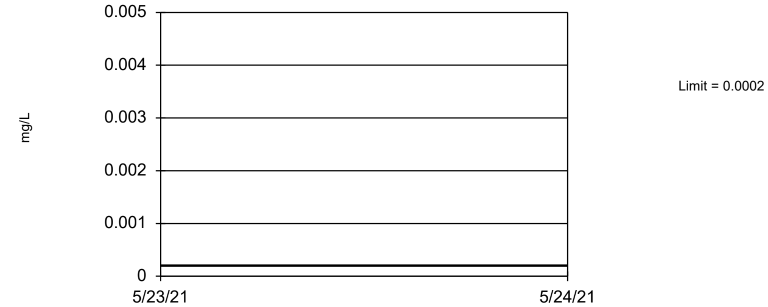
Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 22) were censored; limit is most recent reporting limit. Annual per-constituent alpha = 0.05235. Individual comparison alpha = 0.003355 (1 of 2). Assumes 4 future values. Seasonality was not detected with 95% confidence.

Constituent: Mercury Analysis Run 8/13/2021 4:04 PM

Will County Generating Station Client: NRG Data: Will County

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Prediction Limit

Interwell Non-parametric

Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 22) were censored; limit is most recent reporting limit. Annual per-constituent alpha = 0.05235. Individual comparison alpha = 0.003355 (1 of 2). Assumes 4 future values. Seasonality was not detected with 95% confidence.

Constituent: Thallium Analysis Run 8/13/2021 4:04 PM

Will County Generating Station Client: NRG Data: Will County

Interwell Will Co Interwell Prediction Limit MW-5 all dates

Will County Generating Station   Client: NRG   Data: Will County   Printed 8/13/2021, 4:10 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Calcium (mg/L)	n/a	313.4	n/a	n/a	4 future	n/a	17	0	No	0.000...	Param 1 of 2
Fluoride (mg/L)	n/a	0.8199	n/a	n/a	4 future	n/a	17	0	No	0.000...	Param 1 of 2
Molybdenum (mg/L)	n/a	0.1722	n/a	n/a	4 future	n/a	11	0	No	0.000...	Param 1 of 2
pH (n/a)	n/a	9.4	6.7	n/a	4 future	n/a	17	0	n/a	0.01025	NP (normality) 1 of 2
Selenium (mg/L)	n/a	0.05573	n/a	n/a	4 future	n/a	11	27.27	No	0.000...	Param 1 of 2

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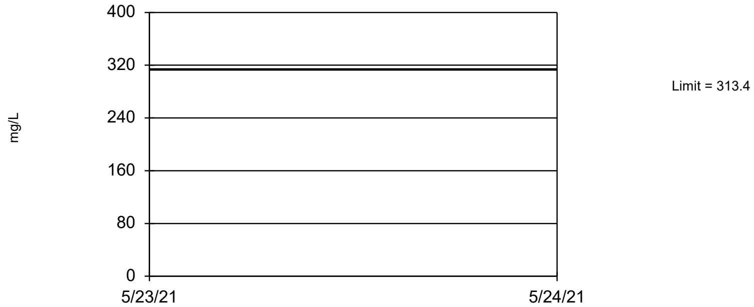
Prediction Limit

Interwell Parametric



Background Data Summary: Mean=138.6, Std. Dev.=65.45, n=17. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9526, critical = 0.892. Kappa = 2.672 (c=22, w=4, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.0002993. Assumes 4 future values.

Constituent: Calcium Analysis Run 8/13/2021 4:09 PM

Will County Generating Station Client: NRG Data: Will County

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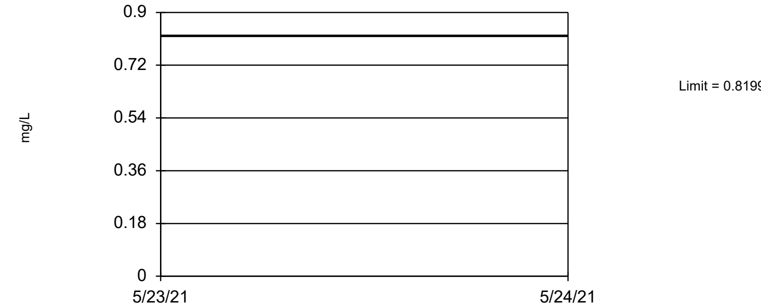
Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.4647, Std. Dev.=0.133, n=17. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9202, critical = 0.892. Kappa = 2.672 (c=22, w=4, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.0002993. Assumes 4 future values.

Constituent: Fluoride Analysis Run 8/13/2021 4:09 PM

Will County Generating Station Client: NRG Data: Will County

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Prediction Limit

Interwell Parametric

Background Data Summary: Mean=0.08764, Std. Dev.=0.02731, n=11. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9642, critical = 0.85. Kappa = 3.098 (c=22, w=4, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.0002993. Assumes 4 future values.

Constituent: Molybdenum Analysis Run 8/13/2021 4:09 PM

Will County Generating Station Client: NRG Data: Will County

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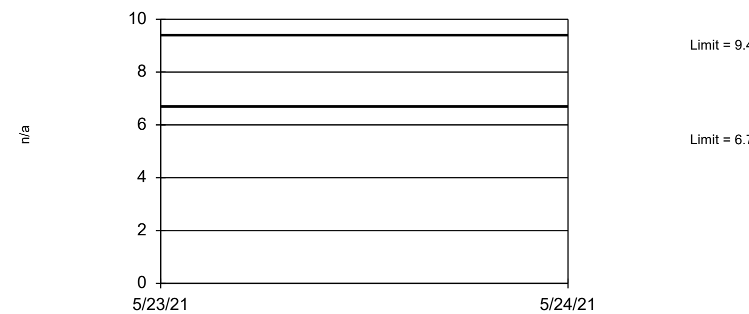
Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limits are highest and lowest of 17 background values. Annual per-constituent alpha = 0.1578. Individual comparison alpha = 0.01025 (1 of 2). Assumes 4 future values. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: pH Analysis Run 8/13/2021 4:09 PM

Will County Generating Station Client: NRG Data: Will County

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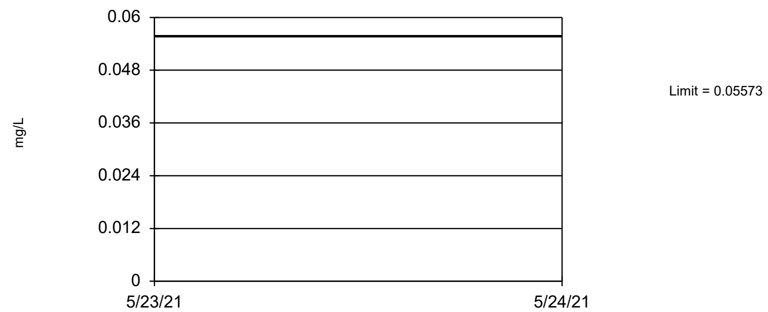
Prediction Limit

Interwell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.01409, Std. Dev.=0.01344, n=11, 27.27% NDs. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8681, critical = 0.85. Kappa = 3.098 (c=22, w=4, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.0002993. Assumes 4 future values.

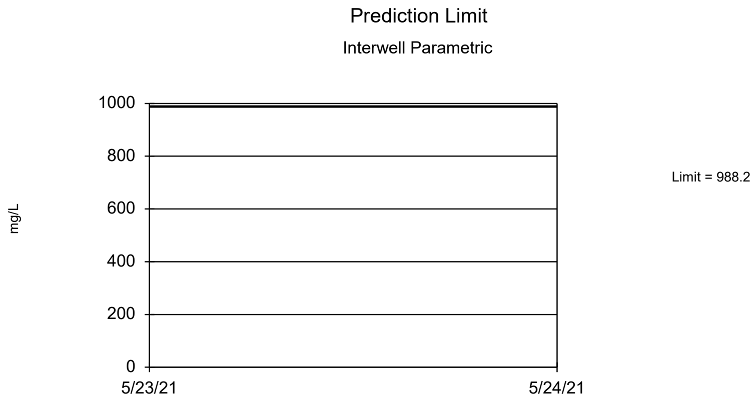
Constituent: Selenium Analysis Run 8/13/2021 4:09 PM

Will County Generating Station Client: NRG Data: Will County

Interwell Will Co Interwell Prediction Limit MW-6 all dates

Will County Generating Station   Client: NRG   Data: Will County   Printed 8/13/2021, 4:18 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Total Dissolved Solids (mg/L)	n/a	988.2	n/a	n/a	4 future	n/a	18	0	No	0.000...	Param 1 of 2



Background Data Summary: Mean=736.1, Std. Dev.=95.56, n=18. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9318, critical = 0.897. Kappa = 2.638 (c=22, w=4, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.0002993. Assumes 4 future values.

Constituent: Total Dissolved Solids Analysis Run 8/13/2021 4:17 PM

Will County Generating Station Client: NRG Data: Will County

Interwell Will Co Interwell Prediction Limit MW-5 and MW-6 initial 8 rounds dates

Will County Generating Station   Client: NRG   Data: Will County   Printed 8/13/2021, 4:24 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Chloride (mg/L)	n/a	166.1	n/a	n/a	4 future	n/a	16	0	No	0.000...	Param 1 of 2

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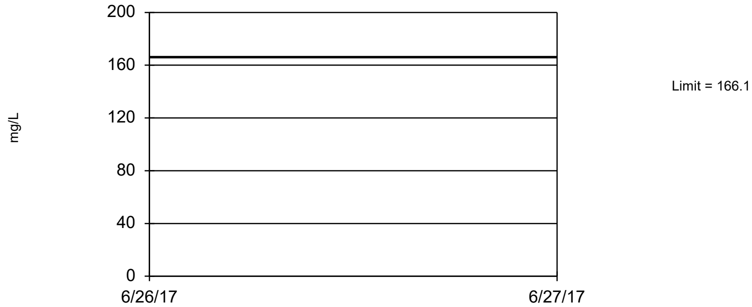
Prediction Limit

Interwell Parametric



Background Data Summary: Mean=95.44, Std. Dev.=26.1, n=16. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9789, critical = 0.887. Kappa = 2.705 (c=22, w=4, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.0002993. Assumes 4 future values.

Constituent: Chloride Analysis Run 8/13/2021 4:23 PM

Will County Generating Station Client: NRG Data: Will County

Will Co Interwell Prediction Limit MW-5 initial 8 rounds dates

Will County Generating Station   Client: NRG   Data: Will County   Printed 8/13/2021, 4:41 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Sulfate (mg/L)	n/a	1053	n/a	n/a	4 future	n/a	8	0	No	0.000...	Param 1 of 2

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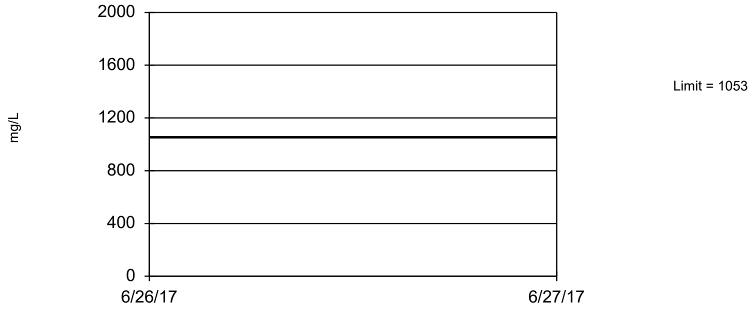
Prediction Limit

Interwell Parametric



Background Data Summary: Mean=587.5, Std. Dev.=128.1, n=8. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9536, critical = 0.818. Kappa = 3.636 (c=22, w=4, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.0002993. Assumes 4 future values.

Constituent: Sulfate Analysis Run 8/13/2021 4:36 PM

Will County Generating Station Client: NRG Data: Will County

Interwell Prediction Limit Will Co MW-5 UG Turbidity

Will County Generating Station   Client: NRG   Data: Will County   Printed 10/7/2021, 11:44 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Turbidity (NTU)	n/a	6.333	n/a	n/a	4 future	n/a	10	0	No	0.000...	Param 1 of 2

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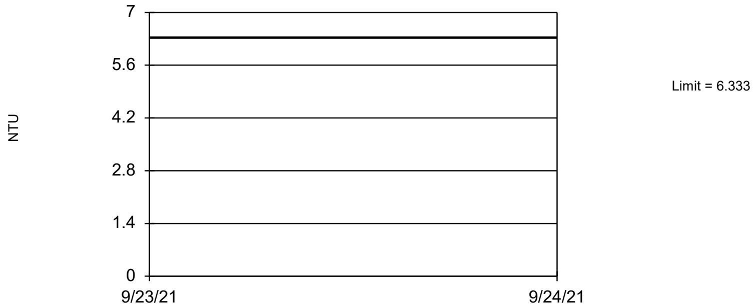
Prediction Limit

Interwell Parametric



Background Data Summary: Mean=2.576, Std. Dev.=1.169, n=10. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.913, critical = 0.842. Kappa = 3.215 (c=22, w=4, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.0002993. Assumes 4 future values.

Constituent: Turbidity Analysis Run 10/7/2021 11:42 AM

Will County Generating Station Client: NRG Data: Will County

Will Co Interwell Prediction Limit MW-6 initial 8 rounds dates

Will County Generating Station   Client: NRG   Data: Will County   Printed 8/13/2021, 4:46 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Barium (mg/L)	n/a	0.1092	n/a	n/a	4 future	n/a	8	0	No	0.000...	Param 1 of 2
Boron (mg/L)	n/a	4.739	n/a	n/a	4 future	n/a	8	0	No	0.000...	Param 1 of 2

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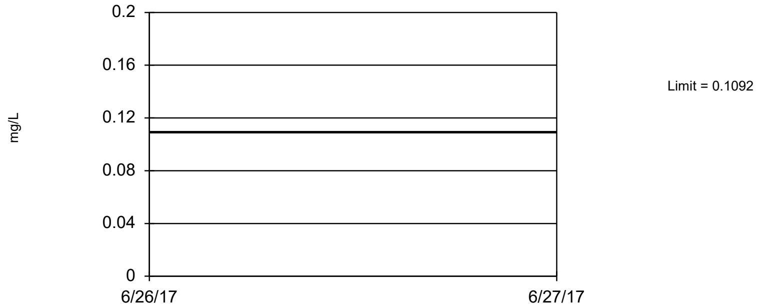
Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.06688, Std. Dev.=0.01163, n=8. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9191, critical = 0.818. Kappa = 3.636 (c=22, w=4, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.0002993. Assumes 4 future values.

Constituent: Barium Analysis Run 8/13/2021 4:45 PM

Will County Generating Station Client: NRG Data: Will County

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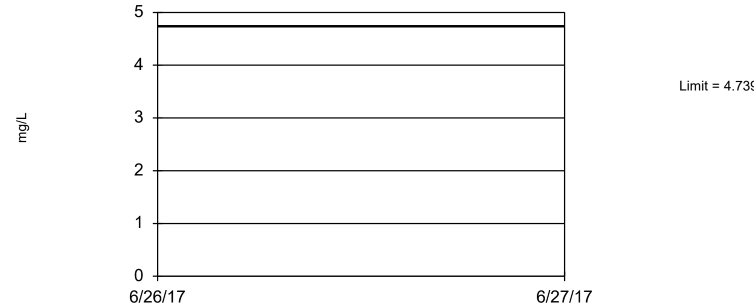
Prediction Limit

Interwell Parametric



Background Data Summary: Mean=3.138, Std. Dev.=0.4406, n=8. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.968, critical = 0.818. Kappa = 3.636 (c=22, w=4, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.0002993. Assumes 4 future values.

Constituent: Boron Analysis Run 8/13/2021 4:45 PM

Will County Generating Station Client: NRG Data: Will County

ATTACHMENT 10
WRITTEN CLOSURE PLAN

MWG

Midwest Generation, LLC
Will County Generating Station

Preliminary Written Closure Plan for South Ash Pond 2 & South Ash Pond 3

Revision 1

October 29, 2021

Issue Purpose: Use

Project No.: 12661-124

55 East Monroe Street
Chicago, IL 60603-5780 USA
312-269-2000
www.sargentlundy.com

Sargent & Lundy

TABLE OF CONTENTS

1.0 PURPOSE & SCOPE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.720(a)
Federal CCR Rule Reference: 40 CFR 257.102(b)

1.1 PURPOSE

South Ash Pond 2 and South Ash Pond 3 at Midwest Generation, LLC's (MWG) Will County Generating Station ("Will County" or the "Station") are existing coal combustion residual (CCR) surface impoundments that are regulated by the Illinois Pollution Control Board's "Standards for the Disposal of Coal Combustion Residuals in CCR Surface Impoundments." These regulations are codified in Part 845 to Title 35 of the Illinois Administrative Code (35 Ill. Adm. Code 845, Ref. 1) and are also referred to herein as the "Illinois CCR Rule." South Ash Ponds 2 and 3 are also regulated by the U.S. Environmental Protection Agency's "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," 40 CFR Part 257 Subpart D (Ref. 2), also referred to herein as the "Federal CCR Rule."

Pursuant to 35 Ill. Adm. Code 845.720(a) and 40 CFR 257.102(b), this document provides the preliminary written closure plan for South Ash Ponds 2 and 3 at Will County. MWG intends to close these CCR surface impoundments by leaving the impounded CCR in place and installing final cover systems over the impoundments in accordance with 35 Ill. Adm. Code 845.750 and 40 CFR 257.102(d). This plan describes the steps necessary to close South Ash Ponds 2 and 3 in this manner.

1.2 SCOPE

Per the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act, South Ash Ponds 2 and 3 will continue to be subject to both the Illinois and Federal CCR Rules until the U.S. EPA approves the Illinois EPA's CCR permit program. The Illinois EPA has yet to publish a timeline for submitting its proposed CCR permit program to the U.S. EPA for approval, and so this preliminary written closure plan has been prepared pursuant to both sets of regulations.

2.0 CLOSURE PLAN NARRATIVE DESCRIPTION

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.720(a)(1)(A) & 845.750(a)
Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(i) & 257.102(d)(1)

Pursuant to 35 Ill. Adm. Code 845.750(a) and 40 CFR 257.102(d), South Ash Ponds 2 and 3 will be closed by leaving the CCR stored in each pond in place and installing a final cover system over each impoundment. Each final cover system will be designed in accordance with the requirements specified in 35 Ill. Adm. Code 845.750(c) and 40 CFR 257.102(d)(3) and as described in the following sections of this closure plan.

The anticipated closure in-place of South Ash Ponds 2 and 3 will be performed in accordance with the following sequential steps:

1. Ceasing all CCR and non-CCR inflows to each pond;
2. Drawing down the free surface water in each pond by evaporation and by draining water into the concrete overflow trough at the west end of each pond;
3. Once the water elevation is below the weir elevation, promoting additional drainage and dewatering by:
    a. Excavating sumps and trenches within the ash material,
    b. Using portable pumps as necessary to remove additional water by pumping water over the weir into each pond's concrete overflow trough, and/or
    c. Utilizing earthmoving equipment to move the ash within each pond;
4. Upon completion of dewatering and stabilization of the impounded ash, grading the ash material to establish the slopes for the final cover system;
5. Placing and grading general fill material within a pond if enough ash is not available in the pond to establish the slopes for the final cover system;
6. Installing the low permeability layer of the final cover system;
7. Installing the final protective layer over the low permeability layer;
8. Seeding the final protective layer; and
9. Initiating post-closure monitoring of vegetation, groundwater, and final cover system integrity.

3.0 FINAL COVER SYSTEM DESCRIPTION

Illinois CCR Rule References: 35 Ill. Adm. Code 845.720(a)(1)(C) & 845.750(a)
Federal CCR Rule References: 40 CFR 257.102(b)(1)(iii) & 257.102(d)(1)

Pursuant to the closure performance standards prescribed in 35 Ill. Adm. Code 845.750(a) and 40 CFR 257.102(d)(1), the final cover systems encapsulating the CCR in South Ash Ponds 2 and 3 will:

1. Minimize the post-closure infiltration of liquid into the CCR;
2. Minimize the risk of release of CCR or contaminated run-off to the ground or surface waters, or to the atmosphere;
3. Preclude the probability of future impoundment of water, sediment, or slurry;
4. Provide major slope stability to prevent sloughing of the final cover systems during the closure and post-closure care period;
5. Minimize future maintenance; and
6. Allow closure activities to be completed as quickly as practical consistent with recognized and generally accepted good engineering practices;

In addition to the preceding performance criteria, the final cover systems installed over South Ash Ponds 2 and 3 must meet the design criteria promulgated by 35 Ill. Adm. Code 845.750(c) and 40 CFR 257.102(d)(3), both of which require the final cover system to consist of at least two layers: a lower, low-permeability layer for infiltration control and an upper, final protective layer for erosion control and for protecting the low permeability layer. MWG plans to install final cover systems over South Ash Ponds 2 and 3 that consist of a 60-mil HDPE geomembrane under a minimum of three feet of vegetated, earthen material.

3.1 ESTABLISH GRADE & SUPPORT FOR FINAL COVER SYSTEM

Illinois CCR Rule References: 35 Ill. Adm. Code 845.750(a)(2), 845.750(a)(3), & 845.750(c)(3))
Federal CCR Rule References: 40 CFR 257.102(d)(1)(ii), 257.102(d)(1)(iii), & 257.102(d)(3)(i)(D)

To accomplish the performance requirements stipulated by 35 Ill. Adm. Code 845.750 and 40 CFR 257.102(d), the CCR remaining in South Ash Ponds 2 and 3 will be graded to direct non-contact storm water run-off to each pond's concrete overflow trough at its western end. Additional general fill material will be placed in a pond to establish the lines and grades for this storm water management scheme if sufficient quantities of CCR are not present in the pond for this purpose at the time of closure. The slopes of this foundation layer for each pond's final cover system will be steep enough to prevent storm water from ponding over the cap but flat enough to limit erosion caused by the storm water run-off. These slopes will also be designed to accommodate potential settling and subsidence while maintaining a positive drainage strategy. In addition, the foundation layer's slopes (and the final cover system in general) will also include measures that provide slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care period. Finally, the foundation layer surface will be prepared such that it is free from large, protruding, or sharp materials that could otherwise cause damage to the overlying low permeability layer.

3.2 LOW PERMEABILITY LAYER

Illinois CCR Rule References: 35 Ill. Adm. Code 845.750(a)(1) & 845.750(c)(1)
Federal CCR Rule References: 40 CFR 257.102(d)(1)(i) & 257.102(d)(3)(ii)(A)

A low permeability layer will be placed on top of the graded CCR (and general fill if necessary) in South Ash Ponds 2 and 3 to minimize the infiltration of liquids through each pond during their post-closure lives. The low permeability layer will control, minimize, and eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere.

Table 1 lists the design criteria for the low permeability layer of a final cover system installed over a CCR surface impoundment as promulgated by the Illinois and Federal CCR Rules. By comparison, the Illinois

CCR Rule's design criteria for the low permeability layer are either as protective or more protective of human health and the environment than the design criteria promulgated by the Federal CCR Rule. Accordingly, the low permeability layers in the final cover systems for South Ash Ponds 2 and 3 will be designed in accordance with the design criteria promulgated by the Illinois CCR Rule.

Table 1 – Comparison of Illinois and Federal CCR Rules' Design Criteria for Low Permeability Layer in a CCR Surface Impoundment's Final Cover System

Construction Material	Parameter	Illinois CCR Rule Design Criterion (35 Ill. Adm. Code 845.750(c)(1))	Federal CCR Rule Design Criterion (40 CFR 257.102(d)(3))
Earthen Material	Thickness	3 feet minimum	1.5 feet minimum
	Hydraulic Conductivity	Least of: • Permeability of any bottom liner system or natural subsoils • 1×10^{-7} cm/sec	Least of: • Permeability of any bottom liner system or natural subsoils • 1×10^{-5} cm/sec
	Compaction	Minimize void spaces	--
Geomembrane	Thickness	40 mil	--
	Hydraulic Flux	Equivalent or superior reduction in infiltration as a low permeability layer constructed with earthen material	Equivalent or superior reduction in infiltration as a low permeability layer constructed with earthen material
	Prepared Subgrade	Free from sharp objects and other materials that may cause damage	--

South Ash Ponds 2 and 3 both have a 60-mil HDPE geomembrane liner on the floors and sides of the ponds; therefore, the low permeability layer in each pond's final cover system must have a permeability that is equal to or less than the effective permeability of the existing liner. In lieu of using earthen materials to minimize the infiltration of liquids through the closed ponds, MWG plans to install a geomembrane-based low permeability layer over each pond pursuant to 35 Ill. Adm. Code 845.750(c)(1)(B) and 40 CFR 257.102(d)(3)(ii)(A). To provide an equivalent or superior reduction in infiltration as a low permeability layer constructed with earthen material in accordance with 35 Ill. Adm. Code 845.750(c)(1)(A) and 40 CFR 257.102(d)(3)(i)(A)–(B), MWG plans to install a 60-mil HDPE geomembrane for the low permeability layer in each pond's final cover system.

As required by 35 Ill. Adm. Code 845.750(c)(1)(B)(i) and 40 CFR 257.102(d)(3)(ii)(A), Table 2 demonstrates that a 60-mil HDPE geomembrane will provide a superior reduction in infiltration when compared to a 3-foot-thick layer of earthen material with a hydraulic conductivity of 1×10^{-7} cm/sec. The liquid flow rate through a 3-

foot-thick layer of earthen material is calculated using the equation derived from Darcy's Law for gravity flow through porous media that is specified by the Illinois and Federal CCR Rules as the basis for demonstrating compliance with both rules' alternative composite liner design criteria (Ref. 1, §845.400(c)(3); Ref. 2, Eq. 1). Meanwhile, the liquid flow rate through a geomembrane liner is calculated using Bernoulli's equation for free flow through an orifice based on the assumption that one 2-mm-diameter hole is present in the geomembrane for every acre (4,000 m^2) of liner (Ref. 3). Both liquid flow rates calculated in Table 2 are based on the assumption that 5.53 inches (0.14 meter) of hydraulic head is present on the low permeability layer, which is the estimated 25-year, 24-hour precipitation depth at the Station (Ref. 4). This is a conservative assumption because the final cover system will be sloped to preclude the build-up of liquid on the low permeability layer.

Table 2 – Liquid Flow Rate Comparison Between Low Permeability Layers Constructed Using Geomembrane & Earthen Material

Parameter	Symbol	Value
Liquid Flow Rate Through Earthen Material		
Hydraulic Conductivity	k	1×10^{-9} m/sec
Hydraulic Head Above Layer	h	0.14 m
Layer Thickness	t	3 ft = 0.91 m
Hydraulic Gradient Through Earthen Material	$i = h / t$	0.15
Liquid Flow Rate Through Layer per Acre of Final Cover System (Ref. 1, §845.400(c)(3); Ref. 2, Eq. 1).	$q = k \times (i + 1)$	1.15×10^{-9} m^3/sec/m^2
Liquid Flow Rate Through Geomembrane		
Hole Area in Geomembrane	a	3.1 mm^2 / 4000 m^2
Acceleration Due to Gravity	g	9.81 m/sec^2
Hydraulic Head Above Layer	h	0.14 m
Liquid Flow Rate Through Layer per Unit Area (Ref. 3)	$q = 0.6a(2gh)^{0.5}$	7.71×10^{-10} m^3/sec/m^2

3.3 FINAL PROTECTIVE LAYER

Illinois CCR Rule References: 35 Ill. Adm. Code 845.750(c)(2)
Federal CCR Rule Reference: 40 CFR 257.102(d)(3)(ii)(B)

A final protective layer consisting of a minimum of three feet of earthen material capable of sustaining native plant growth will be provided to minimize wind and water erosion of each pond's final cover system. The final protective layer will cover the entire low permeability layer in each pond's final cover system and will be installed as soon as possible after placement of the low permeability layer. An appropriate seed mixture will be selected to minimize root penetration into the infiltration-control layer. Finally, a final protective layer thicker than the 3-foot minimum is not warranted because freezing temperatures and freeze-thaw conditions will not affect the hydraulic performance of the HDPE geomembrane liner being utilized as the low permeability layer in each pond's final cover system (Ref. 5).

4.0 ESTIMATED MAXIMUM INVENTORY OF CCR

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.720(a)(1)(D)
Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(iv)

Detailed records of the maximum inventories of CCR ever stored in South Ash Ponds 2 and 3 are not available. For the purposes of this preliminary written closure plan, the maximum CCR inventories for South Ash Ponds 2 and 3 are conservatively based on their estimated maximum capacities, which are 21,300 and 24,400 cubic yards, respectively.

5.0 ESTIMATED COVER SURFACE AREA

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.720(a)(1)(E)
Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(v)

The estimated final cover surface areas for South Ash Ponds 2 and 3 are 2.2 and 2.4 acres, respectively. It is estimated that these areas represent the largest surface areas that will ever require final covers at any point over the ponds' active lives.

6.0 CLOSURE SCHEDULE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.720(a)(1)(F)
Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(vi)

Closure activities are anticipated to be performed concurrently for both South Ash Ponds 2 and 3 and are estimated to be completed in 2025. Table 3 lists the major milestones necessary for closing both ponds and the expected duration for completing each milestone.

Table 3 – Planning Level Schedule for Closing South Ash Ponds 2 & 3

Activity	Estimated Duration
Prepare Closure Construction Design Documents	7 Months
Obtain Closure Construction Permit from Illinois EPA	11 Months
Hire Contractor to Complete Closure Activities in Accordance with Illinois EPA Permit	4 Months
Draw Down Water & Dewater Impounded Ash	4 Months
Grade Dewatered Ash	1 Month
Install Final Cover System	2 Months
Submit Closure Report and Certification to Illinois EPA	2 Weeks
Obtain Approval of Closure Report and Certification from Illinois EPA	3 Months
Complete and Certify Closures of South Ash Ponds 2 and 3	--

7.0 AMENDMENTS TO CLOSURE PLAN

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.720(a)(3)
Federal CCR Rule Reference: 40 CFR 257.102(b)(3)

This preliminary written closure plan will be amended in accordance with 35 Ill. Adm. Code 845.720(a)(3) and 40 CFR 257.102(b)(3) if a change in the operation of either South Ash Pond 2 or South Ash Pond 3 would substantially affect this closure plan or if an unanticipated event necessitates a revision to this closure plan. Any and all amendments to this closure plan will be certified by a qualified professional engineer registered in the State of Illinois in accordance with 35 Ill. Adm. Code 845.720(a)(4) and 40 CFR 257.102(b)(4).

