Luminant

Illinois Power Resource Generating, LLC
1500 Eastport Plaza Dr.
Collinsville, IL 62234

October 25, 2021

Illinois Environmental Protection Agency
DWPC – Permits MC #15
Attn: Part 845 Coal Combustion Residual Rule Submittal
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

Re: Edwards Power Plant Ash Pond; IEPA ID # W1438050005-01

Dear Mr. LeCrone:

In accordance with 35 I.A.C. § 845.200, Illinois Power Resource Generating, LLC (IPRG) is submitting an operating permit application for the Edwards Power Plant Ash Pond (IEPA ID # W1438050005-01). One hardcopy and one digital copy are provided with this submittal.

The permit application was prepared in accordance with 35 I.A.C. § 845.230(d)(2) (Existing, Inactive and Inactive Closed CCR Surface Impoundment that have not completed an Agency approved closure before July 30, 2021). This submittal includes the completed permit forms as required by § 845.210.

Sincerely,

Cynthia Vodopivec
SVP-Environmental Health and Safety

Enclosures

Prepared for

Illinois Power Resources Generating, LLC
1500 EastPort Plaza Drive
Collinsville, Illinois 62234

INITIAL OPERATING PERMIT

EDWARDS POWER PLANT ASH POND

Prepared by

425 South Woods Mill Road, Suite 300
St. Louis, MO 63017

October 25, 2021

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ATTACHMENTS

1. INTRODUCTION

Illinois Power Resources Generating, LLC operates the coal-fired Edwards Power Plant (Plant) located in Peoria County, Illinois. The IEPA assigned identification number assigned to the Edwards Ash Pond is: W1438050005. The National Inventory of Dams (NID) number assigned for the Edwards Ash Pond by the Illinois Department of Natural Resources (IDNR) is IL50710.

This initial operating permit application was developed in accordance with 35 Ill. Admin. Code 845, Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (Part 845).

This initial operating permit application is for the Ash Pond.

1.1. Facility Information

> *Section 845.210(b)(1): All permit applications must contain the name, address, email address and telephone number of the operator, or duly authorized agent, and the property owner to whom all inquiries and correspondence shall be addressed.*

Facility:	Edwards Ash Pond Edwards Power Plant 7800 South Cilco Lane Pekin, IL 61607
Owner/Operator:	Illinois Power Resources Generating, LLC 1500 Eastport Plaza Drive Collinsville, Illinois 62234

1.2. <u>Owner Signatures</u>

> <u>*Section 845.210(b)(2):*</u> *All permit applications must be signed by the owner, operator or a duly authorized agent of the operator.*

The owner of the Edwards Power Plant is a corporation.

> <u>*Section 845.210(b)(3):*</u> *An application submitted by a corporation must be signed by a principal executive officer of at least the level of vice president, or his or her duly authorized representative, if that representative is responsible for the overall operation of the facility described in the application form.*

The signature of Cynthia Vodopivec on behalf of Illinois Power Resources Generating, LLC can be found in the permit applications located in Section 3.

1.3. Legal Description

> <u>*Section 845.210(c):*</u> *All permit applications must contain a legal description of the facility boundary and a description of the boundaries of all units included in the facility.*

A legal description has been developed in compliance with Section 845.210(c) and is included in Attachment A.

1.4. Previous Assessments

> <u>*Section 845.210(d):*</u> *Previous Assessments, Investigations Plans, and Programs*

Previous assessments were performed in accordance with 40 CFR § 257 and are referenced within the permit application and included in the appropriate Attachments.

> <u>*Section 845.210(d)(1):*</u> *The Agency may approve the use of any hydrogeologic site investigation or characterization, groundwater monitoring well or system, or groundwater monitoring plan, bearing the seal and signature of an Illinois Licensed Professional Geologist or Licensed Professional Engineer, completed before April 21, 2021 to satisfy the requirements of this Part.*

A previous hydrogeologic site investigation or characterization, groundwater monitoring well or system, or groundwater monitoring plan have been completed with a seal from an Illinois Licensed Professional Geologist or Licensed Professional Engineer. However, field investigations have been completed that supplement that work that will be utilized in the following sections of this report.

Section 845.210(d)(2): For existing CCR surface impoundments, the owner or operator of the CCR surface impoundment may use a previously completed location restriction demonstration required by Section 845.300 (Placement Above the Uppermost Aquifer), Section 845.310 (Wetlands), Section 845.320 (Fault Areas), Section 845.330 (Seismic Impact Zones), and Section 845.340 (Unstable Areas) provided that the previously completed assessments meet the applicable requirements of those Sections.

Previous assessments are provided for Section 845.300 (Placement Above the Uppermost Aquifer), Section 845.310 (Wetlands), Section 845.320 (Fault Areas), Section 845.330 (Seismic Impact Zones), and Section 845.340 (Unstable Areas) in Attachment D.

Section 845.210(d)(3): For existing CCR surface impoundments, the owner or operator of the CCR surface impoundment may use a previously completed assessment to serve as the initial assessment required by Section 845.440 (Hazard Potential Classification Assessment), Section 845.450 (Structural Stability Assessment) and Section 845.460 (Safety Factor Assessment) provided that the previously completed assessment: A) Was not completed more than five years ago; and B) Meets the applicable requirements of those Sections.

Previous assessments are provided for Section 845.440 (Hazard Potential Classification Assessment), Section 845.450 (Structural Stability Assessment) and Section 845.460 (Safety Factor Assessment) in Attachments O, P, and Q respectively. The addendum and certification for the Hazard Potential Classification Assessment, Structural Stability Assessment and Safety Factor Assessment are located in Attachment U.

Section 845.210(d)(4): For inactive closed CCR surface impoundments, the owner or operator of the CCR surface impoundment may use a post-closure care plan previously approved by the Agency.

No post-closure care plan was previously approved by the Agency.

2. OPERATING PERMIT

2.1. Initial Operating Permit

> Section 845.230(d): *Initial Operating Permit for Existing, Inactive and Inactive Closed CCR Surface Impoundments*

The Edwards Ash Pond is defined by the IEPA as an existing CCR surface impoundment that has not completed post-closure care. Per Part 845, Illinois Power Resources Generating, LLC is submitting an initial operating permit application to IEPA by October 31, 2021. The permit applications (CCR-1 and CCR-2E) are provided in Section 3.

The following sections contain information or references to documents required for the Operating Permit application (Section 845.230).

2.2. History of Construction

> Section 845.230(d)(2)(A): *The history of construction specified in Section 845.220(a)(1);*

The history of construction prepared in 2016 pursuant to 40 CFR § 257.73(c) is provided in Attachment B. An amendment to the history of construction has been prepared in compliance with Section 845.220(a)(1) and is provided in Attachment U.

2.3. Chemical Constituents

> Section 845.230(d)(2)(B): *An analysis of the chemical constituents found within the CCR to be placed in the CCR surface impoundment;*

An analysis of the chemical constituents found within the CCR placed within the Edwards Ash Pond is provided in Attachment C.

> Section 845.230(d)(2)(C): *An analysis of the chemical constituents of all waste streams, chemical additives and sorbent materials entering or contained in the CCR surface impoundment;*

An analysis of the chemical constituents of all waste streams, chemical additives and sorbent materials entering or contained within the Edwards Ash Pond is provided in Attachment C.

2.4. Location Standards Demonstration

Section 845.230(d)(2)(D): 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:

The Edwards Ash Pond location standards as specified in Section 845.230(d)(2)(D) are described in the following sections.

Section 845.230(d)(2)(D)(i): Placement Above the Uppermost Aquifer;

The previous upper aquifer demonstration was certified by a qualified professional engineer stating that the demonstration meets the requirements of 40 C.F.R. § 257.60. The requirements described in 40 C.F.R. § 257.60 are identical to the requirements contained in Section 845.300. Pursuant to Section 845.210(d)(2), a certification is not required for this demonstration. The previously completed upper aquifer demonstration is included in Attachment D.

Section 845.230(d)(2)(D)(ii): Wetlands;

The previous wetlands demonstration was certified by a qualified professional engineer stating that the demonstration meets the requirements of 40 C.F.R. § 257.61. The requirements described in 40 C.F.R. § 257.61 are identical to the requirements contained in Section 845.310. Pursuant to Section 845.210(d)(2), a certification is not required for this demonstration. The previously completed wetlands demonstration is included in Attachment D.

Section 845.230(d)(2)(D)(iii): Fault Areas;

The previous fault area demonstration was certified by a qualified professional engineer stating that the demonstration meets the requirements of 40 C.F.R. § 257.62. The requirements described in 40 C.F.R. § 257.62 are identical to the requirements contained in Section 845.320. Pursuant to Section 845.210(d)(2), a certification is not required for this demonstration. The previously completed fault area demonstration is included in Attachment D.

Section 845.230(d)(2)(D)(iv): Seismic Impact Zone; and

The previous seismic impact zone demonstration was certified by a qualified professional engineer stating that the demonstration meets the requirements of 40 C.F.R. § 257.63. The requirements described in 40 C.F.R. § 257.63 are identical to the requirements contained in Section 845.330. Pursuant to Section 845.210(d)(2), a certification is not required for this demonstration. The previously completed seismic impact zone demonstration is included in Attachment D.

Section 845.230(d)(2)(D)(v): Unstable Areas and Floodplains;

The previous unstable area demonstration was certified by a qualified professional engineer stating that the demonstration meets the requirements of 40 C.F.R. § 257.64. The requirements described in 40 C.F.R. § 257.64 are identical to the requirements contained in Section 845.340. Pursuant to Section 845.210(d)(2), a certification is not required for the unstable area demonstration. The previously completed unstable area demonstration is included in Attachment D.

The boundaries of the impoundment were determined by a survey conducted by a professional surveyor licensed in the State of Illinois. The boundaries of the Ash Pond were compared to the existing FEMA floodplain map, and it was determined that the Ash Pond is located within the floodplain. A demonstration was performed to evaluate compliance with 35 I.A.C. Section 845.340(c). A certification attesting to compliance is provided in Attachment D.

2.5. Permanent Markers

Section 845.230(d)(2)(E): Evidence of permanent markers required by Section 845.130 have been installed;

Evidence of permanent markers at the Edwards Ash Pond as required by Section 845.130 is provided in Attachment E.

2.6. Slope Maintenance

Section 845.230(d)(2)(F): 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;

The Edwards Ash Pond is not incised. Documentation of slope protection as required by Section 845.430 is provided in Attachment J.

2.7. Initial Emergency Action Plan

Section 845.230(d)(2)(G): Initial Emergency Action Plan and accompanying certification (see Section 845.520(e));

The initial emergency action plan and certification has been completed as specified by Section 845.520(e) and is provided in Attachment F.

2.8. Fugitive Dust Control Plan

Section 845.230(d)(2)(H): *Fugitive dust control plan and accompanying certification (see Section 845.500(b)(7));*

The fugitive dust control plan and certification has been completed as specified by Section 845.500(b)(7) and is provided in Attachment G.

2.9. Groundwater Monitoring

Section 845.230(d)(2)(I): *Groundwater monitoring information:*

The groundwater monitoring information for the Edwards Ash Pond are described in the following sections.

Section 845.230(d)(2)(I)(i): *Hydrogeologic site characterization (see Section 845.620);*

Hydrogeologic site characterization for the Edwards Ash Pond is provided in Attachment H.

Section 845.230(d)(2)(I)(ii): *Design and construction plans of a groundwater monitoring system (see Section 845.630);*

Design and construction plans of a groundwater monitoring system are provided in Attachment I.

Section 845.230(d)(2)(I)(iii): *A groundwater sampling and analysis program that includes selection of the statistical procedures to be used for evaluating groundwater monitoring data (see Section 845.640); and*

A groundwater sampling and analysis program that meets the requirements of Section 845.640 is provided in Attachment I.

Section 845.230(d)(2)(I)(iv): *Proposed groundwater monitoring program that includes a minimum of eight independent samples for each background and downgradient well (see Section 845.650(b));*

A proposed groundwater monitoring program that meets the requirements of Section 845.650(b) is provided in Attachment I.

2.10. Initial Post-Closure Care Plan

Section 845.230(d)(2)(K): *Initial written post-closure care plan, if applicable (see Section 845.780(d));*

The Edwards Ash Pond closure will be completed by capping the CCR in place. The initial post closure care plan was developed in accordance with Section 845.780 and is provided in Attachment K.

2.11. History of Groundwater Exceedances

> <u>Section 845.230(d)(2)(M):</u> *History of known exceedances of the groundwater protection standards in Section 845.600, and any corrective action taken to remediate the groundwater;*

A history of known exceedances and any corrective action taken is provided in Attachment M.

2.12. Financial Assurance Requirements

> <u>Section 845.230(d)(2)(N):</u> *A certification that the owner or operator meets the financial assurance requirements of Subpart I;*

A certification meeting the requirement of Section 845.230(d)(2)(N) stating that the Owner meets the financial assurance requirements of *Subpart I* is provided in Attachment N.

2.13. Hazard Potential Classification

> <u>Section 845.230(d)(2)(O):</u> *Hazard potential classification assessment and accompanying certification (see Section 845.440(a)(2));*

The previous Hazard Potential Classification Assessment completed in compliance with 40 CFR §257.73(a) is provided in Attachment O. The addendum to the Hazard Potential Classification Assessment and certification as required by Section 845.440(a) is provided in Attachment U.

2.14. Structural Stability Assessment

> <u>Section 845.230(d)(2)(P):</u> *Structural stability assessment and accompanying certification (see Section 845.450(c));*

The previous Structural Stability Assessment completed in compliance with 40 CFR §257.73(d) is provided in Attachment P. The addendum to the Structural Stability Assessment and certification as required by Section 845.450(c) is provided in Attachment U.

2.15. Safety Factor Assessment

> *Section 845.230(d)(2)(Q):* *Safety factor assessment and accompanying certification (see Section 845.460(b));*

The previous Safety Factor Assessment completed in compliance with 40 CFR §257.73(e) is provided in Attachment Q. The addendum to the Safety Factor Assessment and certification as required by Section 845.460(b) is provided in Attachment U.

2.16. Inflow Design Flood Control System Plan

> *Section 845.230(d)(2)(R):* *Inflow design flood control system plan and accompanying certification (see Section 845.510(c)(3));*

The previous Inflow Design Flood Control System Plan Assessment completed in compliance with 40 CFR §257.82 is provided in Attachment R. The addendum to the Inflow Design Flood Control Plan Assessmentas required by Section 845.510(c)(3) is provided in Attachment U.

2.17. Safety and Health Plan

> *Section 845.230(d)(2)(S):* *Safety and health plan (see Section 845.530); and*

The safety and health plan in accordance with Section 845.530 is included in Attachment S.

2.18. Proposed Closure Priority Categorization

> *Section 845.230(d)(2)(T):* *For CCR surface impoundments required to close under 845.700, the proposed closure priority categorization required by Section 845.700(g).*

A CCR Surface Impoundment Category Designation and Justification letter was submitted to IEPA on May 19, 2021. The Edwards Ash Pond was designated as Category 5 Existing CCR surface impoundment in compliance with groundwater protection standards in Section 845.600. This letter is provided in Attachment T.

3. PERMIT APPLICATION

All permit applications must be made on the forms prescribed by the Agency and must be mailed or delivered to the address designated by the Agency on the forms.   The permit applications (CCR-1 and CCR-2E) are provided below.

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

Bureau of Water ID Number: W1438050005 **CCR Permit Number:** Initial Permit **Facility Name:** Edwards Power Plant	For IEPA Use Only

SECTION 1: FACILITY, OPERATOR, AND OWNER INFORMATION (35 Ill. Adm. Code 845.210(b))

Facility, Operator, and Owner Information

1.1	Facility Name		
	Illinois Power Resources Generating, LLC - Edwards Power Plant		
1.2	Illinois EPA CCR Permit Number (if applicable)		
	Initial Permit		
1.3	Facility Contact Information		
	Name (first and last) Phil Morris	Title Senior Director - Environmental	Phone Number 618-343-7794
	Email address phil.morris@vistracorp.com		
1.4	Facility Mailing Address		
	Street or P.O. box 1500 Eastport Plaza Dr		
	City or town Collinsville	State IL	Zip Code 62234
1.5	Facility Location		
	Street, route number, or other specific identifier 7800 South Cilco Lane		
	County name Peoria	County code (if known)	
	City or town Bartonsville	State IL	Zip Code 61607
1.6	Name of Owner/Operator		
	Illinois Power Resources Generating, LLC		

Facility, Operator, and Owner Info				
	1.7	Owner/Operator Contact Information		
		Name (first and last) Phil Morris	Title Senior Director - Environmental	Phone Number 618-343-7794
		Email address phil.morris@vistracorp.com		
	1.8	Owner/Operator Mailing Address		
		Street or P.O. box 1500 Eastport Plaza Dr		
		City or town Collinsville	State IL	Zip Code 62234

SECTION 2: LEGAL DESCRIPTION (35 Ill. Adm. Code 845.210(c))

Legal Description		
	2.1	Legal Description of the facility boundary
		See Attachment A.

SECTION 3: PUBLICLY ACCESSIBLE INTERNET SITE REQUIREMENTS (35 Ill. Adm. Code 845.810)

Internet Site					
	3.1	Web Address(es) to publicly accessible internet site(s) (CCR website)			
		www.luminant.com/ccr			
	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.		
		W1438050005-01 (see Attachment A)	☑	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
			☐	Attached written description

SECTION 5: CHECKLIST AND CERTIFICATION STATEMENT

Checklist and Certification Statement

5.1 In Column 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
Cynthia Vodopivec	SVP - Environmental
Signature	**Date Signed**
	10/25/2021

Form CCR 2E	Illinois Environmental Protection Agency CCR 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: W1438050005 **CCR Permit Number:** Initial Permit **Facility Name:** Edwards Power Plant	For IEPA Use Only

SECTION 1: CONSTRUCTION HISTORY (35 Ill. Adm. Code 845.220 AND 35 Ill. Adm. Code 845.230)

Construction History

1.1	CCR surface impoundment name.
	Ash Pond
1.2	Identification number of the CCR surface impoundment (if one has been assigned by the Agency).
	W1438050005-01
1.3	Description of the boundaries of the CCR surface impoundment (35 Ill. Adm. Code 845.210(c)).
	See Attachment A.
1.4	State the purpose for which the CCR surface impoundment is being used.
	See Attachment B.
1.5	How long has the CCR surface impoundment been in operation?
	See Attachment B.
1.6	List the types of CCR that have been placed in the CCR surface impoundment.
	See Attachment C.

Construction History (Continued)			
	1.7	List name of the watershed within which the CCR surface impoundment is located.	
		See Attachment B.	
	1.8	Size in acres of the watershed within which the CCR surface impoundment is located.	
		See Attachment B.	
	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 Ill. Adm. Code 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 any record 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 Ill. Adm. Code 845.230(d)(2)(B))

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.

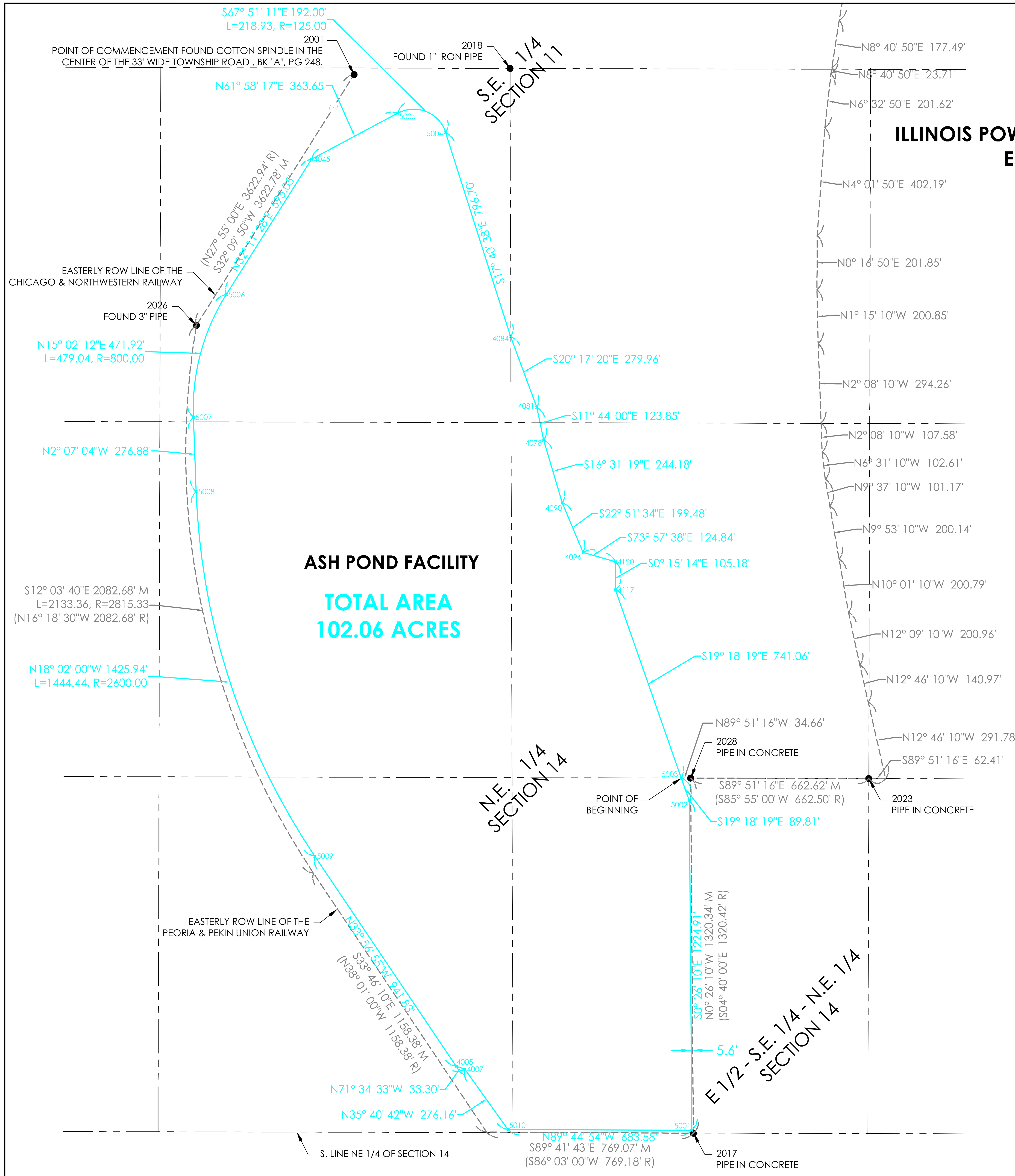
SECTION 3: DEMONSTRATIONS AND CERTIFICATIONS (35 Ill. Adm. Code 845.230(d)(2)(D))						
Demonstrations	3.1	Indicate whether you have attached a demonstration that the CCR surface impoundment, as built, meets, or an explanation of how the CCR surface impoundments fails to meet, the location standards in the following sections:				
		35 Ill. Adm. Code 845.300 (Placement Above the Uppermost Aquifer)	☑	Demonstration	☐	Explanation
		35 Ill. Adm. Code 845.310 (Wetlands)	☑	Demonstration	☐	Explanation
		35 Ill. Adm. Code 845.320 (Fault Areas)	☑	Demonstration	☐	Explanation
		35 Ill. Adm. Code 845.330 (Seismic Impact Zones)	☑	Demonstration	☐	Explanation
		35 Ill. Adm. Code 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 35 Ill. Adm. Code 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 35 Ill. Adm. Code 845.430.
		☑	Initial Emergency Action Plan and accompanying certification required by 35 Ill. Adm. Code 845.520(e).
		☑	Fugitive dust control plan and accompanying certification required by 35 Ill. Adm. Code 845.500(b)(7).
		☐	Preliminary written closure plan as specified in 35 Ill. Adm. Code 845.720(a).
		☑	Initial written post-closure care plan as specified in 35 Ill. Adm. Code 845.780(d), if applicable.
		☐	A certification as specified in 35 Ill. Adm. Code 845.400(h), or a statement that the CCR surface impoundment does not have a liner than meets the requirements of 35 Ill. Adm. Code 845.400(b) or (c).
		☑	History of known exceedances of the groundwater protection standards in 35 Ill. Adm. Code 845.600, and any corrective action taken to remediate the groundwater.
		☑	Safety and health plan, as required by 35 Ill. Adm. Code 845.530.
		☑	For CCR surface impoundments required to close under 35 Ill. Adm. Code 845.700, the proposed closure priority categorization required by 35 Ill. Adm. Code 845.700(g).

SECTION 5: GROUNDWATER MONITORING			
Groundwater	5.1	Check the corresponding boxes to indicate you have attached the following groundwater monitoring information:	
		☑	A hydrogeologic site characterization meeting the requirements of 35 Ill. Adm. Code 845.620.
		☑	Design and construction plans of a groundwater monitoring system meeting the requirements of 35 Ill. Adm. Code 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 35 Ill. Adm. Code 845.640.
		☑	Proposed groundwater monitoring program that includes a minimum of eight independent samples for each background and downgradient well, required by 35 Ill. Adm. Code 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 35 Ill. Adm. Code 845.230(d)(2)(N).
		☑	Hazard potential classification assessment and accompanying certifications required by 35 Ill. Adm. Code 845.440(a)(2).
		☑	Structural stability assessment and accompanying certification, required by 35 Ill. Adm. Code 845.450(c).
		☑	Safety factor assessment and accompanying certification, as required by 35 Ill. Adm. Code 845.460(b).
		☑	Inflow design flood control system plan and accompanying certification, as required by 35 Ill. Adm. Code 845.510(c)(3).

ATTACHMENT A



Luminant

ILLINOIS POWER RESOURCES GENERATING, LLC.
EDWARDS POWER PLANT

N

0' 200' 400'

LEGEND
- SECTION LINE
- PROPERTY BOUNDARY (BY OTHERS)
- CCR FACILITY BOUNDARY
- ● FOUND SURVEY MARKER AS NOTED
- M MEASURED DIMENSION
- R RECORD (DEED) DIMENSION

SURVEY NOTE:
THIS DRAWING AND THE INFORMATION SHOWN HERE ON WAS OBTAINED FROM DATA COLLECTED FROM A FIELD SURVEY MADE BY INGENAE, LLC BETWEEN FEBRUARY 12 THROUGH JULY 30, 2021. SURVEY COORDINATES, BEARINGS & DISTANCES ARE REFERENCED TO ILLINOIS WEST 1202 STATE PLANE COORDINATE SYSTEM NAD 1983.

Land Description of the Edwards Power Plant

Ash Pond Facility

102.06 Acres

Part of the Southeast Quarter of Section 11 and part of the Northeast Quarter of Section 14 in Township 7 North, Range 7 East of the Fourth Principal Meridian, Hollis Township, Peoria County, Illinois being more particularly described as follows:

Commencing at the found Cotton Spindle, in the pavement at the centerline of the 33 feet wide Township Road through the East Half of Section 11 established by an agreement filed for record on November 14, 1891 and recorded in Book "A" on page 248 in the Records of the Town of Hollis, at the intersection of said centerline of the township road with the Easterly Right of Way line of the Chicago and Northwestern Railway; thence South 32 degrees 09 minutes 50 seconds West along the said Right of Way line of the Chicago and Northwestern Railway a distance of 3622.78 to a 3 inch iron pipe on the Easterly Right of Way line of the Peoria and Pekin Union Railway; thence along said Right of Way line being a curve to the left having a radius of 2815.33 feet a curve length of 2133.36 a chord bearing South 12 degrees 03 minutes 40 seconds East a chord distance of 2082.68 feet to the point of tangency; thence South 33 degrees 46 minutes 10 seconds East continuing along said easterly Right of Way line a distance of 1158.38 feet to a point on the South line of the Northeast Quarter of Section 14; thence South 89 degrees 41 minutes 43 seconds East along said South line a distance of 769.07 feet to an iron pipe in concrete at the Southwest corner of the East Half of the Southeast Quarter of the Northeast Quarter of Section 14; thence North 0 degrees 26 minutes 10 seconds West a distance of 1320.34 feet to the iron pipe in concrete at the Northwest corner of the East Half of the Southeast Quarter of the Northeast Quarter of Section 14 from which bears an iron pipe in concrete at the Northeast corner of the East Half of the Southeast Quarter of the Northeast Quarter of Section 14 bearing South 89 degrees 51 minutes 16 seconds East a distance of 662.62 feet; thence from said iron pipe in concrete at the Northwest corner of the East Half of the Southeast Quarter of the northeast Quarter of Section 14 bearing North 89 degrees 51 minutes 16 seconds West a distance of 34.66 feet to the Point of Beginning of the tract described herein; thence South 19 degrees 18 minutes 19 seconds East a distance of 89.81 feet; thence South 0 degrees 26 minutes 10 seconds East a distance of 1224.91 feet; thence North 89 degrees 44 minutes 54 seconds West a distance of 683.58 feet; thence North 35 degrees 40 minutes 42 seconds West a distance of 276.16 feet; thence North 71 degrees 34 minutes 33 seconds West a distance of 33.30 feet; thence North 33 degrees 56 minutes 55 seconds West a distance of 941.83 feet; thence along a curve to the right having a radius of 2600.00 feet a curve length of 1444.44 feet a chord bearing North 18 degrees 02 minutes 00 seconds West a chord distance of 1425.94 feet; thence North 2 degrees 07 minutes 04 seconds West a distance of 276.88 feet; thence along a curve to the right having a radius of 800.00 feet a curve length of 479.04 feet a chord bearing North 15 degrees 02 minutes 12 seconds East a chord distance of 471.92 feet; thence North 32 degrees 11 minutes 28 seconds East a distance of 595.05 feet; thence North 61 degrees 58 minutes 17 seconds East a distance 363.65 feet; thence along a curve to the right having a radius of 125.00 feet a curve length of 218.93 feet a chord bearing South 67 degrees 51 minutes 11 seconds East a chord distance of 192.00 feet; thence South 17 degrees 40 minutes 38 seconds East a distance of 796.70 feet; thence South 20 degrees 17 minutes 20 seconds East a distance of 279.96 feet; thence South 11 degrees 44 minutes 00 seconds East a distance of 123.85 feet; thence South 16 degrees 31 minutes 19 seconds East a distance of 244.18 feet; thence South 22 degrees 51 minutes 34 seconds East a distance of 199.48 feet; thence South 73 degrees 57 minutes 38 seconds East a distance of 124.84 feet; thence South 0 degrees 15 minutes 14 seconds East a distance of 105.18 feet; thence South 19 degrees 18 minutes 19 seconds East a distance of 741.06 feet to the Point of Beginning and containing 102.06 Acres.

CONTROL MONUMENTATION				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
2001	1434266.26	2436353.57	448.07	COTTON SPINDLE IN ROAD
2017	1428195.82	2436273.01	437.88	PIPE IN CONCRETE
2018	1432154.95	2435591.37	439.92	FOUND 1 IN PIPE
2023	1429514.44	2436925.58	440.94	PIPE IN CONCRETE
2026	1431199.56	2434424.87	435.77	FOUND 3 IN PIPE
2028	1429516.12	2436262.96	438.18	PIPE IN CONCRETE

CCR FACILITY BOUNDARY CORNERS		
POINT NO.	NORTHING	EASTING
4005	1428444.42	2435391.09
4007	1428433.90	2435422.68
4045	1431817.61	2434852.90
4078	1430773.19	2435715.92
4081	1430894.45	2435690.74
4084	1431157.04	2435593.66
4090	1430539.09	2435785.36
4096	1430355.27	2435862.86
4117	1430215.60	2435983.30
4120	1430320.78	2435982.84
5001	1428203.71	2436262.44
5002	1429431.45	2436257.99
5003	1429516.21	2436228.30
5004	1431916.11	2435351.74
5005	1431988.50	2435173.90
5006	1431314.04	2434535.89
5007	1430858.28	2434413.46
5008	1430581.59	2434423.69
5009	1429225.70	2434865.12
5010	1428209.57	2435583.74

SURVEYOR CERTIFICATE:
THIS IS TO CERTIFY THAT WE, INGENAE, LLC, HAVE AT THE REQUEST OF AND FOR THE EXCLUSIVE USE OF THE OWNERS, PERFORMED A SURVEY OF THE TRACT AS SHOWN HEREON AND THAT THIS IS A TRUE REPRESENTATION OF THAT SURVEY. THIS PLAT AND THE SURVEY FROM WHICH IT IS BASED WERE DONE IN ACCORDANCE WITH THE "MINIMUM STANDARDS OF PRACTICE" FOR LAND SURVEYING IN THE STATE OF ILLINOIS.

INGENAE, LLC
PROFESSIONAL DESIGN FIRM
LICENSE NO. 184.007588-0010

Sept. 20, 2021

MICHAEL J. GRAMINSKI
I.P.L.S. NO. 035.002901
EXPIRES: 11/30/2022

DATE

IngenAE
502 Earth City Plaza, Suite 120
Earth City, MO 63045
www.ingenae.com

Submissions / Revisions:	Date:
1	
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Luminant

Project Name & Location:

EDWARDS
POWER PLANT

7800 S. CILCO LN.
BARTONVILLE, IL 61607

Drawing Name:
CCR FACILITY BOUNDARY EXHIBIT

Date: 9/21/2021	Project No.
Type: SITE	Drawing No. 1
Drawn By: CB	
Approved By: MG	
Scale: AS NOTED	

Luminant

ILLINOIS POWER RESOURCES GENERATING, LLC.
EDWARDS POWER PLANT

N

0' 200' 400'

LEGEND
- SECTION LINE
- PROPERTY BOUNDARY (BY OTHERS)
- CCR FACILITY BOUNDARY
- ● FOUND SURVEY MARKER AS NOTED
- M MEASURED DIMENSION
- R RECORD (DEED) DIMENSION

SURVEY NOTE:
THIS DRAWING AND THE INFORMATION SHOWN HERE ON WAS OBTAINED FROM DATA COLLECTED FROM A FIELD SURVEY MADE BY INGENAE, LLC BETWEEN FEBRUARY 12 THROUGH JULY 20, 2021. SURVEY COORDINATES, BEARINGS & DISTANCES ARE REFERENCED TO ILLINOIS WEST 1202 STATE PLANE COORDINATE SYSTEM NAD 1983.

IngenAE
502 Earth City Plaza, Suite 120
Earth City, MO 63045
www.ingenae.com

Submissions / Revisions:	Date:
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Luminant

Project Name & Location:

EDWARDS
POWER PLANT

7800 S. CILCO LN.
BARTONVILLE, IL 61607

Drawing Name:

CCR FACILITY BOUNDARY EXHIBIT

Date: 9/21/2021	Project No.
Type: SITE	Drawing No. 2
Drawn By: CB	
Approved By: BH	
Scale: AS NOTED	

ATTACHMENT B

AECOM

October 2016

Illinois Power Resources Generating, LLC
7800 South Cilco Lane
Bartonville, IL 61607

RE: History of Construction
USEPA Final CCR Rule, 40 CFR § 257.73(c)
Edwards Power Station
Bartonville, Illinois

On behalf of Illinois Power Resources Generating, LLC, AECOM has prepared the following history of construction for the Ash Pond at the Edwards Power Station in accordance with 40 CFR § 257.73(c).

BACKGROUND

40 CFR § 257.73(c)(1) requires the owner or operator of an existing coal combustion residual (CCR) surface impoundment that either (1) has a height of five feet or more and a storage volume of 20 acre-feet or more, or (2) has a height of 20 feet or more to compile a history of construction by October 17, 2016 that contains, to the extent feasible, the information specified in 40 CFR § 257.73(c)(1)(i)–(xii).

The history of construction presented herein was compiled based on existing documentation, to the extent that it is reasonably and readily available (see 80 Fed. Reg. 21302, 21380 [April 17, 2015]), and AECOM's site experience. AECOM's document review included record drawings, geotechnical investigations, operation and maintenance information, etc. for Ash Pond at the Edwards Power Station.

AECOM

HISTORY OF CONSTRUCTION

§ 257.73(c)(1)(i): The name and address of the person(s) owning or operating the CCR unit; the name associated with the CCR unit; and the identification number of the CCR unit if one has been assigned by the state.

Owner: Illinois Power Resources Generating, LLC

Address: 1500 Eastport Plaza Drive
Collinsville, IL 62234

CCR Units: Ash Pond

The Ash Pond does not have a state assigned identification number.

§ 257.73(c)(1)(ii): The location of the CCR unit identified on the most recent USGS $7^1/_2$ or 15 minute topographic quadrangle map or a topographic map of equivalent scale if a USGS map is not available.

The location of the Ash Pond has been identified on an USGS 7-1/2 minute topographic quadrangle map in **Appendix A**.

§ 257.73(c)(1)(iii): A statement of the purpose for which the CCR unit is being used.

The Ash Pond is being used to store and dispose of sluiced bottom ash and fly ash and to clarify water, including non-CCR station process wastewaters, prior to discharge in accordance with the station's NPDES permit.

§ 257.73(c)(1)(iv): The name and size in acres of the watershed where the CCR unit is located.

The Ash Pond and the Edwards Power Station are located in the Illinois River Watershed with a 12-digit Hydrologic Unit Code (HUC) of 071300030304 and a drainage area of 8,3821 acres (USGS, 2016).

§ 257.73(c)(1)(v): A description of the physical and engineering properties of the foundation and abutment materials on which the CCR unit is constructed.

The foundation materials consist of native alluvial clay underlain by bedrock. The physical properties of the native alluvial clay are described as lean clay with zones of fat clay. The consistency of the clay varies from soft to stiff. The bedrock is classified as weathered to slightly weathered shale. An available summary of the engineering properties of the foundation and abutment materials is presented in **Table 1** below. The engineering properties are based on previous geotechnical explorations and laboratory testing.

Table 1. Summary of Foundation and Abutment Material Engineering Properties

Material	Unit Weight (pcf)	Effective (drained) Shear Strength Parameters		Total (undrained) Shear Strength Parameters	
		c' (psf)	Φ' (°)	c (psf)	Φ (°)
Native Clay Crust	120	200	27.5	1250	0
Native Clay 1	117	100	26	650	0
Native Clay 2	105	200	26	700	0
Native Clay 3	105	200	26	900	0
Bedrock - Shale	140	1000	36	1000	36

The Ash Pond is an enclosed impoundment with embankments and does not have abutments.

§ 257.73(c)(1)(vi): A statement of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR unit; the method of site preparation and construction of each zone of the CCR unit; and the approximate dates of construction of each successive stage of construction of the CCR unit.

The Ash Pond original embankments were constructed with soils excavated from within the limits of the proposed pond. Physical properties for the original embankment construction are described as lean clay with trace sand and shells. The consistency of the original embankment material varies from soft to stiff, with a general consistency of stiff. The original embankment was later modified for construction of a new rail loop. The modifications were constructed by adding new material to widen the downstream side of the embankment and occasionally raising the crest elevation of the embankment by as much as 12 feet. Physical characteristics for the new embankment material are described as fly ash, classified as silt to poorly-graded silty sand with gravel. The consistency of the new embankment material varies from soft to very stiff, with a general consistency of stiff to very stiff. Construction of the new rail loop also cut off the southern portion of the pond by the construction of a new dike across the interior of the pond. The new dike material consists of medium dense, fine to coarse, crushed stone gravel with sand, classified as poorly graded gravel. The cut off area to the south was filled in with ash and capped by topsoil. An available summary of the engineering properties of the construction materials is presented in **Table 2** below. The engineering properties are based on previous geotechnical explorations and laboratory testing.

Table 2. Summary of Construction Material Engineering Properties

Material	Unit Weight (pcf)	Effective (drained) Shear Strength Parameters		Total (undrained) Shear Strength Parameters	
		c' (psf)	Φ' (°)	c (psf)	Φ (°)
Old Embankment 1	125	200	28	2500	0
Old Embankment 2	125	100	29	1250	0
New Embankment	115	200	30	2500	0
New Embankment (Crushed Stone - Sandy Gravel)	120	0	32	0	32

The method of site preparation of the Ash Pond is not reasonably and readily available.

The approximate dates of construction of each successive stage of construction of the Ash Pond are provided in **Table 3** below.

Table 3. Approximate dates of construction of each successive stage of construction.

Date	Event
1960	Construction of the original embankments
2004	Construction of the rail loop that modified the original embankments and cut-off the southern portion of the Ash Pond

§ 257.73(c)(1)(vii): At a scale that details engineering structures and appurtenances relevant to the design, construction, operation, and maintenance of the CCR unit, detailed dimensional drawings of the CCR unit, including a plan view and cross sections of the length and width of the CCR unit, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or mis-operation.

Drawings that contain items pertaining to the requested information for the Ash Pond are listed in **Table 4** below. Items marked as "Not Available" are items not found during a review of the reasonably and readily available record documentation.

Table 4. List of drawings containing items pertaining to the information requested in § 257.73(c)(1)(vii).

	Ash Pond
Dimensional plan view (all zones)	C175-G1906-3 to 4 03057-PL, 03057-1
Dimensional cross sections	C175-G1906-4, 03057-1X
Foundation Improvements	Not Applicable
Drainage Provisions	Not Applicable
Spillways and Outlets	C175-G1921-1 to 3
Diversion Ditches	Not Found
Instrument Locations	Plate 2, Figure 2A
Slope Protection	Not Available
Normal Operating Pool Elevation	Not Available
Maximum Pool Elevation	Not Available
Approximate Maximum Depth of CCR in 2016	71 feet

All drawings referenced in **Table 4** above can be found in **Appendix B and Appendix C**.

A 6-inch diameter sanitary sewer force main was also identified and is buried at a shallow depth within the Ash Pond. Drawings of the sanitary sewer force main are presented in **Appendix B**.

Based on the review of the drawings listed above, no natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or mis-operation were identified.

§ 257.73(c)(1)(viii): A description of the type, purpose, and location of existing instrumentation.

Existing instrumentation at the Ash Pond consist of open-standpipe piezometers. The purpose of the piezometers is to measure the pore water pressures within the embankment. One (1) open-standpipe piezometer (B-2) was installed in 2010 and the location is presented on Plate 2 in **Appendix C**. Four (4) open-standpipe piezometers (EDW-P001 to P004) were installed in 2015 and the locations are presented on Figure 2A in **Appendix C**.

§ 257.73(c)(1)(ix): Area-capacity curves for the CCR unit.

Area-capacity curves for the Ash Pond are not reasonably and readily available.

§ 257.73(c)(1)(x): A description of each spillway and diversion design features and capacities and calculations used in their determination.

The spillway system for the Ash Pond includes a morning glory spillway structure that consists of vertically stacked 36-inch diameter (dia.) pipe sections seated on a concrete drop inlet structure and pad. The spillway structure discharges clarified plant process water and CCR contact stormwater through a 36-inch dia. corrugated metal pipe (CMP) and into the Illinois River in accordance with the station's NPDES permit. In 2016, the Ash Pond's discharge capability was evaluated using HydroCAD 10 software modeling a 1,000-year, 24-hour rainfall event. The results of the HydroCAD analysis are presented below in **Table 5**.

There are three separate sub-basins within the Ash Pond: the Process Water Pond, the Fly Ash Pond, and the Clarification Pond. The first sub-basin is the Process Water Pond and is located at the northwestern end of the Ash Pond. The second sub-basin is the Fly Ash Pond. The third sub-basin is the Clarification Pond, which is located furthest downstream at the southern end of the Ash Pond. During normal plant operations, bottom ash is sluiced into the Ash Pond. The settling channels located within the Fly Ash Pond discharge into the Clarification Pond through internal culvert pipes. However, during the design storm, rainfall discharge through these channels exceed the capacity of the culvert pipes, and will likely overtop or wash out the small interior splitter dikes and discharge directly into the Clarification Pond. Therefore, the storage potential of the Fly Ash Pond was considered insignificant and rainfall that would normally be collected within the Fly Ash Pond was modeled to discharge directly into the Clarification Pond.

Table 5. Results of HydroCAD 10 analyses

	Ash Pond - Process Water Pond	Ash Pond - Clarification Pond
Approximate Minimum Berm Elevation[1] (ft)	458.8	459.6
Approximate Emergency Spillway Elevation1 (ft)	N/A	N/A
Starting Pool Elevation[1] (ft)	449.5	447.2
Peak Elevation[1] (ft)	457.8	457.4
Time to Peak (hr)	14.4	48.0
Surface Area (ac)	11.4	28.9
Storage [2] (ac-ft)	52.6	265.0

Note: 1. Elevations are based on NAVD88 datum.
2. Storage given is from Starting Pool Elevation to Peak Elevation.

§ 257.73(c)(1)(xi): The construction specifications and provisions for surveillance, maintenance, and repair of the CCR unit.

The construction specifications for the Ash Pond are not reasonably and readily available.

The provisions for surveillance, maintenance, and repair of the Ash Pond are located in *Edwards Power Station; Operation and Maintenance Manual for Ash Ponds and Levees* (presented in **Appendix D**). The operations and maintenance plan for the Ash Pond is currently being revised by Illinois Power Resources Generating, LLC.

§ 257.73(c)(1)(xii): Any record or knowledge of structural instability of the CCR unit.

In early 2009, a minor surficial movement was observed along the northern end of the downstream slope of the west embankment. After the slide was repaired, a second surficial movement occurred in the same area in late 2009. In early 2010, the second movement was repaired with covered stone and the water level in the Process Water Pond area was lowered by approximately 3.5 feet. Annual inspections since 2011 have not identified an issue in the repaired areas. Photos of the 2009 surficial movement area are presented in **Appendix E**.

There is no record or knowledge of any other structural instability of the Ash Pond at Edwards Power Station.

AECOM

LIMITATIONS

The signature of AECOM's authorized representative on this document represents that to the best of AECOM's knowledge, information and belief in the exercise of its professional judgment, it is AECOM's professional opinion that the aforementioned information is accurate as of the date of such signature. Any recommendation, opinion or decisions by AECOM are made on the basis of AECOM's experience, qualifications and professional judgment and are not to be construed as warranties or guaranties. In addition, opinions relating to environmental, geologic, and geotechnical conditions or other estimates are based on available data and that actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

Sincerely,

Claudia Prado

Claudia Prado	Victor Modeer, P.E., D.GE
Project Manager	Senior Project Manager

REFERENCES

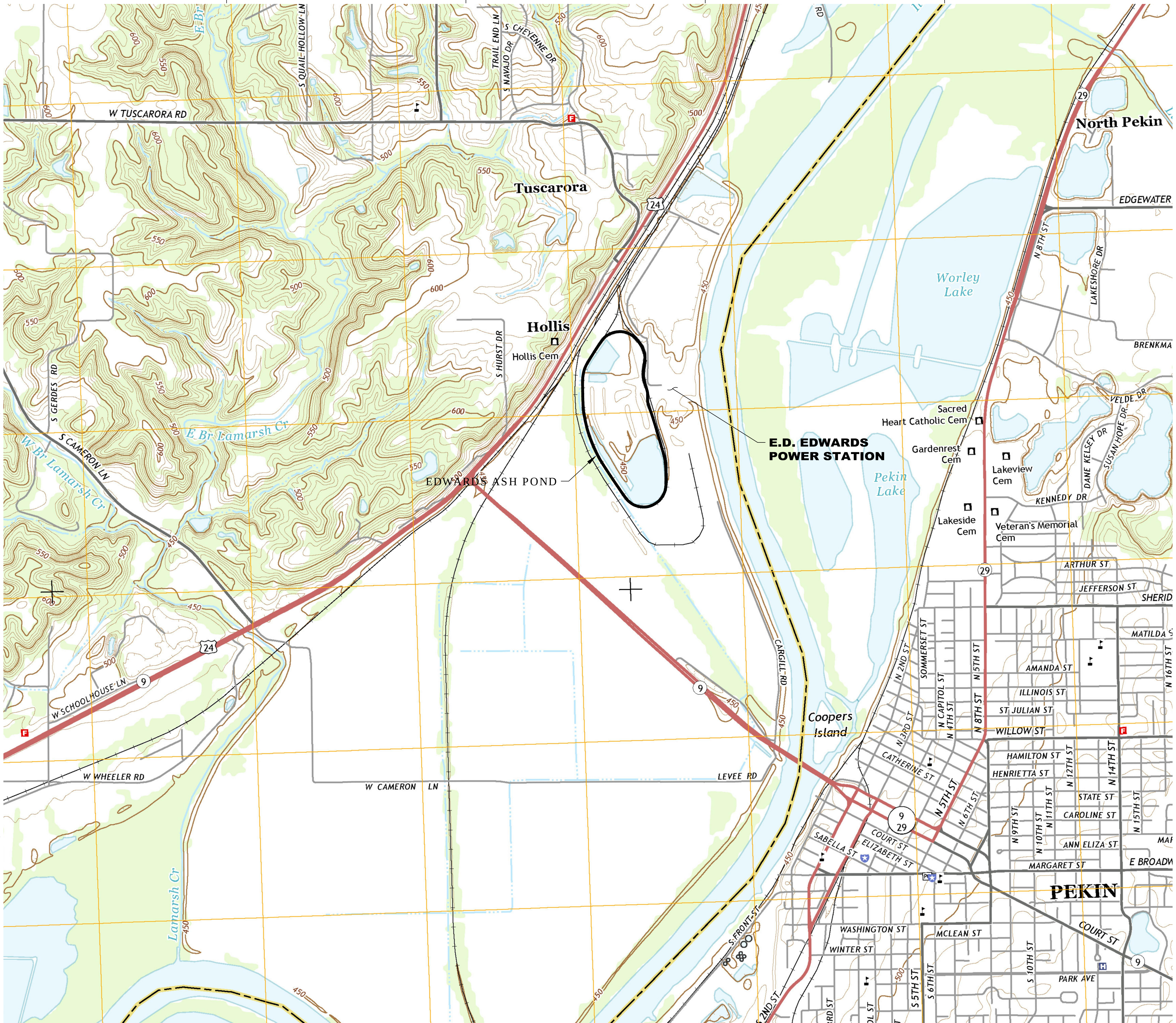
United States Environmental Protection Agency (USEPA). (2015). *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule.* 40 CFR Parts 257 and 261, 80 Fed. Reg. 21302, 21380 April 17, 2015.

United States Geological Survey (USGS). (2016). The National Map Viewer. http://viewer.nationalmap.gov/viewer/. USGS data first accessed in March of 2016.

APPENDICES

Appendix A: History of Construction Vicinity Map
Appendix B: Edwards Power Station Drawings
Appendix C: Edwards Power Station Piezometer Locations
Appendix D: Operation and Maintenance Manual for Ash Ponds and Levees
Appendix E: Photos of 2009 Surficial Movement

Appendix A: History of Construction Vicinity Map



LEGEND

CCR UNITS

SOURCE:
MAP PROVIDED FROM ELECTRONIC USGS DIGITAL RASTER GRAPHIC 7.5 MINUTE TOPOGRAPHIC MAP OF PEKIN ILLINOIS, REVISED 2015.

ILLINOIS

QUADRANGLE LOCATION

N

0 1000 2000 3000

SCALE IN FEET

AECOM
1001 Highland Plaza Drive, Suite 300
St. Louis, Mo. 63110
314 429-0100 (phone)
314-429-0462 (fax)

ILLINOIS POWER RESOURCES, GENERATING, L.L.C.
7800 South Cilco Ln.,
Bartonville, Illinois

HISTORY OF CONSTRUCTION

EDWARDS POWER STATION
BARTONVILLE, ILLINOIS

ISSUED FOR BIDDING — DATE — BY

ISSUED FOR CONSTRUCTION — DATE — BY

REVISIONS

NO.	DESCRIPTION	DATE
△		
△		
△		
△		
△		

AECOM PROJECT NO:	60489731
DRAWN BY:	DJD
DESIGNED BY:	DJD
CHECKED BY:	MN
DATE CREATED:	2016-04-13
PLOT DATE:	
SCALE:	1" = 1000'
ACAD VER:	2014

SHEET TITLE

HISTORY OF CONSTRUCTION VICINITY MAP

01

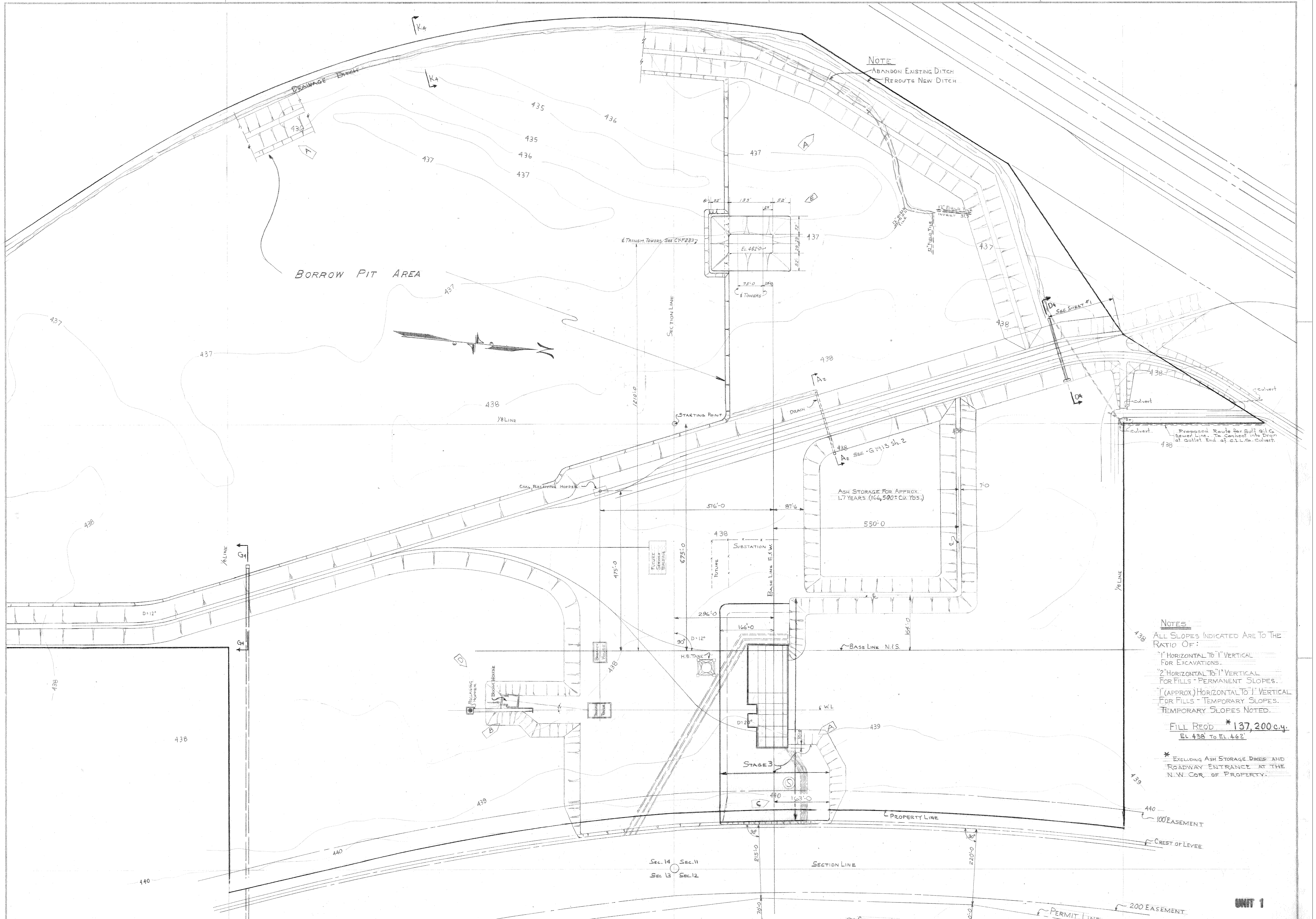
DRAWING PATH: P:\Projects\Geotech\60428794_DynegyCCR\13_Construction History\04 Technical Production\7_Edwards\Reference Documents\Vicinity Location Map References\Figures\C-01 History of Construction Vicinity Map (Edwards) _MJN.dwg NANAK, MATT, 8/12/2016 2:43 PM

Appendix B: Edwards Power Station Drawings

1. “Plant Site Fill, Stage 3 – Final Arrgt.”, Drawing No. C175-G1906-3, Revision F, 1 July, 1960, Commonwealth Associates Inc.
2. “Plant Site Fill, Stage 1 Continuation – Final Arrgt.”, Drawing No. C175-G1906-4, Revision C, 4 March, 1958, Commonwealth Associates Inc.
3. “Construction Thru Levee, Ash Pond Drainage Duct”, Drawing No. C175-G1921-1, Revision C, 26 March, 1975, Commonwealth Associates Inc.
4. “Construction Thru Levee, Ash Pond Drainage Duct Details”, Drawing No. C175-G1921-2, Revision D, 15 February, 1960, Commonwealth Associates Inc.
5. “Construction Thru Levee, Ash Pond Drainage Duct, Cofferdam & Other Details.”, Drawing No. C175-G1921-3, Revision B, 15 June, 1959, Commonwealth Associates Inc.
6. “Proposed 150 Car Loop Track, General Plan”, Drawing No. 03057-PL, Revision 1, 20 November, 2003, Design Nine, Inc.
7. “Proposed 150 Car Loop Track, Plan/Profile - Loop/Wye Track Loop Sta. 0+00 to Sta. 29+00”, Drawing No. 03057-1 (Sheet 6), Revision 2, 3 December, 2003, Design Nine, Inc.
8. “Proposed 150 Car Loop Track, Plan/Profile - Loop Track Sta. 29+00 to Sta. 60+00”, Drawing No. 03057-1 (Sheet 7), Revision 1, 20 November, 2003, Design Nine, Inc.
9. “Proposed 150 Car Loop Track, Plan/Profile - Loop Track Sta. 60+00 to Sta. 91+00”, Drawing No. 03057-1 (Sheet 8), Revision 2, 3 December, 2003, Design Nine, Inc.
10. “Proposed 150 Car Loop Track, Plan/Profile - Loop Track Sta. 91+00 to Sta. 101+22.23”, Drawing No. 03057-1 (Sheet 9), Revision 2, 3 December, 2003, Design Nine, Inc.
11. “Proposed 150 Car Loop Track, Detail of Merchants Track Area”, Drawing No. 03057-1 (Sheet 10), Revision 2, 3 December, 2003, Design Nine, Inc.
12. “Proposed 150 Car Loop Track, Cross Sections - Loop Track Sta. 0+00 to Sta. 7+20.79”, Drawing No. 03057-1X (Sheet 11), Revision 2, 3 December, 2003, Design Nine, Inc.
13. “Proposed 150 Car Loop Track, Cross Sections - Loop Track Sta. 8+00 to Sta. 13+00”, Drawing No. 03057-1X (Sheet 12), Revision 1, 20 November, 2003, Design Nine, Inc.
14. “Proposed 150 Car Loop Track, Cross Sections - Loop Track Sta. 14+00 to Sta. 20+00”, Drawing No. 03057-1X (Sheet 13), Revision 2, 3 December, 2003, Design Nine, Inc.
15. “Proposed 150 Car Loop Track, Cross Sections - Loop Track Sta. 21+03.74 to Sta. 27+00”, Drawing No. 03057-1X (Sheet 14), Revision 2, 3 December, 2003, Design Nine, Inc.
16. “Proposed 150 Car Loop Track, Cross Sections - Loop Track Sta. 27+52 to Sta. 34+00”, Drawing No. 03057-1X (Sheet 15), Revision 2, 3 December, 2003, Design Nine, Inc.
17. “Proposed 150 Car Loop Track, Cross Sections - Loop Track Sta. 35+00 to Sta. 42+00”, Drawing No. 03057-1X (Sheet 16), Revision 1, 20 November, 2003, Design Nine, Inc.
18. “Proposed 150 Car Loop Track, Cross Sections - Loop Track Sta. 42+95.47 to Sta. 50+00”, Drawing No. 03057-1X (Sheet 17), Revision 1, 20 November, 2003, Design Nine, Inc.
19. “Proposed 150 Car Loop Track, Cross Sections - Loop Track Sta. 50+42.36 to Sta. 57+00”, Drawing No. 03057-1X (Sheet 18), Revision 2, 3 December, 2003, Design Nine, Inc.
20. “Proposed 150 Car Loop Track, Cross Sections - Loop Track Sta. 58+00 to Sta. 64+49.7”, Drawing No. 03057-1X (Sheet 19), Revision 2, 3 December, 2003, Design Nine, Inc.

Appendix B: Edwards Power Station Drawings (continued)

21. “Proposed 150 Car Loop Track, Cross Sections - Loop Track Sta. 65+00 to Sta. 70+00”, Drawing No. 03057-1X (Sheet 20), Revision 2, 3 December, 2003, Design Nine, Inc.
22. “Proposed 150 Car Loop Track, Cross Sections - Loop Track Sta. 80+79.67 to Sta. 87+37.4”, Drawing No. 03057-1X (Sheet 21), Revision 1, 20 November, 2003, Design Nine, Inc.
23. “Proposed 150 Car Loop Track, Cross Sections - Loop Track Sta. 87+77.4 to Sta. 94+00”, Drawing No. 03057-1X (Sheet 22), Revision 2, 3 December, 2003, Design Nine, Inc.
24. “Proposed 150 Car Loop Track, Cross Sections - Loop Track Sta. 94+65.41 to Sta. 99+00”, Drawing No. 03057-1X (Sheet 23), Revision 2, 3 December, 2003, Design Nine, Inc.
25. “Proposed 150 Car Loop Track, Cross Sections - Wye Track Sta. 94+00 to Sta. 99+00”, Drawing No. 03057-1X (Sheet 24), Revision 2, 3 December, 2003, Design Nine, Inc.
26. “Proposed 150 Car Loop Track, Cross Sections - Runaround Track Sta. 1+23.8 to Sta. 6+86.72”, Drawing No. 03057-1X (Sheet 25), Revision 2, 3 December, 2003, Design Nine, Inc.



REV.	DATE	DESCRIPTION	BY	APPROVED
F	7/1/60	Roadway Entrance Grades at N. West Cor. of Property added.	H.S.F.	H.S.F.
E	8/5/59	ADDED FILL AT TRANSMISSION TOWER	W.E.R.	H.S.F.

REV.	DATE	DESCRIPTION	BY	APPROVED
D	1/9/59	FILL REVISED @ N.E. CORNER; 165'-0 & 10'-0 DIM. ADDED; - ASH STORAGE LEVEE RELOCATED; - FILL AROUND BOOM HOUSE REVISED.	R.G.D.	H.S.F.
C	7/24/58	RELOCATED FILL @ N.E. CORNER - ADDED 130'-0 MIN. DIMENSION	R.G.D.	H.S.F.
B	7/23/58	ADDED ADDITIONAL ASH STORAGE & ASH STORAGE DRAIN - REMOVED ROADWAY BY LEVEE - REVISED COAL HANDLING AREA.	R.G.D.	H.S.F.
A	3/4/58	ADDED ASH RETAINING DIKE - RELOCATED FILL @ N.E. CORNER	R.G.D.	H.S.F.

DESIGN AND DRAFTING R.G.D. DATE 8-27-57
H.S.F. DATE 10-2-57
H.S. Fenwick REG. P.E. DATE 10-2-57
APPROVED H.B. Schiuling DATE 5-6-58

(SEAL)

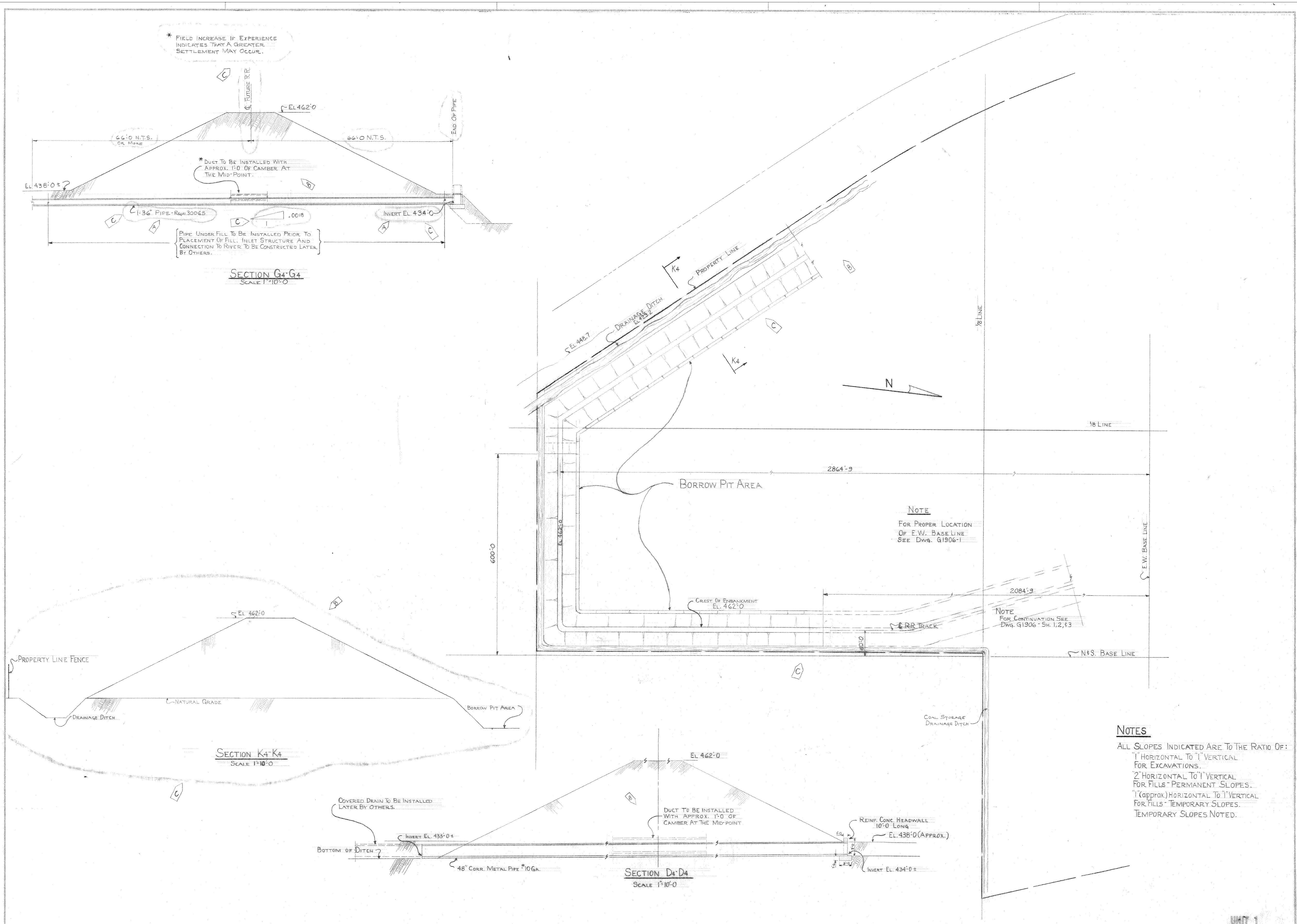
PREPARED UNDER RESPONSIBLE SUPERVISION OF
H. S. FENWICK
MICHIGAN PROFESSIONAL REGISTRATION NO. 3954
ILLINOIS STRUCTURAL REGISTRATION NO. 81-2416
AT OFFICES OF
COMMONWEALTH ASSOCIATES INC.
209 E. WASHINGTON AVE., JACKSON, MICH.

OWNER AND LOCATION
E.D. EDWARDS STATION
CENTRAL ILLINOIS LIGHT CO.
PEORIA, ILLINOIS

TITLE
PLANT SITE FILL
STAGE 3 — FINAL ARRG'T.

SCALE: 1"=100'-0
2-20-118-1
DRAWING NO. C175-G1906
REV. F
SHEET 3

O.K. TO FILE



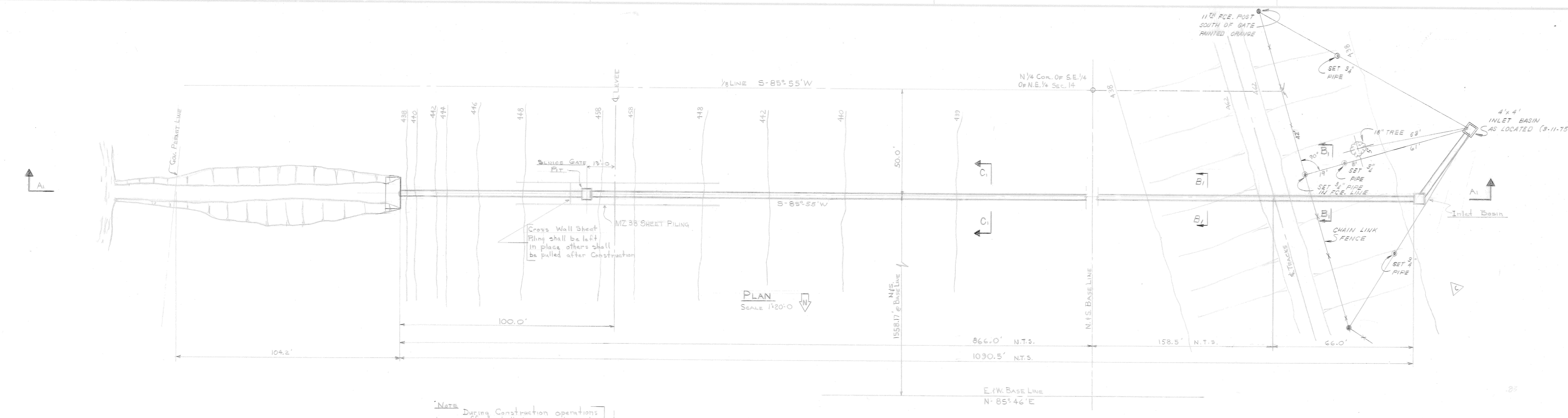
Rev.	Date	Description	By	Approved
C	3/4/58	Revised Section K4-K4 & G4-G4, Revised Ash Dike on Plan. Added Coal Storage Drainage Ditch	R.G. Dunn	H.S.F.
B	10-31-57	Revised Section K4-K4 - Added Camber Notes - Revised Plan @ K4-K4	R.G. Dunn	H.S.F.
A	10-2-57	Added Invert El. @ Sec. G4-G4 - Changed Pipe Mat.	R.G. Dunn	H.S.F.

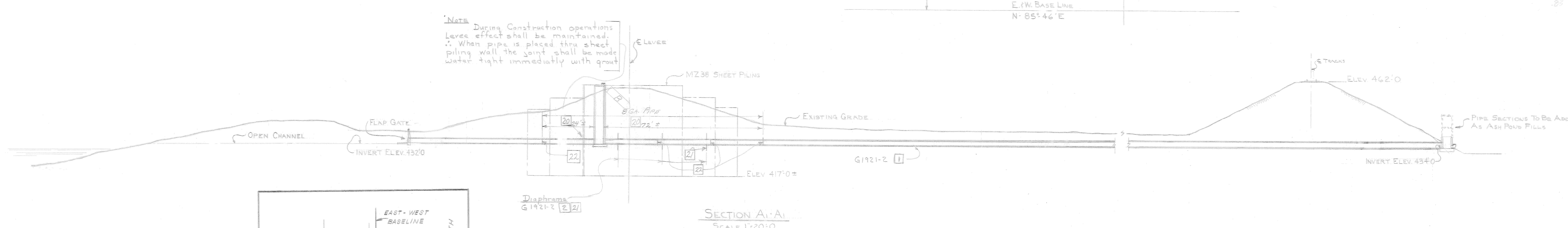
Design and Drafting: R.G. Dunn, Date 9-25-57
H.S.F., Date 10-2-57
H.S. Fenwick, Reg. P.E., Date 10-2-57
Approved: H.B. Schuiling, Date 5-6-58

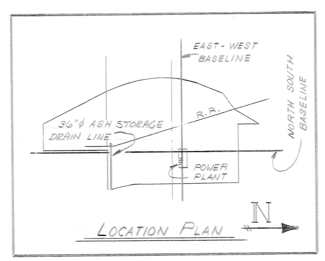
Prepared under responsible supervision of H. S. FENWICK
Michigan Professional Registration No. 3934
Illinois Structural Registration No. 81-2416
At offices of COMMONWEALTH ASSOCIATES INC., 209 E. Washington Ave., Jackson, Mich.

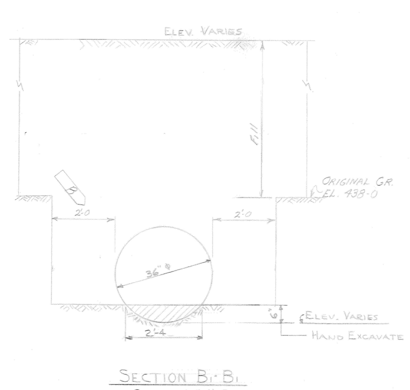
Owner and Location: E.D. EDWARDS STATION, CENTRAL ILLINOIS LIGHT CO., PEORIA, ILLINOIS

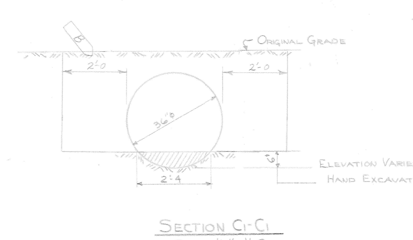
Title: PLANT SITE FILL — STAGE #1 CONTINUATION
Scale: 1"=100'-0
2-20-118-1
Drawing No. C175-G1906 — Rev. C — Sheet 4











Pipe Materials & Handling

1. Drain Pipe Shall Be 36" Ø, 14 Ga. & 8 Ga., Corrugated Pipe Culvert Conforming To Federal Specifications QQ-C-806 For "Culverts"; Iron Or Steel, Zinc Coated, Type I, Of Pure Iron, Copper Bearing Pure Iron, Copper Iron, Or Copper Molybdenum Iron; And The Pipe Shall Be Coated As Follows:

   The Pipe Shall Be Coated On The Inside & Outside With Asbestos Fibers & A Bituminous Material Similar And Equal To That Used On "Free Flow" Drainage Pipe Manufactured By Republic Steel Co., Youngstown, Ohio Or To That Used On Armco "Smooth Flo" Asbestos Bonded Drainage Pipe Manufactured By American Rolling Mill Co. Middletown, Ohio.

2. The Pipe Shall Be Laid, On Original Earth Hand Excavated The Last 6" Of Depth To Fit The Periphery Of The Pipe, To The Established Gradient And Alignment, With Horizontal Seams Of Joining Sections At Quarter Points. Pipe Shall Be Full-Circled, Free From Dents And Other Defects, And Shall Be Cleaned And Lowered Into The Trench In Such Manner As To Avoid Unnecessary Handling And Injury To The Pipe. Connections Between Sections Of Pipe Shall Be Carefully Adjusted And Connecting Bands Shall Lap Equal Distances On The Sections Connected. Immediately Prior To Connecting, The Lapped Portions Of Pipe And The Connecting Band Shall Be Given A 1/16-Inch Coating Of Approved Bituminous Material Similar To That Used For Coating The Pipe. The Band Shall Be Drawn Up Tight To Insure A Water-Tight Joint Under An Internal Pressure Head Of 24.5 Ft. (10.65#/□")

3. After Connections Have Been Completed And Backfill Tamped Into Place, All Joints Shall Be Caulked On The Inside With Approved Bituminous Material Similar To That Used For Coating The Pipe, So Melted And Applied As To Fill The Gap Between Sections Of Pipe Completely And Seal The Joint Effectively. At Any Place Where The Bituminous Coating Has Become Broken Sufficiently To Expose The Metal, Prior To Acceptance, Such Defect Shall Be Remedied By The Application Of A New Coating.

4. Each Pipe Culvert Shall Be Provided With Three Metal Diaphragms, Located Symmetrically About ℄ Centerline Of Pipe And Spaced 20 Feet On Centers, Tightly And Securely Joined To The Pipe In Such Manner As To Prevent Any Seepage Between Pipe And Diaphragm. Diaphragms Shall Be 8 Feet By 8 Feet In Size And Made From 12-Gauge Sheets Conforming To Federal Specification QQ-I-716 For "Iron And Steel; Sheet, Black And Zinc-Coated (Galvanized)," Type III With Class C Zinc Coating; And Base Metal Shall Be Pure Iron, Copper Bearing Iron, Copper Iron, Or Copper Molybdenum Iron, And Made By The Open-Hearth Process. All Diaphragm Fittings Shall Be Zinc-Coated. Diaphragms Shall Be Coated With An Approved Bituminous Material, Not Less Than 0.03 Inch In Thickness, Similar To That Used For Coating The Culvert Pipe, And After Placing, All Seams And Joints Shall Be Thoroughly Caulked With Such Material.

5. A 36-Inch Circular Cast-Iron Automatic Drainage Gate Similar And Equal To Calco Model No. 50c Of The Armco Culvert Manufacturers' Association, Or Tyton Sluice Gate Of The Toncan Culvert Manufacturers' Association, Shall Be Properly Connected To The Outside-District End Of Each Culvert Pipe. The Section Of Pipe To Which The Gate Is Connected Shall Be Not Less Than 20 Feet In Length. After Placing, All Seams And Joints Shall Be Thoroughly Caulked With Approved Bituminous Material Similar To That Used For Coating The Pipe.

6. A 36" Ø Cast Iron Slide Gate Similar & Equal To Armco Drainage & Metal Co. Model 30-05c

Excavation & Backfill

1. Excavation Of The Last 6" Of Material Shall Be Hand Excavated To Fit The Periphery Of The Pipe.

2. Backfill Thru Levee Shall Be Impervious Fill Material Compacted To A Minimum Of 90% Standard Proctor At 4% Above & 2% Below Optimum Moisture Control.

UNIT 1

Rev.	Date	Description	By	Approved
C	3-26-75	Added Extension To Existing Ash Pond Drainage System Per R. Schuler Sketch.	D. Alexander	
B	6/12/59	Add 8 Ga. Pipe, Add 1 Seepage Collar, Increase Trench Width. Revise Backfill Specifications	L. G. Miller	H.S.F.
A	6/17/58	Issued For Construction	L. G. Miller	L.G.M.

Design and Drafting: J. Wilcox, R. G. Dunn, Date 5-7-58
Chkd: L. G. Miller, Date 6-7-58
H. S. Fenwick, Reg. P.E., Date 6-10-58
Approved: H. D. Schuiling, Date 6-17-58

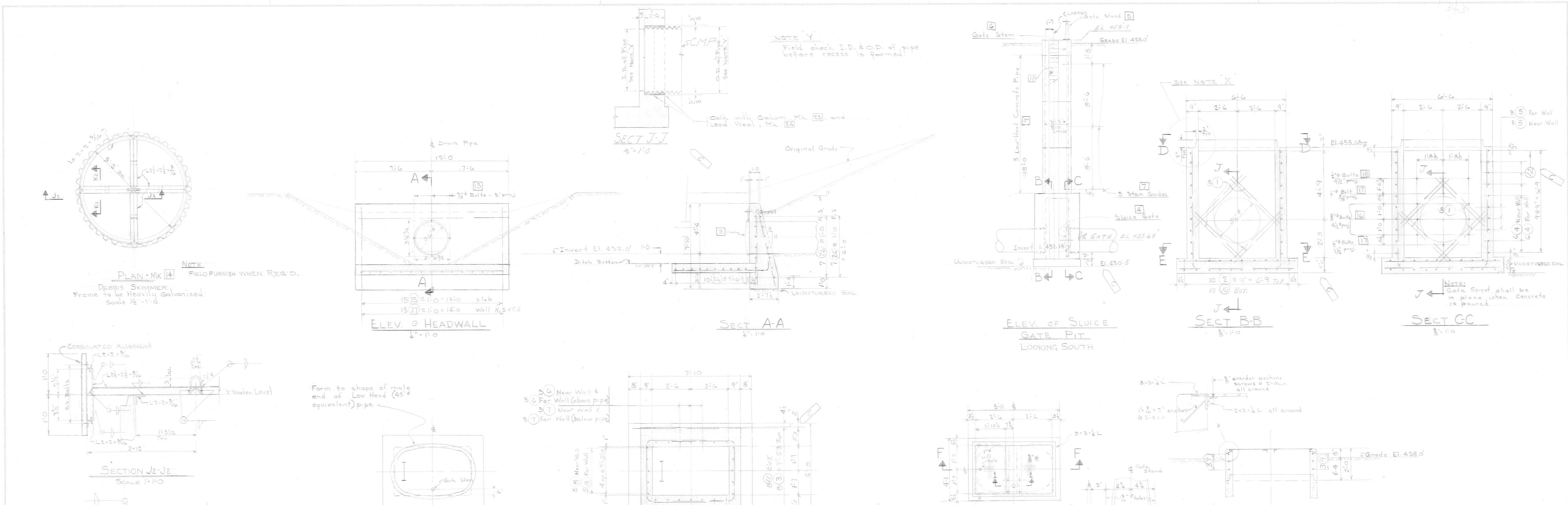
Prepared Under Responsible Supervision Of H. S. Fenwick
Michigan Professional Registration No. 3934
Illinois Structural Registration No. 81-2416
At Offices Of Commonwealth Associates Inc., 209 E. Washington Ave., Jackson, Mich.

Owner and Location: E.D. Edwards Station, Central Illinois Light Co., Peoria, Illinois

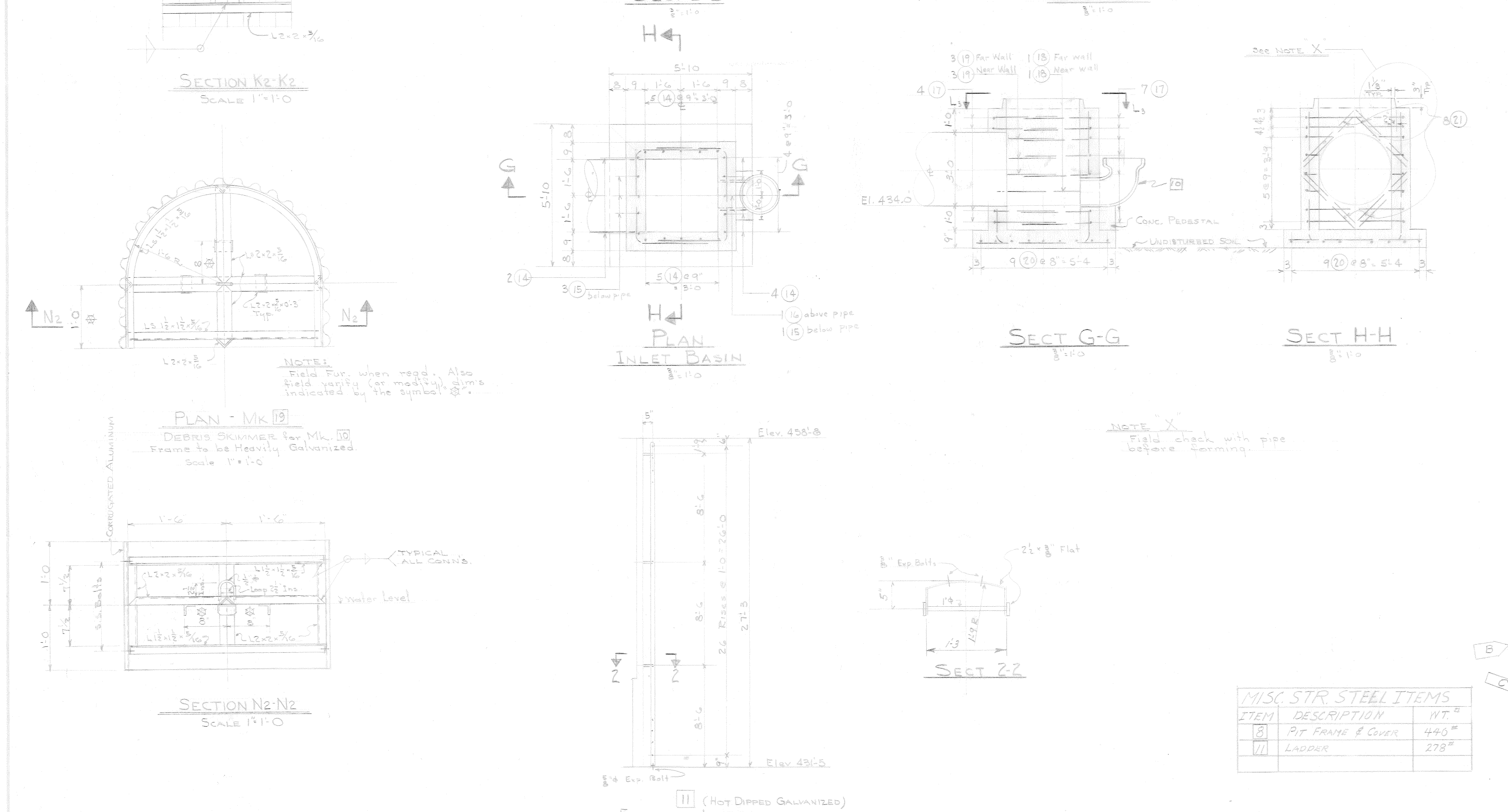
Title: Construction Thru Levee, Ash Pond Drainage Duct

Scale: As Noted — 2-20-118-1 — Drawing No. C175-G1921 — Rev. C — Sheet 1

Prints Sent Out: A 6-23-58; C ... ; Info C 8-13-76; Info C 9-15-76; Const C 11-3-76; Const C 1-7-77



BAR SUMMARY			
SIZE	STR.	BENT	WEIGHT
7	408	882	1290
5	576	94	670
4	88	178	266
TOTAL	1072	1154	2226



MISC. STR. STEEL ITEMS		
ITEM	DESCRIPTION	WT.#
8	PIT FRAME & COVER	446#
11	LADDER	278#

BILL OF MISCELLANEOUS MAT'L

Location	Item No.	Quan.	Description	Purch Local	Req'n No.
G 1921-1	G1921-2 1	1088'	36"φ Corr. Metal Pipe Asphalt & Asbestos Lined		30065
"	2	2	8'-0 sq. 12ga. Galv. Diaphrams		30065
G 1921-2	3	1	36"φ Flap Gate Armco Model 50c or Equal (W/C.I. Seating Face & Flat Back)		30104
"	4	1	Sluice Gate - 36"φ Armco Model 30-05c or Equal with C.I. Seating Surfaces & Spigot Back		
"	5	1	Sluice Gate Stand Armco Model #C.P.E.-2 or Equal		
"	6	1	Sluice Gate Stem 1½"φ Hot Rolled Steel (2 pc's with splice @ mid length		
"	7	3	Sluice Gate Stem Guides Armco Type #1 or Equal for 1½"φ stem		30104
"	8	1	Sluice Gate Pit Frame & Cover		30088
"	9	3	6'-0 Sections of 48"φ Equivalent Lo-head Concrete pipe {ASTM C76-2 CLASS II	C	30087
"	10	1	12"φ Conc. Bell Spig. Elbow		30087
"	11	1	LADDER AS DETAILED		30088
G1921-3	12	LOT	SHEET PILING		30080
"	13	LOT	WALES & BRACES SEE LIST ON G1921-3		30090
G1921-2	14	1	DEBRIS SKIMMER		FIELD FURN.
"	15	4	7/8"x12" GALV. ST. ANCHOR BOLTS W/2 NUTS		30104
"	16	6	5/8"x12½" ANCHOR BOLTS		30104
"	17	2	½"x9" ANCHOR BOLTS		30104
"	18	2	5/8"x12" ANCHOR BOLTS		30104
"	19	1	DEBRIS SKIMMER/12" PIPE		FIELD FURN.
G1921-1	G1921-2 20	96'	36" DIA. CORR. METAL PIPE 8GA., ASPHALT & ASBESTOS LINED.		30386
"	G1921-2 21	1	8' SQ. 12GA. GALV. DIAPHRAM.		30386
"	" 22	4	ASBESTOS ZINC CLAD, ASPHALT COATED, 36" DIA. JT. CONN. BANDS - 24" LG. W/4 SILO RODS & LUGS W/ASPHALT SEALING COMPOUND FED. SPEC. (QQ-C-206).		30386
G1921-2	23	Lot	Oakum - Tarred & Oiled		FIELD FURN.
"	24	Lot	Lead Wool		" "

Req'n 30015 M/c 15

BAR LIST (Deformed Bars)							
LOCATION	MARK	NO. REQD	SIZE	SHAPE	LG'TH	WT.	BEND. DIAG.
Gate Pit	1	16	7	Str.	4'-9	155	
" "	2	10	"	"	5'-6	112	
" "	3	8	"	"	6'-4	104	
" "	4	12	"	Bnt	11'-10	314	
" "	5	6	"	"	6'-4	78	
" "	6	6	"	Str.	3'-0	37	
" "	7	6	"	Bnt.	3'-3	40	
" "	8	18	"	"	9'-9	285	
" "	9	6	"	"	13'-6	165	
" "	10	10	7	STR	5'-6	112	FIELD FURNISH
" "	11	8	7	STR	7'-6	120	FIELD FURNISH
	12	2	7	BNT	11'-10	55	FIELD FURNISH
Inlet Basin	14	16	4	Bnt	7'-3	78	
" "	15	4	"	"	3'-3	9	
" "	16	1	"	str.	2'-9	2	
" "	17	11	"	Bnt	9'-8	71	
" "	18	2	"	"	5'-6	7	
" "	19	6	"	"	3'-4	13	
" "	20	18	"	str.	5'-10	70	
	21	8	"	"	3'-0	16	
Headwall	25	15	5	Bnt	6'-0	94	
"	26	24	5	Str.	14'-4	356	
"	27	30	5	Str.	7'-0	220	

NOTE: Bars Shall Be Tagged With Dwg. No., Gr. No. & Mk. No. - Example; G-1921-1 (1)

All concrete shall attain a compression strength of 3000#/□" after 28 days

UNIT 1

REV.	DATE	DESCRIPTION	BY	APPROVED
D	2/3/60	Debris Skimmers Mk. 14 & Mk. 19 released.	H.S.F.	H.S.F.
C	8/12/60	Add 20 21 22; Add 10 11 & 12 And Increase Thickness Of Pit Slab To 12", Add Sect JJ	L.G.M.	H.S.F.
B	9/14/58	Items 14 Thru 19 Added - Section L2-L2 Added	R.G.D.	H.S.F.
A	6/10/58	Items added to B/M	J.I. Becking	L.G.M.