8.0 COMPLETION OF CLOSURE ACTIVITIES

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.760
Federal CCR Rule Reference: 40 CFR 257.102(f)

Upon completion of all closure activities required by 35 Ill. Adm. Code Part 845 and 40 CFR 257.102(d) and approved by the Illinois EPA in a construction permit, a closure report and a closure certification for South Ash Ponds 2 and 3 will be submitted to the Illinois EPA in accordance with 35 Ill. Adm. Code 845.760(e). The closure report will include (1) the engineering and hydrogeology reports containing any monitoring well completion reports, boring logs, all construction quality assurance (CQA) reports, certifications, designations of CQA officers-in-absentia required by 35 Ill. Adm. Code 845.290; (2) photographs with time, date, and location information relied upon for documentation of construction activities; (3) a written summary of the closure requirements and completed activities as stated in the closure plan in effect and 35 Ill. Adm. Code Part 845; and (4) any other information relied upon by the qualified professional engineer for certification. Pursuant to 35 Ill. Adm. Code 845.760(e)(2) and 40 CFR 257.102(f)(3), the certification will be prepared by an independent, qualified professional engineer licensed in the State of Illinois and will verify that South Ash Ponds 2 and 3 have been closed in accordance with the closure plan in effect at the time of the closure work, the requirements of 35 Ill. Adm. Code Part 845, and the requirements of 40 CFR 257.102. Finally, within 30 days of the Illinois EPA approving the closure report and closure certification, a notification of completion of closure will be prepared in accordance with 35 Ill. Adm. Code 845.760(f) .

9.0 CERTIFICATION

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.720(a)(4)
Federal CCR Rule Reference: 40 CFR 257.102(b)(4)

I certify that:

- This preliminary written closure plan for South Ash Ponds 2 and 3 was prepared by me or under my direct supervision.
- The work was conducted in accordance with the requirements of 35 Ill. Adm. Code Part 845 and with the requirements of 40 CFR 257.102.
- I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin   Date: October 29, 2021

Seal:

LICENSED PROFESSIONAL ENGINEER
THOMAS J DEHLIN
062-069314
OF ILLINOIS

Th. Dehlin
10/29/2021
Exp. 11/30/2021

10.0 REFERENCES

1. Illinois Pollution Control Board. "Standards for Disposal of Coal Combustion Residuals in CCR Surface Impoundments." 35 Ill. Adm. Code 845. Accessed October 19, 2021.

2. U.S. Environmental Protection Agency. "Standards for Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments." 40 CFR Part 257 Subpart D. https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-257/subpart-D. Accessed October 19, 2021.

3. Giroud, J.P. and Bonaparte, R. "Leakage through liners Constructed with Geomembranes—Part I. Geomembrane Liners." *Geotextiles and Geomembranes*. Vol. 8. pp. 27–67. 1989.

4. National Oceanic and Atmospheric Administration. "Point Precipitation Frequency (PF) Estimates." NOAA Atlas 14, Volume 2, Version 3. https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html. Accessed October 19, 2021.

5. Hsuan, Y. *et al*. "Cold Temperatures and Free[ze]-Thaw Cycling Behavior of Geomembranes and Their Seams." GSI White Paper #28. Geosynthetic Institute. June 17, 2013.

ATTACHMENT 11
POST-CLOSURE PLAN

MWG

Midwest Generation, LLC
Will County Generating Station

Post-Closure Care Plan for South Ash Pond 2 & South Ash Pond 3

Revision 1

October 29, 2021

Issue Purpose: Use

Project No.: 12661-124

55 East Monroe Street
Chicago, IL 60603-5780 USA
312-269-2000
www.sargentlundy.com

Sargent & Lundy

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1.0 PURPOSE & SCOPE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.780(d)
Federal CCR Rule Reference: 40 CFR 257.104(d)

1.1 PURPOSE

South Ash Pond 2 and South Ash Pond 3 at Midwest Generation, LLC's (MWG) Will County Generating Station ("Will County" or the "Station") are existing coal combustion residual (CCR) surface impoundments that are regulated by the Illinois Pollution Control Board's "Standards for the Disposal of Coal Combustion Residuals in CCR Surface Impoundments." These regulations are codified in Part 845 to Title 35 of the Illinois Administrative Code (35 Ill. Adm. Code 845, Ref. 1) and are also referred to herein as the "Illinois CCR Rule." South Ash Ponds 2 and 3 are also regulated by the U.S. Environmental Protection Agency's (EPA) "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," 40 CFR Part 257 Subpart D (Ref. 2), also referred to herein as the "Federal CCR Rule."

Pursuant to 35 Ill. Adm. Code 845.780(d) and 40 CFR 257.104(d), this document provides the written post-closure care plan for South Ash Ponds 2 and 3 at Will County. MWG intends to close these CCR surface impoundments by leaving the impounded CCR in place and installing final cover systems over the impoundments in accordance with 35 Ill. Adm. Code 845.750 and 40 CFR 257.102(d). Following completion of all closure activities, MWG will conduct post-closure care for South Ash Ponds 2 and 3 in accordance with the requirements of 35 Ill. Adm. Code 845.780 and 40 CFR 257.104(b). This plan describes the post-closure care activities MWG anticipates performing throughout the post-closure care periods for South Ash Ponds 2 and 3.

1.2 SCOPE

Per the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act, South Ash Ponds 2 and 3 will continue to be subject to both the Illinois and Federal CCR Rules until the U.S. EPA approves the Illinois EPA's CCR permit program. The Illinois EPA has yet to publish a timeline for submitting its proposed CCR permit program to the U.S. EPA for approval, and so this preliminary written closure plan has been prepared pursuant to both sets of regulations.

2.0 POST-CLOSURE MONITORING & MAINTENANCE ACTIVITIES

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.780(d)(1)(A)
Federal CCR Rule Reference: 40 CFR 257.104(d)(1)(i)

Post-closure monitoring for South Ash Ponds 2 and 3 will include (1) maintaining the integrity and effectiveness of each pond's final cover system, (2) maintaining the groundwater monitoring system, and (3) monitoring the groundwater at the site. Table 1 summarizes the post-closure monitoring activities planned to meet these objectives and the corresponding frequencies at which these activities will be performed (at a minimum).

Table 1 – Post-Closure Monitoring Frequency

Monitoring Activity	Description	Monitoring Frequency	Action Items
Final Cover Monitoring	Visually inspect final cover for surface erosion.	Weekly, and following each 25-year, 24-hour storm event if the storm event occurs more than 48 hours before the next scheduled weekly inspection.	Revegetate bare areas as needed.
	Visually inspect final cover for settlement, subsidence, and vertical cracking.		Repair holes, depressions, *etc*. as needed to prevent standing water and infiltration into covered ash (*e.g.*, place fill and regrade).
Groundwater Monitoring	Monitor groundwater quality at South Ash Ponds 2 and 3.	Quarterly for constituents and monthly for groundwater elevations, switching to semi-annually after five years of post-closure monitoring if approved by the Illinois EPA.	If necessary, implement corrective action remedies to achieve compliance with groundwater protection standards.

2.1 FINAL COVER SYSTEM MONITORING & MAINTENANCE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.780(b)(1)
Federal CCR Rule Reference: 40 CFR 257.104(b)(1)

Throughout their post-closure care periods, MWG will maintain the integrity and effectiveness of both final cover systems installed over South Ash Ponds 2 and 3 by regularly inspecting the caps for evidence of surface erosion, settlement, subsidence, or other events. If inspections reveal problems, appropriate corrective measures will be taken to remedy effects of surface erosion, settlement, subsidence, or other events.

2.2 GROUNDWATER MONITORING

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.780(b)(3)
Federal CCR Rule Reference: 40 CFR 257.104(b)(3)

MWG will maintain the groundwater monitoring system for South Ash Ponds 2 and 3 and will continue to monitor groundwater at the site throughout the post-closure care period in accordance with the requirements of 35 Ill. Adm. Code Part 845 Subpart F ("Groundwater Monitoring and Corrective Action") and 40 CFR 257.90 through 40 CFR 257.98. During the first five years of the ponds' post-closure care periods, groundwater monitoring will be performed quarterly for constituents and monthly for groundwater elevations. After five years of post-closure care, groundwater monitoring may be switched to a semi-annual basis if approved by the Illinois EPA.

3.0 FACILITY CONTACT DURING POST-CLOSURE CARE PERIOD

Illinois CCR Rule Reference: 35 Ill. Adm. 845.780(d)(1)(B)
Federal CCR Rule Reference: 40 CFR 257.104(d)(1)(ii)

The name, address, telephone number, and e-mail address of the person to contact about South Ash Ponds 2 and 3 during their post-closure care periods are presented below:

Name:	Phillip Raush, Plant Manager
Address:	Will County Generating Station 529 Romeo Rd. Romeoville, IL 60446
Telephone Number:	(815) 372-4512
E-mail Address:	phillip.raush@nrg.com

4.0 PROPERTY USE DURING POST-CLOSURE CARE PERIOD

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.780(d)(1)(C)
Federal CCR Rule Reference: 40 CFR 257.104(d)(1)(iii)

MWG intends for the sites of South Ash Ponds 2 and 3 to remain undisturbed during their post-closure care periods. MWG plans to limit access to the site only for inspecting the condition of the final cover system, making repairs to the final cover system (as needed), and for accessing the groundwater monitoring wells (if necessary).

5.0 AMENDMENTS TO POST-CLOSURE CARE PLAN

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.780(d)(3)
Federal CCR Rule Reference: 40 CFR 257.104(d)(3)

This post-closure care plan will be amended in accordance with 35 Ill. Adm. Code 845.780(d)(3) and 40 CFR 257.104(d)(3) if a change in the operations of South Ash Pond 2 and/or South Ash Pond 3 would substantially affect this plan or if an unanticipated event necessitates a revision to this plan.

6.0 CERTIFICATION

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.780(d)(4)
Federal CCR Rule Reference: 40 CFR 257.102(d)(4)

I certify that:

- This written post-closure care plan for South Ash Ponds 2 and 3 was prepared by me or under my direct supervision.
- The work was conducted in accordance with the requirements of 35 Ill. Adm. Code 845.780 and with the requirements of 40 CFR 257.104.
- I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin Date: October 29, 2021

Seal:

LICENSED PROFESSIONAL ENGINEER
THOMAS J DEHLIN
062-069314
OF ILLINOIS

Th. Dehlin
10/29/2021
Exp. 11/30/2021

7.0 REFERENCES

1. Illinois Pollution Control Board. “Standards for Disposal of Coal Combustion Residuals in CCR Surface Impoundments.” 35 Ill. Adm. Code 845. Accessed October 19, 2021.
2. U.S. Environmental Protection Agency. “Standards for Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments.” 40 CFR Part 257 Subpart D. https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-257/subpart-D. Accessed October 19, 2021.

ATTACHMENT 12
LINER CERTIFICATION

Attachment 12: Liquid Flow Rate through Alternative Composite Liner
Will County Pond 2S

Darcy's Law for Gravity Flow through Porous Media

Q/A = q = k((h/t)+1)

Q= flow rate (cubic centimeters/second)
A = Surface area of the liner (squared centimeters)
q = flow rate per unit area (cubic centimeters/second/squared centimeter)
k = hydraulic conductivity of the liner (centimeters/second)
h = hydraulic head above the liner (centimeters)
t = thickness of the liner (centimeters)

Section 845.400(c) Comparison Flow Rate

Q/A = q = k((h/t)+1)

Q= calculated
A = 59,317.00 ft^2 = 55,107,296.24 cm^2 Based on surface area at toe of embankment
q = calculated
k = 1.00E-07 cm/s
h = 15.85 ft = 483.108 cm
t = 2 ft = 60.96 cm

Q = 1.00E-07 $\frac{483.108}{60.96}$ +1 * 55,107,296.24

Q = 49.18 cm^3/s	Compare to Surface Impoundment Flow Rate

Pond Profile

Layers	Depth (ft)	Elevation (ft msl) From	Elevation (ft msl) To	Layer Description	Permeability (cm/s)	Layer Thickness (inch)	Layer Thickness (cm)	Product of Permeability & Layer Thickness
Pond	0	590	581.505	Pond embankment crest	--	--	--	--
	8.495	581.505	581.505	Pond bottom	--	--	--	--
Upper Liner Component	8.495'-8.5'	581.505	581.5	60-mil HDPE geomembrane	1E-11	0.06	0.1524	1.524E-12
Lower Liner Component	8.5'-9.5'	581.5	580.5	Poz-O-Pac	3.12E-05	12	30.48	9.51E-04
	9.5'-10'	580.5	580	Lean clay and silty clay	3.65E-07	6	15.24	5.5626E-06
						Totals	45.8724	9.57E-04

Permeability (weighted) = 2.09E-05

Will County Pond 2S Flow Rate Calculation

Q/A = q = k((h/t)+1)

Q= calculated
A = 59317 ft^2 = 55,107,296.24 cm^2 Based on surface area at toe of embankment
q = calculated
k = 2.09E-05 cm/s
h = 15.85 ft = 483.108 cm
t = 1.5 ft = 45.72 cm

Q = 2.09E-05 $\frac{483.108}{45.72}$ +1 * 55,107,296.24

Q = 13,291.33 cm^3/s	Compare to Section 845.400(c) Comparison Flow Rate

Comparison of Surface Impoundment Flow Rate vs Section 845.400(c) Flow Rate

Is the Surface Impoundment Flow Rate of 13,291.33 less than the Section 845.400(c) Comparison Flow Rate of 49.18 **NO**

Will County Pond 3S

Darcy's Law for Gravity Flow through Porous Media

Q/A = q = k((h/t)+1)

Q= flow rate (cubic centimeters/second)

A = Surface area of the liner (squared centimeters)

q = flow rate per unit area (cubic centimeters/second/squared centimeter)

k = hydraulic conductivity of the liner (centimeters/second)

h = hydraulic head above the liner (centimeters)

t = thickness of the liner (centimeters)

Section 845.400(c) Comparison Flow Rate

Q/A = q = k((h/t)+1)

Q= calculated

A = 56,841.00 ft^2 = 52,807,016.97 cm^2 Based on surface area at toe of embankment

q = calculated

k = 1.00E-07 cm/s

h = 15.85 ft = 483.108 cm

t = 2 ft = 60.96 cm

Q = 1.00E-07 $\frac{483.108}{60.96}$ +1 * 52,807,016.97

Q = 47.13 cm^3/s

Compare to Surface Impoundment Flow Rate

Pond Profile

Layers	Depth (ft)	Elevation (ft msl) From	To	Layer Description	Permeability (cm/s)	Layer Thickness (inch)	Layer Thickness (cm)	Product of Permeability & Layer Thickness
Pond	0	590	581.505	Pond embankment crest	--	--	--	--
	8.495	581.505	581.505	Pond bottom	--	--	--	--
Upper Liner Component	8.495'-8.5'	581.505	581.5	60-mil HDPE geomembrane	1E-11	0.06	0.1524	1.524E-12
Lower Liner Component	8.5'-9.5'	581.5	580.5	Poz-O-Pac	3.12E-05	12	30.48	9.51E-04
	9.5'-10'	580.5	580	Lean clay and silty clay	3.65E-07	6	15.24	5.5626E-06
						Totals	45.8724	9.57E-04

Permeability (weighted) =	2.09E-05

Will County Pond 3S Flow Rate Calculation

Q/A = q = k((h/t)+1)

Q= calculated

A = 56841 ft^2 = 52,807,016.97 cm^2 Based on surface area at toe of embankment

q = calculated

k = 2.09E-05 cm/s

h = 15.85 ft = 483.108 cm

t = 1.5 ft = 45.72 cm

Q = 2.09E-05 $\frac{483.108}{45.72}$ +1 * 52,807,016.97

Q = 12,736.52 cm^3/s

Compare to Section 845.400(c) Comparison Flow Rate

Comparison of Surface Impoundment Flow Rate vs Section 845.400(c) Flow Rate

Is the Surface Impoundment Flow Rate of 12,736.52 less than the Section 845.400(c) Comparison Flow Rate of 47.13 **NO**

ATTACHMENT 13
HISTORY OF KNOWN EXCEEDANCES

Attachment 13 – No Attachment

ATTACHMENT 14
FINANCIAL ASSURANCE

<u>CERTIFICATION</u>
<u>35 Ill. Adm. Code 845 Subpart I</u>

In accordance with Section 35 Ill. Adm. Code 845.230(a)(17), Midwest Generation, LLC meets the financial assurance requirements of 35 Ill. Adm. Code 845 Subpart I: Financial Assurance for the Will County Generating Station. The performance bond is attached.

PERFORMANCE BOND

Date bond executed:	06/21/2021

Effective date:	06/21/2021

Principal:	NRG Energy, Inc. on behalf of Midwest Generation, LLC

Type of organization:	Corporation

State of incorporation:	Delaware

Surety:	Arch Insurance Company

Site Will County

Name	Will County Generating Station

Address	529 East 135th Street

City	Romeoville, IL 60446

Amount guaranteed by this bond:	$5,359,872.34		

Name	

Address	

City	

Amount guaranteed by this bond:	$		

Please attach a separate page if more space is needed for all sites.

Total penal sum of bond:	$ 5,359,872.34	

Surety's bond number:	SU1174122	

The Principal and the Surety promise to pay the Illinois Environmental Protection Agency ("IEPA") the above penal sum unless the Principal or Surety provides closure and post-closure care for each site in accordance with the closure and post-closure care plans for that site. To the payment of this obligation the Principal and Surety jointly and severally bind themselves, their heirs, executors, administrators, successors and assigns.

Whereas the Principal is required, under Section 21(d) of the Environmental Protection Act [415 ILCS 5/21(d)], to have a permit to conduct a waste disposal operation;

Whereas the Principal is required, under Section 21.1 of the Environmental Protection Act [415 ILCS 5/21.1], to provide financial assurance for closure and post-closure care;

Whereas the Surety is licensed by the Illinois Department of Insurance or is licensed to transact the business of insurance, or approved to provide insurance as an excess or surplus lines insurer, by the insurance department in one or more states; and

Whereas the Principal and Surety agree that this bond shall be governed by the laws of the State of Illinois;

The Surety shall pay the penal sum to the IEPA or provide closure and post-closure care in accordance with the closure and post-closure care plans for the site if, during the term of the bond, the Principal fails to provide closure or post-closure care for any site in accordance with the closure and post-closure care plans for that site as guaranteed by this bond. The Principal fails to so provide when the Principal:

a) Abandons the site;

b) Is adjudicated bankrupt;

c) Fails to initiate closure of the site or post-closure care when ordered to do so by the Illinois Pollution Control Board or a court of competent jurisdiction;

d) Notifies the IEPA that it has initiated closure, or initiates closure, but fails to close the site or provide post-closure care in accordance with the closure and post-closure care plans; or

e) Fails to provide alternate financial assurance and obtain the IEPA written approval of the assurance provided within 90 days after receipt by both the Principal and the IEPA of a notice from the Surety that the bond will not be renewed for another term.

The Surety shall pay the penal sum of the bond to the IEPA or notify the IEPA that it intends to provide closure and post-closure care in accordance with the closure and post-closure care plans for the site within 30 days after the IEPA mails notice to the Surety that the Principal has met one or more of the conditions described above. Payment shall be made by check or draft payable to the State of Illinois, Landfill Closure and Post-Closure Fund.

If the Surety notifies the IEPA that it intends to provide closure and post-closure care, then the Surety must initiate closure and post-closure care within 60 days after the IEPA mailed notice to the Surety that the Principal met one or more of the conditions described above. The Surety must complete closure and post-closure care in accordance with the closure and post-closure care plans, or pay the penal sum.

The liability of the Surety shall not be discharged by any payment or succession of payments unless and until such payment or payments shall amount in the aggregate to the penal sum of the bond. In no event shall the obligation of the Surety exceed the amount of the penal sum.

This bond shall expire on the __21st day of June__________, 2022 [date]; but such expiration date shall be automatically extended for a period of One [at least one year] on __21st day of June, 2022____ [date] and on each successive expiration date, unless, at least 120 days before the current expiration date, the Surety notifies both the IEPA and the Principal by certified mail that the Surety has decided not to extend the term of this surety bond beyond the current expiration date. The 120 days will begin on the date when both the Principal and the IEPA have received the notice, as evidenced by the return receipts.

The Principal may terminate this bond by sending written notice to the Surety; provided, however, that no such notice shall become effective until the Surety receives written authorization for termination of the bond from the IEPA in accordance with 35 Ill. Adm. Code 807.604.

In Witness Whereof, the Principal and Surety have executed this Performance Bond and have affixed their seals on the date set forth above.

The persons whose signatures appear below certify that they are authorized to execute this surety bond on behalf of the Principal and Surety and that the wording of this surety bond is identical to the wording specified in 35 Ill. Adm. Code 807.Appendix A, Illustration D as such regulation was constituted on the date this bond was executed.

Principal: NRG Energy, Inc. on behalf of Midwest Generation, LLC		Corporate Surety
Signature		Name: Arch Insurance Company
Typed Name Edward Christopher Krupa		Address: Harborside 3, 210 Hudson Street, Suite 300, Jersey City, NJ 07311-1107
Title Vice President		State of Incorporation: Missourt
Date 6/21/2021		Signature
		Typed Name: Mark W. Edwards, II
		Title-Attorney-in-Fact
Corporate seal		Corporate seal

		Bond premium:	$	37,519.00

(Source: Amended at 35 Ill. Reg. 18867, effective October 24, 2011)

Section 807.APPENDIX A Financial Assurance Forms

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated. Not valid for Note, Loan, Letter of Credit, Currency Rate, Interest Rate or Residential Value Guarantees.

POWER OF ATTORNEY

Know All Persons By These Presents:

That the Arch Insurance Company, a corporation organized and existing under the laws of the State of Missouri, having its principal administrative office in Jersey City, New Jersey (hereinafter referred to as the "Company") does hereby appoint:

Alisa B. Ferris, Anna Childress, Jeffrey M. Wilson, Mark W. Edwards II, Richard H. Mitchell, Robert R. Freel and William M. Smith of Birmingham, AL (EACH)

R. E. Daniels and Shelby E. Daniels of Pensacola, FL (EACH)

its true and lawful Attorney(s)in-Fact, to make, execute, seal, and deliver from the date of issuance of this power for and on its behalf as surety, and as its act and deed: Any and all bonds, undertakings, recognizances and other surety obligations, in the penal sum not exceeding Ninety Million Dollars ($90,000,000.00).
This authority does not permit the same obligation to be split into two or more bonds In order to bring each such bond within the dollar limit of authority as set forth herein.

The execution of such bonds, undertakings, recognizances and other surety obligations in pursuance of these presents shall be as binding upon the said Company as fully and amply to all intents and purposes, as if the same had been duly executed and acknowledged by its regularly elected officers at its principal administrative office in Jersey City, New Jersey.

This Power of Attorney is executed by authority of resolutions adopted by unanimous consent of the Board of Directors of the Company on December 10, 2020, true and accurate copies of which are hereinafter set forth and are hereby certified to by the undersigned Secretary as being in full force and effect:
"**VOTED**, That the Chairman of the Board, the President, or the Executive Vice President, or any Senior Vice President, of the Surety Business Division, or their appointees designated in writing and filed with the Secretary, or the Secretary shall have the power and authority to appoint agents and attorneys-in-fact, and to authorize them subject to the limitations set forth in their respective powers of attorney, to execute on behalf of the Company, and attach the seal of the Company thereto, bonds, undertakings, recognizances and other surety obligations obligatory in the nature thereof, and any such officers of the Company may appoint agents for acceptance of process."

This Power of Attorney is signed, sealed and certified by facsimile under and by authority of the following resolution adopted by the unanimous consent of the Board of Directors of the Company on December 10, 2020:

VOTED, That the signature of the Chairman of the Board, the President, or the Executive Vice President, or any Senior Vice President, of the Surety Business Division, or their appointees designated in writing and filed with the Secretary, and the signature of the Secretary, the seal of the Company, and certifications by the Secretary, may be affixed by facsimile on any power of attorney or bond executed pursuant to the resolution adopted by the Board of Directors on December 10, 2020, and any such power so executed, sealed and certified with respect to any bond or undertaking to which it is attached, shall continue to be valid and binding upon the Company. **In Testimony Whereof**, the Company has caused this instrument to be signed and its corporate seal to be affixed by their authorized officers, this **23rd day of April, 2021**.

Attested and Certified

Regan A. Shulman

Regan A. Shulman, Secretary

Arch Insurance Company
CORPORATE SEAL
1971
Missouri

Arch Insurance Company

Stephen C. Ruschak

Stephen C. Ruschak, Executive Vice President

STATE OF PENNSYLVANIA SS
COUNTY OF PHILADELPHIA SS

I, **Michele Tripodi**, a Notary Public, do hereby certify that Regan A. Shulman and Stephen C. Ruschak personally known to me to be the same persons whose names are respectively as Secretary and Executive Vice President of the Arch Insurance Company, a Corporation organized and existing under the laws of the State of Missouri, subscribed to the foregoing instrument, appeared before me this day in person and severally acknowledged that they being thereunto duly authorized signed, sealed with the corporate seal and delivered the said instrument as the free and voluntary act of said corporation and as their own free and voluntary acts for the uses and purposes therein set forth.

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
MICHELE TRIPODI, Notary Public
City of Philadelphia, Phila. County
My Commission Expires July 31, 2021

Michele Tripodi

Michele Tripodi, Notary Public
My commission expires 07/31/2021

CERTIFICATION

I, **Regan A. Shulman**, Secretary of the Arch Insurance Company, do hereby certify that the attached **Power of Attorney dated April 23, 2021** on behalf of the person(s) as listed above is a true and correct copy and that the same has been in full force and effect since the date thereof and is in full force and effect on the date of this certificate; and I do further certify that the said Stephen C. Ruschak, who executed the Power of Attorney as Executive Vice President, was on the date of execution of the attached Power of Attorney the duly elected Executive Vice President of the Arch Insurance Company.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seal of the Arch Insurance Company on this 21st day of Jun, 20 21.

Regan A. Shulman

Regan A. Shulman, Secretary

This Power of Attorney limits the acts of those named therein to the bonds and undertakings specifically named therein and they have no authority to bind the Company except in the manner and to the extent herein stated.

PLEASE SEND ALL CLAIM INQUIRIES RELATING TO THIS BOND TO THE FOLLOWING ADDRESS:
Arch Insurance – Surety Division
3 Parkway, Suite 1500
Philadelphia, PA 19102

Arch Insurance Company
CORPORATE SEAL
1971
Missouri

To verify the authenticity of this Power of Attorney, please contact Arch Insurance Company at SuretyAuthentic@archinsurance.com
Please refer to the above named Attorney-in-Fact and the details of the bond to which the power is attached.

ATTACHMENT 15
HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

MWG

Midwest Generation, LLC
Will County Generating Station

2021 Hazard Potential Classification Assessment for South Ash Pond 2 & South Ash Pond 3

Revision 0

October 14, 2021

Issue Purpose: Use

Project No.: 12661-124

55 East Monroe Street
Chicago, IL 60603-5780 USA
312-269-2000
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1.0 PURPOSE & SCOPE

1.1 PURPOSE

South Ash Pond 2 and South Ash Pond 3 at Midwest Generation, LLC's (MWG) Will County Generating Station ("Will County" or the "Station") are existing coal combustion residual (CCR) surface impoundments that are regulated by the Illinois Pollution Control Board's "Standards for the Disposal of Coal Combustion Residuals in CCR Surface Impoundments." These regulations are codified in Part 845 to Title 35 of the Illinois Administrative Code (35 Ill. Adm. Code 845, Ref. 1) and are also referred to herein as the "Illinois CCR Rule." Pursuant to 35 Ill. Adm. Code 845.440(a)(1), MWG must conduct and complete a hazard potential classification assessment that assigns hazard potential classifications to South Ash Ponds 2 and 3 in accordance with the hazard potential classifications defined in 35 Ill. Adm. Code 845.120.

South Ash Ponds 2 and 3 are also regulated by the U.S. Environmental Protection Agency's "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," 40 CFR Part 257 Subpart D (Ref. 2), also referred to herein as the "Federal CCR Rule." Pursuant to 40 CFR 257.73(f)(3), the Federal CCR Rule requires MWG to conduct and complete a hazard potential classification assessment in accordance with 40 CFR 257.73(a)(2) for South Ash Ponds 2 and 3 every five years.

This report documents the 2021 hazard potential classification assessment conducted and completed in accordance with the Illinois and Federal CCR Rules by Sargent & Lundy (S&L) on behalf of MWG for South Ash Ponds 2 and 3 at Will County. This report:

- Lists the inputs and assumptions used in the 2021 hazard potential classification assessment,
- Discusses the methodology used to conduct the 2021 hazard potential classification assessment,
- Lists and compares the definitions for the hazard potential classifications for CCR surface impoundments promulgated by the Illinois and Federal CCR Rules,
- Summarizes the results from the initial hazard potential classification assessment completed for South Ash Ponds 2 and 3 that was conducted in accordance with the Federal CCR Rule,
- Evaluates potential changes to the factors used as the bases for the initial federal hazard potential classifications assigned to South Ash Ponds 2 and 3 to determine whether revised federal hazard potential classifications are warranted, and
- Provides the 2021 hazard potential classifications for South Ash Ponds 2 and 3 in accordance with 35 Ill. Adm. Code 845.440(a)(1) and 40 CFR 257.73(a)(2).

1.2 SCOPE

Per the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act, South Ash Ponds 2 and 3 will continue to be subject to both the Illinois and Federal CCR Rules until the U.S. EPA approves the Illinois

EPA's CCR permit program. The Illinois EPA has yet to publish a timeline for submitting its proposed CCR permit program to the U.S. EPA for approval, and so MWG must provide hazard potential classifications pursuant to both sets of regulations at this time.

2.0 INPUTS

Hazard Potential Classifications

The Illinois CCR Rule (Ref. 1, § 845.120) defines "hazard potential classification" as "the possible adverse incremental consequences that result from the release of water or stored contents due to failure of the diked CCR surface impoundment or mis-operation of the diked CCR surface impoundment or its appurtenances." The Illinois CCR Rule (Ref. 1, § 845.440(a)(1)) requires a CCR surface impoundment be designated as either a Class 1 CCR surface impoundment or a Class 2 CCR surface impoundment. Per 35 Ill. Adm. Code 845.120, the two Illinois hazard potential classifications are defined as follows:

- *Class 1 CCR surface impoundment* means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.
- *Class 2 CCR surface impoundment* means a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.

The Federal CCR Rule (Ref. 2, § 257.53) has the same definition for "hazard potential classification" as the Illinois CCR Rule. However, the Federal CCR Rule has three hazard potential classifications instead of the two designations promulgated by the Illinois CCR Rule. Per 40 CFR 257.53, the three federal hazard potential classifications are defined as follows:

- *High hazard potential CCR surface impoundment* means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.
- *Low hazard potential CCR surface impoundment* means a diked surface impoundment where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the surface impoundment owner's property.
- *Significant hazard potential CCR surface impoundment* means a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.

Per the preceding sets of definitions for the federal and Illinois hazard potential classifications, a high hazard potential CCR surface impoundment per the Federal CCR Rule is the same as a Class 1 CCR surface impoundment per the Illinois CCR Rule. Similarly, a CCR surface impoundment that is classified as a low or significant hazard potential per the Federal CCR Rule is considered to be a Class 2 CCR surface impoundment per the Illinois CCR Rule.

Site Topography

Two topographic datasets for South Ash Pond 2, South Ash Pond 3, and the surrounding areas were obtained: one from the U.S. Geological Survey's (USGS) National Elevation Dataset (NED) (Ref. 4) and one from the U.S. Department of Agriculture's (USDA) National Digital Elevation Program (NDEP) (Ref. 5). The USGS dataset was published in 2011 and was utilized in the initial hazard potential classification assessment and the 2016 dike breach analysis. The USGS topography reflects elevation data collected in 2004 at a resolution of approximately 3 meters. Based on a review of the USGS NED, the 2004 USGS elevation dataset is the most recent topographic dataset in the NED at a 3-meter or better resolution for the Station and surrounding areas. Meanwhile, the USDA topography reflects elevation data collected in 2010 at a 1-meter resolution and was utilized in this 2021 assessment to determine whether the site topography referenced in the initial hazard potential classification assessment and the 2016 dike breach analysis should be updated.

Impacted Areas

Areas impacted by a hypothetical failure at either South Ash Pond 2 or South Ash Pond 3 were obtained from the ponds' initial hazard potential classification assessment (Ref. 3), the dike breach analysis conducted in 2016 for the ponds' eastern dikes (Ref. 6), and the dike breach inundation maps prepared for the ponds' Emergency Action Plan (Ref. 7). The inputs, assumptions, and methodology utilized to identify areas impacted by failures at each of the ponds' dikes were evaluated to determine whether any updates to these analyses were warranted.

Appendix A provides the initial hazard potential classification assessment conducted by Geosyntec Consultants in 2016 for South Ash Ponds 2 and 3.

Aerial Images

Historical and recent aerial images of the Station and surrounding areas were obtained from Google Earth Pro (Ref. 8).

Property Boundaries

Boundaries for the Station's property and adjacent properties were obtained from the geographic information system (GIS) for Will County, Illinois (Ref. 9).

100-Year Floodway & Floodplain

Delineations for the floodway and floodplain for the 1% annual chance flood ("100-year flood") at and downstream from the Will County site were obtained from the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) for the subject area (Ref. 10).

Ash Pond Conditions

The operating and physical conditions for South Ash Ponds 2 and 3 were based on discussions with MWG personnel.

3.0 ASSUMPTIONS

There are no assumptions in this document that require verification.

4.0 METHODOLOGY

The bases for South Ash Pond 2's and South Ash Pond 3's initial hazard potential classifications as documented within the ponds' initial hazard potential classification assessment were reviewed to determine if any changes have occurred since the initial assessment was completed. Identified changes were then evaluated to determine if the ponds' previous hazard potential classifications warrant adjustments. Where no changes were noted for a given input, or where identified changes were determined to have no impact to the results and conclusions of the initial hazard potential classification assessment, the previous evaluation of that input was considered to still be valid for this 2021 assessment.

In instances where changes to one or more factors used as the bases for the initial hazard potential classifications were identified (*e.g.*, downstream development that was not present in 2016), hypothetical dike breaches were considered at each of the two CCR surface impoundments to evaluate the impacts that a release of CCR and CCR wastewater would have on the identified factor(s). These hypothetical dike breaches were evaluated regardless of potential causes and/or apparent dike stability. When evaluating a hypothetical dike breach at a subject CCR surface impoundment, the solid waste materials in the CCR surface impoundment were conservatively considered as an equivalent volume of liquid, and the CCR surface impoundment was assumed to be entirely filled with liquid.

When evaluating the downstream impacts from a hypothetical dike breach at a CCR surface impoundment, the first consideration examined was whether a loss of human life is probable under the given hypothetical failure scenario. Loss of human life is the critical aspect of a federal high hazard potential classification. If a loss of human life is unlikely to occur, then the CCR surface impoundment was not considered to be a federal high hazard potential. In that case, the next consideration examined was the extent of environmental and economic losses resulting from the hypothetical dike breach. If the losses are low and principally contained to MWG's property, then the CCR surface impoundment was considered to be a federal low hazard potential. If the environmental and/or economic losses extend beyond MWG's property, then the CCR surface impoundment was considered to be a federal significant hazard potential.

After assigning federal hazard potential classifications to South Ash Ponds 2 and 3, Illinois CCR Rule hazard potential classifications (either Class 1 or Class 2) were assigned based on the assigned federal hazard potential classifications. An Illinois Class 1 hazard potential classification was assigned to a CCR surface impoundment if the pond was classified as a federal high hazard potential. Alternatively, the CCR surface impoundment was classified as an Illinois Class 2 hazard potential if the pond was classified as either a federal significant or low hazard potential.

5.0 ASSESSMENT

5.1 SUMMARY OF INITIAL HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

The initial hazard potential classification assessment for South Ash Ponds 2 and 3 was completed in October 2016 and is included in its entirety in Appendix A. This assessment evaluated the potential consequences of hypothetical dike failures for both ponds. A quantitative dike breach analysis was also conducted for each pond's eastern dike which was determined to pose the most risk to human life due to the eastern dikes' proximities to occupied buildings and the adjacent topography sloping towards occupied buildings. The 2016 dike breach analysis also assumed that South Ash Pond 2, South Ash Pond 3, and other nearby, non-CCR surface impoundments were at capacity at the time of the hypothetical failure.

Per Figures 2 and 3 in Appendix A, the 2016 dike breach analysis concluded that the flood released through a hypothetical breach in the eastern dike of either South Ash Pond 2 or South Ash Pond 3 could impact several unoccupied buildings and one occupied building. The 2016 dike breach analysis also concluded that the combination of the estimated flood velocity and depth at the occupied building is within the U.S. Department of the Interior, Bureau of Reclamation's (USBR) "Low Danger Zone" (see Figure 4 in Appendix A). In its "Downstream Hazard Classification Guidelines" (Ref. 11), the USBR states that if the depth-velocity combination of a hazard (*e.g.*, flood) for a given area plots within the "Low Danger Zone," "the number of lives-in-jeopardy associated with possible downstream hazards is assumed to be zero." In other words, floods plotting within the USBR's "Low Danger Zone" are unlikely to cause a probable loss of human life. Therefore, the initial hazard potential classification assessment concluded that a failure at the eastern dike of either South Ash Pond 2 or South Ash Pond 3 would not result in a probable loss of human life.

Although a hypothetical failure at either South Ash Pond 2 or South Ash Pond 3 was determined to not cause a probable loss of human life, it was also determined that wastewater released from a breach at either pond's western dike would flow directly into the Des Plaines River and cause offsite environmental impacts. Therefore, South Ash Ponds 2 and 3 were both classified as significant hazard potential CCR surface impoundments.

5.2 CHANGES IN BASES FOR INITIAL HAZARD POTENTIAL CLASSIFICATIONS

5.2.1 CHANGES IN ASH POND OPERATIONS & EMBANKMENT GEOMETRY

In early October 2020, Will County took South Ash Pond 3 out of service for routine cleaning. In April 2021, MWG filed a notice of intent to close South Ash Pond 3 in accordance with the Federal CCR Rule's closure criteria (Ref. 2, § 257.102). Closure construction activities will commence at the pond upon receipt of a closure construction permit from the Illinois EPA in accordance with Subpart B of the Illinois CCR Rule. Meanwhile, Will County continues to operate South Ash Pond 2 to manage CCR wastestreams and various non-CCR wastestreams from the Station in accordance with 40 CFR 257.103(f)(1). Operating conditions at this pond have not changed since the pond's initial hazard potential classification assessment was conducted in 2016.

As previously mentioned in Section 5.1, South Ash Pond 3's 2016 hazard potential classification assessment examined hypothetical breach scenarios assuming the pond was at capacity; therefore, the assumed operating condition used for the initial assessment is conservative for the pond's current operating condition. Therefore, there is no basis to reevaluate the surface water elevations used to conduct the initial hazard potential classification assessment for South Ash Ponds 2 and 3.

Based on reviews of Google Earth aerial images (Ref. 8), there have been no significant modifications to South Ash Ponds 2 and 3 (mass excavations, major embankment modifications, *etc*.) since the initial hazard potential classification assessment was completed. Therefore, there is no basis to reevaluate the embankment geometry for this 2021 assessment.

5.2.2 CHANGES IN SITE TOPOGRAPHY

When comparing the 2004 USGS topography (Ref. 4) used in the initial hazard potential classification assessment and the 2010 USDA elevation dataset for the area (Ref. 5), no significant differences in the topography adjacent to the ash ponds and within the dike breach impact areas were identified. This observation is further supported by Google Earth aerial images (Ref. 8), which indicate that there have been no significant modifications to the ground surfaces (mass excavations, mass fill placement, *etc*.) adjacent to South Ash Ponds 2 and 3 or within the dike breach impact areas since 2010. Based on these observations, the topographic data used by the initial hazard potential classification assessment remains valid for this 2021 assessment.

5.2.3 CHANGES IN DOWNSTREAM PROPERTY DEVELOPMENTS

Based on reviews of Google Earth aerial images (Ref. 8) and the Will County, Illinois GIS (Ref. 9), no new buildings or transport corridors (roads, rail lines, *etc*.) have been constructed in the past five years within the dike breach impact areas identified in the initial hazard potential classification assessment. Thus, there is no basis to reevaluate the potential impacts to the areas downstream of South Ash Ponds 2 and 3 for this 2021 assessment.

5.2.4 CHANGES IN USBR DEPTH-VELOCITY FLOOD DANGER LEVELS

The USBR has not updated the depth-velocity flood danger level relationships presented in its "Downstream Hazard Classification Guidelines" (Ref. 11) since the initial hazard potential classification assessment for South Ash Ponds 2 and 3 was completed in 2016. Therefore, there is no basis to reevaluate the danger levels assigned to the occupied buildings identified within the inundation area downstream of the eastern dikes for South Ash Ponds 2 and 3 following a hypothetical breach at either pond.

5.3 2021 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

Other than the change in the operational status of South Ash Pond 3, there have been no significant modifications to South Ash Ponds 2 and 3; no significant modifications to the topography adjacent to and downstream of these CCR surface impoundments; and no significant buildings or transport corridors that have been constructed in the areas downstream of the CCR surface impoundments that would be impacted by a hypothetical dike breach. There have also been no changes to the USBR's depth-velocity flood danger level relationships, which were used in the 2016 hazard potential classification assessment. Moreover, the Federal Energy Regulatory Commission's *Engineering Guidelines for the Evaluation of Hydropower Projects*, which references FEMA's *Federal Guidelines for Dam Safety* (Ref. 13), states that "the consequences of failure are not expected to cause a probable loss of human life when incremental effects on downstream structures are approximately two feet or less." FEMA's *Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures* (Ref. 14) also states that an incremental rise in flood depth of two feet or less caused by a dike breach is not considered to be a concern to human life. These two federal guidelines further support the conclusion that the loss of human life at the occupied building is not probable given that the initial dike breach analysis results show the estimated flood depth at this building is less than 2 feet. Therefore, the initial hazard potential classification assessment completed in 2016 for these CCR surface impoundments remains valid. In addition, the 2016 dike breach analysis for the ponds' eastern dikes still represents the worst-case failure scenario for each pond since these dikes are the closest to occupied Station buildings.

Based on the preceding observations, the initial federal significant hazard potential classifications assigned to South Ash Ponds 2 and 3 in accordance with 40 CFR 257.73(a)(2) and the bases for these assignments remain valid for this 2021 assessment. A loss of human life is unlikely to result from a hypothetical failure at these CCR surface impoundments, but potential offsite environmental damage could occur to the Des Plaines River. As discussed in Section 2.0, a CCR surface impoundment classified as a significant hazard potential per the Federal CCR Rule is considered to be an Illinois Class 2 CCR surface impoundment.

Therefore, South Ash Ponds 2 and 3 were classified as Class 2 CCR surface impoundments pursuant to 35 Ill. Adm. Code 845.440(a)(1).

6.0 CONCLUSIONS

This evaluation reviewed the factors and design inputs used as the bases for the initial hazard potential classification assessment completed in accordance with the Federal CCR Rule for Will County's South Ash Ponds 2 and 3. It was determined that no significant operational or physical changes to these CCR surface impoundments and no new downstream developments within the dike breach inundation areas have occurred within the last five years that would necessitate changing either pond's initial federal hazard potential classification. Therefore, the initial federal hazard potential classifications assigned to South Ash Ponds 2 and 3 and the bases for these assignments remain valid for 2021. These federal hazard potential classifications were then used to determine the hazard potential classifications pursuant to the Illinois CCR Rule based on the similarities between the Federal and Illinois CCR Rules' hazard potential classifications for CCR surface impoundments.

Table 6-1 presents the 2021 hazard potential classifications assigned to South Ash Ponds 2 and 3 at Will County in accordance with 35 Ill. Adm. Code 845.440(a)(1) and 40 CFR 257.73(a)(2).

Table 6-1 – 2021 Illinois & Federal Hazard Potential Classifications for South Ash Pond 2 & South Ash Pond 3 at the Will County Generating Station

CCR Surface Impoundment	Illinois Hazard Potential Classification	Federal Hazard Potential Classification
South Ash Pond 2	Class 2	Significant
South Ash Pond 3	Class 2	Significant

7.0 CERTIFICATION

I certify that:

- This hazard potential classification assessment was prepared by me or under my direct supervision.
- The work was conducted in accordance with the requirements of 35 Ill. Adm. Code 845.440 and with the requirements of 40 CFR 257.73(a)(2).
- I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin   Date: October 14, 2021

Seal:

LICENSED PROFESSIONAL ENGINEER
THOMAS J DEHLIN
062-069314
OF ILLINOIS

Th. Dehlin
10/14/2021
Exp. 11/30/2021

8.0 REFERENCES

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APPENDIX A: 2016 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT FOR SOUTH ASH PONDS 2 & 3

ATTACHMENT 16
STRUCTURAL STABILITY ASSESSMENT

STRUCTURAL STABILITY AND FACTOR OF SAFETY ASSESSMENT
ASH PONDS 1N, 1S, 2S, AND 3S, WILL COUNTY STATION
SEPTEMBER 2021

This Structural Stability and Factor of Safety Assessment report has been prepared pursuant to the coal combustion residuals (CCR) rule codified in Title 35 of the Illinois Administrative Code, Section 845.440(a) effective as of April 21, 2021 for North Ash Pond 1 and South Ash Pond 1, South Ash Pond 2, and South Ash Pond 3 (herein referred to as Pond(s) 1N, 1S, 2S, and 3S) at Will County Station in Romeoville, Illinois (Station). The purpose of this project is to perform the initial structural stability and factor of safety assessments for the ponds by a licensed professional engineer. Civil & Environmental Consultants, Inc. (CEC) completed this structural stability and factor of safety assessment as described in the following sections.

1.0 REGULATION REQUIREMENTS - SECTIONS 845.450 AND 845.460

In accordance with Sections 845.450 and 845.460, owners or operator of a CCR impoundment are required to conduct initial and annual structural stability assessments to document whether the design, construction, operation, and maintenance of the CCR surface impoundment is consistent with recognized and generally accepted engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded; and to conduct an initial and annual safety factor assessment for each CCR surface impoundment and document whether the calculated factors of safety for each CCR surface impoundment achieve the minimum safety factors specified for the critical cross section of the embankment.

2.0 SITE CONDITIONS

Ponds 1N, 1S, 2S, and 3S are located at Will County Station, 529 East 135th Street in Romeoville, Will County, Illinois and situated south of 135th Street between the Des Plaines River and the Chicago Sanity and Ship Canal, see Figure 1. Basic information for each of the ponds are provided in Table 1. The ponds are of similar construction, size, and age. Each pond is constructed with a concrete weir spillway along the west half. Gravel access roads are located along the sides of the ponds.

Table 1 - Ash Pond Construction

Pond ID	Year of Original Construction	Dimension (ft x ft)	Depth (ft)	Capacity (ft^3)	Status
Pond 1N	1977	167 x 333	7	520,000	Closed
Pond 1S	1977	300 x 195	7	460,000	Closed
Pond 2S	1977	350 x 178	7	510,000	Active
Pond 3S	1977	234 x 322	7	530,000	Inactive

Based on information provided by Station personnel, the ponds were originally constructed in 1977, and have not undergone significant changes in the geometry. The original operation was designed to receive bottom ash via sluicing with wastewater treated in the wastewater treatment plant and discharged to the Chicago Sanitary and Ship Canal through the permitted National Pollutant Discharge Elimination System Outfall 002.

Ponds 1N and 1S were closed after the shutdown of Unit 1 and Unit 2, respectively. Pond 2S is still active, and at the time of our inspection, Pond 3S was inactive. The ponds are inspected weekly by the environmental specialist including checking the water level in the ponds.

3.0 STRUCTURAL STABILITY ASSESSMENT - SECTION 845.450

The following sections describe the structural stability assessment.

3.1 Stable Foundation and Abutments - Section 845.450(a)(1)

This assessment indicates the soils forming the pond foundations are stable. Soils data from soil boring logs and monitoring well logs within the vicinity of the ponds show the foundations consist of random sandy clay and gravel fill over weathered limestone bedrock. Inspection of the ponds did not show signs of distress due to settlement of the underlying foundation soils.

The ponds are partially incised and supported by earthen embankments. These type of basins constructed with earthen berms do not require abutments, and therefore consideration of abutment design, construction, and operation is not required.

3.2 Adequate Slope Protection - Section 845.450(a)(2)

Ponds 1N, 1S, 2S, and 3S are constructed with concrete overflows on the south end of each pond and the earthen bottom and sidewalls are protected with Poz-o-Pac liner. Additionally, Ponds 2S and 3S are also protected with a flexible membrane liner that provides adequate protection of the interior slopes against surface erosion, wave action, and adverse effects of sudden drawdown. From our inspection, Pond 2S has a protective layer comprised of concrete filled flexible reinforcement grid which is placed over a 6-inch warning layer, 12-inch cushion layer, and a 60 mil textured flexible membrane liner; while Pond 3S has been lined with flexible membrane liner. Our inspection of the ponds showed no signs of erosion.

3.3 Dike Compaction - Section 845.450(a)(3)

As-built construction documents for the initial construction of the ponds are unavailable. It would be standard practice for the dikes to be mechanically compacted to a density sufficient to withstand the range of loading conditions in the ponds. This is supported by the consideration that the ponds have been in operation since the 1977, and that the station has no record of observed distresses or repairs. Furthermore, the initial inspection of the dikes did not shows signs of distress that would be indicative of improperly placed and/or loosely compacted soils.

3.4 Downstream Slope Protection - Section 845.450(a)(4)

Consistent with Section 845.430, the basin slope protection consists of a combination of riprap and vegetative cover over the downstream slopes. Inspection shows the slope protection is maintained; protective against surface erosion, wave action, and adverse effect of rapid drawdown. At the time of inspection, the woody vegetation was observed on the downstream slope. Grassy vegetation did not exceed 12 inches in height.

3.5 Spillway - Section 845.450(a)(5)

Although each of the ponds are constructed with a concrete overflow connected to the on-site wastewater treatment plant, the ponds have not been designed or constructed with a spillway. Section 845.450 specifies a single spillway or a combination of spillways configured as specified in Subsection (a)(5)(A), and that the combined capacity of all spillways must be designed, constructed, operated, and maintained to adequately manage flow during and following the peak discharge from the event specified in Subsection (a)(5)(B). Not having an spillway is considered a deficiency in accordance with the Section 845.450(a)(5). Our inspection shows the ponds have been constructed and operated without incident since 1977, without any spillway, and that water levels are maintained at the level of the overflow.

3.6 Structural Integrity of Hydraulic Structures - Section 845.450(a)(6)

Although each of the ponds are constructed with a concrete overflow connected to the wastewater treatment plant, the pipe leading from the overflow is either a 36-inch (Ponds 2S and 3S) or 48-inch (Ponds 1N and 1S) diameter pipe that passes through earthen embankment. At the time of our inspection, the water flowed into the pipe and evidence showing the structural integrity of the pipe free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris could not be made. At the time of this report, inspection reports for the overflow were unavailable.

3.7 Down Stream Slopes Adjacent To Water Bodies - Section 845.450(a)(7)

The Des Plaines River is downstream of the ponds and a stability analysis was performed for both a low pool and rapid draw down condition. The stability analysis shows that the embankment is designed and constructed to maintain stability during both low pool and rapid draw down conditions.

3.8 Structural Stability Assessment Deficiencies

Structural deficiencies associated with the ponds were not identified during this initial structural stability assessment. Inspection records for the pipe were unavailable. Although our inspection did not identify distress that would suggest the existence of a structural deficiency, the overflow pipe should be inspected in accordance with Section 845.450(a)(6).

3.9 Annual Inspection Requirement

In completing the initial structural stability assessment, the ponds were inspected for signs of distress that would have the potential to disrupt operation and safety. No signs of distress that would have the potential to disrupt operation and safety of the ponds were identified. This inspection can suffice for the 2021 inspection.

4.0 SAFETY FACTOR ASSESSMENT - SECTION 845.460

In accordance with Section 845.460, the owner or operator of a CCR surface impoundment must conduct initial and annual safety factor assessments for each CCR surface impoundment and document whether the calculated factors of safety for each CCR surface impoundment achieve the minimum safety factors specified for the critical cross section of the embankment. The critical cross section is the cross section anticipated to be the most susceptible of all cross sections to structural failure based on appropriate engineering considerations, including loading conditions. The safety factor assessments must be supported by appropriate engineering calculations.

4.1 Slope Stability Methodology

Slope stability software Slide2 was used to calculate the minimum factor of safety for each pond at Cross Section 1N-1N, 1S-1S, 2S-2S, and 3S-3S, respectively. The program uses 2D limit equilibrium methods to determine the minimum factor of safety against slope instability. The auto-refine, non-circular search method with optimization was used utilizing Spencer's method to calculate the factor of safety for each design criteria scenario, as discussed below. For each section analyzed, the program searches for the sliding surface that procures the lowest factor of safety which is defined as the ratio of the shear forces and moment resisting movement along the sliding surface to the forces and moments driving the instability.

Soil data provided by the station personnel was used to develop soil properties for the slope stability analysis. The data shows the soil materials in the vicinity of the ponds consists of up to approximately 5 feet of random clay fill overlying weathered and unweathered limestone bedrock.

4.2 Slope Stability Analysis - Section 845.460

Four cases were analyzed to satisfy the safety factor assessment as per Section 845.460(a)(2) through (a)(4).

4.2.1 Static, Long-Term - Section 845.460(a)(2)

The static, long-term condition with the maximum surcharge loading on the embankment was evaluated. The static, long-term analysis included a pool elevation at 592.5 feet mean sea level and a groundwater elevation at 580.5 feet mean sea level.

4.2.2 Static, Maximum Storage Pool - Section 845.460(a)(3)

The static, long-term, maximum storage pool condition with the maximum surcharge loading on the embankment was evaluated. The static, long-term analysis included a pool elevation set at the lowest points of the embankment crest, 589.5 feet mean sea level, and a groundwater elevation at 580.5 feet mean sea level.

4.2.3 Seismic - Section 845.460(a)(4)

Seismic analysis was performed by incorporating pseudo static seismic loading scenarios in the long-term global stability analysis calculations. A pseudo-static seismic horizontal load was applied to the long-term maximum storage pool loading condition model.

The seismic factor of safety is defined in the proposed CCR regulations as “the factor of safety (safety factor) determined using analysis under earthquake conditions using the peak ground acceleration (PGA) for a seismic event with a 2% probability of exceedance in 50 years, equivalent to a return period of approximately 2,500 years, based on the U.S. Geological Survey (USGS) seismic hazard maps for seismic events with this return period for the region where the CCR surface impoundment is located”.

4.2.4 Liquefaction - Section 845.460(a)(5)

For dikes constructed of soils susceptible to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.20. Soils with potential for liquefaction typically consist of poorly drained fine-grained soils. Soil boring data indicate that the embankment and foundation soils consist of random sandy clay and gravel fill over shallow weathered limestone bedrock. These soil types are not susceptible to liquefaction. Additionally, the Poz-o-Pac liner system makes it unlikely the embankment would become saturated or inundated. Because the likelihood of liquefaction and associated shear strength loss of the embankment soils is very low, the liquefaction condition is represented by the static factor of safety analysis and a separate analysis was not performed.

4.3 Factor of Safety Assessment Results

Results of the slope stability analysis for the critical cross section of the ponds are summarized in Table 2, below, and presented in Figures 1 through 13. The results meet the factor of safety requirements presented in 845.460(a)(2) through (4).

Table 2: Safety Factor Results - Ponds 1N, 1S, 2S, and 3S

Loading Condition	Required FS	Calculated Factor of safety			
		1N	1S	2S	3S
Static, Long-Term 845.460(a)(2)	1.50	3.76	2.87	2.87	3.48
Static, Maximum Storage Pool 845.460(a)(3)	1.40	3.76	2.87	2.87	3.48
Seismic 845.460(a)(4)	1.00	1.89	1.77	2.11	2.56
Liquefaction 845.460(a)(5)	1.20	>1.20	>1.20	>1.20	>1.20

5.0 LIMITATIONS AND CERTIFICATION

This initial Structural Stability and Factor of Safety Assessment report was prepared to meet the requirements of Sections 845.450 and 845.460 of the Illinois Administrative Code draft Title 35 Subtitle G Subchapter I Subchapter j Coal Combustion Waste Surface Impoundments, and was prepared under the direction of Mr. M. Dean Jones, P.E.

By affixing my seal to this, I do hereby certify to the best of my knowledge, information, and belief that the information contained in this report is true and correct. I further certify I am licensed to practice in the State of Illinois and that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

Seal:

Signature: Dean Jones

Name: M. Dean Jones, P.E.