DESIGN AND DRAFTING: John W. Wilcok DATE 5-22-58
CHKD: L.G. Miller DATE 6-7-58
H.S. Fenwick REG. P.E. DATE 6-10-58
APPROVED: H.B. Schiuling DATE 6-17-58

(SEAL)

PREPARED UNDER RESPONSIBLE SUPERVISION OF
H. S. FENWICK
MICHIGAN PROFESSIONAL REGISTRATION NO. 3954
ILLINOIS STRUCTURAL REGISTRATION NO. 81-2416
AT OFFICES OF
COMMONWEALTH ASSOCIATES INC.
209 E. WASHINGTON AVE., JACKSON, MICH.

OWNER AND LOCATION
E.D. EDWARDS STATION
CENTRAL ILLINOIS LIGHT CO.
PEORIA, ILLINOIS

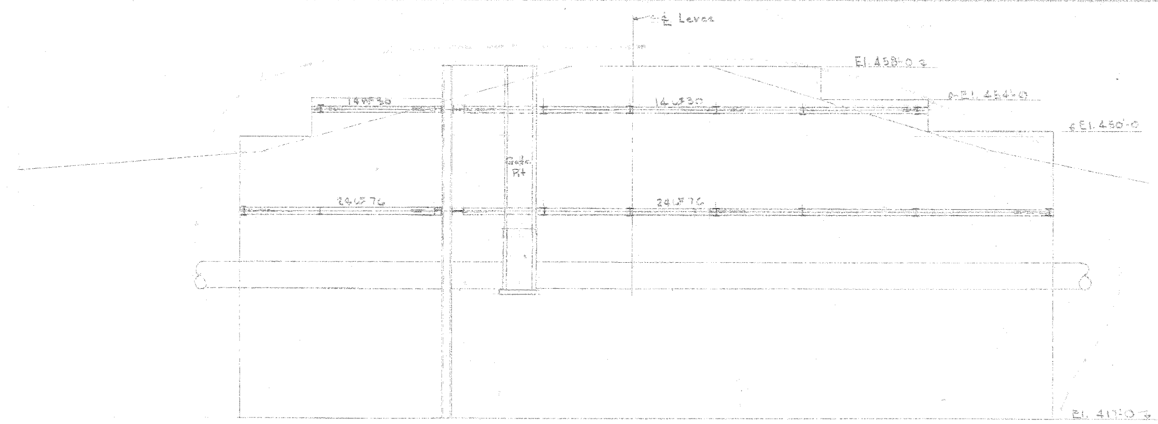
TITLE: Construction Thru Levee Ash Pond Drainage Dust Details

2-20-118-1

C175-G1921 REV. D SHEET 2

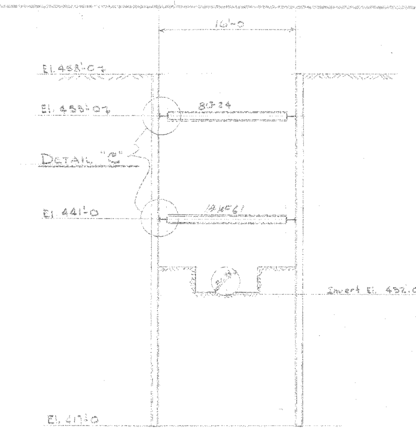
PRINTS SENT OUT: A 6-23-58 D 2-16-60 C 8-12-60

O.K. TO FILE



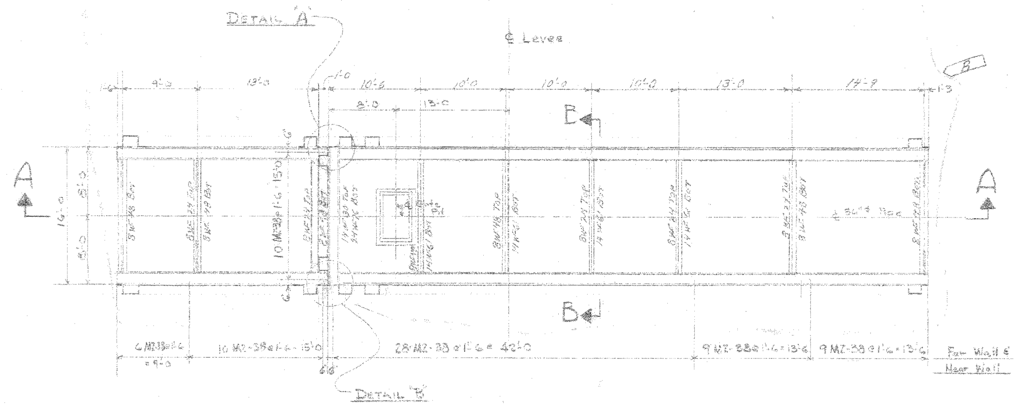
SECT A-A

1/8" = 1'-0



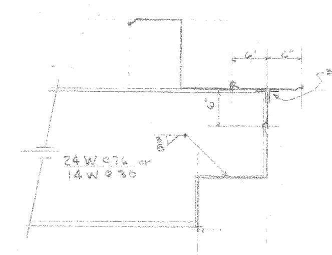
SECT B-B

1/8" = 1'-0



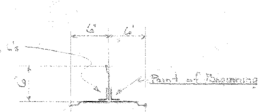
PLAN

1/8" = 1'-0



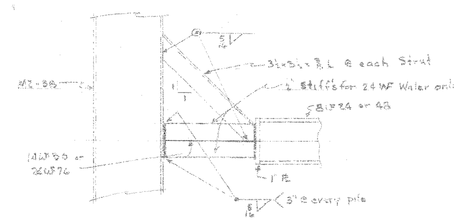
DETAIL "A"

1" = 1'-0

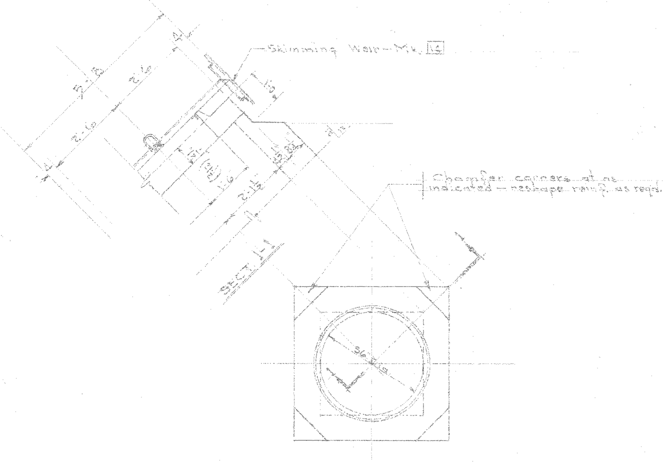


DETAIL "B" See Detail "A" for Waler End Conn.

1" = 1'-0



DETAIL "C"



VIEW L-L

Scale 1/2" = 1'-0

SEE ITEM 13
B/M G1921-2

	MATERIALS LIST BRACES AND WALES
1	5 PCS. 8WF24 BRACES 13'-9" LONG
2	7 PCS. 8WF48 " 12'-1" "
3	1 PC. 24 WF 76 WALE 16'-0" "
4	4 PCS. 24 WF 76 " 34'-0" "
5	2 PCS. 24 WF 76 " 24'-9" "
6	1 PC. 14 WF 30 " 16'-0" "
7	2 PCS. 14 WF 30 " 15'-0" "
8	2 PCS. 14 WF 30 " 22'-0" "
9	2 PCS 14 WF 30 " 34'-0" "
10	24 PCS L 3 1/2 x 3 1/2 x 3/8 BRACES 2'-0" "
	APPROX. WT. 13 TONS
11	4 PCS 14 WF 61 WALE 12'-1 LONG (SALVAGE FROM SC. HSE. COFFERDAM) See Dwg C1923-1 Item 18

UNIT 1

REV.	DATE	DESCRIPTION	BY	APPROVED
B	6/18/59	REVISE STRUT SPACING, ADD 14WF61 STRUTS View L-L added	L.G.M.	H.S.F.
A	6/17/58	ISSUED FOR CONSTRUCTION	L.G. MILLER	L.G.M.

DESIGN AND DRAFTING John W. Wilcox DATE 5-28-58
CHKD L.G. Miller DATE 6-7-58
H.S. Fenwick REG. P.E. DATE 6-10-58
APPROVED H.B. Scheibing DATE 6-17-58

PREPARED UNDER RESPONSIBLE SUPERVISION OF
H. S. FENWICK
MICHIGAN PROFESSIONAL REGISTRATION NO. 3954
ILLINOIS STRUCTURAL REGISTRATION NO. 81-3416
AT OFFICES OF
COMMONWEALTH ASSOCIATES INC.
209 E. WASHINGTON AVE. JACKSON, MICH.

OWNER AND LOCATION
E.D. EDWARDS STATION
CENTRAL ILLINOIS LIGHT CO
PEORIA, ILLINOIS

TITLE
CONSTRUCTION THRU LEVEE
ASH POND DRAINAGE DUCT
COFFERDAM & OTHER DETAILS

SCALE As Noted
2-20-18-1
DRAWING NO. C-175-G1921 REV. B SHEET 3

PRINT DIST.

REVISIONS		
REV.	W.O.	
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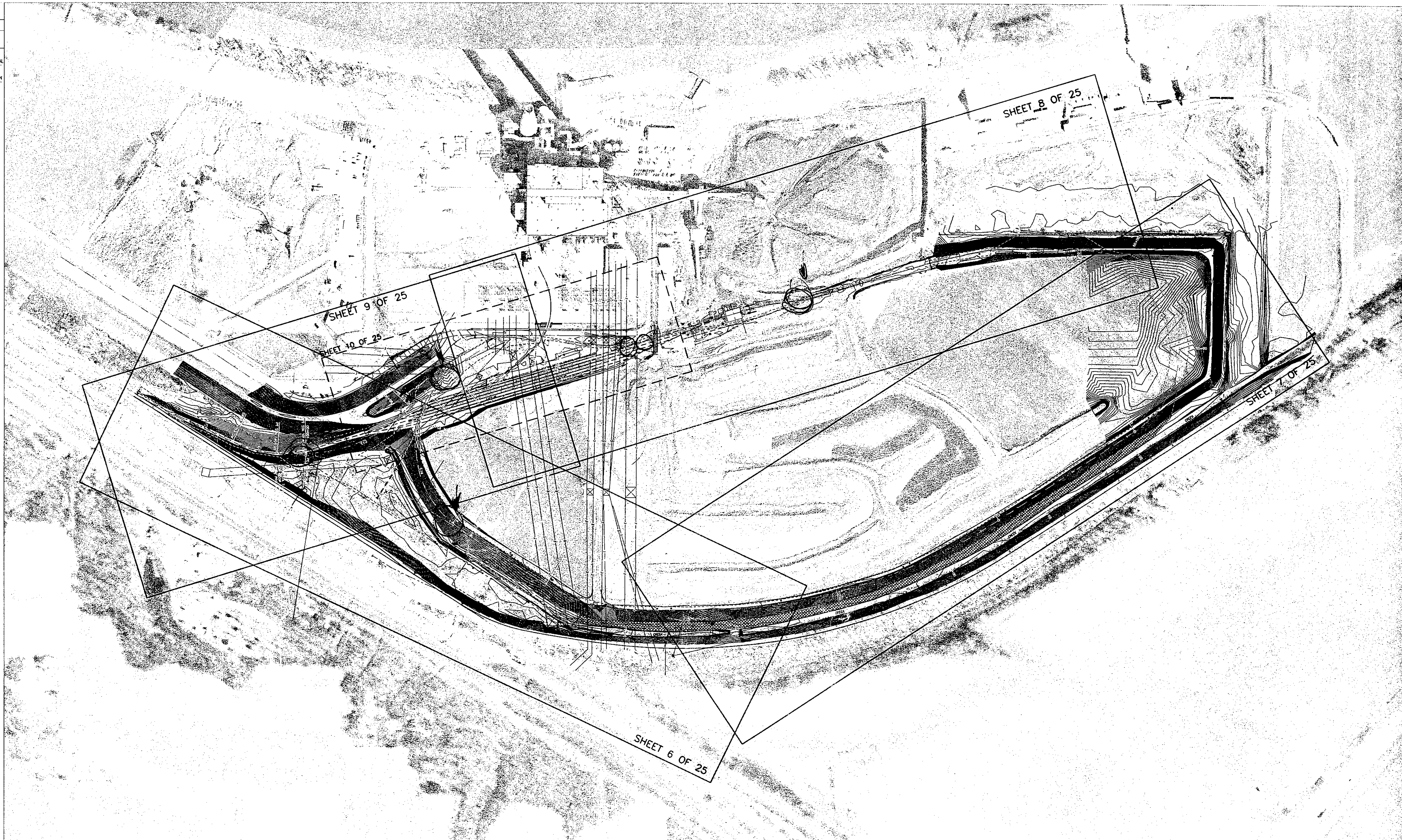
1		11/20/03 ISSUED FOR CONSTRUCTION



LEGEND:

- EXISTING GROUND CONTOURS
- CL EXISTING TRACK
- EXISTING OVERHEAD POWER LINE
- CL EXISTING TRACK TO BE REMOVED
- EXISITING POINT OF SWITCH (P.SW.)
- CL PROPOSED TRACK
- PROPOSED GRADING LIMITS
- PROPOSED POINT OF SWITCH (P.SW.)

0 100 200 400
SCALE 1"=200'

ISSUED FOR CONSTRUCTION

NOTICE OF LIMITED RESPONSIBILITY

THE RESPONSIBILITY OF THE UNDERSIGNED ENGINEER IS LIMITED TO THE DESIGN WORK SHOWN ON PROJECT DRAWINGS AND DOCUMENTS BEARING HIS/HER SEAL, SIGNATURE OR INITIALS HE/SHE DOES NOT HAVE AUTHORITY OVER THE PROJECT AS A WHOLE THE UNDERSIGNED DISCLAIMS ANY RESPONSIBILITY FOR WORK DONE UNDER SUBSCQUENT REVISIONS AND ANY OTHER DOCUMENTS ASSOCIATED WITH THE PROJECT WHICH DO NOT BEAR HIS/HER SEAL, SIGNATURE OR INITIALS

DESIGN NINE, INC.
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
ST. LOUIS, MO.

PREPARED FOR AmerenCILCO

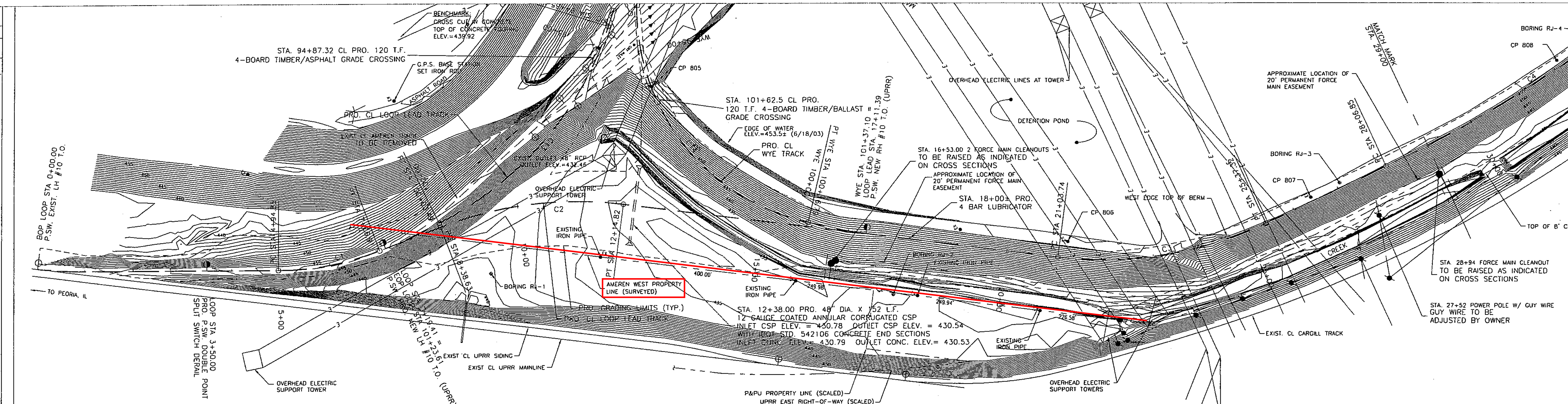
DRAWN	SPH	PROPOSED 150 CAR LOOP TRACK FOR EDWARDS POWER PLANT BARTONVILLE, ILLINOIS
CHKD	GTH	
SUPV.		
APPD.		

LOCATION	GENERAL PLAN	CLASS

AmerenCILCO ST. LOUIS, MISSOURI	DRAWING NO.	SHEET NO	REV.
	03057-PL	5 OF 25	1

T:\2003\Ameren\Edwards\Design-off ROW & pond\03057-1.dwg, General Plan, 12/5/2003 12:18:27 PM, SPH

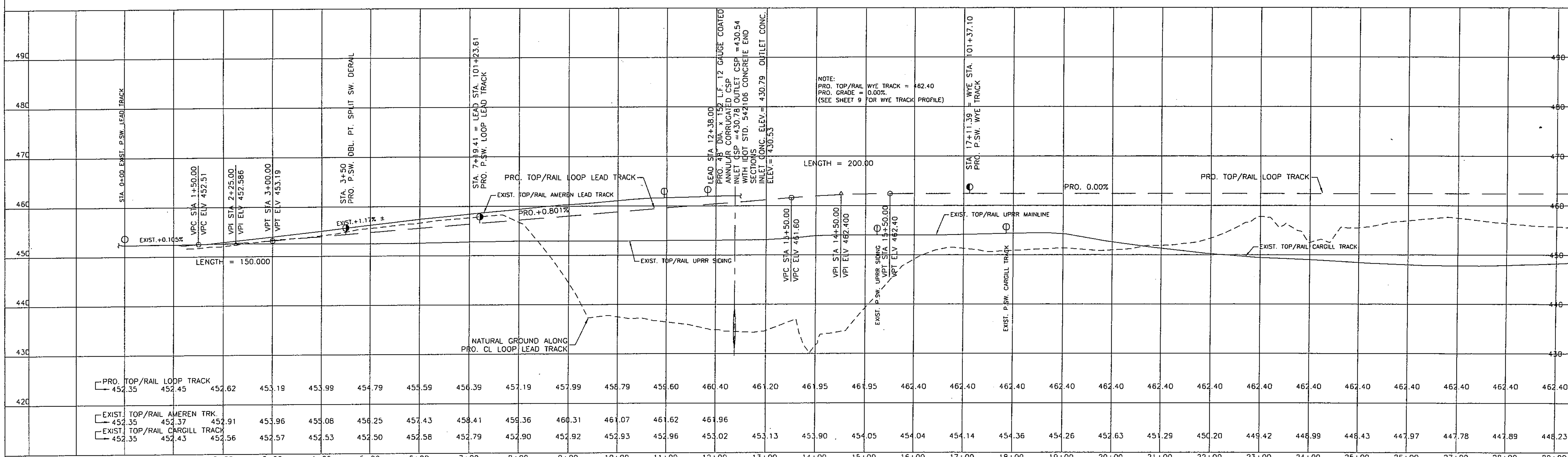
PRINT DIST.	
REVISIONS	
REV.	W.O.
0	11/05/03 PRELIMINARY FOR APPROVAL
1	11/20/03 ISSUED FOR CONSTRUCTION
2	12/03/03 ISSUED FOR CONSTRUCTION



NOTES:

- FORCE MAIN MANHOLES/CLEANOUTS TO BE RAISED ON PROPOSED EMBANKMENT. SEE CROSS SECTIONS FOR DETAILS.
- EXISTING AMEREN TRACK FROM END OF SWITCH TIES OF UPRR TURNOUT (APPROX. STA. 1+20) TO EXISTING AMEREN YARD TO BE REMOVED, GRADING PERFORMED & SUBBALLAST PLACED (SEE CROSS SECTIONS) DURING DUMP HOUSE WORK OUTAGE.
- EXISTING YARD LEAD TURNOUTS TO BE REMOVED, REHABILITATED AS REQUIRED AND REINSTALLED AT PROPOSED LOCATIONS. EXTRA TURNOUTS TO BE DISMANTLED WITH SALVAGEABLE MATERIALS STOCKPILED ON SITE AS DESIGNATED BY OWNER. SCRAP MATERIALS TO BE REMOVED AND PROPERLY DISPOSED OF OFF SITE.
- EXISTING LEAD TRACK AND YARD TRACK TO BE REMOVED TO THE LIMITS REQUIRED BY THE PROPOSED WORK. SALVAGEABLE MATERIALS TO BE STOCKPILED ON SITE AS DESIGNATED BY OWNER. SCRAP MATERIALS TO BE REMOVED AND PROPERLY DISPOSED OF OFF SITE.
- EMBANKMENT CONSTRUCTION DETAILED ON CROSS SECTIONS PURSUANT TO REITZ & JENS, INC.
- DESIGN TOP/RAIL TO DESIGN TOP/SUBBALLAST IS 2.21' WITH 136# RAIL.

LEAD C1	LEAD C2	LEAD C3	LEAD C4	LEAD C13	WYE C14
D_c = 10°00'00"	D_c = 7°30'00"	D_c = 7°30'00"	D_c = 2°15'00"	D_c = 8°30'00"	D_c = 12°45'00"
R = 573.69'	R = 764.49'	R = 764.49'	R = 2546.64'	R = 674.69'	R = 450.31'
Δ = 21°10'44"	Δ = 28°11'38"	Δ = 32°29'45"	Δ = 33°29'31"	Δ = 45°41'42"	Δ = 102°31'42"
T = 107.25'	T = 191.98'	T = 222.80'	T = 766.25'	T = 284.27'	T = 561.36'
L_c = 211.79'	L_c = 375.92'	L = 433.28'	L_c = 1488.53'	L_c = 537.59'	L_c = 804.14'
L_o = 212.06'	L_o = 376.19'	L_o = 433.58'	L_o = 1488.62'	L_o = 538.08'	L_o = 805.81'
E = 9.94'	E = 23.74'	E = 31.80'	E = 112.78'	E = 57.44'	E = 269.34'



LEGEND:

- EXISTING GROUND CONTOURS
- CL EXISTING TRACK
- EXISTING OVERHEAD POWER LINE
- EXISTING PROPERTY LINE
- CL EXISTING TRACK TO BE REMOVED
- EXISITING POINT OF SWITCH (P.SW.)
- CL PROPOSED TRACK
- PROPOSED GRADING LIMITS
- PROPOSED POINT OF SWITCH (P.SW.)

0 50 100 200
SCALE: 1"=100'

ISSUED FOR CONSTRUCTION

NOTICE OF LIMITED RESPONSIBILITY

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DESIGN NINE, INC.
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
ST. LOUIS, MO.

PREPARED FOR AmerenCILCO

DRAWN	SPH
CHKD.	GTH
SUPV.	
APPD.	

PROPOSED 150 CAR LOOP TRACK
FOR EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

LOCATION: PLAN/PROFILE – LOOP/WYE TRACK LOOP STA. 0+00 TO STA. 29+00

CLASS

AmerenCILCO ST. LOUIS, MISSOURI

DRAWING NO.	SHEET NO.	REV.
03057-1	6 OF 25	2

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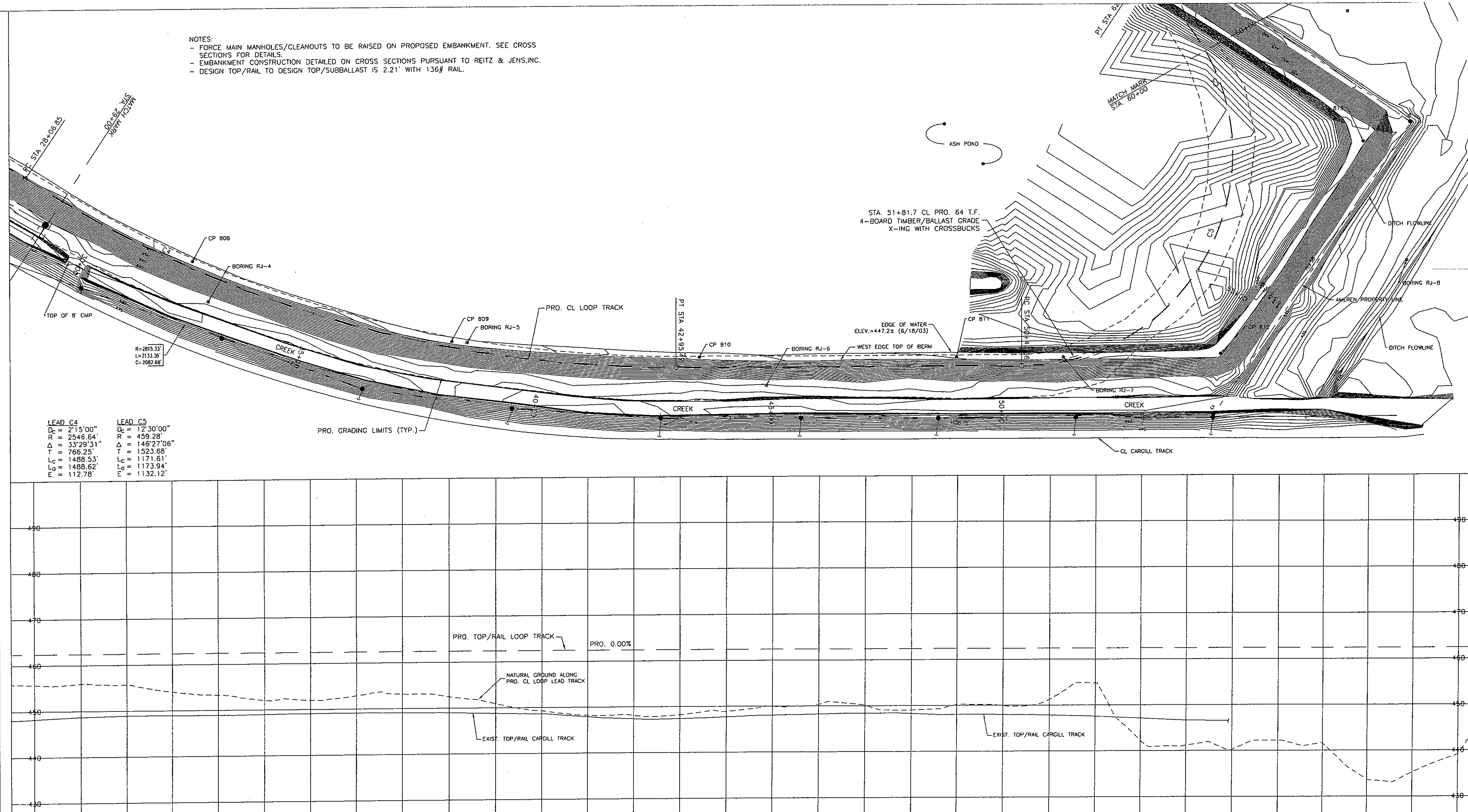
PRINT DIST.		
REVISIONS		
REV.	W.O.	
0	11/05/03	PRELIMINARY FOR APPROVAL
1	11/20/03	ISSUED FOR CONSTRUCTION

NOTES:
- FORCE MAIN MANHOLES/CLEANOUTS TO BE RAISED ON PROPOSED EMBANKMENT. SEE CROSS SECTIONS FOR DETAILS.
- EMBANKMENT CONSTRUCTION DETAILED ON CROSS SECTIONS PURSUANT TO REITZ & JENS,INC.
- DESIGN TOP/RAIL TO DESIGN TOP/SUBBALLAST IS 2.21' WITH 136# RAIL.



Station	PRO. TOP/RAIL LOOP TRACK	EXIST. TOP/RAIL CARGILL TRACK
29+00	462.40	448.23
30+00	462.40	448.67
31+00	462.40	448.91
32+00	462.40	448.91
33+00	462.40	448.89
34+00	462.40	448.98
35+00	462.40	449.09
36+00	462.40	449.12
37+00	462.40	449.06
38+00	462.40	448.99
39+00	462.40	448.77
40+00	462.40	448.60
41+00	462.40	447.90
42+00	462.40	447.37
43+00	462.40	447.38
44+00	462.40	447.70
45+00	462.40	448.04
46+00	462.40	448.23
47+00	462.40	448.36
48+00	462.40	448.26
49+00	462.40	448.01
50+00	462.40	447.98
51+00	462.40	447.82
52+00	462.40	447.53
53+00	462.40	447.08
54+00	462.40	446.65
55+00	462.40	
56+00	462.40	
57+00	462.40	
58+00	462.40	
59+00	462.40	
60+00	462.40	

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LEGEND:
- EXISTING GROUND CONTOURS
- CL EXISTING TRACK
- EXISTING OVERHEAD POWER LINE
- EXISTING PROPERTY LINE
- CL EXISTING TRACK TO BE REMOVED
- EXISITING POINT OF SWITCH (P.SW.)
- CL PROPOSED TRACK
- PROPOSED GRADING LIMITS
- PROPOSED POINT OF SWITCH (P.SW.)

0 50 100 200
SCALE: 1"=100'

ISSUED FOR CONSTRUCTION

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DESIGN NINE, INC.
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
ST. LOUIS, MO.

PREPARED FOR AmerenCILCO

DRAWN	SPH
CHKD.	GTH
SUPV.	
APPD.	

PROPOSED 150 CAR LOOP TRACK
FOR EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

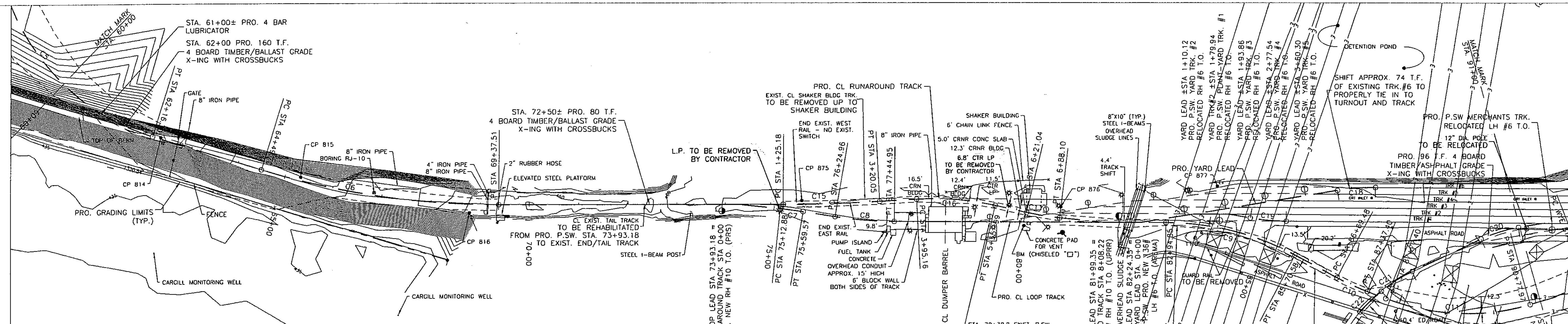
LOCATION: ST. LOUIS, MISSOURI

PLAN/PROFILE – LOOP TRACK
STA. 29+00 TO STA. 60+00

CLASS	DRAWING NO.	SHEET NO.	REV.
	03057-1	7 OF 25	1

AmerenCILCO

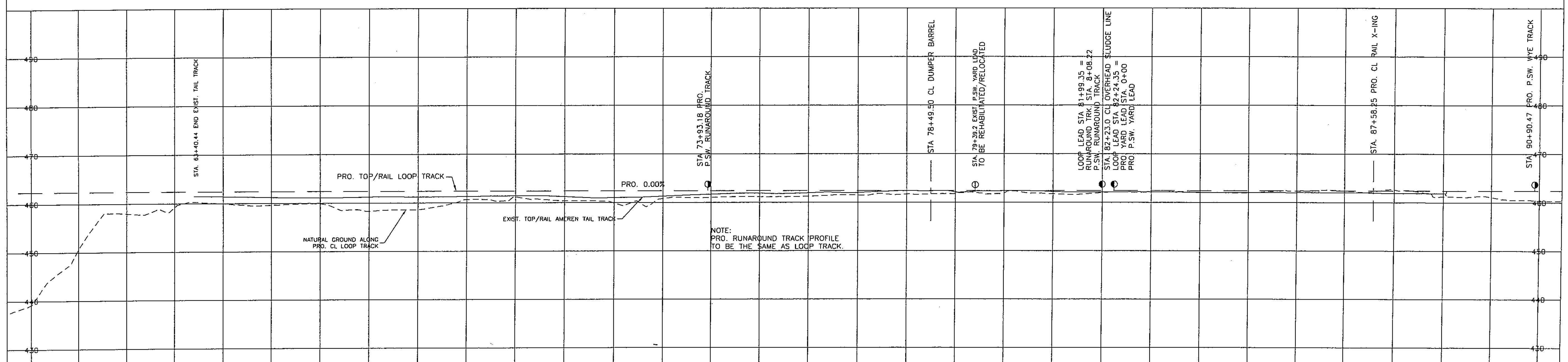
PRINT DIST.	
REVISIONS	
REV.	W.O.
0	11/05/03 PRELIMINARY FOR APPROVAL
1	11/20/03 ISSUED FOR CONSTRUCTION
2	12/03/03 ISSUED FOR CONSTRUCTION



NOTES:
- DESIGN TOP/RAIL TO DESIGN TOP/SUBBALLAST IS 2.21' WITH 136# RAIL.
- REHABILITATE EXISTING TRACK THAT IS TO REMAIN TO SERVE AS LOOP TRACK. REPLACE CROSSTIES, RELAY RAIL, ADJUST/ADD RAIL ANCHORS AND SPIKES, BALLAST AND SURFACE TRACK.
- EXISTING YARD LEAD TURNOUTS TO BE REMOVED, REHABILITATED AS REQUIRED AND REINSTALLED AT PROPOSED LOCATIONS. EXTRA TURNOUTS TO BE DISMANTLED WITH SALVAGABLE MATERIALS STOCKPILED ON SITE AS DESIGNATED BY OWNER. SCRAP MATERIALS TO BE REMOVED AND PROPERLY DISPOSED OF OFF SITE BY CONTRACTOR.
- EXISTING LEAD TRACK AND YARD TRACK TO BE REMOVED TO THE LIMITS REQUIRED BY THE PROPOSED WORK. SALVAGEABLE MATERIALS TO BE STOCKPILED ON SITE AS DESIGNATED BY OWNER. SCRAP MATERIALS TO BE REMOVED AND PROPERLY DISPOSED OF OFF SITE.
- EMBANKMENT CONSTRUCTION DETAILED ON CROSS SECTIONS PURSUANT TO REITZ & JENS, INC.

	LEAD C5	LEAD C6	LEAD C7	LEAD C8	LEAD C9	LEAD C10	LEAD C11	RUNAROUND C15	RUNAROUND C16	RUNAROUND C17
D_c =	12°30'00"	3°30'00"	7°30'00"	7°30'00"	10°00'00"	10°00'00"	12°30'00"	1°45'00"	10°00'00"	10°00'00"
R =	459.28'	1637.28'	764.49'	764.49'	573.69'	573.69'	459.28'	3274.17'	573.69'	573.69'
Δ =	146°27'06"	17°04'15"	3°29'56"	8°59'36"	27°32'18"	6°47'00"	37°29'49"	3°24'36"	16°03'45"	6°41'51"
T =	1523.68'	245.73'	23.35'	60.12'	140.58'	34.00'	155.89'	97.46'	80.94'	33.57'
L_c =	1171.61'	487.74'	46.65'	119.91'	275.38'	67.83'	299.98'	194.86'	160.62'	66.97'
L_o =	1173.94'	487.81'	46.69'	199.99'	275.73'	67.92'	300.57'	194.87'	160.83'	67.06'
E =	1132.12'	18.34'	0.36'	2.36'	16.97'	1.01'	25.74'	1.45'	5.68'	0.98'

STA. 4+19.8 REMOVE & PROPERLY DISPOSE OF EXISTING 32 T.F RUBBER PAD GRADE X-ING. SURFACE, REHABILITATE & SHIFT EXISTING TRACK. PRO. INSTALL 32 T.F. NEW FULL DEPTH RUBBER PAD GRADE CROSSING WITH ASPHALT APPROACHES (HYRAIL OR APPROVED EQUAL) WITH CROSS BUCKS



STATION	PRO. TOP/RAIL LOOP TRACK	EXIST. TOP/RAIL TAIL TRACK AND YARD TRACK #1
60+00	462.40	
61+00	462.40	
62+00	462.40	
63+00	462.40	
64+00	462.40	461.40
65+00	462.40	461.21
66+00	462.40	461.12
67+00	462.40	461.23
68+00	462.40	461.22
69+00	462.40	461.32
70+00	462.40	461.44
71+00	462.40	461.24
72+00	462.40	461.02
73+00	462.40	461.29
74+00	462.40	461.69
75+00	462.40	461.89
76+00	462.40	461.94
77+00	462.40	462.03
78+00	462.40	462.39
79+00	462.40	462.11
80+00	462.40	462.41
81+00	462.40	462.22
82+00	462.40	462.13
83+00	462.40	462.19
84+00	462.40	462.05
85+00	462.40	462.03
86+00	462.40	462.02
87+00	462.40	462.05
88+00	462.40	461.92
89+00	462.40	461.92
90+00	462.40	
91+00	462.40	

LEGEND:
- EXISTING GROUND CONTOURS
- CL EXISTING TRACK
- EXISTING OVERHEAD POWER LINE
- EXISTING PROPERTY LINE
- CL EXISTING TRACK TO BE REMOVED
- EXISITING POINT OF SWITCH (P.SW.)
- CL PROPOSED TRACK
- PROPOSED GRADING LIMITS
- PROPOSED POINT OF SWITCH (P.SW.)

0 50 100 200
SCALE: 1"=100'

ISSUED FOR CONSTRUCTION

DESIGN NINE, INC.
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
ST. LOUIS, MO.

PREPARED FOR AmerenCILCO

DRAWN	SPH	PROPOSED 150 CAR LOOP TRACK FOR EDWARDS POWER PLANT BARTONVILLE, ILLINOIS		
CHKD.	GTH			
SUPV.				
APPD.		LOCATION	PLAN/PROFILE - LOOP TRACK STA. 60+00 TO STA. 91+00	CLASS
AmerenCILCO ST. LOUIS, MISSOURI		DRAWING NO. 03057-1	SHEET NO. 8 OF 25	REV. 2

T:\2003\Ameren\Edwards\Design-off ROW & pond\03057-1.dwg, Plan-Prof 100' (3), 12/5/2003 1:29:46 PM, SPH

PRINT DIST.	
REVISIONS	
REV.	W.O.
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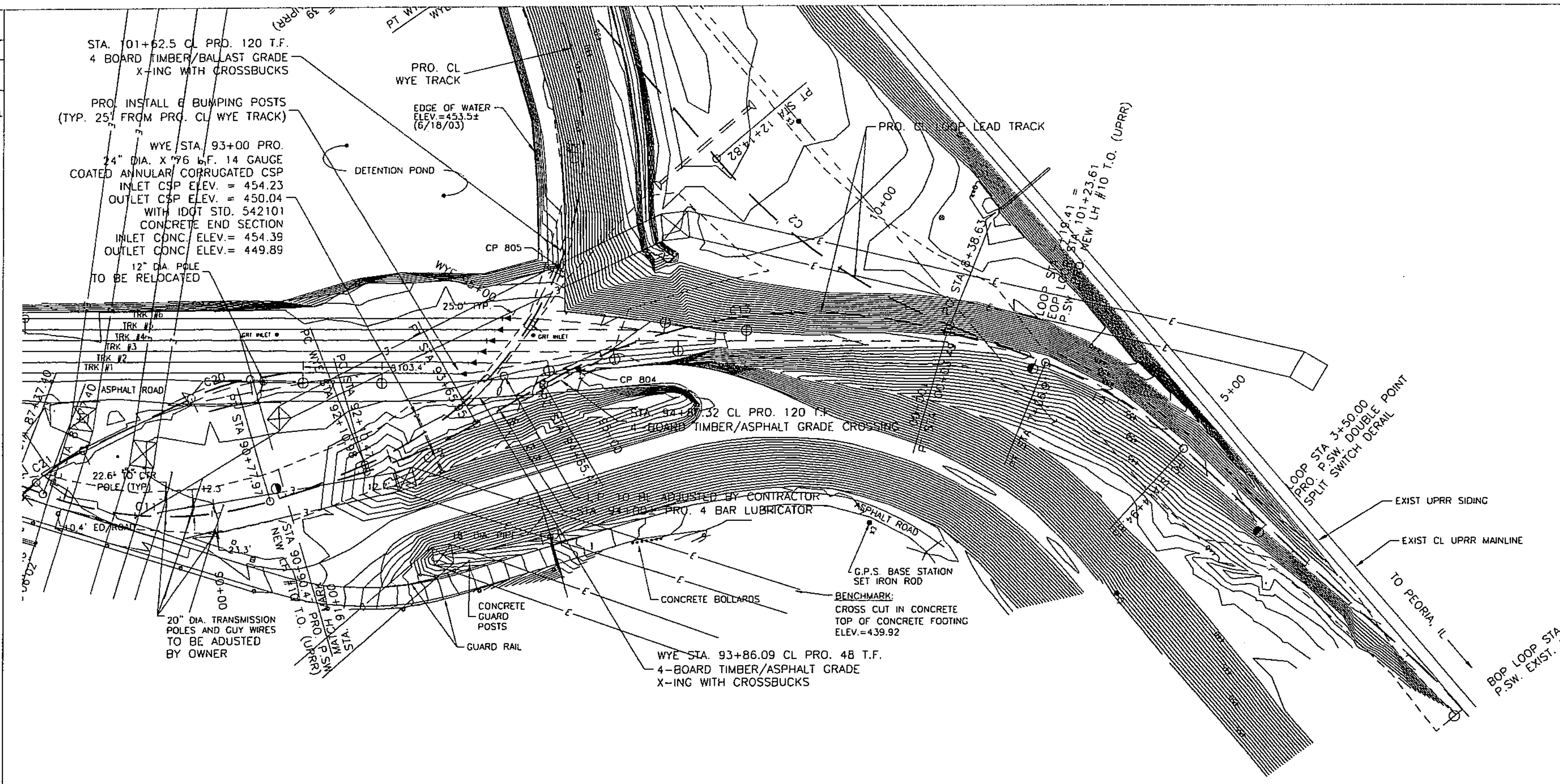
1	11/20/03 ISSUED FOR CONSTRUCTION
2	12/03/03 ISSUED FOR CONSTRUCTION

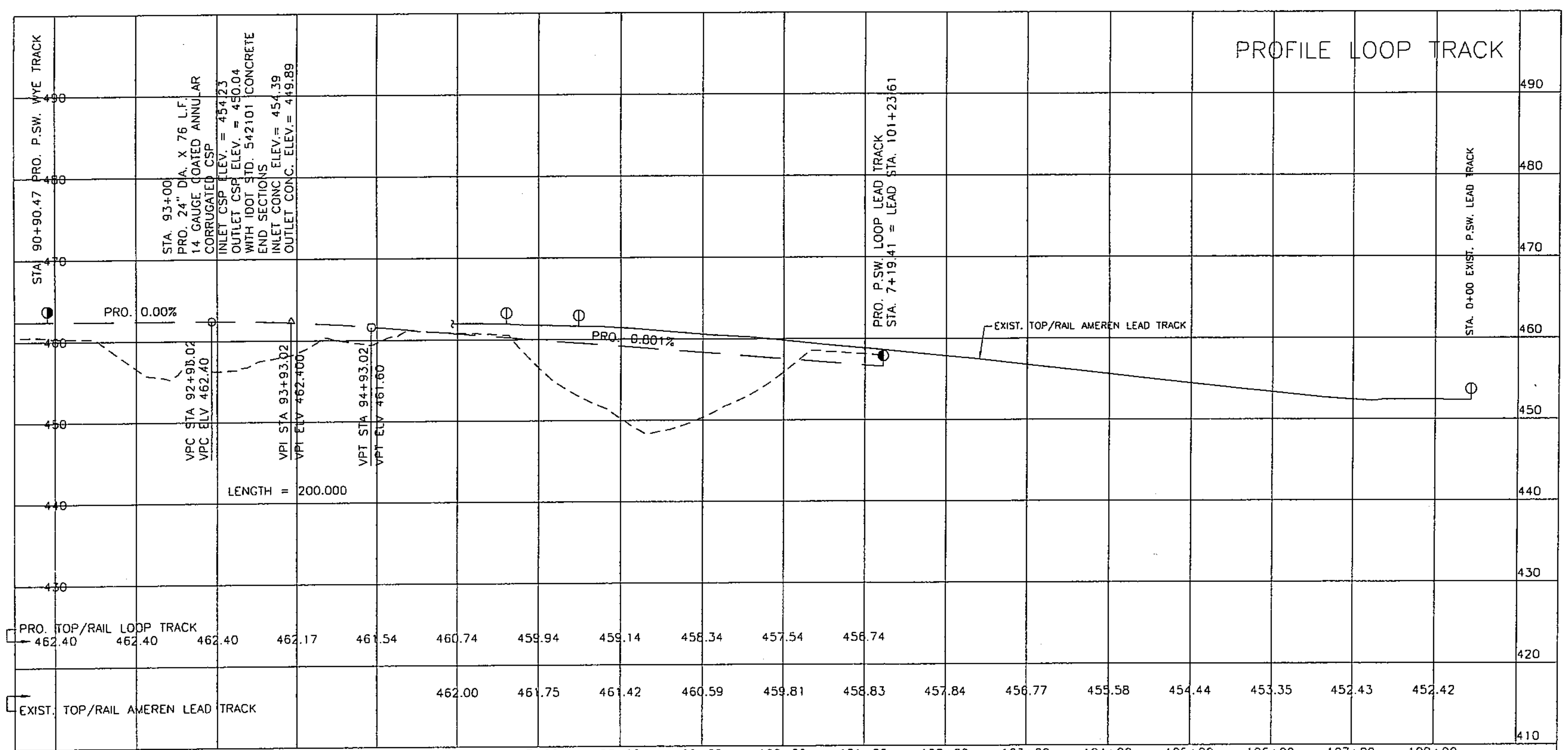


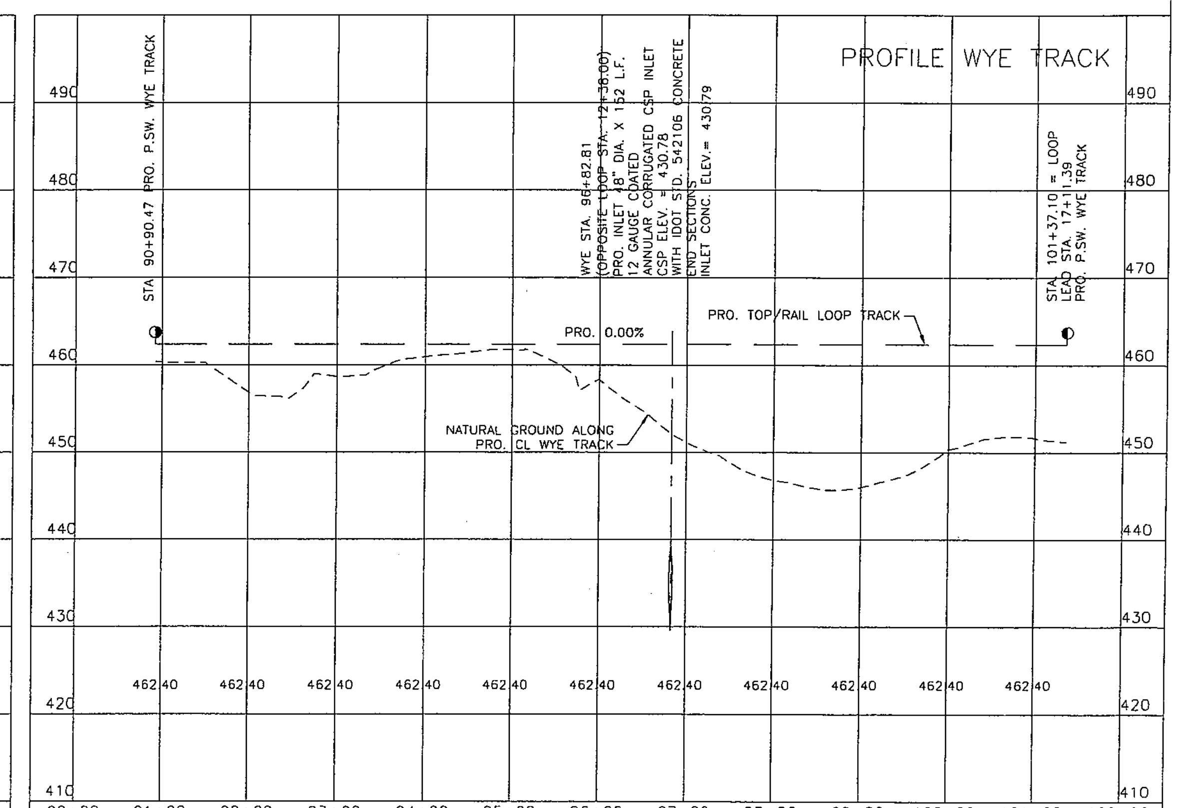
NOTES:
- EXISTING AMEREN TRACK FROM END OF SWITCH TIES OF UPRR TURNOUT (APPROX. STA. 1+20) TO EXISTING AMEREN YARD TO BE REMOVED, GRADING PERFORMED & SUBBALLAST PLACED (SEE CROSS SECTIONS) DURING DUMP HOUSE WORK OUTAGE.
- EXISTING YARD LEAD TURNOUTS TO BE REMOVED, REHABILITATED AS REQUIRED AND REINSTALLED AT PROPOSED LOCATIONS. EXTRA TURNOUTS TO BE DISMANTLED WITH SALVAGEABLE MATERIALS STOCKPILED ON SITE AS DESIGNATED BY OWNER. SCRAP MATERIALS TO BE REMOVED AND PROPERLY DISPOSED OF OFF SITE.
- EXISTING LEAD TRACK AND YARD TRACK TO BE REMOVED TO THE LIMITS REQUIRED BY THE PROPOSED WORK. SALVAGEABLE MATERIALS TO BE STOCKPILED ON SITE AS DESIGNATED BY OWNER. SCRAP MATERIALS TO BE REMOVED AND PROPERLY DISPOSED OF OFF SITE.
- EMBANKMENT & CONSTRUCTION DETAILED ON CROSS SECTIONS PURSUANT TO REITZ & JENS, INC.
- DESIGN TOP/RAIL TO DESIGN TOP/SUBBALLAST IS 2.21' WITH 136# RAIL.

	LEAD C1	LEAD C2	LEAD C9	LEAD C10
D_c =	10°00'00"	7°30'00"	10°00'00"	10°00'00"
R =	573.69'	764.49'	573.69'	573.69'
Δ =	21°10'44"	28°11'38"	27°32'18"	6°47'00"
T =	107.25'	191.98'	140.58'	34.00'
L_c =	211.79'	375.92'	275.38'	67.83'
L_a =	212.06'	376.19'	275.73'	67.92'
E =	9.94'	23.74'	16.97'	1.01'

	LEAD C11	LEAD C12	LEAD C13	WYE C14
D_c =	12°30'00"	8°45'00"	8°30'00"	12°45'00"
R =	459.28'	655.45'	674.69'	450.31'
Δ =	37°29'49"	13°35'29"	45°41'42"	102°31'42"
T =	155.89'	78.11'	284.27'	561.36'
L_c =	299.98'	155.33'	537.59'	804.14'
L_a =	300.57'	155.48'	538.08'	805.81'
E =	25.74'	4.64'	57.44'	269.34'

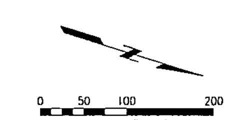
	YARD C18	YARD C19	PLANT C20	PLANT C21	PLANT C22
D_c =	12°30'00"	12°30'00"	20°00'00"	23°00'00"	22°59'47"
R =	459.28'	459.28'	287.94'	250.79'	250.83'
Δ =	9°39'05"	9°21'00"	16°08'24"	16°46'12"	8°10'55"
T =	38.77'	37.56'	40.83'	36.97'	17.94'
L_c =	77.21'	74.80'	80.70'	72.91'	35.58'
L_a =	77.37'	74.95'	81.11'	73.41'	35.82'
E =	1.63'	1.53'	2.88'	2.71'	0.64'





LEGEND:

	EXISTING GROUND CONTOURS
	CL EXISTING TRACK
	EXISTING OVERHEAD POWER LINE
	EXISTING PROPERTY LINE
	CL EXISTING TRACK TO BE REMOVED
	EXISITING POINT OF SWITCH (P.SW.)
	CL PROPOSED TRACK
	PROPOSED GRADING LIMITS
	PROPOSED POINT OF SWITCH (P.SW.)



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DESIGN NINE, INC.
ENGINEERING SERVICES FOR
RAILROADS AND INDUSTRY
ST. LOUIS, MO.

PREPARED FOR AmerenCILCO

DRAWN	SPH
CHKD.	GTH
SUPV.	
APPD.	

PROPOSED 150 CAR LOOP TRACK
FOR EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

LOCATION		CLASS
	PLAN/PROFILE – LOOP/WYE TRACK LOOP STA. 91+00 TO STA. 101+22.23	

AmerenCILCO ST. LOUIS, MISSOURI	DRAWING NO.	SHEET NO.	REV.
	03057-1	9 OF 25	2

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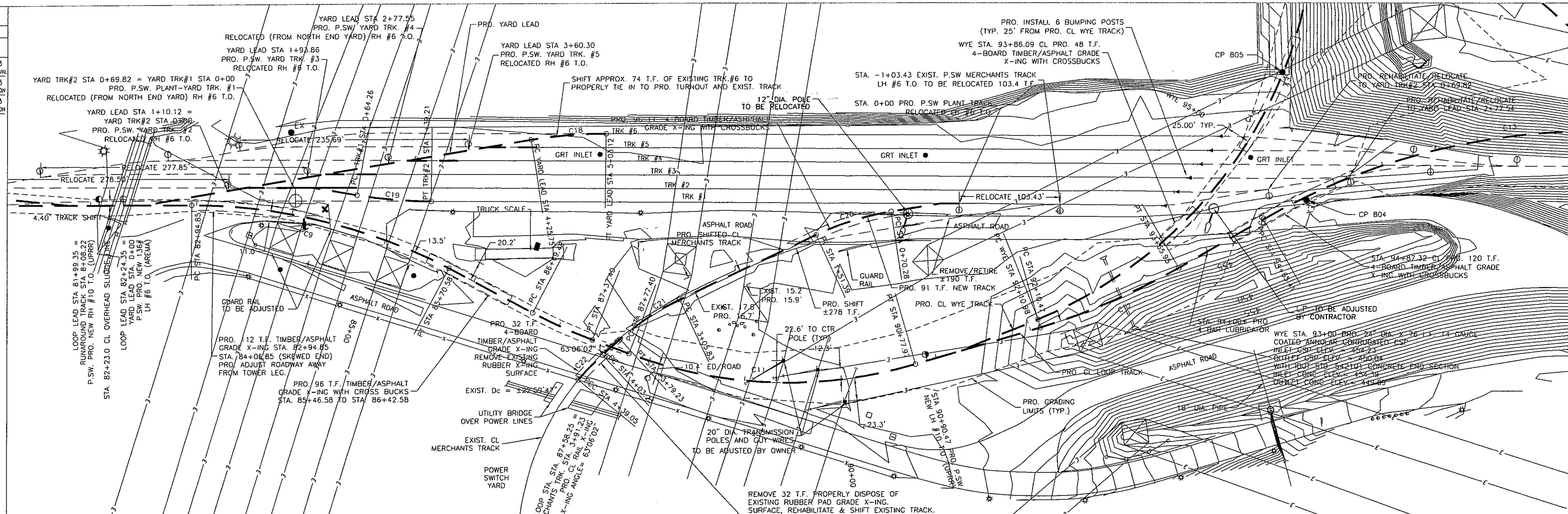
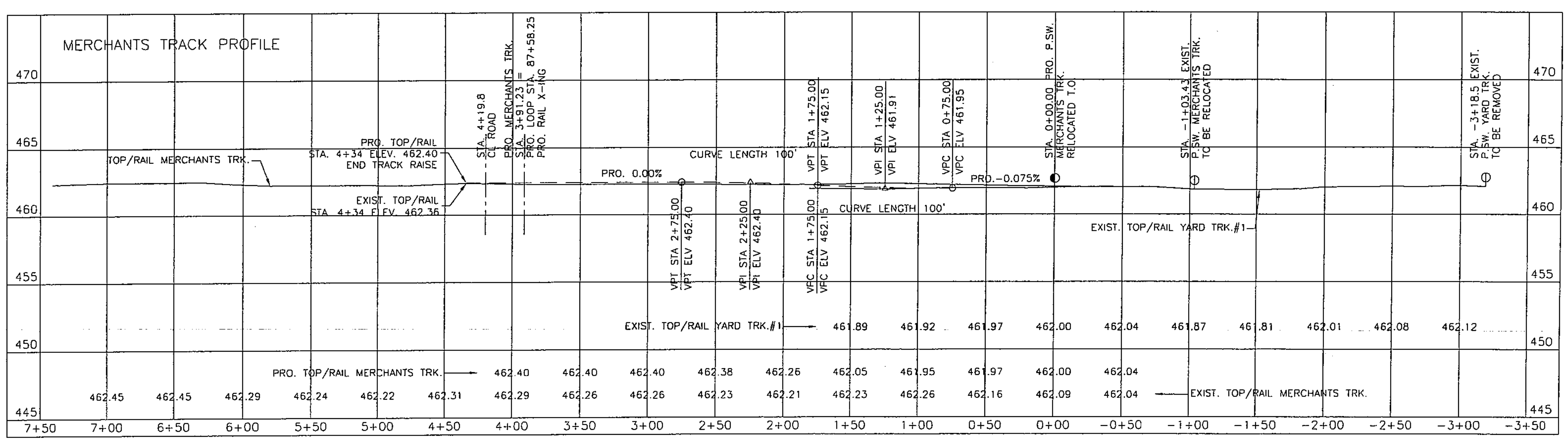
PRINT DIST.	
REVISIONS	
REV.	W.O.
0	11/05/03 PRELIMINARY FOR APPROVAL
1	11/20/03 ISSUED FOR CONSTRUCTION
2	12/03/03 ISSUED FOR CONSTRUCTION



YARD LEAD C18	YARD LEAD C19	MERCHANTS C20	MERCHANTS C21	MERCHANTS C22
D_c = 12°30'00"	D_c = 12°30'00"	D_c = 20°00'00"	D_c = 23°00'00"	D_c = 22°59'47"
R = 459.28'	R = 459.28'	R = 287.94'	R = 250.79'	R = 250.83'
Δ = 9°39'05"	Δ = 9°21'00"	Δ = 16°08'24"	Δ = 16°46'12"	Δ = 8°10'55"
T = 38.77'	T = 37.56'	T = 40.83'	T = 36.97'	T = 17.94'
L_c = 77.21'	L_c = 74.80'	L_c = 80.70'	L_c = 72.91'	L_c = 35.58'
L_a = 77.37'	L_a = 74.95'	L_a = 81.11'	L_a = 73.40'	L_a = 35.82'
E = 1.63'	E = 1.53'	E = 2.88'	E = 2.71'	E = 0.64'

NOTES:
- DESIGN TOP/RAIL TO DESIGN TOP/SUBBALLAST IS 2.21' WITH 136# RAIL.
- EXISTING YARD LEAD TURNOUTS TO BE REMOVED, REHABILITATED AS REQUIRED AND REINSTALLED AT PROPOSED LOCATIONS. EXTRA TURNOUTS TO BE DISMANTLED WITH SALVAGABLE MATERIALS STOCKPILED ON SITE AS DESIGNATED BY OWNER. SCRAP MATERIALS TO BE REMOVED AND PROPERLY DISPOSED OF OFF SITE.
- EXISTING LEAD TRACK AND YARD TRACK TO BE REMOVED TO THE LIMITS REQUIRED BY THE PROPOSED WORK. SALVAGEABLE MATERIALS TO BE STOCKPILED ON SITE AS DESIGNATED BY OWNER. SCRAP MATERIALS TO BE REMOVED AND PROPERLY DISPOSED OF OFF SITE.
- EMBANKMENT CONSTRUCTION DETAILED ON CROSS SECTIONS PURSUANT TO REITZ & JENS, INC.

MERCHANTS TRACK PROFILE



STA.	EXIST. TOP/RAIL YARD TRK.#1	PRO. TOP/RAIL MERCHANTS TRK.	EXIST. TOP/RAIL MERCHANTS TRK.
7+00			462.45
6+50			462.45
6+00			462.29
5+50			462.24
5+00			462.22
4+50			462.31
4+00		462.40	462.29
3+50		462.40	462.26
3+00		462.40	462.26
2+50		462.38	462.23
2+00		462.26	462.21
1+50	461.89	462.05	462.23
1+00	461.92	461.95	462.26
0+50	461.97	461.97	462.16
0+00	462.00	462.00	462.09
-0+50	462.04	462.04	462.04
-1+00	461.87		
-1+50	461.81		
-2+00	462.01		
-2+50	462.08		
-3+00	462.12		

LEGEND:
- EXISTING GROUND CONTOURS
- CL EXISTING TRACK
- EXISTING OVERHEAD POWER LINE
- EXISTING PROPERTY LINE
- CL EXISTING TRACK TO BE REMOVED
- EXISITING POINT OF SWITCH (P.SW.)
- CL PROPOSED TRACK
- PROPOSED GRADING LIMITS
- PROPOSED POINT OF SWITCH (P.SW.)

0 25 50 100
SCALE: 1"=50'

ISSUED FOR CONSTRUCTION

DESIGN NINE, INC.
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
ST. LOUIS, MO.

PREPARED FOR AmerenCILCO

DRAWN	SPH
CHKD.	GTH
SUPV.	
APPD.	

PROPOSED 150 CAR LOOP TRACK FOR EDWARDS POWER PLANT BARTONVILLE, ILLINOIS

LOCATION	DETAIL OF MERCHANTS TRACK AREA	CLASS

AmerenCILCO ST. LOUIS, MISSOURI

DRAWING NO.	SHEET NO.	REV.
03057-1	10 OF 25	2

T:\2003\Ameren\Edwards\Design-off ROW & pond\03057-1.dwg, Detail Merchants Trk Area 50' (5), 12/5/2003 1:31:59 PM, SPH

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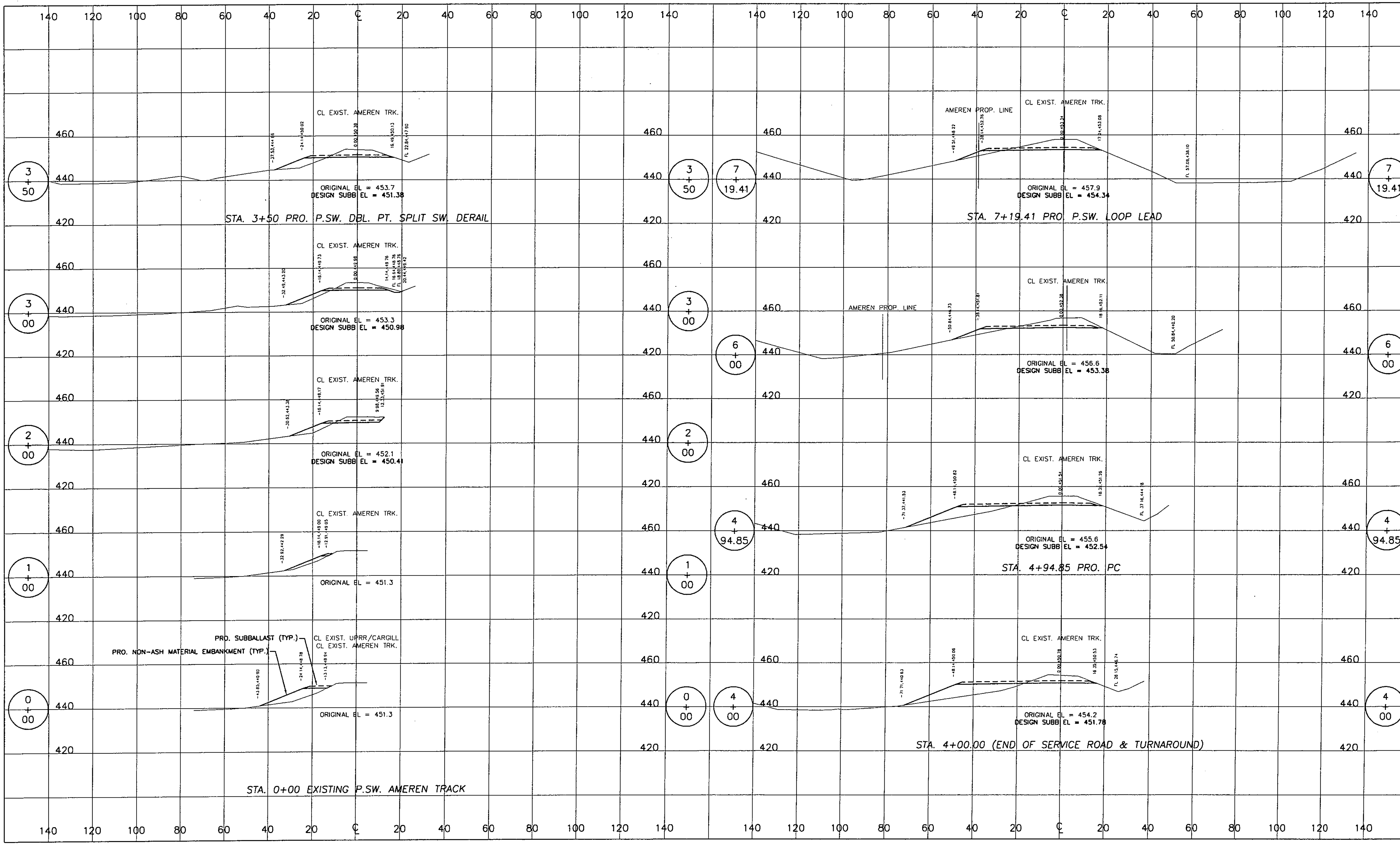
DIST.

REVISIONS

REV.	W.O.
0	11/05/03 PRELIMINARY FOR APPROVAL
1	11/20/03 ISSUED FOR CONSTRUCTION
2	12/03/03 ISSUED FOR CONSTRUCTION



T:\2003\Ameren\Edwards\Design-off ROW & pond\03057-1X.dwg, Sheet(1), 12/5/2003 10:36:47 AM, mpa

LEGEND:

ISSUED FOR CONSTRUCTION

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DESIGN NINE, INC.
ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
ST. LOUIS, MO.

PREPARED FOR AmerenCILCO

DRAWN	SPH
CHKD.	GTH
SUPV.	
APPD.	

PROPOSED 150 CAR LOOP TRACK
FOR EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

LOCATION	CROSS SECTIONS – LOOP TRACK STA. 0+00 TO STA. 7+20.79	CLASS
AmerenCILCO ST. LOUIS, MISSOURI	DRAWING NO. 03057-1X	SHEET NO. 11 OF 25	REV. 2

PRINT DIST.

REVISIONS	
REV.	W.O.
0	11/05/03
PRELIMINARY FOR APPROVAL	
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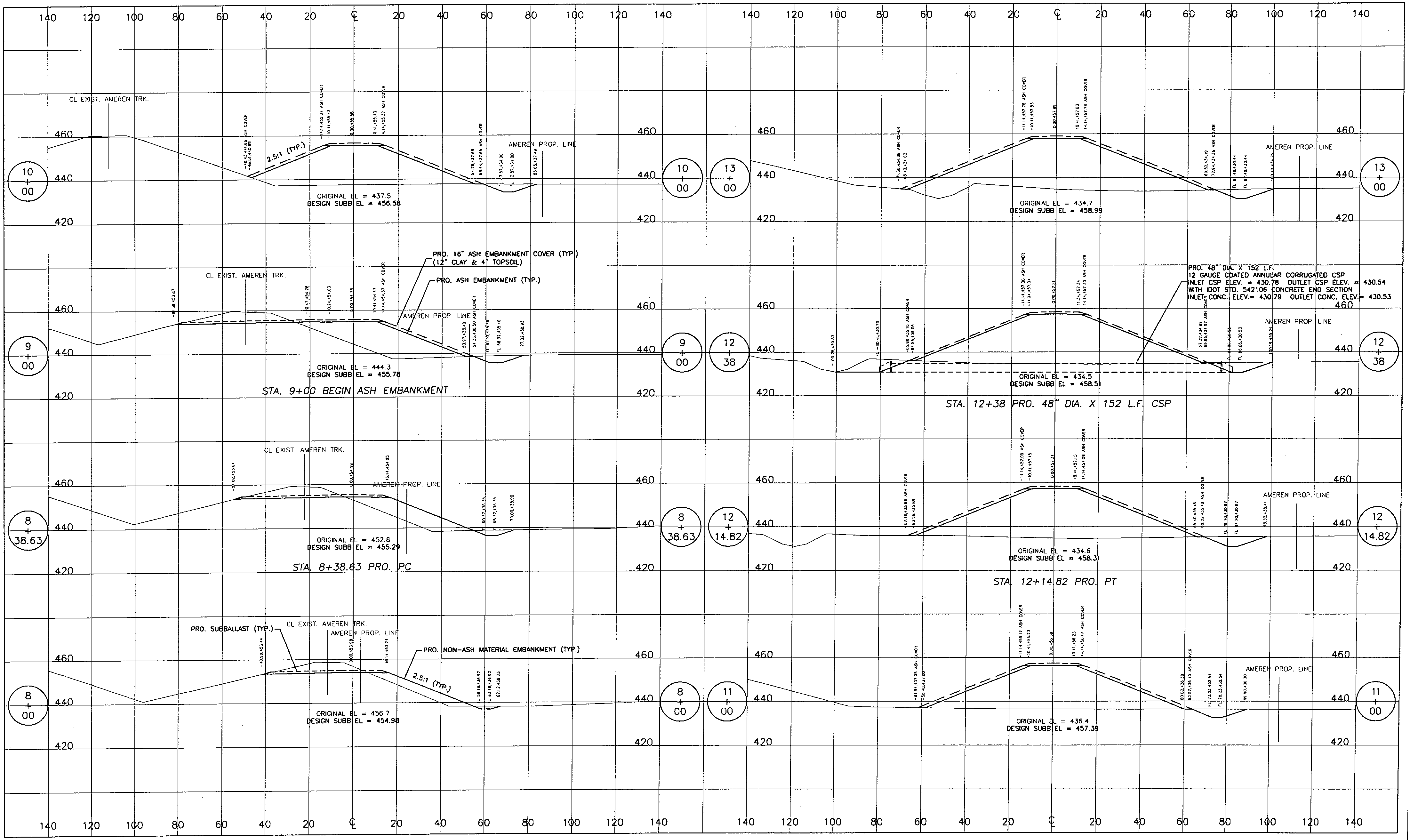

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ENGINEERING SERVICES FOR RAILROADS AND INDUSTRY
ST. LOUIS, MO.

PREPARED FOR AmerenCILCO

DRAWN	SPH
CHKD.	GTH
SUPV.	
APPD.	

PROPOSED 150 CAR LOOP TRACK
FOR EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

LOCATION	CROSS SECTIONS – LOOP TRACK STA. 8+00 TO STA. 13+00	CLASS

ST. LOUIS, MISSOURI	DRAWING NO.	SHEET NO.	REV.
AmerenCILCO	03057-1X	12 OF 25	1

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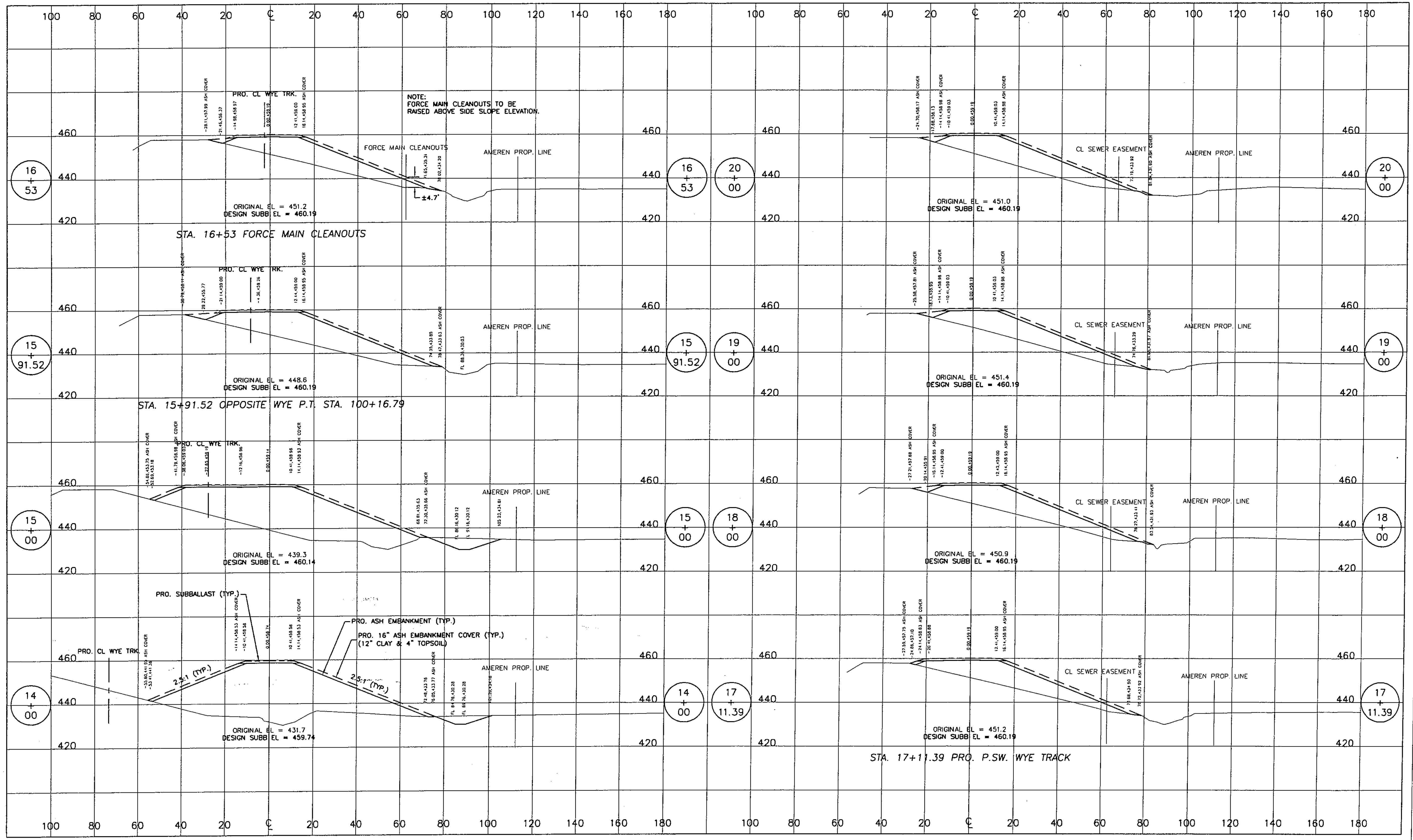

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APPD.	

PROPOSED 150 CAR LOOP TRACK
FOR EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

LOCATION	CROSS SECTIONS – LOOP TRACK STA. 14+00 TO STA. 20+00	CLASS

AmerenCILCO ST. LOUIS, MISSOURI

DRAWING NO.	SHEET NO.	REV.
03057-1X	13 OF 25	2

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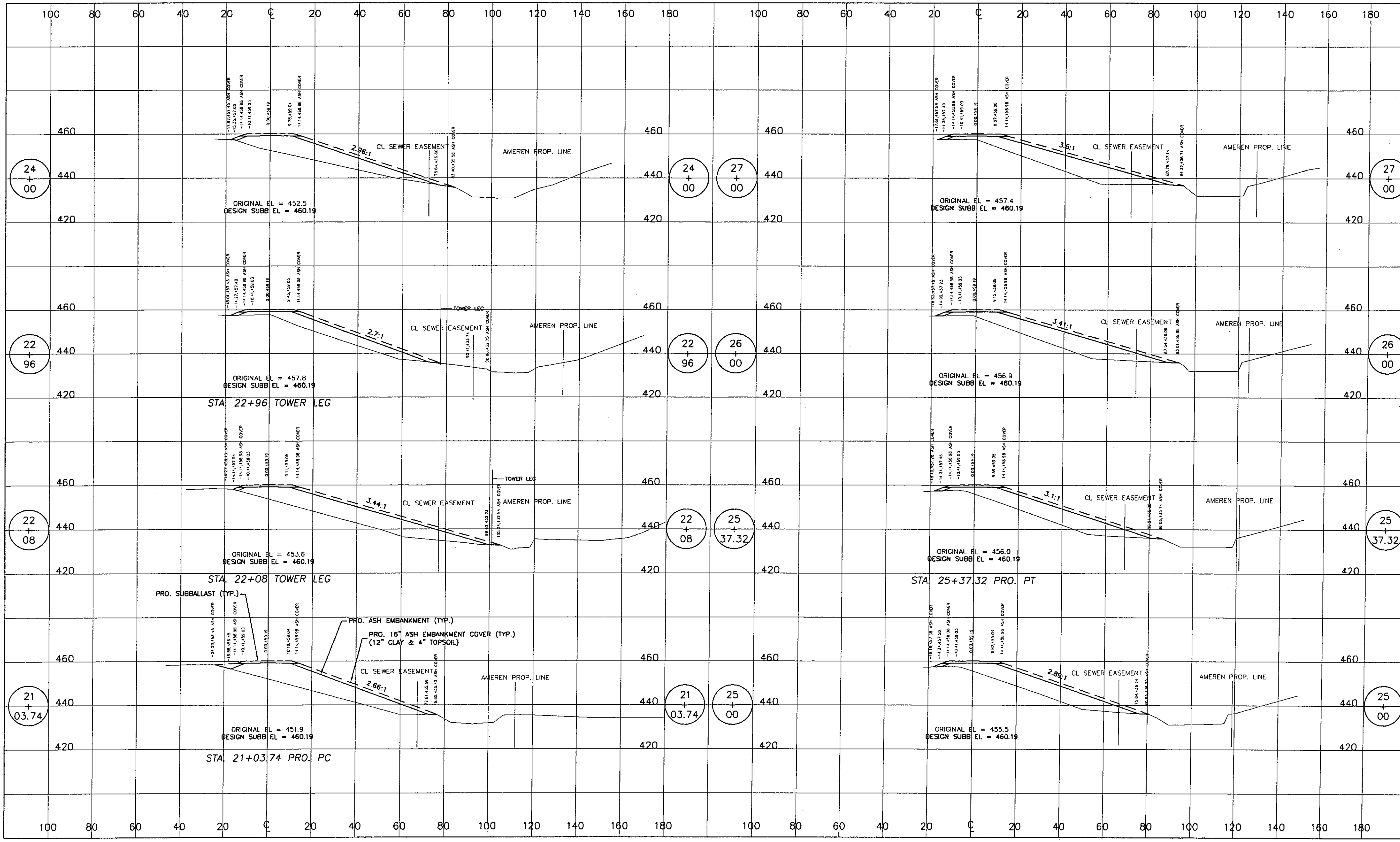

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APPD.	

PROPOSED 150 CAR LOOP TRACK FOR EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

LOCATION: CROSS SECTIONS – LOOP TRACK STA. 21+03.74 TO STA. 27+00

CLASS

ST. LOUIS, MISSOURI AmerenCILCO

DRAWING NO.	SHEET NO.	REV.
03057-1X	14 OF 25	2

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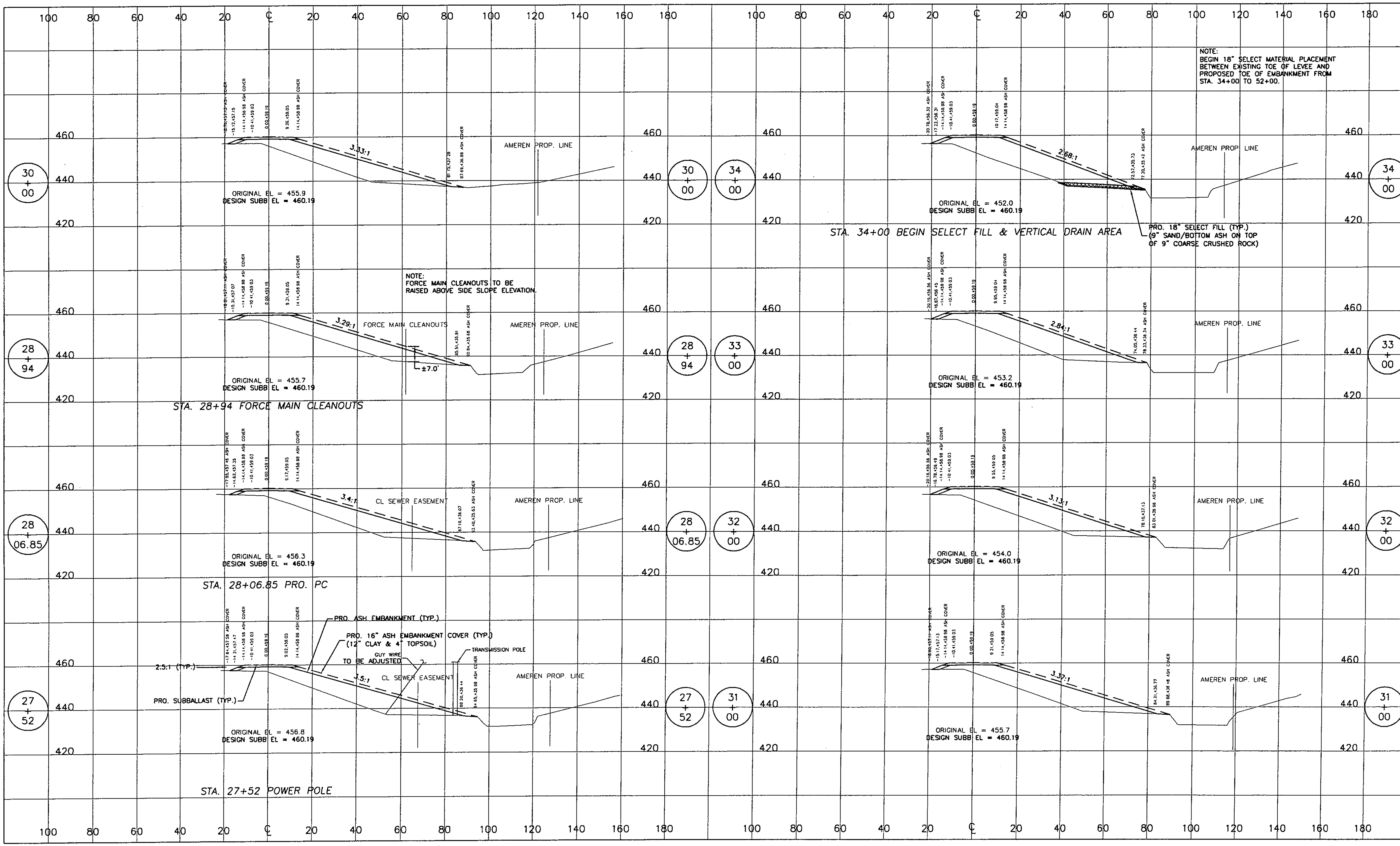

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DRAWN	SPH
CHKD.	GTH
SUPV.	
APPD.	