Date of Certification: September 23, 2021

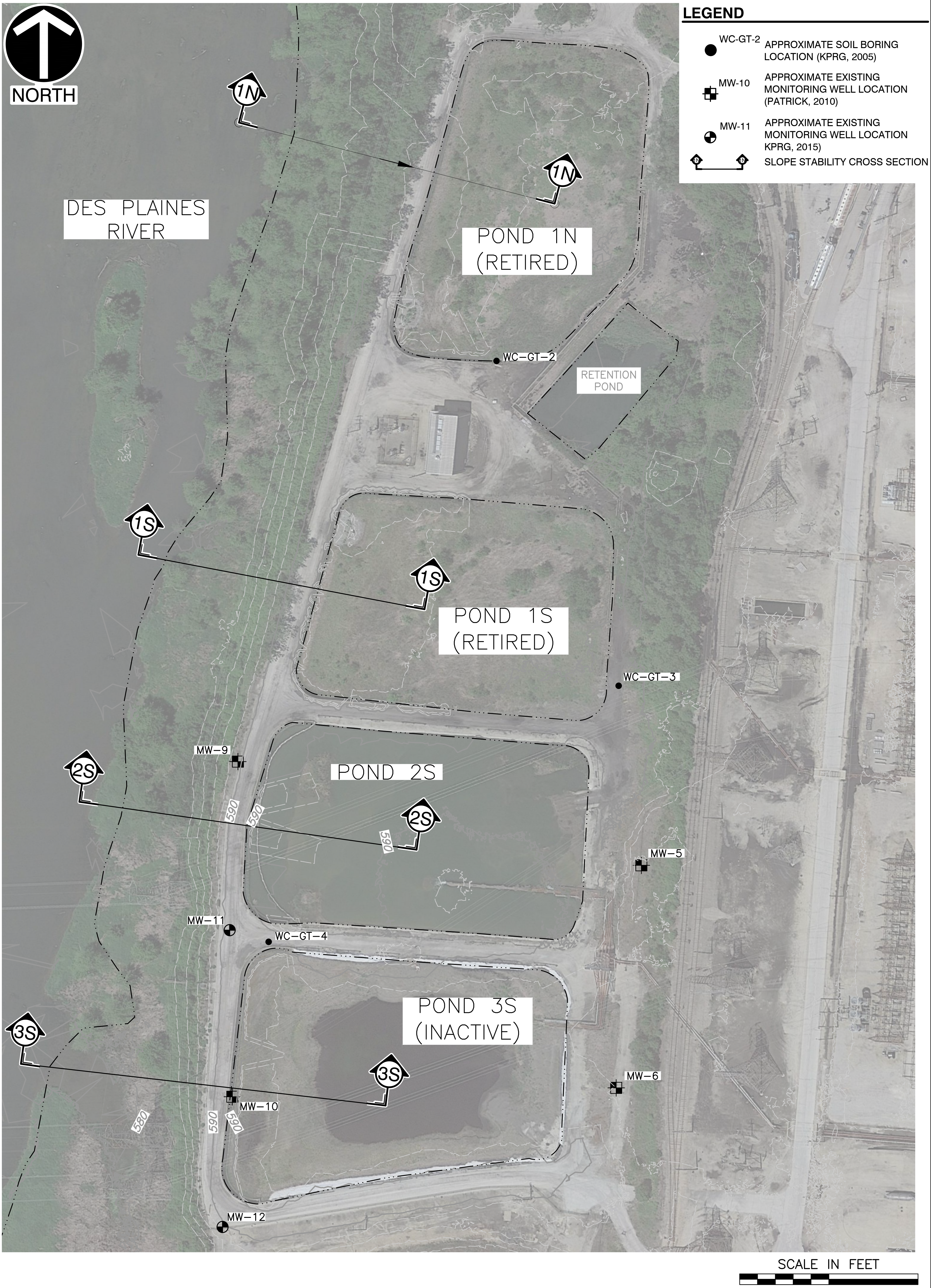
Illinois Professional Engineer No.: 062-051317

Expiration Date: November 30, 2021

Enclosure: Figures

FIGURES

P:\310-000\312-192\-CADD\Dwg\CV01 WILL COUNTY\312192-CV01-C200 EXISTING SITE CONDITIONS - WILL COUNTY.dwg{1} LS:(9/23/2021 - ccase) - LP: 9/23/2021 9:16 AM



*HAND SIGNATURE ON FILE

REFERENCES

1. TOPOGRAPHIC INFORMATION BASED UPON LiDAR POINT CLOUD DATA FROM WILL COUNTY ILLINOIS LiDAR ACQUISITION 2014, ACCESSED AUGUST 2021.
2. AERIAL IMAGE PROVIDED BY GOOGLE EARTH, DATED MAY 29, 2021, ACCESSED AUGUST 20, 2021.

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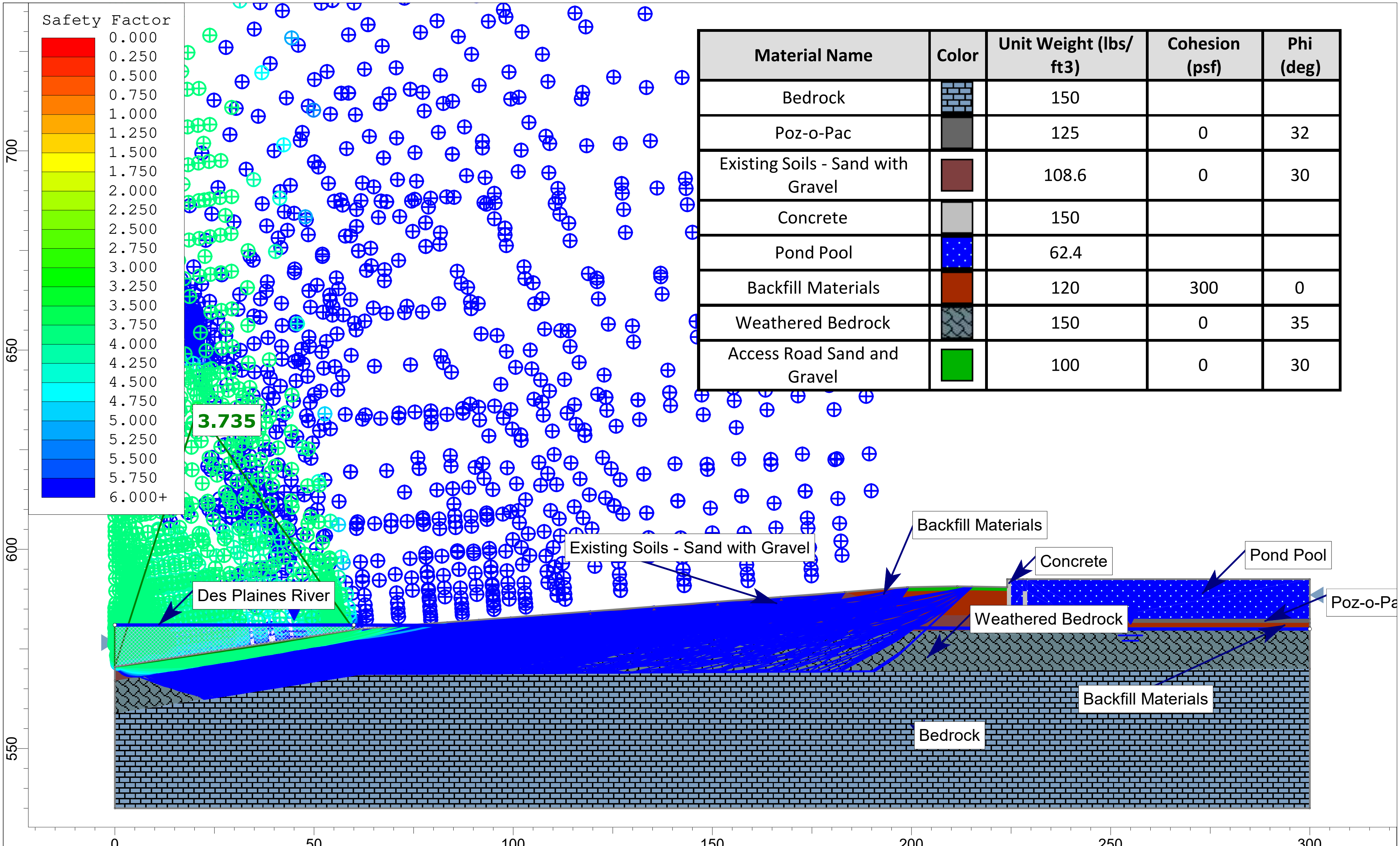
MIDWEST GENERATION LLC
WILL COUNTY STATION
PONDS 1N, 1S, 2S, AND 3S SLOPE STABILITY
ROMEOVILLE, WILL COUNTY, ILLINOIS

SITE PLAN WITH CROSS-SECTIONS

DRAWN BY:	CAC	CHECKED BY:	CAC	APPROVED BY:	MDJ*	FIGURE NO.:		
DATE:	SEPTEMBER 2021	DWG SCALE:	1"=100'	PROJECT NO:	312-192.0230	1		



Material Name	Color	Unit Weight (lbs/ ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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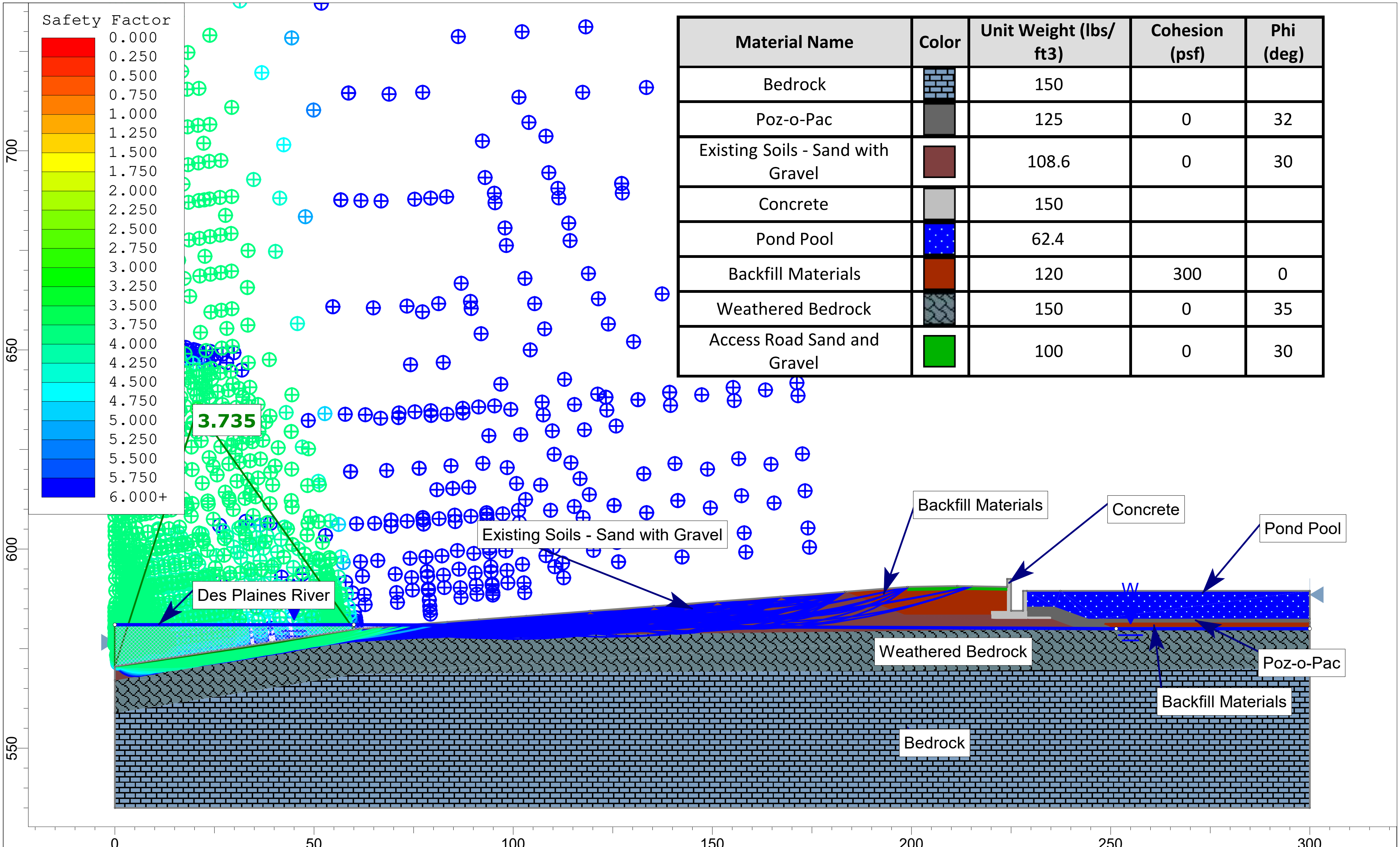
Figure 2: Pond 1N Slope Stability Analysis

Analysis	Spencer	*Scale:*	1:400	*Scenario*	Pond 1N, Long-Term, Maximum Surcharge Pool		
Drawn By	CAC	*Checked By:*	MDB	*Approved By:*	MDJ	*Company*	Civil & Environmental Consultants, Inc.
Date	08/25/2021	*Date:*	9/23/2021	*Date:*	9/23/2021	*File Name*	312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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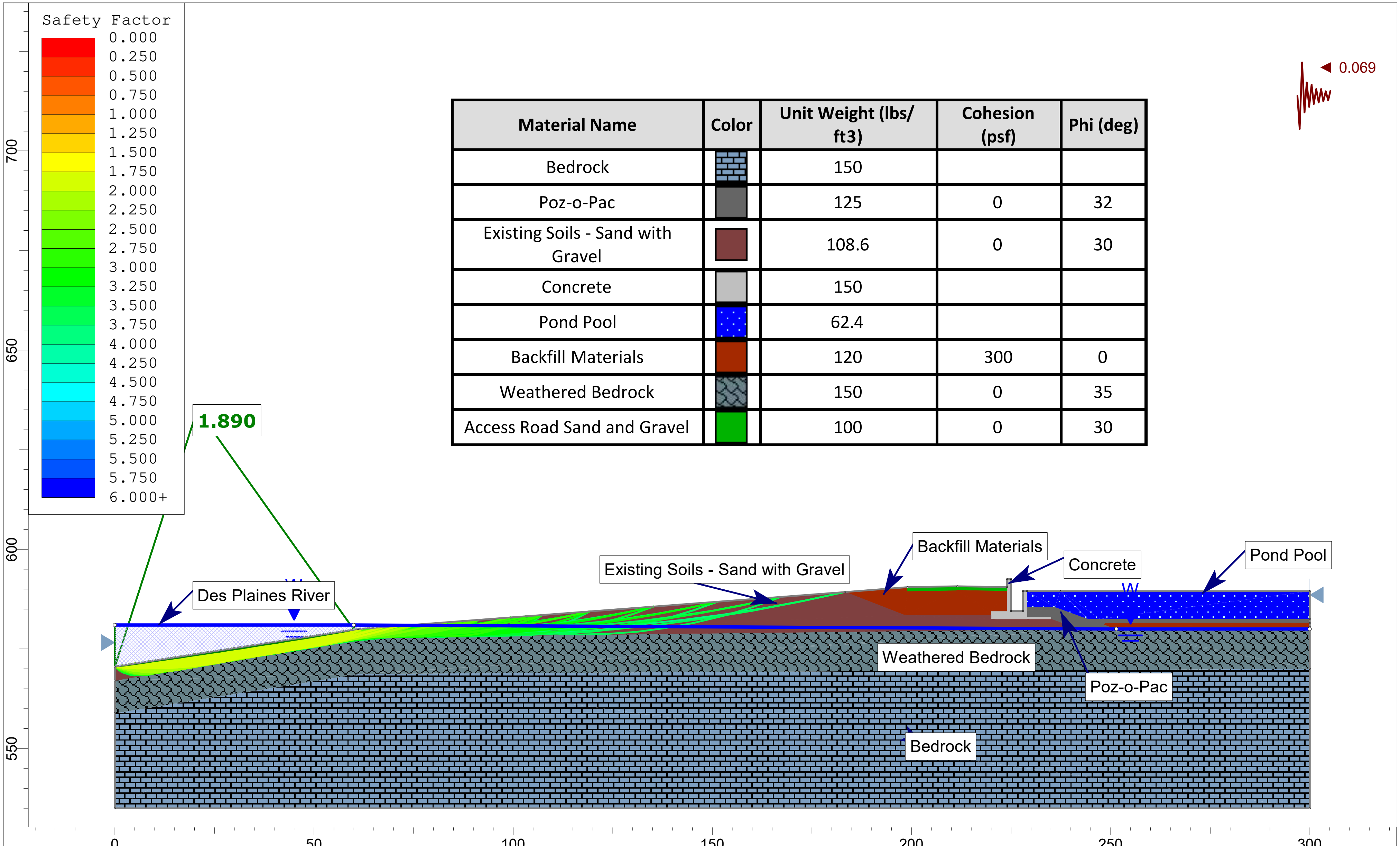
Project	**Figure 3: Pond 1N Slope Stability Analysis**						
Analysis	Spencer	*Scale:*	1:400			*Scenario*	Pond 1N, Long-Term, Maximum Storage Pool
Drawn By	CAC	*Checked By:*	MDB	*Approved By:*	MDJ	*Company*	Civil & Environmental Consultants, Inc.
Date	08/25/2021	*Date:*	9/23/2021	*Date:*	9/23/2021	*File Name*	312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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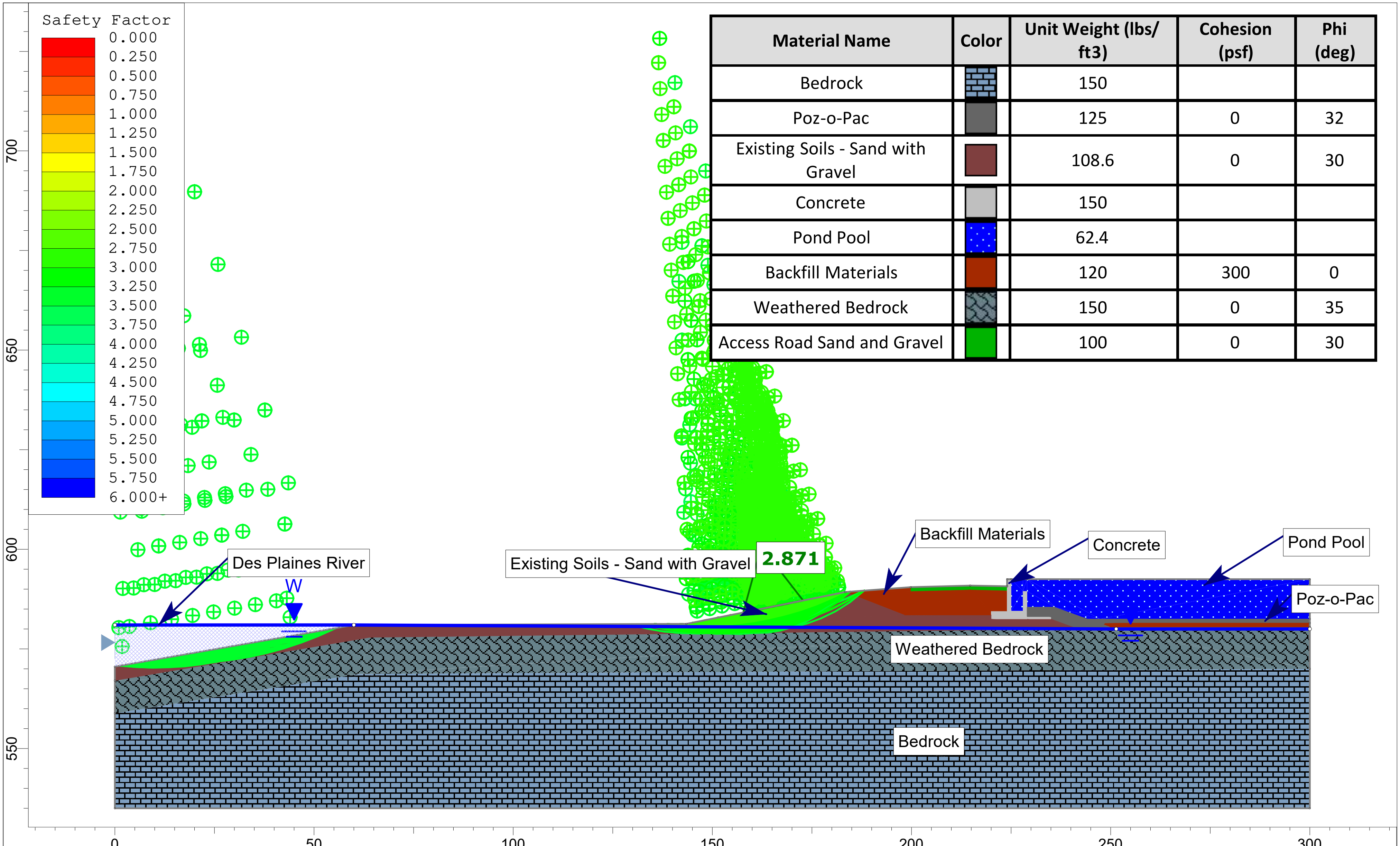
Project	**Figure 4: Pond 1N Slope Stability Analysis**						
Analysis	Spencer	*Scale:*	1:400	*Scenario*	Pond 1N, Long-Term, Maximum Storage Pool - Seismic		
Drawn By	CAC	*Checked By:*	MDB	*Approved By:*	MDJ	*Company*	Civil & Environmental Consultants, Inc.
Date	08/25/2021	*Date:*	9/23/2021	*Date:*	9/23/2021	*File Name*	312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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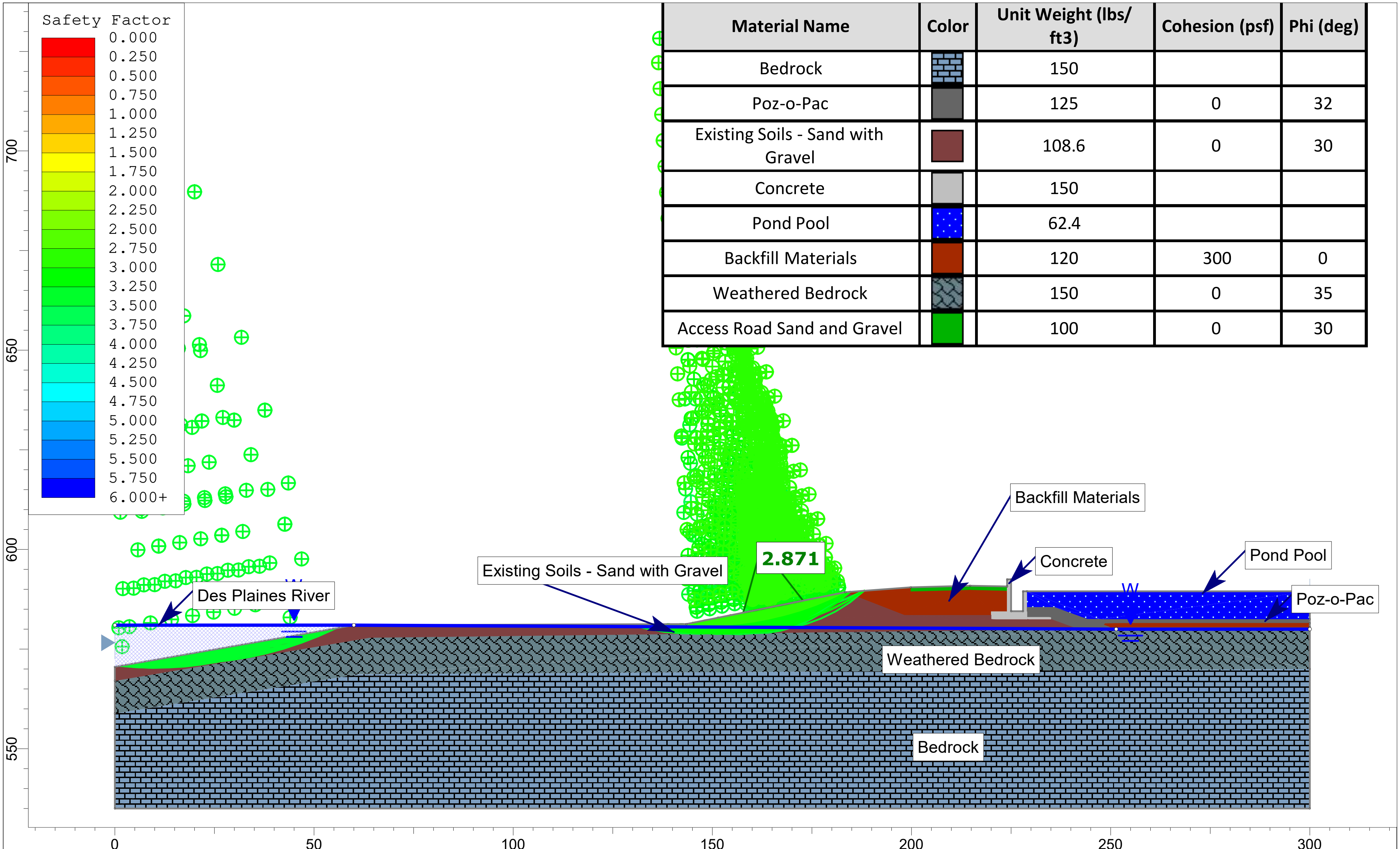
Project	**Figure 5: Pond 1S Slope Stability Analysis**						
Analysis	Spencer	*Scale:*	1:400			*Scenario*	Pond 1S, Long-Term, Maximum Surcharge Pool
Drawn By	CAC	*Checked By:*	MDB	*Approved By:*	MDJ	*Company*	Civil & Environmental Consultants, Inc.
Date	08/25/2021	*Date:*	9/23/2021	*Date:*	9/23/2021	*File Name*	312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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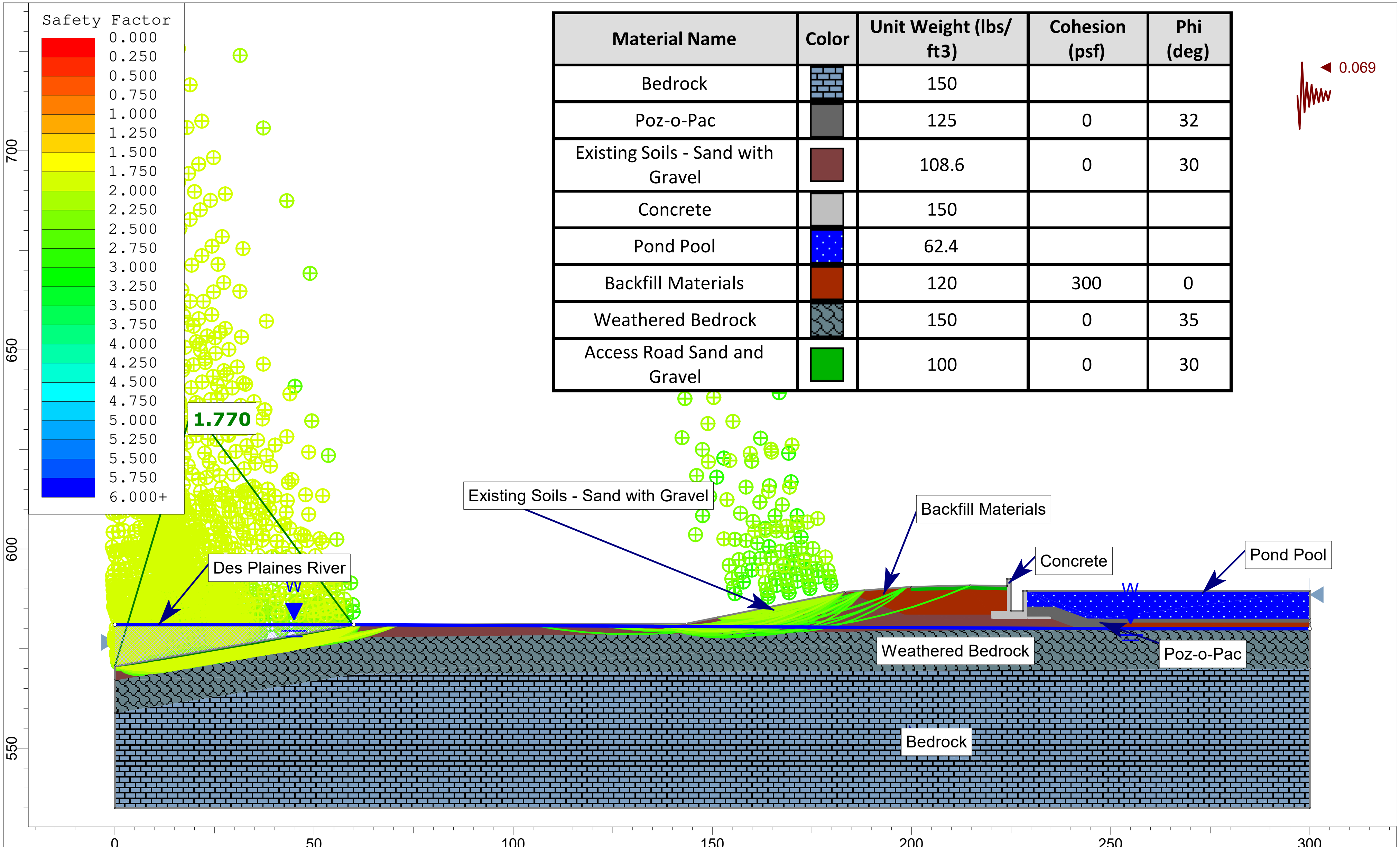
Project	**Figure 6: Pond 1S Slope Stability Analysis**						
Analysis	Spencer	*Scale:*	1:400			*Scenario*	Pond 1S, Long-Term, Maximum Storage Pool
Drawn By	CAC	*Checked By:*	MDB	*Approved By:*	MDJ	*Company*	Civil & Environmental Consultants, Inc.
Date	08/25/2021	*Date:*	9/23/2021	*Date:*	9/23/2021	*File Name*	312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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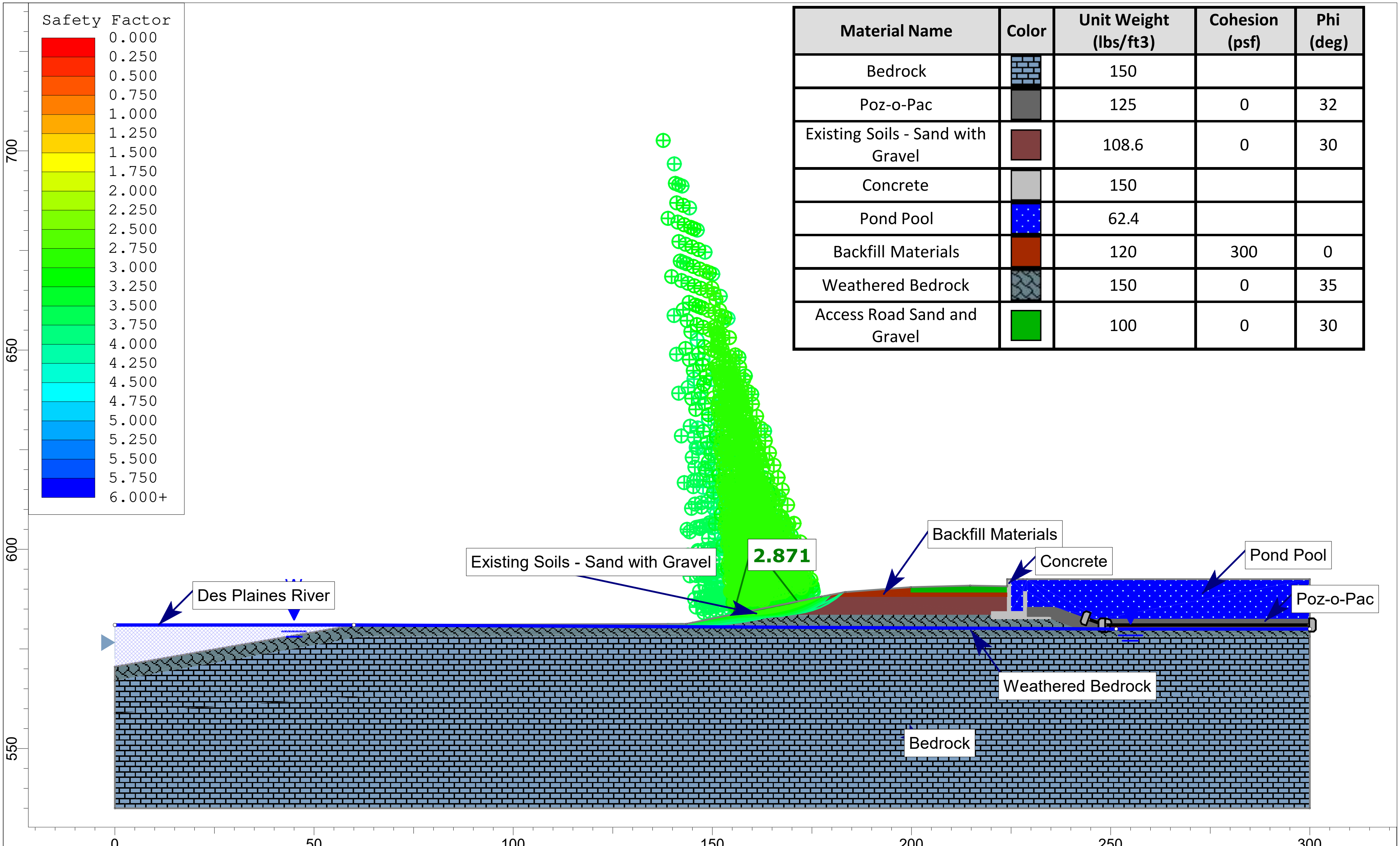
Figure 7: Pond 1S Slope Stability Analysis

Analysis	Spencer	*Scale:*	1:400	*Scenario*	Pond 1S, Long-Term, Maximum Storage Pool - Seismic		
Drawn By	CAC	*Checked By:*	MDB	*Approved By:*	MDJ	*Company*	Civil & Environmental Consultants, Inc.
Date	08/25/2021	*Date:*	9/23/2021	*Date:*	9/23/2021	*File Name*	312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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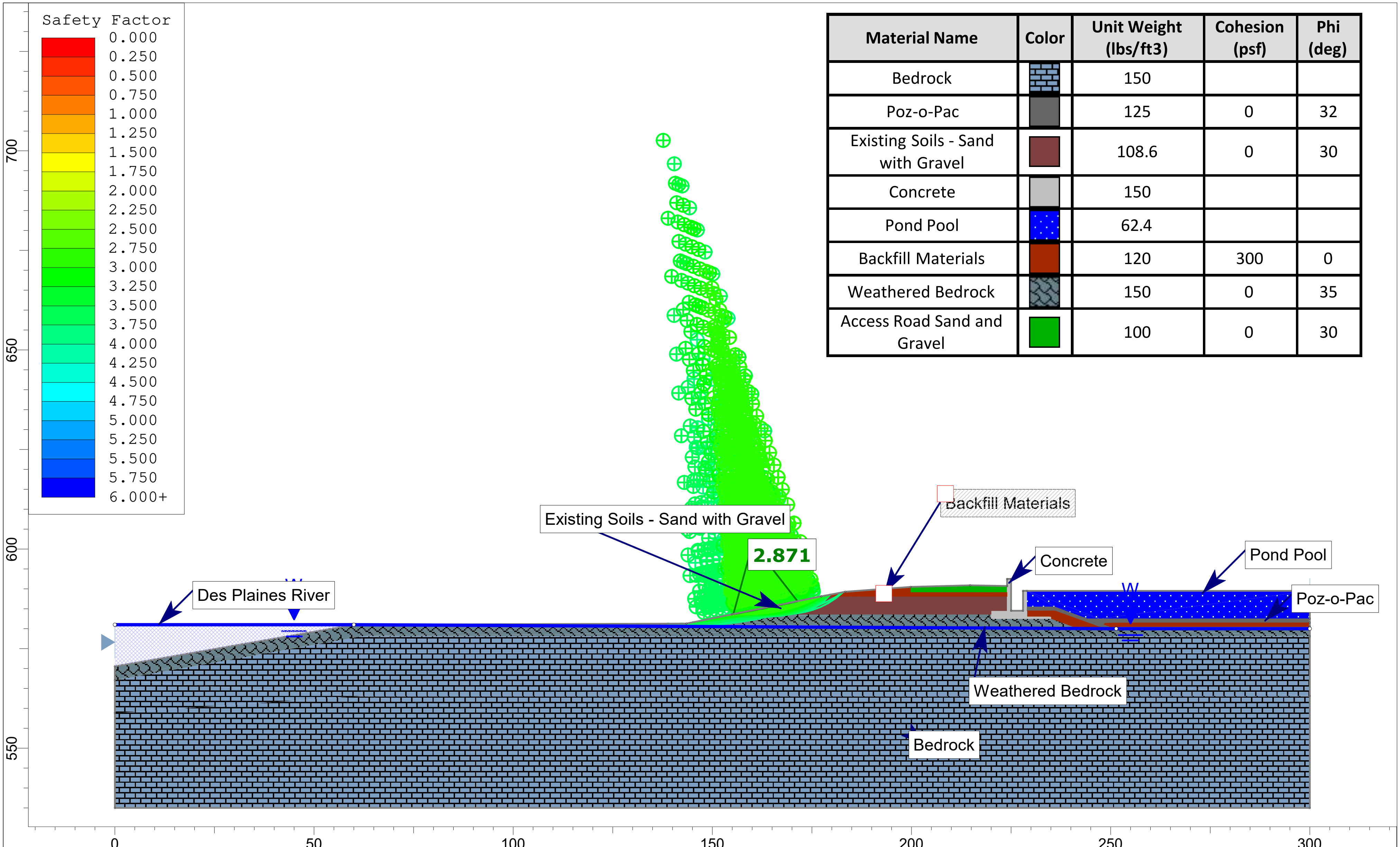
Project	**Figure 8: Pond 2S Slope Stability Analysis**		
Analysis Spencer	*Scale:* 1:400		*Scenario* Pond 2S, Long-Term, Maximum Surcharge Pool
Drawn By CAC	*Checked By:* MDB	*Approved By:* MDJ	*Company* Civil & Environmental Consultants, Inc.
Date 08/25/2021	*Date:* 9/23/2021	*Date:* 9/23/2021	*File Name* 312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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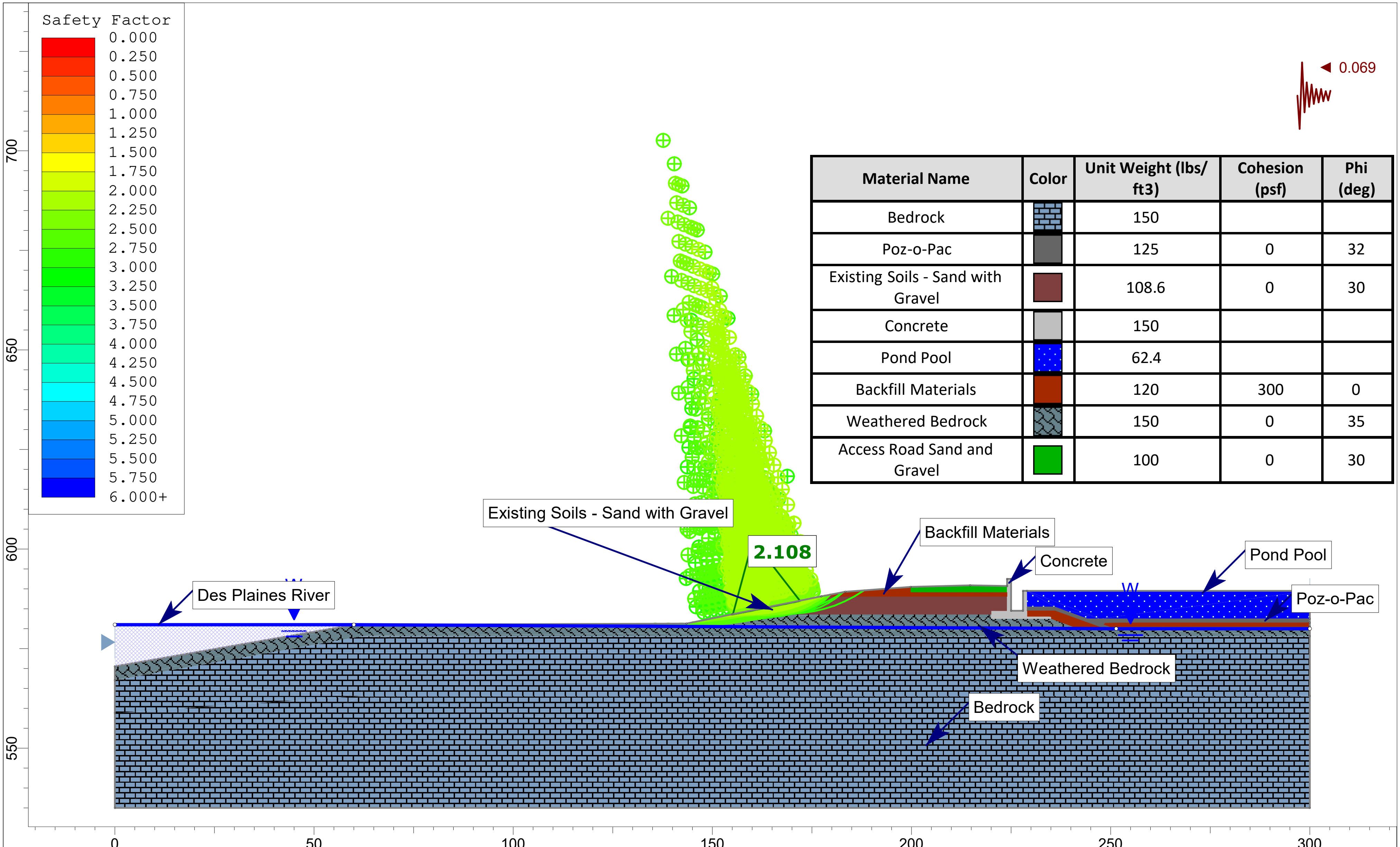
Figure 9: Pond 2S Slope Stability Analysis

Analysis	Spencer		*Scale:*	1:400		*Scenario*	Pond 2S, Long-Term, Maximum Storage Pool
Drawn By	CAC	*Checked By:*	MDB	*Approved By:*	MDJ	*Company*	Civil & Environmental Consultants, Inc.
Date	08/25/2021	*Date:*	9/23/2021	*Date:*	9/23/2021	*File Name*	312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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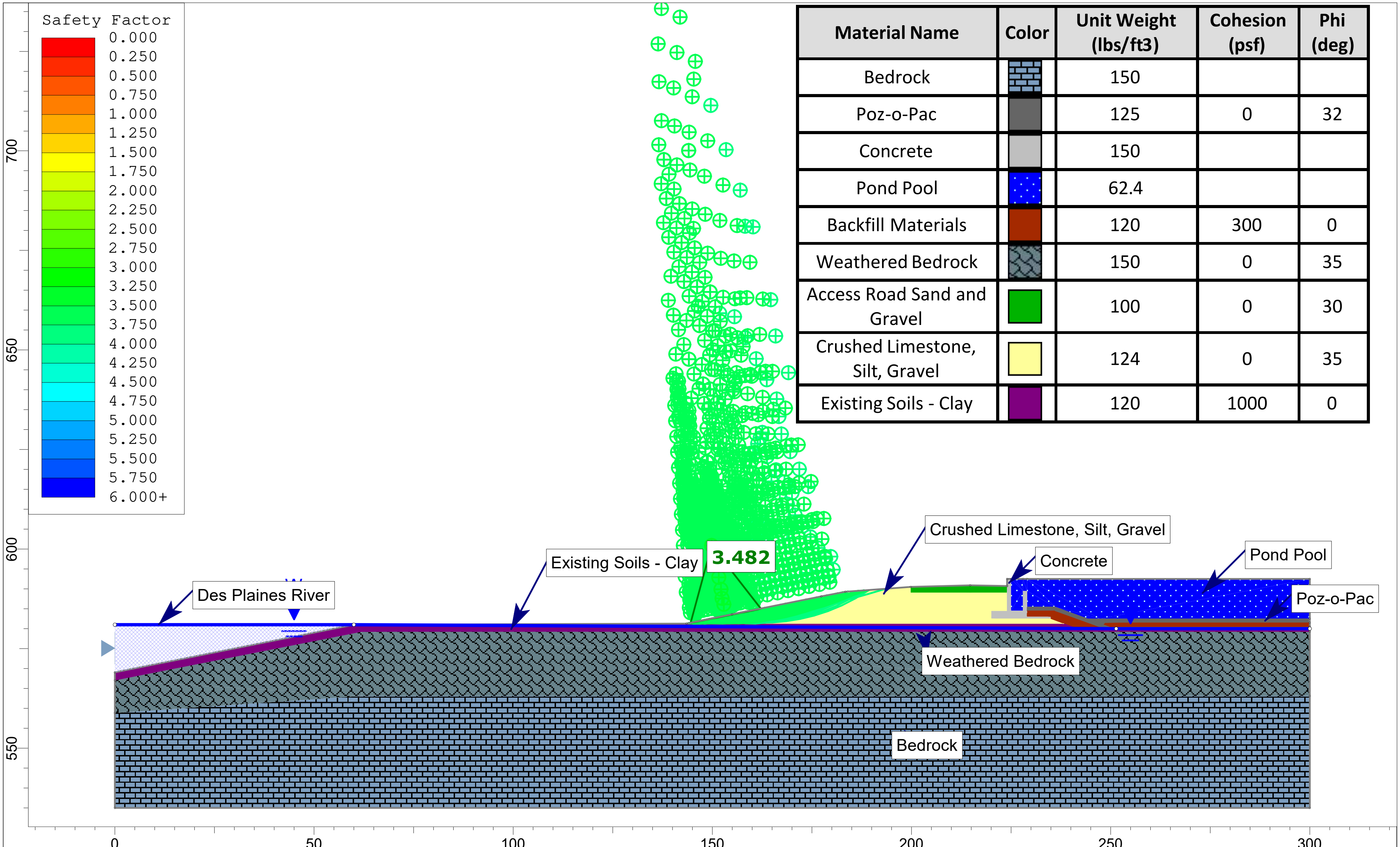
Figure 10: Pond 2S Slope Stability Analysis

Analysis Spencer		*Scale:* 1:400	*Scenario* Pond 2S, Long-Term, Maximum Storage Pool - Seismic
Drawn By CAC	*Checked By:* MDB	*Approved By:* MDJ	*Company* Civil & Environmental Consultants, Inc.
Date 08/25/2021	*Date:* 9/23/2021	*Date:* 9/23/2021	*File Name* 312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30
Crushed Limestone, Silt, Gravel		124	0	35
Existing Soils - Clay		120	1000	0

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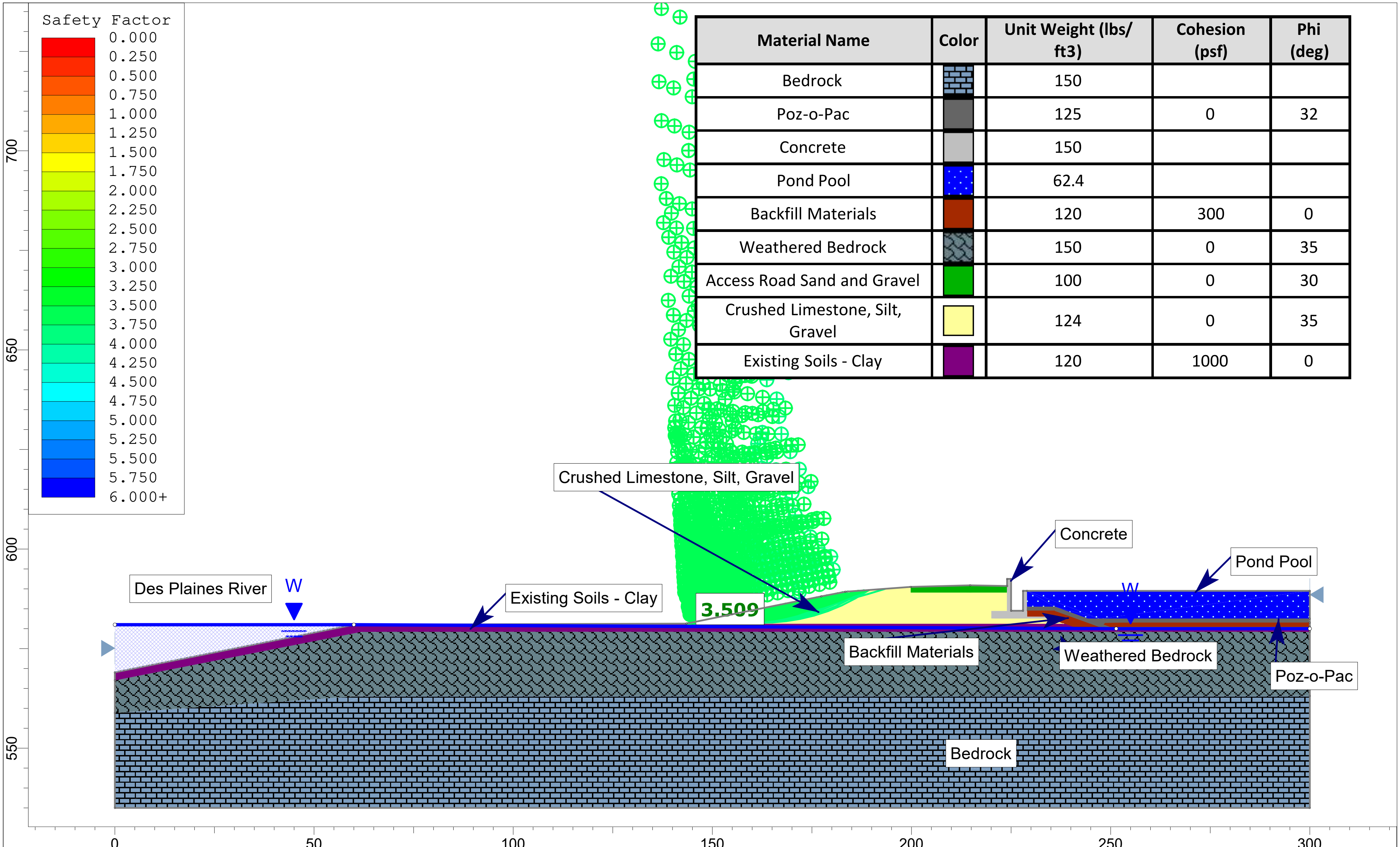
Project	**Figure 11: Pond 3S Slope Stability Analysis**		
Analysis: Spencer	Scale: 1:400		Scenario: Pond 3S, Long-Term, Maximum Surcharge Pool
Drawn By: CAC	Checked By: MDB	Approved By: MDJ	Company: Civil & Environmental Consultants, Inc.
Date: 08/25/2021	Date: 9/23/2021	Date: 9/23/2021	File Name: 312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30
Crushed Limestone, Silt, Gravel		124	0	35
Existing Soils - Clay		120	1000	0

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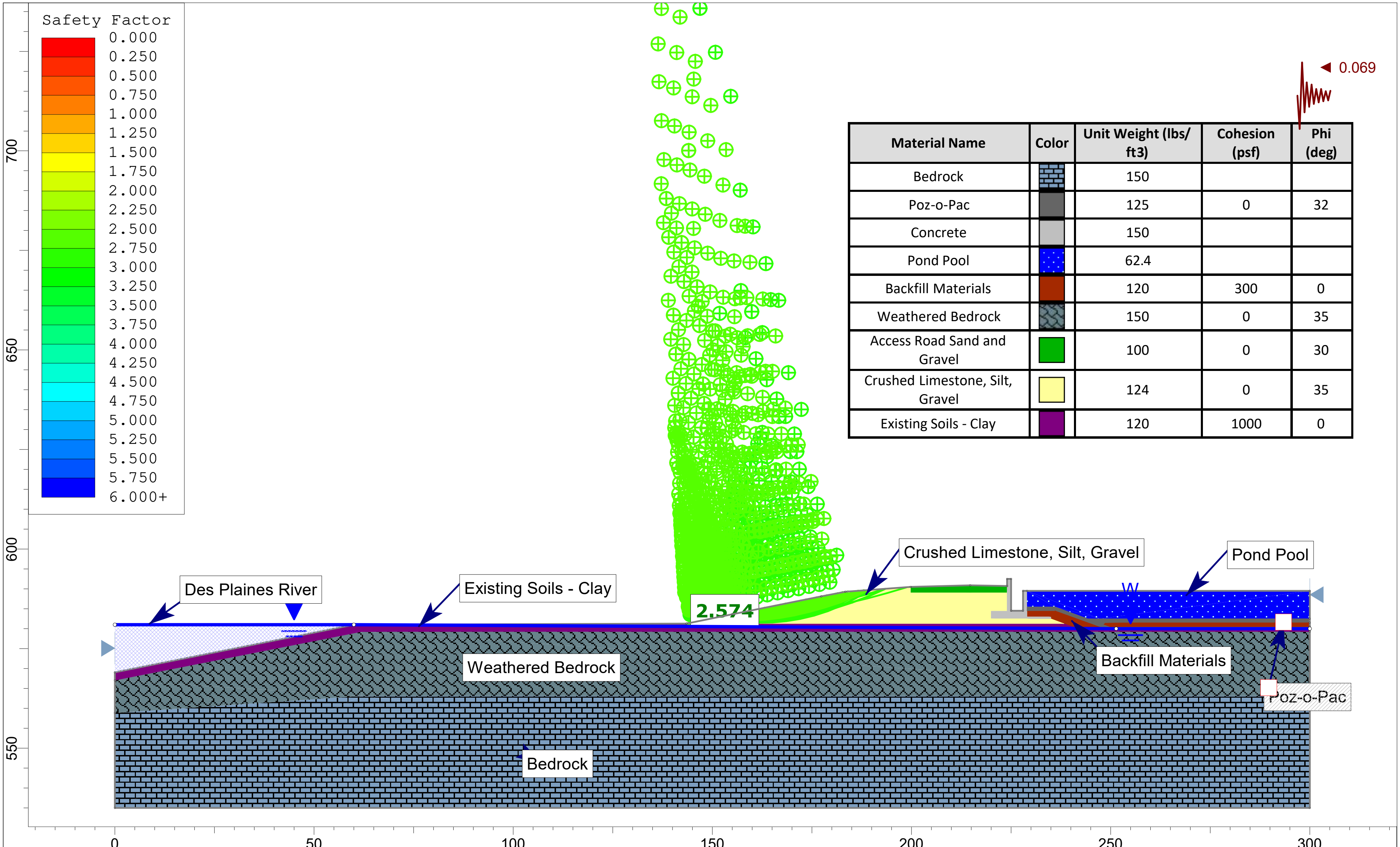
Figure 12: Pond 3S Slope Stability Analysis

Analysis Spencer	*Scale:* 1:400		*Scenario* Pond 3S, Long-Term, Maximum Storage Pool
Drawn By CAC	*Checked By:* MDB	*Approved By:* MDJ	*Company* Civil & Environmental Consultants, Inc.
Date 08/25/2021	*Date:* 9/23/2021	*Date:* 9/23/2021	*File Name* 312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30
Crushed Limestone, Silt, Gravel		124	0	35
Existing Soils - Clay		120	1000	0

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Figure 13: Pond 3S Slope Stability Analysis

Analysis: Spencer	Scale: 1:400	Scenario: Pond 3S, Long-Term, Maximum Storage Pool - Seismic	
Drawn By: CAC	Checked By: MDB	Approved By: MDJ	Company: Civil & Environmental Consultants, Inc.
Date: 08/25/2021	Date: 9/23/2021	Date: 9/23/2021	File Name: 312192-WC-Pond 1N.slmd

ATTACHMENT 17
SAFETY FACTOR ASSESSMENT

STRUCTURAL STABILITY AND FACTOR OF SAFETY ASSESSMENT
ASH PONDS 1N, 1S, 2S, AND 3S, WILL COUNTY STATION
SEPTEMBER 2021

This Structural Stability and Factor of Safety Assessment report has been prepared pursuant to the coal combustion residuals (CCR) rule codified in Title 35 of the Illinois Administrative Code, Section 845.440(a) effective as of April 21, 2021 for North Ash Pond 1 and South Ash Pond 1, South Ash Pond 2, and South Ash Pond 3 (herein referred to as Pond(s) 1N, 1S, 2S, and 3S) at Will County Station in Romeoville, Illinois (Station). The purpose of this project is to perform the initial structural stability and factor of safety assessments for the ponds by a licensed professional engineer. Civil & Environmental Consultants, Inc. (CEC) completed this structural stability and factor of safety assessment as described in the following sections.

1.0 REGULATION REQUIREMENTS - SECTIONS 845.450 AND 845.460

In accordance with Sections 845.450 and 845.460, owners or operator of a CCR impoundment are required to conduct initial and annual structural stability assessments to document whether the design, construction, operation, and maintenance of the CCR surface impoundment is consistent with recognized and generally accepted engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded; and to conduct an initial and annual safety factor assessment for each CCR surface impoundment and document whether the calculated factors of safety for each CCR surface impoundment achieve the minimum safety factors specified for the critical cross section of the embankment.

2.0 SITE CONDITIONS

Ponds 1N, 1S, 2S, and 3S are located at Will County Station, 529 East 135th Street in Romeoville, Will County, Illinois and situated south of 135th Street between the Des Plaines River and the Chicago Sanity and Ship Canal, see Figure 1. Basic information for each of the ponds are provided in Table 1. The ponds are of similar construction, size, and age. Each pond is constructed with a concrete weir spillway along the west half. Gravel access roads are located along the sides of the ponds.

Table 1 - Ash Pond Construction

Pond ID	Year of Original Construction	Dimension (ft x ft)	Depth (ft)	Capacity (ft^3)	Status
Pond 1N	1977	167 x 333	7	520,000	Closed
Pond 1S	1977	300 x 195	7	460,000	Closed
Pond 2S	1977	350 x 178	7	510,000	Active
Pond 3S	1977	234 x 322	7	530,000	Inactive

Based on information provided by Station personnel, the ponds were originally constructed in 1977, and have not undergone significant changes in the geometry. The original operation was designed to receive bottom ash via sluicing with wastewater treated in the wastewater treatment plant and discharged to the Chicago Sanitary and Ship Canal through the permitted National Pollutant Discharge Elimination System Outfall 002.

Ponds 1N and 1S were closed after the shutdown of Unit 1 and Unit 2, respectively. Pond 2S is still active, and at the time of our inspection, Pond 3S was inactive. The ponds are inspected weekly by the environmental specialist including checking the water level in the ponds.

3.0 STRUCTURAL STABILITY ASSESSMENT - SECTION 845.450

The following sections describe the structural stability assessment.

3.1 Stable Foundation and Abutments - Section 845.450(a)(1)

This assessment indicates the soils forming the pond foundations are stable. Soils data from soil boring logs and monitoring well logs within the vicinity of the ponds show the foundations consist of random sandy clay and gravel fill over weathered limestone bedrock. Inspection of the ponds did not show signs of distress due to settlement of the underlying foundation soils.

The ponds are partially incised and supported by earthen embankments. These type of basins constructed with earthen berms do not require abutments, and therefore consideration of abutment design, construction, and operation is not required.

3.2 Adequate Slope Protection - Section 845.450(a)(2)

Ponds 1N, 1S, 2S, and 3S are constructed with concrete overflows on the south end of each pond and the earthen bottom and sidewalls are protected with Poz-o-Pac liner. Additionally, Ponds 2S and 3S are also protected with a flexible membrane liner that provides adequate protection of the interior slopes against surface erosion, wave action, and adverse effects of sudden drawdown. From our inspection, Pond 2S has a protective layer comprised of concrete filled flexible reinforcement grid which is placed over a 6-inch warning layer, 12-inch cushion layer, and a 60 mil textured flexible membrane liner; while Pond 3S has been lined with flexible membrane liner. Our inspection of the ponds showed no signs of erosion.

3.3 Dike Compaction - Section 845.450(a)(3)

As-built construction documents for the initial construction of the ponds are unavailable. It would be standard practice for the dikes to be mechanically compacted to a density sufficient to withstand the range of loading conditions in the ponds. This is supported by the consideration that the ponds have been in operation since the 1977, and that the station has no record of observed distresses or repairs. Furthermore, the initial inspection of the dikes did not shows signs of distress that would be indicative of improperly placed and/or loosely compacted soils.

3.4 Downstream Slope Protection - Section 845.450(a)(4)

Consistent with Section 845.430, the basin slope protection consists of a combination of riprap and vegetative cover over the downstream slopes. Inspection shows the slope protection is maintained; protective against surface erosion, wave action, and adverse effect of rapid drawdown. At the time of inspection, the woody vegetation was observed on the downstream slope. Grassy vegetation did not exceed 12 inches in height.

3.5 Spillway - Section 845.450(a)(5)

Although each of the ponds are constructed with a concrete overflow connected to the on-site wastewater treatment plant, the ponds have not been designed or constructed with a spillway. Section 845.450 specifies a single spillway or a combination of spillways configured as specified in Subsection (a)(5)(A), and that the combined capacity of all spillways must be designed, constructed, operated, and maintained to adequately manage flow during and following the peak discharge from the event specified in Subsection (a)(5)(B). Not having an spillway is considered a deficiency in accordance with the Section 845.450(a)(5). Our inspection shows the ponds have been constructed and operated without incident since 1977, without any spillway, and that water levels are maintained at the level of the overflow.