PROPOSED 150 CAR LOOP TRACK FOR EDWARDS POWER PLANT BARTONVILLE, ILLINOIS

LOCATION	CROSS SECTIONS – LOOP TRACK STA. 27+52 TO STA. 34+00	CLASS

ST. LOUIS, MISSOURI
AmerenCILCO

DRAWING NO.	SHEET NO.	REV.
03057-1X	15 OF 25	2

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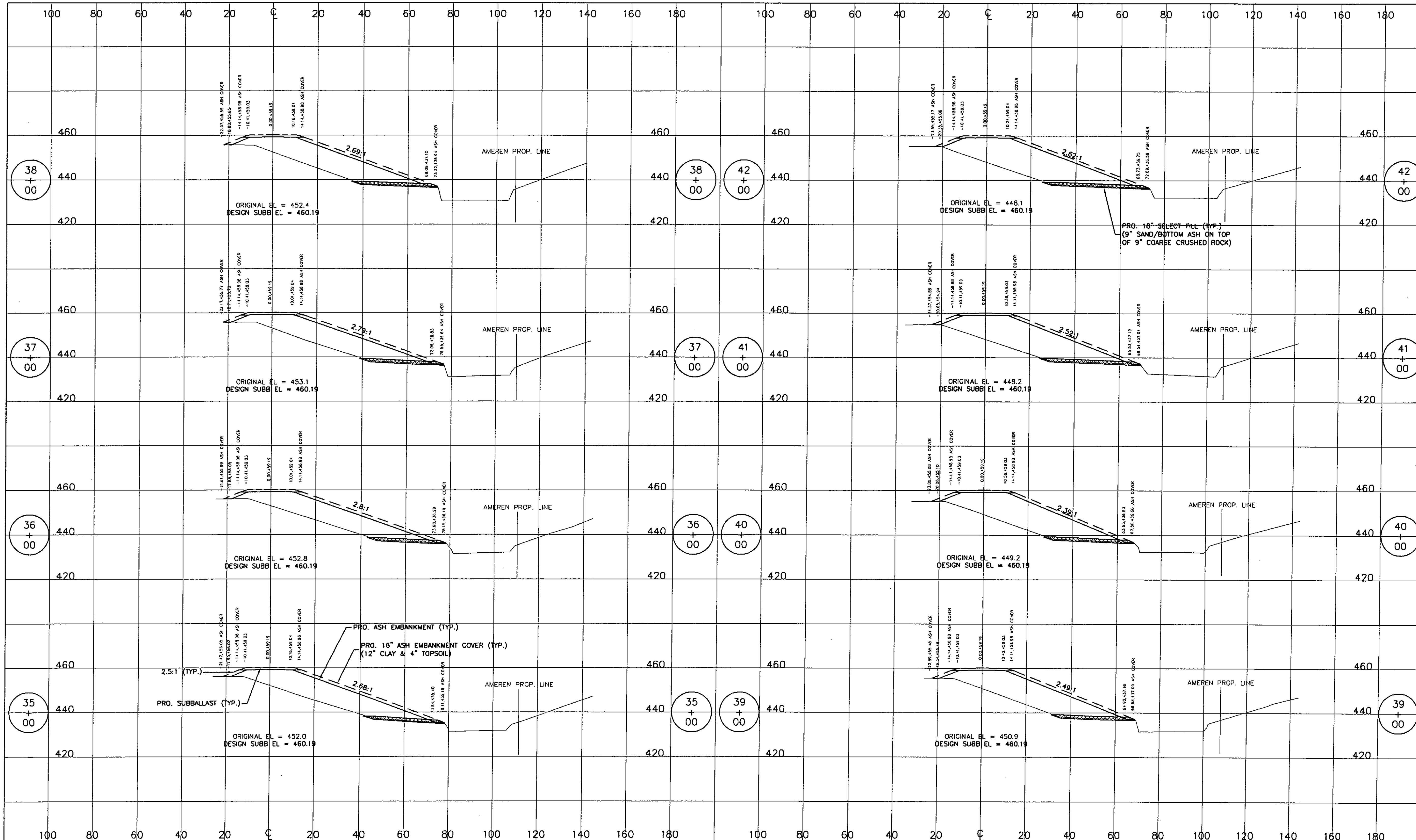

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ST. LOUIS, MO.

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CHKD.	GTH
SUPV.	
APPD.	

PROPOSED 150 CAR LOOP TRACK
FOR EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

LOCATION	CROSS SECTIONS – LOOP TRACK STA. 35+00 TO STA. 42+00	CLASS

AmerenCILCO ST. LOUIS, MISSOURI

DRAWING NO.	SHEET NO.	REV.
03057-1X	16 OF 25	1

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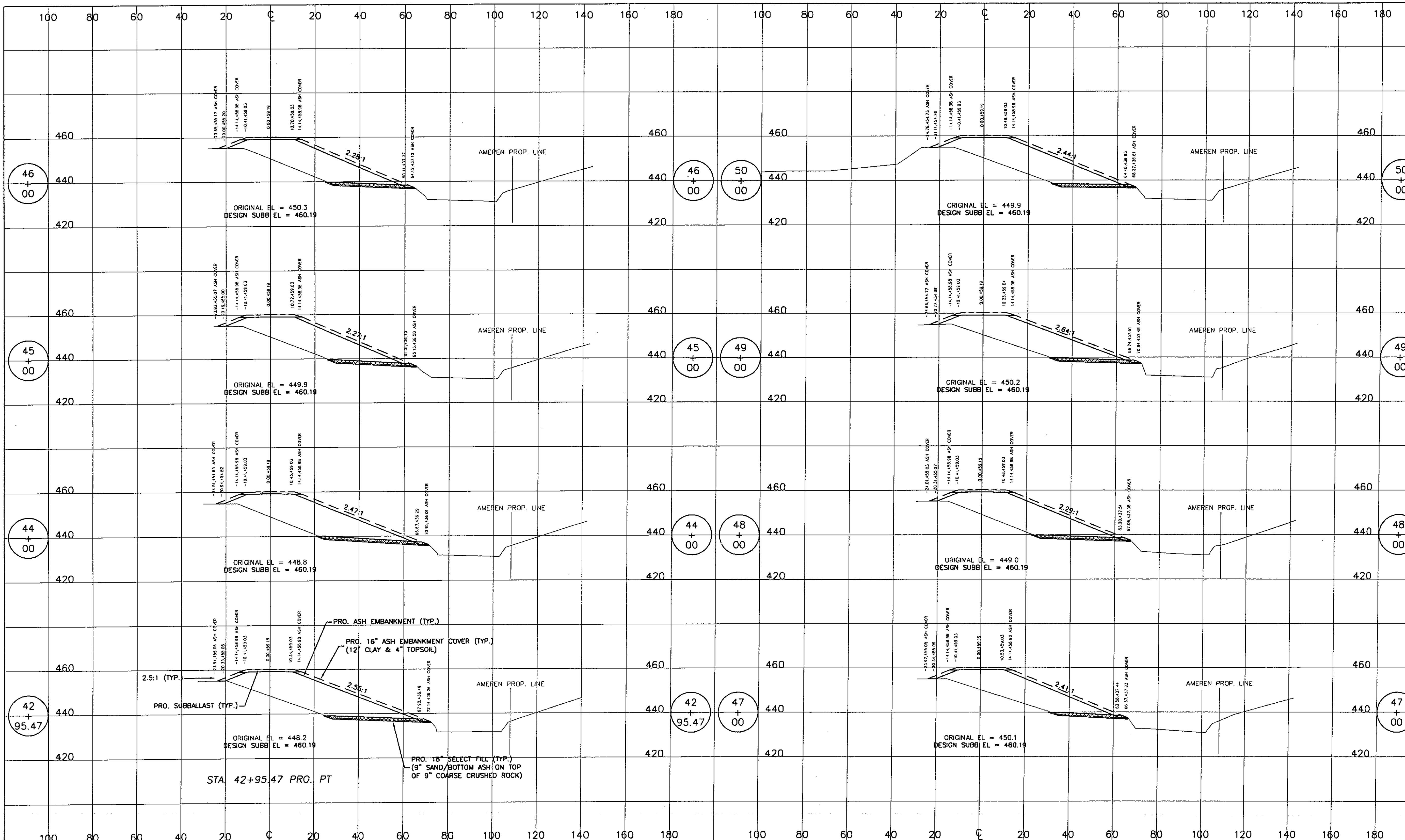

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ST. LOUIS, MO.

PREPARED FOR AmerenCILCO

DRAWN	SPH
CHKD.	GTH
SUPV.	
APPD.	

PROPOSED 150 CAR LOOP TRACK FOR EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

LOCATION: CROSS SECTIONS – LOOP TRACK STA. 42+95.47 TO STA. 50+00

CLASS

AmerenCILCO ST. LOUIS, MISSOURI

DRAWING NO.	SHEET NO.	REV.
03057-1X	17 OF 25	1

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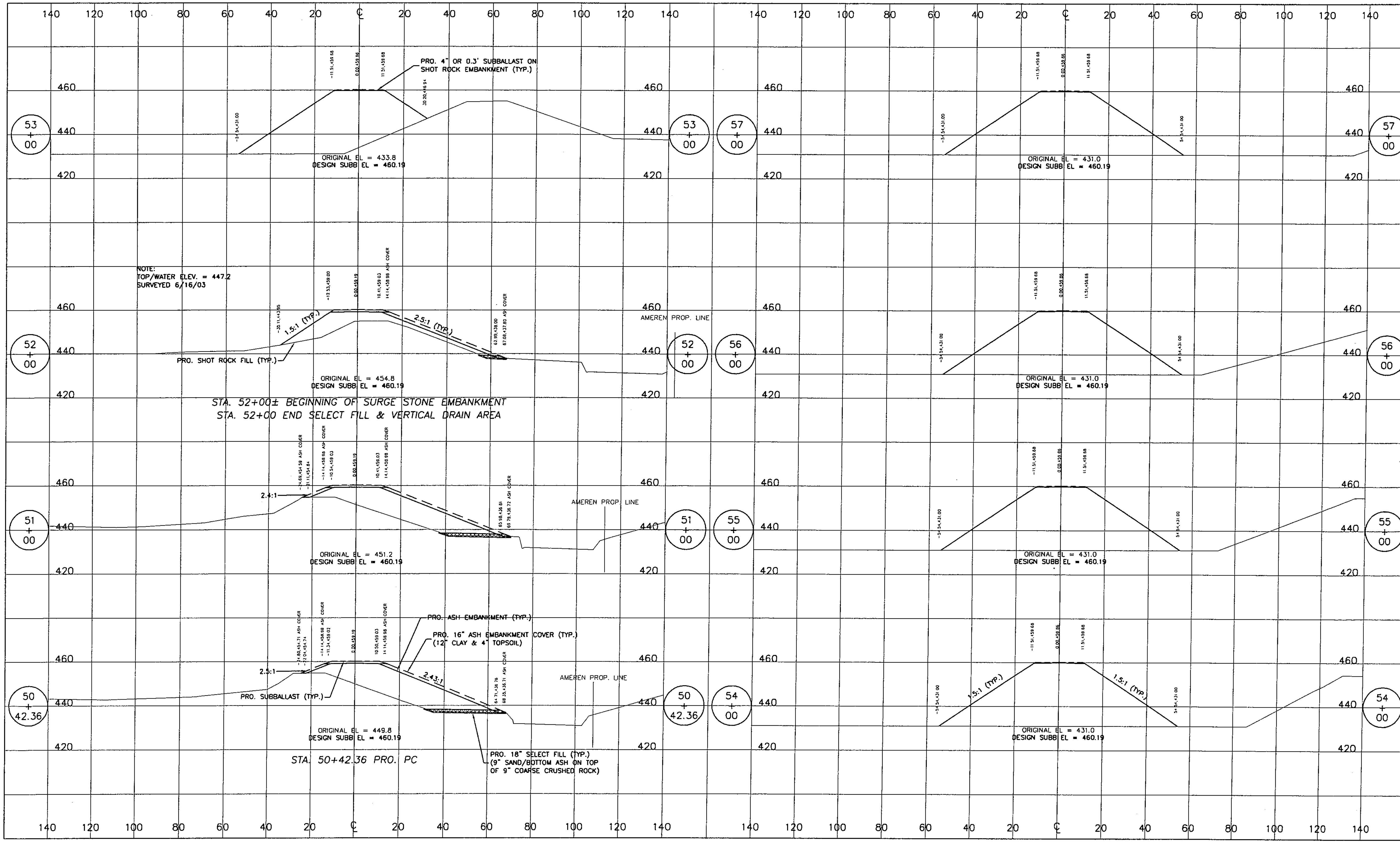

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ST. LOUIS, MO.

PREPARED FOR AmerenCILCO

DRAWN	SPH	PROPOSED 150 CAR LOOP TRACK FOR EDWARDS POWER PLANT BARTONVILLE, ILLINOIS
CHKD.	GTH	
SUPV.		
APPD.		

LOCATION	CROSS SECTIONS – LOOP TRACK STA. 50+42.36 TO STA. 57+00		CLASS
AmerenCILCO ST. LOUIS, MISSOURI	DRAWING NO. 03057-1X	SHEET NO. 18 OF 25	REV. 2

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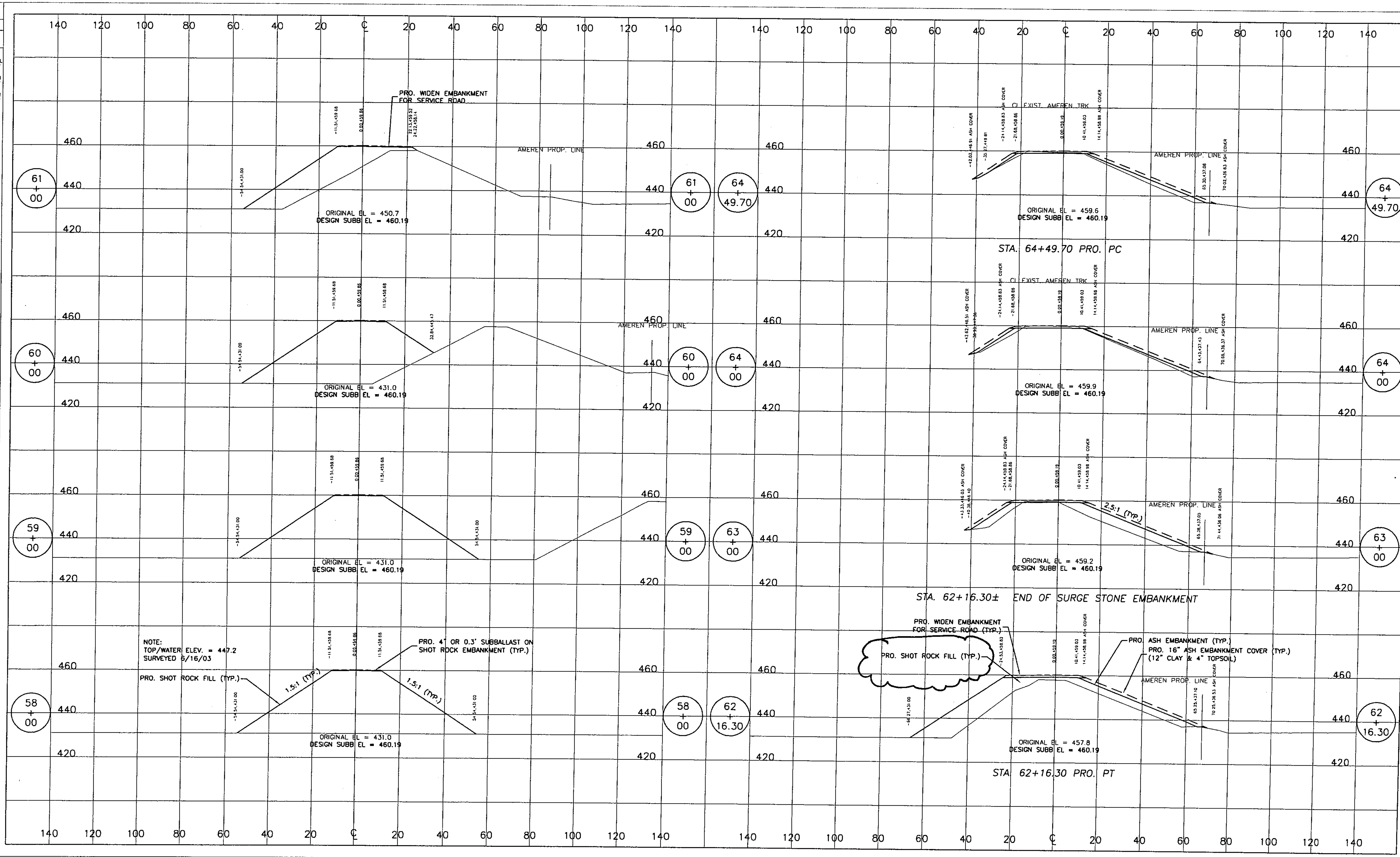

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CHKD.	GTH
SUPV.	
APPD.	

PROPOSED 150 CAR LOOP TRACK FOR EDWARDS POWER PLANT BARTONVILLE, ILLINOIS

LOCATION	CROSS SECTIONS - LOOP TRACK STA. 58+00 TO STA. 64+49.7	CLASS
ST. LOUIS, MISSOURI	DRAWING NO. 03057-1X	SHEET NO. 19 OF 25	REV. 2

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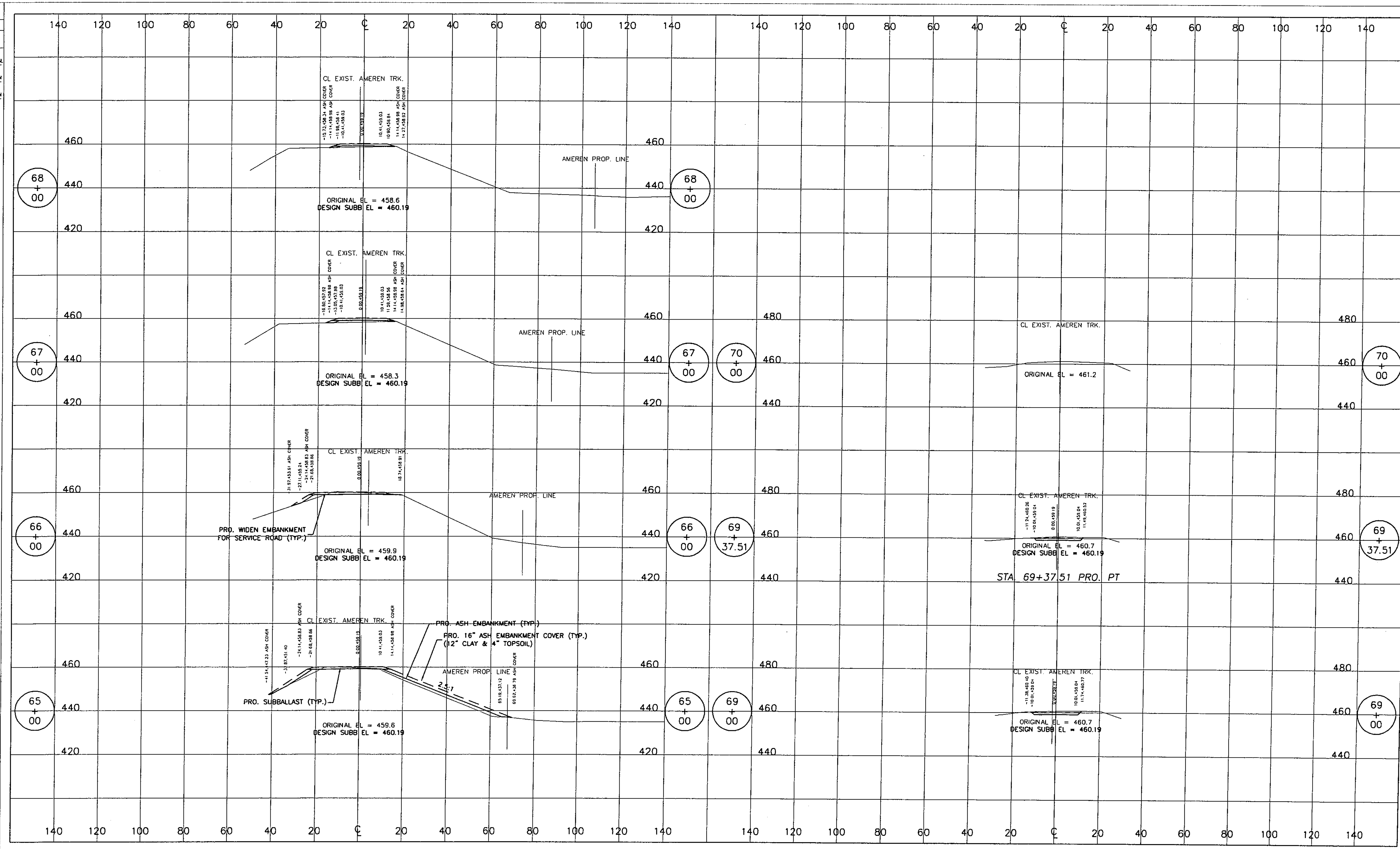

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ST. LOUIS, MO.

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DRAWN	SPH
CHKD.	GTH
SUPV.	
APPD.	

PROPOSED 150 CAR LOOP TRACK
FOR EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

LOCATION	CROSS SECTIONS – LOOP TRACK STA. 65+00 TO STA. 70+00	CLASS

AmerenCILCO ST. LOUIS, MISSOURI

DRAWING NO.	SHEET NO.	REV.
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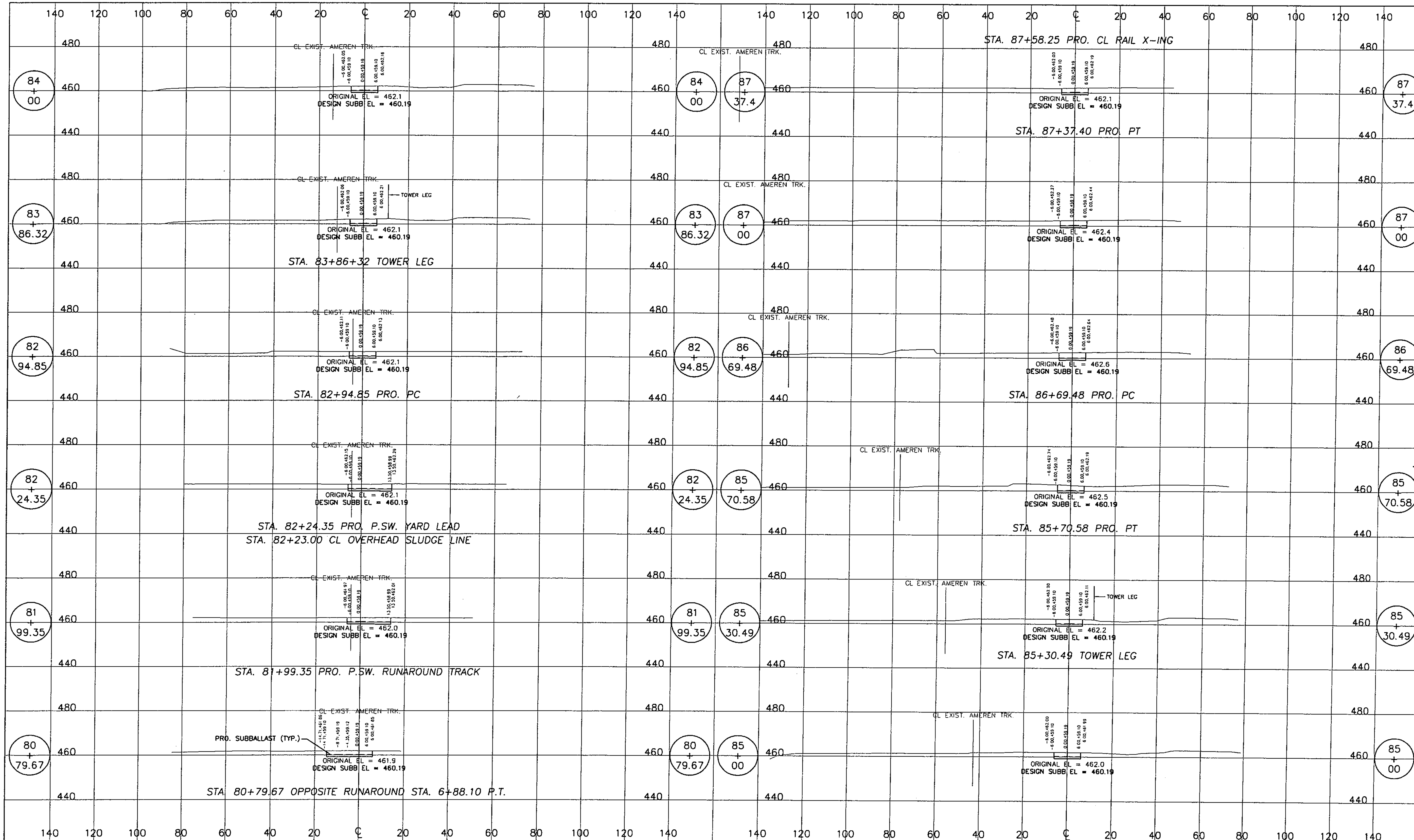

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PREPARED FOR AmerenCILCO

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CHKD.	GTH
SUPV.	
APPD.	

PROPOSED 150 CAR LOOP TRACK FOR EDWARDS POWER PLANT BARTONVILLE, ILLINOIS

LOCATION: ST. LOUIS, MISSOURI

CROSS SECTIONS - LOOP TRACK STA. 80+79.67 TO STA. 87+37.4

CLASS

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DRAWING NO.	SHEET NO.	REV.
03057-1X	21 OF 25	1

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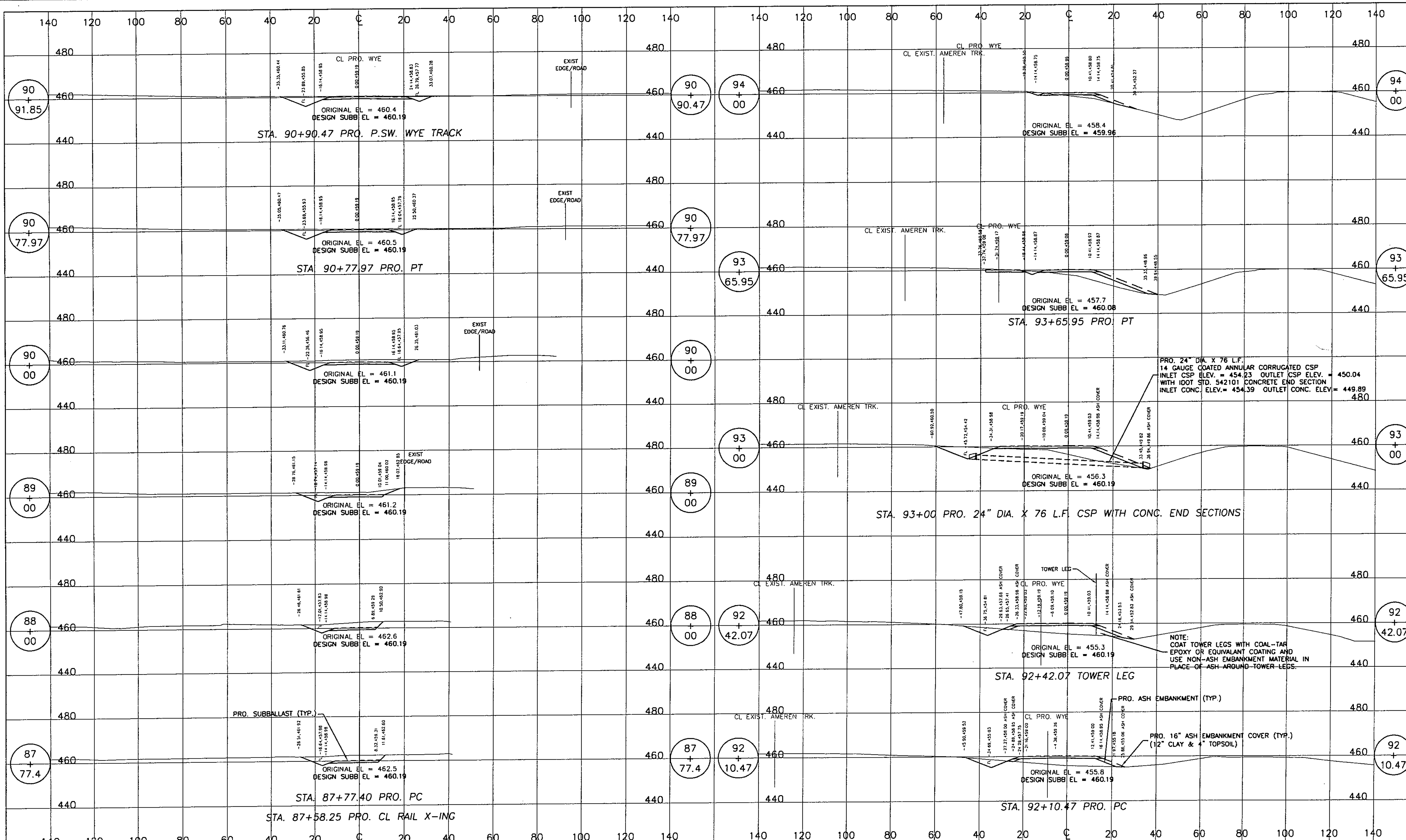

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CHKD.	GTH
SUPV.	
APPD.	

PROPOSED 150 CAR LOOP TRACK FOR EDWARDS POWER PLANT BARTONVILLE, ILLINOIS

LOCATION: CROSS SECTIONS – LOOP TRACK STA. 87+77.4 TO STA. 94+00

CLASS

AmerenCILCO ST. LOUIS, MISSOURI

DRAWING NO.	SHEET NO.	REV.
03057-1X	22 OF 25	2

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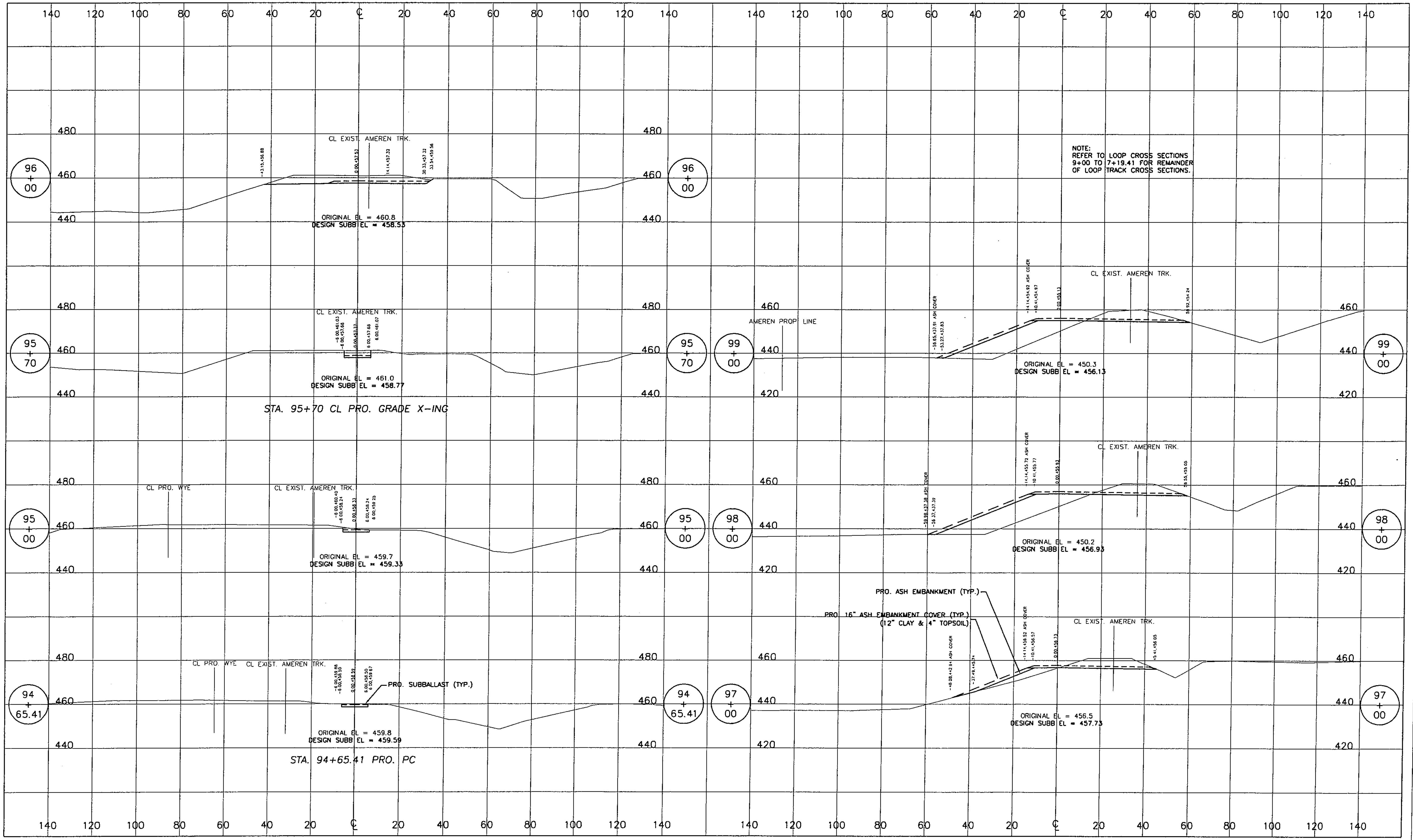

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ST. LOUIS, MO.

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CHKD	GTH
SUPV.	
APPD.	

PROPOSED 150 CAR LOOP TRACK FOR EDWARDS POWER PLANT BARTONVILLE, ILLINOIS

LOCATION: CROSS SECTIONS – LOOP TRACK STA. 94+65.41 TO STA. 99+00

CLASS

AmerenCILCO ST. LOUIS, MISSOURI

DRAWING NO.	SHEET NO.	REV.
03057-1X	23 OF 25	2

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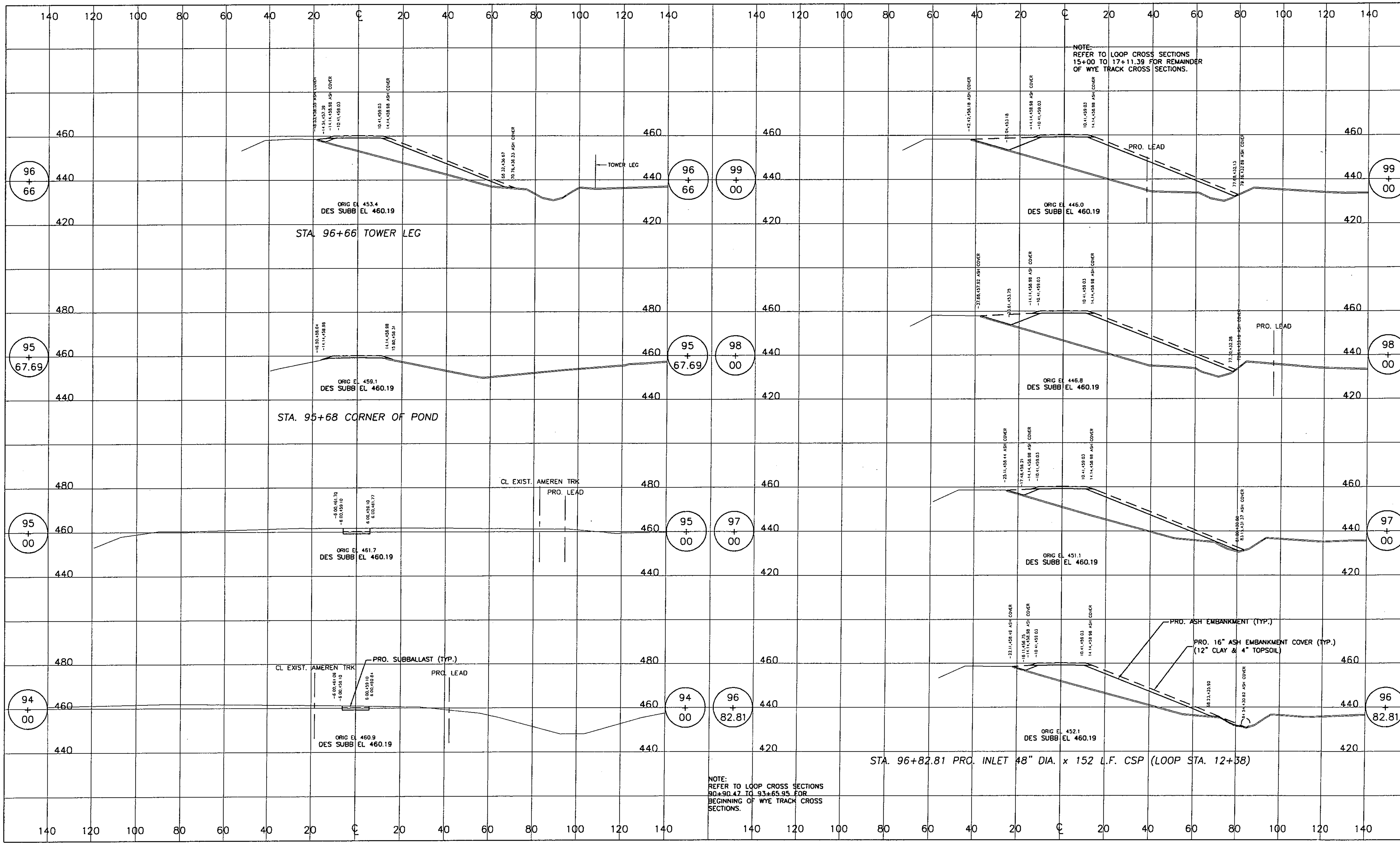

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ST. LOUIS, MO.

PREPARED FOR AmerenCILCO

DRAWN	SPH	PROPOSED 150 CAR LOOP TRACK FOR EDWARDS POWER PLANT BARTONVILLE, ILLINOIS
CHKD.	GTH	
SUPV.		
APPD.	LOCATION	CROSS SECTIONS - WYE TRACK STA. 94+00 TO STA. 99+00 — CLASS

AmerenCILCO ST. LOUIS, MISSOURI	DRAWING NO.	SHEET NO.	REV.
	03057-1X	24 OF 25	2

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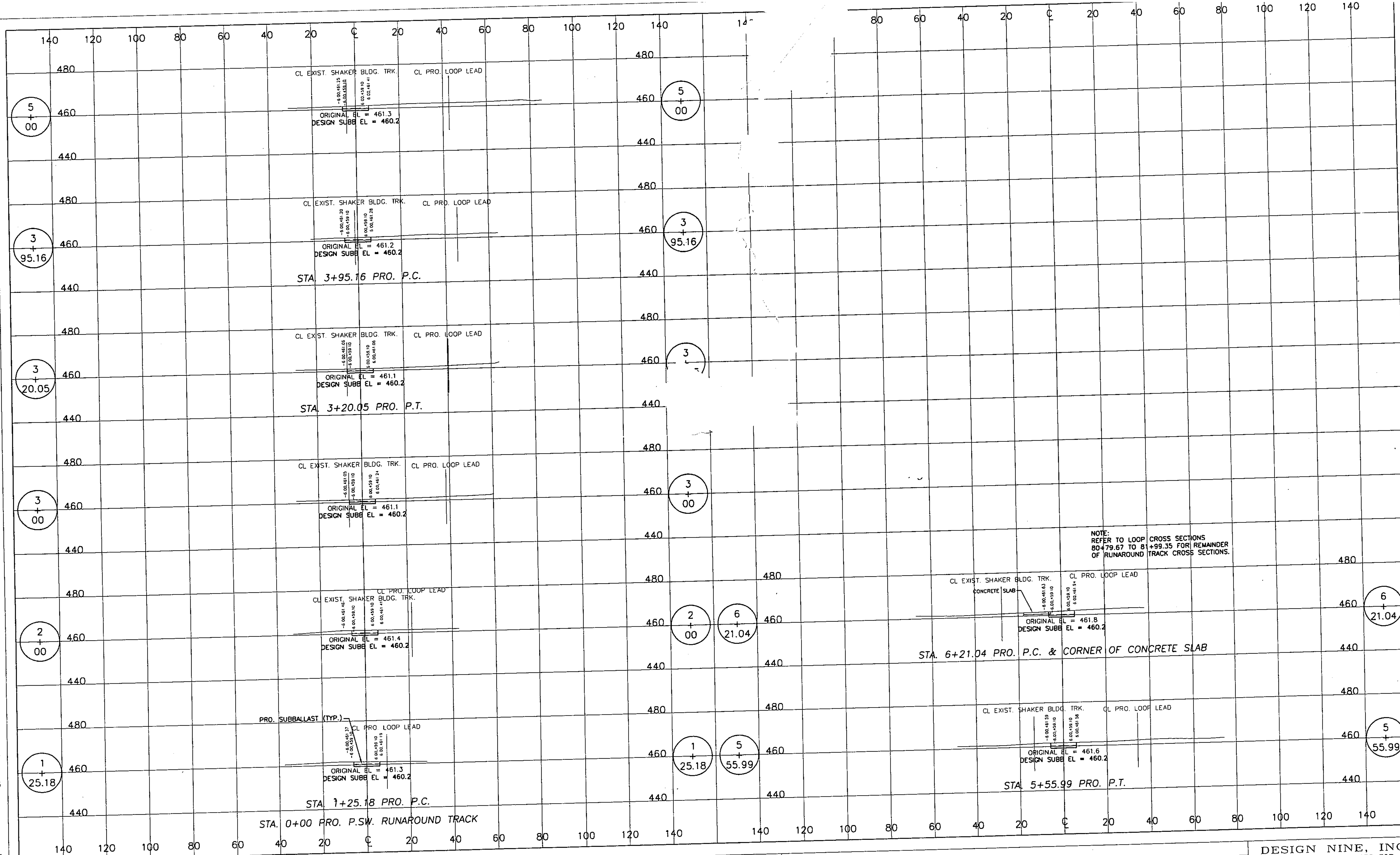

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ST. LOUIS, MO.

PREPARED FOR AmerenCILCO

PROPOSED 150 CAR LOOP TRACK
FOR EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

DRAWN	SPH
CHKD.	GTH
SUPV.	
APPD.	

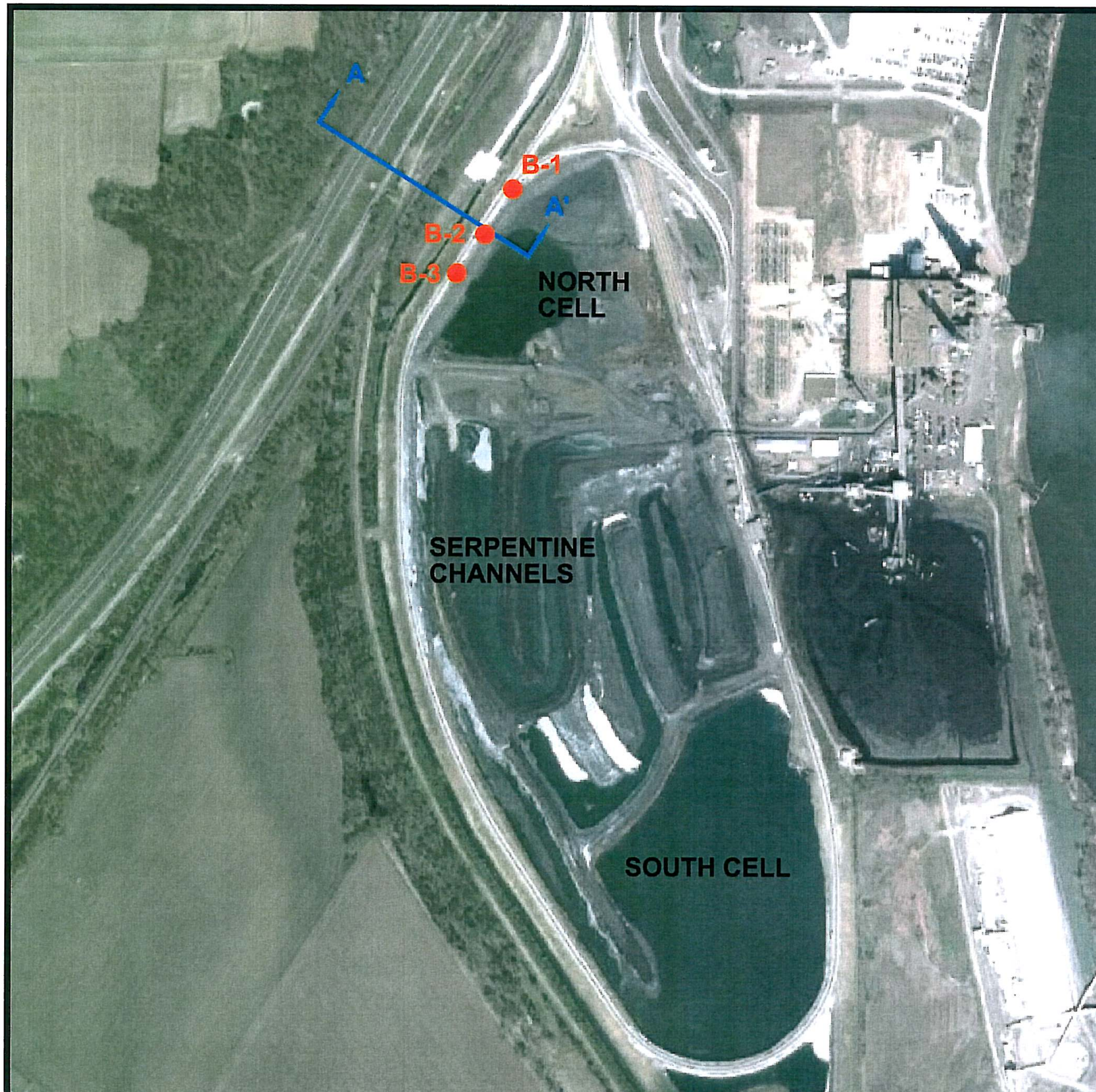
LOCATION: CROSS SECTIONS – RUNAROUND TRACK STA. 1+23.8 TO STA. 6+86.72

CLASS

AmerenCILCO ST. LOUIS, MISSOURI

DRAWING NO.	SHEET NO.	REV.
03057-1X	25 OF 25	2

Appendix C: Edwards Power Station Piezometer Locations



NOTES

1. Plan adapted from an aerial drawing courtesy of Google Earth, dated May 14, 2004.

LEGEND

Boring Location

Slope Stability Cross Section

N

0 1000 2000

SCALE IN FEET

Drawn By: SLC	Ck'd By: SR	App'vd By: DW
Date: 11-09-10	Date: 12/21/10	Date: 1/4/11

GEOTECHNOLOGY INC.
ENGINEERING AND ENVIRONMENTAL SERVICES
ST. LOUIS • COLLINSVILLE • KANSAS CITY

E. D. Edwards Power Station
Bartonville, Illinois

AERIAL PHOTOGRAPH OF SITE AND BORING LOCATIONS

Project Number J017150.01

PLATE 2

EXPLORATION METHOD
(B=BORING, C=CPT,
P=PIEZOMETER)

XXX-X###

ID NUMBER

STATION ABBREVIATION

SOURCE:
MAP PROVIDED BY GOOGLE EARTH PRO 2015

LEGEND

PIEZOMETER LOCATION

CCR UNIT BERM ALIGNMENT

N

0 400

APPROXIMATE SCALE FEET

Illinois Power Resources Generating, LLC	PROJECT NO. 60440202
AECOM	
DRN. BY: djd October 2015 DSGN. BY: eg CHKD. BY: eg	Edwards Ash Pond Piezometer Locations — FIG. NO. 2A

File: P:\PROJECTS\GEOTECH\60428794_DYNEGYCCR\04TASKS\00 PROGRAM TASKS\1.0 TASK 1 INITIAL UNIT ASSESSMENT\CCR FACT SHEETS\SITE MAPS\FIGURE 2A PIEZOMETER LOCATION PLAN (EDWARDS ASH POND).DWG Last edited: NOV. 04, 15 @ 09:32 a.m. by: david_deguire

AECOM

Appendix D: Operation and Maintenance Manual for Ash Ponds and Levees

Edwards Power Station

Operational Procedure

X-XXX-XXXX--XXX

Operation & Maintenance Manual for Ash Ponds and Levees

Effective Date: xx/xx/xxxx

Reason for Change: New Procedure

Approved By: *x* Date: xx/xx/xxxx

x
Greg Russell

Responsible Department: Edwards Power Station, Technical Services Department

- ☐ This entire document shall be in the field during procedure performance.
- ☐ The following portions of this procedure shall be in the field during procedure performance: ____________________
- ☐ __________ from this procedure shall be in the field during procedure performance.
- ☐ No part of this procedure is required to be in the field during procedure performance.

Table of Contents

1.0 Purpose

1.1 This procedure is intended to ensure the safe and environmentally responsible operation and use of all water impoundment and levee structures at Edwards Power Station facility. The primary purpose of the Edwards Fly Ash Pond is for the storage of fly ash and treatment of fly ash sluice water to meet NPDES Permit Conditions. The primary purpose of the Pekin-Lamarsh Levee is flood prevention. This procedure then assures:

1.1.1 The embankment structures and flow regulating structures are properly operated and maintained.

1.1.2 Inspections of these structures are conducted.

1.1.3 A maintenance program will be performed.

1.1.4 Communication takes place with the Dam Safety Staff regarding the structures' condition and operation.

2.0 Scope

2.1 This procedure applies to all onsite personnel and the Dam Safety Group staff.

3.0 Responsibilities

3.1 On-site Technical Services – Conducts ash pond and levee embankment and structure observations and completes the inspections, reporting any undesirable conditions to the Supervising Engineer, Dam Safety.

3.2 On-site personnel – Operates the facilities as described in this Operational Procedure. Reports any conditions noted during routine activities to the shift supervisor. Coordinates scheduling of maintenance as required to maintain proper operations of the ash pond facility.

3.3 Shift Supervisor (SS) - Calls Technical Service personnel when structure concerns are reported. Make entries into the shift log book indicating the concern and actions taken.

3.4 Supervising Engineer, Dam Safety - Conducts annual detailed dam safety inspections and provides a report with findings and recommendations.

4.0 Historical Information

4.1 Plant construction started in 1959. The original ash pond was located north of Unit 1 in the area of the current switch yard. In the 1960's, the current ash pond was opened. Original plans show the top of berm elevation to be constructed at 462'. Site surveys and geotechnical borings show the height of the berm to be 455± and the clay core at 452±. In 2004, the top berm was raised and outer embankment thickened to allow for construction of a railroad loop for coal train unloading. The south end of the pond was cut-off by the rail loop embankment and was subsequently filled in with ash, then covered with a topsoil cap. Specifications for the construction of the original ash pond berm are not available.

4.2 The Pekin-Lamarsh Levee was constructed by the Pekin & Lamarsh Drainage and Levee District. The U.S. Army Corps of Engineers inspects the levee annually and sends the reports to the levee district. The levee district requested that the ash pond outlet pipe be inspected after the Corps inspection in 2008. Due to high water in the Illinois River, the inspection was not completed until December, 2009. The inspection report is on file in the Dam Safety office. Plans of the outlet pipe construction are on file as listed in the table below.

5.0 Flow Regulating Structures

5.1 Embankments

- North Levee (Pekin-Lamarsh Levee District)
  The North Levee is approximately 1300' long with a top elevation of 458'±. This levee was built prior to construction of the plant. There are no known levee penetrations in this portion of levee. Construction of the power plant broke the continuous section of levee into two parts. At the plant, the landside area has been filled to the top of levee. Nature of the fill is not known.

- South Levee (Pekin-Lamarsh Levee District)
  The South levee is approximately 2200' long with a top elevation of 458'±. The levee was constructed prior to construction of the plant. Penetrations thru the south levee include the ash pond drainage pipe and slide gate, cooling water intake, and cooling water discharge piping. Plans for construction of the ash pond drainage pipe, cooling water discharge duct, and cooling water intake pipe/screen house are on file. We currently do not have copies of the original levee drawings on file.

- Ash Pond (Bottom Ash / Fly Ash)
  Top of ash pond berm elevation was originally designed at Elevation 462.00, but the berm was not constructed to this elevation. See attached design plans (1960) and site surveys (2003). From boring logs done in 2003, the top of clay core is approximately 452±. This top of clay elevation

varies around the embankment. In 2004, the east and south berms were modified to accommodate the rail loop. Currently, the top of rail is at elevation 462.40 with top of subgrade being 2.2' below top of rail, or 460.20.

The ash pond is divided into several components: 1.) Fly ash settling basin on the south; 2.) Serpentine channels in the center; and 3.) Bottom ash/Process water basin on the north. The basins are separated by interior dikes constructed of ash. Elevations of the interior dikes are slightly above the exterior embankments at the serpentine channels. Water level in the pond should always be kept 2 feet below the level of the clay core (452.00) in the embankment. Therefore, normal high pool elevation is 450.00. This allows for 2.9 feet of storage depth over the top of the ash pond outlet structure; or approximately 116 acre-ft storage or 37,850,000 gallons (45% of 89 acres times 2.9' deep).

5.2 Structures

- Ash Pond Outlet Structure - The water level in the pond is regulated by the pond outlet structure on the east side of the pond. Plans showing the outlet structure and walkway are on file. The pond outlet structure shall be checked regularly (at least weekly or more often if there are excessive rain events) to ensure proper pond discharge. Elevation of the top of the structure is 447.1'446.1. Elevation of the walkway is 456.4'455.4. Normal depth of flow over the drop structure is 3 to 4 inches during non-rainfall discharge. A 36-inch diameter CMP exits the outlet structure.
- Outlet Pipe Slide Gate – A 36-inch diameter cast iron slide gate regulates flow from the ash pond to the Illinois River. In flood conditions, this gate is closed to prevent flood water from backing up into the pond. The gate is located on the south end of the Pekin-Lamarsh Levee. It is a positively seating gate (flood condition). The gate is actuated by a manual wheel operator at the top of the structure. Depth of the gate is approximately 25'. Plans showing the construction details of the slide gate structure are on file.
- Outlet Pipe Flap Gate – A 36-inch diameter circular cast-iron automatic drainage flap gate is located at the end of the ash pond outlet pipe, 90 feet downstream of the slide gate. This is a general purpose flap gate to keep debris and flow from entering the outlet pipe. The flap gate is 36" diameter. Plans showing notes relating to the flap gate construction are on file.
- Bottom Ash/Process Water Culvert Pipe – This culvert regulates the level of water in north basin of the Ash Pond. This pipe is located in a berm

constructed from ash. Flowline elevations of the pipe are 449.38' inlet and 448.30' outlet.

- Fly Ash Culvert Pipes – Two culvert pipes are located near the sluice pipe outlet to deliver flow into either of two serpentine channels. Each serpentine channel is constructed of ash and used to settle-out the majority of ash prior to the flow entering the south basin. The two serpentine channels are alternated as the ash accumulates and is excavated or dredged from the channel.

6.0 Operations Requirements

Normal Operation - Plant personnel shall monitor the level of all ash pond basins within the perimeter ash pond berm on a daily basis. If levels within any of the basins exceed the prescribed maximum levels, action shall be taken immediately to remedy the situation.

Normal Operating Levels	
Ash Pond Outlet Structure	447.1'
South Pond Water Level	447.3'
North Pond Process Water Culvert Pipe	449.38
North Basin Water Level	449.5'

Illinois River Flood Stage – Plant personnel shall monitor the Illinois River level when approaching and exceeding flood stage on a daily basis. When river level equals the ash pond water level and the river is rising, the slide gate at the Pekin-LaMarsh levee should be closed. Ash pond water levels and river levels should then be monitored on a daily basis to determine when the slide gate should be opened to allow flow from the pond to the river. At no time should water from the river be allowed to flow into the pond.

Emergency Conditions – If a condition arises where there is a possibility of an embankment failure, then the following procedures will be followed:

1. Notify the Supervising Engineer Dam Safety immediately.
2. The pond level will be lowered by portable pumps. Monitor the embankment for changed conditions.

7.0 Maintenance Requirements

7.1 Maintenance Program - The plant's impoundment and flood prevention structures shall be inspected and maintained in a manner to ensure safe and environmentally responsible operations. A regular maintenance program shall be performed and shall consist of the following inspection items:

1. Earth embankments: Walk the crest, side slopes, and downstream toe of the dam concentrating on surface erosion, seepage, cracks,

settlement, slumps, slides, and animal burrows. Frequency of inspection: Quarterly.

2. Vegetation: Grass should be a thick vigorous growth to stabilize the earth embankment soils and prevent erosion form occurring. Note the height of the grass; if greater than one foot a mowing of the area should be scheduled before the next inspection. There should be NO trees on the earth embankment and none within a minimum of 20 feet of the embankment toe or other structures. Frequency of inspection: Quarterly.
3. Pond Outlet Structure: Check for any debris or other obstructions around the concrete inlet which may block or restrict the flow of water. Check for the development of any rusty areas on the concrete, and seepage, cracking, breaking, or spalling of concrete. Check for settlement or cracking in the walkway structure. Frequency of inspection: Quarterly.
4. Outlet Pipe Slide Gate: Check the structure for development of any rusty areas on the concrete, and seepage, cracking, breaking, or spalling of concrete. Check the slide gate stem, grease the stem, and operate the slide gate through its full range of motion to ensure proper operation. Check for buildup of debris in the manhole. Frequency of inspection: Quarterly.
5. Pond/Levee Perimeter: Check the perimeter of the embankment and levee for a distance of at least 100 feet from the toe for signs of seepage or boils. Inspection frequency for levee will be determined by Dam Safety Engineer during flood events. Frequency of ash pond embankment inspection: Quarterly for ash pond embankment.
6. Special Inspections – Special inspections of the levees and ash pond berms shall be performed after earthquakes, floods, water level exceedance in the ponds, or heavy rainfall events. Inspection and report shall be equal to an annual inspection level of detail. Water level in the pond should be noted after a heavy rainfall. Dam Safety staff shall accompany plant personnel on special inspections. Frequency: As required.

8.0 Maintenance Logs

8.1 Plant personnel shall maintain an up-to-date log of operations (water levels, gate adjustments, inlet and outlet flows, serpentine channels, etc.), visual observations, unusual occurrences, and maintenance performed. The log book shall be reviewed during the Annual Engineering Inspection. Logs shall be kept for the life of the plant.

9.0 Contact Numbers

Plant Environmental Supervisor: Mark Davis / 309-633-2861
Plant Operations Office: 309-633-2409
Plant Control Room: 309-633-2428 / 309-633-2425
Supervising Engineer Dam Safety: Steve Bluemner / 314-554-6298
Dam Safety Staff Contact: Mike Wagstaff / 314-554-6296

10.0 References

10.1 AER - DSP-004, "Dam Safety Program for Non-Illinois Department of Natural Resources (non-IDNR) Regulated Facilities"

10.2 Drawings

Drawing Number	Sheet Name	Date
C175-G1915 Rev 2 Sheet A	Corps Permit Applications (Pekin-Lamarsh Levee Penetrations)	6-30-1960
C175-G3902 Rev. Sheet 3	Edwards Plant Site Layout	2-21-1986
C175-G3903 Rev. W Sheet 1	Plant Yard Layout	7-1-1969
C175-G3902 Rev. 0 Sheet 1	Plant Site Survey and Layout	8-7-1967
C175-G1913 Rev. C Sheet 2	Yard Drainage Details	7-31-1958
C175-G1913 Rev. Sheet 3	Yard Drainage Details – Catch Basins and Manholes	4-22-1958
C175-G1906 Rev. A Sheet 5	Plant Site Fill – Depressions Infill for Yard Foundations	5-14-1958
CSK-010 Rev. 0 Sheet	Sanitary Sewer Force Main Plan	2-19-2007
03057-	Proposed 150 Car Loop Track	12-3-2003
C175-G1906 Rev. D Sheet 1	Plant Site Fill – Phase #1	5-6-1958
C175-G1906 Rev. C Sheet 4	Plant Site Fill – Phase #1	5-6-1958
C175-G1906 Rev. B Sheet 2	Plant Site Fill – Phase #2	5-6-1958
C175-G1906 Rev. F Sheet 3	Plant Site Fill – Phase #3	5-6-1958
C175-G1921 Rev. D Sheet 2	Construction Thru Levee / Ash Pond Drainage Duct Detail	6-17-1958
201032 S-1 Rev 1	Overflow Pipe Area Site Plan / Ash Pond Floating Boom Replacement	7-23-2004
201032 S-2 Rev 1	Access Bridge Steel Framing / Ash Pond Floating Boom Replacement	7-23-2004
201032 S-3 Rev 1	Ash Pond Floating Boom Replacement / Hardboom and Stiff Arm Details	7-23-2004
C175-G3077 Rev. C Sheet 2	Site Equipment & Piping Layout	9-10-1976

10.3 Easements: Executed Easement Agreement dated 7 August 1957, between Pekin & Lamarsh Drainage and Levee District and Central Illinois Light

Company, for an easement in perpetuity for the maintenance of the levee. A copy of this document resides in the Dam Safety files.

11.0 Records

	Record Type	Responsible Person	Retention Period	Location
11.1	Copies of weekly inspections	Plant Technical Services	Life of plant	Onsite Environmental Supervisor and Dam Safety Department office
11.2	Copies of Quarterly inspections	Plant Technical Services	Life of plant	Onsite Environmental Supervisor and Dam Safety Department office
11.3	Log Book	Plant Technical Services	Life of plant	Onsite Environmental Supervisor office

Appendix E: Photos of 2009 Surficial Movement

Figure E.1: Photo of 2009 Surficial Movement

Figure E.2: Photo of 2009 Surficial Movement

Figure E.3: Photo of Surficial Movement Area after Repairs

Figure E.4: Photo of Surficial Movement Area after Repairs

ATTACHMENT C

Edwards Power Plant -- Ash Pond's Chemical Constituents

In accordance with 35 I.A.C. 845.230(d)(2)(C), IPRG is submitting available/existing analyses of "the chemical constituents of all waste streams, chemical additives and sorbent materials entering or contained in" the CCR impoundment, Ash Pond.

A list of the chemical constituents' analyses contained in the CCR surface impoundment can be found in Appendix A. As determined through antidegradation studies, this list contains chemical constituents found in the surface free liquid and the subsurface free liquids. IPRG is also including a list of chemical additives, sorbent materials and waste streams that were submitted in the facility's NPDES permit applications to IEPA within the past ten years at a minimum and/or listed in the current NPDES permit (IL0001554) in Appendix B.

Appendix A: Chemical Constituents Contained in the Ash Pond

Pollutant	Units	Surface Free Liquids Average Concentration	Subsurface Free Liquids Average Concentration
Ammonia	mg/L	< 0.275	1.71
Arsenic	mg/L	0.002	0.023
Arsenic, Dissolved	mg/L	< 0.00007	< 0.0004
Barium	mg/L	0.166	0.161
Boron	mg/L	0.332	15.5
Cadmium	mg/L	0.0002	0.0005
Cadmium, Dissolved	mg/L	0.0001	< 0.0001
Chloride	mg/L	103	100
Chromium	mg/L	0.002	0.011
Chromium (hexavalent)	mg/L	< 0.009	< 0.007
Chromium, Trivalent	mg/L	< 0.0002	< 0.0002
Copper	mg/L	0.005	0.011
Copper, Dissolved	mg/L	0.004	0.002
Cyanide	mg/L	< 0.002	< 0.002
Fluoride	mg/L	0.265	< 0.550
Fluoride, Dissolved	mg/L	0.270	< 0.340
Iron	mg/L	0.635	2.42
Iron, Dissolved	mg/L	0.016	< 0.025
Lead	mg/L	0.001	0.012
Lead, Dissolved	mg/L	0.0001	< 0.0001
Manganese	mg/L	0.021	0.026
Mercury	mg/L	0.0000045	0.0000127
Mercury, Dissolved	mg/L	< 0.0001	< 0.0001
Nickel	mg/L	0.002	0.014
Nickel, Dissolved	mg/L	0.002	0.004
Nitrate - Nitrite	mg/L	4.30	1.00
Nitrogen	mg/L	5.00	3.10
Nitrogen, Total Kjeldahl	mg/L	0.690	2.10
Oil and Grease	mg/L	< 1.20	< 1.08
pH*	SU	7.98	9.71
Phenols	mg/L	< 0.003	< 0.005
Selenium	mg/L	0.001	0.048
Silver	mg/L	< 0.00002	< 0.00005
Sulfate	mg/L	78.1	919
TDS	mg/L	517	1567
Total Hardness by 2340B	mg/L	329	501
TSS	mg/L	14.7	89.8
Zinc	mg/L	0.007	0.040
Zinc, Dissolved	mg/L	< 0.003	< 0.003

*Used https://calstormcompliance.com/ph-averaging-tool

Appendix B: List of Chemical Additives, Waste Streams and Sorbent Materials

Chemical Additives
Aqueous Ammonia
Bulab 5532 (polymer)
Bulab 8808 (antiscale)
Bulab 8862 (biocide)
Bulab 6057 (biocide)
Calcium Bromide (52%)*
Carbon Dioxide
Ferric Chloride (35%)
Hawkins Aqua Hawk 9937 (polymer)
Hydrated Lime
Hydrochloric Acid (cleaning only)
Molten Sulfur
Sodium Hydroxide (50%)
Sodium Hypochlorite
Sodium Metabisulfate
Strong Acid Cation Resin
Strong Base Anion Resin
Sulfuric Acid (93%)
Kochkleen L-11 (high pH cleaner)

* Only a very small percentage of these chemicals would enter the ash pond. A high majority of the product would be consumed in the combustion process.

Waste Streams and Sorbent Materials*
Fly Ash and Fly Ash Sluice Water
Bottom Ash, Economizer Ash pyrites sluice water
Non-chemical metal cleaning wastewater
Boiler and Turbine Room Sumps
Coal Pile Runoff
Yard Substation and Track Drains
Water treatment wastewater

*No sorbent materials

DYNEGY

Safety Data Sheet

Section 1
Identification of the Substance and of the Supplier

1.1 Product Identifier

Product Name/Identification:	ASTM Class C Fly Ash
Synonyms:	Coal Fly Ash, Pozzolan
Formula:	UVCB Substance

1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advices Against

Relevant Identified Uses:	Component of wallboard, concrete, roofing material, bricks, cement kiln feed.
Uses Advised Against:	None known.

1.3 Details of the Supplier of the SDS

Manufacturer/Supplier:	Dynegy, Inc.
Street Address:	601 Travis Street, Suite 1400
City, State and Zip Code:	Houston, TX 77002
Customer Service Telephone:	800-633-4704

Section 2
Hazards Identification

2.1 Classification of the Substance

GHS Classification(s) according to OSHA Hazard Communication Standard (29 CFR 1910.1200):

- Eye Irritant, Category 2A
- STOT-SE, Category 3 (Respiratory Irritation)
- Carcinogen, Category 1A
- STOT-RE, Category 1 (Lungs)
- Toxic to Reproduction, Category 2

2.2 Label Elements

Labelling according to 29 CFR 1910.1200 Appendices A, B and C*	
Hazard Pictogram(s):	
Signal word:	**DANGER**
Hazard Statement(s):	*Causes serious eye irritation.* *May cause damage to lungs after repeated/prolonged exposure via inhalation.* *May cause respiratory irritation.* *May cause cancer of the lung.* *Suspected of damaging fertility or the unborn child.*
Precautionary Statement(s):	*Obtain special instructions before use.* *Do not handle until all safety precautions have been read and understood.* *Avoid breathing dust.* *Wear protective gloves/protective clothing/eye protection/face protection.* *Wash thoroughly after handling.* *Do not eat drink or smoke when using this product.* *Use outdoors or in a well-ventilated area.* *If exposed or concerned: Get medical advice/attention.* *Store in a secure area.* *Dispose of product in accordance with local/national regulations.*

** Fly ash and other coal combustion products (CCPs) are UVCB substances (unknown or variable composition or biological). Various CCPs, noted as ashes/ash residuals; Ashes, residues, bottom; Bottom ash; Bottom ash residues; Waste solids, ashes under TSCA are defined as: "The residuum from the burning of a combination of carbonaceous materials. The following elements may be present as oxides: aluminum, calcium, iron, magnesium, nickel, phosphorus, potassium, silicon, sulfur, titanium, and vanadium." Ashes including fly ash and fluidized bed combustion ash are identified by CAS number 68131-74-8. The exact composition of the ash is dependent on the fuel source and flue additives composed of many constituents. The* *classification of the final substance is dependent on the presence of specific identified oxides as well as other trace elements.*

2.3 Other Hazards

Listed Carcinogens:

-Respirable Crystalline Silica

IARC: [Yes] **NTP:** [Yes] **OSHA:** [Yes] **Other:** **(ACGIH)** [Yes]

Section 3
Composition/Information on Ingredients

Substance	***CAS No.***	***Percentage (%)***	***GHS Classification***
Crystalline Silica	*14808-60-7*	*30 - 60%*	*Repeat Dose STOT, Category 1* *Carcinogen, Category 1A*
Silica, crystalline respirable (RCS)	*14808-60-7*	***See Footnote 1***	*Repeat Dose STOT, Category 1* *Carcinogen, Category 1A*
Aluminosilicates	*71243-67-9* *1327-36-2*	*30 - 60%*	*Single Exposure STOT, Category 3*
Iron oxide	*1309-37-1*	*1 - 10%*	*Not Classified*
Calcium oxide (CaO)	*1305-78-8*	*20 - 30%*	*Skin Irritant, Category 2* *Eye Irritant, Category 1* *Single Exposure STOT, Category 3*
Magnesium oxide	*1309-48-4*	*2 - 10%*	*Not Classified*
Phosphorus pentoxide (P_2O_5)	*1314-56-3*	*≤2%*	*Skin Irritant, Category 2* *Eye Irritant, Category 2B*
Sodium oxide	*1313-59-3*	*1-8%*	*Not Classified*
Potassium oxide (K_2O)	*12136-45-7*	*≤1%*	*Skin Irritant, Category 2* *Eye Irritant, Category 2B*
Titanium dioxide (TiO_2)	*13463-67-7*	*<3%*	*Not Classified*
Bromide salt (calcium)	*7789-41-5*	*See Footnote 2*	*Toxic to Reproduction, Category 2*

Footnote 1: *The percentage of respirable crystalline silica has not been determined. Therefore, a GHS classification of Carcinogen, Category 1A has been assigned.*

Footnote 2: *Analytical data are not available to demonstrate that the concentration of bromide salt is <0.1%; therefore, a GHS classification of Toxic to Reproduction, Category 2 has been assigned.*

Section 4
First Aid Measures

4.1 Description of First Aid Measures

Inhalation:	If product is inhaled and irritation of the nose or coughing occurs, remove person to fresh air. Get medical advice/attention if respiratory symptoms persist.
Skin Contact:	If skin exposure occurs, wash with soap and water.
Eye Contact:	If product gets into the eye, rinse copiously with water for several minutes. Remove contact lenses, if present and easy to do. Seek medical attention/advice if irritation occurs or persists.
Ingestion:	No specific first aid measures are required.

4.2 Most Important Health Effects, Both Acute and Delayed

Acute Effects: Direct exposure may cause respiratory irritation, eye irritation and skin irritation. The product dust can dry and irritate the skin and cause dermatitis and can irritate eyes and skin through mechanical abrasion.

Chronic Effects: Chronic exposure may cause lung damage from repeated exposure. Prolonged inhalation of respirable crystalline silica above certain concentrations may cause lung diseases, including silicosis and lung cancer. Repeated exposure to dusts containing inorganic bromide salts may affect fertility and/or result in effects to the unborn child.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

Seek first aid or call a doctor or Poison Control Center if contact with eyes occurs and irritation remains after rinsing. Get medical advice if inhalation occurs and respiratory symptoms persist.

Section 5
Firefighting Measures

5.1 Extinguishing Media

Suitable Extinguishing Media:	Product is not flammable. Use extinguishing media appropriate for surrounding fire.
Unsuitable Extinguishing Media:	Not applicable, the product is not flammable.

5.2 Special Hazards Arising from the Substance or Mixture

Hazardous Combustion Products:	None known.

5.3 Advice for Firefighters

Special Protective Equipment and Precautions for Firefighters:	As with any fire, wear self-contained breathing apparatus (NIOSH approved or equivalent) and full protective gear.

Section 6
Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Personal precautions/Protective Equipment:	See Section 8.2.2 Individual Protective Measures. For concentrations exceeding Occupational Exposure Levels (OELs), use a self-contained breathing apparatus (SCBA).
Emergency procedures:	Use scooping, water spraying/flushing/misting or ventilated vacuum cleaning systems to clean up spills. Do not use pressurized air.

6.2 Environmental Precautions

Environmental precautions:	Prevent contamination of drains or waterways and dispose according to local and national regulations.

6.3 Methods and Material for Containment and Cleaning Up

Methods and materials for containment and cleaning up:	Do not use brooms or compressed air to clean surfaces. Use dust collection vacuum and extraction systems. Large spills of dry product should be removed by a vacuum system. Dampened material should be removed by mechanical means and recycled or disposed of according to local and national regulations.

See Sections 8 and 13 for additional information on exposure controls and disposal.

Section 7
Handling and Storage

7.1 Precautions for Safe Handling

Practice good housekeeping. Use adequate exhaust ventilation, dust collection and/or water mist to maintain airborne dust concentrations below permissible exposure limits (note: respirable crystalline silica dust may be in the air without a visible dust cloud).

Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment. Maintain and test ventilation and dust collection equipment. In cases of insufficient ventilation, wear a NIOSH approved respirator for silica dust when handling or disposing dust from this product. Avoid contact with skin and eyes. Wash or vacuum clothing that has become dusty. Avoid eating, smoking, or drinking while handling the material.

7.2 Conditions for Safe Storage, Including any Incompatibilities

Minimize dust produced during loading and unloading.

Section 8
Exposure Controls/Personal Protection

8.1 Control Parameters

OCCUPATIONAL EXPOSURE LIMITS					
SUBSTANCE		**OSHA PEL TWA (mg/m^3)**	**NIOSH REL TWA (mg/m^3)**	**ACGIH TLV TWA (mg/m^3)**	**CA - OSHA PEL (mg/m^3)**
Calcium oxide		5	2	2	2
Particulates Not Otherwise Regulated	Total	15	15	10	10
	Respirable	5	5	3	5
Respirable Crystalline Silica	Respirable Crystalline Silica	0.05	0.05	0.025	0.05
Titanium dioxide	Total	15	2.4 (fine) 0.3 (ultrafine)	10	10
Manganese dioxide (as manganese compounds)	Total	5 (Ceiling)	1 3 (STEL)	0.1	0.2
	Respirable	-	-	0.02	-

8.2 Exposure Controls

8.2.1 Engineering Controls

Provide ventilation to maintain the ambient workplace atmosphere below the occupational exposure limit(s). Use general and local exhaust ventilation and dust collection systems as necessary to minimize exposure.

8.2.2 Personal Protective Equipment (PPE)

Respiratory protection:	Wear a NIOSH approved particulate respirator if exposure to airborne particulates is unavoidable and where occupational exposure limits may be exceeded. If airborne exposures are anticipated to exceed applicable PELs or TLVs, a self-contained breathing apparatus or airline respirator is recommended.
Eye and face protection:	If eye contact is possible, wear protective glasses with side shields. Avoid contact lenses.
Hand and skin protection:	Wear gloves and protective clothing. Wash hands with soap and water after contact with material.

Section 9
Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

Property: Value	Property: Value
Appearance (physical state, color, etc.): Fine tan/ gray particulate	**Upper/lower flammability or explosive limits:** Not applicable
Odor: Odorless[1]	**Vapor Pressure (Pa):** Not applicable
Odor threshold: Not applicable	**Vapor Density:** Not applicable
pH (25 °C) (in water): Not Determined	**Specific gravity or relative density:** 2.2 – 2.9
Melting point/freezing point (°C): Not applicable	**Water Solubility:** Slight
Initial boiling point/boiling range (°C): NA	**Partition coefficient: n-octane/water:** NA
Flash point (°C): Not determined	**Auto ignition temperature (°C):** Not applicable
Evaporation rate: Not applicable	**Decomposition temperature (°C):** Not determined
Flammability (solid, gas): Not combustible	**Viscosity:** Not applicable

[1] The use of urea or aqueous ammonia injected into the flue gas to reduce nitrogen oxides (NOx) emissions may result in the presence of ammonium sulfate or ammonium bisulfate in the ash at less than 0.1%. When ash containing these substances becomes wet under high pH (>9), free ammonia gas may be released resulting in objectionable/nuisance ammonia odor and potential exposure to ammonia gas especially in confined spaces.

Section 10
Stability and Reactivity

10.1 Reactivity:	The material is an inert, inorganic material primarily composed of elemental oxides.
10.2 Chemical stability:	The material is stable under normal use conditions.
10.3 Possibility of hazardous reactions:	The material is a relatively stable, inert material; however, when ash containing ammonia becomes wet under high pH (>9), free ammonia gas may be released resulting in an objectionable/nuisance ammonia odor and potential exposure to ammonia gas especially in confined spaces. Polymerization will not occur.
10.4 Conditions to avoid:	Product can become airborne in moderate winds. Dry material should be stored in silos. Materials stored out of doors should be covered or maintained in a damp condition.
10.5 Incompatible materials:	None known.
10. 6 Hazardous decomposition products:	None known.

Section 11
Toxicological Information

11.1 Information on Toxicological Effects

Endpoint	Data
Acute oral toxicity	LD50 > 2000 mg/kg
Acute dermal toxicity	LD50 > 2000 mg/kg
Acute inhalation toxicity	LD50 > 5.0 mg/L
Skin corrosion/irritation	Does not meet the classification criteria but may cause slight skin irritation. Product dust can dry the skin which can result in irritation.
Eye damage/irritation	Causes serious eye irritation. Positive scores for conjunctiva irritation and chemosis in 2/3 animals based on average of 24, 48 and 72-hour scores with irritation clearing within 21 days; No corneal or iritis effects observed.
Respiratory/skin sensitization	Not a respiratory or dermal sensitizer.
Germ cell mutagenicity	Not mutagenic in in-vitro and in-vivo assays with or without metabolic activation.
Carcinogenicity	Not available. Respirable crystalline silica has been identified as a carcinogen by OSHA, NTP, ACGIH and IARC.
Reproductive toxicity	No developmental toxicity was observed in available animal studies. Reproductive studies on CCPs showed either no reproductive effects, or some effects on male and female reproductive organs and parameters but without a clear dose response. Inorganic bromide salts have been shown to have adverse effects on reproductive parameters in some animal studies.
STOT-SE	CCPs when present as a nuisance dust may result in respiratory irritation.
STOT-RE	In a 180-day inhalation study with fly ash dust, no effects were observed at the highest dose tested. NOEC = 4.2 mg/m^3; it is not possible to assess the level at which toxicologically significant effects may occur. Repeated inhalation exposures to high levels of respirable crystalline silica may result in lung damage (i.e., silicosis).
Aspiration Hazard	Not applicable based product form.

Section 12
Ecological Information

12.1 Toxicity

Fly Ash C (CAS# 68131-74-8)	
Toxicity to Fish	LC50 > 100 mg/L
Toxicity to Aquatic Invertebrates	Data indicates that the test substance is not toxic to *Daphnia magna* (EC50 undetermined).
Toxicity to Aquatic Algae and Plants	EC50 = 10 mg/L

Calcium oxide CAS# 1305-78-8	
Toxicity to Fish	LC50 = 50.6 mg/L The findings were closely related to the pH of the test solutions; therefore, pH is considered to be the main reason for the effects.
Toxicity to Aquatic Invertebrates	EC50 = 49.1 mg/L The findings were closely related to the pH of the test solutions; therefore, pH is considered to be the main reason for the effects.
Toxicity to Aquatic Algae and Plants	NOEC =48 mg/L @ 72 hours based on $Ca(OH)_2$ The initial pH of the test medium was not directly related to the biologically relevant effects. The formation of precipitates is likely the result of the reaction between CO_2 dissolved in the medium.

12.2 Persistence and Degradability

Not relevant for inorganic materials.

12.3 Bioaccumulative Potential

This material does not contain any compounds that would bioaccumulate up the food chain.

12.4 Mobility in Soil

No data available.

12.5 Results of PBT and vPvB Assessment

This material does not contain any compounds classified as “persistent, bioaccumulative or toxic” nor as “very persistent/very bioaccumulative”.

12.6 Other Adverse Effects

None known.

Section 13

Disposal Considerations

See Sections 7 and 8 above for safe handling and use, including appropriate industrial hygiene practices.

Dispose of all waste product and containers in accordance with federal, state and local regulations.

Section 14
Transport Information

Regulatory entity: U.S. DOT	Shipping Name:	Not Regulated
	Hazard Class:	Not Regulated
	ID Number:	Not Regulated
	Packing Group:	Not Regulated

Section 15
Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Mixture

- TSCA Inventory Status

  All components are listed on the TSCA Inventory.

- California Proposition 65.

  The following substances are known to the State of California to be carcinogens and/or reproductive toxicants:

  - Respirable crystalline silica

- State Right-to-Know (RTK)

Component	CAS	MA[1,2]	NJ[3,4]	PA[5]	RI[6]
Ammonium bisulfate	7803-63-6	No	Yes	No	No
Ammonium sulfate	7783-20-2	Yes	No	Yes	No
Calcium oxide	1305-78-8	Yes	Yes	Yes	No
Iron oxide	1309-37-1	Yes	Yes	Yes	No
Magnesium oxide	1309-48-4	No	Yes	No	No
Manganese oxide-as manganese compounds	1313-13-9; Various	No	No	Yes	Yes
Phosphorus pentoxide (or phosphorus oxide)	1314-56-3	Yes	Yes	Yes	No
Potassium oxide	12136-45-7	No	Yes	No	No
Silica-crystalline (SiO2), quartz	14808-60-7	Yes	Yes	Yes	No
Sodium oxide	1313-59-3	No	Yes	No	No
Titanium dioxide	13463-67-7	Yes	Yes	Yes	Yes

[1] Massachusetts Department of Public Health, no date
[2] 189th General Court of The Commonwealth of Massachusetts, no date
[3] New Jersey Department of Health and Senior Services, 2010a
[4] New Jersey Department of Health, 2010b
[5] Pennsylvania Code, 1986
[6] Rhode Island Department of Labor and Training, no date

Section 16
Other Information, Including Date of Preparation or Last Revision

16.1 Indication of Changes

Date of preparation or last revision: February 23, 2018

16.2 Abbreviations and Acronyms

- ACGIH: American Conference of Industrial Hygienists
- CA: California
- CAS: Chemical Abstract Services
- CCP: Coal Combustion Product
- CFR: Code of Federal Regulations
- EPA: Environmental Protection Agency

- GHS: Globally Harmonized System of Classification and Labelling
- IARC: International Agency for Research on Cancer
- LC50: Concentration resulting in the mortality of 50 % of an animal population
- LD50: Dose resulting in the mortality of 50 % of an animal population
- MA: Massachusetts
- NA: Not Applicable
- NJ: New Jersey
- NOEC: No observed effect concentration
- NIOSH: National Institute of Occupational Safety and Health
- NOx: Nitrogen oxides
- NTP: US National Toxicology Program
- OEL: Occupational Exposure Limit
- OSHA: Occupational Safety and Health Administration
- PA: Pennsylvania
- PBT: Persistent, Toxic and Bioaccumulative
- PEL: Permissible exposure limit
- PPE: Personal Protective Equipment
- REL: Recommended exposure limit
- RI: Rhode Island
- RCS: Respirable Crystalline Silica
- RTK: Right-to-Know
- SCBA: Self-contained breathing apparatus
- SDS: Safety Data Sheet
- STEL: Short-term exposure limit
- STOT-RE: Specific target organ toxicity-repeated exposure
- STOT-SE: Specific target organ toxicity-single exposure
- TLV: Threshold limit value
- TSCA: Toxic Substances Control Act
- TWA: Time-weighted average
- UEL: Upper explosive limit
- UVCB: Unknown or Variable Composition/Biological
- U.S.: United States
- U.S. DOT: United States of Department of Transportation

16.3 Other Hazards

Hazardous Materials Identification System (HMIS) Degree of hazard (0= low, 4 = extreme)								
Health:	2*	**Flammability:**	0	**Physical Hazards:**	0	**Personal protection:****		

** Chronic Health Effects*
*** Appropriate personal protection is defined by the activity to be performed.*
See Section 8 for additional information.

DISCLAIMER:

This SDS has been prepared in accordance with the Hazard Communication Rule 29 CFR 1910.1200. Information herein is based on data considered to be accurate as of date prepared. No warranty or representation, express or implied, is made as to the accuracy or completeness of this data and safety information. No responsibility can be assumed for any damage or injury resulting from abnormal use, failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

Safety Data Sheet

Section 1
Identification of the Substance and of the Supplier

1.1 Product Identifier

Product Name/Identification:	ASTM Bottom Ash
Synonyms:	Ash; Ashes; Ash residues; Ashes, residues, bottom; Bottom ash; Bottom ash residues; Coal Fly Ash; Pozzolan; Waste solids.
Formula:	UVCB Substance

1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advices Against

Relevant Identified Uses:	Component of wallboard, concrete, roofing material, bricks, cement kiln feed.
Uses Advised Against:	None known.

1.3 Details of the Supplier of the SDS

Manufacturer/Supplier:	Dynegy, Inc.
Street Address:	601 Travis Street, Suite 1400
City, State and Zip Code:	Houston, TX 77002
Customer Service Telephone:	800-633-4704

Section 2
Hazards Identification

2.1 Classification of the Substance

GHS Classification(s) according to OSHA Hazard Communication Standard (29 CFR 1910.1200):

- Eye Irritant, Category 2A
- STOT-SE, Category 3 (Respiratory Irritation)
- Carcinogen, Category 1A
- STOT-RE, Category 1 (Lungs)
- Toxic to Reproduction, Category 2

2.2 Label Elements

Labelling according to 29 CFR 1910.1200 Appendices A, B and C*	
Hazard Pictogram(s):	
Signal word:	**DANGER**
Hazard Statement(s):	*Causes serious eye irritation.* *May cause respiratory irritation.* *May cause damage to lungs after repeated/prolonged exposure via inhalation.* *May cause cancer of the lung.* *Suspected of damaging fertility or the unborn child.*
Precautionary Statement(s):	*Obtain special instructions before use.* *Do not handle until all safety precautions have been read and understood.* *Avoid breathing dust.* *Wash thoroughly after handling.* *Do not eat drink or smoke when using this product.* *Wear protective gloves/protective clothing/eye protection/face protection.* *Use outdoors or in a well-ventilated area.* *If exposed or concerned: Get medical advice/attention.* *Store in a secure area.* *Dispose of product in accordance with local/national regulations.*

** Fly ash and other coal combustion products (CCPs) are UVCB substances (unknown or variable composition or biological). Various CCPs, noted as ashes/ash residuals; Ashes, residues, bottom; Bottom ash; Bottom ash residues; Waste solids, ashes under TSCA are defined as: "The residuum from the burning of a combination of carbonaceous materials. The following elements may be present as oxides: aluminum, calcium, iron, magnesium, nickel, phosphorus, potassium, silicon, sulfur, titanium, and vanadium." Ashes including fly ash and fluidized bed combustion ash are identified by CAS number 68131-74-8. The exact composition of the ash is dependent on the fuel source and flue additives composed of many constituents. The classification of the final substance is dependent on the presence of specific identified oxides as well as other trace elements.*

2.3 Other Hazards

Listed Carcinogens:

-Respirable Crystalline Silica

IARC: [Yes] **NTP:** [Yes] **OSHA:** [Yes] **Other:** **(ACGIH)** [Yes]

Section 3
Composition/Information on Ingredients

Substance	*CAS No.*	*Percentage (%)*	*GHS Classification*
Crystalline Silica	*14808-60-7*	*20 - 40%*	*Repeat Dose STOT, Category 1* *Carcinogen, Category 1A*
Silica, crystalline respirable (RCS)	*14808-60-7*	*See Footnote 1*	*Repeat Dose STOT, Category 1* *Carcinogen. Category 1A*
Aluminosilicates[2]	*Various, see Footnote 2*	*10 - 60%*	*Single Exposure STOT, Category 3*
Calcium oxide (CaO)	*1305-78-8*	*10 - 30%*	*Skin Irritant, Category 2* *Eye Irritant, Category 1* *Single Exposure STOT, Category 3*
Iron oxide	*1309-37-1*	*1 - 10%*	*Not Classified*
Manganese dioxide (MnO_2)	*1313-13-9*	*<2%*	*Skin Irritant, Category 2* *Eye Irritant, Category 2B*
Magnesium oxide	*1309-48-4*	*2 - 10%*	*Not Classified*
Phosphorus pentoxide (P_2O_5)	*1314-56-3*	*≤2%*	*Skin Irritant, Category 2* *Eye Irritant, Category 2B*
Sodium oxide	*1313-59-3*	*1 - 10%*	*Not Classified*
Potassium oxide (K_2O)	*12136-45-7*	*≤1%*	*Skin Irritant Category 2* *Eye Irritant Category 2B*
Titanium dioxide (TiO_2)	*13463-67-7*	*<3%*	*Not Classified*

[1]The percentage of respirable crystalline silica has not been determined. Therefore, a GHS classification of Carcinogen 1A has been assigned.