3.6 Structural Integrity of Hydraulic Structures - Section 845.450(a)(6)

Although each of the ponds are constructed with a concrete overflow connected to the wastewater treatment plant, the pipe leading from the overflow is either a 36-inch (Ponds 2S and 3S) or 48-inch (Ponds 1N and 1S) diameter pipe that passes through earthen embankment. At the time of our inspection, the water flowed into the pipe and evidence showing the structural integrity of the pipe free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris could not be made. At the time of this report, inspection reports for the overflow were unavailable.

3.7 Down Stream Slopes Adjacent To Water Bodies - Section 845.450(a)(7)

The Des Plaines River is downstream of the ponds and a stability analysis was performed for both a low pool and rapid draw down condition. The stability analysis shows that the embankment is designed and constructed to maintain stability during both low pool and rapid draw down conditions.

3.8 Structural Stability Assessment Deficiencies

Structural deficiencies associated with the ponds were not identified during this initial structural stability assessment. Inspection records for the pipe were unavailable. Although our inspection did not identify distress that would suggest the existence of a structural deficiency, the overflow pipe should be inspected in accordance with Section 845.450(a)(6).

3.9 Annual Inspection Requirement

In completing the initial structural stability assessment, the ponds were inspected for signs of distress that would have the potential to disrupt operation and safety. No signs of distress that would have the potential to disrupt operation and safety of the ponds were identified. This inspection can suffice for the 2021 inspection.

4.0 SAFETY FACTOR ASSESSMENT - SECTION 845.460

In accordance with Section 845.460, the owner or operator of a CCR surface impoundment must conduct initial and annual safety factor assessments for each CCR surface impoundment and document whether the calculated factors of safety for each CCR surface impoundment achieve the minimum safety factors specified for the critical cross section of the embankment. The critical cross section is the cross section anticipated to be the most susceptible of all cross sections to structural failure based on appropriate engineering considerations, including loading conditions. The safety factor assessments must be supported by appropriate engineering calculations.

4.1 Slope Stability Methodology

Slope stability software Slide2 was used to calculate the minimum factor of safety for each pond at Cross Section 1N-1N, 1S-1S, 2S-2S, and 3S-3S, respectively. The program uses 2D limit equilibrium methods to determine the minimum factor of safety against slope instability. The auto-refine, non-circular search method with optimization was used utilizing Spencer's method to calculate the factor of safety for each design criteria scenario, as discussed below. For each section analyzed, the program searches for the sliding surface that procures the lowest factor of safety which is defined as the ratio of the shear forces and moment resisting movement along the sliding surface to the forces and moments driving the instability.

Soil data provided by the station personnel was used to develop soil properties for the slope stability analysis. The data shows the soil materials in the vicinity of the ponds consists of up to approximately 5 feet of random clay fill overlying weathered and unweathered limestone bedrock.

4.2 Slope Stability Analysis - Section 845.460

Four cases were analyzed to satisfy the safety factor assessment as per Section 845.460(a)(2) through (a)(4).

4.2.1 Static, Long-Term - Section 845.460(a)(2)

The static, long-term condition with the maximum surcharge loading on the embankment was evaluated. The static, long-term analysis included a pool elevation at 592.5 feet mean sea level and a groundwater elevation at 580.5 feet mean sea level.

4.2.2 Static, Maximum Storage Pool - Section 845.460(a)(3)

The static, long-term, maximum storage pool condition with the maximum surcharge loading on the embankment was evaluated. The static, long-term analysis included a pool elevation set at the lowest points of the embankment crest, 589.5 feet mean sea level, and a groundwater elevation at 580.5 feet mean sea level.

4.2.3 Seismic - Section 845.460(a)(4)

Seismic analysis was performed by incorporating pseudo static seismic loading scenarios in the long-term global stability analysis calculations. A pseudo-static seismic horizontal load was applied to the long-term maximum storage pool loading condition model.

The seismic factor of safety is defined in the proposed CCR regulations as "the factor of safety (safety factor) determined using analysis under earthquake conditions using the peak ground acceleration (PGA) for a seismic event with a 2% probability of exceedance in 50 years, equivalent to a return period of approximately 2,500 years, based on the U.S. Geological Survey (USGS) seismic hazard maps for seismic events with this return period for the region where the CCR surface impoundment is located".

4.2.4 Liquefaction - Section 845.460(a)(5)

For dikes constructed of soils susceptible to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.20. Soils with potential for liquefaction typically consist of poorly drained fine-grained soils. Soil boring data indicate that the embankment and foundation soils consist of random sandy clay and gravel fill over shallow weathered limestone bedrock. These soil types are not susceptible to liquefaction. Additionally, the Poz-o-Pac liner system makes it unlikely the embankment would become saturated or inundated. Because the likelihood of liquefaction and associated shear strength loss of the embankment soils is very low, the liquefaction condition is represented by the static factor of safety analysis and a separate analysis was not performed.

4.3 Factor of Safety Assessment Results

Results of the slope stability analysis for the critical cross section of the ponds are summarized in Table 2, below, and presented in Figures 1 through 13. The results meet the factor of safety requirements presented in 845.460(a)(2) through (4).

Table 2: Safety Factor Results - Ponds 1N, 1S, 2S, and 3S

Loading Condition	Required FS	Calculated Factor of safety			
		1N	1S	2S	3S
Static, Long-Term 845.460(a)(2)	1.50	3.76	2.87	2.87	3.48
Static, Maximum Storage Pool 845.460(a)(3)	1.40	3.76	2.87	2.87	3.48
Seismic 845.460(a)(4)	1.00	1.89	1.77	2.11	2.56
Liquefaction 845.460(a)(5)	1.20	>1.20	>1.20	>1.20	>1.20

5.0 LIMITATIONS AND CERTIFICATION

This initial Structural Stability and Factor of Safety Assessment report was prepared to meet the requirements of Sections 845.450 and 845.460 of the Illinois Administrative Code draft Title 35 Subtitle G Subchapter I Subchapter j Coal Combustion Waste Surface Impoundments, and was prepared under the direction of Mr. M. Dean Jones, P.E.

By affixing my seal to this, I do hereby certify to the best of my knowledge, information, and belief that the information contained in this report is true and correct. I further certify I am licensed to practice in the State of Illinois and that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

Seal: MAURICE DEAN JONES, JR. 062-051317 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

Signature: ______________________

Name: M. Dean Jones, P.E.

Date of Certification: September 23, 2021

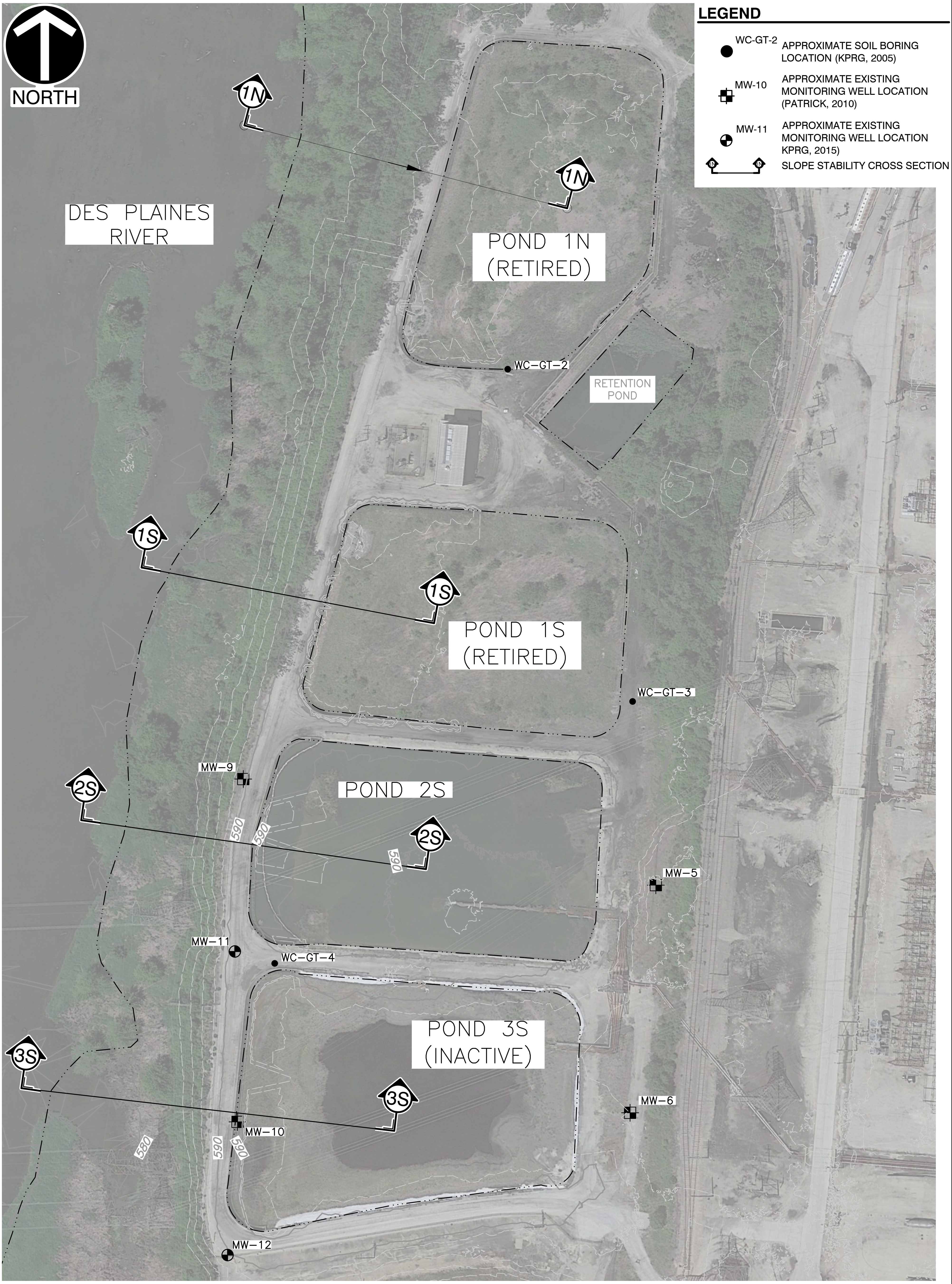
Illinois Professional Engineer No.: 062-051317

Expiration Date: November 30, 2021

Enclosure: Figures

FIGURES

P:\310-000\312-192\-CADD\Dwg\CV01 WILL COUNTY\312192-CV01-C200 EXISTING SITE CONDITIONS - WILL COUNTY.dwg{1} LS:(9/23/2021 - ccase) - LP: 9/23/2021 9:16 AM



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1. TOPOGRAPHIC INFORMATION BASED UPON LiDAR POINT CLOUD DATA FROM WILL COUNTY ILLINOIS LiDAR ACQUISITION 2014, ACCESSED AUGUST 2021.
2. AERIAL IMAGE PROVIDED BY GOOGLE EARTH, DATED MAY 29, 2021, ACCESSED AUGUST 20, 2021.

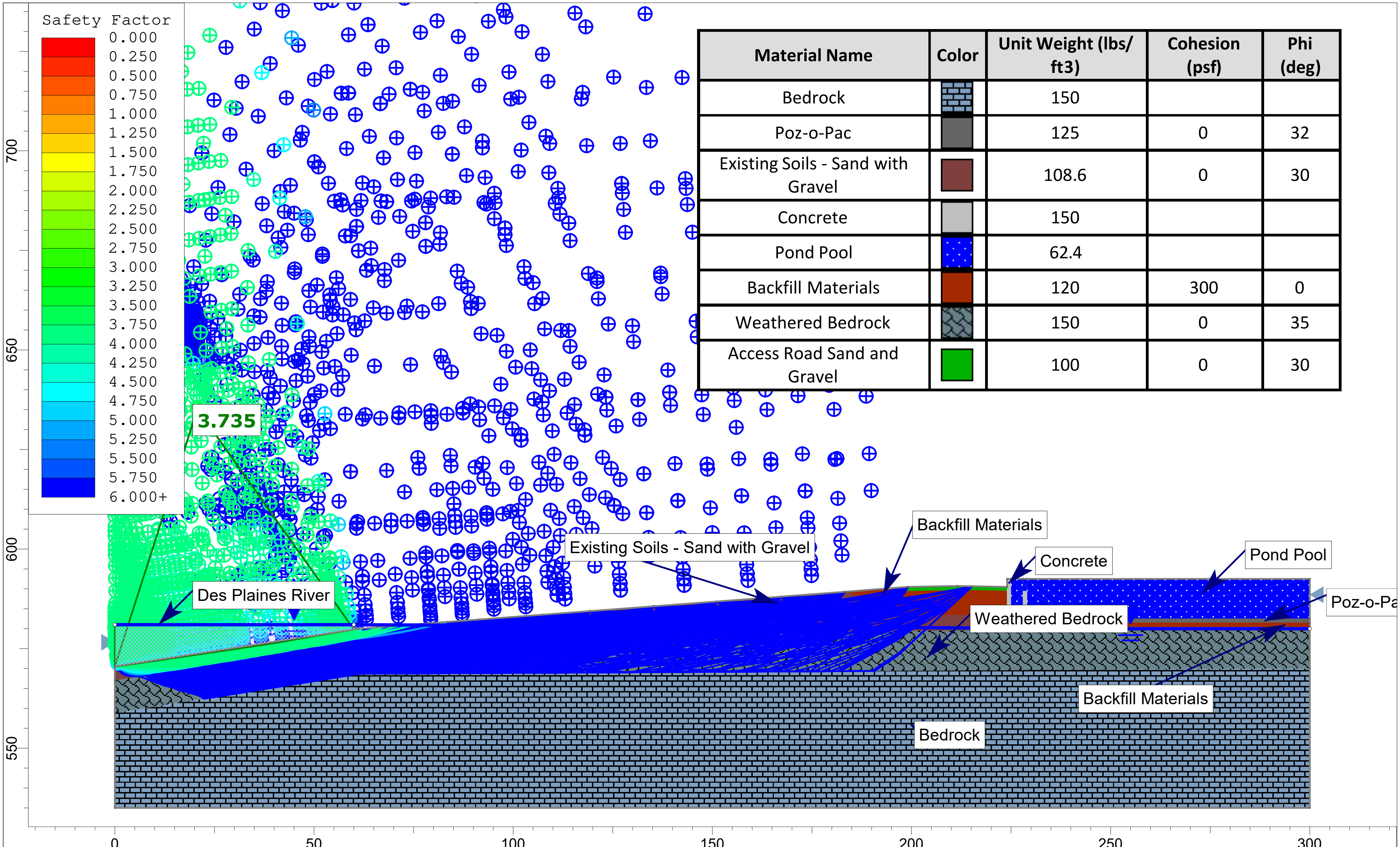
*HAND SIGNATURE ON FILE

Civil & Environmental Consultants, Inc.
1230 East Diehl Road, Suite 200 - Naperville, IL 60563
630-963-6026 · 877-963-6026
www.cecinc.com

MIDWEST GENERATION LLC
WILL COUNTY STATION
PONDS 1N, 1S, 2S, AND 3S SLOPE STABILITY
ROMEOVILLE, WILL COUNTY, ILLINOIS

SITE PLAN WITH CROSS-SECTIONS

DRAWN BY: CAC	CHECKED BY:	CAC	APPROVED BY:	MDJ*	FIGURE NO.:	1
DATE: SEPTEMBER 2021	DWG SCALE:	1"=100'	PROJECT NO:	312-192.0230		



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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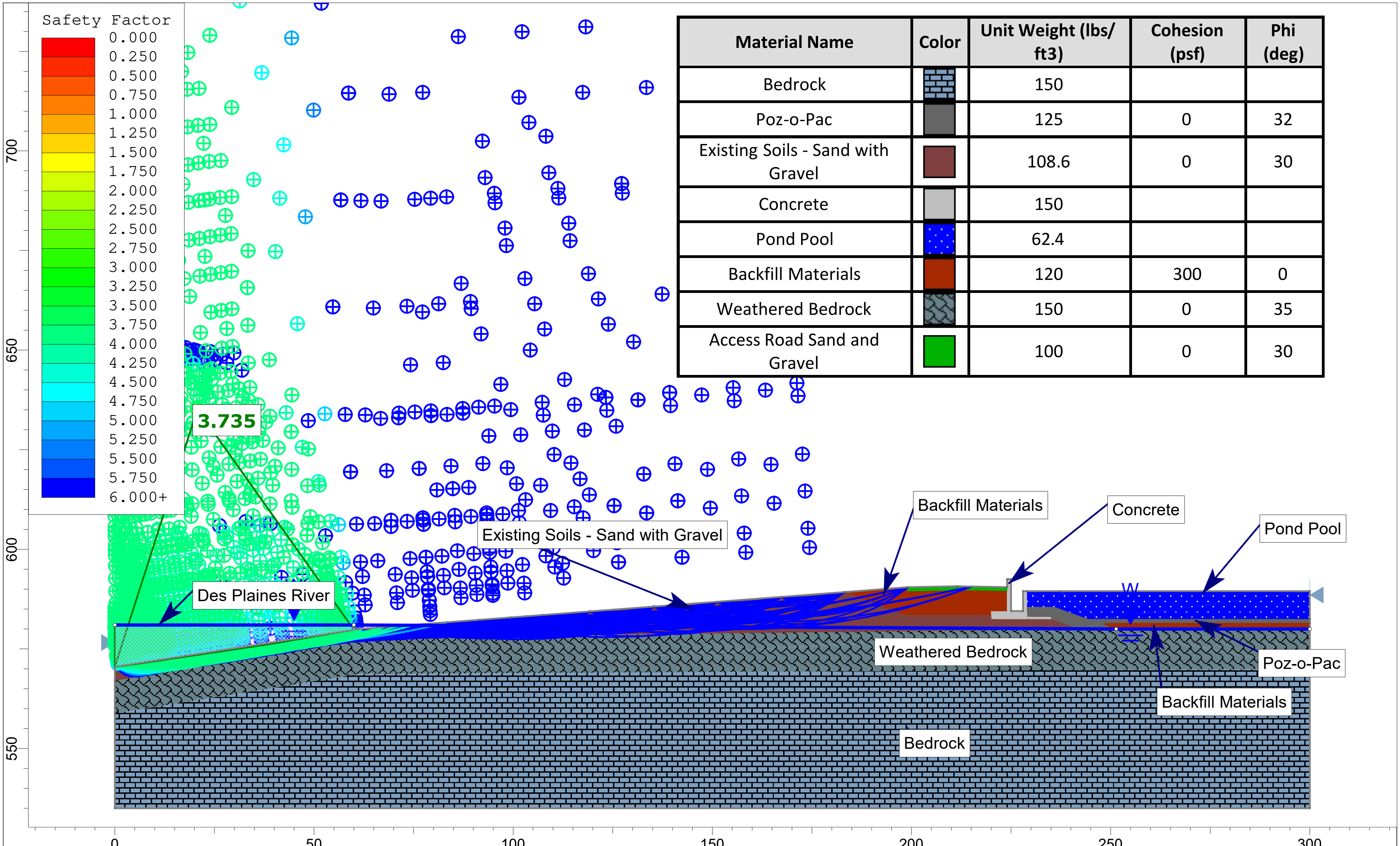
ProjectF

Figure 2: Pond 1N Slope Stability Analysis

Analysis	Spencer		*Scale:*	1:400		*Scenario*	Pond 1N, Long-Term, Maximum Surcharge Pool
Drawn By	CAC	*Checked By:* MDB		*Approved By:*	MDJ	*Company*	Civil & Environmental Consultants, Inc.
Date	08/25/2021	*Date:* 9/23/2021		*Date:*	9/23/2021	*File Name*	312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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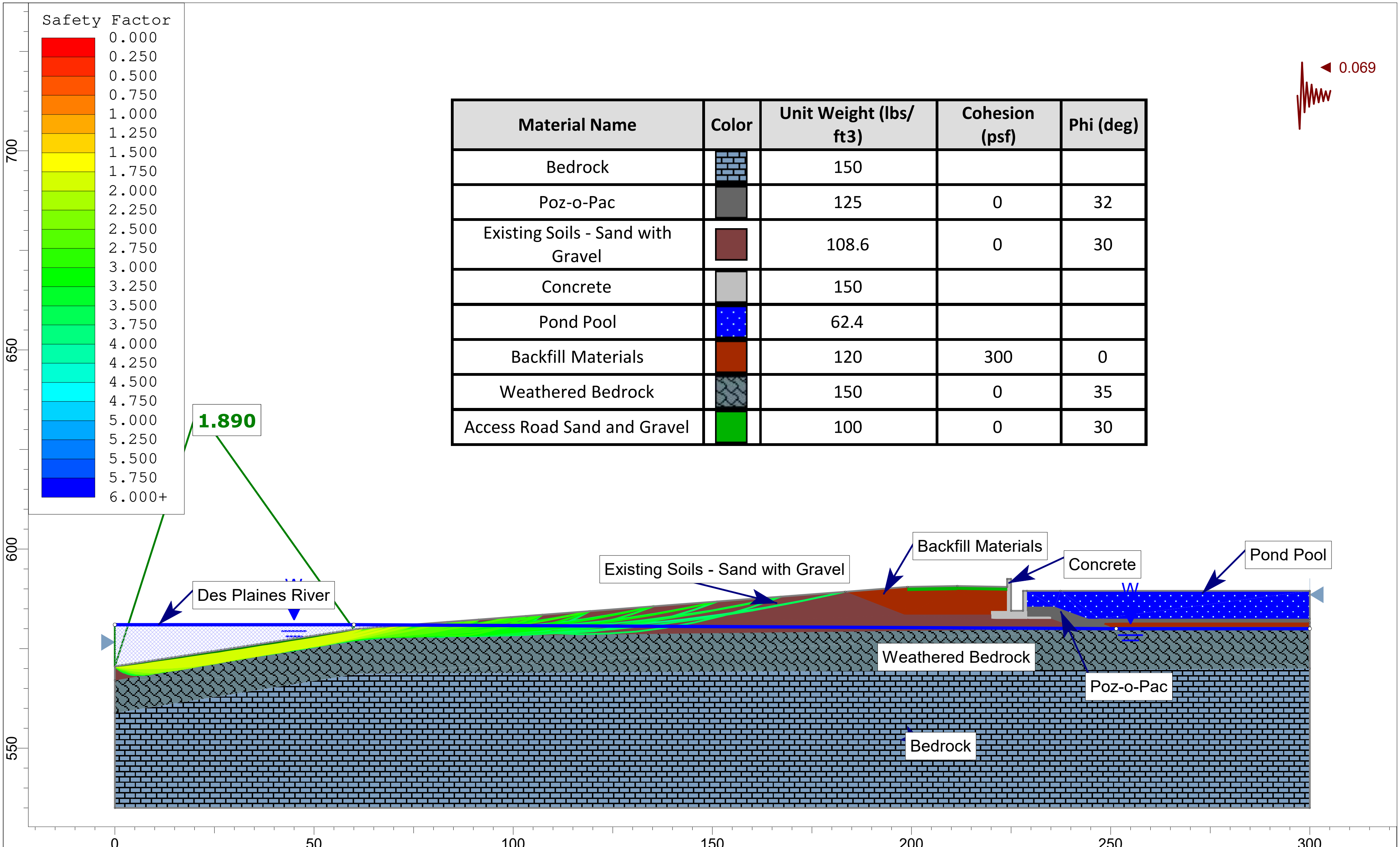
Project	**Figure 3: Pond 1N Slope Stability Analysis**		
Analysis Spencer	*Scale:* 1:400	*Scenario* Pond 1N, Long-Term, Maximum Storage Pool	
Drawn By CAC	*Checked By:* MDB	*Approved By:* MDJ	*Company* Civil & Environmental Consultants, Inc.
Date 08/25/2021	*Date:* 9/23/2021	*Date:* 9/23/2021	*File Name* 312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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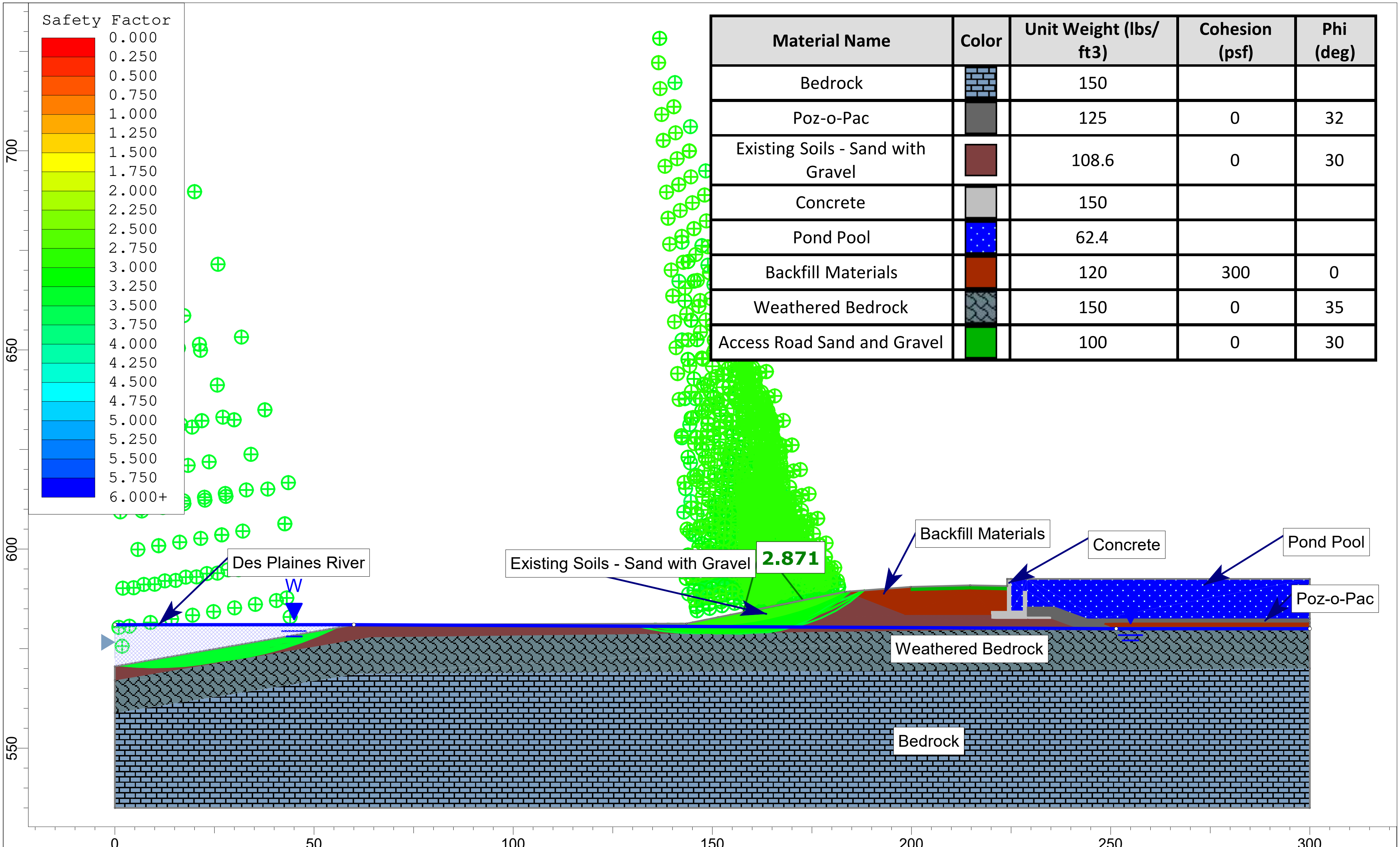
Figure 4: Pond 1N Slope Stability Analysis

Analysis Spencer	*Scale:* 1:400	*Scenario* Pond 1N, Long-Term, Maximum Storage Pool - Seismic

Drawn By CAC	*Checked By:* MDB	*Approved By:* MDJ	*Company* Civil & Environmental Consultants, Inc.
Date 08/25/2021	*Date:* 9/23/2021	*Date:* 9/23/2021	*File Name* 312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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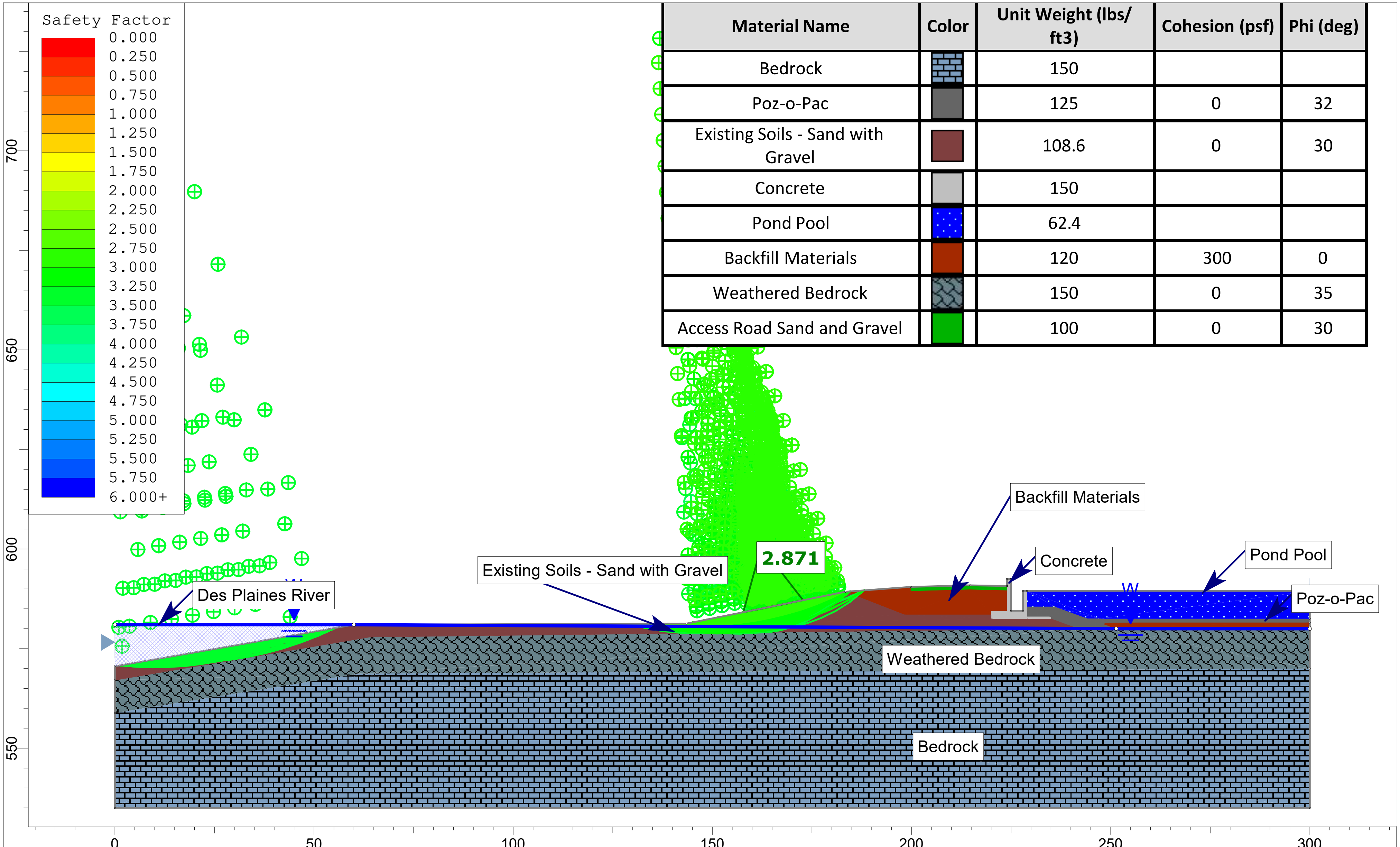
Figure 5: Pond 1S Slope Stability Analysis