[2]Aluminosilicates (CAS# 1327-36-2) may be in the form of mullite (CAS# 1302-93-8); aluminosilicate glass; pozzolans (CAS# 71243-67-9); or calcium aluminosilicates such as tricalcium aluminate (C3A), or calcium sulfoaluminate (C4A3S). The form is dependent on the source of the coal and or the process used to create the CCP. Pulverized coal combustion would be more likely to create high levels of pozzolans. Aluminosilicates may have inclusions of calcium, titanium, iron, potassium, phosphorus, magnesium and other metal oxides.

Section 4
First Aid Measures

4.1 Description of First Aid Measures

Inhalation:	If product is inhaled and irritation of the nose or coughing occurs, remove person to fresh air. Get medical advice/attention if respiratory symptoms persist.
Skin Contact:	If skin exposure occurs, wash with soap and water.
Eye Contact:	If product gets into the eye, rinse copiously with water for several minutes. Remove contact lenses, if present and easy to do. Seek medical attention/advice if irritation occurs or persists.
Ingestion:	No specific first aid measures are required.

4.2 Most Important Health Effects, Both Acute and Delayed

Acute Effects: Direct exposure may cause respiratory irritation, eye irritation and skin irritation. The product dust can dry and irritate the skin and cause dermatitis and can irritate eyes and skin through mechanical abrasion.

Chronic Effects: Chronic exposure may cause lung damage from repeated exposure. Prolonged inhalation of respirable crystalline silica above certain concentrations may cause lung diseases, including silicosis and lung cancer.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

Seek first aid or call a doctor or Poison Control Center if contact with eyes occurs and irritation remains after rinsing. Get medical advice if inhalation occurs and respiratory symptoms persist.

Section 5
Firefighting Measures

5.1 Extinguishing Media

Suitable Extinguishing Media:	Product is not flammable. Use extinguishing media appropriate for surrounding fire.
Unsuitable Extinguishing Media:	Not applicable, the product is not flammable.

5.2 Special Hazards Arising from the Substance or Mixture

Hazardous Combustion Products:	None known.

5.3 Advice for Firefighters

Special Protective Equipment and Precautions for Firefighters:	As with any fire, wear self-contained breathing apparatus (NIOSH approved or equivalent) and full protective gear.

Section 6
Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Personal precautions/Protective Equipment:	See Section 8.2.2 Individual Protective Measures. For concentrations exceeding Occupational Exposure Levels (OELs), use a self-contained breathing apparatus (SCBA).
Emergency procedures:	Use scooping, water spraying/flushing/misting or ventilated vacuum cleaning systems to clean up spills. Do not use pressurized air.

6.2 Environmental Precautions

Environmental precautions:	Prevent contamination of drains or waterways and dispose according to local and national regulations.

6.3 Methods and Material for Containment and Cleaning Up

Methods and materials for containment and cleaning up:	Do not use brooms or compressed air to clean surfaces. Use dust collection vacuum and extraction systems. Large spills of dry product should be removed by a vacuum system. Dampened material should be removed by mechanical means and recycled or disposed of according to local and national regulations.

See Sections 8 and 13 for additional information on exposure controls and disposal.

Section 7
Handling and Storage

7.1 Precautions for Safe Handling

Practice good housekeeping. Use adequate exhaust ventilation, dust collection and/or water mist to maintain airborne dust concentrations below permissible exposure limits (note: respirable crystalline silica dust may be in the air without a visible dust cloud).

Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment. Maintain and test ventilation and dust collection equipment. In cases of insufficient ventilation, wear a NIOSH approved respirator for silica dust when handling or disposing dust from this product. Avoid contact with skin and eyes. Wash or vacuum clothing that has become dusty. Avoid eating, smoking, or drinking while handling the material.

7.2 Conditions for Safe Storage, Including any Incompatibilities

Minimize dust produced during loading and unloading.

Section 8
Exposure Controls/Personal Protection

8.1 Control Parameters

OCCUPATIONAL EXPOSURE LIMITS					
SUBSTANCE		**OSHA PEL TWA (mg/m^3)**	**NIOSH REL TWA (mg/m^3)**	**ACGIH TLV TWA (mg/m^3)**	**CA - OSHA PEL (mg/m^3)**
Calcium oxide		5	2	2	2
Particulates Not Otherwise Regulated	Total	15	15	10	10
	Respirable	5	5	3	5
Respirable Crystalline Silica	Respirable	0.05	0.05	0.025	0.05
Manganese dioxide (as manganese compounds)	Total	5 (Ceiling)	1 3 (STEL)	0.1	0.2
	Respirable	-	-	0.02	-

8.2 Exposure Controls

8.2.1 Engineering Controls

Provide ventilation to maintain the ambient workplace atmosphere below the occupational exposure limit(s). Use general and local exhaust ventilation and dust collection systems as necessary to minimize exposure.

8.2.2 Personal Protective Equipment (PPE)

Respiratory protection:	Wear a NIOSH approved particulate respirator if exposure to airborne particulates is unavoidable and where occupational exposure limits may be exceeded. If airborne exposures are anticipated to exceed applicable PELs or TLVs, a self-contained breathing apparatus or airline respirator is recommended.
Eye and face protection:	If eye contact is possible, wear protective glasses with side shields. Avoid contact lenses.
Hand and skin protection:	Wear gloves and protective clothing. Wash hands with soap and water after contact with material.

Section 9
Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

Property: Value	Property: Value
Appearance (physical state, color, etc.): Fine tan/ gray particulate	**Upper/lower flammability or explosive limits:** Not applicable
Odor: Odorless[1]	**Vapor Pressure (Pa):** Not applicable
Odor threshold: Not applicable	**Vapor Density:** Not applicable
pH (25 °C) (in water): 8 - 11	**Specific gravity or relative density:** 2.2 – 2.9
Melting point/freezing point (°C): Not applicable	**Water Solubility:** Slight
Initial boiling point and boiling range (°C): Not applicable	**Partition coefficient: n-octane/water:** Not determined
Flash point (°C): Not determined	**Auto ignition temperature (°C):** Not applicable
Evaporation rate: Not applicable	**Decomposition temperature (°C):** Not determined
Flammability (solid, gas): Not combustible	**Viscosity:** Not applicable

[1] The use of urea or aqueous ammonia injected into the flue gas to reduce nitrogen oxides (NOx) emissions may result in the presence of ammonium sulfate or ammonium bisulfate in the ash at less than 0.1%. When ash containing these substances becomes wet under high pH (>9), free ammonia gas may be released resulting in objectionable/nuisance ammonia odor and potential exposure to ammonia gas especially in confined spaces.

Section 10
Stability and Reactivity

10.1 Reactivity:	The material is an inert, inorganic material primarily composed of elemental oxides.
10.2 Chemical stability:	The material is stable under normal use conditions.
10.3 Possibility of hazardous reactions:	The material is a relatively stable, inert material; however, when ash containing ammonia becomes wet under high pH (>9), free ammonia gas may be released resulting in an objectionable/nuisance ammonia odor and potential exposure to ammonia gas especially in confined spaces. Polymerization will not occur.
10.4 Conditions to avoid:	Product can become airborne in moderate winds. Dry material should be stored in silos. Materials stored out of doors should be covered or maintained in a damp condition.
10.5 Incompatible materials:	None known.
10. 6 Hazardous decomposition products:	None known.

Section 11
Toxicological Information

11.1 Information on Toxicological Effects

Endpoint	Data
Acute oral toxicity	LD50 > 2000 mg/kg
Acute dermal toxicity	LD50 > 2000 mg/kg
Acute inhalation toxicity	LD50 > 5.0 mg/L
Skin corrosion/irritation	Does not meet the classification criteria but may cause slight skin irritation. Product dust can dry the skin which can result in irritation.
Eye damage/irritation	Causes serious eye irritation. Positive scores for conjunctiva irritation and chemosis in 2/3 animals based on average of 24, 48 and 72-hour scores with irritation clearing within 21 days; no corneal or iritis effects observed.
Respiratory/skin sensitization	Not a respiratory or dermal sensitizer.
Germ cell mutagenicity	Not mutagenic in in-vitro and in-vivo assays with or without metabolic activation.
Carcinogenicity	Not available. Respirable crystalline silica has been identified as a carcinogen by OSHA, NTP, ACGIH and IARC.
Reproductive toxicity	No developmental toxicity was observed in available animal studies. Reproductive studies on CCPs showed either no reproductive effects, or some effects on male and female reproductive organs and parameters but without a clear dose response.
STOT-SE	CCPs when present as a nuisance dust may result in respiratory irritation.
STOT-RE	In a 180-day inhalation study with fly ash dust, no effects were observed at the highest dose tested. NOEC = 4.2 mg/m^3; it is not possible to assess the level at which toxicologically significant effects may occur. Repeated inhalation exposures to high levels of respirable crystalline silica may result in lung damage (i.e., silicosis).
Aspiration Hazard	Not applicable based product form.

Section 12
Ecological Information

12.1 Toxicity

Fly Ash (CAS# 68131-74-8)	
Toxicity to Fish	LC50 > 100 mg/L
Toxicity to Aquatic Invertebrates	Data indicates that the test substance is not toxic to *Daphnia magna* (EC50 undetermined)
Toxicity to Aquatic Algae and Plants	EC50 = 10 mg/L
Calcium oxide CAS# 1305-78-8	
Toxicity to Fish	LC50 = 50.6 mg/L The findings were closely related to the pH of the test solutions; therefore, pH is considered to be the main reason for the effects.
Toxicity to Aquatic Invertebrates	EC50 = 49.1 mg/L The findings were closely related to the pH of the test solutions; therefore, pH is considered to be the main reason for the effects.
Toxicity to Aquatic Algae and Plants	NOEC =48 mg/L @ 72 hours based on $Ca(OH)_2$ The initial pH of the test medium was not directly related to the biologically relevant effects. The formation of precipitates is likely the result of the reaction between CO_2 dissolved in the medium.

12.2 Persistence and Degradability

Not relevant for inorganic materials.

12.3 Bioaccumulative Potential

This material does not contain any compounds that would bioaccumulate up the food chain.

12.4 Mobility in Soil

No data available.

12.5 Results of PBT and vPvB Assessment

This material does not contain any compounds classified as “persistent, bioaccumulative or toxic” nor as “very persistent/very bioaccumulative”.

12.6 Other Adverse Effects

None known.

Section 13
Disposal Considerations

See Sections 7 and 8 above for safe handling and use, including appropriate industrial hygiene practices.

Dispose of all waste product and containers in accordance with federal, state and local regulations.

Section 14
Transport Information

Regulatory entity: U.S. DOT	Shipping Name:	Not Regulated
	Hazard Class:	Not Regulated
	ID Number:	Not Regulated
	Packing Group:	Not Regulated

Section 15
Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Mixture

- TSCA Inventory Status

  All components are listed on the TSCA Inventory.

- California Proposition 65

  The following substances are known to the State of California to be carcinogens and/or reproductive toxicants:

  - Respirable crystalline silica
  - Titanium dioxide

- State Right-to-Know (RTK)

Component	CAS	MA[1,2]	NJ[3,4]	PA[5]	RI[6]
Ammonium bisulfate	7803-63-6	No	Yes	No	No
Ammonium sulfate	7783-20-2	Yes	No	Yes	No
Calcium oxide	1305-78-8	Yes	Yes	Yes	No
Iron oxide	1309-37-1	Yes	Yes	Yes	No
Magnesium oxide	1309-48-4	No	Yes	No	No
Phosphorus pentoxide (or phosphorus oxide)	1314-56-3	Yes	Yes	Yes	No
Potassium oxide	12136-45-7	No	Yes	No	No
Silica-crystalline (SiO_2), quartz	14808-60-7	Yes	Yes	Yes	No
Sodium oxide	1313-59-3	No	Yes	No	No
Titanium dioxide	13463-67-7	Yes	Yes	Yes	Yes

[1] Massachusetts Department of Public Health, no date
[2] 189th General Court of The Commonwealth of Massachusetts, no date
[3] New Jersey Department of Health and Senior Services, 2010a
[4] New Jersey Department of Health, 2010b
[5] Pennsylvania Code, 1986
[6] Rhode Island Department of Labor and Training, no date

Section 16
Other Information, Including Date of Preparation or Last Revision

16.1 Indication of Changes

Date of preparation or last revision: February 23, 2018

16.2 Abbreviations and Acronyms

- ACGIH: American Conference of Industrial Hygienists
- CA: California
- CAS: Chemical Abstract Services
- CCP: Coal Combustion Product
- CFR: Code of Federal Regulations
- EPA: Environmental Protection Agency
- GHS: Globally Harmonized System of Classification and Labelling
- IARC: International Agency for Research on Cancer
- LC50: Concentration resulting in the mortality of 50 % of an animal population
- LD50: Dose resulting in the mortality of 50 % of an animal population
- MA: Massachusetts
- NA: Not Applicable
- NJ: New Jersey
- NOEC: No observed effect concentration
- NIOSH: National Institute of Occupational Safety and Health
- NOx: Nitrogen oxides
- NTP: US National Toxicology Program
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- RCS: Respirable Crystalline Silica
- RTK: Right-to-Know
- SCBA: Self-contained breathing apparatus
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- STEL: Short-term exposure limit
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- STOT-SE: Specific target organ toxicity-single exposure
- TLV: Threshold limit value
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- TWA: Time-weighted average
- UEL: Upper explosive limit
- UVCB: Unknown or Variable Composition/Biological
- U.S.: United States
- U.S. DOT: United States of Department of Transportation

16.3 Other Hazards

Hazardous Materials Identification System (HMIS) Degree of hazard (0= low, 4 = extreme)							
Health:	2*	**Flammability:**	0	**Physical Hazards:**	0	**Personal protection:****	

** Chronic Health Effects*
****** *Appropriate personal protection is defined by the activity to be performed.*
See Section 8 for additional information.

DISCLAIMER:

This SDS has been prepared in accordance with the Hazard Communication Rule 29 CFR 1910.1200. Information herein is based on data considered to be accurate as of date prepared. No warranty or representation, express or implied, is made as to the accuracy or completeness of this data and safety information. No responsibility can be assumed for any damage or injury resulting from abnormal use, failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

ATTACHMENT D

Memorandum

BURNS & McDONNELL

Date: 25 October 2021

Subject: 35 Ill. Admin. Code Part 845 - Placement Above the Uppermost Aquifer Location Demonstration for the Ash Pond at the Edwards Power Plant

Illinois Power Resources Generating, LLC operates the coal-fired Edwards Power Plant, located in Peoria County, Illinois. The Ash Pond is an existing surface impoundment storing coal combustion residuals (CCR). The requirements for the East Ash Pond are found in 35 Ill. Admin. Code (I.A.C.) Part 845 (Part 845).

This memorandum addresses the requirements of Section 845.300 Placement Above the Uppermost Aquifer, which states:

Section 845.300 Placement Above the Uppermost Aquifer

a) *Existing and new CCR surface impoundments, and all lateral expansions of CCR surface impoundments must, be constructed with a base that is located at least 1.52 meters (five feet) above the upper limit of the uppermost aquifer, or must demonstrate that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR surface impoundment and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high water table).*

b) *The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the demonstration meets the requirements of subsection (a).*

Pursuant to Section 845.210(d)(2), for existing CCR surface impoundments, the owner or operator of the CCR surface impoundment may use a previously completed location restriction demonstration required by Section 845.300 (Placement Above the Uppermost Aquifer), Section 845.310 (Wetlands), Section 845.320 (Fault Areas), Section 845.330 (Seismic Impact Zones), and Section 845.340 (Unstable Areas), provided that the previously completed assessments meet the applicable requirements of those Sections.

The previous upper aquifer demonstration was certified by a qualified professional engineer stating that the demonstration meets the requirements of 40 C.F.R. § 257.60. The requirements described in 40 C.F.R. § 257.60 are nearly identical to the requirements contained in I.A.C. Section 845.300. Pursuant to Section 845.210(d)(2), a certification is not required for this demonstration. The previously completed upper aquifer demonstration is included in Attachment D.

HALEY ALDRICH

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

MEMORANDUM

16 October 2018
File No. 129788

SUBJECT: Location Restriction Demonstration – Placement Above Uppermost Aquifer
Ash Pond
Edwards Power Station
Bartonville, Illinois

Illinois Power Resources Generating, LLC operates the coal-fired Edwards Power Station (Plant) located near Bartonville, Illinois. The Ash Pond (Unit) is an existing coal combustion residuals (CCR) surface impoundment. This demonstration addresses the requirements of 40 CFR §257.60 *(Placement above the uppermost aquifer)* of the U.S. Environmental Protection Agency's (EPA) rule entitled *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities.* 80 Fed. Reg. 21,302 (Apr. 17, 2015) (promulgating 40 CFR §257.60); 83 Fed. Reg. 36,435 (July 30, 2018) (amending 40 CFR §257.60).

§257.60(a): New CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must be constructed with a base that is located no less than 1.52 meters (five feet) above the upper limit of the uppermost aquifer, or must demonstrate that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high water table). The owner or operator must demonstrate by the dates specified in paragraph (c) of this section that the CCR unit meets the minimum requirements for placement above the uppermost aquifer.

Haley & Aldrich reviewed available information provided by Vistra including historic record drawings, design drawings, and boring logs, and based on review and evaluation of the information provided, the results do not demonstrate compliance with the requirements of 40 CFR §257.60(a).

<u>§257.60(b):</u> The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration meets the requirements of paragraph (a) of this section.

I, Steven F. Putrich, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify that the above-referenced CCR Unit does not meet the requirements of 40 CFR §257.60(a).

Signed: ______________________
Consulting Engineer

Print Name:	Steven F. Putrich
Illinois License No.:	62048779
Title:	Vice President
Company:	Haley & Aldrich, Inc.

Professional Engineer's Seal:

STEVEN F. PUTRICH
062-048-779
REGISTERED
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS
10/16/18

Memorandum

Date: 25 October 2021

Subject: 35 I.A.C. Admin. Code Part 845 - Wetland Location Demonstration for Ash Pond at Edwards Power Plant

Illinois Power Resources Generating, LLC operates the coal fired Edwards Power Plant (Plant) located in Peoria County, Illinois. The Ash Pond is an existing surface impoundment storing coal combustion residuals (CCR). The requirements for the Ash Pond are found in 35 Ill. Admin. Code (I.A.C.) 845 (Part 845).

This memorandum addresses the requirements of Section 845.310 Wetlands, which states:

Section 845.310 Wetlands

a) *Existing and new CCR surface impoundments, and all lateral expansions of CCR surface impoundments must not be located in wetlands unless the owner or operator demonstrates* [that the requirements listed in 845.310(a)(1) through (5) are met.]

b) *The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the demonstration meets the requirements of subsection (a).*

Pursuant to Section 845.210(d)(2), for existing CCR surface impoundments, the owner or operator of the CCR surface impoundment may use a previously completed location restriction demonstration required by Section 845.300 (Placement Above the Uppermost Aquifer), Section 845.310 (Wetlands), Section 845.320 (Fault Areas), Section 845.330 (Seismic Impact Zones), and Section 845.340 (Unstable Areas), provided that the previously completed assessments meet the applicable requirements of those Sections.

The previous wetlands demonstration was certified by a qualified professional engineer stating that the demonstration meets the requirements of 40 C.F.R. § 257.61. The requirements described in 40 C.F.R. § 257.61 are nearly identical to the requirements contained in I.A.C. Section 845.310. Pursuant to Section 845.210(d)(2), a certification is not required for this demonstration. The previously completed wetlands demonstration is included in Attachment D.

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MEMORANDUM

16 October 2018
File No. 129788

SUBJECT: Location Restriction Demonstration - Wetland Areas
Edwards Power Station
Ash Pond
Bartonville, Illinois

Illinois Power Resources Generating, LLC operates the coal-fired Edwards Power Station (Plant) located near Bartonville, Illinois. The Ash Pond (Unit) is an existing coal combustion residuals (CCR) surface impoundment. This demonstration addresses the requirements of 40 CFR §257.61 *(Wetlands)* of the U.S. Environmental Protection Agency's (EPA) rule entitled *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities*. 80 Fed. Reg. 21,302 (Apr. 17, 2015) (promulgating 40 CFR §257.61); 83 Fed. Reg. 36,435 (July 30, 2018) (amending 40 CFR §257.61.

§257.61(a): New CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must not be located in wetlands, as defined in §232.2 of this chapter, unless the owner or operator demonstrates by the dates specified in paragraph (c) of this section that the CCR unit meets the requirements of paragraphs (a)(1) through (5) of this section.

Based on a review of the U.S. Fish and Wildlife Service's National Wetland Inventory mapping, 0.5-meter resolution aerial imagery (2016) and the results of on-site field assessments, the Unit is not located in wetlands as defined by 40 CFR §232.2.

§257.61(b): The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration meets the requirements of paragraph (a) of this section.

I, Steven F. Putrich, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the CCR Unit is not located in wetlands as included in the CCR Rule Location Restrictions Evaluation memorandum dated 12 October 2018 and, therefore, meets the requirements of 40 CFR §257.61(a).

Signed: ______________________
Consulting Engineer

Print Name:	Steven F. Putrich
Illinois License No.:	62048779
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Company:	Haley & Aldrich, Inc.

Professional Engineer's Seal:

STEVEN F. PUTRICH
062-048-779
REGISTERED
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STATE OF ILLINOIS

Memorandum

BURNS McDONNELL

Date: 25 October 2021

Subject: 35 Ill. Admin. Code Part 845 - Fault Area Location Demonstration for the Ash Pond at the Edwards Power Plant

Illinois Power Resources Generating, LLC operates the coal-fired Edwards Power Plant, located in Peoria County, Illinois. The Ash Pond is an existing surface impoundment storing coal combustion residuals (CCR). The requirements for the East Ash Pond are found in 35 Ill. Admin. Code (I.A.C.) Part 845 (Part 845).

This memorandum addresses the requirements of Section 845.320 Fault Areas, which states:

Section 845.320 Fault Areas

a) *Existing and new CCR surface impoundments, and all lateral expansions of CCR surface impoundments must not be located within 60 meters (200 feet) of the outermost damage zone of a fault that has had displacement in Holocene time unless the owner or operator demonstrates that an alternative setback distance of less than 60 meters (200 feet) will prevent damage to the structural integrity of the CCR surface impoundment.*

b) *The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the demonstration meets the requirements of subsection (a).*

Pursuant to Section 845.210(d)(2), for existing CCR surface impoundments, the owner or operator of the CCR surface impoundment may use a previously completed location restriction demonstration required by Section 845.300 (Placement Above the Uppermost Aquifer), Section 845.310 (Wetlands), Section 845.320 (Fault Areas), Section 845.330 (Seismic Impact Zones), and Section 845.340 (Unstable Areas), provided that the previously completed assessments meet the applicable requirements of those Sections.

The previous fault area demonstration was certified by a qualified professional engineer stating that the demonstration meets the requirements of 40 C.F.R. § 257.62. The requirements described in 40 C.F.R. § 257.62 are nearly identical to the requirements contained in I.A.C. Section 845.320. Pursuant to Section 845.210(d)(2), a certification is not required for this demonstration. The previously completed fault area demonstration is included in Attachment D.

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MEMORANDUM

16 October 2018
File No. 129788

SUBJECT: Location Restriction Demonstration - Fault Areas
Edwards Power Station
Ash Pond
Bartonville, Illinois

Illinois Power Resources Generating, LLC operates the coal-fired Edwards Power Station (Plant) located near Bartonville, Illinois. The Ash Pond (Unit) is an existing coal combustion residuals (CCR) surface impoundment. This demonstration addresses the requirements of 40 CFR §257.62 *(Fault Areas)* of the U.S. Environmental Protection Agency's (EPA) rule entitled *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities.* 80 Fed. Reg. 21,302 (Apr. 17, 2015) (promulgating 40 CFR §257.62); 83 Fed. Reg. 36,435 (July 30, 2018) (amending 40 CFR §257.62).

§257.62(a): New CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must not be located within 60 meters (200 feet) of the outermost damage zone of a fault that has had displacement in Holocene time unless the owner or operator demonstrates by the dates specified in paragraph (c) of this section that an alternative setback distance of less than 60 meters (200 feet) will prevent damage to the structural integrity of the CCR unit.

A review of available data from the U.S. Geologic Survey, the Illinois State Geological Survey, and other available information was completed for this demonstration. The nearest known mapped faults are four unnamed faults associated with the Troy Grove Dome, which are located approximately 63 miles northeast and the timeframe of the most recent activity on this fault is not known. Based on the available published geologic data and information reviewed, there are no active faults or fault damage zones that have had displacement in Holocene time reported or indicated within 200 feet of the Unit.

<u>§257.62(b):</u> *The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration meets the requirements of paragraph (a) of this section.*

I, Steven F. Putrich, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the demonstration that the CCR Unit is not located within 60 meters (200 feet) of the outermost damage zone of a fault that has had a displacement in Holocene time as included in the CCR Rule Location Restrictions Evaluation memorandum dated 12 October 2018 meets the requirements of 40 CFR §257.62(a).

Signed: ______________________
Consulting Engineer

Print Name:	Steven F. Putrich
Illinois License No.:	62048779
Title:	Vice President
Company:	Haley & Aldrich, Inc.

Professional Engineer's Seal:

STEVEN F. PUTRICH
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10/16/18
STATE OF ILLINOIS

Memorandum

BURNS McDONNELL

Date: 25 October 2021

Subject: 35 Ill. Admin. Code Part 845 – Seismic Impact Zone Location Demonstration for Ash Pond at the Edwards Power Plant

Illinois Power Resources Generating, LLC operates the coal-fired Edwards Power Plant, located in Peoria County, Illinois. The Ash Pond is an existing surface impoundment storing coal combustion residuals (CCR). The requirements for the East Ash Pond are found in 35 Ill. Admin. Code (I.A.C.) Part 845 (Part 845).

This memorandum addresses the requirements of Section 845.330 Seismic Impact Zones, which states:

Section 845.330 Seismic Impact Zones

a) *Existing and new CCR surface impoundments, and all lateral expansions of CCR surface impoundments must not be located in seismic impact zones unless the owner or operator demonstrates that all structural components including liners, leachate collection and removal systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.*

b) *The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the demonstration meets the requirements of subsection (a).*

Pursuant to Section 845.210(d)(2), for existing CCR surface impoundments, the owner or operator of the CCR surface impoundment may use a previously completed location restriction demonstration required by Section 845.300 (Placement Above the Uppermost Aquifer), Section 845.310 (Wetlands), Section 845.320 (Fault Areas), Section 845.330 (Seismic Impact Zones), and Section 845.340 (Unstable Areas), provided that the previously completed assessments meet the applicable requirements of those Sections.

The previous seismic impact zone demonstration was certified by a qualified professional engineer stating that the demonstration meets the requirements of 40 C.F.R. § 257.63. The requirements described in 40 C.F.R. § 257.63 are nearly identical to the requirements contained in I.A.C. Section 845.330. Pursuant to Section 845.210(d)(2), a certification is not required for this demonstration. The previously completed seismic impact zone demonstration is included in Attachment D.

HALEY & ALDRICH, INC.
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216.739.0555

MEMORANDUM

16 October 2018
File No. 129788

SUBJECT: Location Restriction Demonstration – Seismic Impact Zone
Edwards Power Station
Ash Pond
Bartonville, Illinois

Illinois Power Resources Generating, LLC operates the coal-fired Edwards Power Station (Plant) located near Bartonville, Illinois. The Ash Pond (Unit) is an existing coal combustion residuals (CCR) surface impoundment. This demonstration addresses the requirements of 40 CFR §257.63 *(Seismic Impact Zones)* of the U.S. Environmental Protection Agency's (EPA) rule entitled *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities*. 80 Fed. Reg. 21,302 (Apr. 17, 2015) (promulgating 40 CFR §257.63); 83 Fed. Reg. 36,435 (July 30, 2018) (amending 40 CFR §257.63).

§257.63(a): New CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of a CCR units must not be located in seismic impact zones unless the owner or operator demonstrates by the dates specified in paragraph (c) of this section that all structural components including liners, leachate collection and removal systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.

A Seismic Impact Zone is defined in the CCR Rule (40 CFR §257.63) as "an area having a 2% or greater probability that the maximum expected horizontal acceleration, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10 g in 50 years". The 2014 US Geological Survey Hazard Map raw data for the E.D. Edwards Power Station Ash Pond indicates that the maximum expected horizontal acceleration for 2 percent probability of exceedance in 50 years is 0.06g. Accordingly, the Unit is not located in a seismic impact zone and a demonstration that the structural components have been designed to resist the maximum horizontal acceleration in lithified earth material for the site is not required.

§257.63(b): The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration meets the requirements of paragraph (a) of this section.

I, Steven F. Putrich, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, that the CCR Unit is not located in a seismic impact zone as included in the CCR Rule Location Restrictions Evaluation memorandum dated 12 October 2018 and, therefore, satisfies all requirements of 40 CFR §257.63(a).

Signed: ______________________
Consulting Engineer

Print Name:	Steven F. Putrich
Illinois License No.:	62048779
Title:	Vice President
Company:	Haley & Aldrich, Inc.

Professional Engineer's Seal:

STEVEN F. PUTRICH
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10/16/18
STATE OF ILLINOIS

Memorandum

Date: 25 October 2021

Subject: 35 Ill. Admin. Code Part 845 – Unstable Areas Location Standard Demonstration for Ash Pond at the Edwards Plant

Illinois Power Resources Generating, LLC operates the coal-fired Edwards Power Plant, located in Peoria County, Illinois. The Ash Pond is an existing surface impoundment storing coal combustion residuals (CCR). The requirements for the East Ash Pond are found in 35 Ill. Admin. Code (I.A.C.) Part 845 (Part 845).

This memorandum addresses the requirements of Section 845.340 Unstable Areas which states:

<u>*Section 845.340 Unstable Areas*</u>

a) *An existing or new CCR surface impoundment, or any lateral expansion of a CCR surface impoundment must not be located in an unstable area unless the owner or operator demonstrates that recognized and generally accepted engineering practices have been incorporated into the design of the CCR surface impoundment to ensure that the integrity of the structural components of the CCR surface impoundment will not be disrupted.*

b) *The owner or operator must consider all the following factors, at a minimum, when determining whether an area is unstable:*

   1) *On-site or local soil conditions, including liquefaction, that may result in significant differential settling;*

   2) *On-site or local geologic or geomorphologic features; and*

   3) *On-site or local human-made features or events (both surface and subsurface)*

d) *The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the demonstration meets the requirements of subsections (a).*

<u>*Demonstration of compliance with Section 845.340(a) and (b) – Unstable Areas*</u>*:*

Pursuant to Section 845.210(d)(2), for existing CCR surface impoundments, the owner or operator of the CCR surface impoundment may use a previously completed location restriction demonstration required by Section 845.300 (Placement Above the Uppermost Aquifer), Section 845.310 (Wetlands), Section 845.320 (Fault Areas), Section 845.330 (Seismic Impact Zones), and Section 845.340 (Unstable Areas), provided that the previously completed assessments meet the applicable requirements of those Sections.

The previous unstable area demonstration was certified by a qualified professional engineer stating that the demonstration meets the requirements of 40 C.F.R. § 257.64. The requirements described in 40 C.F.R. § 257.64 are nearly identical to the requirements contained in I.A.C. Section 845.340. Pursuant to Section 845.210(d)(2), a certification is not required for the unstable area demonstration. The previously completed unstable area demonstration is included in Attachment D.

HALEY & ALDRICH, INC.
6500 Rockside Road
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216.739.0555

MEMORANDUM

16 October 2018
File No. 129788

SUBJECT: Location Restriction Demonstration – Unstable Areas
Edwards Power Station
Ash Pond
Bartonville, Illinois

Illinois Power Resources Generating, LLC operates the coal-fired Edwards Power Station (Plant) located near Bartonville, Illinois. The Ash Pond (Unit) is an existing coal combustion residuals (CCR) surface impoundment. This demonstration addresses the requirements of 40 CFR §257.64 *(Unstable Areas)* of the U.S. Environmental Protection Agency's (EPA) rule entitled *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities.* 80 Fed. Reg. 21,302 (Apr. 17, 2015) (promulgating 40 CFR §257.64); 83 Fed. Reg. 36,435 (July 30, 2018) (amending 40 CFR §257.64).

§257.64(a): An existing or new CCR landfill, existing or new CCR surface impoundment, or any lateral expansion of a CCR unit must not be located in an unstable area unless the owner or operator demonstrates by the dates specified in paragraph (d) of this section that recognized and generally accepted good engineering practices have been incorporated into the design of the CCR unit to ensure that the integrity of the structural components of the CCR unit will not be disrupted.

§257.64(b): The owner or operator must consider all of the following factors, at a minimum, when determining whether an area is unstable:

(1) On-site or local soil conditions that may result in significant differential settling;
(2) On-site or local geologic or geomorphologic features; and
(3) On-site or local human-made features or events (both surface and subsurface).

Determination of compliance with §257.64(b)(1) - Conditions associated with the potential for significant differential settlement due to liquefaction were not identified in the area where the Plant is located. A separate report completed by AECOM entitled "CCR Certification Report: Initial Structural Stability Assessment, Initial Safety Factor Assessment, and Initial Inflow Design Flood Control System Plan for the Ash Pond at E.D. Edwards Power Station" dated October 2016 concluded that the soils beneath the Unit are not susceptible to liquefaction.

Determination of compliance with §257.64(b)(2) - Based on available United States Geological Survey (USGS) and Illinois State Geological Survey (ISGS) information, karst topography or physiographic features such as sinkholes, vertical shafts, sinking streams, caves, large springs, or blind valleys do not exist at the Plant. To evaluate the susceptibility of landslides, we reviewed readily available USGS and ISGS data. The USGS data indicates that the Plant is in an area of high landslide incidence, however more detailed ISGS data indicates that there has not been a documented landslide occurrence at the

Unit. The ISGS documented landslide occurrences near the site are along U.S. Highway 24 and appear to be associated with roadside landslides. Accordingly, it is our opinion that the Unit is not located in an area that has high susceptibility to landslides.

Determination of compliance with §257.64(b)(3) - There are no documented surface or subsurface anthropogenic activities that would be indicative of creating unstable foundation conditions.

§257.64(c): The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration meets the requirements of paragraph (a) of this section.

I, Steven F. Putrich, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the demonstration indicating the CCR Unit is not located in an unstable area as included in the CCR Rule Location Restrictions Evaluation memorandum dated 12 October 2018 meets the requirements of 40 CFR §257.64(a).

Signed: ______________________
Consulting Engineer

Print Name:	Steven F. Putrich
Illinois License No.:	62048779
Title:	Vice President
Company:	Haley & Aldrich, Inc.

Professional Engineer's Seal:

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STATE OF ILLINOIS

Edwards Power Plant Operating Permit Application: Floodplain Compliance for 35 I.A.C. 845.340(c)

Illinois Power Resources Generating, LLC

Revision 1
10/20/2021

Edwards Power Plant Operating Permit Application: Floodplain Compliance for 35 I.A.C. 845.340(c)

prepared for

Illinois Power Resources Generating, LLC
Pekin, Illinois

Revision 1
10/20/2021

prepared by

Burns & McDonnell
Kansas City, Missouri

INDEX AND CERTIFICATION

Illinois Power Resources Generating, LLC
Edwards Power Plant
Operating Permit Application: Floodplain Compliance for 35 I.A.C. 845.340(c)

Report Index

Certification

I hereby certify, as a Professional Engineer in the state of Illinois, that the information in this document was assembled under my direct personal charge. This report is not intended or represented to be suitable for reuse by the Illinois Power Resources Generating, LLC or others without specific verification or adaptation by the Engineer. I hereby certify, for the CCR impoundment discussed herein, that demonstration regarding floodplains meets requirements of 35 I.A.C. 845.340(c).

Madison R. Gibler, P.E., IL, 062.070771

Signature: Madison R. Gibler

Date of Signing: October 20, 2021

Date of License Expiration: November 30, 2021

LICENSED PROFESSIONAL ENGINEER
MADISON R. GIBLER
062.070771
OF ILLINOIS

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1.0 INTRODUCTION

1.1 Purpose

Burns & McDonnell was hired by Illinois Power Resources Generating, LLC to evaluate compliance with *35 I.A.C. 845.340(c)* (2021) for the existing coal combustion residual (CCR) surface impoundment at the Edwards Power Plant in the City of Pekin, Peoria County, Illinois. The existing CCR impoundment was constructed in 1960 and is located west of the Illinois River as shown in Figure 1-1.

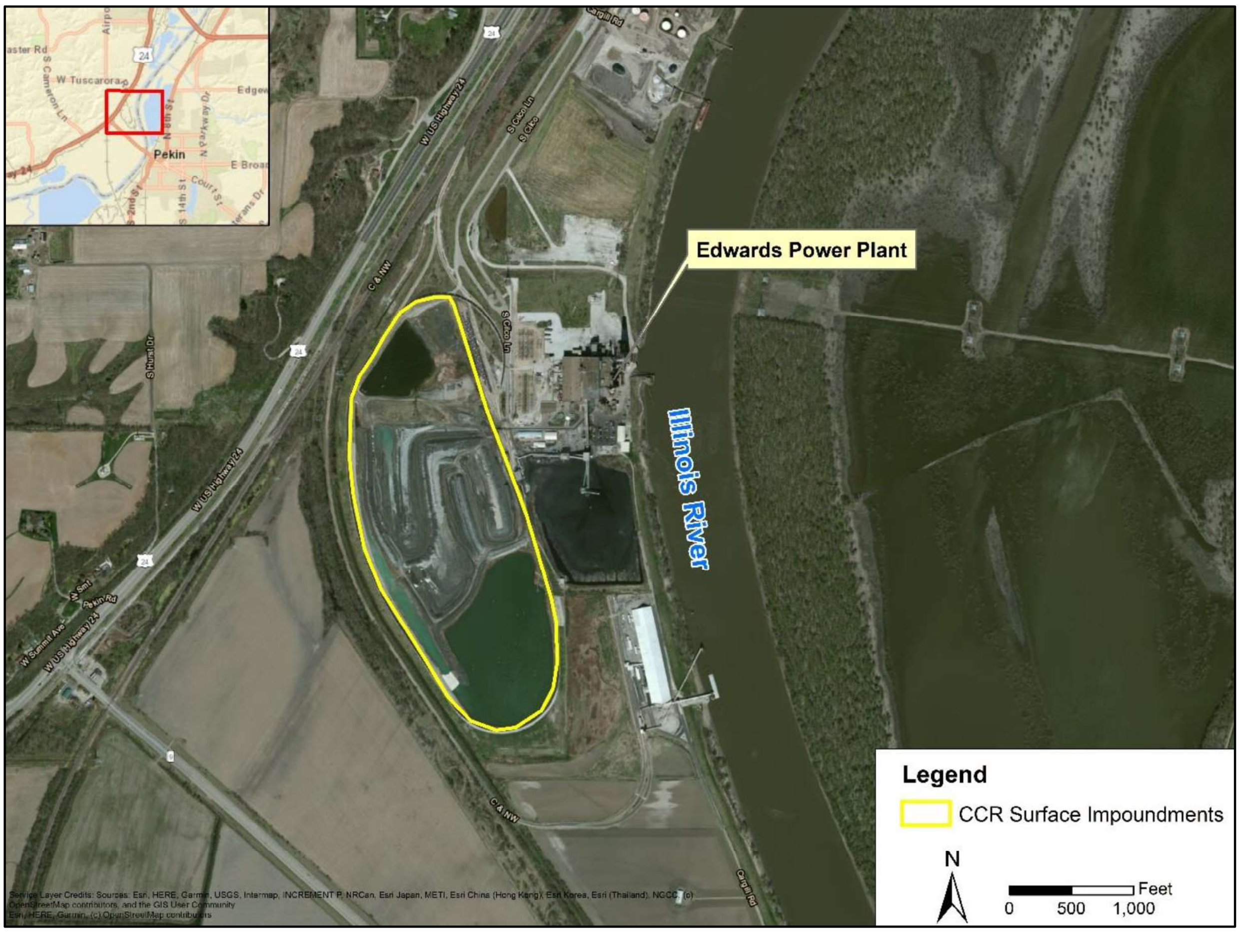

Figure 1-1: Edwards Power Plant Existing CCR Impoundment

1.2 Scope

This report summarizes the evaluation of the existing CCR surface impoundment for compliance with *35 I.A.C 845.340(c)* (2021), herein referenced to as "floodplain compliance." See Appendix A – Excerpt from 35 I.A.C. 845.340(c) for compliance requirements.

1.3 Flooding Source

The Edwards Power Plant CCR impoundment is located west of the Illinois River between river mile 154 and 155. The approximate location of the CCR impoundment delineated in “red” on Figure 1-2.

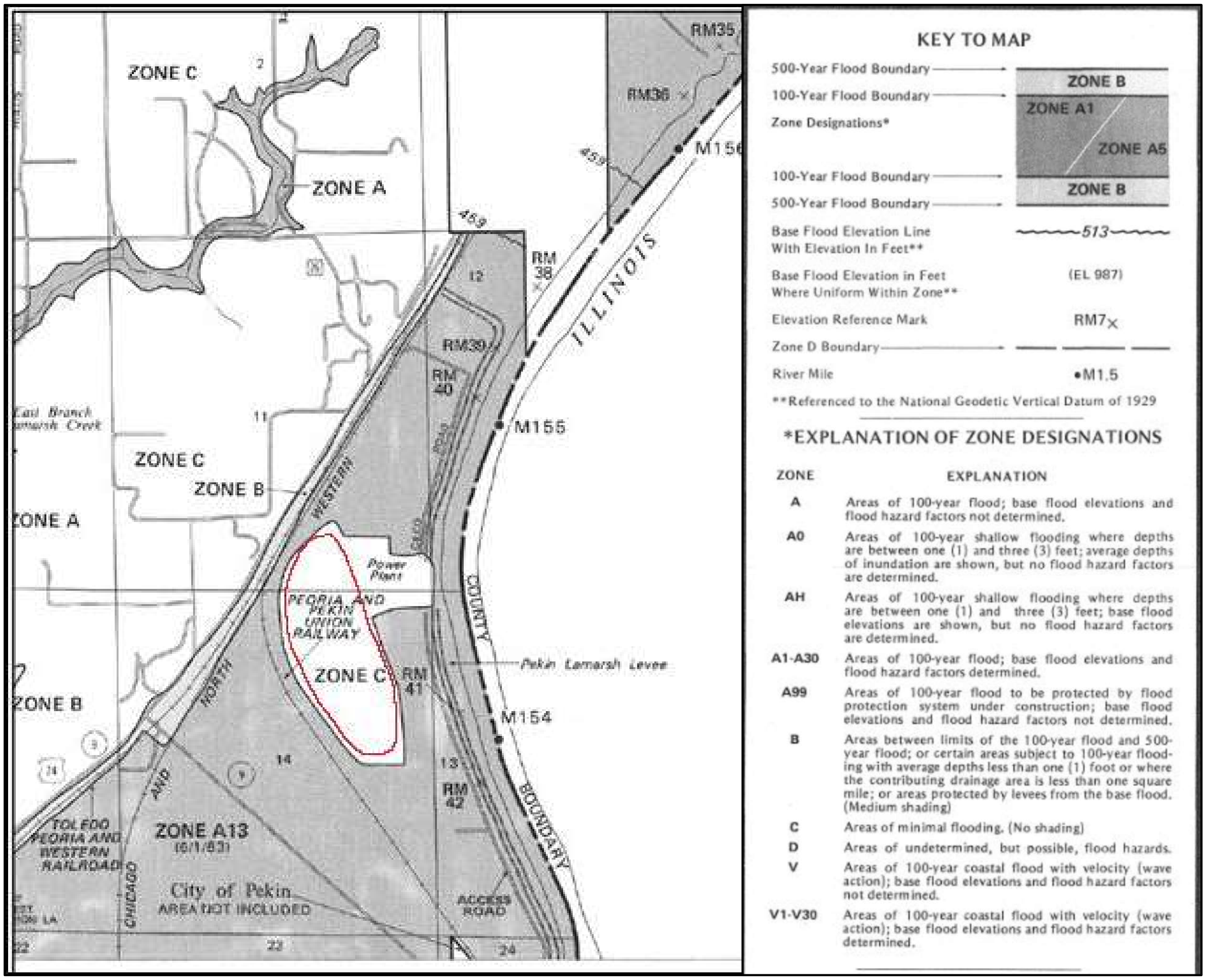

Figure 1-2: CCR Impoundment on FIRM 1705330175B

2.0 DATA AVAILABILITY

2.1 Effective Flood Insurance Rate Map

The effective Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Peoria County that includes the Edwards Power Plant CCR impoundment is map number 1705330175B with an effective date of June 1, 1983. See Appendix B – FEMA Flood Insurance Rate Map.

2.1.1 Flood Hazard Zones

As seen in the FIRM, both the Edwards Power Plant (power plant) and the CCR impoundment are within Zone C, area of minimal flooding. Recent FEMA resources define Zone C as the areas outside of the Special Flood Hazard Area (SFHA) and higher than the elevation of the 0.2% annual chance flood, also referred to as the "500-year" flood (FEMA, 2020a). The SFHA is defined as "the area that will be inundated by the flood event having a 1% chance of being equaled or exceeded in any given year" (FEMA, 2020a).

2.1.2 Pekin and LaMarsh Levee System

The FIRM shows the "Pekin LaMarsh Levee" which is a non-accredited levee system (USACE, 2021). According to the National Levee Database, the Pekin and LaMarsh levee system elevation ranges from 455.17 feet to 458.17 feet North American Vertical Datum of 1988 (NAVD88). Unless otherwise noted, all elevations referenced in this report refer to NAVD88.

According to FEMA's *Guidance for Flood Risk Analysis and Mapping Levees* (FEMA, 2020b), a non-accredited levee system is a system that does not meet the National Flood Insurance Program (NFIP) regulatory requirements of 44 C.F.R. § 65.10 and are not shown on a FIRM as reducing the base flood hazard. Therefore, the effects of the levee system were not considered providing any level of flood protection for the CCR impoundment.

2.2 Flood Insurance Studies

The effective FEMA Flood Insurance Study (FIS) for Peoria County, study number 170533V000, has an effective date of December 1, 1982. However, the neighboring county on the east side of the Illinois River, Tazwell County, updated their FIS, study number 17179CV000A, in 2017. Because Tazwell County has an FIS with a later effective date than Peoria County, it was presumed that more recent floodplain data was available than what was used to develop the Peoria County FIS in 1982.

2.2.1 Topographic Information

According to the Peoria County effective FIS, cross sections were determined from field surveys, whereas topographic information for the Illinois River overbanks was derived from United States Geological Survey (USGS) 7.5 Minute Series Topographic Maps for Peoria Illinois from 1949 and photorevised in 1967 (FEMA, 1982). As no date was provided for the field surveys, it is assumed that the data was collected around the time of the FIS.

According to the Tazwell County effective FIS, the hydrologic and hydraulic analysis was based on the *Upper Mississippi River System Flow Frequency Study*, published in January 2004 (FEMA, 2017). Cross sections for the Illinois River between river mile 80.2 and 286, which includes the area near the Edwards Power Plant, were created data from 1998 aerial photography and photogrammetry as well as digital hydrographic surveys collected from 1997 or later and supplemented with United States Geological Survey (USGS) National Elevation Dataset 1/3 arc second coverage (FEMA, 2017). Because the CCR impoundment was constructed in 1960, its impacts would have been accounted for in the 2017 FIS, where data used was collected in 1997 or later (FEMA, 2017).

2.2.2 Base Flood Elevation

According to the Peoria County effective FIS floodway data table, the base flood elevation (BFE) for the cross sections at river miles 155 and 154, upstream and downstream of the CCR impoundment, is 458.6 and 458.5 feet National Geodetic Vertical Datum of 1929 (NGVD29), respectively. A conversion factor of -0.3 feet, where NAVD88 is 0.3 feet below NGVD29, was reported in the Tazwell County effective FIS and confirmed using the National Geodetic Survey Coordinate Conversion and Transformation Tool (NCAT). Using this conversion factor of -0.3 feet, the BFE for the cross sections at river miles 155 and 154 is 458.3 and 458.2 feet NAVD88, respectively. Therefore, the BFE of the CCR impoundment is assumed to be 458.3 feet.

According to the Tazwell County effective FIS floodway data table, the BFE for the cross sections at river miles 155.1, 154.6, and 154.1, is 457.7, 457.7, and 457.6 feet, respectively. Therefore, by the Tazwell County effective FIS, the BFE of the CCR impoundment is assumed to be 457.7 feet, 0.6 feet lower than the BFE from the Peoria County effective FIS.

2.3 Hydraulic Model

A copy of the hydraulic model for the Illinois River between river mile 80.35 and 157.7 was obtained from the FEMA Engineering Library on August 19, 2021, (USACE Rock Island District, 2005). The model was developed in 2005 using HEC-RAS version 3.1.3. The 100-year water surface elevations were calibrated to the results developed from the January 2004 *Upper Mississippi River System Flow Frequency Study*. This was the model used to develop the floodway extents for the Illinois River in Tazwell County. The 2005 model of the Illinois River was considered the best available model for this analysis.

Geospatial locations of the Illinois River cross sections and river centerline were obtained from FEMA's National Flood Hazard Layer (NFHL) geographic information system (GIS) data (FEMA, 2017). Figure 2-1 provides the locations of these cross sections.

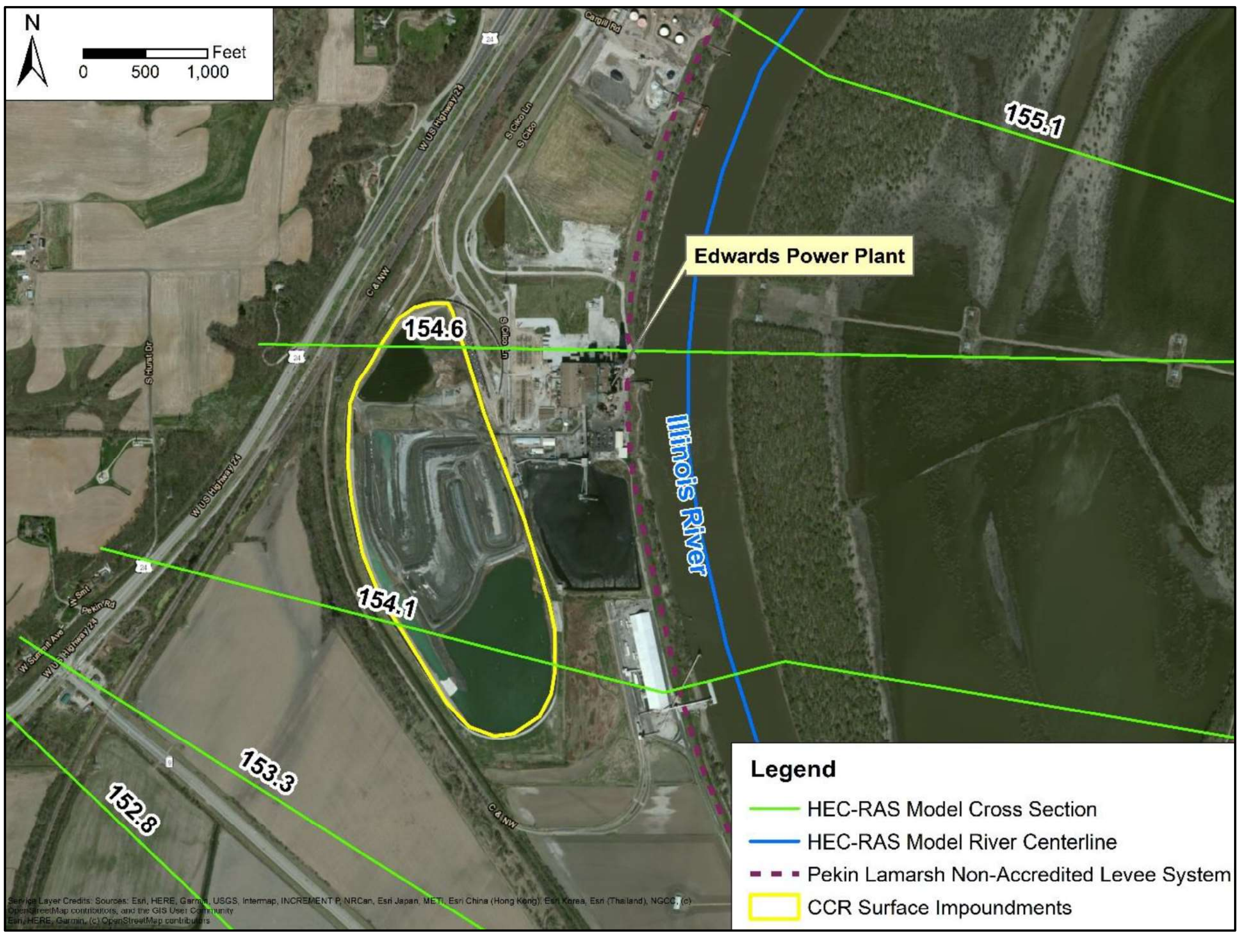

Figure 2-1: Illinois River Cross Sections Near Edwards Power Plant

3.0 HYDRAULIC ANALYSIS

Because the Peoria County effective FIRM did not depict a regulatory floodway, the 2005 model of the Illinois River was used to determine the extents of the floodway, the area that "must be reserved in order to discharge the base flood" (FEMA, 2020c).

3.1 Duplicate Best Available Hydraulic Model

According to the Tazwell County Flood Insurance Study, the model was developed in 2005 using HEC-RAS version 3.1.3. The model was converted to HEC-RAS version 6.0 and the results were within 0.2-feet of the published base flood elevations. Table 3-1 provides a comparison of the Tazwell County effective base flood elevations and modeled water surface elevations for the cross sections shown in Figure 2-1.

Table 3-1: FIS and Duplicate Model BFEs

Cross Section (River Mile)	Tazwell County FIS BFE (feet)	Duplicate Model BFE (feet)	BFE Difference[(a)] (feet)
155.1	457.7	457.6	-0.1
154.6	457.7	457.5	-0.2
154.1	457.6	457.4	-0.2
153.3	457.4	457.2	-0.2
152.8	457.3	457.1	-0.2

(a) Difference = Duplicate Model BFE – Tazwell County FIS BFE

3.2 Corrected Best Available Hydraulic Model

In the 2005 model of the Illinois River, the area landward (west) of the Pekin and LaMarsh levee system, which is located between the Illinois River (flooding source) and the CCR impoundment, is modeled as a blocked obstruction in the right overbank of the cross sections at river miles 155.6 through 149.7. These cross sections also reflect the embankment of the Pekin and LaMarsh levee system in the ground topography.

A corrected best available hydraulic model was developed by replacing the blocked obstructions representing the Pekin and LaMarsh levee system from river stations 155.6 through 149.7 with ineffective flow areas so that the model can simulate the flood hazard landward of the Pekin and LaMarsh levee system. The elevation of the right overbank ineffective flow area was set to the top elevation of the Pekin and LaMarsh levee system based on the elevation provided in the National Levee Database GIS data download (USACE, 2021). Figure 3-1 and Figure 3-2 show a sample cross section 154.6 that compares the duplicate best available hydraulic model and corrected best available hydraulic model conditions.

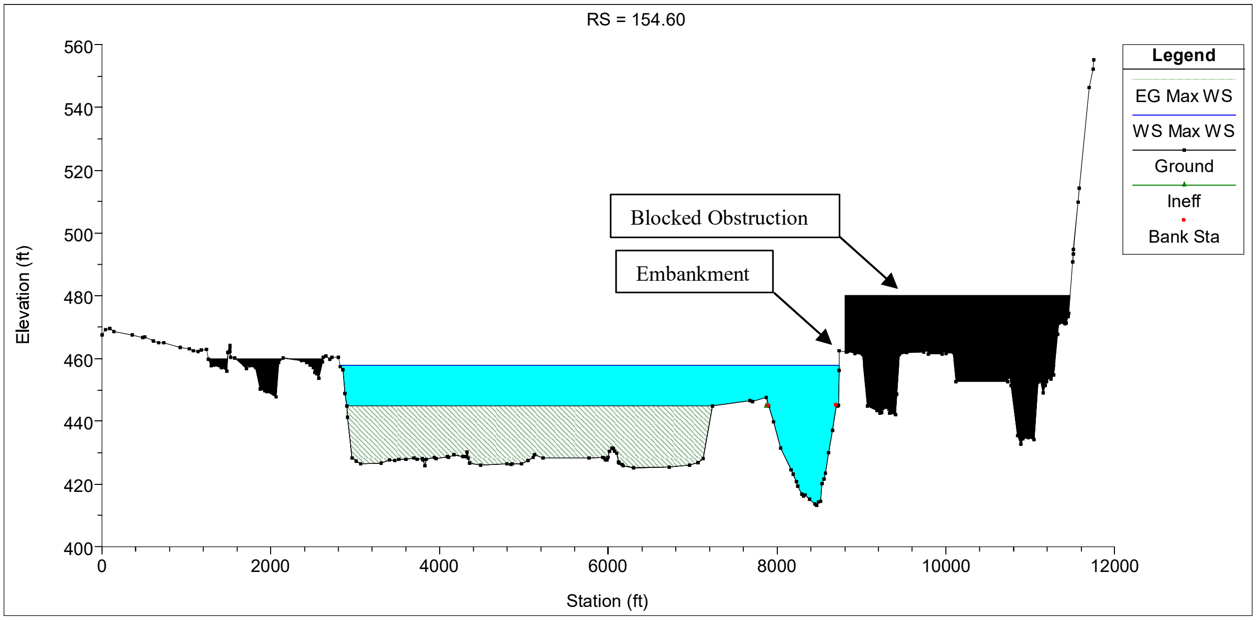

Figure 3-1: Duplicate Model Cross Section

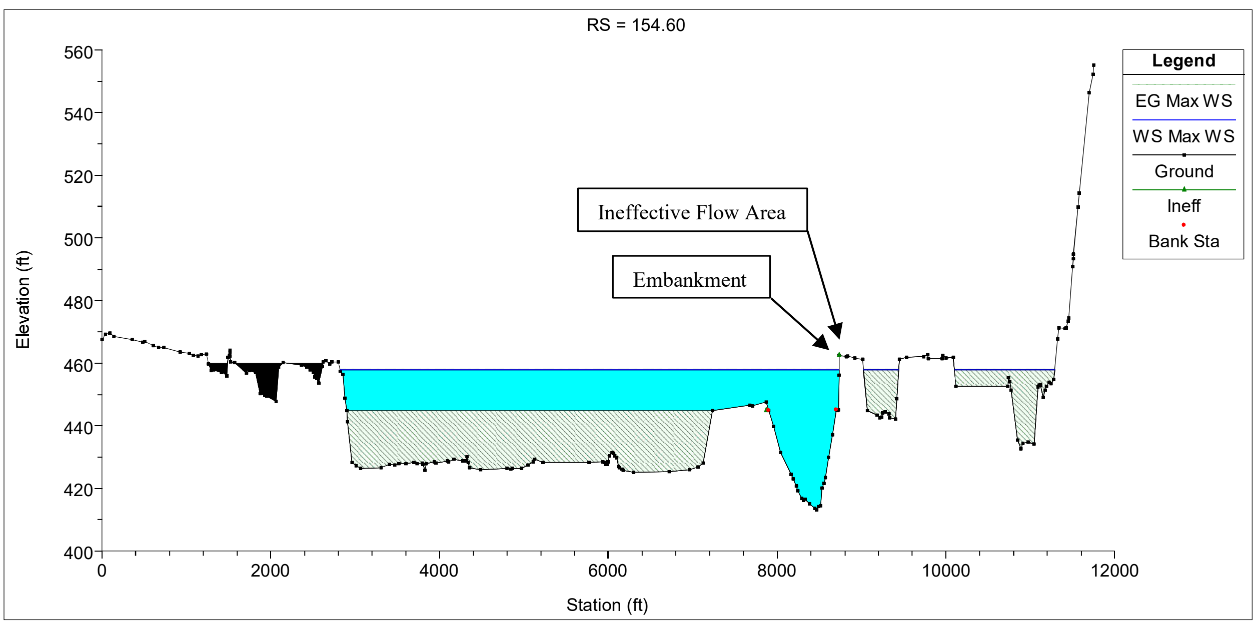

Figure 3-2: Corrected Model Cross Section

A similar analysis was performed for the 2005 floodway encroachment model, where the blocked obstructions representing the Pekin and LaMarsh levee system from river stations 155.6 through 149.7 were replaced with ineffective flow areas. The right overbank encroachment was modeled at the face of the Pekin and LaMarsh levee system embankment. Figure 3-3 and Figure 3-4 show a sample cross section 154.6 that compares the best available duplicate and corrected hydraulic model conditions.

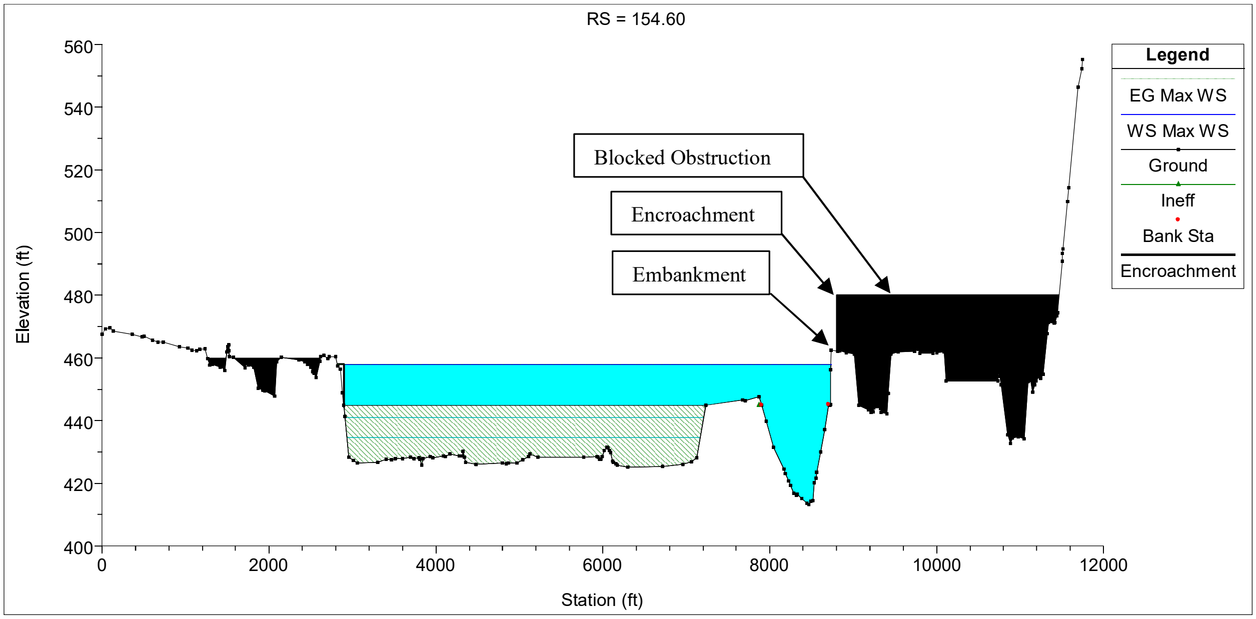

Figure 3-3: Duplicate Model Floodway Encroachment Cross Section

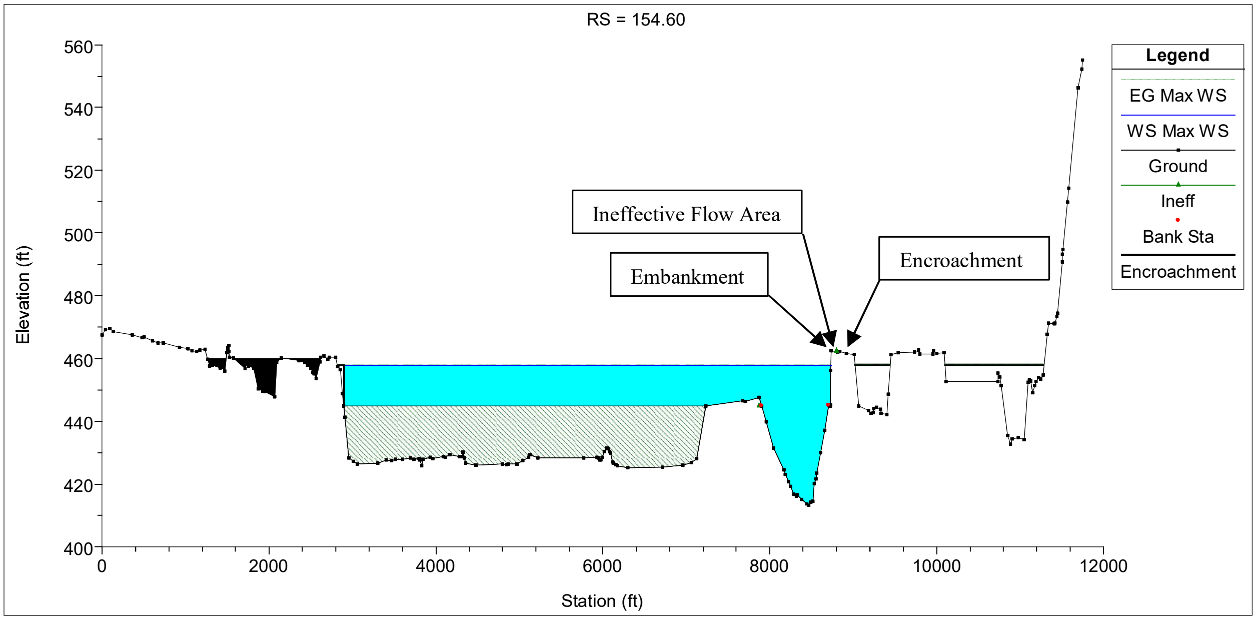

Figure 3-4: Corrected Model Floodway Encroachment Cross Section

Results comparing the corrected best available hydraulic model BFEs without floodway to the duplicate best available hydraulic model and Tazwell County effective FIS are summarized in Table 3-2. The corrected best available hydraulic model BFEs were within 0.1-feet of the duplicate best available hydraulic model BFEs and within 0.2-feet of the BFEs published in the effective FIS.

Table 3-2: Corrected Model BFE Without Floodway

Cross Section (River Station)	Tazwell County FIS BFE (feet)	Duplicate Model BFE Without Floodway (feet)	Corrected Model BFE Without Floodway (feet)	BFE Difference[(a)] (feet)	BFE Difference[(b)] (feet)
155.1	457.7	457.6	457.5	-0.2	-0.1
154.6	457.7	457.5	457.5	-0.2	0.0
154.1	457.6	457.4	457.4	-0.2	0.0
153.3	457.4	457.2	457.2	-0.2	0.0
152.8	457.3	457.1	457.1	-0.2	0.0

(a) Difference = Corrected Model BFE without Floodway – Tazwell County FIS BFE
(b) Difference = Corrected Model BFE without Floodway – Duplicate Model BFE without Floodway

Results comparing the BFE with and without floodway from the corrected best available hydraulic model are summarized in Table 3-2. According to the Tazwell County effective FIS, the State of Illinois limits the increase in BFE with floodway to 0.1-feet (FEMA, 2017). As seen from Table 3-3, the corrected best available hydraulic model with floodway encroachment meets this criterion.

Table 3-3: Corrected Model BFE With Floodway

Cross Section (River Station)	Corrected Model BFE Without Floodway (feet)	Corrected Model BFE With Floodway (feet)	BFE Difference With and Without Floodway (feet)
155.1	457.5	457.6	+0.1
154.6	457.5	457.6	+0.1
154.1	457.4	457.5	+0.1
153.3	457.2	457.3	+0.1
152.8	457.1	457.2	+0.1

4.0 CONCLUSION

Topographic/contour data at the Edwards Power Plant and CCR impoundment was obtained from the Illinois Geospatial Data Clearinghouse (Illinois Geospatial Data Clearinghouse, 2012). Based on that topographic data, the top of embankment elevation for the CCR impoundment is 459 feet. The BFE at the CCR impoundment is estimated to be 457.5 feet, interpolated from the corrected model BFEs at cross sections at river miles 155.1 and 154.6, and rounded to the nearest tenth. Figure 4-1 provides the estimated extents of the area inundated by the base flood (1% annual chance flood) from the corrected best available hydraulic model. The corrected best available hydraulic model extents of the base flood match closely to the Zone A13 extents from the Peoria County effective FIRM provided in Figure 1-2.

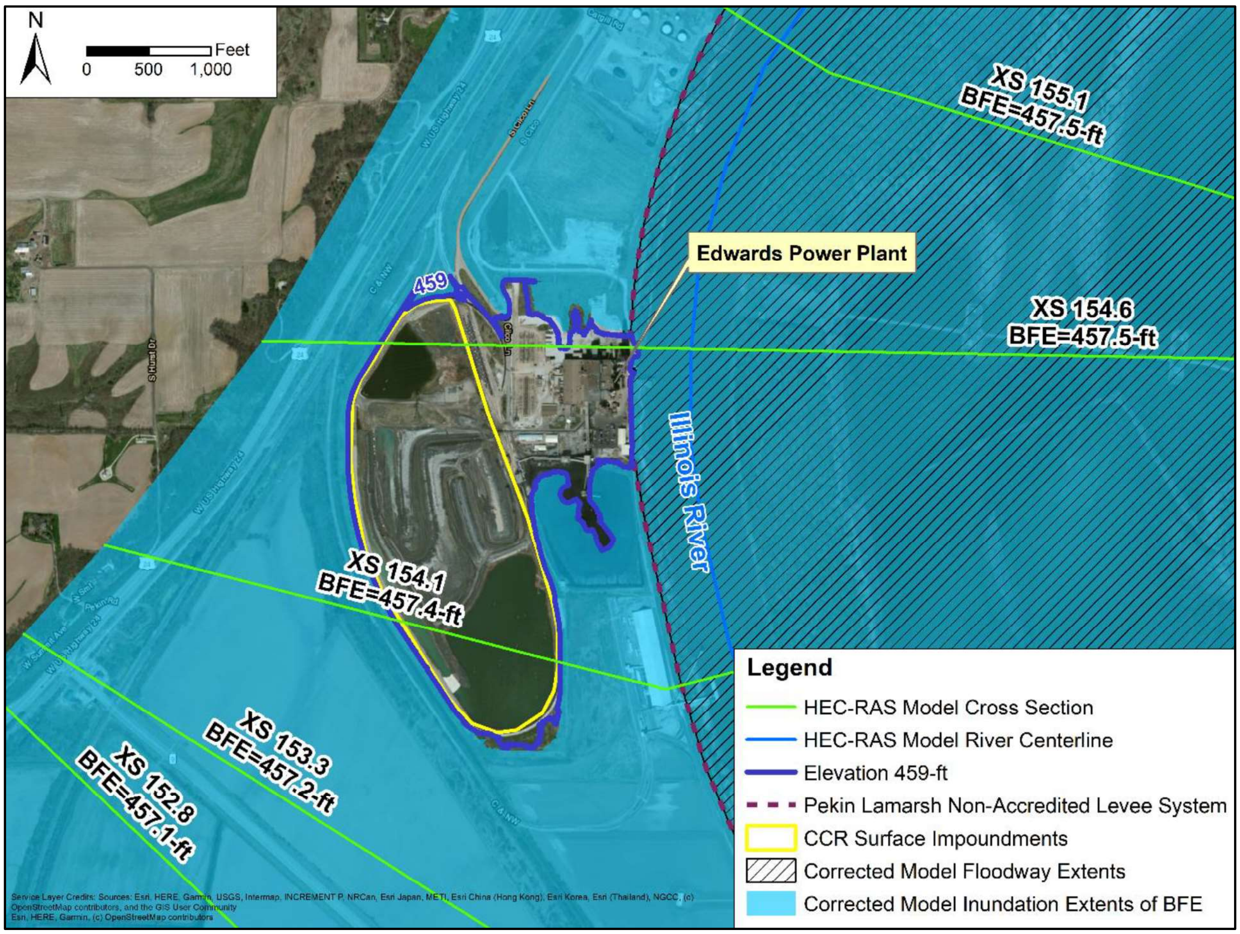

Figure 4-1: Corrected Model Base Flood Elevation and Inundation Extents

As seen in Figure 4-1, the top of embankment for the CCR surface impoundment is located outside of the area subject to inundation by the 1% annual chance flood and has a top of embankment elevation of 459 feet. This is above the corrected best available hydraulic model 1% annual chance flood elevation of 457.5 feet. Therefore, the CCR surface impoundment is not subject to inundation by the base flood.

Since the CCR surface impoundment was constructed in 1960 and the topographic information used to develop the best available hydraulic model, the model (USACE Rock Island District, 2005) used for the Tazwell County effective FIS (FEMA, 2017) was collected in 1997, the CCR surface impoundment does not restrict the flow of the base flood and does not reduce the temporary water storage capacity of the floodplain. The regulatory floodway is defined as the area that “must be reserved in order to discharge the base flood” (FEMA, 2020c). Since the CCR impoundment topography was already included in the hydraulic model that determined the regulatory floodway for Tazwell County, those floodway extents should be applicable to the other side of the Illinois River in Peoria County. Therefore, the CCR surface impoundment does not restrict this base flood discharge. Likewise, the topography of the CCR surface impoundment was included in the hydraulic model that determined the extents of the area inundated by the base flood for Tazwell County, which is the best available hydraulic model. Therefore, the CCR surface impoundment does not reduce the compensatory storage of the base flood.

Based on the analysis included herein the Edwards Power Plant existing CCR surface impoundment complies with the requirements included in *35 I.A.C. 845.340(c)* (2021).

- The CCR impoundment does not restrict the flow of the base flood because it was included in the best available hydraulic model that defined a regulatory floodway for Tazwell County on the west side of the Illinois River and should also apply to the east side of the Illinois River in Peoria County. The floodway is the area reserved to discharge the base flood.
- The CCR impoundment does not reduce the temporary water storage capacity of the 100-year floodplain because it was included in the best available hydraulic model that demonstrates the inundation area of the based flood or 1% annual chance flood is around the CCR impoundment as seen in Figure 4-1.
- The CCR impoundment is not subject to carrying away of CCR by waters of the base flood because the top of embankment elevation for the CCR impoundment is greater than the BFE as demonstrated in the corrected best available hydraulic model (See Section 3.2 Corrected Best Available Hydraulic Model).

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APPENDIX A – EXCERPT FROM 35 I.A.C. 845.340(C)

b) The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the demonstration meets the requirements of subsection (a).

c) The owner or operator of an existing CCR surface impoundment must complete the demonstration required by subsection (a) and submit the completed demonstration, along with the qualified professional engineer's certification to the Agency with the facility's initial operating permit application.

d) The owner or operator of a new CCR surface impoundment or a lateral expansion of a CCR surface impoundment must submit plans and specifications in a construction permit application that demonstrate the CCR surface impoundment will be constructed under subsection (a). Upon completion of construction, the owner or operator must obtain a certification from a qualified professional engineer that the CCR surface impoundment or lateral expansion was constructed in accordance with the requirements of subsection (a) and submit the certification to the Agency in the facility's initial operating permit application.

Section 845.340 Unstable Areas and Floodplains

a) An existing or new CCR surface impoundment, or any lateral expansion of a CCR surface impoundment, must not be located in an unstable area unless the owner or operator demonstrates that recognized and generally accepted engineering practices have been incorporated into the design of the CCR surface impoundment to ensure that the integrity of the structural components of the CCR surface impoundment will not be disrupted.

b) The owner or operator must consider all the following factors, at a minimum, when determining whether an area is unstable:

1) On-site or local soil conditions, including ~~but not limited to~~ liquefaction, that may result in significant differential settling;

2) On-site or local geologic or geomorphologic features; and

3) On-site or local human-made features or events (both surface and subsurface).

c) An existing or new CCR surface impoundment, or any lateral expansion of a CCR surface impoundment, must not be located in a floodplain unless the owner or operator demonstrates that recognized and generally accepted engineering practices have been incorporated into the design of the CCR surface impoundment to ensure that the CCR surface impoundment will not restrict the flow of the base flood, reduce the temporary water storage capacity of a floodplain, or result in washout of CCR, so as to pose a hazard to human life, wildlife, or land or water resources. For this subsection (c):

1) Base flood means a flood that has a 1 percent or greater chance of recurring in any year or a flood of a magnitude equaled or exceeded once in 100 years on average within the time of historical river level records.

2) Floodplain means the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, which are inundated by the base flood.

3) Washout means the carrying away of CCR by waters of the base flood.

d~~c~~) The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the demonstration meets the requirements of subsections (a) and (c).

e~~d~~) The owner or operator of an existing CCR surface impoundment must complete the demonstration required by subsections (a) and (c) of this Section and submit the completed demonstration, along with a qualified professional engineer's certification, to the Agency with the facility's initial operating permit application.

f~~e~~) The owner or operator of a new CCR surface impoundment, or a lateral expansion of a CCR surface impoundment, must submit plans and specifications in a construction permit application that demonstrate the CCR surface impoundment will be constructed under subsections (a)and (c). Upon completion of construction, the owner or operator must obtain a certification from a qualified professional engineer that the CCR surface impoundment or lateral expansion was constructed in accordance with the requirements in subsections (a) and (c) and submit the certification to the Agency in the facility's initial operating permit application.

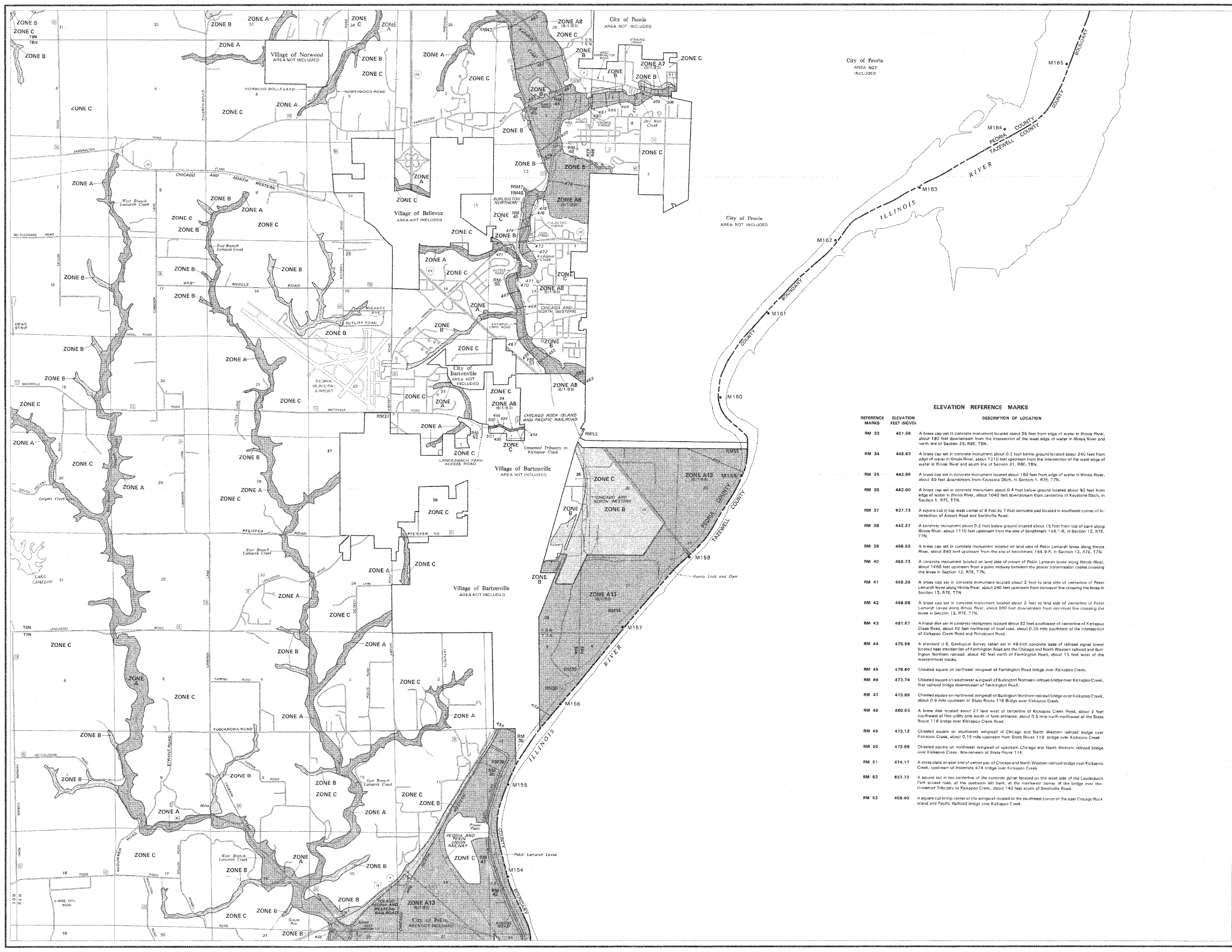
Section 845.350 Failure to Meet Location Standards

a) An owner or operator of an existing CCR surface impoundment who fails to demonstrate compliance with the requirements of this Subpart is subject to the requirements of Section 845.700.

b) An owner or operator of a new CCR surface impoundment, or any lateral expansion of a CCR surface impoundment, who fails to make the demonstration showing compliance with the requirements of this Subpart is prohibited from placing CCR in the CCR surface impoundment.

SUBPART D: DESIGN CRITERIA

Section 845.400 Liner Design Criteria for Existing CCR Surface Impoundments



ELEVATION REFERENCE MARKS

REFERENCE MARKS	ELEVATION FEET (NGVD)	DESCRIPTION OF LOCATION
RM 33	451.56	A brass cap set in concrete monument located about 35 feet from edge of water in Illinois River, about 180 feet downstream from the intersection of the west edge of water in Illinois River and north line of Section 29, R8E, T8N.
RM 34	446.63	A brass cap set in concrete monument about 0.2 foot below ground located about 240 feet from edge of water in Illinois River, about 1310 feet upstream from the intersection of the west edge of water in Illinois River and south line of Section 31, R8E, T8N.
RM 35	442.96	A brass cap set in concrete monument located about 180 feet from edge of water in Illinois River, about 40 feet downstream from Keystone Ditch, in Section 1, R7E, T7N.
RM 36	442.00	A brass cap set in concrete monument about 0.4 foot below ground located about 90 feet from edge of water in Illinois River, about 1040 feet downstream from centerline of Keystone Ditch, in Section 1, R7E, T7N.
RM 37	637.73	A square cut in top west corner of 8-foot by 7-foot concrete pad located in southeast corner of intersection of Airport Road and Smithville Road.
RM 38	442.27	A concrete monument about 0.2 foot below ground located about 15 feet from top of bank along Illinois River, about 1110 feet upstream from the site of benchmark 155.1-R, in Section 12, R7E, T7N.
RM 39	456.50	A brass cap set in concrete monument located on land side of Pekin Lamarsh levee along Illinois River, about 840 feet upstream from the site of benchmark 154.9-R, in Section 12, R7E, T7N.
RM 40	458.73	A concrete monument located on land side of crown of Pekin Lamarsh levee along Illinois River, about 1460 feet upstream from a point midway between the power transmission cables crossing the levee in Section 12, R7E, T7N.
RM 41	459.29	A brass cap set in concrete monument located about 2 feet to land side of centerline of Pekin Lamarsh levee along Illinois River, about 240 feet upstream from conveyor line crossing the levee in Section 13, R7E, T7N.
RM 42	458.99	A brass cap set in concrete monument located about 2 feet to land side of centerline of Pekin Lamarsh Levee along Illinois River, about 600 feet downstream from conveyor line crossing the levee in Section 13, R7E, T7N.
RM 43	481.67	A metal disk set in concrete monument located about 32 feet southwest of centerline of Kickapoo Creek Road, about 60 feet northwest of local road, about 0.35 mile southeast of the intersection of Kickapoo Creek Road and Pottstown Road.
RM 44	475.58	A standard U.S. Geological Survey tablet set in 48-inch concrete base of railroad signal tower located near intersection of Farmington Road and the Chicago and North Western railroad and Burlington Northern railroad, about 40 feet north of Farmington Road, about 15 feet west of the westernmost tracks.
RM 45	478.60	Chiseled square on northeast wingwall of Farmington Road bridge over Kickapoo Creek.
RM 46	473.74	Chiseled square on southwest wingwall of Burlington Northern railroad bridge over Kickapoo Creek, first railroad bridge downstream of Farmington Road.
RM 47	473.89	Chiseled square on northwest wingwall of Burlington Northern railroad bridge over Kickapoo Creek, about 0.6 mile upstream of State Route 116 Bridge over Kickapoo Creek.
RM 48	480.93	A brass disk located about 27 feet west of centerline of Kickapoo Creek Road, about 2 feet southwest of first utility pole south of farm entrance, about 0.5 mile north-northwest of the State Route 116 bridge over Kickapoo Creek Road.
RM 49	473.12	Chiseled square on southwest wingwall of Chicago and North Western railroad bridge over Kickapoo Creek, about 0.15 mile upstream from State Route 116 bridge over Kickapoo Creek.
RM 50	473.66	Chiseled square on northwest wingwall of upstream Chicago and North Western railroad bridge over Kickapoo Creek, downstream of State Route 116.
RM 51	474.17	A brass plate on east end of center pier of Chicago and North Western railroad bridge over Kickapoo Creek, upstream of Interstate 474 bridge over Kickapoo Creek.
RM 52	637.73	A square cut in top centerline of the concrete gutter located on the west side of the Lauderbach Park access road, at the upstream left bank, at the northwest corner of the bridge over the Unnamed Tributary to Kickapoo Creek, about 140 feet south of Smithville Road.
RM 53	459.40	A square cut in top center of the wingwall located at the southeast corner of the east Chicago Rock Island and Pacific Railroad bridge over Kickapoo Creek.

KEY TO MAP

500-Year Flood Boundary — ZONE B
100-Year Flood Boundary
Zone Designations* — ZONE A1 / ZONE A6
100-Year Flood Boundary
500-Year Flood Boundary — ZONE B
Base Flood Elevation Line With Elevation In Feet** — 513
Base Flood Elevation in Feet Where Uniform Within Zone** — (EL 987)
Elevation Reference Mark — RM7×
Zone D Boundary
River Mile — •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
JANUARY 17, 1975
FLOOD HAZARD BOUNDARY MAP REVISIONS:

FLOOD INSURANCE RATE MAP EFFECTIVE:
FEBRUARY 15, 1980

FLOOD INSURANCE RATE MAP REVISIONS:
Map revised June 1, 1983 to update road names, to change zone designation, corporate limits, to revise special flood hazard areas and to reflect FEMA title block.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

N

APPROXIMATE SCALE
2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

COUNTY OF
PEORIA,
ILLINOIS
(UNINCORPORATED AREAS)

PANEL 175 OF 200

COMMUNITY-PANEL NUMBER
170533 0175 B

MAP REVISED:
JUNE 1, 1983

Federal Emergency Management Agency

CREATE AMAZING.

Burns & McDonnell World Headquarters
9400 Ward Parkway
Kansas City, MO 64114
O 816-333-9400
F 816-333-3690
www.burnsmcd.com

ATTACHMENT E


EDWARDS
ASH POND
ID #: W1438050005-01
ILLINOIS
POWER RESOURCES
GENERATING, LLC
SEP/24

ATTACHMENT F

Illinois Power Resources Generating, LLC

EDWARDS POWER PLANT

BARTONVILLE, PEORIA COUNTY, ILLINOIS

Emergency Action Plan (EAP)

40 C.F.R. § 257.73(a)(3), Ill. Adm. Code 845.520
Coal Combustion Residual (CCR) Impoundment
& Related Facilities

- Ash Pond (NID # IL50710) (IEPA # W1438050005-01)

Revision Date: September 16, 2021

Qualified Professional Engineer Certification; Emergency Action Plan for the Edwards Power Plant Ash Pond

In accordance with 40 C.F.R. § 257.73(a)(3)(iv) and 35 Ill. Adm. Code 845.520(e), the owner or operator of a CCR unit that is required to prepare a written Emergency Action Plan under 40 C.F.R. § 257.73(a)(3) and 35 Ill. Adm. Code 845.520(a) must obtain a certification from a qualified professional engineer stating that the written Emergency Action Plan meets the requirements of 40 C.F.R. § 257.73(a)(3) and 35 Ill. Adm. Code 845.520.