Analysis	Spencer		*Scale:*	1:400		*Scenario*	Pond 1S, Long-Term, Maximum Surcharge Pool
Drawn By	CAC	*Checked By:* MDB		*Approved By:*	MDJ	*Company*	Civil & Environmental Consultants, Inc.
Date	08/25/2021	*Date:* 9/23/2021		*Date:*	9/23/2021	*File Name*	312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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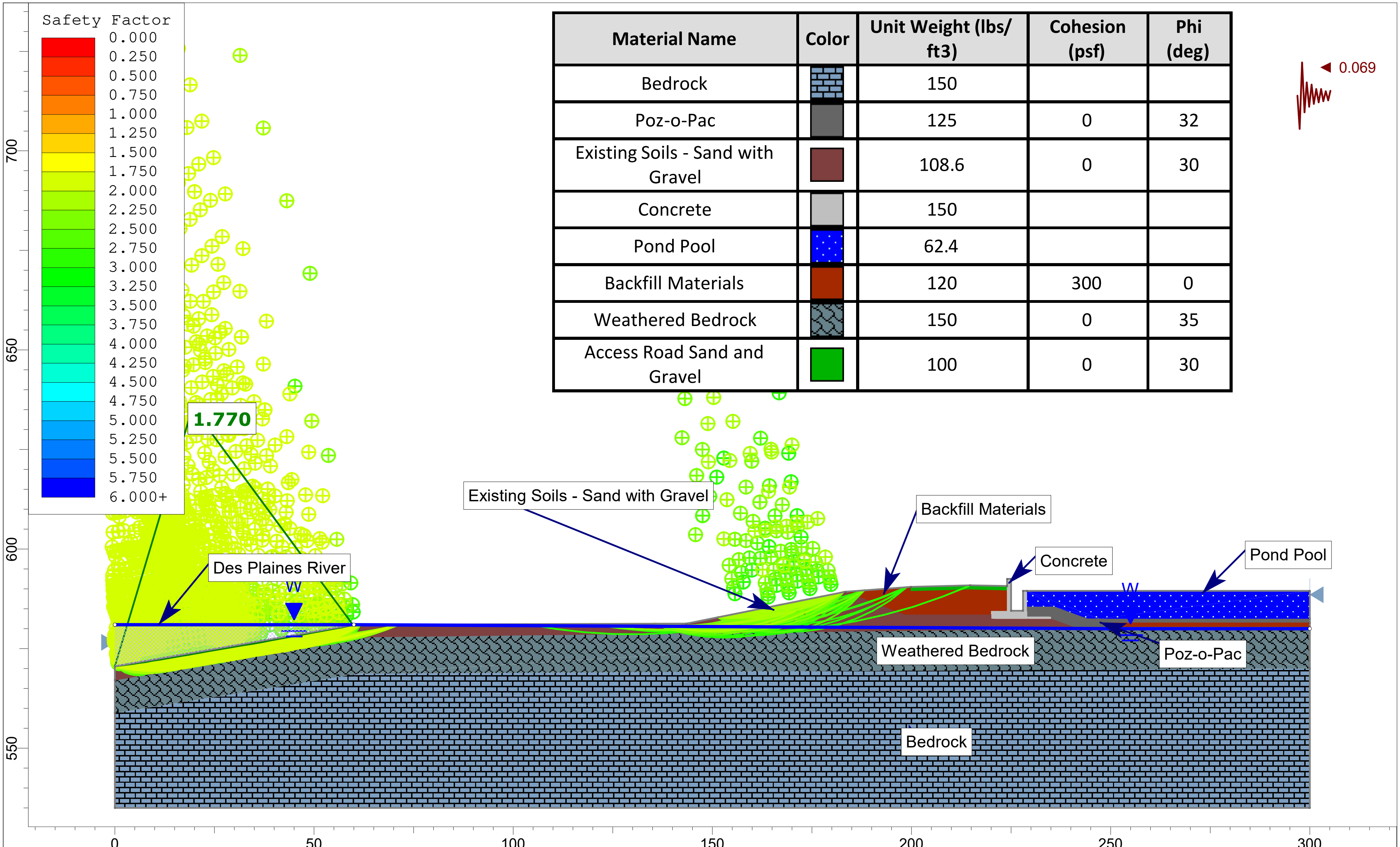
Project **Figure 6: Pond 1S Slope Stability Analysis**			
Analysis Spencer	*Scale:* 1:400		*Scenario* Pond 1S, Long-Term, Maximum Storage Pool
Drawn By CAC	*Checked By:* MDB	*Approved By:* MDJ	*Company* Civil & Environmental Consultants, Inc.
Date 08/25/2021	*Date:* 9/23/2021	*Date:* 9/23/2021	*File Name* 312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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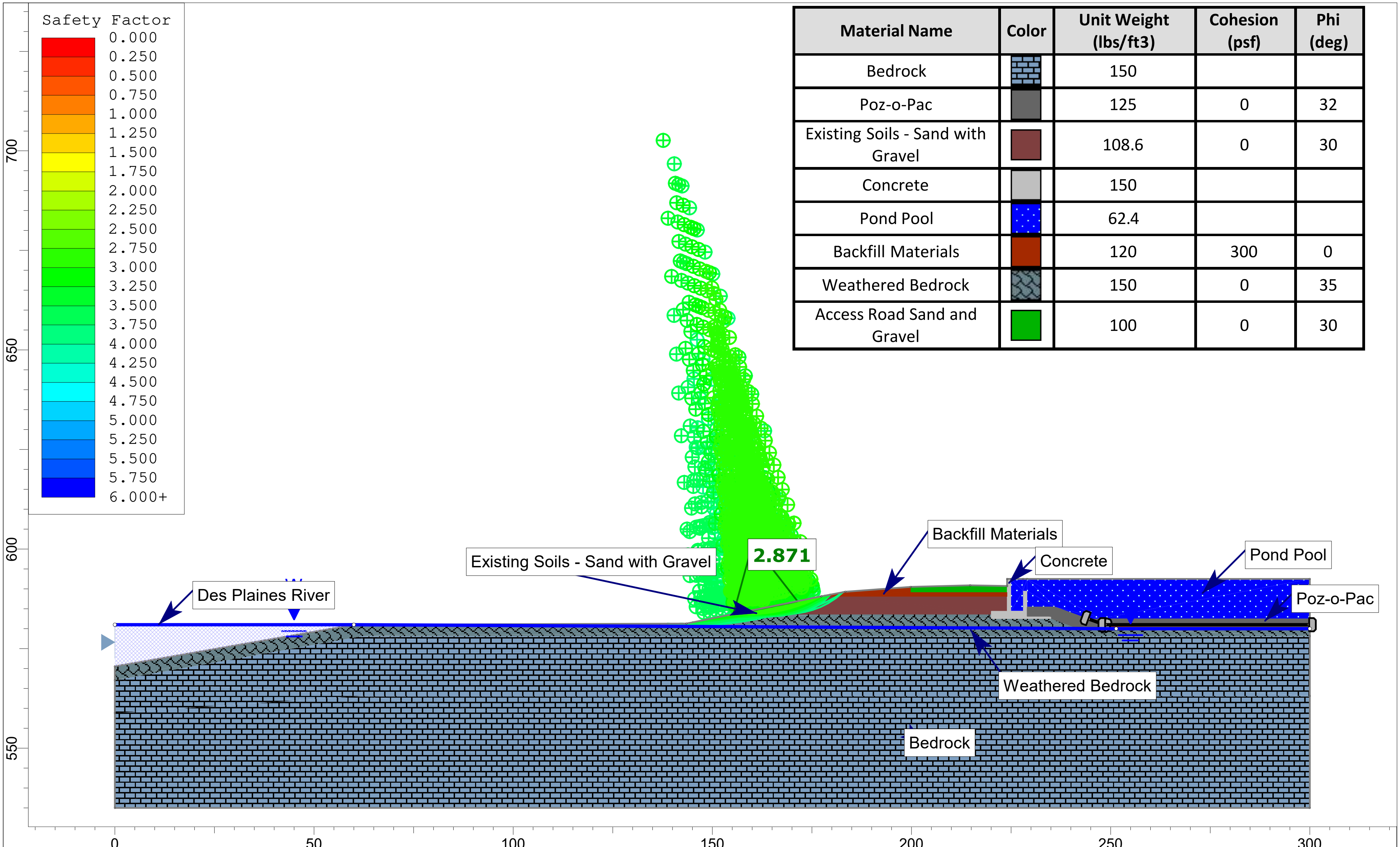
Figure 7: Pond 1S Slope Stability Analysis

Analysis Spencer		*Scale:* 1:400		*Scenario* Pond 1S, Long-Term, Maximum Storage Pool - Seismic	
Drawn By CAC	*Checked By:* MDB	*Approved By:* MDJ		*Company* Civil & Environmental Consultants, Inc.	
Date 08/25/2021	*Date:* 9/23/2021	*Date:* 9/23/2021		*File Name* 312192-WC-Pond 1N.slmd	



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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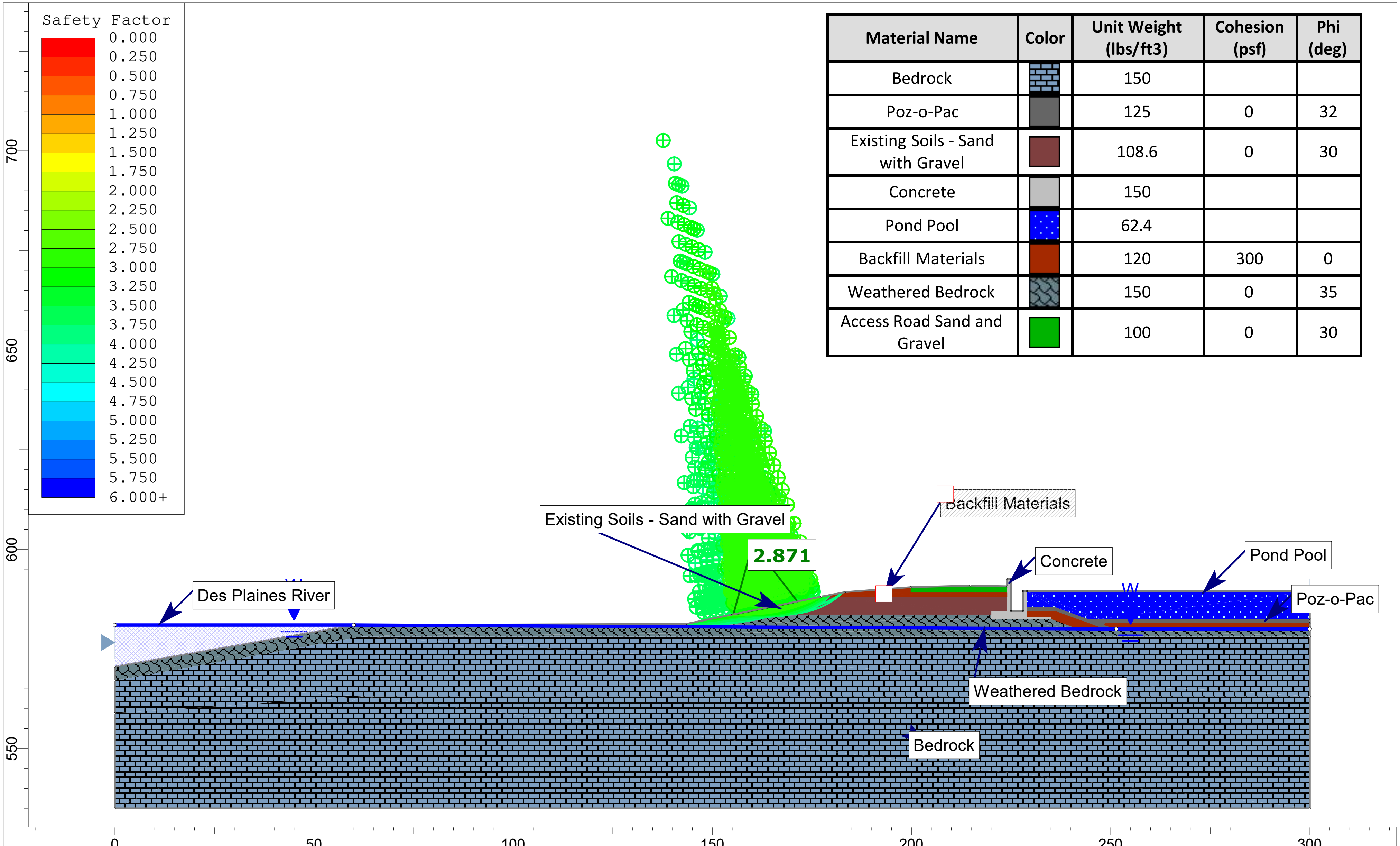
Project	**Figure 8: Pond 2S Slope Stability Analysis**		
Analysis Spencer	*Scale:* 1:400	*Scenario* Pond 2S, Long-Term, Maximum Surcharge Pool	
Drawn By CAC	*Checked By:* MDB	*Approved By:* MDJ	*Company* Civil & Environmental Consultants, Inc.
Date 08/25/2021	*Date:* 9/23/2021	*Date:* 9/23/2021	*File Name* 312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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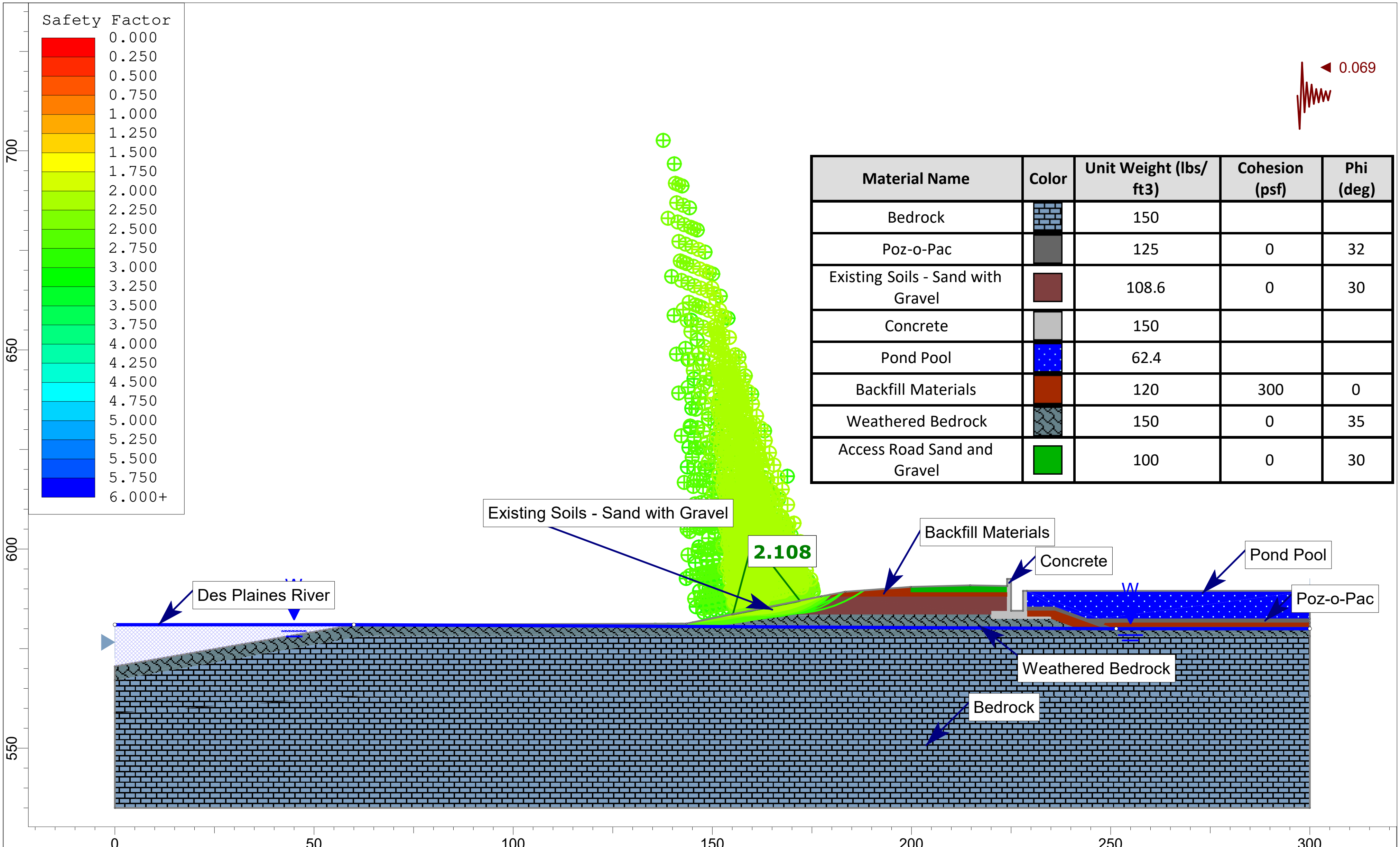
Figure 9: Pond 2S Slope Stability Analysis

Analysis Spencer	*Scale:* 1:400	*Scenario* Pond 2S, Long-Term, Maximum Storage Pool	
Drawn By CAC	*Checked By:* MDB	*Approved By:* MDJ	*Company* Civil & Environmental Consultants, Inc.
Date 08/25/2021	*Date:* 9/23/2021	*Date:* 9/23/2021	*File Name* 312192-WC-Pond 1N.slmd



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Bedrock		150		
Poz-o-Pac		125	0	32
Existing Soils - Sand with Gravel		108.6	0	30
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30

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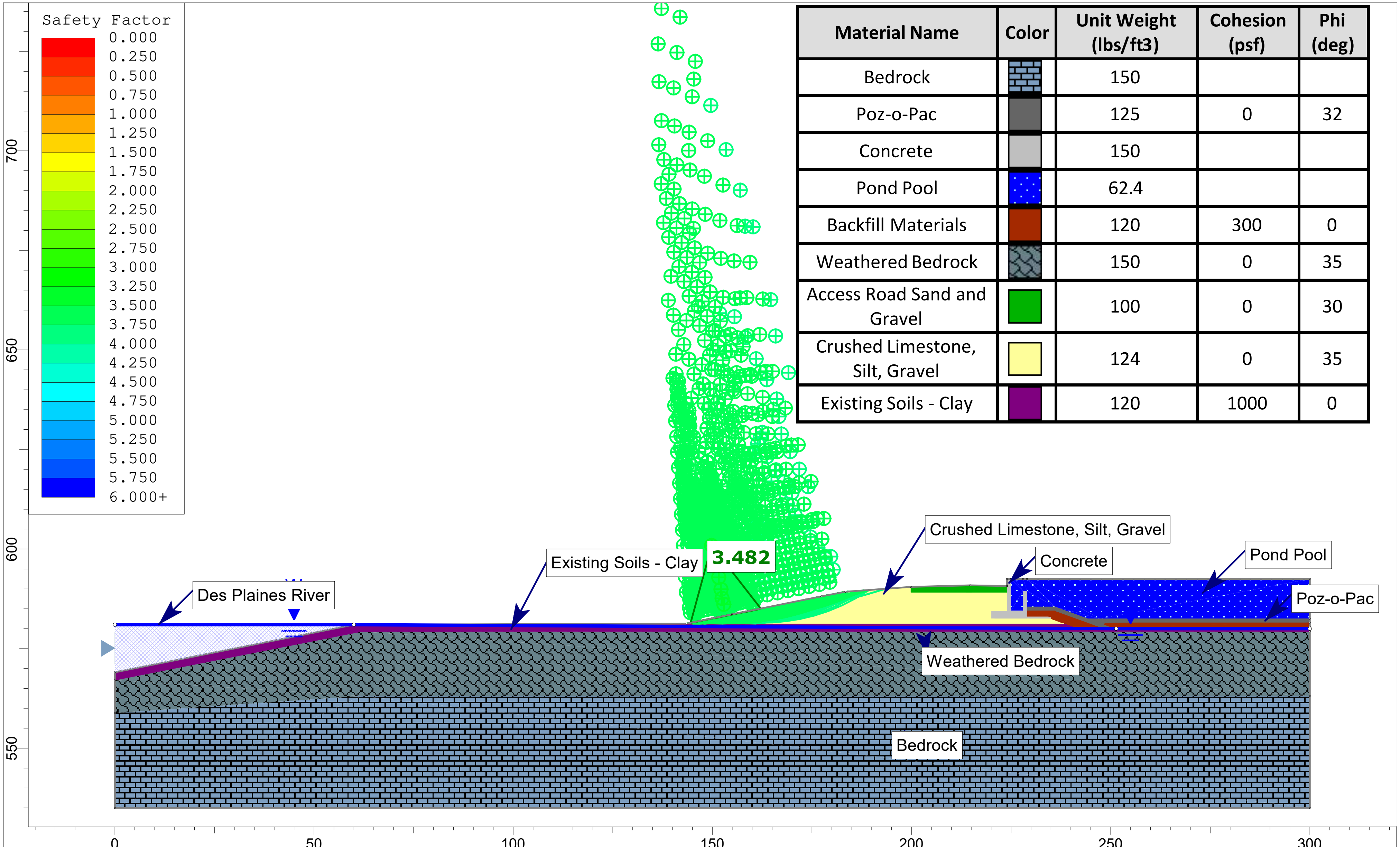
Project	**Figure 10: Pond 2S Slope Stability Analysis**		
Analysis Spencer	*Scale:* 1:400	*Scenario* Pond 2S, Long-Term, Maximum Storage Pool - Seismic	
Drawn By CAC	*Checked By:* MDB	*Approved By:* MDJ	*Company* Civil & Environmental Consultants, Inc.
Date 08/25/2021	*Date:* 9/23/2021	*Date:* 9/23/2021	*File Name* 312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30
Crushed Limestone, Silt, Gravel		124	0	35
Existing Soils - Clay		120	1000	0

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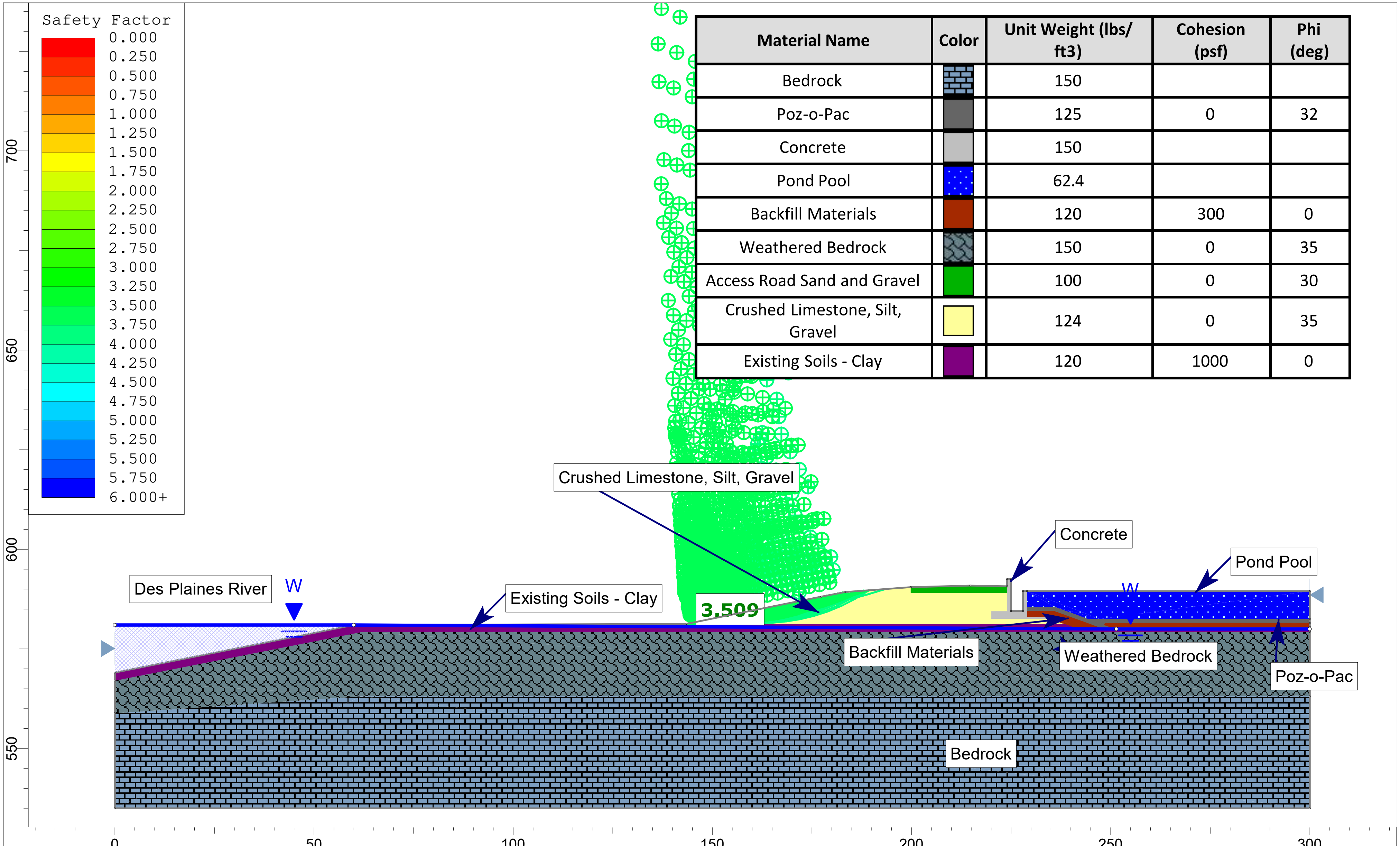
Figure 11: Pond 3S Slope Stability Analysis

Analysis Spencer	*Scale:* 1:400		*Scenario* Pond 3S, Long-Term, Maximum Surcharge Pool
Drawn By CAC	*Checked By:* MDB	*Approved By:* MDJ	*Company* Civil & Environmental Consultants, Inc.
Date 08/25/2021	*Date:* 9/23/2021	*Date:* 9/23/2021	*File Name* 312192-WC-Pond 1N.slmd



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Bedrock		150		
Poz-o-Pac		125	0	32
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30
Crushed Limestone, Silt, Gravel		124	0	35
Existing Soils - Clay		120	1000	0

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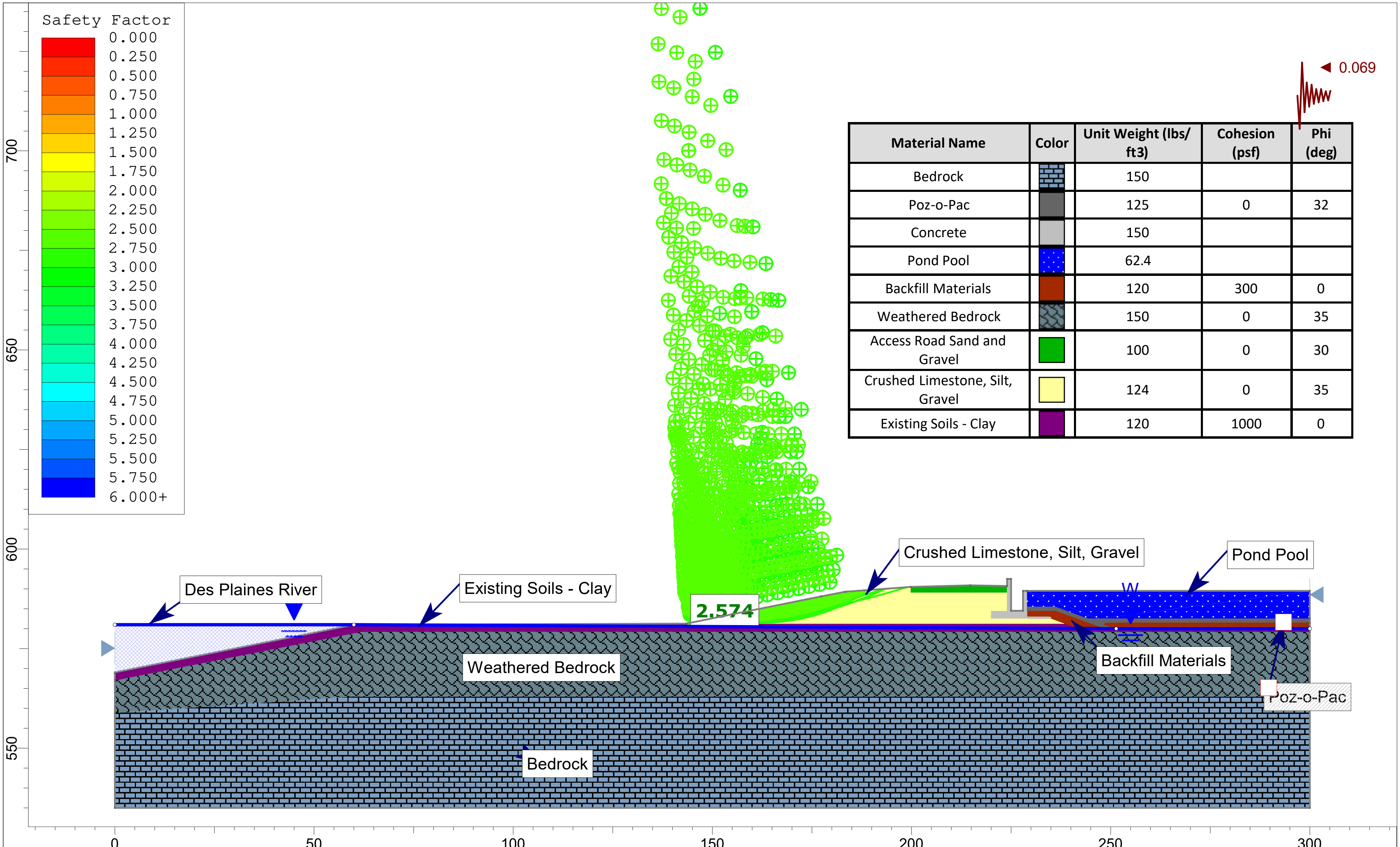
Project	**Figure 12: Pond 3S Slope Stability Analysis**		
Analysis Spencer	*Scale:* 1:400	*Scenario* Pond 3S, Long-Term, Maximum Storage Pool	
Drawn By CAC	*Checked By:* MDB	*Approved By:* MDJ	*Company* Civil & Environmental Consultants, Inc.
Date 08/25/2021	*Date:* 9/23/2021	*Date:* 9/23/2021	*File Name* 312192-WC-Pond 1N.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Bedrock		150		
Poz-o-Pac		125	0	32
Concrete		150		
Pond Pool		62.4		
Backfill Materials		120	300	0
Weathered Bedrock		150	0	35
Access Road Sand and Gravel		100	0	30
Crushed Limestone, Silt, Gravel		124	0	35
Existing Soils - Clay		120	1000	0

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Figure 13: Pond 3S Slope Stability Analysis

Analysis Spencer		*Scale:* 1:400		*Scenario* Pond 3S, Long-Term, Maximum Storage Pool - Seismic	
Drawn By CAC	*Checked By:* MDB		*Approved By:* MDJ	*Company* Civil & Environmental Consultants, Inc.	
Date 08/25/2021	*Date:* 9/23/2021		*Date:* 9/23/2021	*File Name* 312192-WC-Pond 1N.slmd	

ATTACHMENT 18
INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

MWG

Midwest Generation, LLC
Will County Generating Station

2021 Inflow Design Flood Control System Plan for South Ash Pond 2 & South Ash Pond 3

Revision 0

October 14, 2021

Issue Purpose: Use

Project No.: 12661-124

55 East Monroe Street
Chicago, IL 60603-5780 USA
312-269-2000
www.sargentlundy.com

Sargent & Lundy

TABLE OF CONTENTS

1.0 PURPOSE & SCOPE

1.1 PURPOSE

South Ash Pond 2 and South Ash Pond 3 at Midwest Generation, LLC's (MWG) Will County Generating Station ("Will County" or the "Station") are existing coal combustion residual (CCR) surface impoundments that are regulated by the Illinois Pollution Control Board's "Standards for the Disposal of Coal Combustion Residuals in CCR Surface Impoundments." These regulations are codified in Part 845 to Title 35 of the Illinois Administrative Code (35 Ill. Adm. Code 845, Ref. 1) and are also referred to herein as the "Illinois CCR Rule." Pursuant to 35 Ill. Adm. Code 845.510(c)(1), MWG must prepare an inflow design flood control system plan that documents how the inflow design flood control systems for South Ash Ponds 2 and 3 have been designed and constructed to meet the hydrologic and hydraulic capacity requirements for CCR surface impoundments promulgated by 35 Ill. Adm. Code 845.510.