I, Phil Morris, being a Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief that:

1. the information contained in this Emergency Action Plan was prepared in accordance with the accepted practice of engineering; and

2. this Emergency Action Plan meets the requirements of 40 C.F.R. § 257.73(a)(3) and 35 Ill. Adm. Code 845.520.

Phil Morris
Senior Director, Corporate Environmental

9/27/21

Date

PHIL L. MORRIS
062-058763
REGISTERED
PROFESSIONAL
ENGINEER
OF
ILLINOIS
9/27/21

EDWARDS POWER PLANT
EMERGENCY ACTION PLAN
CCR IMPOUNDMENT & RELATED FACILITIES

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EDWARDS POWER PLANT
EMERGENCY ACTION PLAN
CCR IMPOUNDMENT & RELATED FACILITIES

PART I – EAP NARRATIVE AND EXHIBITS

1 STATEMENT OF PURPOSE

The Edwards Power Plant (Power Plant) is located near Bartonville in Peoria County, Illinois. The location is shown in Figure 1-1. The Power Plant is a coal-fired electricity producing power plant owned and operated by Illinois Power Resources Generating, LLC, a subsidiary of Dynegy. This Emergency Action Plan (EAP) was prepared in accordance with 40 CFR § 257.73(a)(3) and covers the following Coal Combustion Residual (CCR) surface impoundment located at the site:

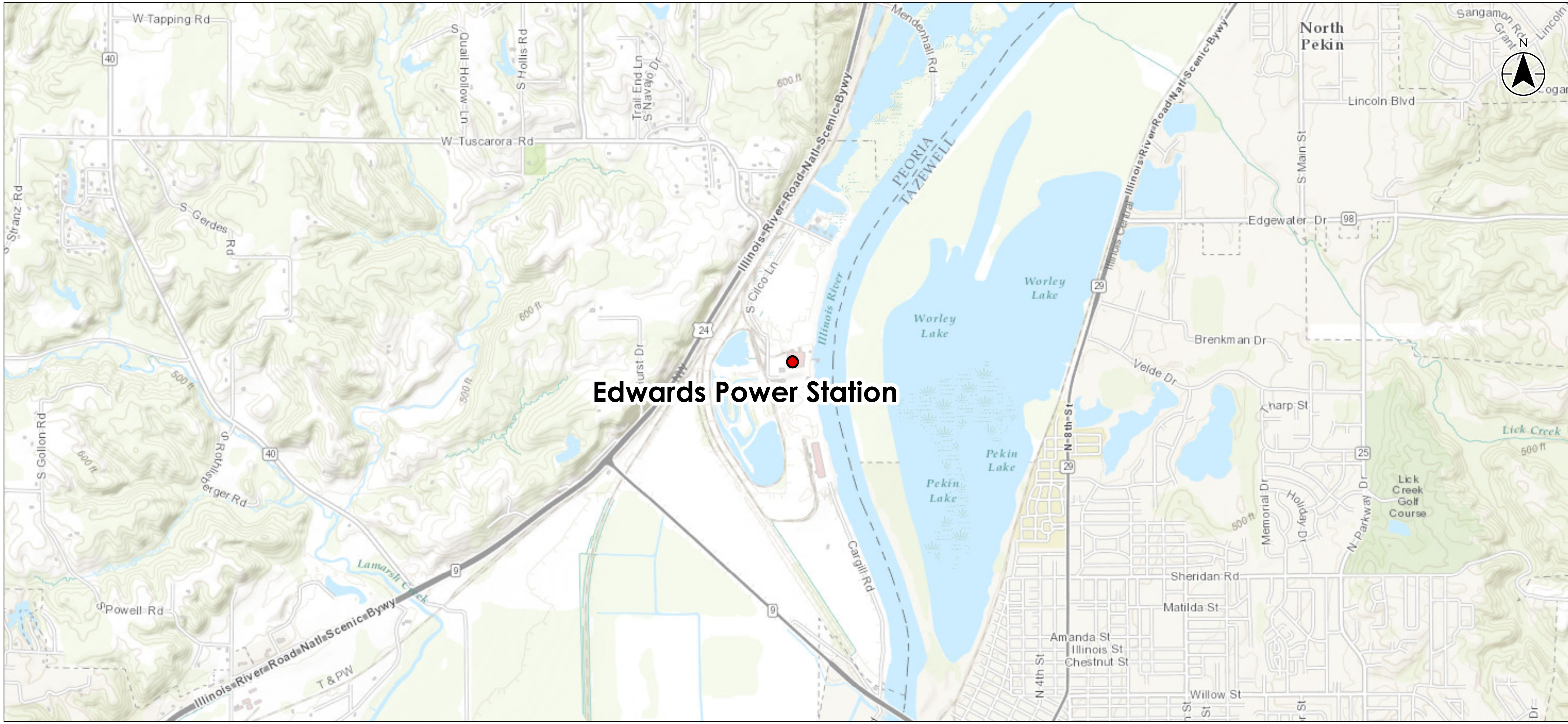
- Ash Pond (NID # IL50710) (IEPA # W1438050005-01)

The location of this impoundment is shown in Figure 1-2. Section 6 of this EAP includes a description of the impoundment.

The purpose of this Emergency Action Plan (EAP) is to:

1. Safeguard the lives, as well as to reduce property damage, of citizens living within potential downstream flood inundation areas of the CCR impoundment and related facilities at the Edwards Power Plant.
2. Define the events or circumstances involving the CCR impoundment and related facilities at the Edwards Power Plant that represent atypical operating conditions that pose a safety hazard or emergency and how to identify those conditions.
3. Define responsible persons, their responsibilities, and notification procedures in the event of a safety emergency.
4. Provide contact information of emergency responders.
5. Identify emergency actions in the event of a potential or imminent failure of the impoundment.
6. Identify the downstream area that would be affected by failure of the impoundment.
7. Provide for effective facility surveillance, prompt notification to local Emergency Management Agencies, citizen warning and notification responses, and preparation should an emergency occur.

Information provided by Illinois Power Resources Generating, LLC was utilized and relied upon in preparation of this report.



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Notes

1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Aerial Source: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO,
3. NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User

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Stantec DYNEGY

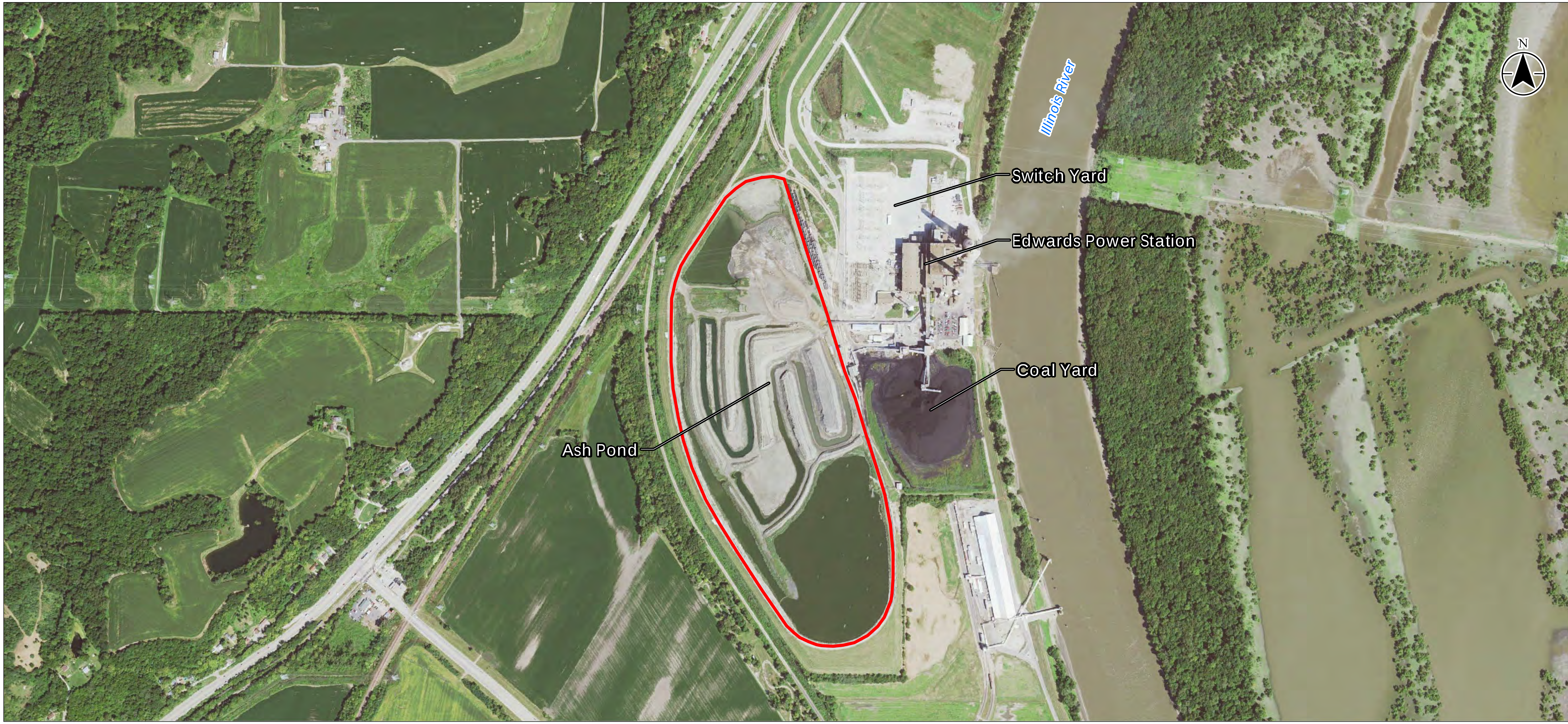
Project Location 175605019
Latitude: 40.595595 Prepared by CMB on 2017-04-12
Longitude: -89.662764 Technical Review by SN on 2017-04-12
Peoria County, Illinois Independent Review by WSW on 2017-04-12

Client/Project
Edwards Power Station
Emergency Action Plan

Figure No.
1-1

Title
Location Map

U:\175605019-Matt_Hoy\gis\mxd\009_edwards\EdwardsLocationMap_1-1.mxd Revised: 2017-04-12 By: snurre



Legend

CCR Surface Impoundment Boundary

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Stantec DYNEGY

Project Location
Latitude: 40.595484
Longitude: -89.663301
Peoria County, Illinois

175605019
Prepared by CMB on 2017-03-29
Technical Review by SN on 2017-03-29
Independent Review by WSW on 2017-03-29

Client/Project
Edwards Power Station
Emergency Action Plan

Figure No.
1-2

Title
CCR Impoundment

Notes
1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Aerial Source: 2015 NAIP Imagery
3. Impoundment Boundaries Provided by Client (Dated 9/9/2015)

U:\175605019-Matt_Hoy\gis\mxd\009_edwards\Edwards\OverviewMap_1-2.mxd Revised: 2017-03-29 By: swheatley

2 COMMUNICATION

To facilitate understanding among everyone involved in implementing this EAP, four response levels are used to identify the condition of an impoundment. These are:

Response Levels:

- **Level 0:** Normal conditions and routine operations, including surveillance and initial investigation of unusual conditions and effects of storm events.
- **Level 1:** Potentially hazardous condition exists, requiring investigation and possible corrective action.
- **Level 2:** Potential failure situation is developing; possible mode of failure is being assessed; corrective measures are underway.
- **Level 3:** Failure is occurring or is imminent, public protective actions are required.

The 4-Step Incident Response Process is outlined in Figure 2-1. This should be used in conjunction with the Notification Flowchart (Figure 2-2) and EAP Decision Tree (Figure 2-3). Section 4 provides guidance tables for determining Response Levels and a table providing emergency actions to be taken given various situations. Table 2-1 lists contact information for the emergency responders.

Figure 2-1. Summary/Sequence of Tasks 4-Step Incident Response Process

Step 1: Detection, Evaluation, and Response Level Determination

Sequence of Tasks:

- Notify EAP Coordinator, Plant Manager, and Dam Safety Manager of unusual condition detected and confer on next steps needed. Conduct technical evaluation of conditions as needed.
- Conduct technical evaluation of conditions as needed.
- Determine Response Level based on evaluation. **(Table 4-1)**
- Reset Response Level as revised evaluations warrant.

Step 2: Notification

Sequence of Tasks:

- Notify authorities, designated personnel, and external response partners of change in Response Level, using the Notification Flowchart. **(Figure 2-2)**
- *Re-notify authorities, designated personnel, and external response partners as Response Level is changed.*

Step 3: Emergency Actions

Sequence of Tasks:

- Perform emergency actions with goal of saving the impoundment and minimizing impacts to life, property, and environment. **(Table 4-3)**
- Take continuous actions to include situation assessment, information sharing, remediation, and public safety advisories or warnings, as warranted.
- *Revise action plan as changes in conditions warrant.*

Step 4: Follow-up

Sequence of Tasks:

- Document conditions and decisions in the Emergency Incident Log.
- Notify authorities, designated personnel, and external response partners that condition is stabilized; limit incident termination declarations to conditions at the site.
- Conduct and document after-action review of incident and response.

Figure 2-2. Notification Flowchart

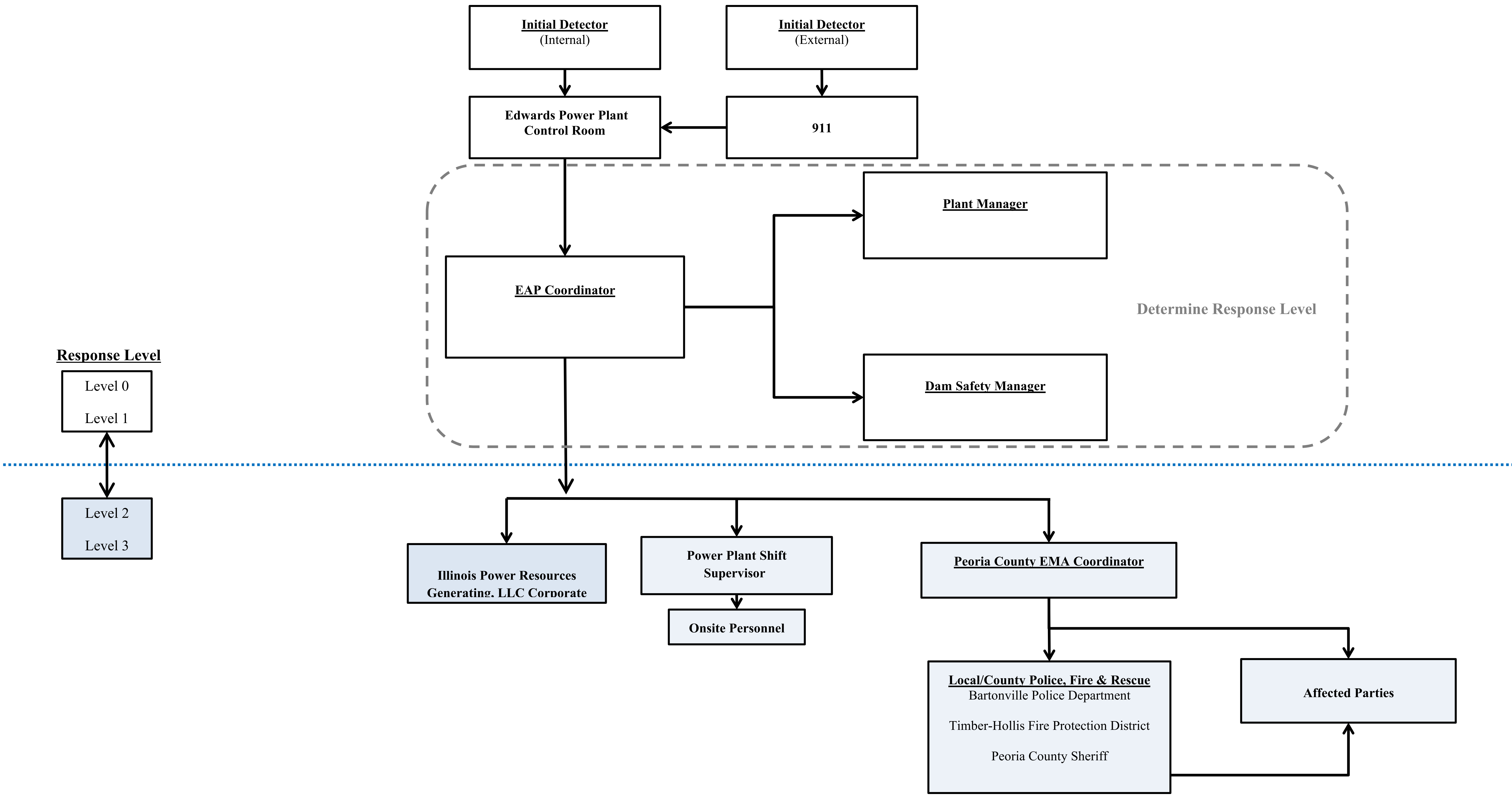

Figure 2-3. EAP Response Process Decision Tree

Note: At any given below, if failure is imminent or actively occurring **CALL 911 IMMEDIATELY** to notify emergency responders and then continue with process afterwards.

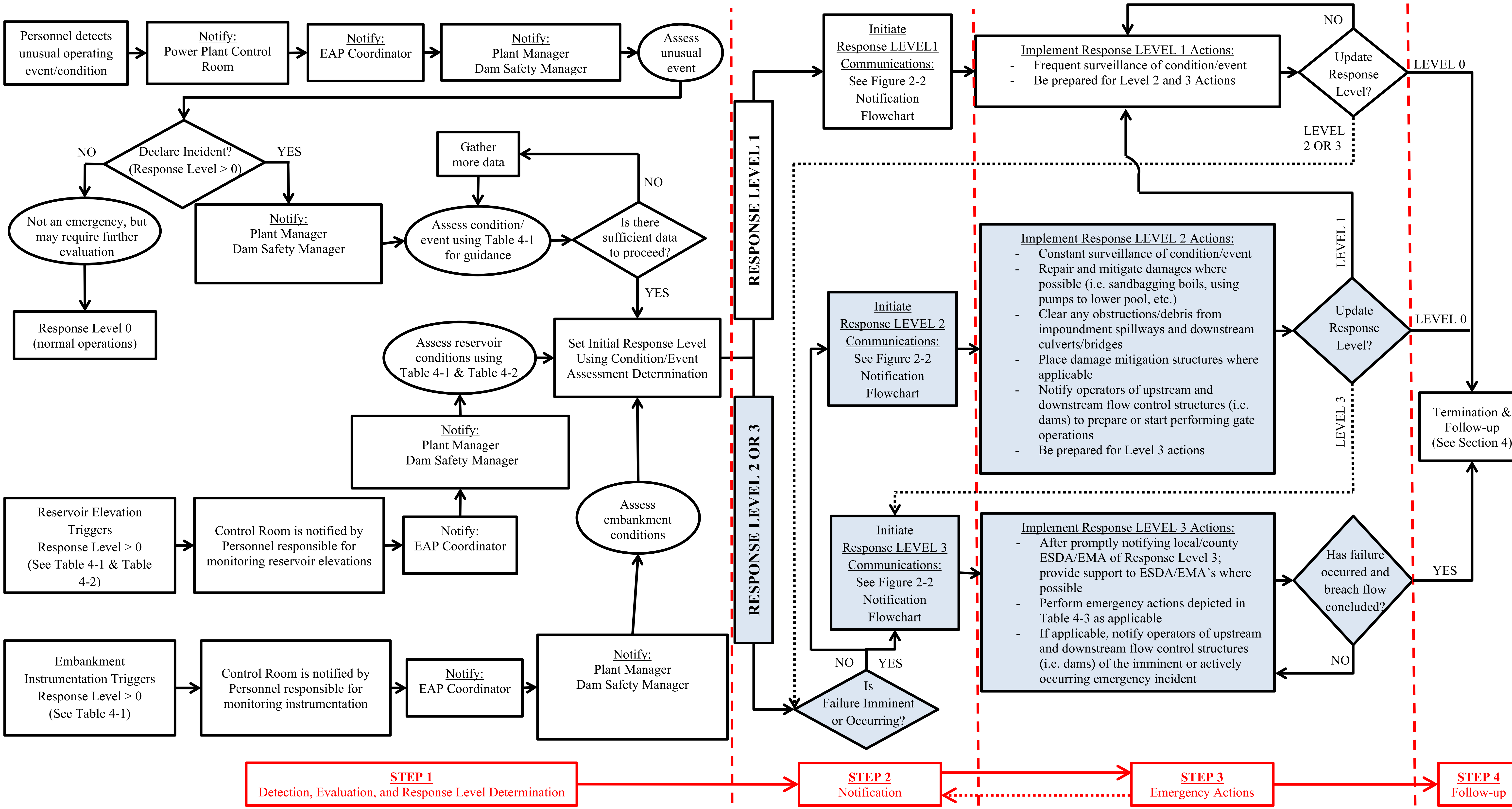

Table 2-1. EAP Emergency Responders

Position/Entity	Name
Internal Contacts	
Edwards Power Plant	**Phone #**
Plant Manager	
EAP Coordinator	(309) 241-4219
Control Room	(309) 633-2425
DMG Corporate Operations	
Dam Safety Manager	(618) 792-8488
External Contacts	
Local/County EMA, Police, & Fire	**Phone #**
Peoria County – EMA	(309) 691-3111
Peoria County – Sheriff Dept.	(309) 697-8515
Bartonville, IL Police Department	(309) 697-2323
Timber-Hollis Fire Protection District	(309) 303-3458
Spring Lake State Fish and Wildlife Area	(309) 968-7135
Peoria County E-911 Board	911
State Emergency Management Agencies & Organizations	**Phone #**
Illinois Conservation Police	(309) 573-8434

3 EAP ROLES AND RESPONSIBILITIES

Table 3-1 provides a summary of the EAP roles during an emergency event.

Table 3-1. Summary of EAP Roles

Entity	Role Description
Emergency Response Team (ERT)	**ERT:** Personnel responsible for EAP implementation, distribution, updates/maintenance, and training activities. The *ERT* is comprised of the following roles: 1. **Corporate:** DMG corporate entity, committee, team, or position with relevant responsibility for a given generating power plant. 2. **Plant Manager:** Personnel responsible for day-to-day operation and management of the Power Plant. 3. **Dam Safety Manager:** Personnel that is most knowledgeable about the design and technical operation of facilities at a given power plant. 4. **EAP Coordinator:** Personnel responsible for implementing the EAP and associated activities. **Emergency Event – EAP Responsibilities** 1. Respond to emergencies at the Power Plant. 2. Verify and assess emergency conditions. 3. Notify and coordinate as appropriate with participating emergency services disaster agencies or emergency management agencies (ESDA/EMA's), emergency responders, regulatory agencies, and all other entities involved or affected by this EAP. 4. Take corrective action at the Power Plant. 5. Declare termination of emergencies at the Power Plant.
Peoria County EMA	1. Receive Response Level reports from *Illinois Power Generating Resources, LLC Corporate* through *EAP Coordinator*. 2. Coordinate emergency response activities with local authorities: police, fire, and rescue, etc. 3. Coordinate notification of public as necessary through established channels, which may include door-to-door contact. 4. Coordinate notification activities to affected parties within inundation areas. 5. Evaluate risk to areas beyond the inundation areas, communicate needs to the *Illinois Power Generating Resources, LLC Corporate* and/or *EAP Coordinator*, and coordinate aid as appropriate. 6. Responsible for declaring termination of an emergency condition off-site upon receiving notification of an emergency status termination from the *Corporate*. 7. If necessary, coordinate with *State ESDA/EMA*.
Local/County Police, Fire & Rescue	1. Receive alert status reports from the *ERT* or the Peoria County *EMA*. 2. If necessary, notify Affected Parties and general public within inundation areas (see Section 7). 3. Render assistance to Peoria County EMA, as necessary. 4. Render assistance to *Illinois Power Generating Resources, LLC Corporate* and *Power Plant Management*, as necessary.

4 EAP RESPONSE

The 4-Step Incident Response Process is shown in Figure 2-1. The Decision Tree shown in Figure 2-3 provides a flowchart for the various elements of the response process. Upon reaching Step 4 of the response process (termination and follow-up), the EAP Coordinator is responsible for notifying the ESDA/EMA's that the condition of the dam/impoundment has been stabilized. The purpose of this section is to provide specific information that can be used during a response. This information is provided in the following tables:

- Table 4-1 provides guidance for determining the response level.
- Table 4-2 provides impoundment pool level trigger elevations.
- Table 4-3 lists emergency actions to be taken depending on the situation.

Table 4-1. Guidance for Determining the Response Level

Event	Situation	Response Level
Spillway flow (See Table 4-2 for relevant elevations)	Primary spillway flow is not causing active erosion and impoundment water surface elevation is below auxiliary spillway crest elevation (if equipped).	Level 0
	Impoundment water surface elevation is at or above auxiliary spillway crest elevation (if equipped). No active erosion caused by spillway flow.	Level 1
	Spillway flow actively causing minor erosion that is not threatening the control section or dam/impoundment stability.	Level 2
	Spillway flow that could result in flooding of people downstream if the reservoir level continues to rise.	Level 2
	Abnormal operation of the spillway system due to blockage or damage that could lead to flooding.	Level 2
	Spillway flow actively eroding the soil around the spillway that is threatening the control section (e.g., undermining) or dam/impoundment stability.	Level 3
	Spillway flow that is flooding people downstream.	Level 3
Embankment Overtopping (See Table 4-2 for relevant elevations)	Impoundment water surface elevation at or below typical normal pool fluctuation elevation.	Level 0
	Impoundment water surface elevation above typical high pool fluctuation elevation.	Level 1
	Impoundment water surface elevation within 2 feet of the embankment crest elevation	Level 2
	Impoundment water surface elevation at or above embankment crest elevation.	Level 3
Seepage	New seepage areas in or near the dam/impoundment with clear flow.	Level 1
	New seepage areas with cloudy discharge or increasing flow rate.	Level 2
	Heavy seepage with active erosion, muddy flow, and/or sand boils.	Level 3
Sinkholes	Observation of new sinkhole in impoundment area or on embankment.	Level 2
	Rapidly enlarging sinkhole and/or whirlpool in the impoundment.	Level 3

Table 4-1. Guidance for Determining the Response Level

Event	Situation	Response Level
Embankment cracking	New cracks in the embankment greater than ¼ inch wide without seepage.	Level 1
	Any crack in the embankment with seepage.	Level 2
	Enlarging cracks with muddy seepage.	Level 3
Embankment movement	Visual signs of movement/slippage of the embankment slope.	Level 1
	Detectable active movement/slippage of the embankment slope or other related effects (tension cracking, bulges/heaves, etc.) that could threaten the integrity of the embankment.	Level 2
	Sudden or rapidly proceeding slides of the embankment slopes.	Level 3
Embankment Monitoring Equipment (piezometers, inclinometers, surface displacement mounts, etc.)	Instrumentation readings beyond historic normal.	Level 1
	Instrumentation readings indicate the embankment is susceptible to failure.	Level 2
	Instrumentation readings indicate embankment is at threshold of failure or is currently failing.	Level 3
Earthquake or another event	Measurable earthquake felt or reported on or within 100 miles of the impoundment.	Level 1
	Earthquake or other event resulting in visible damage to the impoundment or appurtenances.	Level 2
	Earthquake or other event resulting in uncontrolled release of water or materials from the impoundment.	Level 3
Security threat	Verified bomb threat or other physical threat that, if carried out, could result in damage to the impoundment.	Level 2
	Detonated bomb or other physical damage that has resulted in damage to the impoundment or appurtenances.	Level 3
Sabotage/ vandalism	Damage to impoundment or appurtenance with no impact to the functioning of the impoundment.	Level 1
	Modification to the impoundment or appurtenances that could adversely impact the functioning of the impoundment. This would include unauthorized operation of spillway facilities.	Level 2
	Damage to impoundment or appurtenances that has resulted in seepage flow.	Level 2
	Damage to impoundment or appurtenances that has resulted in uncontrolled water release.	Level 3

Table 4-2. Impoundment Trigger Elevations

Impoundment	Embankment Crest Elevation	Auxiliary spillway Crest Elevation	Normal Pool Fluctuation	
			Typical	High
Ash Pond (north open water area)	461 ft.	Not Applicable	449.8 ft.	452 ft.
Ash Pond (south open water area)	461 ft.	Not Applicable	447.6 ft.	452 ft.

Notes:
Elevations are in reference to NAVD88
All remaining values are GIS estimated.

Table 4-3. Step 3: Emergency Actions

Condition	Description of Condition	Action to be Taken
High Water Level/ Large Spillway Release	See Table 4-1 and Table 4-2 for elevations and triggering water levels associated with the impoundment and spillway covered by this EAP.	1. Assess cause of increased reservoir stage, especially during fair weather conditions. 2. Determine Response Level. 3. Make proper notifications as outlined in the Figure 2-2 Notification Flowchart. 4. Perform additional tasks as determined through consultation with the ERT. 5. Make notifications if condition worsens such that downstream flooding is imminent. **Response Level 0**: require enhanced surveillance 3 times per day **Response Level 1**: contact internal chain of command and external partners as necessary; inspect impoundment minimum 1 time per hour **Response Level 2**: contact internal chain of command; notify ESDA/EMA's and notify additional external partners (ESDA/EMA's notify affected parties) **Response Level 3**: contact internal chain of command; notify ESDA/EMA's and notify additional external partners (ESDA/EMA's notify affected parties of emergency incident)
Seepage	Localized new seepage or boil(s) observed along downstream face / toe of earthen embankment with muddy discharge and increasing but controllable discharge of water.	1. Measure and record feature dimensions, approximate flow rate, and relative location to existing surface features. Take photos. Document location on a site plan and in inspection notes. 2. Determine Response Level. 3. Make proper notifications as outlined in the notification flowcharts in the Figure 2-2 Notification Flowchart. 4. ERT (with Dam Safety Manager as lead) to determine mitigation actions. The following actions may apply: a) Place a ring of sand bags with a weir at the top towards the natural drainage path to monitor flow rate. If boil becomes too large to sand bag, place a blanket filter over the area using non-woven filter fabric and pea gravel. Attempt to contain flow in such a manner (without performing any excavations) that flow rates can be measured. Stockpile gravel and sand fill for later use, if necessary. b) Inspect the embankment and collect piezometer, water level and seepage flow data daily unless otherwise instructed by the Engineer. Record any changes of conditions. Carefully observe embankment for signs of depressions, seepage, sinkholes, cracking or movement.

Table 4-3. Step 3: Emergency Actions

Condition	Description of Condition	Action to be Taken
		c) Maintain continuous monitoring of feature. Record measured flow rate and any changes of condition, including presence or absence of muddy discharge. 5. Make notifications as outlined in the lower portion of the Figure 2-2 Notification Flowchart if condition worsens such that failure is imminent.
Sabotage and Miscellaneous Other Issues	Criminal action with significant damage to embankment or structures where significant repairs are required and the integrity of the facility is compromised—condition appears stable with time.	1. Contact law enforcement authorities and restrict all access (except emergency responders) to impoundment. Restrict traffic on embankment crest to essential emergency operations only. 2. Determine Response Level. 3. Make internal notifications as outlined in the flowcharts in the upper portion of the Figure 2-2 Notification Flowchart. 4. In conjunction with the Dam Safety Manager, assess extent of damage and visually inspect entire embankment and ancillary structures for additional less obvious damage. Based on inspection results, confirm if extent of damage to various components of the impoundment warrants a revised Response Level and additional notifications. 5. Perform additional tasks as directed by the ERT. 6. Make notifications if conditions worsen.
Embankment Deformation	**Cracks:** New longitudinal (along the embankment) or transverse (across the embankment) cracks more than 6 inches deep or more than 3 inches wide or increasing with time. New concave cracks on or near the embankment crest associated with slope movement.	1. Measure and record feature dimensions, approximate flow rate, and relative location to existing surface features. Take photos. Document location on a site plan and in inspection notes. 2. Restrict traffic on embankment crest to essential emergency operations only. 3. Determine Response Level. 4. Make notifications as outlined in the Figure 2-2 Notification Flowchart 5. ERT (with Dam Safety Manager as lead) to determine mitigation actions. The following actions may apply: a) Place buttress fill against base of slope immediately below surface feature. Stockpile additional fill. b) Place sandbags as necessary around crack area to divert any storm water runoff from flowing into crack(s). 6. As directed by the Dam Safety Manager, additional inspection and monitoring of the dam may be required. Items may include inspect the dam on a schedule determined by the engineers; collect piezometer and water level data; and record any changes of condition. Carefully observe dam for signs of depressions, seepage, sinkholes, cracking or movement. 7. Make notifications as outlined in the Figure 2-2 Notification Flowchart if conditions worsen such that failure is imminent.
Embankment Deformation (cont.)	**Slides / Erosion:** Deep slide / erosion (greater than 2 feet deep) on the embankment that may also extend beyond the embankment toe but does not encroach onto the embankment crest and appears stable with time.	1. Measure and record feature dimensions, approximate flow rate, and relative location to existing surface features. Take photos. Document location on a site plan and in inspection report. 2. Restrict traffic on embankment crest to essential emergency operations only. 3. Determine the Response Level. 4. Make notifications as outlined in the Figure 2-2 Notification Flowchart. 5. ERT (with Dam Safety Manager as lead) to determine mitigation actions. Additional actions may include the following items. a) Place sandbags as necessary around slide area to divert any storm water runoff from flowing into slide(s). b) Increase inspections of the dam; collect piezometer and water level data; and record any changes of condition. During inspections,

Table 4-3. Step 3: Emergency Actions

Condition	Description of Condition	Action to be Taken
		carefully observe dam for signs of depressions, seepage, sinkholes, cracking or movement. 6. Make notifications as outlined in the Figure 2-2 Notification Flowchart if conditions worsen such that failure is imminent.
	Sinkholes: Small depression observed on the embankment or within 50 feet of the embankment toe that is less than 5 feet deep and 30 feet wide or which is increasing with time.	1. Slowly open drain gates to lower pool elevation. 2. Measure and record feature dimensions, approximate flow rate, and relative location to existing surface features. Take photos. Document location on a site plan and in inspection notes. 3. Restrict traffic on embankment crest to essential emergency operations only. 4. Determine Response Level. 5. Make notifications as outlined in the Figure 2-2 Notification Flowchart. 6. ERT (with Dam Safety Manager as lead) to determine mitigation actions. Additional actions may include the following items: a) Backfill the depression with relatively clean earth fill (free of organic materials) generally even with surrounding grade and slightly mounded (6 to 12 inches higher) in the center to shed storm water away from the depression. Stockpile additional fill. b) Increase inspections of the dam; collect piezometer and water level data daily unless otherwise instructed by engineer; and record any changes of condition. Carefully observe dam for signs of depressions, seepage, sinkholes, cracking or movement. 7. Make notifications as outlined in the Figure 2-2 Notification Flowchart if conditions worsen such that failure is imminent.
Gate Malfunction or Failure	Sluice gate damaged structurally (sabotage, debris, etc.) with uncontrolled release of water at a constant volume. Condition appears stable.	1. Close any other gates, if open. 2. Determine Response Level. 3. Make notifications as outlined in the Figure 2-2 Notification Flowchart. 4. Obtain instructions from the Engineer to determine if there are other methods to stop or slow down the flow of water. 5. If conditions worsen such that failure is imminent, make notifications as outlined in the lower portion of the Figure 2-2 Notification Flowchart.

5 PREPAREDNESS

The intent of this section is to provide information that will be utilized during a response. Established emergency supplies and locations, suppliers, and equipment are provided in Table 5-1. Supplier contact information is listed in Table 5-2.

A coordination meeting shall be conducted annually between representatives of the Illinois Power Resources Generating, LLC and local emergency responders. This meeting may be in the form of a face-to-face meeting, tabletop exercise, or additional training regarding the EAP.

Table 5-1. Emergency Supplies and Equipment

Item	On-site (Yes/No/Occasionally)	Remarks
Flashlights	Yes	Contact Shift Supervisor for location(s).
Generator	Yes	Contact Shift Supervisor for location(s). Contact National Rental, Inc. for additional emergency generators (see Table 5-2).
Extension Cords	Yes	Contact Shift Supervisor for location(s).
Fire extinguishers	Yes	Contact Shift Supervisor for location(s).
Floodlights	Yes	Contact Shift Supervisor for location(s). Contact JM Industrial Supply for additional emergency lighting (see Table 5-2).
Backhoe	Yes	Contact Shift Supervisor for location(s).
Dozer	Yes	Contact Shift Supervisor for location(s).
Dump Truck	No	Contact Shift Supervisor for resources and availability. Contact: • National Rental, Inc.
Large Equipment (Rental – including excavating equipment, pumps, lighting)	Occasionally	Contact Shift Supervisor for resources and availability. Contact: • National Rental, Inc. • Sunbelt Rentals
Pump and Hoses	Yes	Contact Shift Supervisor for location(s). Contact National Rental, Inc. and/or JM Industrial Supply for high-capacity portable pumps (see Table 5-2).
Sandbags and Sand	No	Contact: • Pekin Sand & Gravel, L.L.C. (see Table 5-2)
Fill (Stone, aggregate, sand)	No	Contact: • Pekin Sand & Gravel, L.L.C. (see Table 5-2) • Westside Aggregates (see Table 5-2)
Concrete/grout	No	Contact: • Roanoke Concrete Products (see Table 5-2) • United Ready-Mix Inc. (see Table 5-2)
Geotextile Filter Fabric	Yes	Contact Shift Supervisor for location(s).
Plastic Sheeting	Yes	Contact Shift Supervisor for location(s).
Rope	Yes	Contact Shift Supervisor for location(s). Should be maintained near any features that might require immediate access.
Personal Flotation Devices	Yes	Contact Shift Supervisor for location(s).

Table 5-2. Supplier Addresses

Supplier	Distance from Site (miles)	Address
National Rental, Inc.	4.4	706 S. 2nd, Pekin, IL 61554
Sunbelt Rentals	18.9	1601 N. Main Street, East Peoria, IL 61611
JM Industrial Supply	6.7	2323 Lakeshore, Pekin, IL 61554
Pekin Sand & Gravel, L.L.C.	7.9	13018 Manito Road, Pekin, IL 61554
Westside Aggregates	8.8	2401 West Rhodora Avenue, West Peoria, IL
Roanoke Concrete Products	5.5	1675 S. 2nd Street, Pekin, IL 661544
United Ready-Mix Inc.	6.0	2101 S. 2nd Street, Pekin, IL 61544

6 FACILITY/IMPOUNDMENT DESCRIPTION

The impoundment included in this EAP is described as follows and illustrated in Figure 1-2. Table 6-1 contains additional geometric details for the impoundment.

The Edwards Power Plant is located in Peoria County, Illinois approximately one-half mile east of the intersection of U.S. Highway 24 and Illinois Route 9. The plant is located on the west bank of the Illinois River, just over one mile northwest of downtown Pekin, Illinois. The Ash Pond is located west of the power plant and Switch Yard and east of the Toledo Peoria & Western Railroad.

The Ash Pond is located on the west side of the Edwards Power Plant. The impoundment is a perched pond with watershed area beyond the extent of the pond limited to small areas of the switchyard and Edwards Power Plant. The surrounding areas will contribute an insignificant amount of runoff to the Ash Pond. According to the drainage construction plans for the Ash Pond primary spillway, flow from the Ash Pond discharges east to the Illinois River through a 36-inch diameter Corrugated Metal Pipe (CMP) located parallel to the property boundary, south of the Coal Yard. The primary spillway is equipped with a flapgate and has a sluice gate located at the embankment along the Illinois River. The Ash Pond has wet bottom storage areas on the north and south ends and does not have a dedicated auxiliary spillway. The earthen impoundment also services a railroad line.

Table 6-1. Power Plant Impoundment Characteristics

Feature/Parameter	Ash Pond
Maximum Embankment Height	29 ft.
Length of Dam	6,700 ft.
Crest Width	14 ft.
Crest Elevation	461 ft. **
Reservoir Area at Top of Dam	89 acres
Storage Capacity at Top of Dam	1,024 acre-ft.
Primary Spillway Type	36-inch diameter CMP*
Primary Spillway Crest Elevation	450.1*
Storage Capacity at Primary Spillway Elevation	580
Reservoir Area at Normal Water Surface Elevation (south wet bottom storage area)	23 acres
Reservoir Area at Normal Water Surface Elevation (north wet bottom storage area)	5 acres
Auxiliary spillway Type	N/A
Auxiliary spillway Crest Elevation	N/A

Notes:
*Kleinfelder. (May 2011). *Coal Ash Impoundment Site Assessment Final Report.* All remaining values are GIS estimated.
**Elevation in reference to NAVD88

7 BREACH INUNDATION MAP AND POTENTIAL IMPACTS

An inundation map for Ash Pond potential breach scenarios is provided in this section. It is the Peoria County EMA's responsibility to keep a current list of affected parties/properties to contact in the case of emergencies that result in Response Level 2 or 3. This list should encompass all properties within and adjacent to the probable inundation extents shown in the provided map.

The methodology used to identify probable inundation extents for potential breach scenarios varied as a function of the impoundment size, location, surrounding topography, and surrounding structures/facilities/waterbodies.

Probable Maximum Flood (PMF) and crest volume transfer analyses were completed for potential breach scenarios to the west and east embankments of the Ash Pond. The approximate inundation area is illustrated in Figure 7-1.

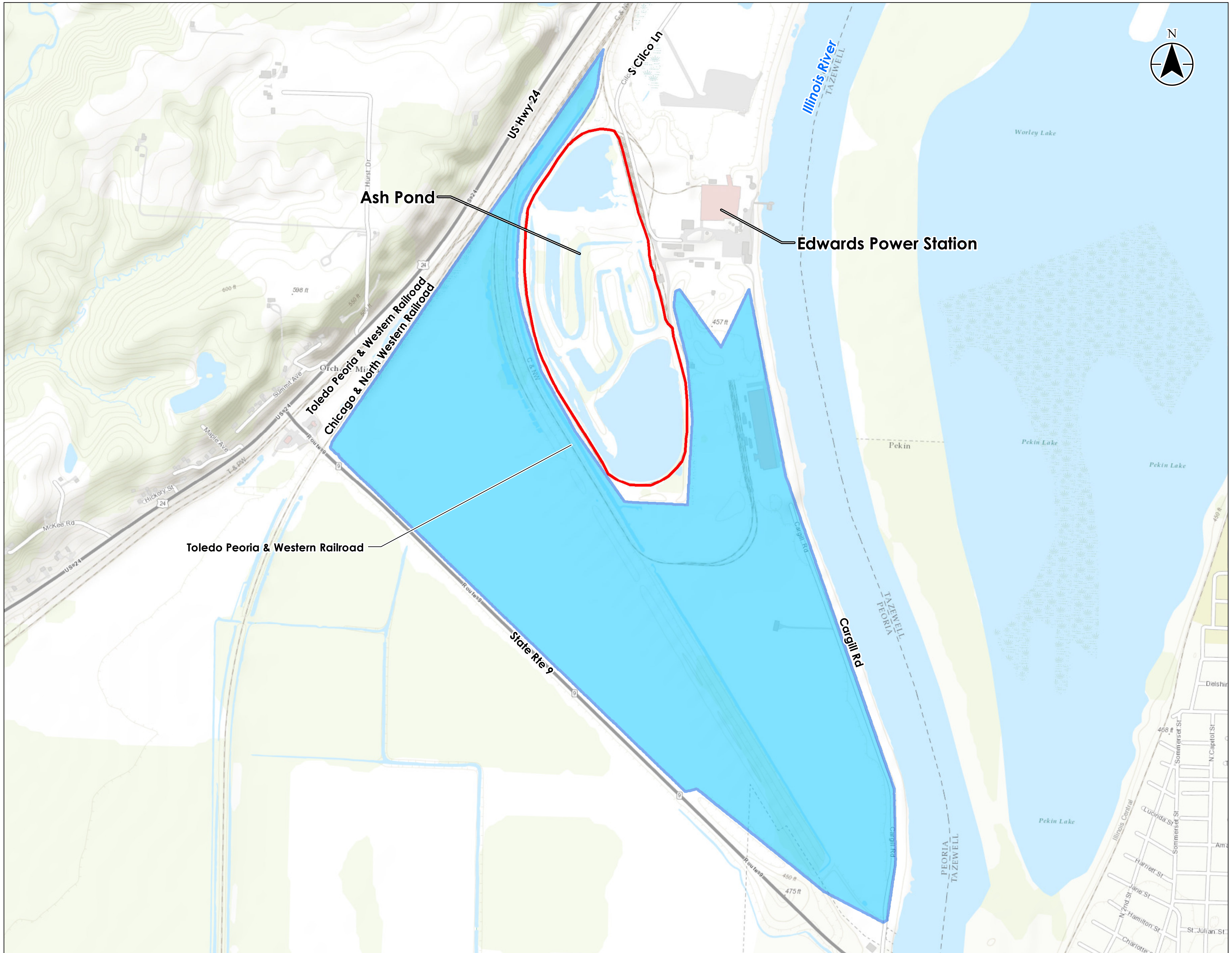

Figure No.
7-1

Title
Inundation Map
Ash Pond

Client/Project
Edwards Power Station
Emergency Action Plan

Project Location 175605019
Latitude: 40.595595
Longitude: -89.662764
Peoria County, Illinois

Prepared by CMB on 2017-04-12
Technical Review by SN on 2017-04-12
Independent Review by WSW on 2017-04-12

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Feet
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Legend

CCR Surface Impoundment Boundary
Expected Breach Inundation Area

Notes
1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
2. Aerial Source: 2015 NAIP Imagery

Stantec DYNEGY

U:\175605019-Matt_Hoy\gis\mxd\009_edwards\EdwardsInundationMap_7-1C.mxd Revised: 2017-04-12 By: snurre

ATTACHMENT G

CCR Fugitive Dust Control Plan

for

Edwards Power Plant

Prepared for:

Illinois Power Resources Generating, LLC

Edwards Power Plant
7800 South Cilco Lane
Bartonville, IL 61607

Prepared by:

Burns & McDonnell
Kansas City, Missouri

Amendment 2

October 2021

Table of Contents

List of Tables

1 Introduction

This Coal Combustion Residuals (CCR) fugitive dust control plan has been prepared for the Edwards Power Plant, located in Peoria County, Illinois. This plan addresses the air criteria in 40 C.F.R. § 257.80 of the United States Environmental Protection Agency's CCR rule, which requires the owner or operator of a CCR unit to "adopt measures that will effectively minimize CCR from becoming airborne at the facility" and to "prepare and operate in accordance with a CCR fugitive dust control plan." The plan also addresses the air criteria in 35 I.A.C. 845.500 of the Illinois Environmental Protection Agency's CCR rule, which contains similar requirements to the federal CCR rule.

1.1 Facility Information

- Facility Name: Edwards Power Plant
- Facility Address: 7800 South Cilco Road, Bartonville, IL 61607
- Owner/Operator: Illinois Power Resources Generating, LLC

1.2 Certification

The owner or operator must obtain a certification from a qualified professional engineer that the initial CCR fugitive dust control plan, or any subsequent amendment of it, meets the requirements of 40 C.F.R.§ 257.80 and 35 I.A.C. 845.500. See 40 C.F.R. § 257.80(b)(7); 35 I.A.C. 845.500(b)(7).

I certify under penalty of law that, to the best of my knowledge, this plan meets the requirements of 40 C.F.R. § 257.80 and 35 I.A.C. 845.500. This certification is based on my review of the document and conditions at the site and on my inquiry of the person or persons who managed the preparation of this document.

John R. Hesemann
Printed Name of Qualified Professional Engineer

John R. Hesemann 9/09/2021
Signature of Qualified Professional Engineer and Date

062.058523 – Illinois – Expires 11/30/2021
Registration Number and State

JOHN ROBERT HESEMANN
062-058523
LICENSED
PROFESSIONAL
ENGINEER
OF
ILLINOIS

2 CCR Fugitive Dust Control Measures and Appropriateness

CCR fugitive dust has the potential to become airborne at the facility during periods of CCR management in the CCR unit, CCR handling and CCR transport. Areas at the facility that have the potential for airborne CCR fugitive dust include a CCR surface impoundment, CCR handling equipment and CCR transport in trucks. This section identifies and describes the control measures selected and adopted by the facility to minimize CCR from becoming airborne at the facility and explains how the selected measures are applicable and appropriate for site conditions. The control measures may be adjusted or modified based on observed effectiveness of minimizing CCR from becoming airborne and weather conditions.

2.1 Management of CCR in the CCR Unit

The facility manages CCR in a surface impoundment located at the facility. Table 2-1 below identifies CCR fugitive dust control measures that have been selected for use by the facility during CCR management in the CCR unit, including placement of CCR into the CCR unit, and explains how the selected measures are applicable and appropriate for site conditions. The facility will use the identified measures during CCR management in the CCR unit to minimize CCR from becoming airborne at the facility.

CCR Activity	CCR Fugitive Dust Control Measure	Applicability and Appropriateness of Control Measure
Management of CCR in the facility's CCR unit	Maintain CCR inventory levels in the CCR unit at lowest practicable height	Maintaining CCR inventory levels at lowest practicable height reduces the potential for CCR fugitive dust generation in excessively dry or windy conditions.
	Wet management of CCR bottom ash and CCR fly ash in the CCR surface impoundment.	Wet management of CCR minimizes the potential for CCR fugitive dust generation.
	Water or apply chemical dust suppressant on areas of exposed CCR in or near the CCR unit, as necessary	Using water or mixing an appropriate chemical dust suppressant with water and applying to areas of exposed CCR will minimize the potential for CCR fugitive dust generation in excessively dry or windy conditions.
	Naturally occurring grass vegetation in areas of exposed CCR in the CCR surface impoundment.	Vegetation provides a wind screen and/or cover and reduces wind entrainment of CCR.
	Reduce or halt operations during high wind events, as necessary.	Reducing or halting operations during high wind events minimizes the potential for CCR fugitive dust generation.

Table 2-1. Control Measures for CCR Management in the CCR Unit

2.2 Handling of CCR

CCR is regularly removed from the boiler system and conveyed to the CCR handling system, which includes silos and truck loading areas. CCR fly ash is pneumatically conveyed in an enclosed system from the boiler system to storage silos. CCR bottom ash, and sometimes fly ash, is wet sluiced into a CCR surface impoundment. When unloading the CCR fly ash silos for transport to an offsite landfill, a batch mixer is used to condition the CCR fly ash as it is loaded into trucks. Table 2-2 below identifies CCR fugitive dust control measures that have been selected for use by the facility during handling of CCR and explains how the selected measures are applicable and appropriate for site conditions. The facility will use the identified measures when handling CCR to minimize CCR from becoming airborne at the facility.

CCR Activity	CCR Fugitive Dust Control Measure	Applicability and Appropriateness of Control Measure
Handling of CCR at the facility	Wet sluice CCR bottom ash and fly ash to CCR surface impoundment.	Wet sluicing CCR minimizes the potential for CCR fugitive dust generation.
	Pneumatically convey dry CCR fly ash to storage silos in an enclosed system.	Conveying CCR fly ash in an enclosed system minimizes the potential for CCR fugitive dust generation.
	Condition CCR fly ash to be emplaced in an offsite landfill before loading into trucks for transport to the landfill.	Conditioning allows CCR to bind together and thus. minimizes the potential for CCR fugitive dust generation while loading CCR into trucks (and during transport and emplacement in the landfill).
	Condition CCR materials to be transported offsite before they are loaded into trucks, as necessary.	Conditioning allows CCR to bind together and thus minimizes the potential for CCR fugitive dust generation while loading CCR into trucks (and during transport and emplacement in the landfill).
	Load CCR transport trucks from the CCR fly ash silos in a covered/contained area.	Covering/containing the CCR transport truck loading area reduces the potential for wind to cause CCR fugitive dust to become airborne.
	Load CCR transport trucks from the CCR fly ash silos using a telescoping chute with vacuum equipment when applicable	Use of a telescoping chute reduces the drop height from the end of the chute into the truck and minimizes the potential for CCR fugitive dust to become airborne.
	Perform housekeeping, as necessary, in the fly ash loading area.	Good housekeeping measures, such as sweeping or wetting the loading area, minimize the potential for CCR fugitive dust generation during handling activities.
	Operate fly ash handling system in accordance with good operating practices.	Operation in accordance with good operating practices minimize the potential for CCR fugitive dust generation.
	Maintain and repair as necessary dust controls on the fly ash handling and truck load-out systems.	Performing maintenance and repairs as needed to maintain dust controls in good operating condition minimizes the potential for CCR fugitive dust generation.
	Reduce or halt operations during high wind events, as necessary.	Reducing or halting operations during high wind events minimizes the potential for CCR fugitive dust generation.

Table 2-2. Control Measures for Handling CCR

2.2.1 Conditioning of CCR Prior to Emplacement in CCR Landfill

Conditioned CCR is CCR that has been wetted with water or an appropriate chemical dust suppressant. Water or a chemical dust suppressant is added to raise the moisture content of the CCR to prevent wind dispersal but will not result in free liquids. Conditioning allows for the CCR to bind together, which minimizes the potential for CCR fugitive dust.

All CCR generated on site that is placed into an offsite landfill is conditioned in a mixer or otherwise conditioned prior to loading into trucks for transport to the landfill. Therefore, all CCR is emplaced in a landfill as conditioned CCR.

2.3 Transportation of CCR

CCR is transported via trucks at the facility using a combination of paved and unpaved facility roads. Table 2-3 below identifies CCR fugitive dust control measures that have been selected for use by the facility during transport of CCR. The facility will use the identified measures when transporting CCR to minimize CCR from becoming airborne at the facility.

CCR Activity	CCR Fugitive Dust Control Measure	Applicability and Appropriateness of Control Measure
Transportation of CCR at the facility	Condition CCR to be emplaced in an offsite landfill before it is loaded into vehicles for transport to the landfill.	Conditioning CCR increases moisture content of the CCR and minimizes the potential for CCR fugitive dust generation during CCR transport (and emplacement in the landfill).
	Condition CCR materials to be transported offsite before they are loaded into trucks, as necessary.	Conditioning allows CCR to bind together and thus minimizes the potential for CCR fugitive dust generation while loading CCR into trucks and during transport.
	Cover or enclose trucks used to transport CCR fly ash offsite.	Covering or enclosing trucks transporting CCR fly ash offsite minimizes the potential for CCR fugitive dust generation from the CCR transport trucks.
	Limit the speed of vehicles to no more than 15 mph on facility roads.	Limiting the speed of vehicles traveling on facility roads minimizes the potential for CCR fugitive dust generation from the CCR transport trucks.
	Cover or enclose trucks used to transport CCR other than fly ash, as necessary.	Covering or enclosing trucks transporting CCR minimizes the potential for CCR fugitive dust generation from the CCR transport trucks.
	Sweep or rinse CCR off of the outside of the trucks transporting CCR, as necessary.	Removing CCR present on the outside of the truck minimizes the potential for movement of the truck or wind to cause CCR fugitive dust to become airborne.
	Condition CCR haul roads with water or dust suppressant, as necessary.	Watering CCR haul roads minimizes the potential for CCR fugitive dust generation in excessively dry or windy conditions.
	Sweep paved roads, as needed.	Utilizing contracted street sweeping equipment minimizes the potential for fugitive dust that has been deposited onto the road surface.
	Remove CCR, as necessary, deposited on facility road surfaces during transport.	Removing CCR deposited on facility road surfaces as a result of transport minimizes the potential for CCR fugitive dust generation from vehicle traffic.
	Reduce or halt operations during high wind events, as necessary.	Reducing or halting operations during high wind events minimizes the potential for CCR fugitive dust generation.

Table 2-3. Control Measures for Transportation of CCR

3 Procedures for Periodic Assessment of Effectiveness of the Plan

The facility conducts inspections associated with CCR fugitive dust control. The facility also uses the procedures identified in Section 5 of this plan to log every citizen complaint involving CCR fugitive dust events at the facility. These inspections and the investigations of citizen complaints will be used to periodically assess the effectiveness of the CCR fugitive dust control plan per 40 C.F.R. § 257.80(b)(4) and 35 I.A.C. 845.500(b)(3).

The facility routinely performs inspections to verify the effectiveness of the CCR fugitive dust control measures used at the facility. Inspections are conducted during daylight working hours and include observing for the presence of CCR fugitive dust emissions from vehicles transporting CCR on facility roads, CCR handling and CCR management activities, including CCR placement in CCR units. Inspection records include information such as the name of the person conducting the inspection, the date and time of the inspection, the results of the inspection, and any corrective action taken.

When a CCR fugitive dust event is observed or a citizen complaint involving a CCR fugitive dust event at the facility is received, current CCR management practices will be reviewed to see that the selected control measures are being properly implemented. If the control measures are not being properly implemented, relevant operating personnel will be notified and, as warranted, re-trained in the proper implementation of CCR fugitive dust control measures. If appropriate, use of revised and/or additional control measures will be evaluated. As warranted, revised and/or additional control measures found to be applicable and appropriate to control CCR fugitive dust emissions will be incorporated into an amended CCR fugitive dust control plan.

The plan also will be reassessed in the event of material changes in site conditions potentially resulting in CCR fugitive dust becoming airborne at the facility.

4 Recordkeeping, Notification, Internet Site

The written CCR fugitive dust control plan, any amendment of the written plan, and the annual CCR fugitive dust control report required by 40 C.F.R. § 257.80(c) and 35 I.A.C. 845.500(c) will be placed in the facility's written operating record and posted to the company's CCR website in accordance with 40 C.F.R. § 257.105(g), § 257.107(g), and 845.800(d)(7), (14) and 845.810(e). Notification of the availability of the CCR fugitive dust control plan, any amendment of the plan, and the annual CCR fugitive dust control report will be provided to IEPA in accordance with 40 C.F.R. § 257.106(g). Any amendment of the fugitive dust control plan will be submitted to IEPA in accordance with 845.500(b)(5).

Additionally, pursuant to 845.500(b)(6), this fugitive dust control plan is being placed in facility's operating record and posted to the company's CCR website prior to the submission of any permits for the Edwards Power Plant.

5 Procedures to Log Citizen Complaints

In the event the owner or operator of the facility receives a citizen complaint involving a CCR fugitive dust event at the facility, relevant information about the complaint will be logged. Information that will be recorded includes, as applicable:

- Date/Time the complaint is received
- Date/Time and duration of the CCR fugitive dust event
- Description of the nature of the CCR fugitive dust event
- Name of the citizen entering the complaint
- Address & phone number of citizen entering the complaint
- Name of the personnel who took the complaint
- All actions taken to assess and resolve the complaint

All citizen complaints involving CCR fugitive dust events at the facility will be investigated promptly. As deemed appropriate or necessary, corrective measures will be taken and a follow-up response will be provided to the complainant.

Pursuant to 35 I.A.C. 845.500(b)(2), quarterly reports will be submitted to IEPA no later than 14 days from the end of the quarter for all complaints received in that quarter. At a minimum, the quarterly report will include the date of the complaint, the date of the incident, the name and contact information of the complainant (if given), and all actions taken to assess and resolve the complaint.

6 Amendments

The written CCR fugitive dust control plan may be amended at any time provided the revised plan is placed in the facility's operating record as required by 40 C.F.R. § 257.105(g)(1) and 845.500(b)(6). Any amendment of the fugitive dust control plan will be submitted to IEPA in accordance with 845.500(b)(5). The written CCR fugitive dust control plan must be amended whenever there is a change in conditions that would substantially affect the written plan in effect.

Amendment Number and Date	Pages or Section	Description of Amendment	Professional Engineer Certifying Plan
Version 0 October 2015	--	Initial Plan	Wendy M. Pennington
Amendment 1 May, 2017	Section 2-3	Add haul road watering as needed and contract street sweep, as needed, to CCR fugitive dust control measures	
Amendment 2 October, 2021	Various	Administrative changes and adjustments to site condition controls as appropriate.	John R. Hesemann

Table 6-1. CCR Fugitive Dust Control Plan Amendments

ATTACHMENT H

Intended for
Illinois Power Resources Generating, LLC

Date
October 25, 2021

Project No.
1940100806-004

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT

ASH POND

EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT EDWARDS POWER PLANT ASH POND

Project Name	**Edwards Power Plant Ash Pond**
Project No.	**1940100806-004**
Recipient	**Illinois Power Resources Generating, LLC**
Document Type	**Hydrogeologic Site Characterization Report**
Revision	**FINAL**
Date	**October 25, 2021**

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APPENDICES

ACRONYMS AND ABBREVIATIONS

§	Section
°F	degrees Fahrenheit
35 I.A.C.	Title 35 of the Illinois Administrative Code
40 C.F.R.	Title 40 of the Code of Federal Regulations
bgs	below ground surface
CCR	coal combustion residuals
cm/s	centimeters per second
CPT	cone penetrometer test
CSM	Conceptual Site Model
EPP	Edwards Power Plant
ESRI	Environmental Systems Research Institute
Federal CCR Rule	40 C.F.R. § 257 Subpart D
FEMA	Federal Emergency Management Agency
ft/day	feet per day
ft/ft	feet per feet
g	horizontal acceleration
GMP	Groundwater Monitoring Plan
gpm	gallons per minute
GWPS	Groundwater Protection Standard
HCR	Hydrogeologic Site Characterization Report
HUC	Hydrologic Unit Code
ID	identification
IDNR	Illinois Department of Natural Resources
IEPA	Illinois Environmental Protection Agency
ILWATER	Illinois Water and Related Wells
IPRG	Illinois Power Resources Generating, LLC
ISGS	Illinois State Geological Survey
ISWS	Illinois State Water Survey
LEL	lower explosive limit
MGD	million gallons per day
mg/L	milligrams per liter
NAVD88	North American Vertical Datum of 1988
NID	National Inventory of Dams
No.	Number
NGVD29	National Geodetic Vertical Datum of 1929
NPDES	National Pollutant Discharge Elimination System
NRT	Natural Resource Technology, Inc.
NRT/OBG	Natural Resource Technology, Inc., an OBG Company
Part 845	Residuals in Surface Impoundments: Title 35 of the Illinois Administrative Code § 845
pCi/L	picoCuries per liter
pcf	Pound per cubic foot
PMP	Potential Migration Pathway
Ramboll	Ramboll Americas Engineering Solutions, Inc.
Rapps	Rapps Engineering & Applied Science
SI	Surface Impoundment

SU	standard units
SSURGO	Soil Survey Geographic
TDS	total dissolved solids
USCS	Unified Soil Classification System
USFWS	United States Fish and Wildfire Service
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

EXECUTIVE SUMMARY

This Hydrogeologic Site Characterization Report (HCR) for the Ash Pond at Edwards Power Plant (EPP) has been assembled to satisfy the information and analysis requirements of Title 35 of the Illinois Administrative Code (35 I.A.C.) Section (§) 845.620 as summarized in **Table ES-1**. The Conceptual Site Model (CSM) includes hydrogeologic and groundwater quality data specific to the Ash Pond, which has been collected between 2015 and 2021. The Ash Pond is located at the Former EPP which is located in Bartonville, Illinois (**Figure 1-1**).

The EPP property is situated in an agricultural/industrial area. The EPP is bound by a salt processing facility to the north, a fertilizer processing plant and the Illinois River to the east, agricultural fields to the south, and railroad tracks and Highway 42 to the west. The Ash Pond is the only coal combustion residuals (CCR) Unit present on the EPP (Vistra identification [ID] number [No.] 301, Illinois Environmental Protection Agency [IEPA] ID No. W1438050005-01, and National Inventory of Dams [NID] No. IL50710).

Four hydrogeologic units are present at the EPP and described as follows from the surface downward:

- **CCR:** Saturated CCR consisting primarily of fly ash within the Ash Pond. CCR is present at thicknesses up to 46.5 feet and at elevations as low as 413.9 feet North American Vertical Datum of 1988 (NAVD88) in the central and northern portion of the Ash Pond**.**
- **Upper Cahokia Formation/Potential Migration Pathway (PMP):** Low permeability clays and silts of the Upper Cahokia Formation are present at the surface. This unit is considered a PMP at elevations similar to the base of the Ash Pond, and in places where thin discontinuous sand lenses occur within the Upper Cahokia Formation adjacent to the Ash Pond.
- **Uppermost Aquifer:** Thin (generally less than 4 feet), moderate permeability sand, silty sand, and clayey gravel material within the Lower Cahokia Formation, bedrock, and/or weathered shale bedrock, where present. In locations where higher permeability materials and coarser grained material are absent, the uppermost aquifer is interpreted as the interface between the Lower Cahokia Formation and shale bedrock.
- **Bedrock Confining Unit:** Thick, very low permeability shales and siltstones of the Carbondale and Modesto Formations. This unit was encountered at elevations ranging from approximately 400 to 422 feet NAVD88 with higher bedrock elevations occurring beneath the northern portion of the Ash Pond.

In general, the Upper Cahokia Formation consists of low permeability clays and silts, with limited occurrences of thin discontinuous sand lenses. In several locations, generally near the southern and western portions of the unit, coarser grained materials are present at the base of the Lower Cahokia Formation and/or the top of the bedrock is weathered resulting in relatively higher hydraulic conductivities. Because the interface is laterally continuous, and has relatively higher conductivity, the unlithified/lithified contact was designated as the uppermost aquifer.

Occasional sand lenses within the Upper Cahokia Formation, and clay intervals downgradient at elevations similar to the base of ash in the Ash Pond were identified as PMPs. The underlying bedrock is interpreted as the lower confining unit and has hydraulic conductivities generally an order of magnitude less than those measured in the uppermost aquifer.

Groundwater occurs within both the unlithified materials and bedrock and consistently flows east to west/southwest towards what is interpreted as a former channel of the Illinois River. Based on calculations in this HCR, horizontal gradients range from 0.0014 to 0.0041 feet per feet (ft/ft) and groundwater velocity in the uppermost aquifer ranges from 1.7×10^{-4} to 2.7×10^{-1} feet per day (ft/day) in the north-central and southern portions of the unit, respectively. Calculation of vertical gradients indicate variable results with groundwater migrating from the lower bedrock confining unit into the uppermost aquifer during the winter season (as observed in February). Upward gradients measured in February 2021 were larger in well nests nearer to the Illinois River, indicating the Illinois River may be a regional discharge zone for the bedrock near the Ash Pond.

Part 845 parameters were monitored in uppermost aquifer and PMP monitoring wells as part of groundwater quality evaluations for the 40 C.F.R. § 257 monitoring program performed between 2015 and present. These data were supplemented with installation and sampling of additional locations in 2021. The results indicate that the following parameters were detected at concentrations greater than the applicable 35 I.A.C. § 845.600(a)(1) groundwater protection standards (GWPSs) and are considered potential exceedances:

- Arsenic – at downgradient uppermost aquifer wells AW-05, AW-06, AW-09, AW-10, AW-11, AW-13, AW-14, AW-19 and AW-20; upgradient uppermost aquifer wells AP05S and AW-08; PMP monitoring wells APW-01 and APW-04; and downgradient bedrock wells AP07D and AW-15C.
- Barium – at downgradient uppermost aquifer wells AW-10, AW-11, and AW-15; and bedrock monitoring wells AW-15C and AP07D.
- Beryllium – at downgradient uppermost aquifer wells AW-08, AW-09, AW-10, and AW-11; and bedrock monitoring well AP07D.
- Boron - at downgradient uppermost aquifer wells AW-05, AW-18, AW-19, AW-20, and AW-21; and PMP wells AP07S and AW-15S.
- Chloride – at downgradient uppermost aquifer well AW-05; PMP monitoring wells APW-01 and APW-04; and at bedrock monitoring wells AP05D and AP07D.
- Cobalt - at downgradient uppermost aquifer wells AW-05, AW-06, AW-09, AW-10, AW-11, AW-14, and AW-17; PMP monitoring wells APW-01 and AW-15S; downgradient bedrock well AP07D; and upgradient well AP05S.
- Lead – at downgradient uppermost aquifer wells AW-05, AW-06, AW-09, AW-10, AW-11, and AW-22; upgradient uppermost aquifer well AP05S; PMP monitoring wells APW-01 and AW-15S; and downgradient bedrock well AP07D.
- Lithium - at downgradient uppermost aquifer wells AW-05, AW-06, AW-09, AW-10, AW-11, AW-15, AW-16, AW-17, and AW-18; upgradient uppermost aquifer well AP05S; downgradient bedrock wells AP07D and AW-15C; and upgradient bedrock well AP05D.
- Radium 226 and 228 combined – at downgradient uppermost aquifer wells AW-09, AW-10, AW-11, AW-15 and AW-16; upgradient uppermost aquifer well AP05S; and downgradient bedrock wells AP07D and AW-15C.
- Sulfate – at downgradient uppermost aquifer well AW-05, and downgradient PMP wells AP07S and AW-15S.

- Total Dissolved Solids (TDS) - at downgradient uppermost aquifer well AW-05; downgradient PMP wells AP07S and AW-15S, and bedrock monitoring wells AP05D, AP07D, and AW-15C.
- Chromium, fluoride, pH, and thallium were also detected at concentrations and/or measured (for pH) outside of their respective GWPSs at one or more locations during monitoring. However, the occurrences were infrequent and/or isolated and individual locations are not listed.

Concentration results for the above parameters were compared directly to 35 I.A.C. § 845.600(a)(1) GWPS to determine potential exceedances. Potential exceedances include results reported during the background groundwater monitoring or prior period that are greater than the GWPS. The results are considered potential exceedances because the results were compared directly to the standard and did not include an evaluation of background groundwater quality, the statistical methodologies proposed in the groundwater monitoring plan (GMP) provided in the Operating Permit application, or alternative source demonstrations. Exceedances will be determined following IEPA approval of the GMP.

TABLE ES-1. PART 845 REQUIREMENTS CHECKLIST
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Part 845 Reference	Individual Part 845 Components Reviewed for Completeness	Location of Information in HCR
845.620(b)	**The hydrogeologic site characterization shall include but not be limited to the following:**	--
845.620(b)(1)	Geologic well logs/boring logs;	Table 3-1 Figure 3-1 Appendix C
845.620(b)(2)	Climatic aspects of the site, including seasonal and temporal fluctuations in groundwater flow;	Sections 3.2.4 & 3.3.1 Tables 3-2, 3-3 & 4-2 Figures 3-3 & 3-4
845.620(b)(3)	Identification of nearby surface water bodies and drinking water intakes;	Sections 3.3.2 & 5.2 Appendix B
845.620(b)(4)	Identification of nearby pumping wells and associated uses of the groundwater;	Section 5.1 Appendix B
845.620(b)(5)	Identification of nearby dedicated nature preserves;	Section 5.3 Appendix B
845.620(b)(6)	Geologic setting;	Section 2.4 & 2.5 Figure 2-3
845.620(b)(7)	Structural characteristics;	Section 2.4.3 Figure 2-4
845.620(b)(8)	Geologic cross-sections;	Figures 2-6 to 2-8
845.620(b)(9)	Soil characteristics;	Section 2.3 Figure 2-2
845.620(b)(10)	Identification of confining layers;	Section 3.2.1

TABLE ES-1. PART 845 REQUIREMENTS CHECKLIST
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Part 845 Reference	Individual Part 845 Components Reviewed for Completeness	Location of Information in HCR
845.620(b)(11)	Identification of potential migration pathways;	Sections 3.2.1 & 3.2.3
845.620(b)(12)	Groundwater quality data;	Section 4.2 Table 4-1 & Table 4-2
845.620(b)(13)	Vertical and horizontal extent of the geologic layers to a minimum depth of 100 feet below land surface, including lithology and stratigraphy;	Section 2.5 Figures 2-6 to 2-8 Appendix C
845.620(b)(14)	A map displaying any known underground mines beneath a CCR surface impoundment;	Section 2.4.5 Appendix B
845.620(b)(15)	Chemical and physical properties of the geologic layers to a minimum depth of 100 feet below land surface;	Section 2.5.1 & 3.2.5 Table 3-4 Appendix D
845.620(b)(16)	Hydraulic characteristics of the geologic layers identified as migration pathways and geologic layers that limit migration, including:	Section 3.2 Tables 3-2 to 3-4 Appendices D & F
845.620(b)(16)(A)	water table depth;	Section 3.2.4 Figures 3-3 to 3-4 Appendix E
845.620(b)(16)(B)	hydraulic conductivities;	Section 3.2.5 Table 3-3 Appendices D & F
845.620(b)(16)(C)	effective and total porosities;	Section 2.5.1 Table 2-1
845.620(b)(16)(D)	direction and velocity of groundwater flow; and	Sections 3.2.4, 3.2.5, & 3.2.6 Tables 3-2, 3-3, & 3-4 Figures 3-3 & 3-4

TABLE ES-1. PART 845 REQUIREMENTS CHECKLIST
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Part 845 Reference	Individual Part 845 Components Reviewed for Completeness	Location of Information in HCR
845.620(b)(16)(E)	map of the potentiometric surface;	Figures 3-3 & 3-4
845.620(b)(17)	Groundwater classification pursuant to 35 I.A.C. § 620; and	Section 3.2.7

Notes: [O:SSW 7/13/21, U:CJC 08/16/21; C:SSW 08/16/21]

-- = reference to main regulation
35 I.A.C. § 620 = Title 35 of the Illinois Administrative Code, Part 620
HCR = Hydrogeologic Site Characterization Report

1. INTRODUCTION

1.1 Overview

In accordance with requirements of the Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (SIs): 35 I.A.C. § 845 (Part 845) (IEPA, April 15, 2021), Ramboll Americas Engineering Solutions, Inc. (Ramboll) has prepared this HCR on behalf of EPP (**Figure 1-1**), operated by Illinois Power Resources Generating, LLC (IPRG). This report will apply specifically to the CCR Unit referred to as the Ash Pond. The Ash Pond is a 91-acre unlined CCR SI used to manage CCR and non-CCR waste streams at the EPP. This HCR includes Part 845 content requirements specific to 35 I.A.C. § 845.620(b) (Hydrogeologic Site Characterization) for the Ash Pond at EPP.

1.2 Part 845 Description

Part 845 contains comprehensive rules for the design, construction, operation, corrective action, closure, and post closure care of SIs containing CCR. CCR is commonly referred to as coal ash, and CCR SIs are commonly referred to as coal ash ponds. This rule includes GWPSs applicable to each CCR SI at the waste boundary and requires each owner or operator to monitor groundwater. IEPA’s rule includes a permitting program as well as all federal standards for CCR SIs promulgated by the United States Environmental Protection Agency (USEPA). In addition, the rules include procedures for public participation, closure alternatives analyses, and closure prioritization, and provides access to records via public website. The rule also includes financial assurance requirements for CCR SIs.

A checklist which identifies the specific requirements of 35 I.A.C. § 845.620 is included in **Table ES-1**. The table provides references to sections, tables, and figures included in this document to locate the information that meets specific requirements of 35 I.A.C. § 845.620.

1.3 Previous Investigations and Reports

Numerous hydrogeologic investigations have been performed concerning the CCR Unit located at the EPP. The information presented in this HCR includes data collected in support of the monitoring well network established for development of the GMP and supplements comprehensive data collection and evaluations from prior hydrogeologic investigation reports (recent to oldest), including, but not limited to, the following:

- ***Natural Resource Technology, Inc., an OBG Company (NRT/OBG), October 17, 2017. Hydrogeologic Monitoring Plan – Edwards Ash Pond.*** A summary of data collected since the submittal of the *Site Characterization and Groundwater Monitoring Plan for CCP Impoundment (Rapps Engineering & Applied Science [Rapps], 2009)* including site geology and hydrogeology, aquifer properties, and monitoring network placement and rationale.
- ***Foth, September 8, 2017. Antidegradation Alternative Analysis, Dynegy Midwest Generation, LLC, Edwards Power Station, Bartonville, Illinois.*** An assessment to determine if unwatering and dewatering activities in preparation for installation of a final cover system will cause an impairment to the Illinois River.
- ***AECOM, January 12, 2016. 30% Design Data Report for Edwards Ash Pond Coal Combustion Residuals units at the E.D. Edwards Power Station.*** A geotechnical

program consisting of installation of auger borings, cone penetrometer test (CPT) soundings and piezometers to obtain information for compliance with requirements of Title 40 of the Code of Federal Regulations (40 C.F.R.) § 257 Subpart D (Federal CCR Rule), design basis, and summary, in addition to preliminary construction costs and schedule.

- ***Natural Resource Technology, Inc. (NRT), March 19, 2013. Phase I Hydrogeological Assessment Report, Coal Combustion Product Impoundment, E.D. Edwards Energy Center, Peoria County IL.*** An investigation and assessment of groundwater quality from the unlined SI at the EPP. Summarizes hydrogeologic information pertinent to the site, evaluates groundwater quality data to determine whether or not operation of the impoundment had adversely affected groundwater, and determined the potential for off-site migration and whether or not there are potential groundwater receptors in the event of a release.
- ***Rapps, December 11, 2009. Site Characterization and Groundwater Monitoring Plan for CCP Impoundment, Ameren Energy Resources Generating, E.D. Edwards Plant, Peoria County, IL.*** A summary assessing the potential for constituent migration from the impoundment. Includes an assessment of subsurface hydrogeologic conditions at the site, identification of private, potable water wells, and oil and gas wells within 2,500 feet of the facility, public water supply wells within 10 miles of the facility, and plans for a groundwater monitoring network.

A GMP is being prepared for the Ash Pond in conjunction with this report and is included in the Operating Permit to which this Report is attached.

1.4 Site Location and Background

The EPP is located in Peoria County between Mapleton and Bartonville in Section 11, Township 7 North, Range 7 East (**Figure 1-1**). The EPP is located near the Illinois River adjacent to a levee and has one CCR SI, the Ash Pond, covering approximately 91 surface acres.

The EPP is situated in a predominantly agricultural area with industrial parcels bordering the property. Historically several coal mines were operated at depths of 100 to 160 feet below ground surface (bgs) in the vicinity of the EPP. The EPP property is bordered by a salt processing facility to the north, railroad right-of-way and former Orchard Mines to the west, the Illinois River and fertilizer production facility to the east, and agricultural land to the south (**Figure 1-2**).

The Ash Pond was investigated in 2013, as requested by IEPA. Results of the investigation (NRT, 2013) indicated that CCR constituents had not impacted groundwater in the vicinity of the Ash Pond. However, exceedances of Class I Groundwater Standards were reported for pH, chloride, iron, manganese, TDS, and sulfate. Additional wells were installed in 2015 to comply with the Federal CCR Rule, and again in 2021 to collect additional data to meet the requirements of 35 I.A.C. § 845.620.

1.5 Site History and Unit Description

The EPP began power generation in 1960 and the original Ash Pond embankments were placed into service at that time. In 2004, modifications to the rail loop surrounding the Ash Pond increased the elevations of the embankments and reduced the footprint of the active impoundment (AECOM, 2016b). CCR material remains between the rail loop and the berm at the south end of the Ash Pond. High power transmission lines bisect the Ash Pond and two sub-basins, referred to as the North and South Ponds, were established. The sub-basins are hydraulically connected and CCR placement is continuous throughout the Ash Pond.

The Ash Pond has a surface area of approximately 91 acres with berms up to 27 feet higher than the surrounding land surface. This pond currently discharges to the Illinois River through Outfall 001 included in the facility National Pollutant Discharge Elimination System (NPDES) permit, IL0001970. The primary treatment method for the pond water is settlement via reduced velocity whereby solids settle out in various flow channels and in the main South Pond. The permitted total average daily flow is 5.24 million gallons per day (MGD) (Foth, 2017).

2. REGIONAL AND SITE GEOLOGY

2.1 Topography

The EPP and embankments surrounding the Ash Pond are located at an elevation of approximately 460 feet NAVD88 (**Figure 2-1**). Topographic maps drawn prior to construction indicate the areas of the Ash Pond were generally between 435 and 440 feet National Geodetic Vertical Datum (NGVD29), except for a historic drainage feature or former river channel located in the western portion of the Ash Pond, which has an elevation of approximately 430 feet NGVD29 (**Appendix A**). The areas surrounding the EPP are generally at an elevation of around 435 to 440 feet NVGD29. West of the Ash Pond (across Highway 24), the elevation increases to approximately 600 feet NGVD29, where bedrock outcrops or is present near the surface at the edge of the former historic Illinois River valley.

2.2 Regional Geomorphology

The Ash Pond lies at the eastern edge of the Galesburg Plain of the Till Plains section, the largest physiographic division in Illinois, covering approximately four-fifths of the state. It is characterized by level to undulatory till plains with a few morainic ridges in a late youthful stage of erosion. The Galesburg Plain includes the western portion of the Illinoian drift sheet in western Illinois, with most streams flowing from a central upland region westward into the Mississippi River and eastward and southward into the Illinois River. Drainage systems are well developed, and the larger valleys tend to be steep walled, alluviated, and terraced (Rapps, 2009; NRT, 2013).

2.3 Soils

Surficial soils at the Ash Pond are shown on **Figure 2-2** and based on Peoria County soil survey data available in the Soil Survey Geographic (SSURGO) by the United States Department of Agriculture's Natural Resources Conservation Service provided by Environmental Systems Research Institute (ESRI) web hosted layer. Soils surrounding the Ash Pond, not including the Urban Land (#533) within the limits of the EPP, are identified as: Orthents (loamy, hilly/undulating) along the entire Ash Pond boundary; Beaucoup silty clay loam (0 to 2 percent slopes, rarely flooded) and Titus silty clay (0 to 2 percent slopes, rarely flooded) north and south of the Ash Pond within agricultural land; Lawson silt loam (0 to 2 percent slopes, frequently flooded) east of the Illinois River; Sarpy loamy fine sand (0 to 2 percent slopes, frequently flooded, long duration) east of the Ash Pond and adjacent to the Illinois River.

2.4 Regional Geology

2.4.1 Regional Unlithified Geology

The Ash Pond is located in the Illinois Valley where the general sequence of unlithified Quaternary deposits consists of poorly sorted sand, silt, and clay of the Cahokia Formation. The upper part of the Cahokia Formation consists of overbank silts and clays, while the coarser-textured lower portion is mainly sandy channel and lateral accretion deposits. The Cahokia Formation is present along all Illinois streams, although locally absent where active stream erosion is occurring. In major valleys, it commonly overlies the well-sorted deposits of the Henry Formation (Willman and Frye, 1970). The Cahokia Formation is generally greater than 20 feet thick in the study area (NRT, 2017). Regional surficial deposits, which were mapped on a regional scale, shown on **Figure 2-3** indicate Radnor Till may be present near the topographic bluffs discussed in Section 2.1.

Underlying the Cahokia Formation is glacial outwash belonging to the Henry and Banner Formations. The sands of the Henry and Banner Formations fill the deepest parts of the Illinois Valley, and are generally 75 to 150 feet thick in the area. The Sankoty Sand Member of the Banner Formation rests directly on bedrock and fills the deepest part of the Illinois Valley in the area. Its thickness varies from about 50 to 150 feet due to erosion and irregularities on the bedrock surface (Burch and Kelly, 1993). The Sankoty Sand is the most extensive aquifer in the region and is characterized by coarse- to medium-grained sand with an abundance of quartz grains, of which 25 percent or more are pink, rounded, and polished. Gravel is present in some beds but is not common (Willman and Frye, 1970).

2.4.2 Regional Bedrock Geology

The unlithified deposits are underlain by Pennsylvanian age bedrock, much of which is shale, of the Carbondale and Modesto Formations (Kolata, 2005; Willman et al., 1967). The Carbondale Formation, named for Carbondale, Jackson County, near the outcrop belt of the formation, includes all strata from the base of the Colchester (No. 2) Coal Member to the top of the Danville (No. 7) Coal Member. It overlies the Spoon Formation and varies in thickness from less than 150 feet in western and northeastern Illinois to more than 400 feet in southern Illinois. The Carbondale Formation consists of sandstones, shales, limestones, and coals. The sandstones occur in elongate, channel facies up to about 100 feet thick, are typically subgraywackes, and are more argillaceous than older Pennsylvanian sandstones in Illinois. Gray shales make up the greatest part of the formation, with the thicker gray shales representing delta front or prodelta deposits. Gray to dark-gray, argillaceous limestones are widespread and normally fossiliferous. The coals include the principal economic coals of Illinois, the Danville (No. 7), the Herrin (No. 6), the Springfield-Harrisburg (No. 5), and the Colchester (No. 2).

The Modesto Formation, named for Modesto, Macoupin County, near the type locality, overlies the Carbondale Formation and includes all strata from the top of Danville (No. 7) Coal to the base of the Shoal Creek Limestone Member or the LaSalle Limestone Member. Its thickness varies from less than 125 feet along the LaSalle Anticlinal Belt in east-central Illinois to over 450 feet in southern Illinois, averaging approximately 350 feet. The Modesto Formation consists of sediments similar to those found in the underlying Carbondale Formation, but the coals are thinner and less extensive, the limestones tend to be thicker and less argillaceous, and several red claystones and shales are associated with the open-marine limestones. Gray shales constitute a major part of the Modesto Formation and individual beds tend to be extremely thick.

The elevation of the bedrock surface in the study area ranges from approximately 400 to 450 feet above mean sea level (Herzog et al., 1994). Well logs indicate that the depth to bedrock ranges from more than 50 feet in the Illinois Valley to less than 20 feet in the adjacent uplands, and the lithology of the uppermost bedrock is mainly shale.

2.4.3 Structure

The major geologic structural features around Illinois are shown on **Figure 2-4**. The Ash Pond is located within a stable region of the continent within the north-central portion of the Illinois Basin. In accordance with 40 C.F.R. § 257.62(a), an analysis was completed to identify fault areas. The results indicate the following: "The nearest known mapped faults are four unnamed faults associated with the Troy Grove Dome, which are located approximately 63 miles northeast and the timeframe of the most recent activity on the fault is not known. Based on the available published geologic data and information reviewed, there are no active faults or fault damage zones that have had displacement in Holocene time reported or indicated within 200 feet of the Site" (Haley & Aldrich, Inc., 2018).

2.4.4 Seismic Setting

As required in 35 I.A.C. § 845.330, existing and new CCR SIs and lateral expansions of existing landfills must not be located in seismic impact areas, unless owners or operators demonstrate that the unit is designed to resist the maximum horizontal acceleration (g) in lithified earth material. The definition of a seismic impact zone per 40 C.F.R. § 257.63 is "areas having a 10 percent or greater probability that the maximum expected horizontal acceleration in hard rock, expressed as a percentage of the earth's gravitational pull, will exceed 0.10 g in 50 years." Based on the data illustrated on the 2014 United States Geological Survey (USGS) Hazard Map, the vicinity of the EPP exhibits a potential horizontal acceleration of 0.06 g with a 98 percent probability of not being exceeded in 50 years. The Ash Pond is therefore not within a seismic impact area, as currently defined in 35 I.A.C. § 845.330. This assessment was completed during evaluation of the Ash Pond with respect to 40 C.F.R. § 257.63 (Haley & Aldrich, Inc., 2018).

2.4.5 Mining Activities

A survey to identify historic mining activities was conducted for a 1,000-meter radius around the Ash Pond and is provided in **Appendix B**. Based on the directory of coal mines for Putnam County (Illinois State Geological Survey [ISGS], 2019), the nearest coal mines in the vicinity of the Ash Pond are immediately adjacent to the western berm of the Ash Pond. These subsurface mines, identified as #828 (located adjacent to western property boundary), #6673 (located approximately 0.1 miles northwest of the Ash Pond), and #3021 (located approximately 0.6 miles north of the Ash Pond), are abandoned underground shaft mines that used the longwall method of mining, essentially removing all of the coal. Orchard Mine (#828), was owned and operated by the Third Vein Coal Company between 1890 and 1909. The coal seam at this location ranged from 32 to 42 inches in thickness, and was mined at depths of approximately 100 to 160 feet bgs. The lateral extent of the mine (with uncertainty limits) extends to the western edge of the Ash Pond (**Figure 1-2** and **Appendix B**). The Petri Mine (#6673) was owned and operated by George Petri Coal Company between 1919 and 1933. The coal seam at this location was on average 4.67 feet thick and located at a depth of approximately 112 feet. The Hollis Mine (#3021) was owned and operated by Robert Rogers between 1933 and 1940. The coal seam at this location was on average 3 feet thick. The source map for this mine indicated some type of fault was present (perhaps a channel) that separated the east and west portions of the mine.

The primary coal mined in this region was the Springfield Coal Seam. The Springfield Coal Seam is located within the central portion of the Carbondale Formation. The Springfield Coal Seam crops out along the margins of the Illinois Basin and reaches a maximum depth in Illinois of about 1,300 feet bgs.

An oil and gas well survey was also conducted in 2021 for a 1,000-meter radius around the Ash Pond. Based on records obtained from ISGS, there are no oil or gas wells located within a 1,000-meter radius of the EPP property. A gas storage field with multiple abandoned and active storage wells is located approximately six miles west of the Ash Pond. Additionally, two wells of unknown status and one stratigraphic test well are located outside of the 1,000-meter radius to the southeast of the Ash Pond.

2.5 Site Geology

A field investigation was performed in 2021 to collect additional data for the discussion of vertical and horizontal lithology, stratigraphy, chemical properties, and physical properties of geologic layers to a minimum of 100 feet bgs as specified in 35 I.A.C. § 845.620(b). Field investigation locations are shown on **Figure 2-5**.

2.5.1 Site Specific Unlithified Geology

The stratigraphy within and immediately surrounding the Ash Pond consists of fill material and CCR underlain by unlithified river alluvium of the Cahokia Formation. The Cahokia Formation (consisting of clay/silt and sandy or gravelly materials in contact with the bedrock) has been separated into two units for this discussion: the upper unit, consisting of predominantly clay/silt, and the lower unit, consisting of sandy and/or gravelly material observed near the top of bedrock. Boring logs, monitoring well and piezometer construction forms obtained from investigations at the Ash Pond are provided in **Appendix C**.

Cross-sections illustrating the subsurface materials encountered at the Ash Pond are included in **Figures 2-6** through **2-8**.

2.5.1.1 Fill and CCR

Fill, predominantly coal ash (fly ash, bottom ash, and slag) within the Ash Pond, and materials within constructed berms and railroad embankments, are present around the Ash Pond. Ash is present within the Ash Pond at thicknesses up to approximately 46.5 feet as measured in XPW02, and ash is generally between 30.5 and 43 feet thick as observed in XPW01, XPW01A, XPW03, EDW-B002, EDW-B003 and EDW-B014 (**Figure 2-9** and **Appendix C**). The Ash Pond overlies the Upper Cahokia Formation, and the lowest base of ash elevation of 413.9 feet NAVD88 was observed in the center of the Ash Pond while the highest base of ash elevation was observed along the berms around 450 feet NAVD88 (**Figure 2-9** and **Appendix C)**.

Geotechnical analysis results from six samples collected from ash at soil borings XPW01, XPW01A and XPW02, yielded Unified Soil Classification System (USCS) soil classifications of silt, elastic silt, and silty sand. Previous geotechnical analyses of samples collected from within the ash at the Ash Pond did not provide USCS soil classifications, however, the percent composition of gravel, sand, and fines (silt and clay) were consistent with the most recent samples collected. Sample locations are shown on **Figure 2-5** and the geotechnical results of ash samples collected in 2021 are summarized in **Table 2-1** and the geotechnical laboratory report is provided in **Appendix D**. Geotechnical results from XPW01, XPW01A and XPW02 indicated the following:

- The average moisture content was 40.5 percent and ranged from 33.4 to 45.1 percent.
- The average total porosity (calculated) was 52 percent and ranged from 47 to 55 percent.
- The average dry density was 71.3 pounds per cubic foot (pcf) and ranged from 67.5 to 77.1 pcf.
- The average specific gravity was 2.38 and ranged from 2.335 to 2.414.
- The average grain size distribution was 0.2 percent gravel, 29.9 percent sand, and 69.9 percent fines (silt and clay).

Solid samples were collected from XPW01, XPW01A, XPW02 and XPW03 in 2021. The results of chemical analysis of solid samples collected from ash within the Ash Pond are summarized in **Table 2-2**.

Leachate wells were installed near the base of ash at locations XPW01A, XPW02 and XPW03 in 2021, and porewater samples were collected. The analytical results of porewater samples collected from within the Ash Pond are summarized in **Table 2-3**.

2.5.1.2 Upper Cahokia Formation

The Upper Cahokia Formation located in the vicinity of the Ash Pond is generally classified as lean or fat clay with traces of sand and gravel, although the unit is siltier in the southern portion of the Ash Pond as observed in boring locations AW-08, AW-09, AW-10, and AW-11 (**Figure 2-9** and **Figure 2-10**). Thickness of the Upper Cahokia Formation ranged from 5 feet (as observed in EDW-B014, located in the northern portion of the Ash Pond) to approximately 40 feet (as measured in AW-08). Beneath the Ash Pond, the thickness of the Upper Cahokia Formation is variable. A minimum of five feet of clay was observed between the base of ash and the top of bedrock at EDW-B014 and clay is approximately 10 feet thick in other centrally located borings as observed in EDW-B002, EDW-B003, EDW-B005, and XPW01 (**Figure 2-9** and **Figure 2-10**). Near the berms where the fill deposits are thinner, the Upper Cahokia can exceed 40 feet in thickness as observed at EDW-B012 (**Appendix C**).

Discontinuous sandy lenses have been observed within the Upper Cahokia as indicated by a sand/silty sand lens encountered in EDW-B001 (**Figure 2-10**) and AP07S/D, with a thickness of up to 5 feet, but was not observed in any surrounding borings, indicating it is not laterally continuous. A clayey sand lens was observed in AW-22, with a thickness of 1.6 feet, but was not observed in any surrounding borings, indicating it is not laterally continuous. Portions of the Upper Cahokia Formation may have been removed from within the footprint of the Ash Pond either through erosion or during construction of the berms surrounding the pond as indicated by bottom of ash elevations that are lower than preconstruction topography; however, this unit has been encountered in all borings installed below the footprint of the Ash Pond.

Sample locations are shown on **Figure 2-5** and the geotechnical results collected from the Upper Cahokia Formation in 2021 are summarized in **Table 2-1** and the geotechnical laboratory report is provided in **Appendix D**. Geotechnical results from the Upper Cahokia Formation are consistent with the results from previous investigations (Haley & Aldrich, Inc., 2018; and AECOM, 2016a, **Appendix D**), with the exception of grain size as detailed below.

- Moisture content of the samples ranged from 23.2 to 35.1 percent, with an average of 27.9 percent. These observations are at the lower end of the range observed during previous investigations (Haley & Aldrich, Inc., 2018) that indicate a range of 33.1 to 57.9 percent, with an average of 42.1 percent.
- The average total porosity (calculated) was 45 percent, with a range between 42 and 50 percent.
- The average dry density was 91.9 pcf and ranged from 83.9 to 101.3 pcf. These observations are consistent with previous investigations (Haley & Aldrich, Inc., 2018) which indicated an average dry density of 84.45 pcf and range between 67.4 and 101.7 pcf.
- The average specific gravity was 2.69 with a range of 2.661 to 2.700.

- The average grain size distribution was 0 percent gravel, 24.4 percent sand, and 75.6 percent silt and clay. Previous investigations identified the following grain size distribution: 0 percent gravel, 1.75 percent sand, and 98.25 percent silt and clay. The difference in grain size distribution is attributed to sandy intervals that were sampled in 2021 which included a clayey sand, and shallow clay with a higher sand percentage.

Soil samples obtained from the Upper Cahokia Formation were also analyzed for chemical parameters. The results of soil samples collected from the Upper Cahokia Formation are summarized in **Table 2-4**.

2.5.1.3 Lower Cahokia Formation

Several borings encountered thin sandy or gravelly units overlying the bedrock (*i.e.,* EDW-B009 [4 feet], EDW-B010 [1 foot], AW-11 [1 foot] and AW-12 [3 feet]; **Appendix C**), which for this discussion is referred to as the Lower Cahokia Formation. Borings with greater thicknesses (>1 foot) are generally located in the south portion of the Ash Pond. Based on these observations, the coarser grained material of Lower Cahokia Formation is limited in extent and generally only present outside the center of a bedrock valley (discussed in the next section).

The composition of the Lower Cahokia Formation varies across the Ash Pond and was classified as well-graded gravel, clayey gravel, silty sand, and poorly graded sand. Boring locations identified for collection of geotechnical and chemical parameters in 2021 were not able to collect samples due to the size of the gravel, or did not encounter the coarser grained materials of the Lower Cahokia Formation and no samples were collected. Therefore, no geotechnical or chemical results are available for the Lower Cahokia Formation.

2.5.2 Bedrock

The unlithified deposits are underlain by Pennsylvanian age bedrock, much of which is shale, of the Carbondale and Modesto Formations. The elevation of the top of bedrock (**Figure 2-10**) is highest north of the Ash Pond at AW-21 (422.88 feet NAVD88) and declines in elevation to the east toward AW08 (404.5 feet NAVD88) and south toward AW-16 (400.92 feet NAVD88). The top of rock was described as shale, siltstone, and shaley limestone based on borings which were advanced to bedrock. Deep borings AP07D and AP05D, installed in 2017, encountered thin layers of sandstone within the shale and siltstone (**Appendix C**).

The cross-sections (**Figures 2-6** through **2-8**) indicate the presence of a bedrock valley/depression in the west and southwest portion of the pond. Based on the distribution of coarser grained materials of the Lower Cahokia Formation, it appears that the materials are likely present in limited areas on the southern side of the bedrock valley. No geotechnical or solid samples were collected within the bedrock. Boring locations are shown on **Figure 2-5.**

3. REGIONAL AND LOCAL HYDROGEOLOGY

3.1 Regional Hydrogeology

Berg, Kempton, and Cartwright (1984) classified the area as AX (alluvium, a mixture of gravel, sand, silt, and clay along streams, variable in composition and thickness). Aquifers in the Illinois Valley generally fall into two broad categories: (1) unlithified sediments that are glacial or alluvial in origin and contain mostly sand and gravel deposits interbedded with clay and silt, and (2) bedrock aquifers like sandstone and fractured limestone, which vary widely in permeability. The principal aquifer in the area is the sand and gravel outwash deposits of the Banner and Henry Formations in the Illinois Valley. Well logs indicate that high-capacity wells with yields up to 1,000 gallons per minute (gpm) have been developed in this aquifer. These high yield formations have not been observed with any continuity in the vicinity of the Ash Pond. Groundwater wells in the adjacent uplands are either shallow wells in thin sand and gravel lenses which occur within the Glasford Formation diamicton or drilled into the underlying bedrock.

The general pattern of groundwater movement is generally toward the Illinois River, which represents a discharge boundary and receives ground water from both sides. Consequently, the ground-water system plays a role in maintaining baseflow in the Illinois River. Smaller flow systems exist, but the main impetus of flow-direction is toward the river (Burch and Kelley, 1993).

3.2 Site Hydrogeology

Prior to 2015, there were four monitoring wells (APW-01 through APW-04) located around the Ash Pond for monitoring groundwater. In 2015 and 2017, additional wells and piezometers were installed within and around the Ash Pond to meet requirements of 40 C.F.R. § 257. In 2021, additional wells were installed to provide information to meet the requirements of Part 845. A summary of monitoring well locations and construction details are included in **Table 3-1** and depicted on **Figure 3-1**.

3.2.1 Hydrostratigraphic Units

Four distinct water-bearing layers have been identified at the Ash Pond based on stratigraphic relationships and common hydrogeologic properties which are summarized below and discussed in subsequent sections.

- **CCR:** CCR consisting primarily of fly ash within the Ash Pond. CCR is present from the surface (approximately 450 to 460 feet) to a minimum elevation of approximately 414 feet. Water elevations measured in piezometers screened within the Ash Pond indicate the phreatic surface ranges from approximately 450 to 455 feet which is higher than surrounding monitoring wells (**Appendix E**).
- **Upper Cahokia Formation/PMP:** Low permeability clays and silts of the Upper Cahokia Formation. This unit also includes discontinuous lenses of sand, sandy clay to clayey sand, and sandy silt where they occur within the clay and silt. Isolated sand lenses of limited thickness were encountered in three borings located in the northern portion of the site. The saturated and unconfined sandy lenses within the Upper Cahokia Formation and clay and silt screened near the adjacent base of ash in the southern portion of the property (where bedrock is at a lower elevation) have been identified as PMPs.

- **Uppermost Aquifer:** Thin (generally less than 4 feet), moderate permeability sand, silty sand, and clayey gravel units which includes the unconfined clays and silts of the Upper Cahokia Formation, where saturated, and the thin, moderate permeability sands and gravels of the Lower Cahokia Formation, which at some locations also includes the bedrock interface. More permeable materials are generally located in the southern portion of the site. The top of the uppermost aquifer is presented in **Figure 3-2**.
- **Bedrock Confining Unit:** Thick, very low permeability shales and siltstones of the Carbondale and Modesto Formations that are the base of the uppermost aquifer. The bedrock elevation varies between approximately 422 and 400 feet on site, with varying degrees of weathering observed during drilling.

3.2.2 Uppermost Aquifer

The uppermost aquifer includes saturated portions of the Cahokia Formation (both upper and lower) in the vicinity of the Site. Higher permeability materials are generally present at the interface between the unlithified materials and the underlying bedrock. Groundwater monitoring for the uppermost aquifer is focused on this zone because it is continuous, moderate permeability, and likely to indicate potential impacts from the Ash Pond. The top of uppermost aquifer (**Figure 3-2**) was evaluated with respect to the location restrictions in 2018 (Haley & Aldrich, Inc., 2018).

3.2.3 Potential Migration Pathways

The Upper Cahokia Formation consists of low permeability clays and silts, with limited occurrences of thin discontinuous sand lenses. Isolated sand lenses of limited extent within the Upper Cahokia Formation, and clay intervals downgradient of the Ash Pond at elevations similar to the base of ash and above the unlithified/lithified interface, were identified as PMPs. Monitoring wells AP-06, APW-02 through APW-04, P002, AW-15S (clay and silts of the upper Cahokia Formation) and AP07S (discontinuous sand lens) are considered to be screened within PMPs and utilized for this discussion.

3.2.4 Water Table Elevation and Groundwater Flow

Groundwater in the uppermost aquifer generally flows from east to west in the central portion of the Ash Pond towards what is interpreted as a former channel of the Illinois River, and south/southeast at the south end of the Ash Pond (**Figures 3-3** and **3-4**). In the northernmost portion of the Ash Pond there is a minor northwest and northern component of flow in both the uppermost aquifer and PMP. Groundwater elevations vary seasonally, generally less than 5 feet, while across the site they range between approximately 430 and 450 feet, although flow directions are generally consistent. Groundwater contour maps are located in **Appendix E**.

Groundwater elevations in PMP wells range from approximately 455 feet NAVD88 (APW-02) to 430 feet NAVD88 (AW-15S) with flow generally from the east to the south and northwest (**Figures 3-3** and **3-4**) similar to that observed in the uppermost aquifer. Groundwater elevations measured at APW02 are similar to CCR piezometers and the location of the well (within the berm of the unit) may be affected by water elevations in the active Ash Pond. Given the elevations of groundwater detected in these unconfined wells and the lowest elevation of ash (414 feet NAVD88), portions of the Ash Pond are likely in contact with groundwater.

Groundwater elevations within the bedrock were not contoured because the wells are screened at different elevations and within different lithologic materials in this confining unit. However, comparison of elevations in bedrock wells shows flow directions may be consistent with shallower flow systems.

3.2.4.1 Vertical Hydraulic Gradients

Vertical hydraulic gradients were calculated using available groundwater elevation data from February to July 2021 at nested well locations within the Upper Cahokia Formation/PMPs, uppermost aquifer, and bedrock. Vertical hydraulic gradients are presented in **Table 3-2**. The results of the vertical hydraulic gradient calculations for these hydrostratigraphic units are summarized below:

- Within CCR unit:
  - Gradients calculated between AP08 (CCR) and XPW02 (CCR) in the northern portion of the Ash Pond were upward for all events in February through July 2021.
  - Gradients calculated between AP09 (CCR) and XPW03 (CCR) in the central portion of the Ash Pond were downward for all events in February through July 2021.
- Bedrock confining unit to uppermost aquifer:
  - Gradients calculated between AW-15 (uppermost aquifer) and AW-15C (bedrock) indicate variable directions, with upward gradients measured during four events and flat to slightly downward gradients measured in four events.
  - In monitoring wells AP-05S (uppermost aquifer) and AP-05D (bedrock), gradients were upward in February 2021, and downward in March through July 2021. The Illinois River was measured at an elevated level during April and May and measured gradients are likely a result of the river elevation.
- Uppermost aquifer to Upper Cahokia Formation/PMPs:
  - Gradients between AW-15 (uppermost aquifer) and AW-15S (PMP) were upward for all events in February through July 2021.
  - Gradients between APW-03 (PMP) and AW-10 (uppermost aquifer) were upward for all events in March through July 2021.
  - Gradients between APW-04 (PMP) and AW-13 (uppermost aquifer) were upward for all events in February through July 2021.

Although gradients were downward at times between the uppermost aquifer and bedrock surface and the deep bedrock wells, it is expected that groundwater within the bedrock aquifer discharges to the Illinois River during time periods with lower river elevations or in locations south of the site, which is consistent with flow directions in the uppermost aquifer.

3.2.4.2 Impact of River Stage on Groundwater Flow

Based on groundwater elevations and flow maps it does not appear groundwater from the uppermost aquifer consistently flows into the Illinois River adjacent to the EPP property (**Figures 3-3** and **3-4**). However, the River is likely a regional discharge area for the unlithified materials and bedrock although not along the section of the EPP property. Vertical gradients observed in 2021, indicate that water within the bedrock periodically migrates vertically into the Illinois River.

3.2.5 Hydraulic Conductivity

3.2.5.1 Field Hydraulic Conductivities

Field hydraulic conductivity tests were performed in monitoring wells screened within all hydrostratigraphic units in 2021. The test analyses and results are summarized in **Table 3-3**, and analyses are included in **Appendix F**.

Field hydraulic conductivity tests from wells screened within the ash (XPW01A, XPW02 and XPW03) resulted in a geometric mean horizontal hydraulic conductivity of 6.8×10^{-4} cm/s. Previous field hydraulic conductivity tests performed in 2017 (NRT/OBG, 2017) from wells screened within the ash (AP08 and AP09) resulted in a geometric mean of 2.7×10^{-3} cm/s (AP08) and 1.44×10^{-3} cm/s (AP09). Overall, the geometric mean horizontal hydraulic conductivity of the CCR material is 1.4×10^{-3} cm/s.

In the uppermost aquifer wells (AW-12, AW-15, AW-16, AW-17, AW-18, AW-19, AW-20, AW-21, and AW-22) analysis of hydraulic conductivity tests resulted in a geometric mean horizontal conductivity of 1.6×10^{-4} cm/s. Previous field hydraulic conductivity tests (NRT/OBG, 2017) in wells screened within the uppermost aquifer (APW-01, AP05S, AW-05, AW-06, AW-08, AW-09, AW-10 and AW-11) resulted in a geometric mean horizontal hydraulic conductivity of 2.1×10^{-4} cm/s (**Appendix F**). Overall, the geometric mean horizontal hydraulic conductivity for all uppermost aquifer wells is 1.7×10^{-4} cm/s.

Field hydraulic conductivity tests performed in Upper Cahokia monitoring well AW-15S in 2021 resulted in a hydraulic conductivity of 3.2×10^{-3} cm/s, which is an order of magnitude higher than previous results (AP06 and AP07S; NRT/OBG 2017) of approximately 5×10^{-4} cm/s (**Appendix F**). Overall, the geometric mean horizontal hydraulic conductivity for the PMP wells is 9.2×10^{-4} cm/s.

Previous field hydraulic conductivity tests (NRT/OBG, 2017) performed in bedrock wells AP07D and AP05D resulted in horizontal hydraulic conductivities that ranged 1.1×10^{-7} to 3.49×10^{-7} cm/s. A field hydraulic conductivity test from bedrock well AW-15C resulted in a horizontal hydraulic conductivity of 8.2×10^{-4} cm/s. AW-15C is located in the southern portion of the Site within the top 15 feet of shale bedrock. The hydraulic conductivity measured at this location indicates that the surficial bedrock is likely weathered at this location while it is more competent in the northern portions of the Site and at greater depths. The overall geometric mean hydraulic conductivity calculated from AP05D, AP07D, and AW-15C results in a horizontal hydraulic conductivity of 3.2×10^{-6} cm/s which is likely more representative of the bedrock underlying the Site.

3.2.5.2 Laboratory Hydraulic Conductivities

Ten samples were collected for laboratory vertical hydraulic conductivity analysis (ASTM D 5084) during the 2021 field investigation from the hydrostratigraphic units described in Section 3.2.1.1 of this HCR. The results of the 2021 analyses are tabulated in **Table 2-1**, sample locations are shown on **Figure 2-5**, and laboratory reports are provided in **Appendix D**. The results of the 2021 vertical hydraulic conductivity analysis, as well as data available from previous investigations, for these hydrostratigraphic units are summarized below:

- **CCR:** Six samples collected in 2021 from ash borings XPW01, XPW01A, XPW02, and XPW03. Vertical permeability test results in the ash indicated a geometric mean vertical hydraulic conductivity of 9.3×10^{-6} cm/s. Historical results from two samples collected by AECOM (2016a) from ash borings EDW-B002 and EDW-B003 indicated a geometric mean vertical hydraulic conductivity of 7.9×10^{-5} cm/s (NRT, 2017).

- **Upper Cahokia Formation/PMP:** Four samples were collected in 2021 from soil borings AW-13A, AW-15, AW-20, and AW-22 for geotechnical testing. Falling head permeability tests results in the Upper Cahokia Formation from these locations indicated a geometric mean vertical hydraulic conductivity of 6.4×10^{-8} cm/s. This result is consistent with results of historical samples collected by Haley & Aldrich, Inc. (2018) and AECOM (2016a) which indicated a geometric mean vertical hydraulic conductivity of 7.3×10^{-8} cm/s.
- **Lower Cahokia Formation and Bedrock:** Samples were either unable to be collected or analyzed due to their composition.

3.2.6 Horizontal Groundwater Gradients and Groundwater Flow Velocity

Groundwater in the uppermost aquifer generally flows from east to west in the central portion of the Ash Pond towards what is interpreted as a former channel of the Illinois River, and south/southeast at the south end of the Ash Pond. In the northernmost portion of the Ash Pond there is a minor northwest and northern component of flow in both the uppermost aquifer and PMP. Groundwater elevations and flow directions near the Ash Pond are illustrated in 2021 contour maps (**Figures 3-3** and **3-4**). There is little seasonal variation in groundwater flow direction in the unlithified materials regardless of the river elevation as illustrated in **Figures 3-3** and **3-4** (additional contour maps are included in **Appendix E**). Groundwater elevation contours begin to turn toward the river in the southern portion of the site indicating that the uppermost aquifer may discharge to the river south of the site. Horizontal hydraulic gradients were calculated for the uppermost aquifer and PMP, and are summarized in **Table 3-4**.

Horizontal hydraulic gradients calculated for the uppermost aquifer between February and July 2021 range from 0.001 to 0.004 ft/ft. The horizontal hydraulic gradient for the uppermost aquifer is slightly steeper as it nears the sand and gravel in the southwest portion of the Ash Pond, with an average horizontal hydraulic gradient of 0.004 ft/ft (between wells AW-10 and AW-15), in comparison to the central portion of the Ash Pond with an average horizontal hydraulic gradient of 0.002 ft/ft (**Table 3-4**). The steepening gradient towards the southwest portion of the Ash Pond are consistent with previously the reported gradient trends (NRT/OBG, 2017).

Horizontal hydraulic gradients calculated for the PMP between February and July 2021 between wells APW-03 and APW-04 range from 0.003 to 0.004 ft/ft, with an average horizontal hydraulic gradient of 0.003 ft/ft (**Table 3-4**).

The average of hydraulic gradients between wells and an average effective porosity as derived from geotechnical test data obtained from soil borings completed in 2021 were used to calculate uppermost aquifer and PMP groundwater velocities.

Groundwater velocities in the uppermost aquifer determined in the center portion of the Ash Pond (between AW-08 and AW-06) ranged from approximately 1.7×10^{-4} to 4.0×10^{-4} ft/day in 2021 with an average of 2.5×10^{-4} ft/day. Groundwater velocities determined in the southern portion of the Ash Pond between AW-10 and AW-15 were consistent, ranging from 0.25 to 0.27 ft/day, with an average of 0.26 ft/day (**Table 3-4**). The higher velocities observed in the southern portion of the Ash Pond are a result of coarse-grained materials present there.

Groundwater velocities in the PMP determined in the southeastern portion of the Ash Pond (between APW-03 and APW-04) ranged from 0.35 to 0.53 ft/day, with an average of 0.43 ft/ day (**Table 3-4**).

3.2.7 Groundwater Classification

Per 35 I.A.C. § 620.210, groundwater within the uppermost aquifer at the Ash Pond meets the definition of a Class I – Potable Resource Groundwater based on the following criteria:

- Groundwater in the uppermost aquifer extends 10 feet or more below the land surface.
- Hydraulic conductivity exceeds the 1 x 10^{-4} cm/s criterion (**Table 3-3**).

Field hydraulic conductivity tests performed on the unlithified geologic materials that include moderate permeability sand, silty sand, and clayey gravel units which includes the Lower Cahokia Formation and the bedrock interface) and lithified materials (shales and siltstones of the Carbondale and Modesto Formations) at the EPP had geometric mean hydraulic conductivities exceeding 1 x 10^{-4} cm/s. Based on this information groundwater is classified as Class I – Potable Resource Groundwater.

3.2.8 Methane Observed in Groundwater

Methane, a decomposition product of organic materials, is a colorless, odorless, flammable gas. Methane is known to be present in aquifers throughout Illinois, due to both natural and anthropogenic processes (coal mining). Methane may accumulate in the borehole, well, protective casing or in the general work area near a well or boring. During field activities in 2021, methane was detected above 10 percent of the lower explosive limit (LEL) at borehole monitoring well locations AW-13, AW-14, AW-15, AW-15C, AW-16, AW-17, AW-22, and P002. Levels quickly dissipated after venting the monitoring wells to the atmosphere. A methane monitoring plan was established for the safe completion of field activities, including groundwater sampling at EPP. Anyone completing soil borings or approaching any monitoring well at EPP must follow a methane monitoring plan to manage and mitigate potential hazards associated with the presence of methane gas in groundwater.

3.3 Surface Water Hydrology

3.3.1 Climate

The climate in Bartonville is humid and annual precipitation generally exceeds evapotranspiration. Illinois State Water Survey (ISWS) records from 1989 through 2020 at Peoria, Illinois, which is located northeast of the EPP, indicates precipitation averages 35.3 inches per year. Monthly precipitation averages higher than 3 inches from April through August, and 1 to 3 inches in September through March. On average 16 inches of precipitation occur as snowfall.

As shown below in **Table A** below, ISWS temperature records show average maximum daily temperatures for 1989 to 2020 ranging from above 70 degrees Fahrenheit (°F) in May through September and minimum average daily temperatures that are below freezing December through March.

Table A. Average Monthly Temperature Extremes and Precipitation for Peoria, Illinois.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Maximum Temperature (ºF)	33.3	37.6	49.9	62.5	72.6	81.3	84.4	82.5	76.9	64.5	50.1	37.2	61.2
Minimum Temperature (ºF)	18.3	21.5	31.6	41.8	52.2	61.7	65.4	63.2	55.4	44.1	33.3	22.7	42.7
Precipitation (inches)	1.71	1.60	2.08	3.42	3.93	3.18	3.02	3.10	2.97	2.64	2.35	1.84	35.3
https://www.isws.illinois.edu/warm/stationmeta.asp?site=ICC&from=wx													

3.3.2 Surface Waters

The predominant surface water body in the region is the Illinois River and associated lowland backwater lakes. The Illinois River is located directly adjacent to and upgradient from the Ash Pond. A USGS stream gage (#05568500) for the Illinois River at Kingston Mines, Illinois is located 8.7 miles south and west (downstream) of the EPP. The gage datum elevation is 428 feet NGVD29. Daily gage heights for the period of January 1, 2018 to March 18, 2021 are shown in **Figure A** below. The gage height of 3 feet, representing approximate baseflow, occurs at an elevation of about 431 feet NGVD29. Bordering the east perimeter of the Ash Pond, the river has a normal baseflow elevation of about 431 feet NGVD29.

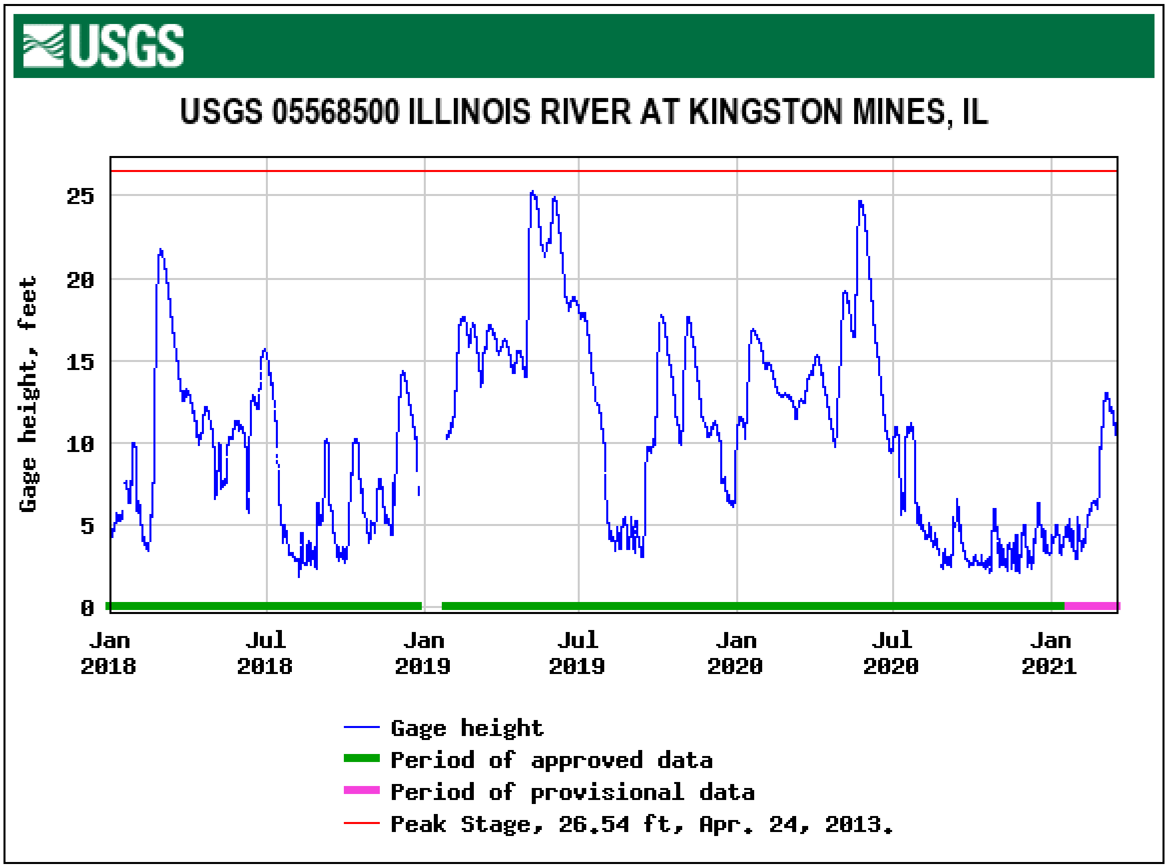

Figure A. Daily Gage Height, January 1, 2018 to March 18, 2021 for USGS Gaging Station 05568500 at the Illinois River at Kingston Mines, Illinois.

A map of surface waters in the vicinity of the Ash Pond is presented in **Appendix B**. The headwaters for the East Branch of Lamarsh Creek are located approximately 0.45 miles northwest of the Ash Pond. The East Branch of the Lamarsh Creek flows southwest to the Lamarsh Creek and ultimately to the Illinois River. Other surface waters in the vicinity include Worley Lake and Pekin Lake, both of which are located across the Illinois River at approximately 0.5 miles from the Ash Pond.

A Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map is not available for Peoria County. A historic (1983) floodplain map indicates that the Ash Pond is located within a Zone C floodplain, and the area surrounding the Ash Pond is within a Zone A13 floodplain (**Appendix G**). Additional information is provided in **Section 5.2**.

4. GROUNDWATER QUALITY

4.1 Summary of Groundwater Monitoring Activities

Between 2010 and 2012, groundwater samples were collected from a subset of wells (APW-01 through APW-04) to assess groundwater quality in the vicinity of the Ash Pond. That assessment included collection of groundwater samples, dissolved analyses of potential indicators of CCR impacts, and comparison to 35 I.A.C. § 620 Groundwater Quality Standards. Results from that assessment indicated no impacts were present from the Ash Pond and the information was reported to IEPA in the *Phase I Hydrogeological Assessment Report* (NRT, 2013). The 2010 to 2012 results are not included in this report.

In 2015 and 2016, additional well installation and groundwater sampling was initiated to meet the requirements of 40 C.F.R. § 257. Groundwater samples were collected, and totals analyses were completed for Appendix III and Appendix IV parameters. In 2021, additional wells were installed to comply with Part 845; wells were sampled for the parameters listed in 35 I.A. C. § 845.600. A review and summary of data from both the 40 C.F.R. § 257 and proposed Part 845 monitoring programs is included in the evaluation of groundwater quality at the Ash Pond.

4.1.1 40 C.F.R. § 257 Program Monitoring and Well Network

The 40 C.F.R. § 257 monitoring well network consists of six monitoring wells screened in the uppermost aquifer, including two background monitoring wells (AP05S and AW-08) and six compliance wells (AW-06, AW-09, AW-10, and AW-11). The boring logs, well construction forms, and other related monitoring well forms for the monitoring well network are included in **Appendix C** of this HCR. The CCR Monitoring Well Network locations are shown on **Figure 3-1**.

Assessment monitoring of these wells was established on April 9, 2018. Details on the procedures and techniques used to fulfill the groundwater sampling and analysis program requirements are found in the Sampling and Analysis Plan for the Ash Pond. Results are discussed in **Section 4.2**.

Groundwater samples are collected and analyzed for the field and laboratory parameters from Appendix III and Appendix IV of 40 C.F.R. § 257 as summarized in **Table B** below.

Table B. 40 C.F.R. § 257 Groundwater Monitoring Program Parameters

Field Parameters[1]			
Groundwater Elevation	pH		
Appendix III Parameters (Total, except TDS)			
Boron	Chloride	Sulfate	
Calcium	Fluoride	TDS	
Appendix IV Parameters (Total)			
Antimony	Cadmium	Lead	Selenium
Arsenic	Chromium	Lithium	Thallium
Barium	Cobalt	Molybdenum	Radium 226 and 228 combined
Beryllium			

[1]Dissolved oxygen, temperature, specific conductance, oxidation/reduction potential, and turbidity are recorded during sample collection

4.1.2 Part 845 Well Installation and Groundwater Monitoring

In 2021, 23 additional monitoring wells (AP05D, AP05S, AP07D, AP07S, APW-02, APW-03, APW-04, AW-05, AW-08, AW-12, AW-13, AW-14, AW-15, AW-15C, AW-15S, AW-16, AW-17, AW-18, AW-19, AW-20, AW-21, AW-22, P002) were installed along the perimeter of the Ash Pond to assess the vertical and horizontal lithology, stratigraphy, chemical properties, and physical properties of geologic layers to a minimum of 100 feet bgs as specified in 35 I.A.C. § 845.620(b). Additionally, three leachate monitoring wells (XPW01A, XPW02, and XPW03) were installed within the Ash Pond to characterize CCR materials and leachate. These locations and samples were discussed in **Section 2.5.1**. The boring logs, well construction forms, and related monitoring well forms for the well network are included in **Appendix C** of this HCR. The well locations are shown on **Figure 3-1**.

Prospective monitoring wells sampled for eight rounds between February and August 2021 and the test results were used to develop this HCR and assess well locations for inclusion in the Part 845 monitoring well network.

Groundwater samples were analyzed for 35 I.A.C. § 845.600 parameters summarized in **Table C** below. Part 845 groundwater monitoring results are included below in **Section 4.2**. A summary of groundwater analytical results is presented in **Table 4-1**.

Table C. Part 845 Groundwater Monitoring Program Parameters

Field Parameters[1]			
pH	Turbidity	Groundwater Elevation	
Metals (Total)			
Antimony	Boron	Cobalt	Molybdenum
Arsenic	Cadmium	Lead	Selenium
Barium	Calcium	Lithium	Thallium
Beryllium	Chromium	Mercury	
Inorganics (Total)			
Fluoride	Sulfate	Chloride	TDS
Other (Total)			
Radium 226 and 228 combined			

[1]Dissolved oxygen, temperature, specific conductance, and oxidation/reduction potential were recorded during sample collection.

4.2 Groundwater Monitoring Results and Analysis

Groundwater data collected from the 40 C.F.R. § 257 network monitoring wells between 2015 and 2021 and from the wells installed in 2021 were evaluated with respect to standards included in 35 I.A.C. § 845.600(a)(1). The groundwater analytical results are summarized in **Table 4-1** and discussed in the subsections below and groundwater field parameters are included in **Table**

4-2. Results indicate that the parameters discussed in the following sections were greater than the applicable 35 I.A.C. § 845.600(a)(1) standards and are considered potential exceedances[1].

4.2.1 Arsenic

Arsenic was detected at concentrations greater than the GWPS (0.010 milligrams per liter [mg/L]) in eleven uppermost aquifer wells: downgradient wells AW-05, AW-06, AW-09, AW-10, AW-11, AW-13, AW-14, AW-19 and AW-20 and upgradient wells AP05S and AW-08. Concentrations ranged from non-detect (at a reporting limit of 0.001 mg/L) to 0.097 mg/L and have shown temporal variability with concentrations greater than and less than the GWPS at all wells. The median concentration of arsenic in these uppermost aquifer wells was 0.01 mg/L.

PMP wells APW-01 and APW-04 had arsenic concentrations greater than the GWPS during sampling events in 2021. Concentrations of arsenic in these wells range from 0.0054 to 0.025 mg/L with a median concentration of 0.0127 mg/L.

Bedrock well AP07D had arsenic concentrations greater than the GWPS during three of six events in 2021. The concentrations at AP07D ranged from 0.0044 to 0.057 mg/L and results are consistent with variability seen in other parameters. The median concentration of arsenic in bedrock well AP07D was 0.0209 mg/L. Bedrock well AW-15C had arsenic concentrations greater than the GWPS during one event in 2021 at 0.011 mg/L.

4.2.2 Barium

Barium was detected at concentrations greater than the GWPS (2.0 mg/L) in three uppermost aquifer wells (AW-10, AW-11, and AW-15). These wells are located around the southern portion of the Ash Pond, in the locations where the bedrock is at lower elevation and concentrations are variable. AW-10 and AW-11 have not exceeded the standard since 2018, and AW-15 only exceeded the standard once in 2021 shortly after installation of the well. Barium concentrations have declined at AW-15 following the initial sampling.

No PMP wells had barium concentrations greater than the GWPS.

Bedrock well AW-15C had barium concentrations greater than the GWPS during all events sampled in 2021 with a median barium concentration of 3.3 mg/L. Bedrock well AP07D had concentrations greater than the GWPS during 50 percent of events sampled in 2021 and fluctuated significantly, ranging from 0.31 to 8.6 mg/L between sampling events. The median barium concentration in bedrock well AP07D was 1.95 mg/L.

4.2.3 Beryllium

Beryllium was detected at concentrations greater than the GWPS (0.004 mg/L) in four uppermost aquifer wells (AW-08, AW-09, AW-10, and AW-11). Three of the uppermost aquifer wells (AW-08, AW-09, and AW-10) have not had beryllium concentrations greater than the GWPS since 2016, and AW-11 has not had beryllium concentrations greater than the GWPS since 2018.

[1] Potential exceedances include results reported during the eight rounds of baseline groundwater monitoring that are greater than the applicable 35 I.A.C. § 845.600(a)(1) standards. The results are considered potential exceedances because they were compared directly to the standard and did not include an evaluation of background groundwater quality or apply the statistical methodologies proposed in the Groundwater Monitoring Plan (GMP). For simplicity, "GWPS" will be used hereafter in discussing potential exceedances. Exceedances will be determined following IEPA approval of the GMP.

No PMP wells have had beryllium concentrations greater than the GWPS.

Bedrock well AP07D had beryllium concentrations greater than the GWPS during three events in 2021. The beryllium concentrations at AP07D ranged from non-detect (at a reporting limit of 0.001 mg/L) to 0.017 mg/L with a median concentration of 0.0057 mg/L.

4.2.4 Boron

Boron is a primary indicator parameter for CCR leachate impacts on groundwater quality. Boron was detected at concentrations greater than the GWPS (2 mg/L) in five uppermost aquifer wells (AW-05, AW-18, AW-19, AW-20 and AW-21). At AW-18, concentrations of boron are variable with results both greater than and less than the GWPS, with the most recent results generally less than the GWPS. Uppermost aquifer wells AW-05, AW-19, AW-20, and AW-21 have consistently had concentrations greater than the GWPS during all sampling events in 2021. These wells are located on the west-northwest and north side of the Ash Pond. Concentrations in these wells range from 0.41 to 12 mg/L, with the most elevated boron concentrations occurring in AW-21.

Two PMP wells located north and southwest of the Ash Pond (AP07S screened in a sand lens and AW-15S screened in clay near the base of the Ash Pond), reported boron concentrations greater than the GWPS during all sampling events in 2021. Concentrations of boron in these wells range from 5.4 to 12 mg/L. Based on the eight rounds collected in 2021, boron concentrations in AW-15S and AP07S appear to be consistently within this range. No other wells screened within PMPs have had boron concentrations greater than the GWPS.

Concentrations of boron in bedrock wells (AP05D, AP07D, and AW-15C) range from 0.6 to 1.8 mg/L which are consistent with concentrations detected in the Peoria region (Burch and Kelley, 1993).

4.2.5 Chloride

Chloride was detected at concentrations greater than the GWPS (200 mg/L) in one uppermost aquifer well (AW-05). Concentrations of chloride in this well have declined, similar to boron and sulfate, and groundwater from AW-05 has not exceeded the standard since 2017.

In samples from PMP well APW-04, three of five samples collected in 2021 had concentrations greater than the GWPS with concentrations increasing between sampling events. The median concentration of chloride in APW-04 was 220 mg/L. This well is located near the southeast corner of the unit. One sample collected 2021 from PMP well APW-01, located northeast and upgradient of the unit, had a concentration greater than the GWPS.

Bedrock wells AP05D (background) and AP07D have consistently reported chloride concentrations above the standard in all sampling events in 2021. Concentrations in these wells range from 230 to 830 mg/L, which are generally greater than those measured in the Ash Pond. Concentrations are similar to those detected in groundwater in the Peoria region (Burch and Kelley, 1993).

4.2.6 Chromium

Chromium was detected at concentrations greater than the GWPS (0.1 mg/L) in three uppermost aquifer wells (AW-09, AW-10, and AW-11). The three uppermost aquifer wells have only had chromium concentrations greater than the GWPS once each with the last occurrence in 2018 (AW-11).

No PMP wells have had chromium concentrations greater than the GWPS.

Bedrock well AP07D has had chromium concentrations greater than the GWPS during three events in 2021. The concentrations ranged from non-detect (at a reporting limit of 0.004 mg/L) to 0.59 mg/L and the median concentration of chromium in bedrock well AP07D was 0.175 mg/L. The variability of chromium is consistent with other parameters at this location.

4.2.7 Cobalt

Cobalt was detected at concentrations greater than the GWPS (0.006 mg/L) in seven downgradient uppermost aquifer wells (AW-05, AW-06, AW-09, AW-10, AW-11, AW-14 and AW-17). Cobalt was also detected at concentrations greater than the GWPS in upgradient uppermost aquifer well AP05S. In general, the frequency of cobalt concentrations greater than the GWPS has declined in these wells.

Cobalt was detected at concentrations greater than the GWPS in PMP well APW-01 during two sampling events in 2021. PMP well AW-15S reported cobalt concentrations greater than the GWPS only during the initial event following installation in 2021.

Bedrock well AP07D had cobalt concentrations greater than the GWPS during five of six sampling events in 2021. The concentrations ranged from non-detect (at a reporting limit of 0.002 mg/L) to 0.290 mg/L, with similar variability to other parameters. The median concentration of cobalt at bedrock well AP07D was 0.104 mg/L.

4.2.8 Fluoride

Fluoride was detected at concentrations greater than the GWPS (4.0 mg/L) during two of eight sampling events in 2021 at downgradient uppermost aquifer well AW-18.

No PMP wells had fluoride concentrations greater than the GWPS.

No bedrock wells had fluoride concentrations greater than the GWPS.

4.2.9 Lead

Lead was detected at concentrations greater than the GWPS (0.0075 mg/L) in six uppermost aquifer wells (AW-05, AW-06, AW-09, AW-10, AW-11, and AW-22). Lead was also detected at concentrations greater than the GWPS in upgradient uppermost aquifer well AP05S.

Lead was detected at concentrations greater than the GWPS in PMP well APW-01 during one sampling event in 2021. PMP well AW-15S had lead concentrations greater than the GWPS during the initial event following installation in 2021.

Bedrock well AP07D has had lead concentrations greater than the GWPS during five events in 2021. The concentrations ranged from non-detect (with a reporting limit of 0.001 mg/L) to 0.270 mg/L; the median concentration of lead in bedrock well AP07D was 0.09 mg/L. The variability of lead concentrations is consistent with other parameters at this location.

4.2.10 Lithium

Lithium was detected at concentrations greater than the GWPS (0.04 mg/L) in nine downgradient uppermost aquifer wells (AW05, AW-06, AW-09, AW-10, AW-11, AW-15, AW-16, AW-17, and AW-18). Lithium was also detected greater than the GWPS in upgradient uppermost aquifer AP05S.

No PMP wells have had lithium concentrations greater than the GWPS.

Bedrock wells AP05D, AP07D, and AW-15C have consistently reported lithium concentrations greater than the GWPS in all sampling events in 2021. Lithium concentrations ranged from 0.045 to 0.72 mg/L with a median concentration of 0.065 mg/L.

4.2.11 pH

pH was measured below the lower GWPS of 6.5 standard units (SU) in upgradient uppermost aquifer well AP05S and seven downgradient uppermost aquifer wells (AW-08, AW-12, AW-16, AW-17, AW-18, AW-19, and AW-20), during one sampling event in 2021.

pH was also measured below the lower GWPS in PMP wells AP07S, APW-03, and P002 during the same sampling event.

No bedrock wells had pH measurements outside of the range between the lower and upper (9.0 SU) GWPS.

4.2.12 Radium 226 and 228 Combined

Radium 226 and 228 combined was detected at concentrations greater than the GWPS (5 picoCuries per liter [pCi/L]) in five uppermost aquifer wells (AW-09, AW-10, AW-11, AW-15, and AW-16). Uppermost aquifer wells AW-09, AW-10, and AW-11 have not had radium 226 and 228 combined concentrations greater than the GWPS since 2018. Uppermost aquifer well AW-15 has had radium 226 and 228 combined concentrations greater than the GWPS during two events in 2021 with a median concentration of 4.14 pCi/L. Uppermost aquifer well AW-16 had radium 226 and 228 combined concentrations greater than the GWPS five times in 2021 with a median concentration of 5.63 pCi/L. Upgradient uppermost aquifer well AP05S had radium 226 and 228 combined concentrations greater than the GWPS three times in 2021 with a median concentration of 2.68 pCi/L.

No PMP wells have had radium 226 and 228 combined concentrations greater than the GWPS.

Bedrock wells AP07D and AW-15C have had radium 226 and 228 combined concentrations greater than the GWPS during three events in 2021. The concentrations ranged from 0.268 to 23 pCi/L with median concentrations of 8.22 pCi/L (AP07D) and 5.09 pCi/L (AW-15C).

4.2.13 Sulfate

Sulfate is also a primary indicator parameter of CCR leachate impacts on groundwater quality. Sulfate was detected at concentrations greater than the GWPS (400 mg/L) in uppermost aquifer well AW-05 during one event in July 2017.

PMP wells AP07S and AW-15S have had sulfate concentrations greater than the GWPS during multiple events in 2021. The concentrations ranged from 150 to 570 mg/L with a median concentration of 480 mg/L.

No bedrock wells had sulfate concentrations greater than the GWPS.

4.2.14 Thallium

Thallium was detected at concentrations greater than the GWPS (0.002 mg/L) at uppermost aquifer well AW-10 during one sampling event in 2016.

No PMP wells have had thallium concentrations greater than the GWPS.

Thallium was detected at concentrations greater than the GWPS in bedrock well AP07D during one sampling event in 2021.

4.2.15 Total Dissolved Solids

Total Dissolved Solids (TDS) was detected at concentrations greater than the GWPS (1,200 mg/L) at uppermost aquifer well AW-05 during four sampling events from 2016 to 2017 with a median concentration of 1,100 mg/L.

TDS was detected at similar concentrations greater than the GWPS in PMP wells AP07S and AW-15S during multiple sampling events in 2021.

TDS was detected at concentrations greater than the GWPS in bedrock wells AP05D, AP07D, and AW-15C. Concentrations ranged from 820 mg/L to 2,600 mg/L with a median concentration of 1,200 mg/L.

5. EVALUATION OF POTENTIAL RECEPTORS

5.1 Water Well Survey

A potable water well inventory was completed in 2021 utilizing federal and state databases to assess nearby pumping wells, drinking water receptors, and other uses of water in the vicinity of the Ash Pond. The following sources of information were queried to identify well locations, drinking water receptors, and other uses of water within 1,000 meters of the Ash Pond boundary:

- ISGS Illinois Water and Related Wells (ILWATER) Map[1]

Based on records obtained from the ISGS ILWATER, there are 14 wells located outside of the EPP property within 1,000 meters of the Ash Pond (**Appendix B**). These included seven engineering test wells, three industrial-commercial wells, three farm/domestic wells, and one monitoring well. Three of the 14 identified offsite water wells are downgradient of the Ash Pond, two of which are identified as water wells, and one is identified as plugged and abandoned. No potable wells were identified downgradient of the Ash Pond. Primary uses are industrial applications, monitoring, and engineering test wells.

5.2 Surface Water

A search was performed utilizing the United States Fish and Wildlife Service (USFWS) Wetlands Mapper[2] and the USGS National Map [3] for surface water bodies within 1,000 meters of the Ash Pond (**Appendix B**). The predominant surface water body in the region is the Illinois River and associated lowland backwater lakes. The Illinois River is located approximately 900 feet to the east and upgradient from the Ash Pond. As discussed in **Section 3.3.2**, a USGS stream gage (#05568500) for the Illinois River at Kingston Mines, Illinois is located 8.7 miles south and west (downstream) of the EPP. The gage datum elevation is 428 feet NGVD29. Daily gage heights for the period of January 1, 2018 to March 18, 2021 are shown on **Figure A** in **Section 3.3.2**. The gage height of 3 feet, representing approximate baseflow, occurs at an elevation of about 431 feet NGVD29.

The headwaters for the East Branch of Lamarsh Creek are located approximately 0.45 miles northwest of the Ash Pond. The East Branch of the Lamarsh Creek flows southwest to the Lamarsh Creek and ultimately to the Illinois River. Other surface waters in the vicinity include Worley Lake and Pekin Lake, both of which are located across the Illinois River at a distance of approximately 0.5 miles from the Ash Pond.

Additional surface waters indicated in the USFWS Wetland Mapper and USGS National Map include several freshwater forested/shrub wetlands located generally to the north, west and southeast of the EPP, several freshwater ponds ranging in size from 0.2 acres to approximately 3.7 acres and located generally to the north and west of the Ash Pond, and two freshwater emergent wetlands located to the northeast of the EPP. A map of wetlands and surface waters in the vicinity of the Ash Pond is presented in **Appendix B**.

[1] ISGS ILWATER Map: https://prairieresearch.maps.arcgis.com/apps/webappviewer/index.html?id=e06b64ae0c814ef3a4e43a191cb57f87
[2] USFWS Wetlands Mapper: https://www.fws.gov/wetlands/data/mapper.html
[3] USGS National Map: https://apps.nationalmap.gov/viewer/

The USGS National Map places the EPP within the Pekin Lake-Illinois River subwatershed (Hydrologic Unit Code [HUC] 071300030304), which is part of the Lamarsh Creek-Illinois River watershed (HUC 0713000303) and located within the larger Lower Illinois-Lake Chautauqua subbasin (HUC 07130003).

A FEMA Flood Insurance Rate Map is not available for Peoria County. A historic (1983) floodplain map indicates that the Ash Pond is located within a Zone C floodplain, and the area surrounding the Ash Pond is within a Zone A13 floodplain (**Appendix G**). The map shows that the area immediately surrounding the Ash Pond is defined as Zone A, indicating a 100-year flood boundary, that has a 1 percent chance of being equaled or exceeded in any given year.

5.3 Nature Preserves, Historic Sites, Endangered/Threatened Species

A search of the Illinois Department of Natural Resources (IDNR) Natural Heritage Database[4] for natural areas and protected areas within 1,000 meters of the Ash Pond was performed. No natural or protected areas were identified within 1,000 meters of the Ash Pond (**Appendix B**).

The IDNR Natural Heritage Database Threatened and Endangered Species by County[5] lists 24 threatened and endangered species as located within Peoria County, including nine endangered and 15 threatened species. Habitats for endangered or threatened species are identified at the county level only (**Appendix B**).

Additionally, a search of the IDNR Historic Preservation Division[6] database for historic sites in the vicinity of the Ash Pond yielded no results within 1,000 meters of the Ash Pond (**Appendix B**). The Illinois State Archaeological Survey (ISAS)[7] databases that do not require credentials to access were also searched and yielded no results within 1,000 meters of the Ash Pond.

[4] IDNR Natural Heritage Database: https://www2.illinois.gov/dnr/conservation/NaturalHeritage/Pages/NaturalHeritageDatabase.aspx
[5] Illinois Threatened and Endangered Species by County: https://www2.illinois.gov/dnr/ESPB/Documents/ET_by_County.pdf
[6] IDNR Historic Preservation Division: https://www2.illinois.gov/dnrhistoric/Pages/default.aspx
[7] ISAS: https://www.isas.illinois.edu/

6. CONCLUSIONS

Hydrogeologic characterization of the EPP was originally developed as part of the Site Characterization and Groundwater Monitoring Plan for Coal Combustion Product (CCP) Impoundment, Ameren Energy Resources Generating, E.D. Edwards Plant, Peoria County, IL (Rapps, 2009) and most recently updated for this HCR. Results of these hydrogeologic studies were reintroduced in this HCR and updated to include geologic, hydrogeologic, and groundwater quality data collected with a focus on the Ash Pond (Part 845 regulated CCR Unit and subject of this HCR).

The data were summarized and evaluated for changes in groundwater conditions since the previous investigations; available groundwater quality data for the Ash Pond was compared to the Part 845 Standards.

The results of the hydrogeologic and groundwater quality evaluation are:

- There are three principal types of unlithified materials above the bedrock in the vicinity of the Ash Pond, these include the following in descending order: Fill, predominantly coal ash (fly ash, bottom ash, and slag) within the Ash Pond, and materials within constructed berms and railroad embankments, are present around the Ash Pond; Upper Cahokia Formation (fine-grained deposits of the Cahokia Formation ranging in thickness at the Ash Pond from 5 to 40 feet); and Lower Cahokia Formation (course-grained deposits of the Cahokia Formation consisting of sands and gravels ranging in thickness at the Ash Pond from 1 to 4 feet). Depth to bedrock at the Ash Pond ranges from approximately 20 feet at AW-05 in the north to 58 feet at AW-16 in the southwest.
- Four distinct water bearing layers have been identified at the Ash Pond based on stratigraphic relationships and common hydrogeologic characteristics, these include the following in descending order: Ash Unit (saturated CCR consisting primarily of fly ash within the ash pond, and having a geometric mean horizontal hydraulic conductivity of 1.4×10^{-3} cm/s); Upper Cahokia Formation/PMP (low permeability clays and silts of the Upper Cahokia Formation and discontinuous lenses of sand that have been identified as PMPs); uppermost aquifer (thin, generally less than 4 feet thick sand, silty sand, and clayey gravel units which includes the Lower Cahokia Formation and the bedrock interface with a geometric mean horizontal hydraulic conductivity of 1.7×10^{-4} cm/s); Bedrock Confining Unit (generally low permeability shales and siltstones with interbedded sandstone) with a geometric mean horizontal hydraulic conductivity of 3.2×10^{-6} cm/s.
- Groundwater within the uppermost aquifer flows predominantly to the west and south, with a minor component to the north. Groundwater flow occurs primarily in the more permeable zones within the Lower Cahokia Formation.
- Groundwater velocities in the uppermost aquifer determined in the center portion of the Ash Pond (between AW-08 and AW-06) ranged from approximately 1.7×10^{-4} to 4.0×10^{-4} ft/day in 2021 with an average of 2.5×10^{-4} ft/day. Groundwater velocities determined in the southern portion of the Ash Pond between AW-10 and AW-15 were consistent with an average of 0.26 ft/day. The higher velocities observed in the southern portion of the Ash Pond are a result of coarse-grained materials present there.

- As determined by the detailed geologic information provided, and the hydrogeologic and groundwater quality data, groundwater within the uppermost aquifer at the Ash Pond is classified as Class I – Potable Resource Groundwater.
- Potential exceedances of 35 I.A.C. § 845.600 GWPSs were detected in monitoring wells at the Ash Pond are summarized as follows:
  - Arsenic – at downgradient uppermost aquifer wells AW-05, AW-06, AW-09, AW-10, AW-11, AW-13, AW-14, AW-19 and AW-20; upgradient uppermost aquifer wells AP05S and AW-08; PMP monitoring wells APW-01 and APW-04; and downgradient bedrock wells AP07D and AW-15C.
  - Barium – at downgradient uppermost aquifer wells AW-10, AW-11, and AW-15; and bedrock monitoring wells AW-15C and AP07D.
  - Beryllium – at downgradient uppermost aquifer wells AW-08, AW-09, AW-10, and AW-11; and bedrock monitoring well AP07D.
  - Boron - at downgradient uppermost aquifer wells AW-05, AW-18, AW-19, AW-20, and AW-21; and PMP wells AP07S and AW-15S.
  - Chloride – at downgradient uppermost aquifer well AW-05; PMP monitoring wells APW-01 and APW-04; and at bedrock monitoring wells AP05D and AP07D.
  - Cobalt - at downgradient uppermost aquifer wells AW-05, AW-06, AW-09, AW-10, AW-11, AW-14, and AW-17; PMP monitoring wells APW-01 and AW-15S; downgradient bedrock well AP07D; and upgradient well AP05S.
  - Lead – at downgradient uppermost aquifer wells AW-05, AW-06, AW-09, AW-10, AW-11, and AW-22; upgradient uppermost aquifer well AP05S; PMP monitoring wells APW-01 and AW-15S; and downgradient bedrock well AP07D.
  - Lithium - at downgradient uppermost aquifer wells AW-05, AW-06, AW-09, AW-10, AW-11, AW-15, AW-16, AW-17, and AW-18; upgradient uppermost aquifer well AP05S; downgradient bedrock wells AP07D and AW-15C; and upgradient bedrock well AP05D.
  - Radium 226 and 228 combined – at downgradient uppermost aquifer wells AW-09, AW-10, AW-11, AW-15 and AW-16; upgradient uppermost aquifer well AP05S; and downgradient bedrock wells AP07D and AW-15C.
  - Sulfate – at downgradient uppermost aquifer well AW-05, and downgradient PMP wells AP07S and AW-15S.
  - TDS - at downgradient uppermost aquifer well AW-05; downgradient PMP wells AP07S and AW-15S, and bedrock monitoring wells AP05D, AP07D, and AW-15C.
  - Chromium, fluoride, pH, and thallium were also detected at concentrations and/or measured (for pH) outside of their respective GWPSs at one or more locations during monitoring. However, the occurrences were infrequent and/or isolated and individual locations are not listed.

This HCR satisfies Part 845 content requirements specific to 35 I.A.C. § 845.620(b) (Hydrogeologic Site Characterization) for the Ash Pond at the EPP.

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TABLES

TABLE 2-1. GEOTECHNICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Field Location ID	Top of Sample (ft bgs)	Bottom of Sample (ft bgs)	Moisture Content (%)	Dry Density (pcf)	Specific Gravity	Total Porosity [1]	Vertical Hydraulic Conductivity (cm/s)	LL	PL	PI	Laboratory USCS	Gravel (%)	Sand (%)	Fines (%)
CCR															
XPW01 (20-22)	XPW01	20	22	43.7	69.8	2.381	53%	1.18E-05	51	53	NP	SM	0	68.9	31.1
XPW01A (41-41.5)	XPW01A	41	41.5	35.1	71.7	2.378	52%	6.77E-06	60	43	17	MH	0	13.7	86.3
XPW02 (10-12)	XPW02	10	12	45.1	67.5	2.414	55%	1.20E-05	52	47	5	MH	0.5	28.1	71.4
XPW02 (22-24)	XPW02	22	24	33.4	77.1	2.335	47%	2.08E-06	38	30	8	ML	0	4.1	95.9
XPW02 (45.5-46.5)	XPW02	45.5	46.5	41.7	73.5	2.397	51%	1.00E-05	39	33	6	ML	0.1	37.4	62.5
XPW03 (10-12)	XPW03	10	12	43.8	68	2.388	54%	3.29E-05	36	29	7	ML	0.4	27.2	72.4
Upper Cahokia Formation															
AW-13A (5-7)	AW-13A	5	7	25.2	96.5	2.661	42%	4.72E-08	30	14	16	CL	0	30.3	69.7
AW-15 (20-22)	AW-15	20	22	27.9	85.8	2.694	49%	2.87E-08	57	19	38	CH	0	2.0	98
AW-20 (15-17)	AW-20	15	17	35.1	83.9	2.690	50%	7.23E-08	47	18	29	CL	0	7.8	92.2
AW-22 (30-32)	AW-22	30	32	23.2	101.3	2.700	40%	1.74E-07	22	13	9	SC	0	57.4	42.6

[O:LTA 7/13/21, U: SSW 08/13/21; C:CJC 08/16/21; U: LDC 09/16/21; C: SSW 09/16/21]

Notes:

[1] Porosity calculated as relationship of bulk density to particle density ($n = 100[1- (p_b/p_d)]$)
bgs = below ground surface
% = Percent
CCR = coal combustion residuals
cm/s = centimeters per second
ft = foot/feet
LL = Liquid limit
NP = Non Plastic
pcf = pounds per cubic foot
PI = Plasticity Index
PL = Plastic Limit

USCS = Unified Soil Classification System
CH = Fat Clay
CL = Lean Clay
MH = Elastic Silt
ML = Silt
SC = Clayey Sand
SM = Silty Sand
SP = Poorly Graded-Sand

TABLE 2-2. ASH ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Depth (ft BGS)	Sample Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Boron (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)	Lead (mg/kg)	Lithium (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Selenium (mg/kg)	Thallium (mg/kg)
XPW01	17-19	01/08/2021	<6.6	24	840	4	170	7.5	67	11	90	47	<0.44	25	4.9	<2.2
XPW01A	40.5-42.5	01/08/2021	<7	22	190	4.7	700	11	37	4.7	93	<12	<0.46	11	4	<2.3
XPW02	24-25	01/09/2021	20	72	160	6.8	400	2.3	60	19	76	20	<0.32	7	5.5	<1.6
XPW02	43-45	01/09/2021	8.9	42	94	8.3	840	8.5	84	19	140	<91	<0.36	14	6.5	2.1
XPW03	13-15	01/09/2021	<5.5	8	1300	2.2	500	<1.8	27	6.1	14	33	<0.37	3.2	2.2	<1.8
XPW03	35-37	01/09/2021	<7	37	600	5.8	970	20	65	8	130	20	<0.47	11	3.6	<2.3

Notes:
< = concentration is less than the concentration shown, which corresponds to the reporting limit for the method.
BGS = below ground surface
ft = feet
mg/kg = milligrams per kilogram

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TABLE 2-3. POREWATER ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Boron, total (mg/L)	Cadmium, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	pH (field) (SU)	Radium 226 and 228 combined (pCi/L)	Selenium, total (mg/L)	Sulfate, total (mg/L)	Thallium, total (mg/L)
XPW01A	02/11/2021	0.0032	0.069	0.04	<0.001	18	0.0023	39	93	<0.004	<0.002	<0.25	0.0087	0.64	<0.0002	4	12.0	0.256	0.014	210	<0.001
XPW01A	03/04/2021	<0.003	0.082	0.031	<0.001	15	0.0017	39	83	<0.004	<0.002	<0.25	<0.001	0.57	<0.0002	5	11.4	0.275	0.01	210	<0.001
XPW01A	03/23/2021	<0.003	0.072	0.028	<0.001	15	0.0015	36	91	<0.004	<0.002	<0.25	<0.001	0.61	<0.0002	4.6	11.2	0.261	0.0089	210	<0.001
XPW01A	04/12/2021	<0.003	0.088	0.029	<0.001	16	0.0014	38	93	<0.004	<0.002	<0.25	0.0011	0.64	<0.0002	4.3	11.9	0.233	0.011	220	<0.001
XPW01A	05/04/2021	0.0042	0.079	0.034	<0.001	17	0.0011	51	47	<0.004	<0.002	<0.25	<0.001	0.67	<0.0002	3.8	11.9	0.425	0.011	210	<0.001
XPW01A	07/21/2021	<0.003	0.096	0.032	<0.001	19	0.0012	52	96	<0.004	<0.002	<0.25	<0.001	0.72	<0.0002	3.3	11.8	0.604	0.0095	230	<0.001
XPW02	02/11/2021	<0.003	0.13	0.022	<0.001	15	0.0013	40	110	<0.004	<0.002	0.3	0.0043	0.34	0.00021	2.9	12.2	0.548	0.13	800	<0.001
XPW02	03/03/2021	<0.003	0.16	0.017	<0.001	14	0.0011	37	110	<0.004	<0.002	0.294	<0.001	0.33	0.00022	3.2	11.9	0.179	0.14	840	<0.001
XPW02	03/23/2021	<0.003	0.15	0.017	<0.001	16	<0.001	37	120	<0.004	<0.002	0.313	<0.001	0.32	<0.0002	2.8	11.6	0.101	0.14	890	<0.001
XPW02	04/12/2021	<0.003	0.18	0.015	<0.001	13	<0.001	27	110	<0.004	<0.002	0.324	<0.001	0.34	0.00021	2.9	12.2	0.464	0.15	880	<0.001
XPW02	05/04/2021	<0.003	0.18	0.022	<0.001	15	<0.001	29	120	<0.004	<0.002	0.361	<0.001	0.3	<0.0002	3.3	12.2	0.133	0.15	950	<0.001
XPW02	07/22/2021	<0.003	0.2	0.018	<0.001	14	0.001	28	130	<0.004	<0.002	0.412	<0.001	0.32	<0.0002	3	12.1	0.427	0.17	970	<0.001
XPW03	02/11/2021	<0.003	0.026	0.071	<0.001	5.4	0.0013	50	96	<0.004	<0.002	0.265	<0.001	0.18	<0.0002	3.1	11.9	0.194	0.024	270	<0.001
XPW03	03/03/2021	<0.003	0.028	0.066	<0.001	4.9	0.0012	53	91	<0.004	<0.002	0.27	<0.001	0.16	<0.0002	3.6	11.7	0.349	0.024	280	<0.001
XPW03	03/23/2021	<0.003	0.027	0.063	<0.001	5.3	0.0011	49	250	<0.004	<0.002	0.275	<0.001	0.18	<0.0002	3.1	11.2	0.065	0.024	300	<0.001
XPW03	04/12/2021	<0.003	0.027	0.067	<0.001	5	0.0011	51	93	<0.004	<0.002	<0.25	<0.001	0.17	<0.0002	3.6	12.0	0.208	0.023	290	<0.001
XPW03	05/04/2021	<0.003	0.027	0.07	<0.001	5.5	0.0012	52	86	<0.004	<0.002	<0.25	<0.001	0.16	<0.0002	3.8	12.0	0.213	0.023	280	<0.001
XPW03	07/22/2021	<0.003	0.025	0.065	<0.001	7	0.0011	52	94	<0.004	<0.002	0.284	<0.001	0.17	<0.0002	3.3	11.7	0.211	0.021	270	<0.001

Notes:
Field readings are reported with as many significant figures as provided by analytical laboratory.
< = concentration is less than the concentration shown, which corresponds to the reporting limit for the method.
mg/L = milligrams per liter
pCi/L = picocuries per liter
SU = standard units

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TABLE 2-4. SOIL ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Geologic Unit	Sample Depth (ft BGS)	Sample Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Boron (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)	Lead (mg/kg)	Lithium (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Selenium (mg/kg)	Thallium (mg/kg)
AW-15	Upper Cahokia Formation	33-35	01/08/2021	<4.7	4.9	170	<1.6	22	<1.6	31	12	15	37	<0.31	<1.6	<1.6	<1.6
AW-20	Upper Cahokia Formation	17-19	01/10/2021	<3.9	3.2	150	<1.3	16	<1.3	21	11	14	22	<0.26	1.5	1.4	<1.3
AW-22	Upper Cahokia Formation	32-34	01/08/2021	<3.7	4	83	<1.2	21	<1.2	28	10	12	25	<0.25	<1.2	<1.2	<1.2
AW-22	Upper Cahokia Formation	45-47	01/08/2021	<4.6	7.2	230	<1.5	39	<1.5	42	14	18	36	<0.31	<1.5	<3.1	<1.5

Notes:
< = concentration is less than the concentration shown, which corresponds to the reporting limit for the method.
BGS = below ground surface
ft = foot or feet
mg/kg = milligrams per kilogram
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TABLE 3-1. MONITORING WELL LOCATIONS AND CONSTRUCTION DETAILS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Well Number	HSU	Date Constructed	Top of PVC Elevation (ft)	Measuring Point Elevation (ft)	Measuring Point Description	Ground Elevation (ft)	Screen Top Depth (ft BGS)	Screen Bottom Depth (ft BGS)	Screen Top Elevation (ft)	Screen Bottom Elevation (ft)	Well Depth (ft BGS)	Bottom of Boring Elevation (ft)	Screen Length (ft)	Screen Diameter (inches)	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)
AP05S	UA	11/29/2016	443.53	443.53	Top of PVC	441.13	32.87	37.64	408.26	403.49	38.06	403.10	4.8	2	40.598807	-89.66191
AP05D	BCU	12/05/2016	443.45	443.45	Top of PVC	441.23	47.09	56.69	394.14	384.54	57.17	382.90	9.6	2	40.598796	-89.661901
AP06	UCF	11/30/2016	442.17	442.17	Top of PVC	439.53	19.93	24.72	419.60	414.81	25.00	414.50	4.8	2	40.601038	-89.662759
AP07S	UCF	12/02/2016	461.08	461.08	Top of PVC	458.31	29.95	34.74	428.36	423.57	35.00	423.30	4.8	2	40.59793	-89.666919
AP07D	BCU	12/08/2016	460.89	460.89	Top of PVC	458.42	55.01	64.59	403.41	393.83	65.00	393.40	9.6	2	40.597941	-89.666926
AP08	CCR	12/06/2016	460.60	460.60	Top of PVC	458.10	9.99	19.58	448.11	438.52	19.98	438.10	9.6	2	40.594578	-89.668728
AP09	CCR	12/07/2016	460.22	460.22	Top of PVC	457.24	9.79	19.39	447.45	437.85	19.80	437.40	9.6	2	40.59149	-89.666303
APW-01	UCF	07/27/2010	441.07	441.07	Top of PVC	437.83	7.60	18.00	430.23	419.83	18.00	419.30	10.4	2	40.600127	-89.66512
APW-02	UCF	07/20/2010	464.92	464.92	Top of PVC	461.72	39.60	50.00	422.12	411.72	50.00	411.70	10.4	2	40.594228	-89.665642
APW-03	UCF	07/19/2010	444.37	444.37	Top of PVC	441.22	19.60	30.00	421.62	411.22	30.00	411.20	10.4	2	40.591259	-89.663843
APW-04	UCF	07/27/2010	439.66	439.66	Top of PVC	437.19	9.60	20.00	427.59	417.19	20.00	417.20	10.4	2	40.587909	-89.663726
AW-01[1]	PMP	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AW-05	UA	07/22/2015	--	443.37	Top of Disk	440.55	15.87	20.47	424.68	420.08	21.10	419.50	4.6	2	40.598645	-89.666407
AW-06	UA	08/03/2015	--	461.57	Top of Disk	459.19	36.60	41.09	422.59	418.10	41.69	416.90	4.5	2	40.594237	-89.670051
AW-08	UA	07/21/2015	--	462.54	Top of Disk	460.66	47.55	57.19	413.11	403.47	57.70	403.00	9.6	2	40.593964	-89.661996
AW-09	UA	08/03/2015	--	461.45	Top of Disk	458.32	47.14	51.62	411.18	406.70	52.23	406.10	4.5	2	40.590422	-89.668777
AW-10	UA	07/23/2015	--	439.93	Top of Disk	437.64	27.62	32.23	410.02	405.41	32.74	404.90	4.6	2	40.590733	-89.663826
AW-11	UA	07/28/2015	--	439.87	Top of Disk	437.16	24.21	28.81	412.95	408.35	29.31	407.20	4.6	2	40.587261	-89.663781
AW-12	UA	01/07/2021	443.80	443.80	Top of PVC	441.16	26.00	31.00	415.16	410.16	31.00	406.20	5	2	40.591071	-89.661333
AW-13	UA	01/09/2021	441.26	441.26	Top of PVC	438.67	25.00	30.00	413.67	408.67	30.00	408.70	5	2	40.588378	-89.663714
AW-14	UA	01/08/2021	439.40	439.40	Top of PVC	436.83	24.00	29.00	412.83	407.83	29.00	401.80	5	2	40.58729	-89.665621
AW-15	UA	01/08/2021	441.51	441.51	Top of PVC	438.95	33.00	38.00	405.95	400.95	38.00	399.00	5	2	40.587964	-89.666822
AW-15C	BCU	01/08/2021	440.02	440.02	Top of PVC	437.62	43.00	48.00	394.62	389.62	48.00	337.60	5	2	40.588	-89.666882

TABLE 3-1. MONITORING WELL LOCATIONS AND CONSTRUCTION DETAILS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Well Number	HSU	Date Constructed	Top of PVC Elevation (ft)	Measuring Point Elevation (ft)	Measuring Point Description	Ground Elevation (ft)	Screen Top Depth (ft BGS)	Screen Bottom Depth (ft BGS)	Screen Top Elevation (ft)	Screen Bottom Elevation (ft)	Well Depth (ft BGS)	Bottom of Boring Elevation (ft)	Screen Length (ft)	Screen Diameter (inches)	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)
AW-15S	UCF	01/08/2021	440.71	440.71	Top of PVC	437.92	8.00	18.00	429.92	419.92	18.00	417.90	10	2	40.587955	-89.666841
AW-16	UA	01/08/2021	461.79	461.79	Top of PVC	459.45	55.00	60.00	404.45	399.45	60.00	396.50	5	2	40.589457	-89.667799
AW-17	UA	01/08/2021	462.10	462.10	Top of PVC	459.69	51.00	56.00	408.69	403.69	56.00	402.70	5	2	40.591698	-89.669404
AW-18	UA	01/09/2021	462.65	462.65	Top of PVC	460.28	46.00	51.00	414.28	409.28	51.00	405.30	5	2	40.593044	-89.669822
AW-19	UA	01/09/2021	460.74	460.74	Top of PVC	458.53	35.00	40.00	423.53	418.53	40.00	415.50	5	2	40.595434	-89.66972
AW-20	UA	01/10/2021	461.48	461.48	Top of PVC	459.08	36.50	41.50	422.58	417.58	41.50	416.10	5	2	40.596469	-89.66891
AW-21	UA	01/10/2021	460.61	460.61	Top of PVC	458.28	32.00	37.00	426.28	421.28	37.00	420.30	5	2	40.597294	-89.667734
AW-22	UA	01/08/2021	463.19	463.19	Top of PVC	460.30	44.00	49.00	416.30	411.30	49.00	410.30	5	2	40.596836	-89.666783
P002	UCF	--	460.39	460.39	Top of PVC	458.70	30.60	35.60	--	--	35.90	--	5	2	40.596235	-89.669084
XPW01A	CCR	01/09/2021	464.16	464.16	Top of PVC	460.99	33.00	43.00	427.99	417.99	43.00	418.00	10	2	40.596306	-89.667345
XPW02	CCR	01/09/2021	473.79	473.79	Top of PVC	471.16	36.00	46.00	435.16	425.16	46.00	424.20	10	2	40.594351	-89.668312
XPW03	CCR	01/10/2021	466.04	466.04	Top of PVC	462.62	27.00	37.00	435.62	425.62	37.00	422.60	10	2	40.591416	-89.666188
SG-01	SW	--	--	--	--	--	--	--	--	--	--	--	--	--	40.596075	-89.661625

Notes:
1 Well location is planned, well construction details not available.
All elevation data are presented relative to the North American Vertical Datum 1988 (NAVD88), GEOID 12A
-- = data not available
BCU = bedrock confining unit
BGS = below ground surface
CCR = Coal Combustion Residual
ft = foot or feet
HSU = Hydrostratigraphic Unit
PMP = potential migration pathway
PVC = polyvinyl chloride
SW = surface water
UA = uppermost aquifer
UCF = Upper Cahokia Formation

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TABLE 3-2. VERTICAL HYDRAULIC GRADIENTS

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT

EDWARDS POWER PLANT

ASH POND

BARTONVILLE, ILLINOIS

Date	AP08 Groundwater Elevation (ft NAVD88)	XPW02 Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	CCR-shallow	CCR-deep				
2/9/2021	452.60	452.97	-0.37	13.16	-0.03	up
3/2/2021	452.85	453.17	-0.32	13.16	-0.02	up
3/22/2021	453.59	454.08	-0.49	13.16	-0.04	up
4/12/2021	453.16	453.73	-0.57	13.16	-0.04	up
5/4/2021	452.70	453.23	-0.53	13.16	-0.04	up
6/15/2021	452.40	452.90	-0.50	13.16	-0.04	up
6/28/2021	452.92	453.47	-0.55	13.16	-0.04	up
7/21/2021	452.97	453.67	-0.70	13.16	-0.05	up
			Middle of screen elevation AP08			443.32
			Middle of screen elevation XPW02			430.16

Date	AP09 Groundwater Elevation (ft NAVD88)	XPW03 Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	CCR-shallow	CCR-deep				
2/9/2021	451.96	450.74	1.22	12.03	0.10	down
3/2/2021	451.95	450.72	1.23	12.03	0.10	down
3/22/2021	451.95	450.77	1.18	12.03	0.10	down
4/12/2021	451.86	450.62	1.24	12.03	0.10	down
5/4/2021	452.12	450.84	1.28	12.03	0.11	down
6/15/2021	451.61	450.38	1.23	12.03	0.10	down
6/28/2021	452.09	450.86	1.23	12.03	0.10	down
7/21/2021	452.19	451.03	1.16	12.03	0.10	down
			Middle of screen elevation AP09			442.65
			Middle of screen elevation XPW03			430.62

RAMBOLL

TABLE 3-2. VERTICAL HYDRAULIC GRADIENTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Date	AW-15 Groundwater Elevation (ft NAVD88)	AW-15C Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	UA	BCU				
2/9/2021	433.03	433.32	-0.29	11.33	-0.03	up
3/2/2021	433.50	433.50	0.00	11.33	0.00	flat
3/22/2021	433.68	433.66	0.02	11.33	0.00	down
4/12/2021	433.76	433.80	-0.04	11.33	0.00	up
5/4/2021	433.69	433.71	-0.02	11.33	0.00	up
6/15/2021	433.65	433.63	0.02	11.33	0.00	down
6/28/2021	433.59	433.58	0.01	11.33	0.00	flat
7/21/2021	433.65	433.67	-0.02	11.33	0.00	up
			Middle of screen elevation AW-15			403.45
			Middle of screen elevation AW-15C			392.12

Date	AW-15S Groundwater Elevation (ft NAVD88)	AW-15 Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	UCF/PMP	UA				
2/9/2021	431.91	433.03	-1.12	21.47	-0.05	up
3/2/2021	431.19	433.50	-2.31	21.47	-0.11	up
3/22/2021	431.33	433.68	-2.35	21.47	-0.11	up
4/12/2021	431.13	433.76	-2.63	21.47	-0.12	up
5/4/2021	429.82	433.69	-3.87	26.37	-0.15	up
6/15/2021	431.00	433.65	-2.65	21.47	-0.12	up
6/28/2021	429.86	433.59	-3.73	26.41	-0.14	up
7/21/2021	431.25	433.65	-2.40	21.47	-0.11	up
			Middle of screen elevation AW-15S			424.92
			Middle of screen elevation AW-15			403.45

TABLE 3-2. VERTICAL HYDRAULIC GRADIENTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Date	AP05S Groundwater Elevation (ft NAVD88)	AP05D Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	UA	BCU				
2/9/2021	437.61	439.14	-1.53	16.54	-0.09	up
3/2/2021	437.93	435.81	2.12	16.54	0.13	down
3/22/2021	438.43	433.33	5.10	16.54	0.31	down
4/12/2021	438.59	431.96	6.63	16.54	0.40	down
5/4/2021	438.43	432.29	6.14	16.54	0.37	down
6/15/2021	438.30	435.02	3.28	16.54	0.20	down
6/28/2021	438.24	433.14	5.10	16.54	0.31	down
7/21/2021	438.67	437.15	1.52	16.54	0.09	down
			Middle of screen elevation AP-05S			405.88
			Middle of screen elevation AP-05D			389.34

Date	APW-03 Groundwater Elevation (ft NAVD88)	AW-10 Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	UCF/PMP	UA				
2/9/2021	436.78	- - -	- - -	- - -	- - -	- - -
3/2/2021	436.47	438.84	-2.37	8.70	-0.27	up
3/22/2021	436.75	438.84	-2.09	8.70	-0.24	up
4/12/2021	436.25	438.85	-2.60	8.70	-0.30	up
5/4/2021	436.06	438.80	-2.74	8.70	-0.31	up
6/15/2021	435.64	438.62	-2.98	8.70	-0.34	up
6/28/2021	436.22	438.61	-2.39	8.70	-0.27	up
7/21/2021	436.13	438.60	-2.47	8.70	-0.28	up
			Middle of screen elevation APW-03			416.42
			Middle of screen elevation AW-10			407.72

TABLE 3-2. VERTICAL HYDRAULIC GRADIENTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Date	APW-04 Groundwater Elevation (ft NAVD88)	AW-13 Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	UCF/PMP	UA				
2/9/2021	432.44	435.52	-3.08	11.22	-0.27	up
3/2/2021	432.74	435.84	-3.10	11.22	-0.28	up
3/22/2021	432.75	435.86	-3.11	11.22	-0.28	up
4/12/2021	432.91	435.92	-3.01	11.22	-0.27	up
5/4/2021	432.40	435.83	-3.43	11.22	-0.31	up
6/15/2021	431.79	435.56	-3.77	11.22	-0.34	up
6/28/2021	431.21	435.40	-4.19	11.22	-0.37	up
7/21/2021	432.13	435.98	-3.85	11.22	-0.34	up
			Middle of screen elevation APW-04			422.39
			Middle of screen elevation AW-13			411.17

[O:SSW 7/13/21, U: SSW 08/13/21; C:CJC 08/16/21; U:SSW 9/22/21]

Notes:

[1] Distance change was calculated using the midpoint of the piezometer screen and water table surface. If the water table surface was above the top of the monitoring well screen, then distance change was calculated using the midpoint of both screens.

[2] Vertical gradients between ±0.0015 are considered flat, and typically have less than 0.02 foot difference in groundwater elevation between wells.