South Ash Ponds 2 and 3 are also regulated by the U.S. Environmental Protection Agency's "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," 40 CFR Part 257 Subpart D (Ref. 2), also referred to herein as the "Federal CCR Rule." Pursuant to 40 CFR 257.82(c)(4), the Federal CCR Rule requires MWG to prepare a periodic inflow design flood control system plan in accordance with 40 CFR 257.82(c)(1) for South Ash Ponds 2 and 3 every five years.

This report documents the 2021 inflow design flood control system plan prepared in accordance with the Illinois and Federal CCR Rules by Sargent & Lundy (S&L) on behalf of MWG for South Ash Ponds 2 and 3 at Will County. This report:

- Lists the inputs and assumptions used to determine whether South Ash Ponds 2 and 3 can manage the inflow design flood,
- Discusses the methodology used to determine whether South Ash Ponds 2 and 3 can manage the inflow design flood,
- Evaluates potential changes to the design inputs used in the initial hydrologic and hydraulic assessment completed for South Ash Ponds 2 and 3 that was conducted in accordance with the Federal CCR Rule, and
- Summarizes the results of the hydrologic and hydraulic calculations performed to support the conclusion of whether South Ash Ponds 2 and 3 meet the hydrologic and hydraulic requirements for CCR surface impoundments promulgated by both the Federal and Illinois CCR Rules.

1.2 SCOPE

Per the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act, South Ash Ponds 2 and 3 will continue to be subject to both the Illinois and Federal CCR Rules until the U.S. EPA approves the Illinois

EPA's CCR permit program. The Illinois EPA has yet to publish a timeline for submitting its proposed CCR permit program to the U.S. EPA for approval, and so MWG must prepare an inflow design flood control system plan pursuant to both sets of regulations at this time.

2.0 INPUTS

Inflow Design Flood Control System

The inflow design flood control systems for South Ash Ponds 2 and 3 are documented in the ponds' initial inflow design flood control system plan, which was prepared by Geosyntec Consultants in October 2016 (Ref. 3). This plan is provided in its entirety in Appendix A.

Inflow Design Flood Event

Per the ponds' 2021 hazard potential classification assessment (Ref. 4), South Ash Ponds 2 and 3 are classified as Class 2 CCR surface impoundments pursuant to 35 Ill. Adm. Code 845.440(a)(1) and as significant hazard potential CCR surface impoundments pursuant to 40 CFR 257.73(a)(2). Therefore, the inflow design flood event used in this hydrologic and hydraulic assessment of both ponds is based on the 1,000-year storm (Ref. 1, § 845.510(a)(3); Ref. 2, § 257.82(a)(3)). Per the National Oceanic and Atmospheric Administration's Atlas 14 (Ref. 5), the precipitation depth for the 1,000-year, 24-hour storm event at the Will County site is 13.3 inches.

Site Topography

Topographic data for South Ash Ponds 2 and 3 and the surrounding areas was obtained from the U.S. Department of Agriculture's (USDA) National Digital Elevation Program (Ref. 6). This topography reflects elevation data collected in 2010 at a 1-meter resolution.

Aerial Images

Historical and recent aerial images of the Station and surrounding areas were obtained from Google Earth Pro (Ref. 7).

Ash Pond Conditions

The operating and physical conditions for South Ash Ponds 2 and 3 were based on discussions with MWG personnel.

3.0 ASSUMPTIONS

There are no assumptions in this document that require verification.

4.0 HYDROLOGIC & HYDRAULIC ASSESSMENT

4.1 CHANGES SINCE INITIAL INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

4.1.1 CHANGES IN ASH POND OPERATIONS

In early October 2020, Will County took South Ash Pond 3 out of service for routine cleaning and is dewatered as necessary. In April 2021, MWG filed a notice of intent to close South Ash Pond 3 in accordance with the Federal CCR Rule's closure criteria (Ref. 2, § 257.102). Meanwhile, Will County continues to operate South Ash Pond 2 to manage CCR wastestreams and various non-CCR wastestreams from the Station in accordance with 40 CFR 257.103(f)(1). Operating conditions at this pond have not changed since the pond's initial inflow design flood control system plan was prepared in 2016.

Based on reviews of Google Earth aerial images (Ref. 7), there have been no significant modifications to South Ash Pond 2 or South Ash Pond 3 (mass excavations, major embankment modifications, *etc*.) since the ponds' initial inflow design flood control system plan was completed. Therefore, there is no basis to reevaluate the embankment geometry for this 2021 assessment.

4.1.2 CHANGES IN ASH POND TOPOGRAPHY

Based on reviews of Google Earth aerial images (Ref. 7), there have been no significant modifications to the embankments for South Ash Ponds 2 and 3 (mass excavations, mass fill placement, *etc*.) since the initial inflow design flood control system plan was completed. Therefore, the 2010 USDA topography for the site (Ref. 4) and the original construction drawings for the ponds (see Appendix A) remain valid for use in this 2021 assessment.

4.2 METHODOLOGY

PondPack (Ref. 8) was used to analyze the abilities of South Ash Ponds 2 and 3 to manage direct precipitation and stormwater run-on from the 1000-year, 24-hour storm event. The analysis conservatively assumed that the hydraulic structures downstream of the ponds were full at the time of the storm event and, therefore, the ponds would need to contain the inflow design flood without water overtopping their dikes (EL. 590.50 feet). The surface water elevations in the ponds at the time of the design storm event were assumed to be at the elevation of the overflow weir in each pond (EL. 589.00 feet). This assumption is conservative for South Ash Pond 3, which, as previously mentioned, is no longer in service and is dewatered as necessary. Finally, the time of concentration for this hydrologic and hydraulic assessment was assumed to be 5 minutes in accordance with the minimum time of concentration recommended in the U.S. Department of Agriculture's Technical Release No. 55, *Urban Hydrology for Small Watersheds* (Ref. 9).

4.3 RESULTS

Table 4-1 summarizes the results from the hydrologic and hydraulic calculations performed for South Ash Ponds 2 and 3 (Ref. 10). Based on these results, water entering South Ash Ponds 2 and 3 during the inflow design flood event will not overtop the either pond's dikes. The freeboard in each pond during the design event was estimated to be 0.15 foot.

Table 4-1 – Summary of Hydrologic & Hydraulic Assessment Results for Ash Pond 2

CCR Surface Impoundment	Illinois Hazard Potential Classification	Federal Hazard Potential Classification	Inflow Design Flood	Maximum Surface Water Elevation	Pond Crest Elevation
South Ash Pond 2	Class 2	Significant	1,000 Year	590.35 feet	590.50 feet
South Ash Pond 3	Class 2	Significant	1,000 Year	590.35 feet	590.50 feet

5.0 CONCLUSIONS

Based on the hydrologic and hydraulic calculations performed for South Ash Ponds 2 and 3 (Ref. 10), the ponds have adequate hydraulic capacities to retain the 1000-year flood event without water overtopping the ponds' dikes. Therefore, South Ash Ponds 2 and 3 are able to collect and control the inflow design flood event specified in 35 Ill. Adm. Code 845.510(a)(3) and 40 CFR 257.82(a)(3).

6.0 CERTIFICATION

I certify that:

- This inflow design flood control system plan was prepared by me or under my direct supervision.
- The work was conducted in accordance with the requirements of 35 Ill. Adm. Code 845.510 and with the requirements of 40 CFR 257.82.
- I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin   Date: October 14, 2021

Seal:

LICENSED PROFESSIONAL ENGINEER
THOMAS J DEHLIN
062-069314
OF ILLINOIS

Th. Dehlin
10/14/2021
Exp. 11/30/2021

7.0 REFERENCES

1. Illinois Pollution Control Board. "Standards for Disposal of Coal Combustion Residuals in CCR Surface Impoundments." 35 Ill. Adm. Code 845. Accessed October 13, 2021.
2. U.S. Environmental Protection Agency. "Standards for Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments." 40 CFR Part 257 Subpart D. https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-257/subpart-D. Accessed October 13, 2021.
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4. Sargent & Lundy. "2021 Hazard Potential Classification Assessment for South Ash Pond 2 & South Ash Pond 3." Rev. 0. S&L Project No. 12661-124. October 2021.
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7. Google Earth Pro v7.3.0.3832. Accessed October 13, 2021.
8. Bentley PondPack V8i Version 10.02.00.01.
9. U.S. Department of Agriculture. *Urban Hydrology for Small Watersheds*. Technical Release No. 55. 1986.
10. Sargent & Lundy. "South Ash Ponds 2 and 3 Hydraulic Capacity Calculation." S&L Calc. No. MG-WC-C001, Rev. 0. S&L Project No. 12661-124. October 2021.

APPENDIX A: 2016 SOUTH ASH POND 2 & SOUTH ASH POND 3 INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

ATTACHMENT 19
SAFETY AND HEALTH PLAN

1.0 SAFETY REQUIREMENTS

1.1 The entire performance of the Work shall comply with the standards authorized by the latest issue of the U.S. Department of Labor Occupational Safety and Health Act (OSHA), as well as state and local jurisdictional requirements.

1.2 CONTRACTORS SAFETY MANUAL

A. The Contractor shall have on file with the Midwest Generation corporate safety office a copy of the most current Safety and Industrial Hygiene Manual. As a minimum, this Manual must address the following items when applicable to their trade: OSHA Compliance, Accident Investigation, Corrective Action, First Aid Treatment, Inspections and Reporting of Deficiencies, Material Handling and Rigging, Performance and Accountability, Personal Safety Equipment, Safety Guidelines, Safety Meetings, Training, Housekeeping, Hearing Protection, Respiratory Protection, Fire Prevention, Grounding Program, Confined Space Entry, Hazard Communication, Fall Protection, Working on or near water and Trenching and Shoring.

B. The Contractor's superintendent or other responsible person must have a copy of the Contractor's most current Safety and Industrial Hygiene Manual available at the job site.

1.3 PRE-MOBILIZATION MEETING

A. The Contractor shall meet with the Purchasers Representative(s) for a pre-mobilization meeting. The pre-mobilization meeting will include a review of safety requirements, job hazard identification, a job specific safety plan (to be developed by the Contractor and provided to Midwest Generation), submittal requirements for health & safety records, scope and schedule. Hazard identification and assessment will include all chemical constituents found present in the analyses of the CCR and/or other waste streams within the impoundment(s). Recommendations within the NIOSH Pocket Guide to Chemical Hazards will be reviewed and considered. Applicable safety data sheets will be provided, as necessary.

B. Prior to the start of the work at the job site. Contractor shall contact Purchaser's Representative to arrange to receive Purchasers site safety orientation. This session will last approximately 2 hours. The Contractor will be provided with information on the potential hazardous constituents of the CCR

C. Contractor shall provide his employees with orientation in all Contractor, and job specific safety requirements related to their work area. Contractor shall provide Purchaser with completed training documents showing date of training and each employees craft related training as it relates to OSHA requirements. (i.e. competent person, scaffold builder, fork truck and crane operators)

D. The Contractor Shall provide proof of training for all on site personnel in the following:
   - HAZWOPER 29CFR1910.120/29CFR1926.65
   - OSHA 10 Hour or 30 Hour Voluntary Compliance Training for Construction
   - Hazard Communication 29 CFR 1910.1200
   - Contractor's Safety Plan

E. A Competent Person shall be identified by name for Excavations, Fall Protection ,etc. if applicable.

1.4 FITNESS FOR DUTY

A. The Contractor/Sub-Contractor/Supplier is required to have a drug and alcohol screening program for all employees assigned to work on Purchaser's property. The program must provide screening for pre-access testing, "for cause" testing and random testing. The Contractor/Sub-Contractor/Supplier shall certify that their employees have passed the appropriate screening test in accordance with their programs.

B. Personnel covered by this program shall be denied access to, or may be required to leave the Purchaser's location if there are reasonable grounds to believe that the individual is:
   1. Under the influence of using, possessing, buying, selling, or otherwise exchanging (whether or not for profit) controlled substances or drug paraphernalia.
   2. Under the influence of consuming, possessing, buying, selling, or otherwise exchanging (whether or not for profit) alcoholic beverages.

1.5 PERSONNEL PROTECTIVE EQUIPMENT (PPE)

A. Prior to starting work, the contractor shall perform a Hazard assessment for PPE
   1. The Contractor will conduct a walk-through survey of each work area to identify sources of work hazards. Each survey will be documented in which it will identify the work area surveyed, the relevant task, the person conducting the survey, findings of potential hazards, control measures, and date of the survey.

   2. The Contractor will conduct, review, and update the hazard assessment for PPE whenever:

      - A job changes
      - New equipment or process is installed
      - There has been an accident
      - Whenever a supervisor or employee requests it
      - Or at least every year
      - Any new PPE requirements that are developed will be added into the Contractors written safety program.

B. Head Protection/ Hard Hats: Hard hats shall be worn in all work areas.
   1. Hard hats must not be more than 5 years old, and the harness shall not be more than 1 year old.
   2. Hard hats must be worn with brim forward
   3. Hard hats must be assigned and used in accordance with ANSI/ISEA Z89.1-2014(R2019)
   4. Hard Hats must be cleaned and maintained in accordance with the manufacturer's instruction.

C. Eye Protection: Eye protection shall be worn in all work areas.
   1. At a minimum, ANSI Z87-1-2020 compliant Safety Glasses shall be worn.
   2. Goggles and face shields shall be used for splash hazards.
   3. Fogging potential shall be considered for humid conditions and appropriate anti-fog materials may be used.
   4. Detachable side protectors (e.g. clip-on or slide on side shields) that meet OSHA Rule 29 CFR Part 1910.133 and ANSI Z87.1 specifications are also acceptable to wear with prescription glasses. Prescription glasses used with detachable side shields must conform to ANSI Z87.1
   5. Employees must keep eyewear in clean condition and fit for use at all times.

D. Protection Foot Wear
   1. All foot wear must be compliant with ASTM F2413-18: Performance Requirements For Protective (Safety) Toe Cap Footwear
   2. For work on or near the CCR impoundments, consideration shall be given to traction and slip issues.
   3. Safety shoes must be maintained and cleaned in accordance with the manufacturer's guidelines.
   4. Boot covers or Rubber boots shall be used in all areas that do or may contain CCR. These covers or boots must be cleaned or disposed of prior to leaving the work area.

E. Hand Protection
   1. Employers shall base the selection of the appropriate hand protection on an evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use, and the hazards and potential hazards identified.
   2. Impervious disposable gloves shall be used when working with CCR. Leather, Cotton or other readily absorbable gloves shall not be used.

F. Personal Flotation Devices
   1. When working with 10 feet of the water in the impoundments the following shall apply:
      a. All personnel shall wear a Coast Guard Approved PFD
         - Type I: Off-Shore Life Jacket; effective for all waters or where rescue may be delayed.

- Type II: Near-Shore Buoyant Vest; intended for calm, inland water or where there is a good chance of quick rescue.
- Type III: Flotation aid; good for calm, inland water, or where there is a good chance of rescue.
- Type IV: PFD's are throwable devices. They are used to aid persons who have fallen into the water.
- Type V: Flotation aids such as boardsailing vests, deck suits, work vests, and inflatable PFD's marked for commercial use.

2. Serviceable condition: A PFD is considered to be in serviceable condition only if the following conditions are met.
   a. No PFD may exhibit deterioration that could diminish the performance of the PFD, including:

      1. Metal or plastic hardware used to secure the PFD on the wearer that is broken, deformed, or weakened by corrosion;

      2. Webbings or straps used to secure the PFD on the wearer that are ripped, torn, or which have become separated from an attachment point on the PFD; or

      3. Any other rotted or deteriorated structural component that fails when tugged;

      4. Rips, tears, or open seams in fabric or coatings, that are large enough to allow the loss of buoyant material;

      5. Buoyant material that has become hardened, non-resilient, permanently compressed, waterlogged, oil-soaked, or which shows evidence of fungus or mildew; or

      6. Loss of buoyant material or buoyant material that is not securely held in position.

1.6 EXISTING PLANT FACILITIES

A. Contractor shall be aware that Work may be performed in and around operating equipment.

B. The Contractor shall give proper notices, make all necessary arrangements, and perform all other services required to avoid damage to all utilities, including gas mains, water pipes, sewer pipes, electric cables, fire hydrants, lamp posts, etc., for which Purchaser could be held liable.

C. The Contractor shall barricade or cover any opening created during the course of work for excavations, or grating removal. Barricades shall be a "hard" barrier such as cable or pipe and clamp, safety barrier tape is unacceptable. In addition, any openings creating a fall hazard of 4 feet or more must have a permit authorized before the barrier can be removed. See section 11.4 below for permit requirements.

D. Housekeeping, walkways and tripping hazards

   All equipment and material must be kept in an orderly manner. Aisles exits stairways and emergency equipment must never be obstructed. Hoses and welding cables must be tied above walkways so as to not pose as a trip hazard. Barricades, signs and notifications provided by the contractor when required. The owner and contractor will conduct periodic housekeeping audits to assure compliance.

E. Contractor's personnel shall observe all safety, warning, equipment identification instructional signs and tags. Do not remove any tag without prior consent of Purchaser's Representative.

F. When work has been completed, and Contractor decides equipment is ready to be returned to service, Contractor employees shall have all of their employees (working party members) sign off the permit. Contractor shall notify Purchaser's Representative in whose name the outage is being held.

1.7 WELDING, CUTTING and BURNING PERMITS

A. Contractor shall not start welding or cutting operations without a "Welding and Cutting Permit". Permits shall be obtained from Purchaser and posted in accordance with Station site-specific Safety Training requirements.

B. Contractor shall use non-asbestos, fire retardant blankets as required to protect Purchaser's equipment, cable trays, coal transport and storage areas, etc. and to cover gratings (for personnel safety) when welding, grinding and flame cutting processes are used overhead or in such close proximity as to pose a hazard.

C. Contractor shall supply appropriate portable fire extinguishers in welding and cutting areas.

D. Contractor shall furnish a designated “Fire-watch” employee to monitor the area above to the sides and below the cutting and burning area. The fire-watch is to extinguish fires started by sparks from the acts of cutting or welding. The fire-watch employee is to continue monitoring on the job 30 minutes after cutting or burning has been completed.

1.8 SAFETY DATA SHEETS

A. The Purchaser shall make Safety Data Sheets (SDS's) readily available to the Contractor for those substances to which the Contractor’s employees may be exposed during normal working conditions and which are under the Purchaser’s control.

B. The Contractor shall make Safety Data Sheets (SDS's) readily available to the Purchaser for those substances which are furnished by and under the control of the Contractor. These are to be available at the time of delivery of the substance to the Purchaser’s Premises.

C. It is the responsibility of the Contractor to train their employees on SDS's.

1.9 CHEMICALS, SOLVENTS AND GASES

A. Contractor shall comply with all federal, state and local regulations and codes pertaining to handling and storage of flammable liquids and gases.

B. Cleaning agents, solvents, or other substances brought by Contractor onto any of Purchaser's properties by Contractor shall be stored, handled and used in accordance with applicable standards.

C. Contractor shall ensure that liquids or solids will not be poured (disposed of) into Purchaser's drain, sewer systems, lake (where applicable), or onto ground. Contractor shall be liable for any damage and cleanup of improperly disposed liquids or solids.

D. The Contractor is to provide the Purchaser with the name and quantity of usage of any listed Section 313 Toxic Chemical of the Emergency Planning and Community Right-to-Know Act of 1986 (40CFR372).

E. Signage must be posted detailing the presence of and hazards of CCR.

1.10 DISTURBANCE OF DUST

Contractor's work practices shall minimize dust generated while working with CCR. A fugitive dust mitigation plan shall be submitted to the facility prior to activities beginning.

1.11 FALL PROTECTION

Mandatory fall protection is required when working near and area where a fall hazard of **4** feet or more exits.

1.12 BARRIERS AND WARNING SYSTEMS

A. Warning and barricade systems shall be used to divert personnel from a work area. All warning barriers shall be tagged with yellow “Caution Cards”. The caution card shall state the hazard, the date erected and a contact name, company and phone number. There are 2 levels of barricade systems. The barricade systems shall be taken down immediately when the hazard has been removed or at the end of the work shift.

B. A <u>conditional warning</u> is designated with ‘Yellow” safety warning tape. This is used to warn workers of a hazard such as wet floors, welding and cutting in an area, or other hazards that with an awareness and proper PPE can be approached.

C. An <u>Unconditional warning</u> is designated with “Red” safety warning tape. This is used to worn workers of a hazard such as a crane lift or overhead work. Red safety tape barriers cannot be access or removed until permission is granted from the person responsible for installing it.

D. Fire and Evacuation warning sirens. Each plant has a siren for fire notification and evacuation notification. The response location and procedure will be addressed in the pre-mobilization meeting and plant site-specific orientation.

1.13 For Contractor's and subcontractor's employees, visitors and any other individuals: Smoking is prohibited on the work site.

1.14 The Contractor is expected to pre-arrange medical emergency services for on-site and off-site treatment. This includes, but is not limited to, first aid and confined space rescue.

1.15 WORKING ON OR NEAR WATER:

A. Life jackets and work vests shall be inspected before and after each use.

B. Ring buoys or Class IV rescue device with at least 90 feet of line shall be provided and readily available for employee rescue operations.

C. The distance from ring buoys to each worker shall not exceed 200 feet.

D. At least one lifesaving skiff shall be immediately available at locations where employees are working over water and/or the local coast guard shall be notified when working in navigable waterways.

E. Under no circumstances will team members enter water bodies without protective clothing (e.g.; waders, wet suit)

F. At least one person should remain on shore as a lookout if other methods of rescue are not available.

1.16 EXCAVATIONS

A. A Competent person shall determine the proper slope or identify engineering controls for all excavations in the CCR area.

B. An inspection of the banks shall be made and documented at least daily to determine any impact of the excavation.

2.0 **<u>CONTRACTOR'S FACILITIES</u>**

2.1 Temporary chemical toilet accommodations shall be furnished and maintained by Contractor for the use of his employees. Location shall be as directed by Purchaser's Representative. Use of Purchaser's toilet facilities by Contractor's employees is not permitted.

2.2 Contractor shall provide his own storage vessels, coolers, ice, water containers, etc., as required for his own drinking water use. Contractor shall supply a trash can with each drinking water container to receive used paper cups. Contractor shall maintain drinking water container, supply suitable water cups and dispose of trash as required. Open drinking cups and containers in the plant areas are not permitted.

2.3 Each Contractor is expected to pre-arrange medical emergency services for on-site and off site treatment. This includes, but is not limited to, first aid and confined space rescue.

2.4 FIRE PROTECTION FACILITIES

A. Contractor shall provide his own temporary fire protection facilities for the equipment and materials furnished by him or by Purchaser and for his temporary construction buildings and structures. This equipment shall be maintained and inspected in accordance with applicable NFPA codes.

B. Furnish a suitable quantity and type of portable fire extinguishers and equipment, to meet OSHA and applicable codes.

2.5 Purchaser will not furnish any additional illumination of aisles, passages in the buildings, floodlighting of outdoor areas or lighting inside equipment other than that which is existing. Any additional lighting required by the Contractor shall be provided by the Contractor.

2.6 Contractor shall provide and maintain suitably located distribution centers with fused switching equipment and Ground Fault Interruption protection. The equipment supplied shall comply with OSHA regulations and standards.

2.7 Contractor shall supply all adapters and equipment required to connect to station air, water, and electrical systems. All air hoses shall be safety clipped together.

2.8 Any heating facilities required for the performance of the Work shall be furnished, maintained, and removed by Contractor. Open fires WILL NOT BE PERMITTED at any time. Heating equipment shall be as approved by Purchaser's Representative.

3.0 **<u>CONTRACTOR'S TOOLS AND EQUIPMENT</u>**

3.1 TOOLS AND EQUIPMENT

A. Contractor shall maintain, inspect and store tools and equipment for safe and proper use. This includes guards, shields, safety switches and electrical cords.

B. Contractor shall provide hoisting equipment as required to perform the Work. Provide all the necessary guards, signals, and safety devices required for its safe operation. Construction and operation of hoisting equipment shall comply with all applicable requirements of ANSI A10.5, the AGC Manual of Accident Prevention in Construction, and to all applicable federal, state, and local codes. Hoisting equipment shall not be used to transport personnel.

3.2 RIGGING

A. Contractor shall design, furnish, and maintain rigging required for the Work. All rigging plans must be designed by an Illinois licensed structural engineer.

B. Purchaser reserves the right to examine Contractor's design calculations, engineering data, plans, and procedures. Contractor shall submit any documentation requested by the Purchaser for the purpose of this review, including, but not limited to, calculations, diagrams and documents associated with computer-aided analyses and programs. If requested information is considered proprietary by Contractor, Contractor shall allow the Purchaser to review the information at Contractor's offices with the understanding that no copies of proprietary information will be given to the Purchaser. Purchaser's review and approval of submitted information is for general detail only and will not relieve the Contractor of responsibility for meeting all requirements and for accuracy.

C. Lifting and rigging areas shall have the target area and corresponding personnel access landings barricaded with "red" safety tape or hard barriers. No one is allowed under the load or in the target area during lifts.

D. All cranes, hoists, or derricks shall be operated in compliance with existing State and Federal regulations or orders. Cranes and hoists shall be inspected in accordance with OSHA and ANSI requirements. Cranes and hoists shall not be operated near high voltage lines or equipment until a safe operating clearance plan has been established.

ATTACHMENT 20
CLOSURE PRIORITY CATEGORIZATION

Attachment 20 – No Attachment