\- - - = no data collected on date / no vertical gradient calculated
BCU = bedrock confining unit
dh = head change
dl = distance change
ft = foot/feet
NAVD88 = North American Vertical Datum of 1988
UCF/PMP = Upper Cahokia Formation/potential migration pathway
UA = uppermost aquifer

TABLE 3-3. FIELD HYDRAULIC CONDUCTIVITIES
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Well ID	Gradient Position	Bottom of Screen Elevation (ft NAVD88)	Screen Length [1] (ft)	Field Identified Screened Material	Slug Type	Analysis Method	Number of Field Tests	Test Analyzed [3]	Hydraulic Conductivity (cm/s)	Minimum Hydraulic Conductivity (cm/s)	Maximum Hydraulic Conductivity (cm/s)	Hydraulic Conductivity Geometric Mean (cm/s)
Uppermost Aquifer												
AW-12	U	410.16	5	(GW)s	Solid	Bouwer-Rice	6	RH-2	1.5E-02	4.7E-07	1.5E-02	1.6E-04
AW-15	D	400.95	5	CL/BR [2]	Solid	Cooper-Bredehoeft-Papadopulos	6	RH-3	7.5E-03			
AW-16	D	399.45	5	CL/ML/BR [2]	Solid	Cooper-Bredehoeft-Papadopulos	4	RH-1	7.7E-04			
AW-17	D	403.69	5	CL/ML/BR	Solid	Bouwer-Rice	1	FH-1	4.7E-07			
AW-18	D	409.28	5	CL/ML/BR	Solid	Bouwer-Rice	1	RH-1	7.3E-07			
AW-19	D	418.53	5	CL/ML	Solid	Cooper-Bredehoeft-Papadopulos	1	RH-1	4.1E-05			
AW-20	D	417.58	5	CL/ML/BR [2]	Solid	Cooper-Bredehoeft-Papadopulos	1	RH-1	2.5E-03			
AW-21	D	421.28	5	CL/ML/BR [2]	Solid	Cooper-Bredehoeft-Papadopulos	2	RH-2	2.5E-04			
AW-22	D	411.30	5	CL/BR [2]	Solid	Cooper-Bredehoeft-Papadopulos	2	RH-2	1.1E-04			
Potential Migration Pathway												
AW-15S	D	419.92	10	ML/CL	Solid	Bouwer-Rice	3	RH-1	3.2E-03	3.2E-03	3.2E-03	3.2E-03
Bedrock												
AW-15C	D	389.62	5	BR	Solid	Cooper-Bredehoeft-Papadopulos	6	RH-2	8.2E-04	8.2E-04	8.2E-04	8.2E-04
Ash Pond												
XPW01A	CCR	417.99	10	s(ML)	Solid	Cooper-Bredehoeft-Papadopulos	4	FH-1	3.2E-04	3.2E-04	1.8E-03	6.8E-04
XPW02	CCR	425.16	10	s(ML)	Solid	Kansas Geological Survey	5	RH-2	1.8E-03			
XPW03	CCR	425.62	10	(SP-SM)g	Solid	Cooper-Bredehoeft-Papadopulos	4	RH-1	5.5E-04			

[O:SSW 7/13/21, U: SSW 08/13/21; C:CJC 08/16/21; U:CJC 08/16/21]

Notes:
[1] All wells are constructed from 2 inch PVC with 0.01 inch slotted screens.
[2] Boring log indicates well is screened in weathered shale bedrock.
[3] Test response data (elapsed time and corresponding changes in water levels) were plotted as normalized displacement to evaluate similarity among repeat test data within each well. A single test was selected for analysis at each well based on the quality of the test data (*i.e.,* smooth recovery curve) and coincidence of repeat test data.
cm/s = centimeters per second
BR = bedrock
CCR = coal combustion residuals
CL - lean clay
D = downgradient
FH-1 = Falling Head 1 Test
ft = foot/feet
ML = silt
NA = Not Applicable
NAVD88 = North American Vertical Datum of 1988
RH-1 = Rising Head 1 Test
RH-2 = Rising Head 2 Test
RH-3 = Rising Head 3 Test
SP-SM = poorly graded silty sand

TABLE 3-4. HORIZONTAL HYDRAULIC GRADIENTS AND GROUNDWATER FLOW VELOCITIES
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

$V = K\,i\ /\ n_e$

V = Groundwater Velocity
K = Hydraulic Conductivity [1]
i = hydraulic gradient
n_e = Effective Porosity [2]

Central Portion of CCR Unit (AW-08 to AW-06): Uppermost Aquifer

Distance between Wells (ft): 2213
Hydraulic Conductivity (ft/day): 0.02
Effective Porosity (%): 13 Assumes: silt/clay

Date	AW-08 Elevation (ft NAVD88)	AW-06 Elevation (ft NAVD88)	Change in Elevation (ft)	Horizontal Gradient (ft/ft)	Velocity (ft/day)
2/9/2021	438.28	434.40	3.88	0.002	2.1E-04
3/2/2021	437.77	434.62	3.15	0.001	1.7E-04
3/22/2021	439.27	434.70	4.57	0.002	2.5E-04
4/12/2021	440.09	434.85	5.24	0.002	2.9E-04
5/4/2021	439.47	434.48	4.99	0.002	2.7E-04
6/15/2021	440.14	434.26	5.88	0.003	3.2E-04
6/28/2021	439.41	434.60	4.81	0.002	2.6E-04
7/21/2021	441.74	434.40	7.34	0.003	4.0E-04
			Average	0.002	2.5E-04

Southern Portion of CCR Unit (AW-10 to AW-15): Uppermost Aquifer

Distance between Wells (ft): 1300
Hydraulic Conductivity (ft/day): 10.7
Effective Porosity (%): 16 Assumes: gravel/ clay

Date	AW-10 Elevation (ft NAVD88)	AW-15 Elevation (ft NAVD88)	Change in Elevation (ft)	Horizontal Gradient (ft/ft)	Velocity (ft/day)
2/9/2021	--	433.03	--	--	--
3/2/2021	438.84	433.50	5.34	0.004	0.27
3/22/2021	438.84	433.68	5.16	0.004	0.27
4/12/2021	438.85	433.76	5.09	0.004	0.26
5/4/2021	438.80	433.69	5.11	0.004	0.26
6/15/2021	438.62	433.65	4.97	0.004	0.26
6/28/2021	438.61	433.59	5.02	0.004	0.26
7/21/2021	438.60	433.65	4.95	0.004	0.25
			Average	0.004	0.26

TABLE 3-4. HORIZONTAL HYDRAULIC GRADIENTS AND GROUNDWATER FLOW VELOCITIES

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Southeastern Portion of CCR Unit (APW-03 to APW-04): Potential Migration Pathway

Distance between Wells (ft): 1220
Hydraulic Conductivity (ft/day): 9.1
Effective Porosity (%): 7 Assumes: clay

Date	APW-03 Elevation (ft NAVD88)	APW-04 Elevation (ft NAVD88)	Change in Elevation (ft)	Horizontal Gradient (ft/ft)	Velocity (ft/day)
2/9/2021	436.78	432.44	4.34	0.004	0.46
3/2/2021	436.47	432.74	3.73	0.003	0.40
3/22/2021	436.75	432.75	4.00	0.003	0.42
4/12/2021	436.25	432.91	3.34	0.003	0.35
5/4/2021	436.06	432.40	3.66	0.003	0.39
6/15/2021	435.64	431.79	3.85	0.003	0.41
6/28/2021	436.22	431.21	5.01	0.004	0.53
7/21/2021	436.13	432.13	4.00	0.003	0.42
			Average	0.003	0.43

[O:SSW 7/13/21, U: CJC 08/13/21; NRK 8/16/21; C:CJC 08/17/21]

Notes:

[1] Hydraulic conductivity values used above are average of the individual wells or average of the hydrostratigraphic unit as derived from slug tests completed in March and April 2021 by Ramboll and published in the 2017 Hydrogeologic Monitoring Plan - Edwards Ash Pond (OBG/NRT, 2017).

[2]Effective porosity used in these calculations was derived from an average between estimated values of 0.20 for silt material, 0.267 for gravel, 0.07 for clay, and 0.28 for sand from *Morris, D.A. and A.I. Johnson, 1967. Summary of hydrologic and physical properties of rock and soil materials as analyzed by the Hydrologic Laboratoryof the U.S. Geological Survey, U.S. Geological Survey Water-Supply Paper 1839-D, 42p. and Heath, R.C., 1983. Basicground-water hydrology, U.S. Geological Survey Water-Supply Paper 2220, 86p*. Effective porosity may be as high as maximum total porosity (50%) calculated in Table 2-1

-- = data not available
% = percent
ft = foot/feet
ft/day = feet per day
ft/ft = feet per foot
NAVD88 = North American Vertical Datum of 1988

TABLE 4-1. GROUNDWATER ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Location	Sample Date	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Boron, total (mg/L)	Cadmium, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	pH (field) (SU)	Radium 226 and 228 combined (pCi/L)	Selenium, total (mg/L)	Sulfate, total (mg/L)	Thallium, total (mg/L)	Total Dissolved Solids (mg/L)
35 I.A.C. 845.600	Lower	0	0	0	0	0	0	--	0	0	0	0	0	0	0	0	6.5	0	0	0	0	0
	Upper	0.006	0.010	2.0	0.004	2	0.005	--	200	0.1	0.006	4.0	0.0075	0.04	0.002	0.1	9.0	5	0.05	400	0.002	1200
AP05S	01/18/2017	0.0041	0.003	0.54	<0.001	0.36	<0.001	110	44	<0.004	0.0025	<0.25	0.001	0.04	<0.0002	0.019	6.9	1.05	<0.001	38	<0.001	860
AP05S	05/10/2017	<0.003	0.0041	0.54	<0.001	0.34	<0.001	110	42	<0.004	<0.002	<0.25	<0.001	0.038	<0.0002	0.015	7.1	1.32	<0.001	32	<0.001	810
AP05S	06/07/2017	<0.003	0.0055	0.59	<0.001	0.34	<0.001	110	42	<0.004	<0.002	<0.25	<0.001	0.034	<0.0002	0.015	6.8	1.43	<0.001	29	<0.001	500
AP05S	06/22/2017	<0.003	0.0063	0.65	<0.001	0.32	<0.001	110	42	<0.004	<0.002	<0.25	<0.001	0.036	<0.0002	0.015	7.2	1.89	<0.001	26	<0.001	880
AP05S	07/21/2017	<0.003	0.0077	0.69	<0.001	0.27	<0.001	120	41	<0.004	<0.002	<0.25	<0.001	0.035	<0.0002	0.014	6.9	1.75	<0.001	23	<0.001	840
AP05S	07/31/2017	<0.003	0.0074	0.77	<0.001	0.29	<0.001	130	44	<0.004	<0.002	<0.25	<0.001	0.038	<0.0002	0.012	7.0	1.38	<0.001	19	<0.001	750
AP05S	08/07/2017	<0.003	0.0077	0.77	<0.001	0.3	<0.001	120	41	<0.004	<0.002	<0.25	<0.001	0.035	<0.0002	0.011	7.0	2.2	<0.001	17	<0.001	840
AP05S	08/23/2017	<0.003	0.0072	0.79	<0.001	0.31	<0.001	98	43	<0.004	<0.002	<0.25	<0.001	0.044	<0.0002	0.0076	6.9	2.63	<0.001	12	<0.001	820
AP05S	11/02/2017	--	--	--	--	0.37	--	100	39	--	--	<0.25	--	--	--	--	7.2	--	--	10	--	820
AP05S	05/07/2018	<0.003	0.0028	0.46	<0.001	0.29	<0.001	94	42	<0.004	<0.002	<0.25	<0.001	0.032	<0.0002	0.0038	7.2	--	<0.001	8.1	<0.001	860
AP05S	05/29/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.68	--	--	--	--
AP05S	07/27/2018	--	0.0047	0.7	<0.001	0.33	--	110	41	<0.004	<0.002	<0.25	<0.001	0.025	--	0.0029	7.1	3.19	<0.001	6.2	--	940
AP05S	08/27/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.0	--	--	--	--	--
AP05S	02/27/2019	<0.003	0.0046	0.87	<0.001	0.29	<0.001	91	40	<0.004	<0.002	<0.25	<0.001	0.02	<0.0002	0.0014	7.1	2.3	<0.001	4	<0.001	880
AP05S	08/06/2019	--	0.0067	1.1	<0.001	0.24	--	110	37	<0.004	<0.002	<0.25	<0.001	0.031	--	<0.001	7.1	3	<0.001	<1	--	900
AP05S	02/27/2020	<0.003	0.0088	1.4	<0.001	0.31	<0.001	170	40	0.028	0.013	<0.25	0.0099	0.059	<0.0002	0.0026	6.7	2.85	0.0016	<1	<0.001	840
AP05S	09/01/2020	--	0.003	1.2	<0.001	0.38	--	110	41	0.0076	0.004	<0.25	0.0033	0.036	--	<0.001	6.9	3.16	<0.001	<1	--	760
AP05S	02/10/2021	<0.003	0.0016	0.56	<0.001	0.26	<0.00089	110	38	<0.004	<0.002	<0.25	<0.001	0.028	<0.0002	<0.001	6.9	0.773	<0.001	1.2	<0.001	790
AP05S	02/23/2021	<0.003	0.0059	1.3	<0.001	0.39	<0.001	120	47	0.02	0.0083	<0.25	0.0091	0.044	<0.0002	0.002	6.8	2.9	<0.001	<1	<0.001	530
AP05S	03/08/2021	<0.003	0.0022	1.1	<0.001	0.39	<0.001	110	45	0.0043	0.0028	<0.25	0.0016	0.039	<0.0002	0.004	6.8	2.7	<0.001	<1	<0.001	670
AP05S	03/24/2021	<0.003	0.0024	1	<0.001	0.31	<0.001	110	45	0.0045	0.0029	<0.25	0.0018	0.033	<0.0002	<0.001	6.3	4.48	<0.001	2.2	<0.001	850
AP05S	04/13/2021	<0.003	0.0026	1.2	<0.001	0.34	<0.001	99	42	0.007	0.0041	<0.25	0.0027	0.04	<0.0002	<0.001	7.0	2.66	<0.001	5	<0.001	830

RAMBOLL

TABLE 4-1. GROUNDWATER ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Location	Sample Date	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Boron, total (mg/L)	Cadmium, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	pH (field) (SU)	Radium 226 and 228 combined (pCi/L)	Selenium, total (mg/L)	Sulfate, total (mg/L)	Thallium, total (mg/L)	Total Dissolved Solids (mg/L)
35 I.A.C. 845.600	Lower	0	0	0	0	0	0	--	0	0	0	0	0	0	0	0	6.5	0	0	0	0	0
	Upper	0.006	0.010	2.0	0.004	2	0.005	--	200	0.1	0.006	4.0	0.0075	0.04	0.002	0.1	9.0	5	0.05	400	0.002	1200
AP05S	05/07/2021	<0.003	0.0044	1.2	<0.001	0.36	<0.001	120	43	0.019	0.0071	<0.25	0.0074	0.037	<0.0002	0.0013	6.8	3.38	<0.001	2.7	<0.001	950
AP05S	06/16/2021	<0.003	0.01	1.7	0.0014	0.35	0.0011	170	47	0.043	0.024	<0.25	0.03	0.068	<0.0002	0.0029	6.9	9.64	0.003	1.8	<0.001	620
AP05S	06/29/2021	<0.003	0.0066	1.3	<0.001	0.36	<0.001	120	56	0.021	0.013	<0.25	0.015	0.065	<0.0002	0.002	6.9	8.25	<0.001	1.6	<0.001	550
AP05S	07/22/2021	<0.003	0.012	1.4	0.0019	0.42	0.0011	160	44	0.048	0.028	<0.25	0.033	0.071	<0.0002	0.0034	7.0	6.09	0.0032	2.5	<0.001	950
AP05D	02/10/2021	<0.003	<0.001	0.44	<0.001	1.1	<0.00089	22	230	<0.004	<0.002	0.562	<0.001	0.065	0.0014	0.017	7.7	1.21	<0.001	40	<0.001	1100
AP05D	03/08/2021	<0.003	0.0017	0.82	<0.001	1.3	<0.001	28	260	<0.004	<0.002	0.415	<0.001	0.073	<0.0002	0.017	7.2	1.19	<0.001	32	<0.001	1200
AP05D	03/24/2021	<0.003	0.0012	0.43	<0.001	1	<0.001	21	240	<0.004	<0.002	<0.25	<0.001	0.063	<0.0002	0.016	7.6	0.997	<0.001	43	<0.001	1000
AP05D	04/15/2021	<0.003	0.0018	1.6	<0.001	1.7	<0.001	33	410	<0.004	<0.002	0.557	<0.001	0.13	<0.0002	0.0029	7.4	2.75	<0.001	1.6	<0.001	2600
AP05D	05/07/2021	<0.003	0.0035	1.3	<0.001	1.6	<0.001	30	510	0.02	0.0028	0.683	0.0024	0.077	<0.0002	0.0057	7.7	3.75	<0.001	1.3	<0.001	1900
AP07S	02/10/2021	<0.003	<0.001	0.064	<0.001	5.8	<0.00089	120	80	<0.004	0.003	0.524	<0.001	<0.02	0.00021	<0.001	6.8	0.123	<0.001	160	<0.001	610
AP07S	03/04/2021	<0.003	<0.001	0.08	<0.001	6.2	<0.001	130	74	0.0054	0.0045	0.347	0.002	<0.01	<0.0002	0.0017	6.7	1.22	<0.001	150	<0.001	620
AP07S	03/24/2021	<0.003	<0.001	0.065	<0.001	5.8	<0.001	120	79	<0.004	0.0027	0.39	<0.001	<0.02	<0.0002	<0.001	6.2	0.207	<0.001	160	<0.001	770
AP07S	04/13/2021	<0.003	<0.001	0.14	<0.001	7.3	<0.001	230	190	<0.004	0.0027	<0.25	0.0011	<0.02	<0.0002	0.001	6.8	0.336	<0.001	430	<0.001	1200
AP07S	05/05/2021	<0.003	<0.001	0.15	<0.001	8.3	<0.001	260	110	0.096	0.0036	<0.25	0.0018	<0.02	<0.0002	0.0023	6.6	1.2	<0.001	420	<0.001	1400
AP07S	06/16/2021	<0.003	<0.001	0.12	<0.001	7.4	<0.001	280	120	<0.004	0.002	<0.25	<0.001	<0.02	<0.0002	<0.001	6.6	1.82	<0.001	440	<0.001	1400
AP07S	06/28/2021	<0.003	<0.001	0.12	<0.001	10	<0.001	280	130	<0.004	0.0021	<0.25	<0.001	<0.02	<0.0002	<0.001	6.8	1.85	<0.001	410	<0.001	1500
AP07S	07/22/2021	<0.003	<0.001	0.13	<0.001	12	<0.001	260	130	<0.004	0.0023	<0.25	<0.001	<0.02	<0.0002	<0.001	6.6	1.4	<0.001	480	<0.001	1600
AP07D	02/10/2021	<0.003	0.0049	0.31	<0.001	1.3	<0.00089	16	500	<0.004	<0.002	1	<0.001	0.053	<0.0002	0.011	8.2	0.268	<0.001	130	<0.001	1400
AP07D	03/08/2021	<0.003	0.036	2.6	0.0096	1.4	0.0025	90	550	0.29	0.18	1.07	0.15	0.41	0.00033	0.01	7.8	12.2	0.012	96	<0.001	1500
AP07D	03/24/2021	<0.003	0.033	4.1	0.01	1.2	0.0023	78	830	0.34	0.22	1.21	0.17	0.49	0.00029	0.0092	7.5	19.4	0.014	51	0.0012	850
AP07D	04/13/2021	<0.003	0.0088	1.3	0.0018	1.3	<0.001	18	710	0.059	0.028	1.27	0.03	0.15	<0.0002	0.015	7.8	4.24	0.0018	54	<0.001	2000
AP07D	05/05/2021	<0.003	0.057	8.6	0.017	1.4	0.004	58	820	0.59	0.29	1.32	0.27	0.72	0.00054	0.015	7.9	23	0.019	47	0.0026	820

RAMBOLL

TABLE 4-1. GROUNDWATER ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Location	Sample Date	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Boron, total (mg/L)	Cadmium, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	pH (field) (SU)	Radium 226 and 228 combined (pCi/L)	Selenium, total (mg/L)	Sulfate, total (mg/L)	Thallium, total (mg/L)	Total Dissolved Solids (mg/L)
35 I.A.C. 845.600	Lower	0	0	0	0	0	0	--	0	0	0	0	0	0	0	0	6.5	0	0	0	0	0
	Upper	0.006	0.010	2.0	0.004	2	0.005	--	200	0.1	0.006	4.0	0.0075	0.04	0.002	0.1	9.0	5	0.05	400	0.002	1200
AP07D	07/22/2021	<0.003	0.0044	1.2	0.0012	1.8	<0.001	18	700	0.034	0.018	0.984	0.014	0.12	<0.0002	0.0087	7.5	1.68	0.0098	100	<0.001	2300
APW-01	06/17/2021	<0.003	0.025	0.12	<0.001	0.69	<0.001	190	210	0.012	0.0053	0.294	0.0063	0.028	<0.0002	0.0025	6.9	1.62	<0.001	300	<0.001	1000
APW-01	06/29/2021	<0.003	0.023	0.19	<0.001	0.71	0.0014	180	160	0.024	0.013	0.322	0.019	0.032	<0.0002	0.0023	6.8	4.15	0.0017	280	<0.001	780
APW-01	07/22/2021	<0.003	0.018	0.13	<0.001	0.84	<0.001	180	160	0.013	0.0065	<0.25	0.0075	<0.02	<0.0002	0.0024	6.9	1.73	0.0011	300	<0.001	1100
APW-02	02/10/2021	<0.003	<0.001	0.15	<0.001	0.047	<0.001	100	12	<0.004	<0.002	0.36	<0.001	<0.02	<0.0002	<0.001	7.0	0.207	<0.001	1.4	<0.001	400
APW-02	03/03/2021	<0.003	<0.001	0.17	<0.001	0.074	<0.001	120	10	<0.004	<0.002	0.277	<0.001	<0.02	<0.0002	<0.001	7.0	0.836	<0.001	1.4	<0.001	510
APW-02	03/24/2021	<0.003	<0.001	0.17	<0.001	0.048	<0.001	120	12	<0.004	<0.002	0.3	<0.001	<0.02	<0.0002	<0.001	6.5	0.578	<0.001	5.7	<0.001	480
APW-02	04/13/2021	<0.003	0.0012	0.19	<0.001	0.11	<0.001	130	9.7	0.0068	0.0043	<0.25	0.0012	<0.02	<0.0002	<0.001	6.9	0.0707	<0.001	11	0.0019	440
APW-02	05/06/2021	<0.003	<0.001	0.16	<0.001	0.13	<0.001	120	13	0.023	<0.002	<0.25	<0.001	<0.02	<0.0002	<0.001	6.8	0.365	<0.001	10	<0.001	580
APW-03	02/10/2021	<0.003	<0.001	0.26	<0.001	0.15	<0.001	160	27	<0.004	<0.002	0.34	<0.001	<0.02	<0.0002	<0.001	6.8	0.37	<0.001	<1	<0.001	720
APW-03	03/04/2021	<0.003	<0.001	0.3	<0.001	0.13	<0.001	180	28	<0.004	<0.002	<0.25	<0.001	0.018	<0.0002	<0.001	6.6	1.1	<0.001	2	<0.001	850
APW-03	03/24/2021	<0.003	<0.001	0.3	<0.001	0.13	<0.001	170	28	<0.004	<0.002	<0.25	<0.001	<0.02	<0.0002	<0.001	6.4	0.756	<0.001	3.5	<0.001	880
APW-03	04/13/2021	<0.003	0.0011	0.35	<0.001	0.14	<0.001	200	28	<0.004	<0.002	<0.25	0.0015	<0.02	<0.0002	<0.001	6.8	0.547	<0.001	7.1	<0.001	860
APW-03	05/07/2021	<0.003	0.0011	0.34	<0.001	0.14	<0.001	200	33	0.0082	<0.002	<0.25	0.0012	<0.02	<0.0002	<0.001	6.8	1.38	<0.001	8.7	<0.001	950
APW-04	02/10/2021	<0.003	0.0089	0.34	<0.001	0.56	<0.001	160	170	<0.004	<0.002	0.422	<0.001	<0.02	<0.0002	0.0034	6.9	0.551	<0.001	20	<0.001	740
APW-04	03/04/2021	<0.003	0.0094	0.38	<0.001	0.6	<0.001	180	180	<0.004	<0.002	0.256	<0.001	0.012	<0.0002	0.0046	6.8	1.18	<0.001	32	<0.001	630
APW-04	03/22/2021	<0.003	0.0064	0.33	<0.001	0.63	<0.001	180	230	0.0044	<0.002	<0.25	<0.001	<0.02	<0.0002	0.0015	6.9	0.748	<0.001	42	<0.001	850
APW-04	04/13/2021	<0.003	0.016	0.5	<0.001	0.54	<0.001	180	220	0.012	0.0035	<0.25	0.0037	<0.02	<0.0002	0.0049	6.8	3.85	<0.001	43	<0.001	860
APW-04	05/07/2021	<0.003	0.0054	0.33	<0.001	0.69	<0.001	200	350	0.0072	<0.002	0.252	<0.001	<0.02	<0.0002	0.0014	6.8	0.553	<0.001	58	<0.001	1100
AW-05	11/09/2015	<0.003	0.0053	0.19	<0.001	1.8	<0.001	180	280	0.0099	0.0047	<0.25	0.0024	0.03	<0.0002	0.0023	6.7	0.35	0.0012	290	<0.001	1100
AW-05	02/17/2016	<0.003	0.013	0.28	<0.001	1.7	<0.001	180	180	0.026	0.013	0.326	0.011	0.046	<0.0002	0.0028	6.8	3.51	0.0013	280	<0.001	1000
AW-05	05/17/2016	<0.003	0.028	0.41	<0.001	1.6	<0.001	210	290	0.03	0.019	0.325	0.018	0.047	<0.0002	0.0035	6.7	0.602	0.0014	270	<0.001	1100

RAMBOLL

TABLE 4-1. GROUNDWATER ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Location	Sample Date	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Boron, total (mg/L)	Cadmium, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	pH (field) (SU)	Radium 226 and 228 combined (pCi/L)	Selenium, total (mg/L)	Sulfate, total (mg/L)	Thallium, total (mg/L)	Total Dissolved Solids (mg/L)
35 I.A.C. 845.600	Lower	0	0	0	0	0	0	--	0	0	0	0	0	0	0	0	6.5	0	0	0	0	0
	Upper	0.006	0.010	2.0	0.004	2	0.005	--	200	0.1	0.006	4.0	0.0075	0.04	0.002	0.1	9.0	5	0.05	400	0.002	1200
AW-05	07/21/2016	<0.003	0.007	0.26	<0.0005	2.7	<0.001	190	570	0.017	0.0091	0.427	0.0069	0.038	<0.0002	0.0023	6.9	1.31	0.0011	380	<0.001	1700
AW-05	11/10/2016	<0.003	0.0035	0.14	<0.001	2.8	<0.001	200	300	<0.004	0.0022	0.278	<0.001	0.021	<0.0002	0.0012	7.1	1.01	<0.001	330	<0.001	1300
AW-05	01/17/2017	<0.003	0.0025	0.13	<0.001	1.5	<0.001	160	130	<0.004	<0.002	<0.25	<0.001	0.018	<0.0002	0.0021	7.1	2.06	<0.001	270	<0.001	1000
AW-05	05/08/2017	0.003	0.013	0.39	0.0016	1.4	0.0015	180	140	0.04	0.029	<0.25	0.023	0.07	<0.0002	0.0038	7.2	2.13	0.0037	280	<0.001	1100
AW-05	07/19/2017	<0.003	0.029	0.63	0.003	5.9	0.0023	260	420	0.088	0.054	<0.25	0.046	0.12	<0.0002	0.0041	7.1	1.07	0.004	470	<0.001	1300
AW-05	11/01/2017	--	--	--	--	7.6	--	260	650	--	--	<0.25	--	--	--	--	7.2	--	--	370	--	1600
AW-05	02/27/2020	<0.003	0.032	0.4	0.001	1.8	<0.001	170	81	0.04	0.018	0.284	0.014	0.053	<0.0002	0.004	7.0	0.809	0.0017	270	<0.001	910
AW-05	06/17/2021	<0.003	0.0039	0.12	<0.001	2.6	<0.001	160	110	<0.004	0.0025	0.371	<0.001	0.024	<0.0002	0.0022	7.0	0.801	<0.001	330	<0.001	970
AW-05	06/28/2021	<0.003	0.0035	0.11	<0.001	3.1	<0.001	170	69	<0.004	<0.002	0.308	<0.001	<0.02	<0.0002	0.0018	7.0	0.14	<0.001	290	<0.001	910
AW-05	07/22/2021	<0.003	0.0032	0.11	<0.001	2.9	<0.001	150	67	<0.004	<0.002	0.272	<0.001	<0.02	<0.0002	0.002	7.1	3.77	<0.001	300	<0.001	1100
AW-06	11/10/2015	<0.003	0.0034	0.29	<0.001	0.31	<0.001	110	61	0.014	0.006	<0.25	0.006	0.035	<0.0002	0.0034	7.0	2.54	0.001	36	<0.001	560
AW-06	02/17/2016	<0.003	0.0018	0.2	<0.001	0.29	<0.001	72	75	0.0071	0.0024	0.441	0.0023	0.029	<0.0002	0.0038	7.2	2.62	<0.001	40	<0.001	650
AW-06	05/18/2016	<0.003	0.0014	0.18	<0.001	0.17	<0.001	110	43	<0.004	<0.002	0.465	<0.001	0.017	<0.0002	0.0044	7.2	1.21	<0.001	41	<0.001	490
AW-06	07/22/2016	<0.003	0.0082	0.32	0.00085	0.21	<0.001	120	50	0.026	0.014	0.414	0.014	0.042	0.0018	0.0052	7.1	2.08	0.0022	42	<0.001	540
AW-06	11/11/2016	<0.003	0.0045	0.25	<0.001	0.16	<0.001	110	45	0.024	0.0068	0.429	0.0064	0.03	<0.0002	0.0064	7.2	0.498	<0.001	39	<0.001	530
AW-06	01/17/2017	<0.003	0.0036	0.19	<0.001	0.17	<0.001	100	39	0.0084	0.0028	0.351	0.0063	0.02	<0.0002	0.0066	7.2	0.372	<0.001	39	<0.001	540
AW-06	05/09/2017	<0.003	0.0014	0.16	<0.001	0.18	<0.001	110	37	<0.004	<0.002	0.415	0.0012	0.018	<0.0002	0.0095	7.2	0.399	<0.001	38	<0.001	560
AW-06	07/20/2017	<0.003	0.032	0.46	0.0011	0.19	<0.001	140	34	0.033	0.019	0.314	0.019	0.049	<0.0002	0.0086	7.3	0.813	0.0023	34	<0.001	480
AW-06	11/02/2017	--	--	--	--	0.18	--	100	32	--	--	0.405	--	--	--	--	7.1	--	--	32	--	500
AW-06	05/05/2018	<0.003	0.037	0.45	0.0014	0.17	<0.001	120	37	0.034	0.018	0.286	0.019	0.048	<0.0002	0.008	7.2	--	0.0028	29	<0.001	430
AW-06	05/29/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.09	--	--	--	--
AW-06	08/24/2018	--	0.0048	0.18	<0.001	0.14	--	110	35	<0.004	<0.002	0.366	0.0018	<0.01	--	0.0057	7.9	1.98	<0.001	31	--	540

TABLE 4-1. GROUNDWATER ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Location	Sample Date	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Boron, total (mg/L)	Cadmium, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	pH (field) (SU)	Radium 226 and 228 combined (pCi/L)	Selenium, total (mg/L)	Sulfate, total (mg/L)	Thallium, total (mg/L)	Total Dissolved Solids (mg/L)
35 I.A.C. 845.600	Lower	0	0	0	0	0	0	--	0	0	0	0	0	0	0	0	6.5	0	0	0	0	0
	Upper	0.006	0.010	2.0	0.004	2	0.005	--	200	0.1	0.006	4.0	0.0075	0.04	0.002	0.1	9.0	5	0.05	400	0.002	1200
AW-06	02/27/2019	<0.003	0.0046	0.18	<0.001	0.13	<0.001	110	35	<0.004	<0.002	0.28	0.0013	<0.01	<0.0002	0.0051	7.3	0.357	<0.001	29	<0.001	580
AW-06	08/06/2019	--	0.02	0.35	<0.001	0.093	--	120	33	0.024	0.01	0.393	0.011	0.035	--	0.0055	7.2	1.82	0.002	29	--	580
AW-06	02/27/2020	<0.003	0.0053	0.21	<0.001	0.12	<0.001	110	33	0.0068	<0.002	0.413	0.0016	0.02	<0.0002	0.0049	7.0	0.242	<0.001	23	<0.001	500
AW-06	08/31/2020	--	0.0024	0.15	<0.001	0.12	--	100	34	<0.004	<0.002	0.372	<0.001	<0.02	--	0.0046	7.3	0.945	<0.001	25	--	540
AW-06	02/23/2021	<0.003	0.026	0.4	<0.001	0.13	<0.001	130	36	0.026	0.014	0.355	0.014	0.033	<0.0002	0.0063	7.1	1.97	0.0014	27	<0.001	390
AW-08	11/09/2015	<0.003	0.0011	0.15	<0.001	0.16	<0.001	140	19	<0.004	0.0038	<0.25	<0.001	0.025	<0.0002	0.0028	6.6	1.12	0.0012	80	<0.001	740
AW-08	02/17/2016	<0.003	0.0014	0.16	<0.001	0.17	<0.001	150	20	<0.004	0.0034	0.324	<0.001	0.025	<0.0002	0.0027	6.8	1.27	<0.001	61	<0.001	660
AW-08	05/17/2016	<0.003	0.0056	0.19	0.014	0.21	<0.001	160	18	<0.004	0.0053	0.376	<0.001	0.019	<0.0002	0.0044	6.8	0.454	<0.001	59	<0.001	680
AW-08	07/21/2016	<0.003	0.0018	0.13	<0.0005	0.14	<0.001	100	23	<0.004	0.002	0.34	<0.001	0.019	<0.0002	0.004	7.0	0.357	<0.001	55	<0.001	680
AW-08	11/10/2016	<0.003	0.011	0.2	<0.001	0.15	<0.001	160	20	<0.004	0.0034	0.346	<0.001	0.016	<0.0002	0.0085	7.1	0.433	<0.001	46	<0.001	710
AW-08	01/17/2017	<0.003	0.0012	0.15	<0.001	0.13	<0.001	110	20	<0.004	0.003	<0.25	<0.001	0.02	<0.0002	0.0032	7.2	0.408	<0.001	64	<0.001	640
AW-08	05/08/2017	<0.003	0.017	0.21	<0.001	0.11	<0.001	160	16	<0.004	<0.002	0.331	<0.001	0.014	<0.0002	0.0072	7.1	0.975	<0.001	23	<0.001	780
AW-08	07/19/2017	<0.003	0.016	0.22	<0.001	0.085	<0.001	160	16	<0.004	<0.002	<0.25	<0.001	0.014	<0.0002	0.0062	7.3	0.394	<0.001	19	<0.001	640
AW-08	11/01/2017	--	--	--	--	0.14	--	150	16	--	--	0.334	--	--	--	--	7.1	--	--	11	--	680
AW-08	05/05/2018	<0.003	0.027	0.24	<0.001	0.096	<0.001	130	18	<0.004	<0.002	0.338	<0.001	0.014	<0.0002	0.0044	7.1	--	<0.001	7.5	<0.001	640
AW-08	05/29/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.422	--	--	--	--
AW-08	07/27/2018	--	0.02	0.19	<0.001	0.13	--	130	17	<0.004	<0.002	0.313	<0.001	<0.01	--	0.0043	7.2	0.807	<0.001	6	--	600
AW-08	08/27/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.1	--	--	--	--	--
AW-08	02/27/2019	<0.003	0.019	0.22	<0.001	0.12	<0.001	140	17	<0.004	<0.002	0.27	<0.001	<0.01	<0.0002	0.0049	7.1	0.402	<0.001	9.6	<0.001	670
AW-08	08/06/2019	--	0.0074	0.18	<0.001	0.1	--	130	19	<0.004	<0.002	0.287	<0.001	0.017	--	0.0037	7.3	3.95	<0.001	20	--	700
AW-08	02/27/2020	<0.003	0.019	0.23	<0.001	0.11	<0.001	140	16	<0.004	<0.002	0.3	<0.001	<0.02	<0.0002	0.0051	6.9	0.933	<0.001	<1	<0.001	680
AW-08	09/01/2020	--	0.0086	0.17	<0.001	0.17	--	130	16	<0.004	<0.002	0.278	<0.001	<0.02	--	0.0023	7.1	0.124	<0.001	2.3	--	660

RAMBOLL

TABLE 4-1. GROUNDWATER ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Location	Sample Date	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Boron, total (mg/L)	Cadmium, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	pH (field) (SU)	Radium 226 and 228 combined (pCi/L)	Selenium, total (mg/L)	Sulfate, total (mg/L)	Thallium, total (mg/L)	Total Dissolved Solids (mg/L)
35 I.A.C. 845.600	Lower	0	0	0	0	0	0	--	0	0	0	0	0	0	0	0	6.5	0	0	0	0	0
	Upper	0.006	0.010	2.0	0.004	2	0.005	--	200	0.1	0.006	4.0	0.0075	0.04	0.002	0.1	9.0	5	0.05	400	0.002	1200
AW-08	02/10/2021	<0.003	0.0081	0.16	<0.001	0.12	<0.001	130	17	<0.004	<0.002	0.291	<0.001	<0.02	<0.0002	0.0015	7.1	0.158	<0.001	<1	<0.001	550
AW-08	02/23/2021	<0.003	0.018	0.28	<0.001	0.12	<0.001	150	5.2	0.0095	0.0041	0.318	0.0044	<0.02	<0.0002	0.0033	6.9	1.82	<0.001	<1	<0.001	410
AW-08	03/05/2021	<0.003	0.0065	0.18	<0.001	0.17	<0.001	140	16	<0.004	<0.002	0.263	<0.001	<0.02	<0.0002	0.0051	6.9	0.291	<0.001	3.2	<0.001	670
AW-08	03/24/2021	<0.003	0.0063	0.16	<0.001	0.099	<0.001	130	20	<0.004	<0.002	0.34	<0.001	<0.02	<0.0002	0.0056	6.3	0.251	<0.001	3.9	<0.001	620
AW-08	04/13/2021	<0.003	0.024	0.33	<0.001	0.19	<0.001	150	14	0.008	0.0025	<0.25	0.0024	<0.02	<0.0002	0.0027	6.8	0.416	<0.001	<1	<0.001	680
AW-08	05/07/2021	<0.003	0.014	0.24	<0.001	0.12	<0.001	150	14	<0.004	<0.002	0.297	<0.001	<0.02	<0.0002	0.0025	7.0	0.0155	<0.001	1.5	<0.001	680
AW-08	06/16/2021	<0.003	0.024	0.27	<0.001	0.18	<0.001	150	15	<0.004	<0.002	0.269	<0.001	<0.02	<0.0002	0.0041	7.0	0.139	<0.001	<1	<0.001	640
AW-08	06/28/2021	<0.003	0.018	0.24	<0.001	0.13	<0.001	150	17	<0.004	<0.002	0.396	<0.001	<0.02	<0.0002	0.0017	7.0	0.568	<0.001	1.5	<0.001	480
AW-08	07/21/2021	<0.003	0.02	0.26	<0.001	0.11	<0.001	140	14	<0.004	<0.002	<0.25	<0.001	<0.02	<0.0002	0.0014	6.9	0.589	<0.001	<1	<0.001	730
AW-09	11/10/2015	<0.003	0.018	0.62	0.0029	0.79	<0.001	170	31	0.075	0.04	<0.25	0.038	0.11	<0.0002	0.014	6.8	7.71	0.0067	28	<0.001	700
AW-09	02/17/2016	<0.003	0.046	1.1	0.007	0.86	0.0028	210	31	0.2	0.093	0.313	0.11	0.26	0.00026	0.02	6.6	5.97	0.0091	23	0.0016	700
AW-09	05/17/2016	<0.003	<0.001	0.15	<0.001	1.3	<0.001	120	32	<0.004	0.0023	0.338	<0.001	0.022	<0.0002	0.015	6.5	0.464	<0.001	37	<0.001	640
AW-09	07/22/2016	<0.003	0.025	0.57	0.0025	0.51	0.0012	180	32	0.073	0.043	0.342	0.036	0.11	<0.0002	0.024	6.6	3.46	0.0036	19	<0.001	660
AW-09	11/11/2016	<0.003	0.02	0.39	<0.001	0.38	<0.001	140	29	0.03	0.017	0.334	0.0097	0.04	<0.0002	0.026	6.7	2.23	0.0013	8.6	<0.001	790
AW-09	01/17/2017	<0.003	<0.001	0.18	<0.001	0.84	<0.001	120	32	<0.004	0.0029	<0.25	<0.001	0.022	<0.0002	0.012	6.9	0.729	<0.001	28	<0.001	710
AW-09	05/09/2017	<0.003	0.0049	0.22	<0.001	0.49	<0.001	140	28	<0.004	0.0051	0.281	<0.001	0.022	<0.0002	0.02	7.1	0	<0.001	13	<0.001	760
AW-09	07/20/2017	<0.003	0.031	0.57	0.0013	0.31	<0.001	160	28	0.039	0.024	<0.25	0.024	0.06	<0.0002	0.028	6.9	1.86	0.002	1.6	<0.001	700
AW-09	11/02/2017	--	--	--	--	0.9	--	110	32	--	--	0.279	--	--	--	--	7.0	--	--	29	--	690
AW-09	05/05/2018	<0.003	0.036	0.37	<0.001	0.29	<0.001	130	26	0.015	0.01	0.294	0.0076	0.029	<0.0002	0.037	7.0	--	0.0015	<1	<0.001	670
AW-09	05/29/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.633	--	--	--	--
AW-09	08/24/2018	--	<0.001	0.18	<0.001	0.72	--	120	36	<0.004	0.0034	0.334	<0.001	0.011	--	0.015	7.0	0.466	<0.001	26	--	720
AW-09	02/27/2019	<0.003	0.0019	0.22	<0.001	0.52	<0.001	120	29	<0.004	0.0036	0.25	<0.001	0.013	<0.0002	0.016	7.0	0.771	<0.001	12	<0.001	780

RAMBOLL

TABLE 4-1. GROUNDWATER ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Location	Sample Date	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Boron, total (mg/L)	Cadmium, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	pH (field) (SU)	Radium 226 and 228 combined (pCi/L)	Selenium, total (mg/L)	Sulfate, total (mg/L)	Thallium, total (mg/L)	Total Dissolved Solids (mg/L)
35 I.A.C. 845.600	Lower	0	0	0	0	0	0	--	0	0	0	0	0	0	0	0	6.5	0	0	0	0	0
	Upper	0.006	0.010	2.0	0.004	2	0.005	--	200	0.1	0.006	4.0	0.0075	0.04	0.002	0.1	9.0	5	0.05	400	0.002	1200
AW-09	08/06/2019	--	0.026	0.54	<0.001	0.2	--	140	27	0.017	0.011	<0.25	0.011	0.036	--	0.015	7.2	1.94	0.0012	<1	--	770
AW-09	02/27/2020	<0.003	0.017	0.46	<0.001	0.24	<0.001	130	24	0.0092	0.0051	<0.25	0.0035	0.023	<0.0002	0.012	6.9	1.51	<0.001	<1	<0.001	740
AW-09	08/31/2020	--	0.02	0.46	<0.001	0.26	--	120	26	0.0089	0.0059	<0.25	0.0044	0.022	--	0.016	6.9	1.43	<0.001	<1	--	760
AW-09	02/23/2021	<0.003	0.017	0.46	<0.001	0.28	<0.001	140	8.1	0.022	0.013	<0.25	0.013	0.034	<0.0002	0.018	6.9	1.01	0.0011	<1	<0.001	470
AW-10	11/09/2015	<0.003	0.01	0.98	<0.001	0.42	<0.001	140	94	0.015	0.0083	<0.25	0.0054	0.073	<0.0002	0.0017	6.6	3.83	0.0013	2.8	<0.001	1100
AW-10	02/18/2016	<0.003	0.097	6.3	0.015	0.56	0.0031	280	99	0.45	0.25	<0.25	0.27	0.85	0.00033	0.0094	7.0	7.06	0.016	1.2	0.0023	1200
AW-10	05/18/2016	<0.003	0.04	3.4	0.0011	0.53	<0.001	170	83	0.056	0.034	0.324	0.035	0.11	<0.0002	0.0028	7.1	5.73	0.0021	<1	<0.001	1100
AW-10	07/21/2016	<0.003	0.01	1	<0.0005	0.46	<0.001	130	100	0.015	0.0097	<0.25	0.0074	0.08	<0.0002	0.0016	7.1	6.07	0.001	<1	<0.001	1100
AW-10	11/11/2016	<0.003	0.018	1.4	0.0012	0.44	<0.001	140	92	0.038	0.026	<0.25	0.022	0.12	<0.0002	0.0029	7.1	3.57	0.0025	<1	<0.001	1100
AW-10	01/17/2017	<0.003	0.0023	0.58	<0.001	0.44	<0.001	110	85	<0.004	0.0022	<0.25	<0.001	0.056	<0.0002	0.0023	7.1	1.23	<0.001	1.8	<0.001	1100
AW-10	05/10/2017	<0.003	0.0032	0.66	<0.001	0.49	<0.001	120	89	<0.004	0.0027	<0.25	<0.001	0.057	<0.0002	0.0032	6.9	1.12	<0.001	4.1	<0.001	1200
AW-10	07/20/2017	<0.003	0.0052	0.67	<0.001	0.43	<0.001	130	84	0.0042	0.0033	<0.25	0.0018	0.052	<0.0002	0.0043	7.0	0.875	<0.001	<1	<0.001	980
AW-10	11/02/2017	--	--	--	--	0.54	--	100	85	--	--	<0.25	--	--	--	--	7.2	--	--	2.8	--	1000
AW-10	05/07/2018	<0.003	0.0089	0.88	<0.001	0.42	<0.001	110	85	<0.004	0.0031	<0.25	0.001	0.042	<0.0002	0.002	7.3	--	<0.001	<1	<0.001	1000
AW-10	05/29/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.4	--	--	--	--
AW-10	07/27/2018	--	0.018	1.4	0.0022	0.48	--	170	88	0.063	0.036	<0.25	0.035	0.11	--	0.003	7.2	8.03	0.0035	<1	--	1100
AW-10	08/27/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.1	--	--	--	--	--
AW-10	02/27/2019	<0.003	0.012	0.93	<0.001	0.47	<0.001	130	85	<0.004	0.0037	<0.25	0.0024	0.04	<0.0002	0.028	7.2	1.79	<0.001	<1	<0.001	1100
AW-10	08/06/2019	--	0.019	1.5	0.0014	0.5	--	160	100	0.05	0.026	<0.25	0.026	0.12	--	0.0022	7.3	4.08	0.0033	<1	--	1200
AW-10	02/27/2020	<0.003	0.011	1.2	<0.001	0.46	<0.001	140	83	0.023	0.0098	<0.25	0.0092	0.065	<0.0002	0.0012	6.8	2.19	0.0012	<1	<0.001	1200
AW-10	08/31/2020	--	0.014	1.3	<0.001	0.54	--	140	88	0.0095	0.0062	<0.25	0.0051	0.051	--	<0.001	6.8	3.43	<0.001	<1	--	1200
AW-10	02/23/2021	<0.003	0.01	1	<0.001	0.55	<0.001	130	110	0.0051	0.0037	<0.25	0.0024	0.047	<0.0002	<0.001	6.9	3.1	<0.001	<1	<0.001	680

RAMBOLL

TABLE 4-1. GROUNDWATER ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Location	Sample Date	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Boron, total (mg/L)	Cadmium, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	pH (field) (SU)	Radium 226 and 228 combined (pCi/L)	Selenium, total (mg/L)	Sulfate, total (mg/L)	Thallium, total (mg/L)	Total Dissolved Solids (mg/L)
35 I.A.C. 845.600	Lower	0	0	0	0	0	0	--	0	0	0	0	0	0	0	0	6.5	0	0	0	0	0
	Upper	0.006	0.010	2.0	0.004	2	0.005	--	200	0.1	0.006	4.0	0.0075	0.04	0.002	0.1	9.0	5	0.05	400	0.002	1200
AW-10	03/23/2021	<0.003	0.0095	0.98	<0.001	0.5	<0.001	130	96	<0.004	0.0022	<0.25	0.0011	0.04	<0.0002	<0.001	6.8	1.77	<0.001	<1	<0.001	1100
AW-11	11/09/2015	<0.003	0.011	1.2	<0.001	0.23	<0.001	170	33	0.029	0.011	<0.25	0.0099	0.067	<0.0002	0.0043	6.5	2.78	0.0019	1.4	<0.001	870
AW-11	02/18/2016	<0.003	0.014	1.6	0.0013	0.24	<0.001	210	36	0.044	0.023	0.29	0.026	0.078	<0.0002	0.0066	6.9	3.2	0.0021	2	<0.001	900
AW-11	05/18/2016	<0.003	0.0053	0.83	<0.001	0.25	<0.001	170	31	0.0095	0.0067	0.38	0.0049	0.033	<0.0002	0.0065	7.0	0.558	<0.001	1.8	<0.001	860
AW-11	07/22/2016	<0.003	0.0054	0.84	<0.0005	0.22	<0.001	160	36	0.0042	0.0034	<0.25	0.0019	0.033	<0.0002	0.0037	7.0	2.69	<0.001	1.9	<0.001	880
AW-11	11/11/2016	<0.003	0.021	2	0.0027	0.25	0.0014	220	33	0.095	0.044	<0.25	0.049	0.14	<0.0002	0.0088	7.1	2.69	0.0061	<1	<0.001	880
AW-11	01/17/2017	<0.003	0.0042	0.56	<0.001	0.22	0.0015	150	35	0.0063	0.0038	<0.25	0.0015	0.031	<0.0002	0.01	7.2	0.394	0.0012	2.2	<0.001	920
AW-11	05/09/2017	<0.003	0.014	1.4	0.0012	0.23	<0.001	210	34	0.031	0.023	<0.25	0.024	0.08	<0.0002	0.0073	7.0	5.75	0.003	4.9	<0.001	940
AW-11	07/20/2017	<0.003	0.025	2.5	0.0028	0.23	0.0017	240	30	0.091	0.046	<0.25	0.05	0.14	<0.0002	0.0077	7.2	4.47	0.0042	<1	<0.001	920
AW-11	11/02/2017	--	--	--	--	0.23	--	140	33	--	--	<0.25	--	--	--	--	7.2	--	--	3.2	--	920
AW-11	05/07/2018	<0.003	0.011	0.73	<0.001	0.21	<0.001	140	30	<0.004	0.0029	<0.25	<0.001	0.021	<0.0002	0.0064	7.2	--	<0.001	<1	<0.001	880
AW-11	05/29/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.75	--	--	--	--
AW-11	08/27/2018	--	0.029	3	0.0046	0.3	--	290	31	0.15	0.07	0.27	0.08	0.16	--	0.0099	7.2	7.6	0.0083	1.1	--	980
AW-11	02/27/2019	<0.003	0.013	0.76	<0.001	0.22	<0.001	160	30	<0.004	0.0031	<0.25	0.0012	0.017	<0.0002	0.0053	7.2	2.33	<0.001	<1	<0.001	970
AW-11	08/06/2019	--	0.018	0.88	<0.001	0.18	--	160	30	<0.004	0.0023	<0.25	<0.001	0.031	--	0.0046	7.2	1.69	<0.001	<1	--	980
AW-11	02/27/2020	<0.003	0.013	1.3	<0.001	0.22	<0.001	170	30	0.0081	0.0041	<0.25	0.0033	0.029	<0.0002	0.0028	6.7	3.68	<0.001	<1	<0.001	970
AW-11	08/31/2020	--	0.011	0.77	<0.001	0.21	--	150	29	<0.004	0.0024	<0.25	<0.001	0.025	--	0.0021	6.9	1.52	<0.001	<1	--	970
AW-11	02/23/2021	<0.003	0.011	0.98	<0.001	0.25	<0.001	160	33	<0.004	0.0023	<0.25	0.0011	0.024	<0.0002	0.0016	7.0	2.46	<0.001	<1	<0.001	510
AW-12	02/11/2021	<0.003	0.0021	1.4	<0.001	0.27	<0.001	130	43	<0.004	<0.002	0.37	<0.001	0.036	<0.0002	0.023	6.8	1.62	0.0013	2.8	<0.001	770
AW-12	03/04/2021	<0.003	0.0026	1.5	<0.001	0.24	<0.001	120	41	<0.004	<0.002	<0.25	<0.001	0.028	<0.0002	0.0048	6.8	0.828	<0.001	<1	<0.001	780
AW-12	03/24/2021	<0.003	0.0025	1.4	<0.001	0.21	<0.001	120	45	<0.004	<0.002	2.14	<0.001	0.026	<0.0002	0.0037	6.4	0.846	<0.001	<1	<0.001	830
AW-12	04/12/2021	<0.003	0.0068	1.5	<0.001	0.23	<0.001	130	39	<0.004	<0.002	2.78	0.0012	0.031	<0.0002	0.0048	7.0	1.87	<0.001	1.2	<0.001	810

TABLE 4-1. GROUNDWATER ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Location	Sample Date	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Boron, total (mg/L)	Cadmium, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	pH (field) (SU)	Radium 226 and 228 combined (pCi/L)	Selenium, total (mg/L)	Sulfate, total (mg/L)	Thallium, total (mg/L)	Total Dissolved Solids (mg/L)
35 I.A.C. 845.600	Lower	0	0	0	0	0	0	--	0	0	0	0	0	0	0	0	6.5	0	0	0	0	0
	Upper	0.006	0.010	2.0	0.004	2	0.005	--	200	0.1	0.006	4.0	0.0075	0.04	0.002	0.1	9.0	5	0.05	400	0.002	1200
AW-12	05/07/2021	<0.003	0.0038	1.5	<0.001	0.26	<0.001	140	34	0.0072	<0.002	1.62	<0.001	0.025	<0.0002	0.004	7.0	1.24	<0.001	<1	<0.001	840
AW-13	02/11/2021	<0.003	0.013	1.5	<0.001	0.3	<0.001	140	80	0.0046	0.0041	<0.25	0.0034	0.033	<0.0002	0.0028	6.9	3.05	<0.001	3.2	<0.001	920
AW-13	03/04/2021	<0.003	0.0098	1.2	<0.001	0.29	<0.001	140	74	0.0077	0.0024	<0.25	0.0013	0.03	<0.0002	0.0015	6.7	3.02	<0.001	2	<0.001	1000
AW-13	03/23/2021	<0.003	0.012	1.3	<0.001	0.28	<0.001	140	89	<0.004	0.002	<0.25	0.0012	0.029	<0.0002	<0.001	6.7	2.98	<0.001	1.4	<0.001	1000
AW-13	04/12/2021	<0.003	0.014	1.3	<0.001	0.27	<0.001	140	81	<0.004	0.0021	<0.25	<0.001	0.036	<0.0002	0.0014	6.8	1.39	<0.001	<1	<0.001	1000
AW-13	05/07/2021	<0.003	0.014	1.4	<0.001	0.3	<0.001	150	86	<0.004	<0.002	<0.25	<0.001	0.03	<0.0002	<0.001	6.8	3.14	<0.001	<1	<0.001	1100
AW-14	02/11/2021	<0.003	0.0064	0.63	<0.001	0.21	<0.001	170	28	0.009	0.011	<0.25	0.0061	0.027	<0.0002	0.046	7.0	2.69	0.0016	54	<0.001	950
AW-14	03/04/2021	<0.003	0.011	0.59	<0.001	0.19	<0.001	170	26	<0.004	0.0058	<0.25	<0.001	0.023	<0.0002	0.022	6.9	2.67	<0.001	26	<0.001	960
AW-14	03/22/2021	<0.003	0.011	0.63	<0.001	0.18	<0.001	170	37	<0.004	0.0043	<0.25	<0.001	0.02	<0.0002	0.0044	6.9	2.38	<0.001	10	<0.001	1000
AW-14	04/12/2021	0.0045	0.01	0.7	<0.001	0.17	<0.001	170	24	<0.004	0.0041	<0.25	0.0022	0.025	<0.0002	0.0037	6.8	2.36	<0.001	3	<0.001	1100
AW-14	05/06/2021	<0.003	0.0096	0.75	<0.001	0.19	<0.001	180	25	<0.004	0.0029	1.21	<0.001	<0.02	<0.0002	<0.001	6.8	1.99	<0.001	<1	<0.001	1000
AW-14	06/28/2021	<0.003	0.009	0.76	<0.001	0.17	<0.001	180	26	<0.004	0.0029	1.37	<0.001	0.029	<0.0002	<0.001	6.8	3.66	<0.001	1.7	<0.001	760
AW-14	07/21/2021	<0.003	0.0085	0.75	<0.001	0.17	<0.001	170	25	<0.004	0.0025	<0.25	<0.001	<0.02	<0.0002	<0.001	6.7	1.94	<0.001	<1	<0.001	1100
AW-15	02/12/2021	<0.003	0.0023	2.1	<0.001	0.57	<0.001	130	49	<0.004	<0.002	<0.25	<0.001	0.049	<0.0002	0.001	6.8	2.96	<0.001	1	<0.001	1100
AW-15	03/05/2021	<0.003	0.0037	2	<0.001	0.43	<0.001	140	43	<0.004	0.0023	<0.25	<0.001	0.041	<0.0002	<0.001	6.7	5.14	<0.001	<1	<0.001	980
AW-15	03/22/2021	<0.003	0.0041	1.7	<0.001	0.47	<0.001	140	51	<0.004	<0.002	<0.25	<0.001	0.039	<0.0002	<0.001	6.8	6.89	<0.001	<1	<0.001	990
AW-15	05/06/2021	<0.003	0.0058	1.8	<0.001	0.43	<0.001	140	41	<0.004	<0.002	0.881	<0.001	0.033	<0.0002	<0.001	6.6	4.14	<0.001	<1	<0.001	1000
AW-15	06/17/2021	<0.003	0.0063	1.4	<0.001	0.3	<0.001	140	38	<0.004	<0.002	0.706	<0.001	0.041	<0.0002	0.0031	--	1.49	<0.001	<1	<0.001	780
AW-15C	02/12/2021	<0.003	0.0059	3.1	<0.001	0.81	<0.001	99	92	0.0048	0.0032	<0.25	0.0026	0.06	<0.0002	0.0088	7.0	4.84	<0.001	3.1	<0.001	1200
AW-15C	03/04/2021	<0.003	0.0038	3.6	<0.001	0.73	<0.001	110	55	<0.004	0.0025	<0.25	0.0011	0.058	<0.0002	0.0082	6.8	7.49	<0.001	<1	<0.001	1700
AW-15C	03/22/2021	<0.003	0.0035	3.2	<0.001	0.6	<0.001	110	59	<0.004	0.0021	<0.25	0.0012	0.056	<0.0002	0.0014	6.7	7.52	<0.001	<1	<0.001	1100
AW-15C	04/13/2021	0.0033	0.011	2.9	<0.001	0.68	<0.001	92	110	0.0044	0.0026	<0.25	0.0029	0.062	<0.0002	0.0059	7.0	5.25	<0.001	1.9	<0.001	1200

RAMBOLL

TABLE 4-1. GROUNDWATER ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Location	Sample Date	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Boron, total (mg/L)	Cadmium, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	pH (field) (SU)	Radium 226 and 228 combined (pCi/L)	Selenium, total (mg/L)	Sulfate, total (mg/L)	Thallium, total (mg/L)	Total Dissolved Solids (mg/L)
35 I.A.C. 845.600	Lower	0	0	0	0	0	0	--	0	0	0	0	0	0	0	0	6.5	0	0	0	0	0
	Upper	0.006	0.010	2.0	0.004	2	0.005	--	200	0.1	0.006	4.0	0.0075	0.04	0.002	0.1	9.0	5	0.05	400	0.002	1200
AW-15C	05/06/2021	<0.003	0.0056	3.4	<0.001	0.63	<0.001	110	63	<0.004	<0.002	1.55	<0.001	0.047	<0.0002	0.0016	6.8	4.68	<0.001	<1	<0.001	1000
AW-15C	07/21/2021	<0.003	0.0064	3.6	<0.001	0.69	<0.001	99	72	<0.004	<0.002	0.407	<0.001	0.045	<0.0002	0.0011	6.8	4.92	<0.001	<1	<0.001	1100
AW-15S	02/12/2021	<0.003	0.0043	0.22	0.0011	5.5	<0.001	250	50	0.022	0.011	0.302	0.014	0.032	<0.0002	0.0042	7.0	0.74	0.0024	480	<0.001	1300
AW-15S	03/04/2021	<0.003	0.001	0.11	<0.001	5.4	<0.001	270	47	<0.004	<0.002	0.27	<0.001	<0.02	<0.0002	0.0043	7.1	1.08	0.0013	510	<0.001	1200
AW-15S	03/22/2021	<0.003	0.001	0.1	<0.001	6.2	<0.001	260	42	<0.004	<0.002	0.25	0.0014	<0.02	<0.0002	0.0033	6.9	0.236	0.0015	520	<0.001	1300
AW-15S	04/26/2021	<0.003	<0.001	0.1	<0.001	5.4	<0.001	270	41	<0.004	<0.002	<0.25	<0.001	<0.02	<0.0002	0.0034	7.0	--	0.0013	550	<0.001	1400
AW-15S	05/06/2021	<0.003	<0.001	0.098	<0.001	5.8	<0.001	270	40	<0.004	<0.002	<0.25	<0.001	<0.02	<0.0002	0.0034	6.7	0.532	0.0012	540	<0.001	1300
AW-15S	06/17/2021	<0.003	<0.001	0.093	<0.001	5.7	<0.001	270	37	<0.004	<0.002	0.336	<0.001	0.021	<0.0002	0.0031	6.7	0.229	<0.001	550	<0.001	1300
AW-15S	06/29/2021	<0.003	<0.001	0.097	<0.001	5.4	<0.001	260	39	<0.004	<0.002	0.255	<0.001	<0.02	<0.0002	0.0033	6.9	0.582	<0.001	560	<0.001	1200
AW-15S	07/21/2021	<0.003	0.0015	0.11	<0.001	6.1	<0.001	260	38	<0.004	<0.002	<0.25	<0.001	<0.02	<0.0002	0.003	6.6	1.09	<0.001	570	<0.001	1400
AW-16	02/11/2021	<0.003	0.0013	1.4	<0.001	0.52	<0.001	130	59	<0.004	<0.002	<0.25	<0.001	0.045	<0.0002	<0.001	6.8	5.73	<0.001	<1	<0.001	1100
AW-16	03/03/2021	<0.003	0.0015	1.4	<0.001	0.54	<0.001	140	53	<0.004	<0.002	<0.25	<0.001	0.045	<0.0002	<0.001	6.8	7.02	<0.001	<1	<0.001	1100
AW-16	03/24/2021	<0.003	<0.001	1.3	<0.001	0.49	<0.001	130	53	<0.004	<0.002	<0.25	<0.001	0.046	<0.0002	<0.001	6.4	7.46	<0.001	<1	<0.001	1000
AW-16	04/23/2021	<0.003	0.0016	1.2	<0.001	0.45	<0.001	140	55	<0.004	<0.002	<0.25	<0.001	0.036	<0.0002	<0.001	6.8	4.69	<0.001	<1	<0.001	1000
AW-16	05/05/2021	<0.003	0.0016	1.3	<0.001	0.5	<0.001	140	53	<0.004	<0.002	<0.25	<0.001	0.039	<0.0002	<0.001	6.7	5.52	<0.001	<1	<0.001	1200
AW-16	06/24/2021	<0.003	0.0018	1.2	<0.001	0.54	<0.001	150	49	<0.004	<0.002	<0.25	<0.001	0.1	<0.0002	<0.001	6.6	4.41	<0.001	<1	<0.001	1200
AW-16	06/29/2021	<0.003	0.002	1.1	<0.001	0.51	<0.001	140	54	<0.004	<0.002	<0.25	<0.001	0.043	<0.0002	<0.001	6.8	5.84	<0.001	<1	<0.001	1100
AW-16	07/21/2021	<0.003	0.002	1.2	<0.001	0.56	<0.001	130	56	<0.004	<0.002	<0.25	<0.001	0.036	<0.0002	<0.001	6.8	4.77	<0.001	<1	<0.001	1200
AW-17	02/11/2021	<0.003	0.0064	1.2	<0.001	0.48	<0.001	100	56	0.0053	0.0046	<0.25	0.0031	0.071	<0.0002	0.0024	7.0	2.91	<0.001	<1	<0.001	850
AW-17	03/03/2021	<0.003	0.0079	1.2	<0.001	0.44	<0.001	120	52	0.0094	0.0065	<0.25	0.0048	0.057	<0.0002	0.003	6.8	3.57	<0.001	<1	<0.001	970
AW-17	03/23/2021	<0.003	0.0052	1.1	<0.001	0.43	<0.001	100	60	<0.004	0.0022	0.787	<0.001	0.043	<0.0002	0.0014	6.2	2.41	<0.001	<1	<0.001	950
AW-17	04/23/2021	<0.003	0.0054	1	<0.001	0.4	<0.001	110	57	<0.004	0.0024	<0.25	<0.001	0.041	<0.0002	0.0017	6.9	2.33	<0.001	<1	<0.001	700

TABLE 4-1. GROUNDWATER ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Location	Sample Date	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Boron, total (mg/L)	Cadmium, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	pH (field) (SU)	Radium 226 and 228 combined (pCi/L)	Selenium, total (mg/L)	Sulfate, total (mg/L)	Thallium, total (mg/L)	Total Dissolved Solids (mg/L)
35 I.A.C. 845.600	Lower	0	0	0	0	0	0	--	0	0	0	0	0	0	0	0	6.5	0	0	0	0	0
	Upper	0.006	0.010	2.0	0.004	2	0.005	--	200	0.1	0.006	4.0	0.0075	0.04	0.002	0.1	9.0	5	0.05	400	0.002	1200
AW-17	05/05/2021	<0.003	0.0053	1.1	<0.001	0.44	<0.001	110	55	<0.004	0.0021	<0.25	<0.001	0.04	<0.0002	0.0012	6.8	3.1	<0.001	<1	<0.001	860
AW-17	06/24/2021	<0.003	0.0052	1	<0.001	0.46	<0.001	110	59	<0.004	0.0023	<0.25	<0.001	0.094	<0.0002	<0.001	6.6	2.85	<0.001	<1	<0.001	950
AW-17	06/29/2021	<0.003	0.0058	1.1	<0.001	0.44	<0.001	110	55	0.0053	0.0049	<0.25	0.0039	0.064	<0.0002	0.0015	6.9	2.8	<0.001	<1	<0.001	720
AW-17	07/21/2021	<0.003	0.0051	1.2	<0.001	0.48	<0.001	100	56	<0.004	0.0023	<0.25	<0.001	0.039	<0.0002	0.0016	7.0	2.98	<0.001	<1	<0.001	1000
AW-18	02/11/2021	<0.003	0.0037	0.6	<0.001	2.7	<0.001	110	69	<0.004	0.0028	0.345	<0.001	0.11	<0.0002	0.022	7.0	2.68	<0.001	23	<0.001	740
AW-18	03/03/2021	<0.003	0.0095	1	<0.001	1	<0.001	140	75	<0.004	0.0024	2.88	<0.001	0.13	<0.0002	0.022	7.0	4.7	<0.001	6.5	<0.001	900
AW-18	03/23/2021	<0.003	0.0059	0.59	<0.001	3	<0.001	110	64	<0.004	<0.002	4.04	<0.001	0.062	<0.0002	0.027	6.4	2.82	<0.001	28	<0.001	750
AW-18	04/13/2021	<0.003	0.005	0.85	<0.001	1.6	<0.001	110	80	<0.004	<0.002	3.41	<0.001	0.067	<0.0002	0.011	6.9	1.29	<0.001	12	<0.001	860
AW-18	05/05/2021	<0.003	0.0055	0.97	<0.001	0.96	<0.001	140	81	<0.004	<0.002	10.2	<0.001	0.055	<0.0002	0.0071	6.9	2.23	<0.001	4	<0.001	910
AW-18	06/23/2021	<0.003	0.0051	1	<0.001	1.2	<0.001	140	88	<0.004	<0.002	<0.25	<0.001	0.093	<0.0002	0.0044	6.9	2.86	0.0037	3.2	<0.001	870
AW-18	06/29/2021	<0.003	0.0031	1.4	<0.001	0.41	<0.001	130	74	<0.004	<0.002	<0.25	<0.001	0.07	<0.0002	0.0051	6.9	3.42	<0.001	12	<0.001	710
AW-18	07/21/2021	<0.003	0.0033	1.1	<0.001	1.3	<0.001	120	85	<0.004	<0.002	0.251	<0.001	0.039	<0.0002	0.0033	7.0	2.34	<0.001	4.6	<0.001	930
AW-19	02/11/2021	<0.003	0.016	0.23	<0.001	2.9	<0.001	110	81	0.0073	0.0038	0.455	0.0047	0.033	<0.0002	0.0097	7.0	0.483	<0.001	28	<0.001	510
AW-19	03/03/2021	<0.003	0.02	0.24	<0.001	2.7	<0.001	120	80	0.0076	0.0039	0.329	0.0036	0.025	<0.0002	0.0052	7.1	0.795	<0.001	26	<0.001	650
AW-19	03/23/2021	<0.003	0.014	0.2	<0.001	2.6	<0.001	110	88	<0.004	<0.002	0.346	0.0016	<0.02	<0.0002	0.0034	6.4	0.129	<0.001	29	<0.001	590
AW-19	04/12/2021	<0.003	0.016	0.18	<0.001	2.5	<0.001	110	77	<0.004	<0.002	0.318	0.0013	<0.02	<0.0002	0.004	6.9	0.492	<0.001	29	<0.001	570
AW-19	05/05/2021	<0.003	0.015	0.18	<0.001	2.6	<0.001	120	86	<0.004	<0.002	0.414	<0.001	<0.02	<0.0002	0.0043	7.1	0.882	<0.001	33	<0.001	530
AW-19	06/23/2021	<0.003	0.016	0.18	<0.001	2.5	<0.001	120	88	<0.004	<0.002	0.289	<0.001	0.023	<0.0002	0.0036	7.0	0.658	<0.001	37	<0.001	580
AW-19	06/29/2021	<0.003	0.0075	0.19	<0.001	2.6	<0.001	110	80	<0.004	<0.002	0.276	<0.001	0.021	<0.0002	0.0035	7.1	2.15	<0.001	36	<0.001	550
AW-19	07/21/2021	<0.003	0.0092	0.18	<0.001	2.8	<0.001	110	86	<0.004	<0.002	0.342	<0.001	<0.02	<0.0002	0.0033	7.2	0.458	<0.001	38	<0.001	670
AW-20	02/11/2021	<0.003	0.012	0.15	<0.001	2.3	<0.001	150	90	0.0055	0.0034	0.394	0.0042	0.027	<0.0002	0.0028	6.8	0.606	<0.001	48	<0.001	790
AW-20	03/03/2021	<0.003	0.013	0.13	<0.001	2.2	<0.001	170	89	<0.004	0.002	0.286	<0.001	<0.02	<0.0002	0.0028	6.9	0.515	<0.001	45	<0.001	830

TABLE 4-1. GROUNDWATER ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Location	Sample Date	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Boron, total (mg/L)	Cadmium, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	pH (field) (SU)	Radium 226 and 228 combined (pCi/L)	Selenium, total (mg/L)	Sulfate, total (mg/L)	Thallium, total (mg/L)	Total Dissolved Solids (mg/L)
35 I.A.C. 845.600	Lower	0	0	0	0	0	0	--	0	0	0	0	0	0	0	0	6.5	0	0	0	0	0
	Upper	0.006	0.010	2.0	0.004	2	0.005	--	200	0.1	0.006	4.0	0.0075	0.04	0.002	0.1	9.0	5	0.05	400	0.002	1200
AW-20	03/23/2021	<0.003	0.011	0.13	<0.001	2.3	<0.001	160	89	<0.004	<0.002	0.275	<0.001	<0.02	<0.0002	0.0025	6.4	1.38	<0.001	43	<0.001	800
AW-20	04/12/2021	<0.003	0.012	0.13	<0.001	2.1	<0.001	160	87	<0.004	<0.002	0.321	<0.001	0.021	<0.0002	0.0022	6.9	1.17	<0.001	39	<0.001	730
AW-20	05/05/2021	<0.003	0.012	0.14	<0.001	2.2	<0.001	160	93	<0.004	<0.002	0.313	<0.001	<0.02	<0.0002	0.0026	6.9	0.448	<0.001	41	<0.001	730
AW-21	02/11/2021	<0.003	<0.001	0.079	<0.001	12	<0.001	110	100	<0.004	<0.002	0.646	<0.001	<0.02	<0.0002	0.019	7.2	0.645	<0.001	250	<0.001	650
AW-21	03/03/2021	<0.003	0.0011	0.063	<0.001	11	<0.001	120	96	<0.004	<0.002	0.474	<0.001	<0.02	<0.0002	0.024	7.2	0.493	<0.001	240	<0.001	710
AW-21	03/23/2021	<0.003	0.0011	0.08	<0.001	12	<0.001	110	99	<0.004	<0.002	0.399	<0.001	<0.02	<0.0002	0.018	6.7	0.223	<0.001	250	<0.001	650
AW-21	04/12/2021	<0.003	0.0016	0.085	<0.001	11	<0.001	110	100	<0.004	<0.002	0.416	0.0012	<0.02	<0.0002	0.021	7.2	0.83	<0.001	41	<0.001	630
AW-21	05/05/2021	<0.003	0.0011	0.067	<0.001	11	<0.001	120	96	<0.004	<0.002	0.526	<0.001	<0.02	<0.0002	0.02	7.2	0.237	<0.001	230	<0.001	710
AW-21	06/23/2021	<0.003	0.0022	0.062	<0.001	12	<0.001	120	93	<0.004	<0.002	0.372	<0.001	<0.02	<0.0002	0.015	7.2	1.08	<0.001	250	<0.001	700
AW-21	06/29/2021	<0.003	0.0013	0.075	<0.001	11	<0.001	110	95	<0.004	<0.002	0.409	<0.001	<0.02	<0.0002	0.016	7.2	0.645	<0.001	250	<0.001	640
AW-21	07/21/2021	<0.003	0.0015	0.075	<0.001	12	<0.001	110	100	<0.004	<0.002	0.275	<0.001	<0.02	<0.0002	0.016	7.3	1	<0.001	260	<0.001	800
AW-22	02/12/2021	<0.003	0.0043	0.76	<0.001	0.32	<0.001	78	40	<0.004	<0.002	<0.25	<0.001	0.023	<0.0002	0.0015	7.0	1.55	<0.001	<1	<0.001	540
AW-22	03/03/2021	<0.003	0.0029	0.8	<0.001	0.23	<0.001	82	39	<0.004	<0.002	<0.25	<0.001	0.022	<0.0002	0.0013	6.9	1	<0.001	<1	<0.001	570
AW-22	03/23/2021	<0.003	0.0016	0.73	<0.001	0.23	<0.001	77	39	<0.004	<0.002	0.374	<0.001	0.022	<0.0002	0.0017	6.5	1.12	<0.001	<1	<0.001	540
AW-22	04/23/2021	<0.003	0.0032	0.99	<0.001	0.33	<0.001	110	42	0.0041	<0.002	<0.25	0.0081	<0.02	<0.0002	0.0021	6.9	2.37	0.0011	<1	<0.001	500
AW-22	05/05/2021	<0.003	0.0017	0.8	<0.001	0.38	<0.001	80	40	<0.004	<0.002	<0.25	<0.001	<0.02	<0.0002	<0.001	6.9	2.13	<0.001	<1	<0.001	530
P002	02/12/2021	<0.003	0.0046	0.11	<0.001	1.4	<0.001	170	78	<0.004	0.0042	0.344	<0.001	<0.02	<0.0002	0.0016	6.6	0.166	<0.001	1.1	<0.001	730
P002	03/03/2021	<0.003	0.0071	0.1	<0.001	1.1	<0.001	180	70	<0.004	0.0042	0.297	<0.001	<0.02	<0.0002	0.0017	6.8	0.4	<0.001	1.2	<0.001	810
P002	03/23/2021	<0.003	0.0062	0.096	<0.001	1.2	<0.001	170	71	<0.004	0.0041	0.363	<0.001	<0.02	<0.0002	0.0017	6.3	0.195	<0.001	1.2	<0.001	830
P002	04/13/2021	<0.003	0.0084	0.097	<0.001	1.2	<0.001	170	74	<0.004	0.0044	0.337	<0.001	<0.02	<0.0002	0.0017	6.8	0.124	<0.001	<1	<0.001	790
P002	05/04/2021	<0.003	0.0079	0.1	<0.001	1.2	<0.001	180	69	<0.004	0.0045	0.335	<0.001	<0.02	<0.0002	0.002	6.8	0.0443	<0.001	<1	<0.001	860

TABLE 4-1. GROUNDWATER ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Location	Sample Date	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Boron, total (mg/L)	Cadmium, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	pH (field) (SU)	Radium 226 and 228 combined (pCi/L)	Selenium, total (mg/L)	Sulfate, total (mg/L)	Thallium, total (mg/L)	Total Dissolved Solids (mg/L)
35 I.A.C. 845.600	Lower	0	0	0	0	0	0	--	0	0	0	0	0	0	0	0	6.5	0	0	0	0	0
	Upper	0.006	0.010	2.0	0.004	2	0.005	--	200	0.1	0.006	4.0	0.0075	0.04	0.002	0.1	9.0	5	0.05	400	0.002	1200

Notes:
Detected at concentration greater than the GWPS
-- = data not available
GWPS = Groundwater Protection Standard
mg/L = milligrams per liter
pCi/L = picocuries per liter
SU = standard units
< = concentration is less than the concentration shown, which corresponds to the reporting limit for the method. Estimated concentrations below the reporting limit and associated qualifiers are not provided since they are not utilized in statistics to determine exceedances above Part 845 standards.
35 I.A.C. 845.600 = Residuals in Surface Impoundments: Title 35 of the Illinois Administrative Code § 845

TABLE 4-2. GROUNDWATER FIELD PARAMETERS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (field) (SU)	Specific Conductance (micromhos/cm)	Temperature (deg. C)	Turbidity (NTU)
AP05D	02/10/2021	0.33	126	7.7	2032	8.4	3.9
AP05D	03/08/2021	0.20	-67.3	7.2	2821	14.9	27.5
AP05D	03/24/2021	6.13	-54	7.6	1882	13.7	0
AP05D	04/15/2021	0.43	-97.9	7.4	3148	10.1	36.6
AP05D	05/07/2021	1.50	-106	7.7	3722	17.4	323
AP05S	01/18/2017	0	95	6.9	1095	12.1	96
AP05S	05/10/2017	0	105	7.1	1035	14.6	73.9
AP05S	06/07/2017	0	103	6.8	989	15.4	63.9
AP05S	06/22/2017	0	105	7.2	1017	18.3	68.7
AP05S	07/21/2017	0	89	6.9	1030	19.8	61.8
AP05S	07/31/2017	0	70	7.0	1011	15.6	94
AP05S	08/07/2017	0	95	7.0	1040	15.4	82.8
AP05S	08/23/2017	0	96	6.9	1002	15.7	98.1
AP05S	11/02/2017	0	79	7.2	1120	12.8	95.8
AP05S	05/07/2018	0	94	7.2	1040	13.7	85.4
AP05S	07/27/2018	0	79	7.1	1010	15.1	95.3
AP05S	08/27/2018	0	95	7.0	1112	15.3	99.1
AP05S	02/27/2019	0	89	7.1	1270	11.9	99
AP05S	08/06/2019	0	80	7.1	1010	16.9	1000
AP05S	02/27/2020	0.20	-102	6.7	1711	8.6	518
AP05S	09/01/2020	0.14	-118	6.9	1664	18.6	466
AP05S	02/10/2021	0.19	8.3	6.9	1648	6.5	15
AP05S	02/23/2021	0.50	-120	6.8	1499	15.1	1410
AP05S	03/08/2021	0.11	-85.9	6.8	1821	13.9	447
AP05S	03/24/2021	0.17	-26.3	6.3	1561	12.5	276
AP05S	04/13/2021	0.06	-138	7.0	1496	13.9	380
AP05S	05/07/2021	0.72	-112	6.8	1651	15.1	271
AP05S	06/16/2021	0.12	-201	6.9	1753	27.2	2780
AP05S	06/29/2021	0.30	-152	6.9	1736	20.7	2500
AP05S	07/22/2021	0.20	-122	7.0	1721	26.6	1450
AP07D	02/10/2021	6.63	128	8.2	3028	8.8	21.1
AP07D	03/08/2021	7.44	30.9	7.8	3453	16.4	6830
AP07D	03/24/2021	5.54	9.5	7.5	3509	14.3	13900
AP07D	04/13/2021	0.26	-129	7.8	3621	19.0	1620
AP07D	05/05/2021	0	-168	7.9	3209	22.8	635
AP07D	07/22/2021	3.60	47.4	7.5	3002	17.8	1930
AP07S	02/10/2021	0.76	80.3	6.8	1193	9.2	16.2
AP07S	03/04/2021	0.69	79.5	6.7	1118	12.1	12
AP07S	03/24/2021	0.43	26.4	6.2	1084	13.6	0
AP07S	04/13/2021	0.60	29.9	6.8	1792	15.4	146
AP07S	05/05/2021	0.61	20.9	6.6	1875	17.9	1240
AP07S	06/16/2021	1.60	21.8	6.5	1986	36.0	27.5
AP07S	06/28/2021	2.20	55.8	6.8	2034	16.7	34.3
AP07S	07/22/2021	1.20	16.5	6.6	2473	17.7	591

TABLE 4-2. GROUNDWATER FIELD PARAMETERS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (field) (SU)	Specific Conductance (micromhos/cm)	Temperature (deg. C)	Turbidity (NTU)
APW-01	06/17/2021	0.63	-103	6.9	1450	37.3	2000
APW-01	06/29/2021	24.00	-95.6	6.8	10540	19.9	3560
APW-01	07/22/2021	0.09	-135	6.9	1648	16.6	3280
APW-02	02/10/2021	0.22	-104	7.0	1042	9.0	1.24
APW-02	03/03/2021	0.17	-76.8	7.0	1046	14.0	34.3
APW-02	03/24/2021	0.30	-41.6	6.5	992.8	12.8	249
APW-02	04/13/2021	1.50	-93.7	6.9	989	12.6	123
APW-02	05/06/2021	0.67	-118	6.8	943	16.5	71.1
APW-03	02/10/2021	0.14	-111	6.8	1574	10.9	106
APW-03	03/04/2021	0.19	-52.9	6.6	1637	12.5	67.3
APW-03	03/24/2021	0.23	-51.7	6.4	1628	13.4	0
APW-03	04/13/2021	0.23	-128	6.8	1696	21.7	732
APW-03	05/07/2021	0.98	-106	6.8	1641	27.2	595
APW-04	02/10/2021	0.18	-89.8	6.9	1636	7.5	141
APW-04	03/04/2021	0.21	-55	6.8	1596	10.2	131
APW-04	03/22/2021	0.21	-50.9	6.9	1458	11.3	514
APW-04	04/13/2021	0.26	-123	6.8	1706	18.7	1300
APW-04	05/07/2021	0.19	-125	6.8	1805	21.5	114
AW-05	11/09/2015	0	-9	6.7	2210	15.8	268
AW-05	02/17/2016	0	-17	6.8	1980	12.5	286
AW-05	05/17/2016	0	-30	6.7	1736	13.7	238
AW-05	07/21/2016	0	-54	6.9	1662	18.3	237
AW-05	11/10/2016	0	-48	7.1	1340	13.9	190
AW-05	01/17/2017	0	-56	7.1	1288	14.2	190
AW-05	05/08/2017	0	-63	7.2	1229	14.8	164
AW-05	07/19/2017	0	-74	7.1	1230	19.9	217
AW-05	11/01/2017	0	-50	7.2	1250	13.4	206
AW-05	02/27/2020	3.80	51.4	7.0	1273	9.7	922
AW-05	06/17/2021	0.64	-42.2	7.0	1433	17.4	186
AW-05	06/28/2021	0.80	6.8	7.0	1430	19.5	39.2
AW-05	07/22/2021	0.73	-35.6	7.1	1351	19.5	19
AW-06	11/10/2015	0	78	7.0	1140	14.0	1000
AW-06	02/17/2016	0	80	7.2	1110	11.8	1000
AW-06	05/18/2016	0	108	7.2	1024	12.7	1000
AW-06	07/22/2016	0	95	7.1	1035	15.0	1000
AW-06	11/11/2016	0	83	7.2	995	14.0	1000
AW-06	01/17/2017	0	95	7.2	1030	14.6	1000
AW-06	05/09/2017	0	80	7.2	963	14.5	1000
AW-06	07/20/2017	0	89	7.3	1080	18.8	1000
AW-06	11/02/2017	0	111	7.1	1100	13.4	1000
AW-06	05/05/2018	0	74	7.2	1010	14.0	1000
AW-06	08/24/2018	0	96	7.9	1049	15.1	98.1
AW-06	02/27/2019	0	65	7.3	860	11.5	91.4
AW-06	08/06/2019	0	111	7.2	1031	17.2	1000

TABLE 4-2. GROUNDWATER FIELD PARAMETERS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (field) (SU)	Specific Conductance (micromhos/cm)	Temperature (deg. C)	Turbidity (NTU)
AW-06	02/27/2020	2.40	16.2	7.0	985	12.4	119
AW-06	08/31/2020	5.40	-42.6	7.3	924	19.2	36
AW-06	02/23/2021	2.00	-30.1	7.1	1008	12.0	1650
AW-08	11/09/2015	0	21	6.6	1380	16.8	0
AW-08	02/17/2016	0	67	6.8	1290	12.3	104
AW-08	05/17/2016	0	48	6.8	1244	13.3	112
AW-08	07/21/2016	0	78	7.0	1275	15.7	102
AW-08	11/10/2016	0	74	7.1	1149	14.2	78
AW-08	01/17/2017	0	67	7.2	1105	15.3	75
AW-08	05/08/2017	0	74	7.1	1002	15.4	78.4
AW-08	07/19/2017	0	68	7.3	1010	21.4	76.5
AW-08	11/01/2017	0	74	7.1	1120	13.0	80.4
AW-08	05/05/2018	0	65	7.1	1080	13.7	93.1
AW-08	07/27/2018	0	72	7.2	1120	15.0	75.6
AW-08	08/27/2018	0	70	7.1	1088	15.3	81.6
AW-08	02/27/2019	0	73	7.1	1162	12.0	99.2
AW-08	08/06/2019	0	73	7.3	1160	17.2	88.7
AW-08	02/27/2020	0.23	-140	6.9	1303	12.1	33.5
AW-08	09/01/2020	0.07	-149	7.1	1280	19.3	3.3
AW-08	02/10/2021	0.26	-104	7.1	1328	11.8	2.51
AW-08	02/23/2021	0.46	-144	6.9	1405	15.2	1310
AW-08	03/05/2021	0.33	-64	6.9	1253	14.2	3.75
AW-08	03/24/2021	0.28	-83.6	6.3	1320	15.8	1.32
AW-08	04/13/2021	0.64	-154	6.8	1453	17.5	500
AW-08	05/07/2021	1.70	-156	7.0	1372	17.6	59.8
AW-08	06/16/2021	3.50	-152	7.0	1386	23.1	87.9
AW-08	06/28/2021	7.90	-98.8	7.0	1246	23.8	133
AW-08	07/21/2021	0	-126	6.9	764	23.2	16.9
AW-09	11/10/2015	0.67	87	6.8	1280	13.6	1000
AW-09	02/17/2016	0	115	6.6	1240	12.0	1000
AW-09	05/17/2016	0	82	6.5	1268	13.2	1000
AW-09	07/22/2016	0	67	6.6	1242	15.4	1000
AW-09	11/11/2016	0	39	6.7	1148	14.4	1000
AW-09	01/17/2017	0	57	6.9	1162	14.2	1000
AW-09	05/09/2017	0	68	7.1	1046	15.0	1000
AW-09	07/20/2017	0	64	6.9	1150	19.5	1000
AW-09	11/02/2017	0	59	7.0	1060	13.1	1000
AW-09	05/05/2018	0	55	7.0	1100	13.9	1000
AW-09	08/24/2018	0	59	7.0	1128	14.6	95
AW-09	02/27/2019	0	55	7.0	1055	11.8	1000
AW-09	08/06/2019	0	73	7.2	1324	16.9	1000
AW-09	02/27/2020	1.00	-114	6.9	1490	12.3	135
AW-09	08/31/2020	1.80	-115	6.9	1477	19.2	352
AW-09	02/23/2021	1.10	-123	6.9	1515	12.5	485

TABLE 4-2. GROUNDWATER FIELD PARAMETERS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (field) (SU)	Specific Conductance (micromhos/cm)	Temperature (deg. C)	Turbidity (NTU)
AW-10	11/09/2015	4.47	-38	6.6	2240	14.5	583
AW-10	02/18/2016	0.17	-24	7.0	2020	11.2	1000
AW-10	05/18/2016	0	-20	7.1	2230	13.6	1000
AW-10	07/21/2016	0	-56	7.1	1985	14.9	1000
AW-10	11/11/2016	0	-65	7.1	1784	13.8	1000
AW-10	01/17/2017	0	-67	7.1	1682	14.7	1000
AW-10	05/10/2017	0	-65	6.9	1607	15.0	1000
AW-10	07/20/2017	0	-78	7.0	1740	18.0	1000
AW-10	11/02/2017	0	-70	7.2	1560	13.7	1000
AW-10	05/07/2018	0	-62	7.3	1740	12.7	1000
AW-10	07/27/2018	0	-71	7.2	1460	15.1	1000
AW-10	08/27/2018	0	-57	7.1	1603	15.1	1000
AW-10	02/27/2019	0	-67	7.2	1624	11.9	1000
AW-10	08/06/2019	0	-72	7.3	1420	17.1	1000
AW-10	02/27/2020	0.04	-127	6.8	2169	8.3	863
AW-10	08/31/2020	0.05	-135	6.8	2167	21.3	375
AW-10	02/23/2021	0	-138	6.9	2234	10.3	740
AW-10	03/23/2021	0.13	-55.7	6.8	2222	10.8	1610
AW-11	11/09/2015	5.27	-12	6.5	1900	13.2	844
AW-11	02/18/2016	0	61	6.9	1860	11.9	1000
AW-11	05/18/2016	0	40	7.0	1625	13.4	1000
AW-11	07/22/2016	0	55	7.0	1534	15.3	1000
AW-11	11/11/2016	0	64	7.1	1441	14.3	1000
AW-11	01/17/2017	0	66	7.2	1539	15.1	1000
AW-11	05/09/2017	0	61	7.0	1625	14.6	1000
AW-11	07/20/2017	0	58	7.2	1530	21.8	1000
AW-11	11/02/2017	0	72	7.2	1390	12.8	1000
AW-11	05/07/2018	0	71	7.2	1540	14.1	1000
AW-11	08/27/2018	0	71	7.2	1460	15.1	1000
AW-11	02/27/2019	0	72	7.2	1240	12.0	1000
AW-11	08/06/2019	0	74	7.2	1307	17.0	1000
AW-11	02/27/2020	0	-152	6.7	1780	7.8	2400
AW-11	08/31/2020	0.01	-163	6.9	1805	23.7	170
AW-11	02/23/2021	0	-140	7.0	1799	9.7	582
AW-12	02/11/2021	0.10	-114	6.8	1592	12.9	531
AW-12	03/04/2021	0.07	-65.1	6.8	1487	13.7	6.58
AW-12	03/24/2021	0.09	-57.8	6.4	1469	13.6	48.1
AW-12	04/12/2021	0.09	-89.6	7.0	1476	15.4	139
AW-12	05/07/2021	0.91	-128	7.0	1154	17.0	3.07
AW-13	02/11/2021	0.15	-90.2	6.9	2016	8.7	134
AW-13	03/04/2021	0.05	-28.8	6.7	1891	10.4	46.9
AW-13	03/23/2021	0.09	-48.2	6.7	1778	10.4	112
AW-13	04/12/2021	0.14	-86	6.8	1897	12.0	1200
AW-13	05/07/2021	0.08	-96.5	6.8	1700	15.1	30.1

TABLE 4-2. GROUNDWATER FIELD PARAMETERS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (field) (SU)	Specific Conductance (micromhos/cm)	Temperature (deg. C)	Turbidity (NTU)
AW-14	02/11/2021	0.21	-85.8	7.0	2138	10.0	473
AW-14	03/04/2021	0.08	-80.7	6.9	1895	11.2	85.8
AW-14	03/22/2021	0.08	-79.4	6.9	1841	11.8	88.8
AW-14	04/12/2021	0.10	-127	6.8	1874	13.3	67.7
AW-14	05/06/2021	0.83	-146	6.8	1891	14.2	67
AW-14	06/28/2021	0.06	-150	6.8	1851	17.0	30.6
AW-14	07/21/2021	0	-131	6.6	1940	25.5	40.4
AW-15	02/12/2021	0.20	-81.8	6.8	1824	11.0	24.4
AW-15	03/05/2021	0.16	-47.7	6.7	1756	12.6	78.3
AW-15	03/22/2021	0.60	-51.5	6.8	27.6	14.4	383
AW-15	05/06/2021	0.53	-118	6.6	1936	14.4	30.6
AW-15C	02/12/2021	0.16	-84.2	7.0	1495	7.9	155
AW-15C	03/04/2021	0.10	-76.4	6.8	1281	12.3	111
AW-15C	03/22/2021	0.08	-36.5	6.7	1216	13.0	782
AW-15C	04/13/2021	0.01	-53.6	7.0	2127	13.9	0.67
AW-15C	05/06/2021	0.72	-99.3	6.8	1824	13.4	33.2
AW-15C	07/21/2021	0	-85	6.8	2360	23.0	30.1
AW-15S	02/12/2021	1.79	62.9	7.0	1609	7.7	702
AW-15S	03/04/2021	0.67	-3.5	7.1	1707	10.0	24.8
AW-15S	03/22/2021	0.52	50.1	6.9	1773	12.6	73.1
AW-15S	04/26/2021	1.10	7.1	7.0	1966	13.2	0.89
AW-15S	05/06/2021	0.89	64.5	6.7	1801	12.8	38.4
AW-15S	06/17/2021	0.47	-47.1	6.6	1812	15.7	32.1
AW-15S	06/29/2021	0.24	117	6.9	1795	18.5	23.3
AW-15S	07/21/2021	0	-5	6.6	1960	20.2	326
AW-16	02/11/2021	0.28	-69.5	6.8	2465	12.8	0
AW-16	03/03/2021	0.13	-63.7	6.8	455.1	13.6	146
AW-16	03/24/2021	0.14	-40.7	6.4	140.3	13.8	0
AW-16	04/23/2021	0.52	-99.4	6.8	1574	14.1	3.19
AW-16	05/05/2021	0.08	-107	6.7	1638	15.8	312
AW-16	06/24/2021	2.00	-100	6.6	2040	17.2	0
AW-16	06/29/2021	0.01	-108	6.8	2242	19.0	18.8
AW-16	07/21/2021	0.16	-136	6.8	1949	16.8	38.9
AW-17	02/11/2021	0.25	-104	7.0	2079	11.1	182
AW-17	03/03/2021	0.20	-86.3	6.8	1922	12.7	462
AW-17	03/23/2021	0.18	-35.6	6.2	1476	13.4	11.3
AW-17	04/23/2021	0.23	-136	6.9	1778	13.6	110
AW-17	05/05/2021	0.13	-133	6.8	1723	14.8	79.6
AW-17	06/24/2021	2.60	-96	6.6	1960	17.0	44.1
AW-17	06/29/2021	0.03	-130	6.9	1825	18.4	751
AW-17	07/21/2021	0.40	-157	7.0	1795	17.0	245
AW-18	02/11/2021	0.36	-70.8	7.0	1684	9.3	101
AW-18	03/03/2021	0.25	-113	7.0	1996	13.2	217
AW-18	03/23/2021	0.15	-69.4	6.4	1466	13.4	330

TABLE 4-2. GROUNDWATER FIELD PARAMETERS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (field) (SU)	Specific Conductance (micromhos/cm)	Temperature (deg. C)	Turbidity (NTU)
AW-18	04/13/2021	0.32	-136	6.9	1884	14.9	81.4
AW-18	05/05/2021	0.11	-164	6.9	1830	15.5	48.4
AW-18	06/23/2021	0.12	-142	6.9	1815	17.2	8.23
AW-18	06/29/2021	0.14	-144	6.9	1887	20.6	20.1
AW-18	07/21/2021	0.02	-149	7.0	1870	17.3	60
AW-19	02/11/2021	0.34	-55.5	7.0	1220	11.0	397
AW-19	03/03/2021	0.52	-37.9	7.1	827.2	13.7	445
AW-19	03/23/2021	0.26	9.6	6.4	1125	13.7	97.7
AW-19	04/12/2021	1.40	-59.5	6.9	985	16.5	20.7
AW-19	05/05/2021	0.91	-90.4	7.1	1038	15.5	111
AW-19	06/23/2021	0.87	-61.9	7.0	206	17.8	0.95
AW-19	06/29/2021	0.85	-79.1	7.1	1131	17.8	14.7
AW-19	07/21/2021	0.44	-111	7.2	1119	16.6	18.9
AW-20	02/11/2021	0.25	-52.9	6.8	1570	12.4	144
AW-20	03/03/2021	0.12	-41.5	6.9	1390	14.3	51.9
AW-20	03/23/2021	0.19	-1.2	6.4	1420	14.1	21.9
AW-20	04/12/2021	1.30	-62.2	6.9	1334	16.1	4.52
AW-20	05/05/2021	0.70	-93.2	6.9	1369	16.5	37.8
AW-21	02/11/2021	1.09	-92.6	7.2	1133	10.2	17.8
AW-21	03/03/2021	0.28	-38.5	7.2	1134	14.0	0
AW-21	03/23/2021	0.30	1.6	6.7	1068	13.7	11.1
AW-21	04/12/2021	1.90	-18.3	7.2	1003	16.1	17.4
AW-21	05/05/2021	0.55	-40.6	7.2	1052	15.7	37.7
AW-21	06/23/2021	0.93	-26.5	7.2	1068	16.0	33.7
AW-21	06/29/2021	0.85	-36.9	7.2	1053	16.7	14.9
AW-21	07/21/2021	1.90	9.5	7.3	1081	20.8	39.9
AW-22	02/12/2021	1.00	-73.7	7.0	1048	2.9	47.3
AW-22	03/03/2021	0.09	-89.6	6.9	248.4	14.1	5950
AW-22	03/23/2021	0.08	-51.3	6.5	778.3	13.4	0
AW-22	04/23/2021	0.59	-99.3	6.9	1108	13.4	4.17
AW-22	05/05/2021	0.19	-122	6.9	916	15.6	292
P002	02/12/2021	0.64	-30.8	6.6	1384	8.8	25.8
P002	03/03/2021	0.25	-4.6	6.8	1348	14.5	19.9
P002	03/23/2021	0.39	21.5	6.3	1504	13.6	6.77
P002	04/13/2021	0.86	-50.1	6.8	1509	14.1	18.1
P002	05/04/2021	0.89	-55.7	6.8	1141	14.3	20.7

Notes:
Field readings are reported with as many significant figures as provided by analytical laboratory.
cm = centimeter
deg. C = degrees Celsius
mg/L = milligrams per liter
mV = millivolts
NTU = nephelometric turbidity units
SU = standard units

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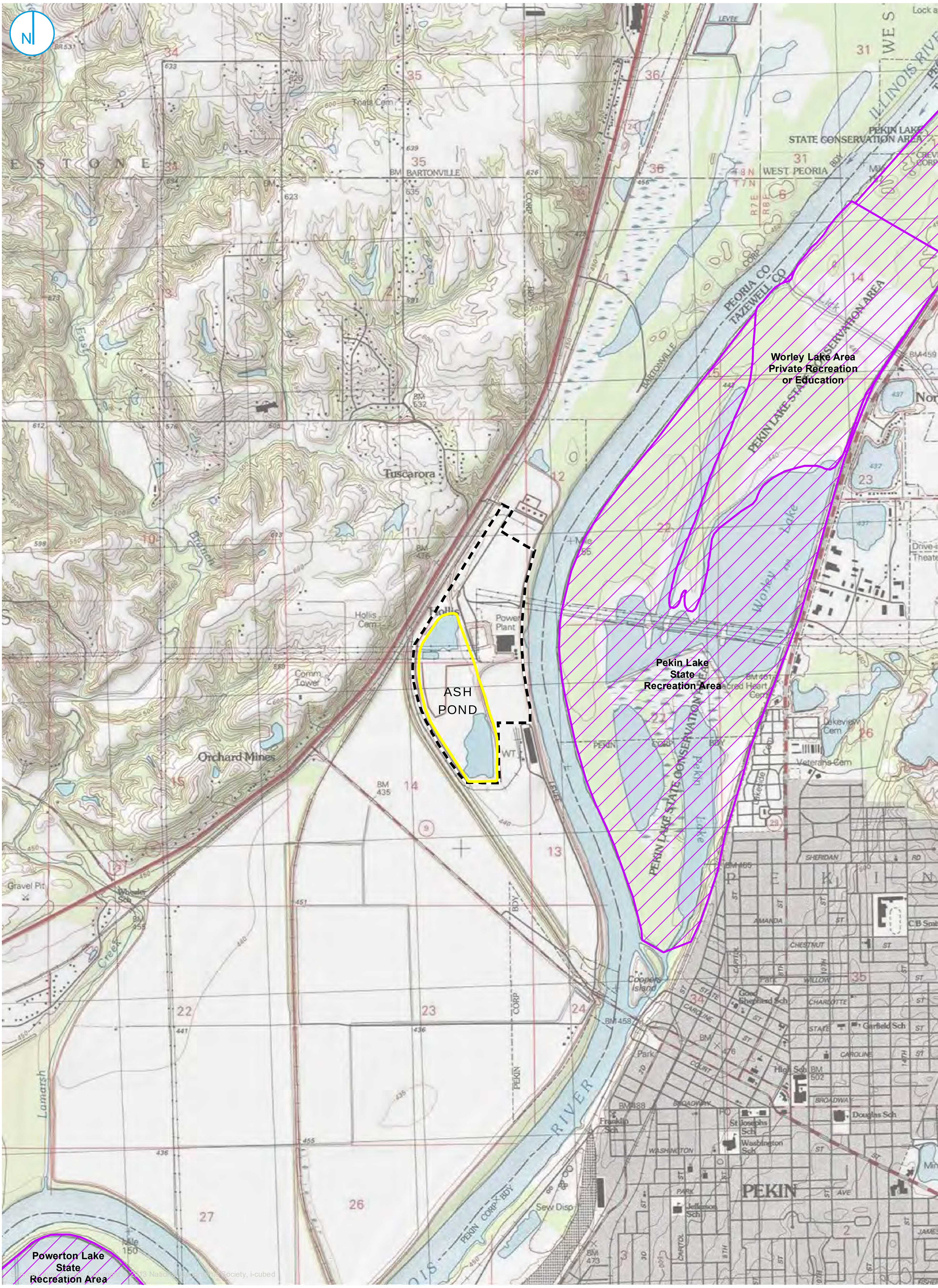
FIGURES



PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY
PROTECTED AREA

0 1,000 2,000
Feet

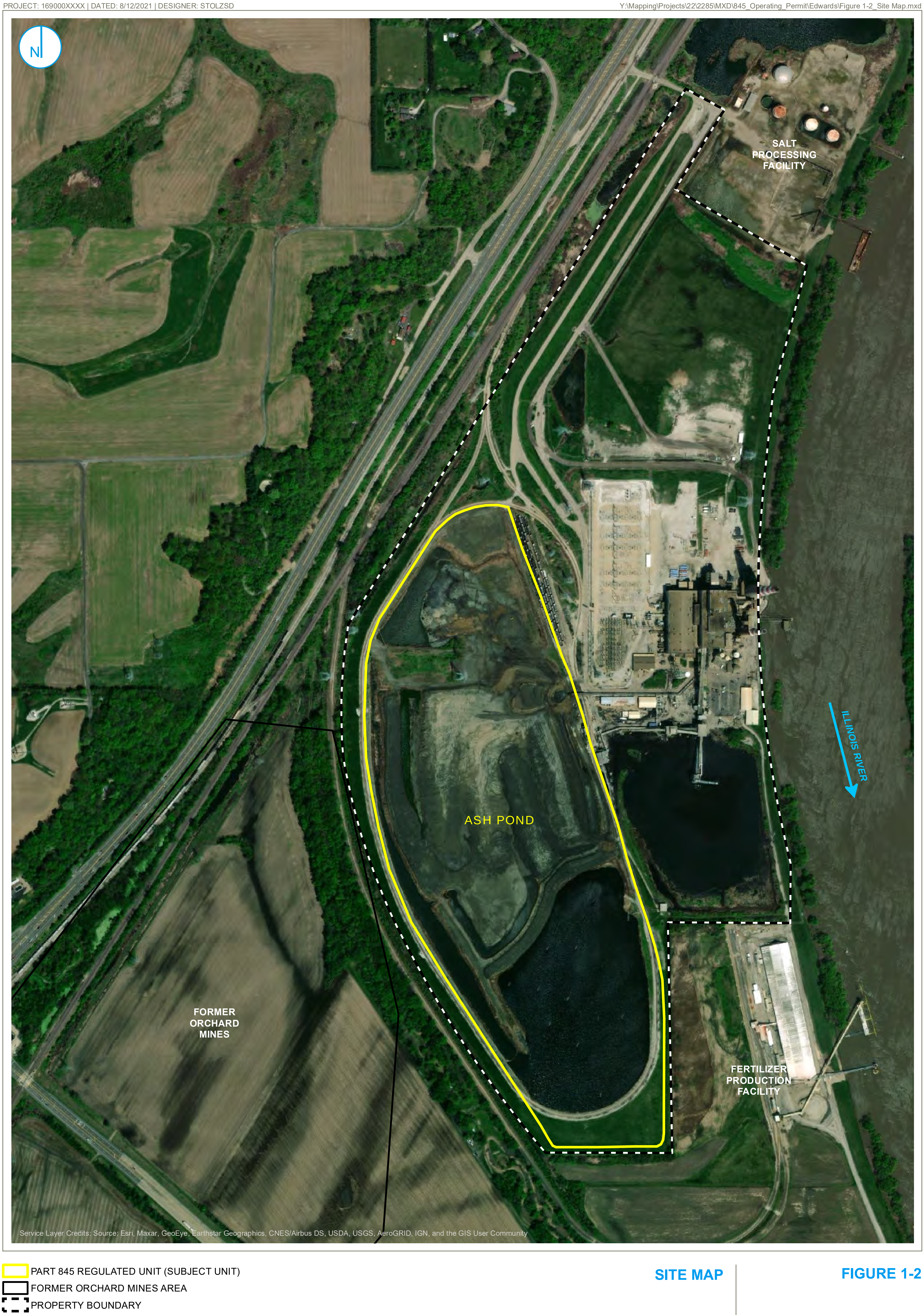
SITE LOCATION MAP

FIGURE 1-1

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL



SITE MAP

FIGURE 1-2

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL

5FT TOPOGRAPHIC CONTOUR
PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

0 200 400 Feet

SOURCE
INGENAE SURVEY, 2021

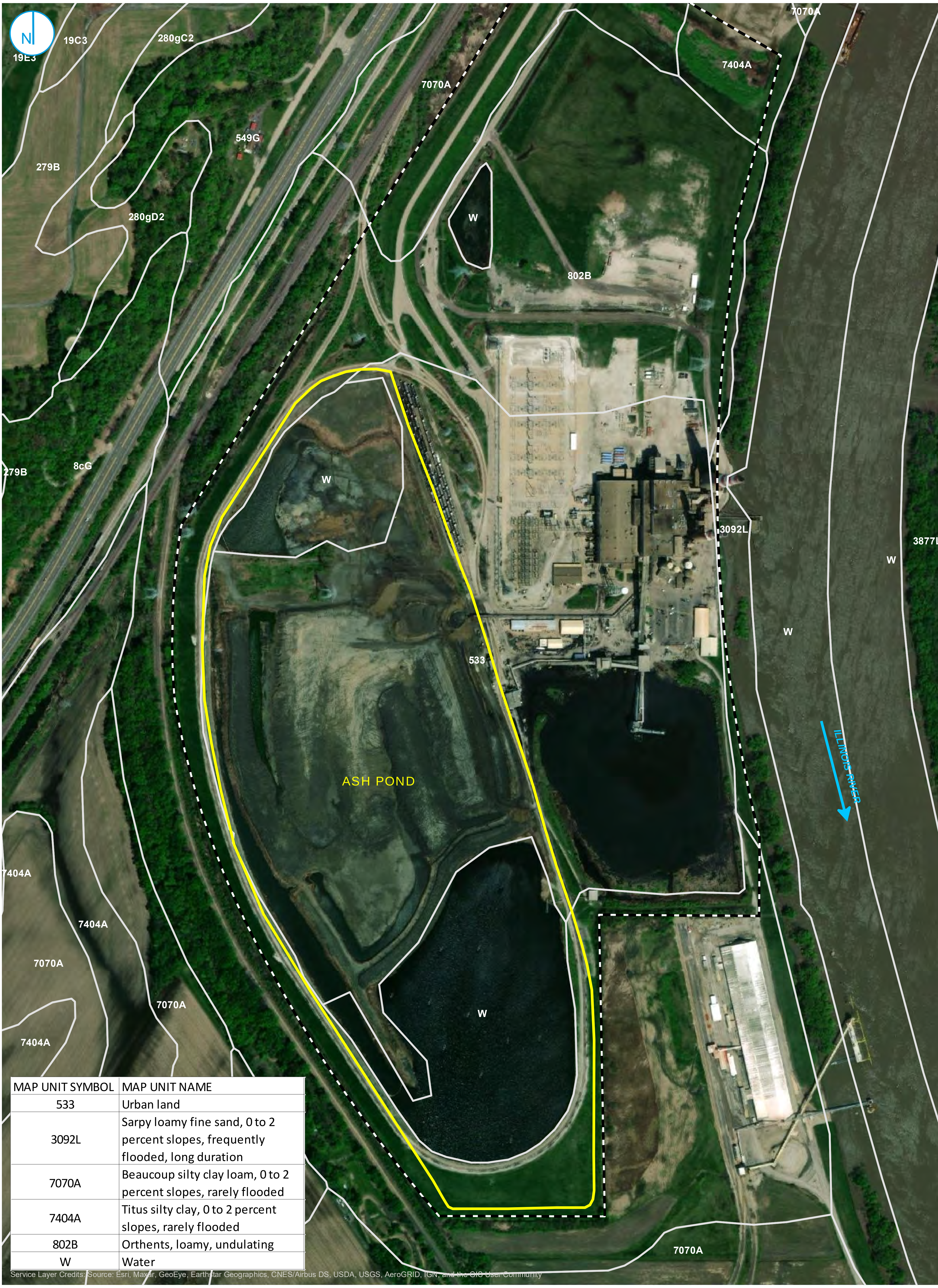
SITE TOPOGRAPHIC MAP

FIGURE 2-1

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL



MAP UNIT SYMBOL	MAP UNIT NAME
533	Urban land
3092L	Sarpy loamy fine sand, 0 to 2 percent slopes, frequently flooded, long duration
7070A	Beaucoup silty clay loam, 0 to 2 percent slopes, rarely flooded
7404A	Titus silty clay, 0 to 2 percent slopes, rarely flooded
802B	Orthents, loamy, undulating
W	Water

NRCS SOIL SURVEY MAP UNIT BOUNDARY
PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

0 200 400 Feet

SOURCE
NATURAL RESOURCES CONSERVATION SERVICE (NRCS)

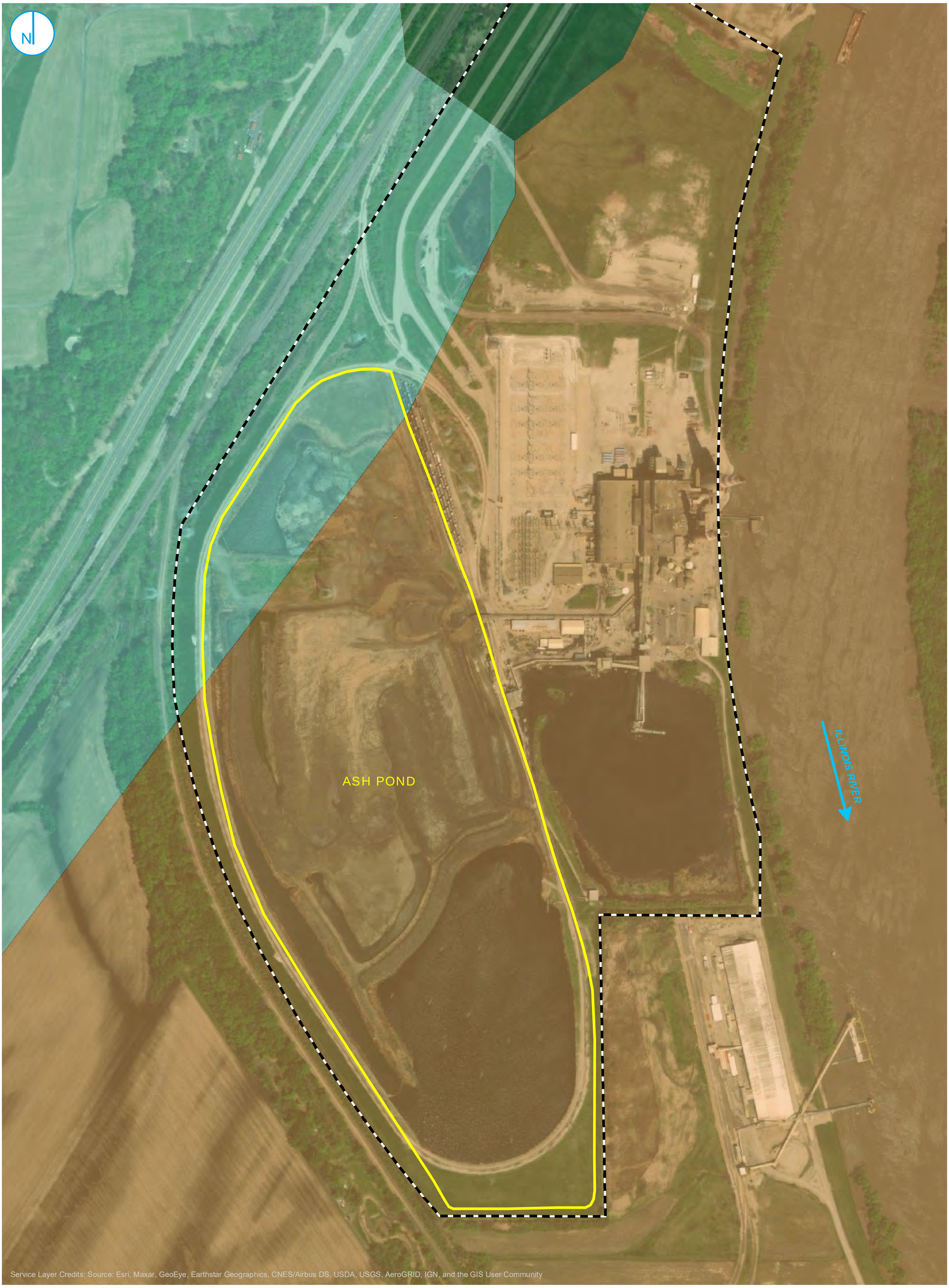
SOIL SURVEY MAP

FIGURE 2-2

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL



PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY
CAHOKIA ALLUVIUM (INCLUDES ALLUVIAL FAN FACIES)
NOT A QUATERNARY DEPOSIT
RADNOR TILL MEMBER

0 200 400 Feet

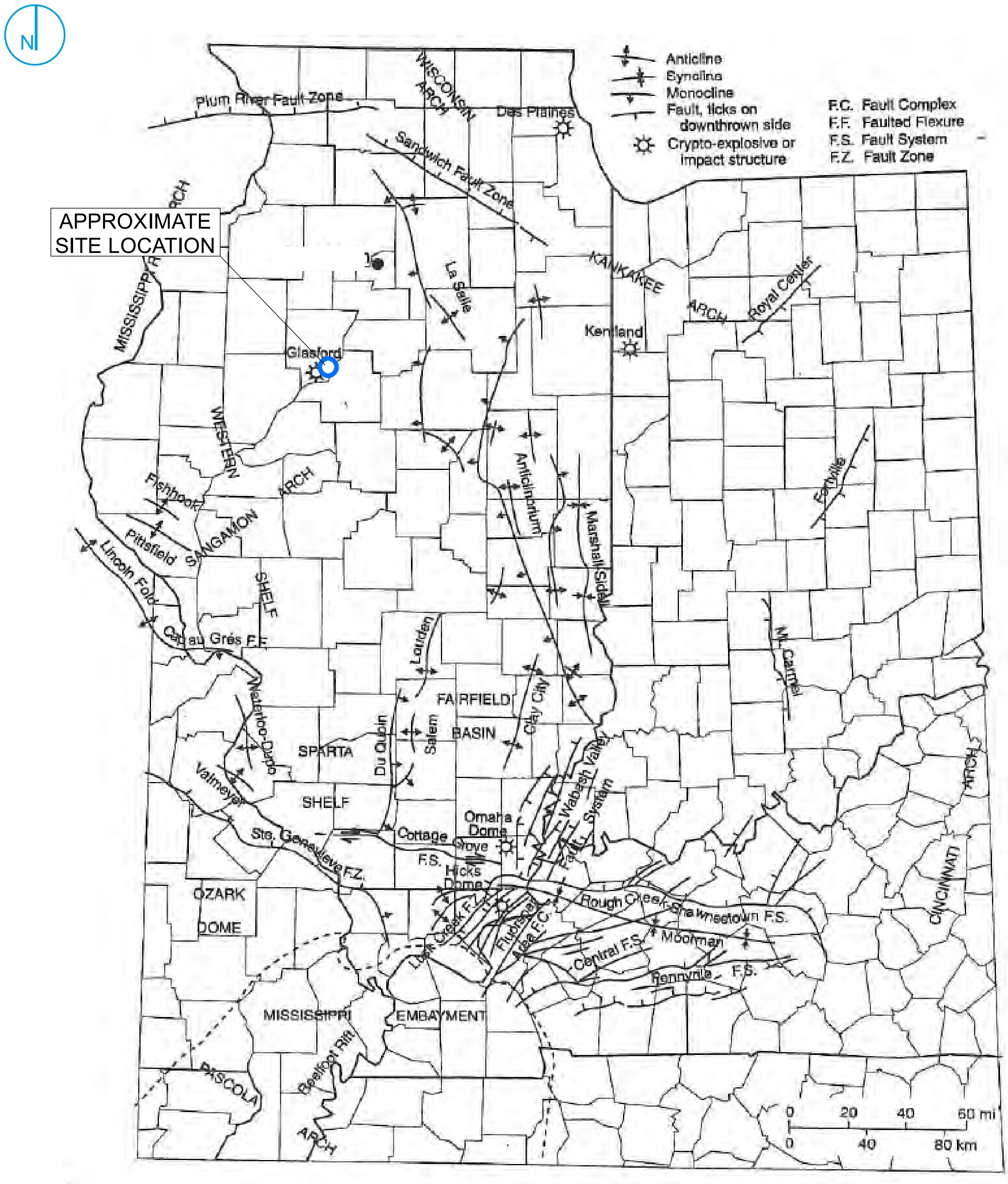
SOURCE:
ILLINOIS STATE GEOLOGICAL SURVEY (ISGS)

SURFICIAL GEOLOGIC DEPOSITS

FIGURE 2-3

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.



SOURCE NOTE: MODIFIED FROM "NELSON, W.J. 1995, STRUCTURAL FEATURES IN ILLINOIS, ILLINOIS STATE GEOLOGICAL SURVEY, BULLETIN 100, CHAMPAIGN, ILLINOIS."

Service Layer Credits:

PROJECT: 169000XXXX | DATED: 8/12/2021 | DESIGNER: STOLZSD

Y:\Mapping\Projects\22\2285\MXD\845_Operating_Permit\Edwards\Figure 2-4_Major Structural Features of Illinois.mxd

MAJOR STRUCTURAL FEATURES OF ILLINOIS

FIGURE 2-4

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

MONITORING WELL
SOURCE SAMPLE LOCATION
STAFF GAGE
PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

0 200 400 Feet

FIELD INVESTIGATION LOCATIONS

FIGURE 2-5

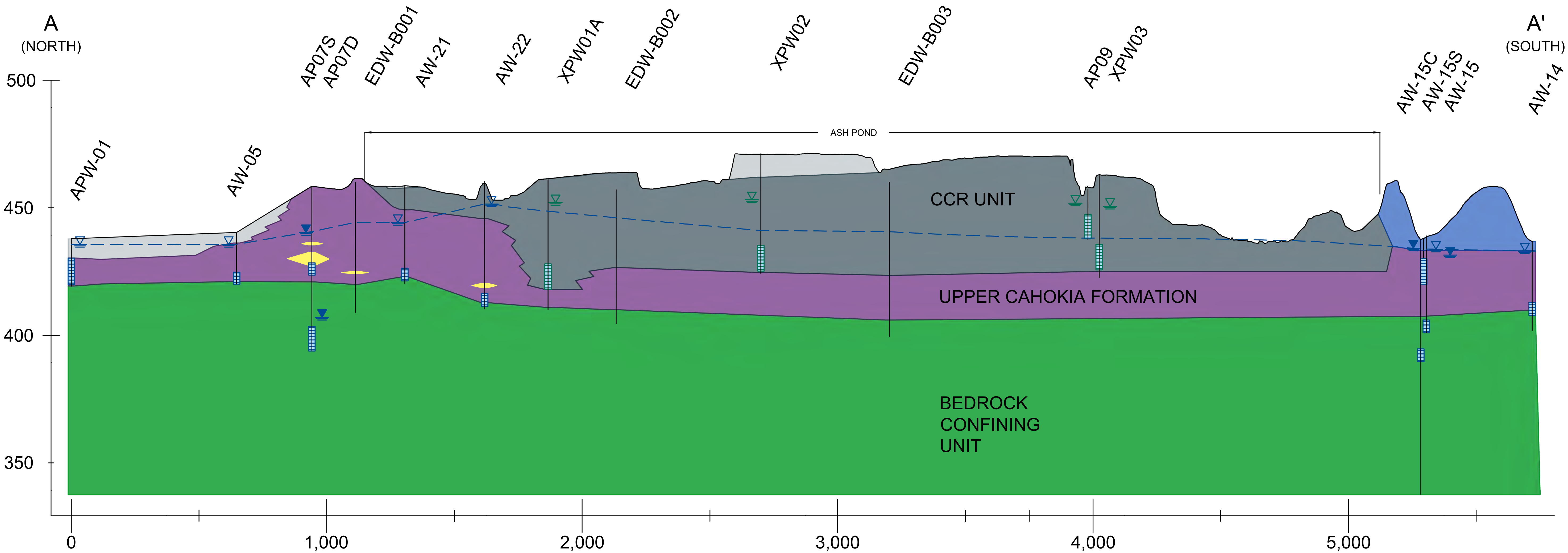
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

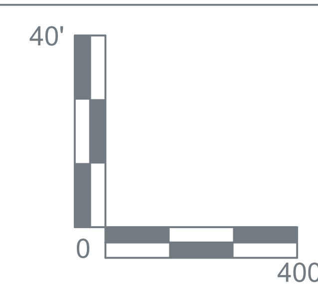
NOTES

1. This profile was developed by interpolation between widely spaced boreholes. Only at the borehole location should it be considered as an approximately accurate representation and then only to the degree implied by the notes on the borehole logs.
2. Scale is approximate.
3. Vertical scale is exaggerated 10X.
4. Vertical Datum: NAVD88
5. Groundwater elevations measured on April 12, 2021.



LEGEND

- COAL COMBUSTION RESIDUALS, CCRs
- FILL
- CLAY (CL/CH)
- SILT (ML)
- SAND (SP/SM/SW)
- BEDROCK / WEATHERED BEDROCK (INTERBEDDED SHALE, LIMESTONE, SANDSTONE, V. LITTLE SS)
- WELL SCREEN INTERVAL
- UPPERMOST AQUIFER POTENTIOMETRIC SURFACE
- UPPER AQUIFER GROUNDWATER ELEVATION
- POREWATER ELEVATION
- BEDROCK GROUNDWATER / OTHER GROUNDWATER / SURFACE WATER ELEVATION(S)



GEOLOGIC CROSS SECTION A-A'

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT ASH POND

EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

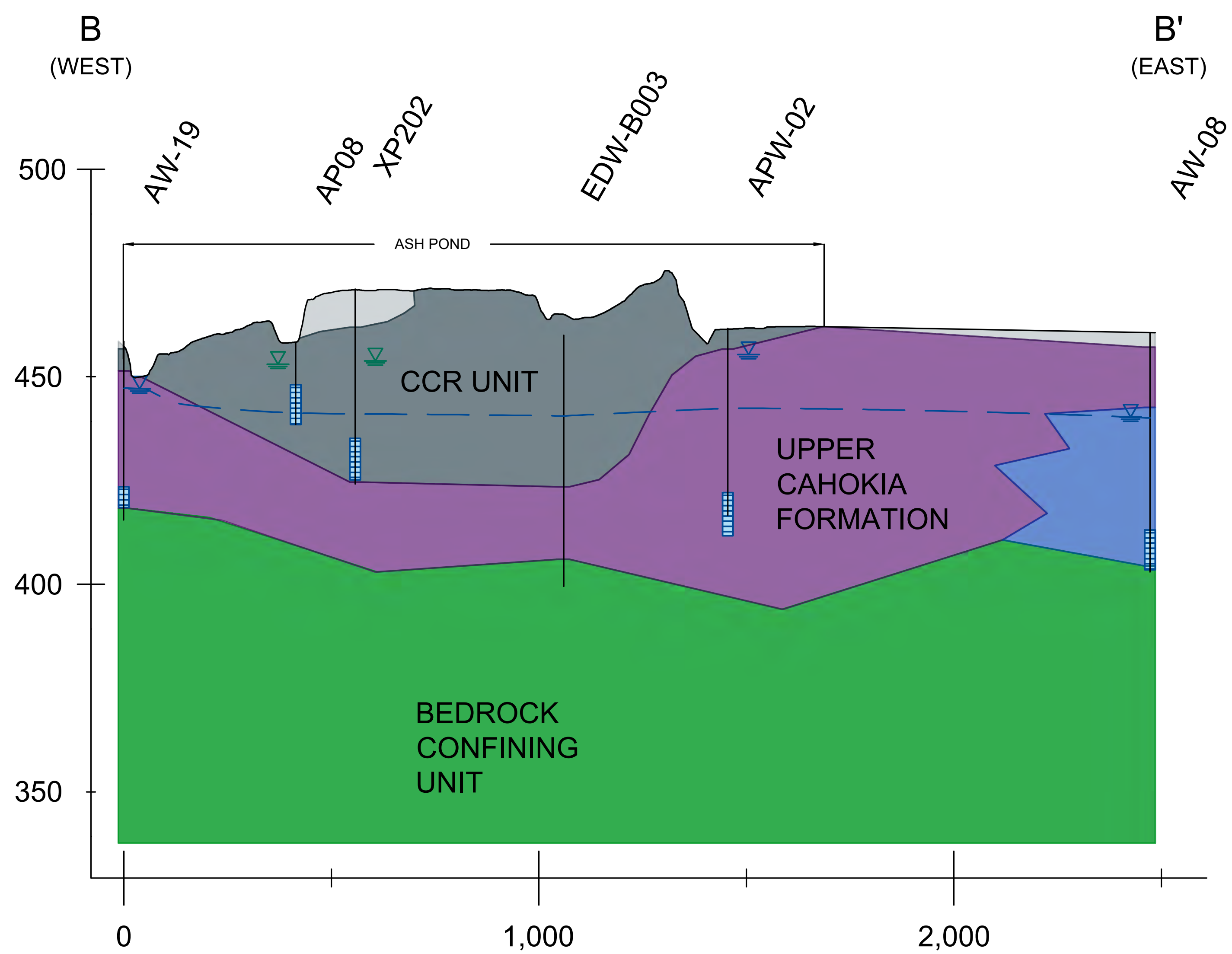
FIGURE 2-6

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL

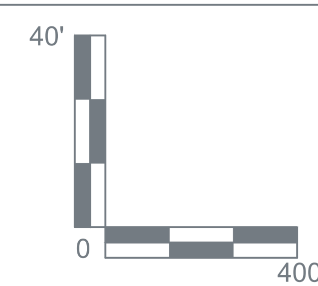
NOTES

1. This profile was developed by interpolation between widely spaced boreholes. Only at the borehole location should it be considered as an approximately accurate representation and then only to the degree implied by the notes on the borehole logs.
2. Scale is approximate.
3. Vertical scale is exaggerated 10X.
4. Vertical Datum: NAVD88
5. Groundwater elevations measured on April 12, 2021.



LEGEND

- COAL COMBUSTION RESIDUALS, CCRs
- FILL
- CLAY (CL/CH)
- SILT (ML)
- SAND (SP/SM/SW)
- BEDROCK / WEATHERED BEDROCK (INTERBEDDED SHALE, LIMESTONE, SANDSTONE, V. LITTLE SS)
- WELL SCREEN INTERVAL
- UPPERMOST AQUIFER POTENTIOMETRIC SURFACE
- UPPER AQUIFER GROUNDWATER ELEVATION
- POREWATER ELEVATION
- BEDROCK GROUNDWATER / OTHER GROUNDWATER / SURFACE WATER ELEVATION(S)



GEOLOGIC CROSS SECTION B-B'

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT ASH POND

EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

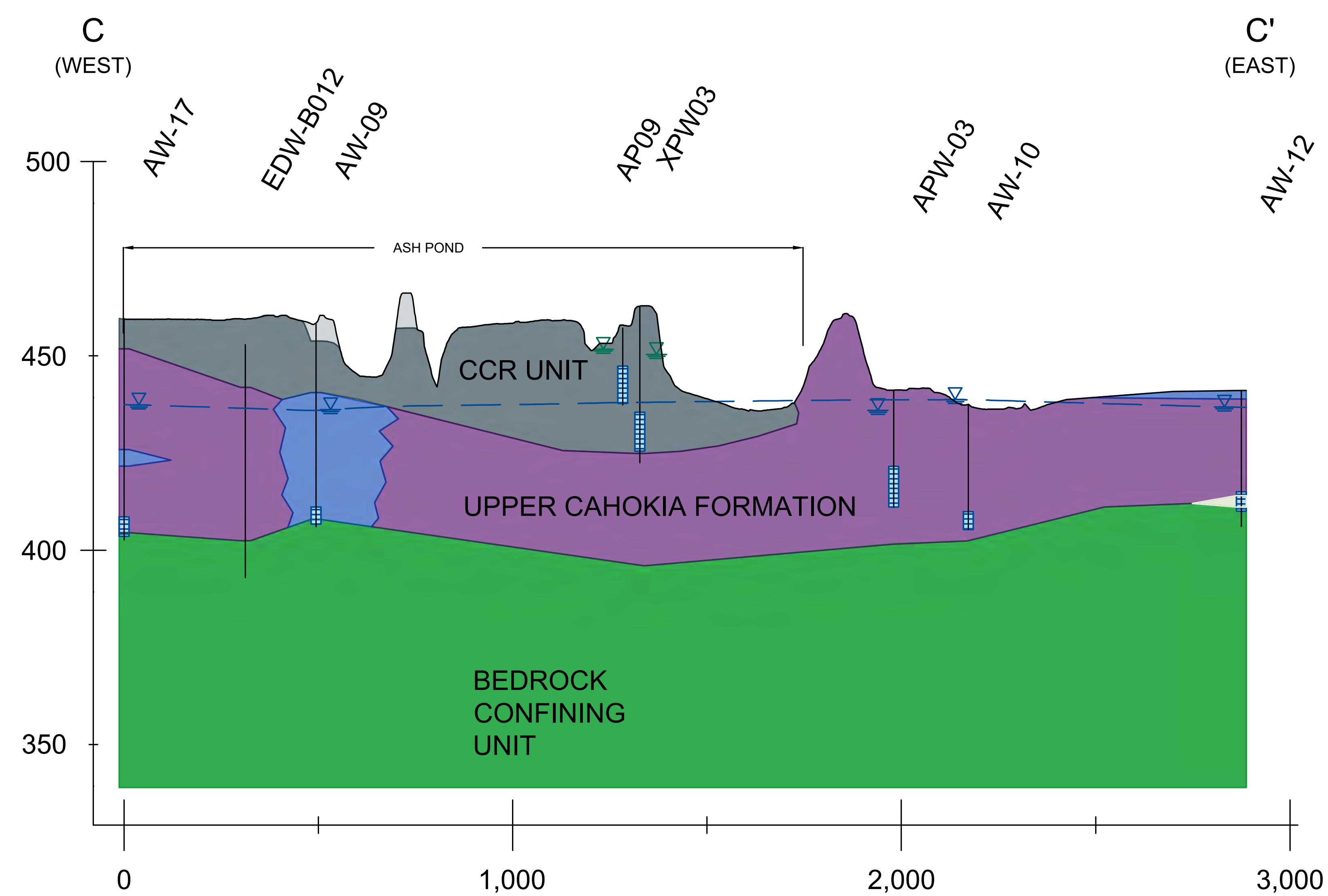
FIGURE 2-7

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL

NOTES

1. This profile was developed by interpolation between widely spaced boreholes. Only at the borehole location should it be considered as an approximately accurate representation and then only to the degree implied by the notes on the borehole logs.
2. Scale is approximate.
3. Vertical scale is exaggerated 10X.
4. Vertical Datum: NAVD88
5. Groundwater elevations measured on April 12, 2021.



LEGEND

- COAL COMBUSTION RESIDUALS, CCRs
- FILL
- CLAY (CL/CH)
- SILT (ML)
- GRAVEL (GP/GW)
- BEDROCK / WEATHERED BEDROCK (INTERBEDDED SHALE, LIMESTONE, SANDSTONE, V. LITTLE SS)
- WELL SCREEN INTERVAL
- UPPERMOST AQUIFER POTENTIOMETRIC SURFACE
- UPPER AQUIFER GROUNDWATER ELEVATION
- POREWATER ELEVATION
- BEDROCK GROUNDWATER / OTHER GROUNDWATER / SURFACE WATER ELEVATION(S)

40'
0
400'

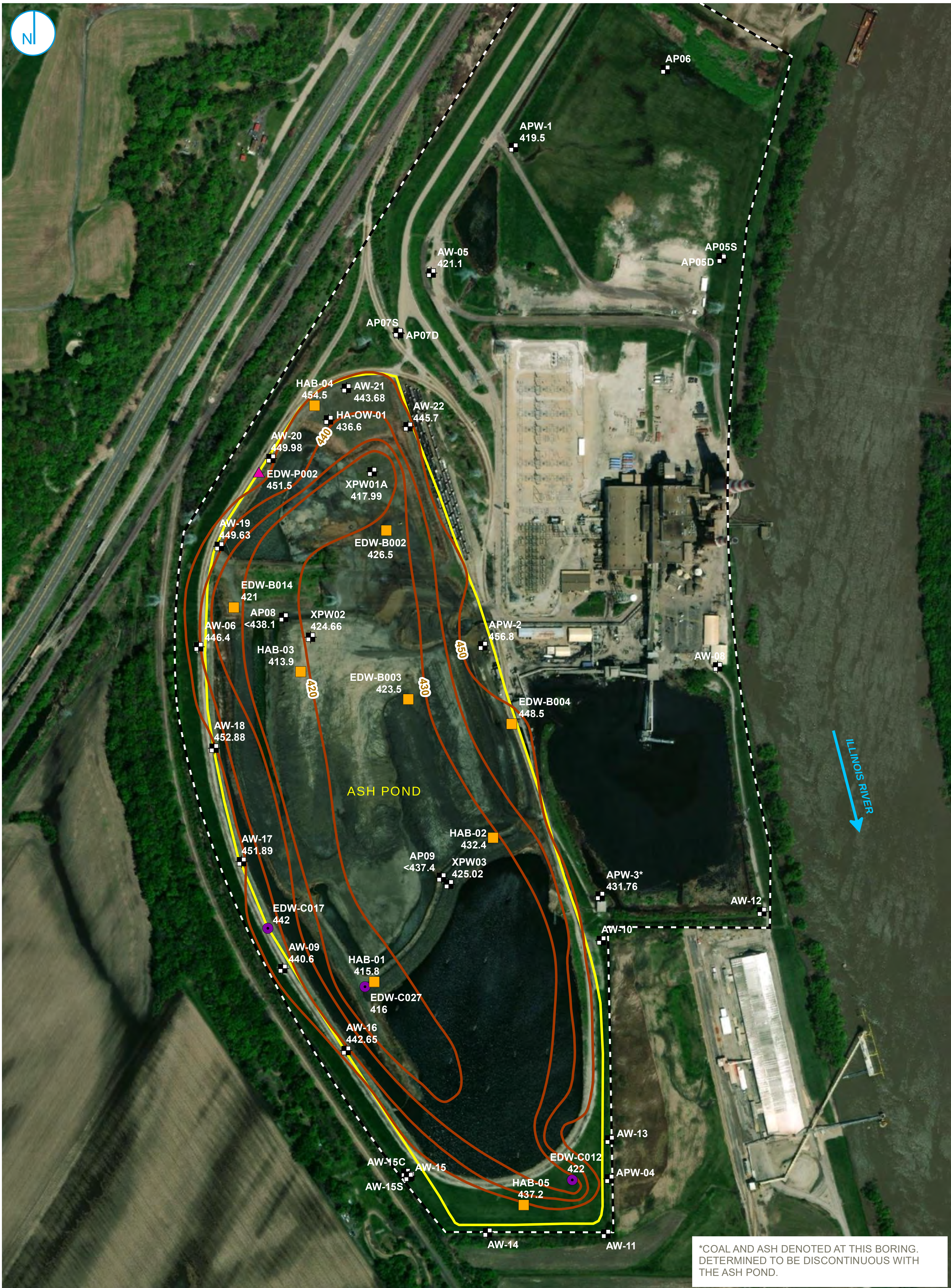
GEOLOGIC CROSS SECTION C-C'

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

FIGURE 2-8

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL



BORING
MONITORING WELL LOCATION
CPT
PIEZOMETER
BOTTOM OF ASH ELEVATION CONTOUR
PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

0 200 400 Feet

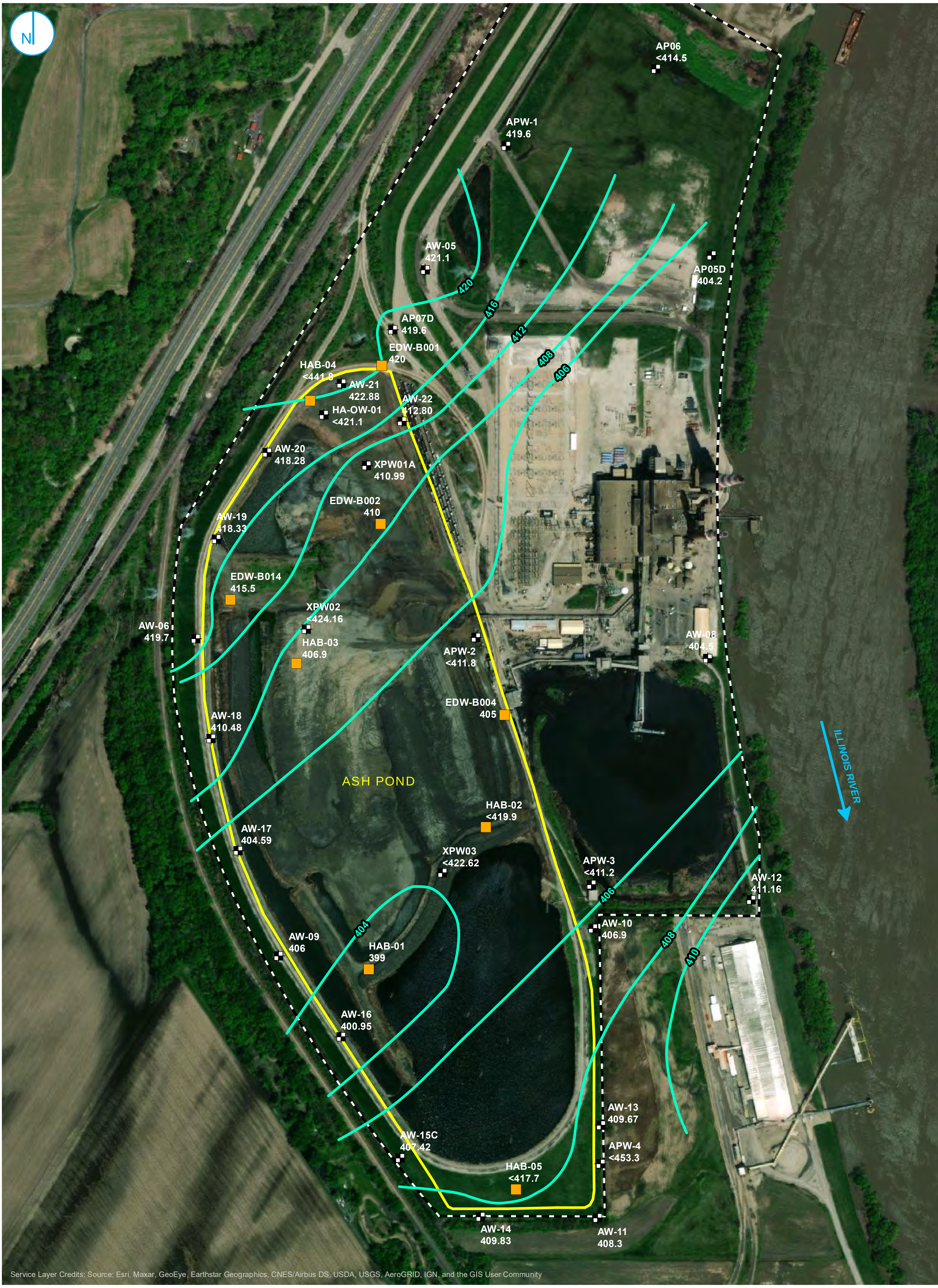
NOTE:
ELEVATION CONTOURS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

BOTTOM OF ASH

FIGURE 2-9

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.



BORINGS
MONITORING WELL
BEDROCK ELEVATION CONTOUR (1-FT INTERVAL)
PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

0 200 400 Feet

NOTE:
ELEVATION CONTOURS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

TOP OF BEDROCK

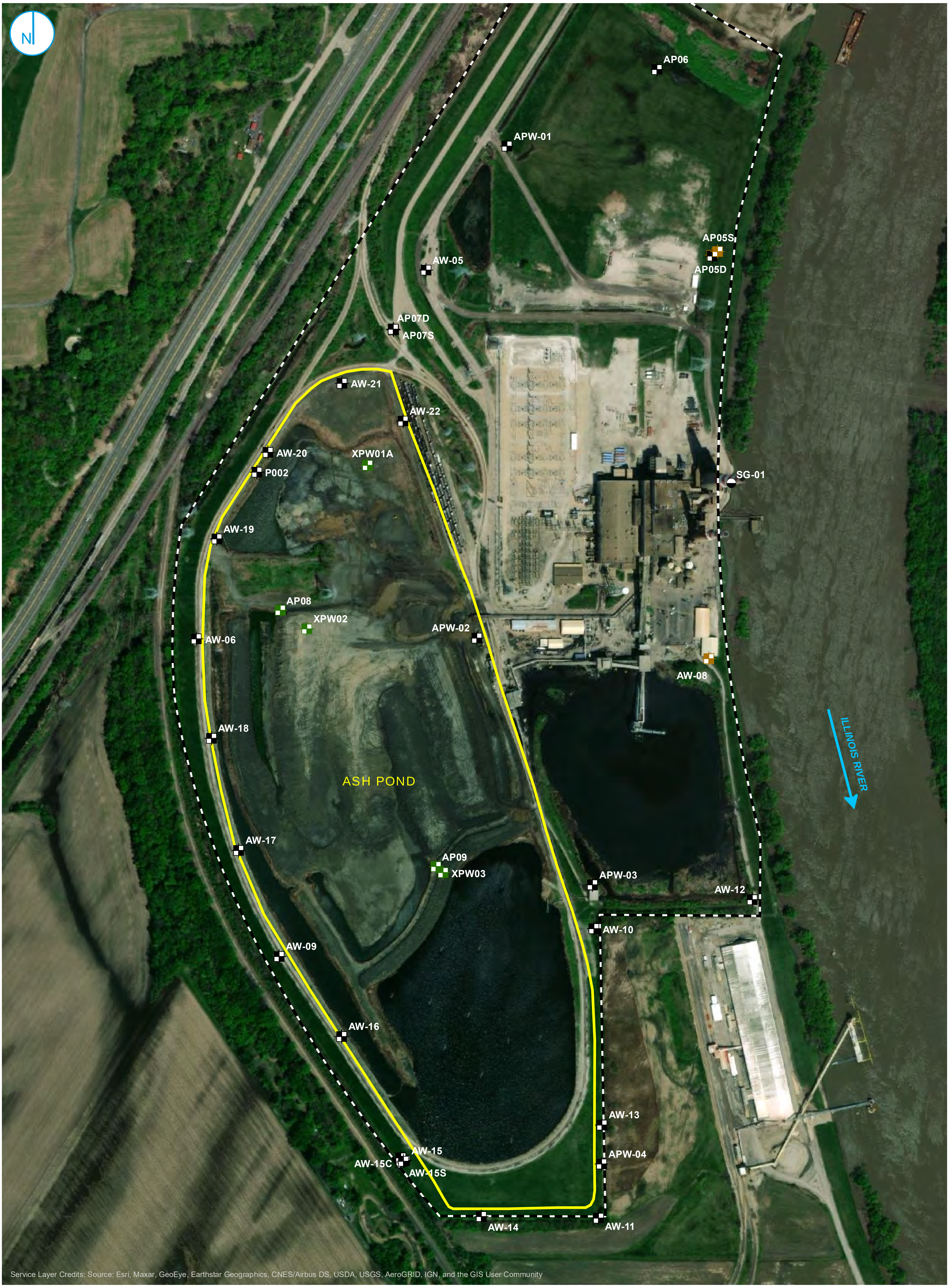
FIGURE 2-10

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

PROJECT: 169000XXXX | DATED: 9/28/2021 | DESIGNER: STOLZSD

Y:\Mapping\Projects\22\2285\MXD\845_Operating_Permit\Edwards\Figure 3-1_Monitoring Well Location Map.mxd



BACKGROUND WELL
MONITORING WELL
SOURCE SAMPLE LOCATION
STAFF GAGE
PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

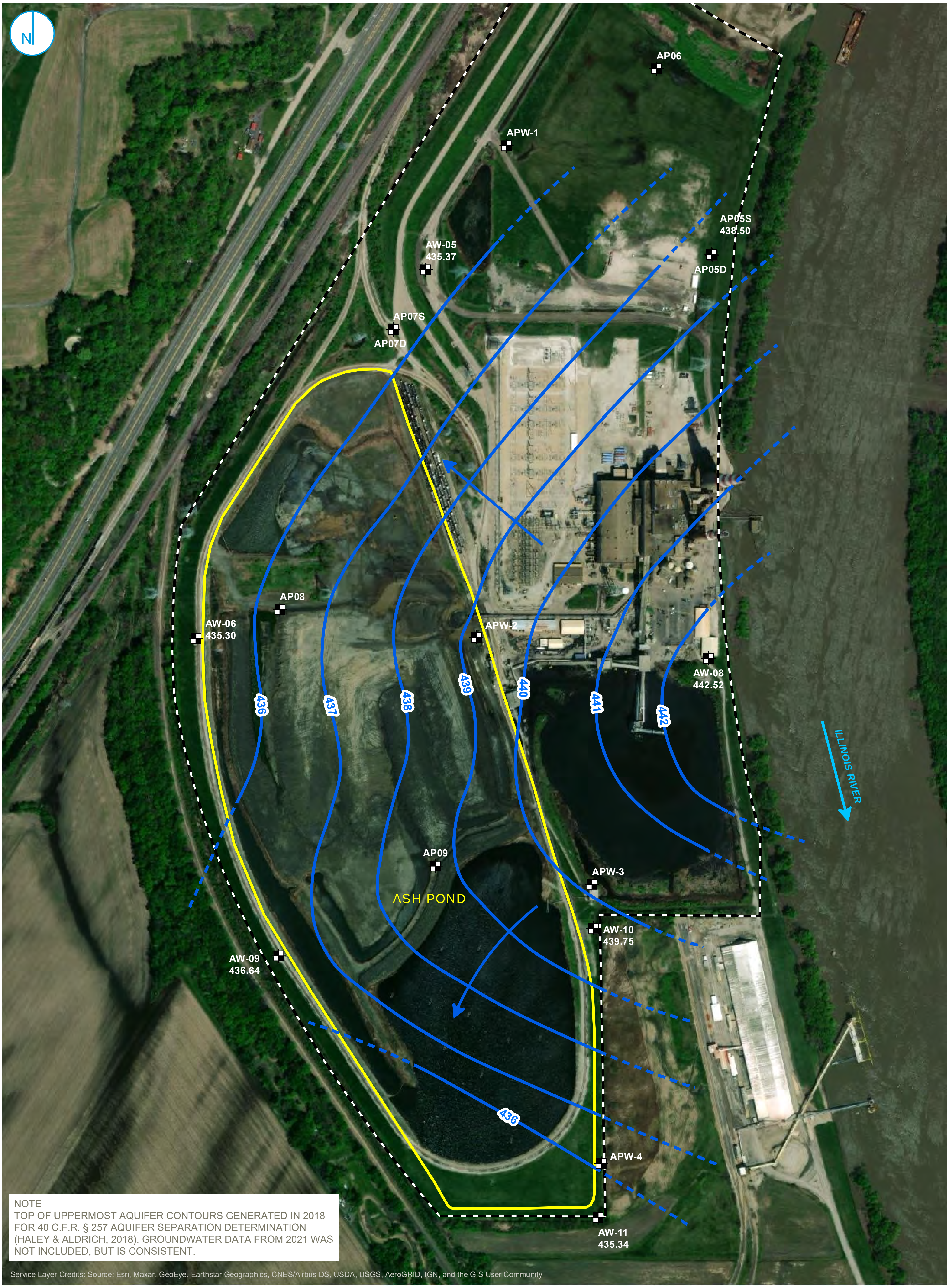
0 200 400 Feet

MONITORING WELL LOCATION MAP

FIGURE 3-1

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.



MONITORING WELL
INTERPRETED TOP OF UPPERMOST AQUIFER (95TH PERCENTILE GROUNDWATER ELEVATION CONTOURS, 2017)
INFERRED TOP OF UPPERMOST AQUIFER CONTOUR
GROUNDWATER FLOW DIRECTION
PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

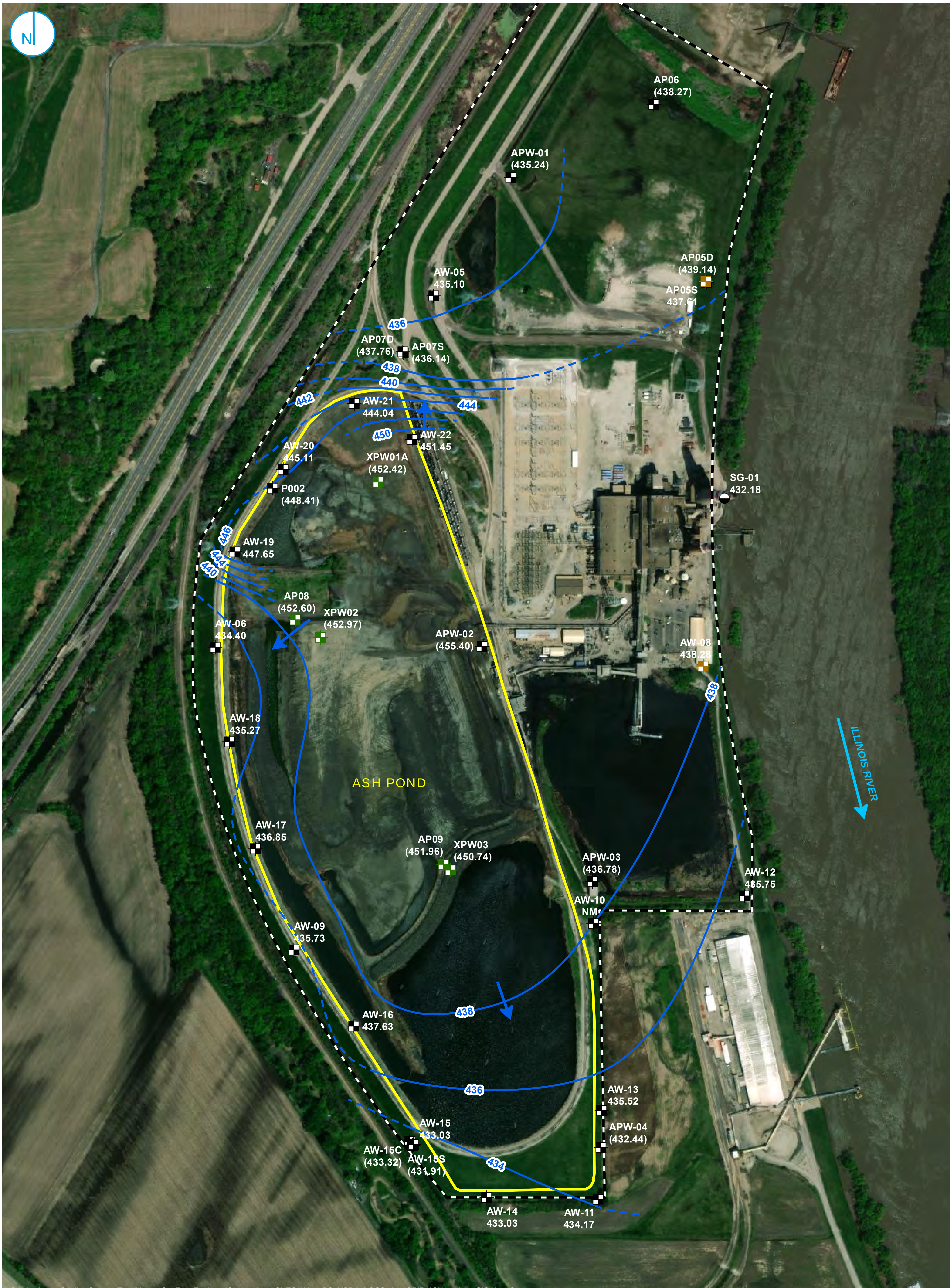
0 200 400 Feet

TOP OF UPPERMOST AQUIFER

FIGURE 3-2

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.



BACKGROUND WELL
MONITORING WELL
SOURCE SAMPLE LOCATION
STAFF GAGE
PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

GROUNDWATER ELEVATION CONTOUR (2-FT CONTOUR INTERVAL, NAVD88)
INFERRED GROUNDWATER ELEVATION CONTOUR
GROUNDWATER FLOW DIRECTION

0 212.5 425 Feet

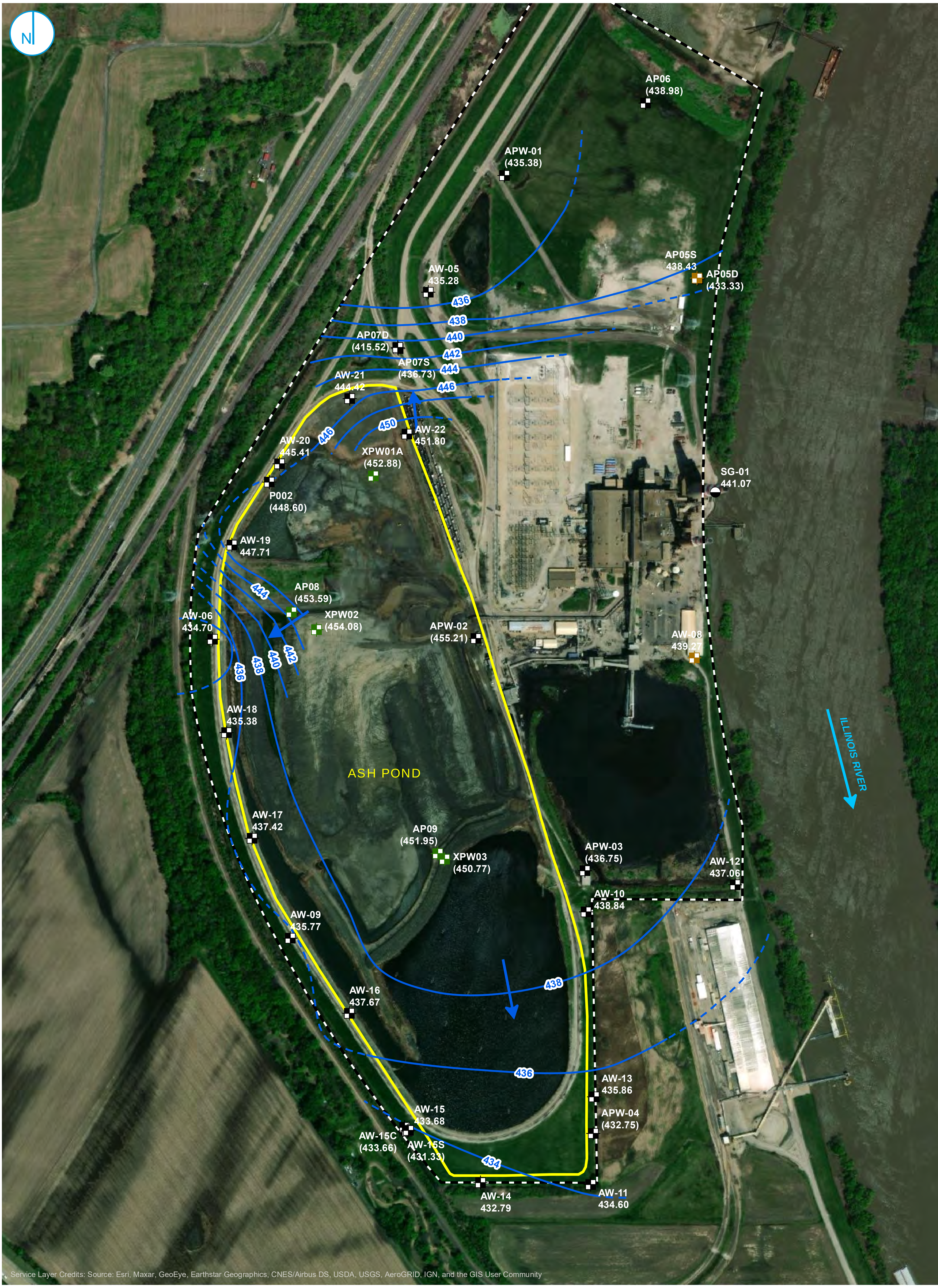
NOTES
1. PARENTHESIS INDICATES WELL NOT USED FOR CONTOURING
2. ELEVATION CONTOURS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988

UPPERMOST AQUIFER GROUNDWATER ELEVATION CONTOURS FEBRUARY 9, 2021

FIGURE 3-3

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.



BACKGROUND WELL
MONITORING WELL
SOURCE SAMPLE LOCATION
STAFF GAGE
PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

GROUNDWATER ELEVATION CONTOUR (2-FT CONTOUR INTERVAL, NAVD88)
INFERRED GROUNDWATER ELEVATION CONTOUR
GROUNDWATER FLOW DIRECTION

0 212.5 425 Feet

NOTES
1. PARENTHESIS INDICATES WELL NOT USED FOR CONTOURING
2. ELEVATION CONTOURS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

UPPERMOST AQUIFER GROUNDWATER ELEVATION CONTOURS
MARCH 22, 2021

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

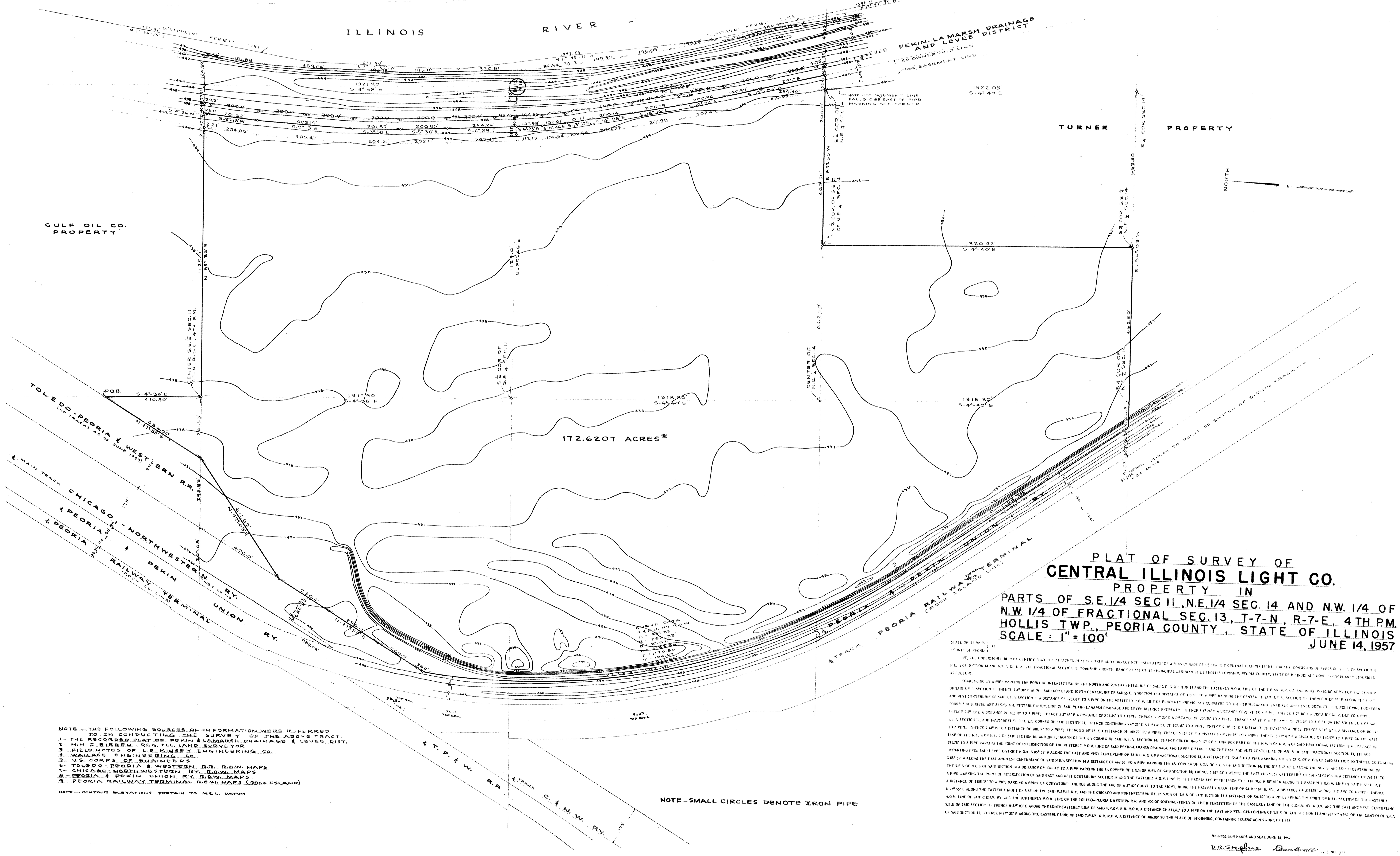
FIGURE 3-4

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL

APPENDICES

APPENDIX A
HISTORIC TOPOGRAPHIC MAP (1957)



PLAT OF SURVEY OF
CENTRAL ILLINOIS LIGHT CO.
PROPERTY IN
PARTS OF S.E. 1/4 SEC 11, N.E. 1/4 SEC. 14 AND N.W. 1/4 OF N.W. 1/4 OF FRACTIONAL SEC. 13, T-7-N, R-7-E, 4TH P.M. HOLLIS TWP., PEORIA COUNTY, STATE OF ILLINOIS
SCALE: 1" = 100'

JUNE 14, 1957

WITNESS OUR HANDS AND SEAL JUNE 14, 1957.

D. R. Stephens

NOTE — THE FOLLOWING SOURCES OF INFORMATION WERE REFERRED TO IN CONDUCTING THE SURVEY OF THE ABOVE TRACT

1 - THE RECORDED PLAT OF PEKIN & LAMARSH DRAINAGE & LEVEE DIST.
2 - M. H. J. BIRREN - REG. ILL. LAND SURVEYOR
3 - FIELD NOTES OF L. B. KINSEY ENGINEERING CO.
4 - WALLACE ENGINEERING CO.
5 - U.S. CORPS OF ENGINEERS
6 - TOLEDO - PEORIA & WESTERN R.R. R.O.W. MAPS
7 - CHICAGO - NORTHWESTERN RY. R.O.W. MAPS
8 - PEORIA & PEKIN UNION RY. R.O.W. MAPS
9 - PEORIA RAILWAY TERMINAL R.O.W. MAPS (ROCK ISLAND)

NOTE — CONTOUR ELEVATIONS PERTAIN TO M.S.L. DATUM

NOTE - SMALL CIRCLES DENOTE IRON PIPE

REV.	DATE	DESCRIPTION	BY	APPROVED	REV.	DATE	DESCRIPTION	BY	APPROVED

DESIGN AND DRAFTING ______ DATE ______
______ DATE ______
______ REG. ______ DATE ______
APPROVED ______ DATE ______

(SEAL)

PREPARED UNDER RESPONSIBLE SUPERVISION OF H. S. FENWICK
MICHIGAN PROFESSIONAL REGISTRATION NO. ______
ILLINOIS STRUCTURAL REGISTRATION NO. ______
AT OFFICES OF
COMMONWEALTH ASSOCIATES INC.
209 E. WASHINGTON AVE., JACKSON, MICH.

OWNER AND LOCATION
E.D. EDWARDS STATION
CENTRAL ILLINOIS LIGHT CO.
PEORIA, ILLINOIS

TITLE
PLANT - SITE SURVEY MAP
SCALE 1" = 200'-0"

SCALE: 1" = 200'-0"
2-20-118-1

DRAWING NO. C175-F1902

REV. | SHEET 1

INSP'D BY | PRINTS SENT OUT | AP

Gleason & Karn, Inc., Chicago

APPENDIX B
INFORMATION PERTINENT TO 35 I.A.C. § 845.220(a)(3)

SUMMARY OF POTENTIAL RECEPTORS WITHIN 1,000 METERS

DESKTOP STUDY

EDWARDS POWER PLANT

ASH POND

BARTONVILLE, IL

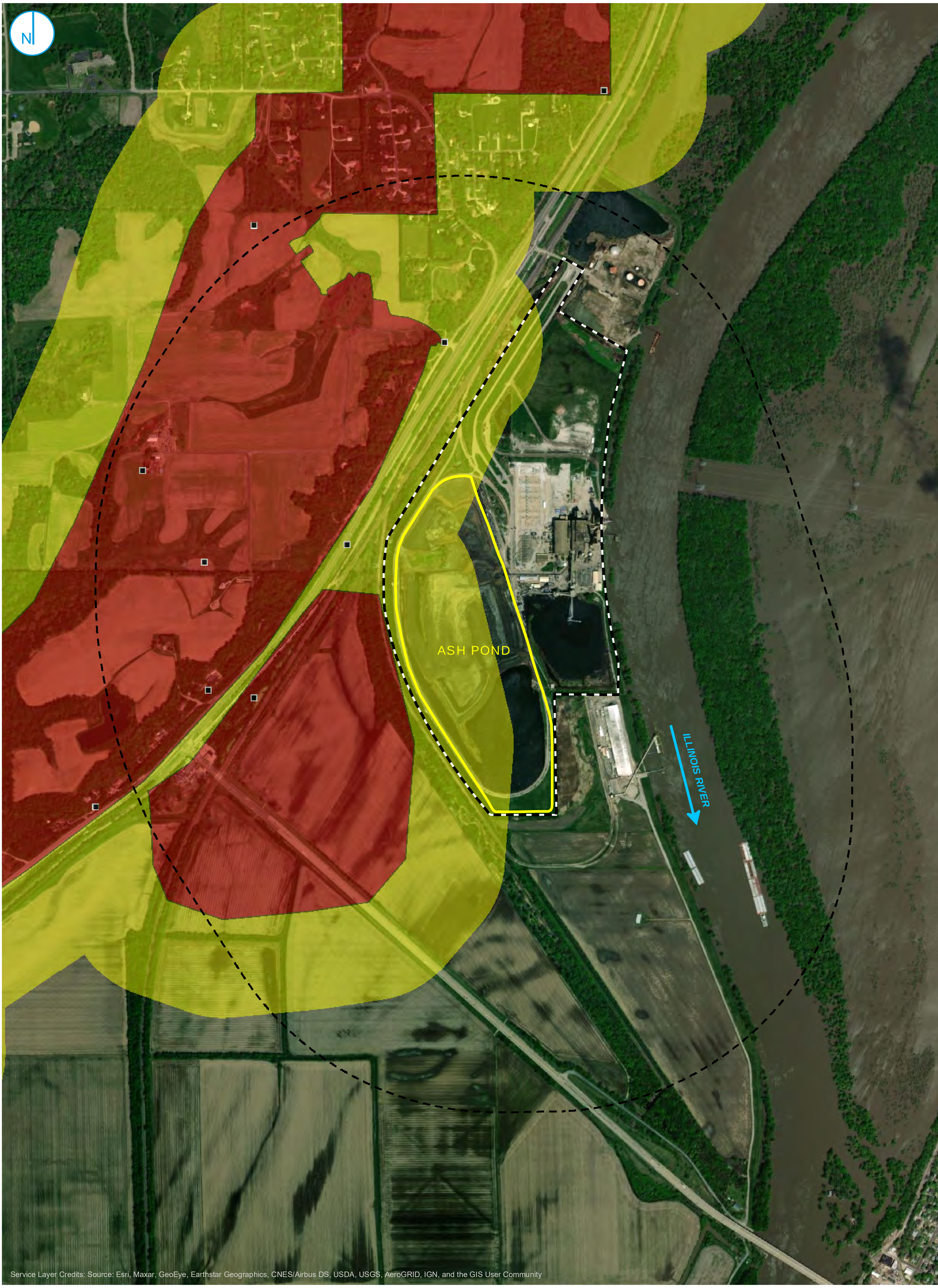
Category	Number of Receptors Identified Within 1,000 Meters	Number of Receptors Identified Downgradient of Unit	Notes
Mines	3	0	
Wells	14	3	No potable wells identified downgradient. Primary uses are industrial applications, monitoring and engineering test wells.
Surface Water Features	21	17	
Historic Sites	0	---	
Natural Sites	0	---	
Threatened or Endangered Species	24	---	Data provided only at a county level.
Oil Fields	0	3	Two wells of unknown status and one stratigraphic test well upgradient from unit.

[O: CJC 03/26/21; C: LDC 09/16/21]

Notes:
--- = none

RAMBOLL

MINING ACTIVITIES



COAL MINE SHAFT
UNDERGROUND COAL MINE
UNDERGROUND MINE BUFFER REGION
PART 845 REGULATED UNIT (SUBJECT UNIT)
1000 METER UNIT BUFFER
PROPERTY BOUNDARY

0 500 1,000 Feet

SOURCES: ISGS - ILMINES

ACTIVE AND ABANDONED COAL MINES

FIGURE B-1

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

MINES WITHIN 1,000 METERS
DESKTOP STUDY
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, IL

Mine ID	Mine Name	Distance from Unit (meters)	Physical Orientation to Unit	Hydraulic Orientation to Unit	Range of Active Dates	Mine Type	Coal Unit Mined	Mine Depth Top (ft BGS)	Mine Depth Bottom (ft BGS)	Final Extent Map Available	Notes
828	Third Vein Coal Co., Orchard Mine	0	U	Downgradient	1890-1909	Underground/Longwall	Springfield/Colchester	100	165	Y	Gas noted from roof of Colchester coal.
6673	George Petri Coal Co., Petri Mine	161	NW	Downgradient	1919-1933	Underground	Springfield	112	--	Y	None
3021	Robert Rogers, Hollis Mine	966	N	Downgradient	1933-1940	Main Slope	Springfield	--	--	Y	Fault noted (possible channel)

[O: CJC 03/26/21; C: LDC 09/16/21]

Notes:
BGS = below ground surface
ft = feet
ID = identification number
N = north
NW = northwest
U = underlying

RAMBOLL

WATER WELL SURVEY

DRY
ENGINEERING
WATER
N/A
PART 845 REGULATED UNIT (SUBJECT UNIT)
1000 METER UNIT BUFFER
PROPERTY BOUNDARY

0 500 1,000 Feet

SOURCE
IL WELLS

DRINKING WATER INTAKES, PUMPS, AND OTHER WATER USES

FIGURE B-2

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

WELLS WITHIN 1,000 METERS
DESKTOP STUDY
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, IL

Well Number	Date Constructed	Ground Elevation (ft NAVD88)	Screen Top Depth (FT BGS)	Screen Bottom Depth (ft BGS)	Screen Length (ft)	Screen Diameter (inches)	Well Depth (ft BGS)	Total Boring Depth (ft BGS)	Latitude (DD)	Longitude (DD)	Hydraulic Position Designation (B/Sd/U/D)	Notes
121792344300	11/19/1998	450	108	118	10	2	118	118	40.58296	-89.655159	U	
121433424000	8/16/2001	---	---	---	---	---	---	20	40.588081	-89.664793	U	
121432480200	9/30/1971	454	---	---	---	---	---	95	40.588073	-89.660552	U	
121432356000	---	---	---	---	---	---	---	60	40.605076	-89.661192	Sd	
121432525900	9/29/1971	---	---	---	---	---	---	51	40.587184	-89.659272	U	
121432526000	9/30/1971	445	---	---	---	---	---	96	40.587184	-89.659272	U	
121432526100	10/31/1971	436	---	---	---	---	---	96	40.587184	-89.659272	U	
121432526200	10/31/1971	437	---	---	---	---	---	92	40.587184	-89.659272	U	
121432526300	10/31/1971	437	---	---	---	---	---	92	40.587184	-89.659272	U	
121432526400	10/31/1971	436	---	---	---	---	---	35	40.587184	-89.659272	U	
121430133300	4/4/1968	---	---	---	---	---	---	30	40.590234	-89.662127	U	
121432221000	8/18/1978	570	---	---	---	---	---	65	40.600805	-89.667324	D	
121433566000	12/11/2017	---	---	---	---	---	---	98	40.586327	-89.679076	D	
121433566500	12/13/2017	---	80	300	220	4	300	300	40.586327	-89.679076	D	

[O: CJC 03/26/21; C: LDC 09/16/21]

Notes:
--- = no data
B = background
BGS = below ground surface
D = downgradient
DD = decimal degrees
ft = foot/feet
LCU = lower confining unit
NAVD88 = North American Vertical Datum of 1988, GEOID 12A
Sd= sidegradient
U = upgradient

RAMBOLL

ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
s.s. #55311	0	0
black dirt	0	10
grit gravel yellowish	10	12
dark tough clay black	12	30
Total Depth		**30**

Casing: 24" CONCRETE(TOP/BOTTOM) from 0' to 0'
Water from Gilbert gravel at 0' to 0'.

Remarks: tracing done by Dept. of Pub. Health
Driller's Log filed
Sample set # 55311 (1' - 25')
Owner Address: P.O. Box 876 Pekin, IL
Location source: Location from the driller

Permit Date: January 1, 1968 **Permit #:** NF3700

COMPANY Hampton, E. T.
FARM Cargo Carriers
DATE DRILLED April 5, 1968 **NO.**
ELEVATION 0 **COUNTY NO.** 01333
LOCATION 200'S 250'W NE/c SE NE
LATITUDE 40.590234 **LONGITUDE** -89.662127
COUNTY Peoria **API 121430133300** **14 - 7N - 7E**

ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
clay	0	30
rock	30	65
Total Depth		**65**

Casing: 24" ID CEMENT from 11' to 51'

Water from rock at 37' to 38'.
Static level 37' below casing top which is 1' above GL

Driller's Log filed

Owner Address: 911 Chestnut St. Pekin, IL
Location source: Location from permit

Permit Date: August 8, 1978 **Permit #:** 77945

COMPANY Shaver, D.
FARM Frazier, Sam
DATE DRILLED August 19, 1978 **NO.**
ELEVATION 570GL **COUNTY NO.** 22210
LOCATION NE NW SE
LATITUDE 40.600805 **LONGITUDE** -89.667324
COUNTY Peoria **API** 121432221000 11 - 7N - 7E

ILLINOIS STATE GEOLOGICAL SURVEY

Industrial Water Well	Top	Bottom
clay,sand & gravel	0	3
clay-sticky,black	3	10
clay-softer	10	15
clay-dark	15	29
sandstone-gray,soft	29	35
limestone	35	36
shale-gray	36	37
limestone-shale	37	43
shale-softer	43	60
Total Depth		**60**

Size hole below casing: 0"

Remarks: no water

Owner Address: 7022 S. Cilco Lane Bartonville, IL

Location source: Location from permit

Permit Date: September 17, 1987 **Permit #:** 135221

COMPANY Sauder, Steven E.

FARM Clark Oil & Refining

DATE DRILLED **NO.**

ELEVATION 0 **COUNTY NO.** 23560

LOCATION 100'N line, 50'W line of NW SW NW

LATITUDE 40.605076 **LONGITUDE** -89.661192

COUNTY Peoria **API 121432356000** **12 - 7N - 7E**

ILLINOIS STATE GEOLOGICAL SURVEY

Engineering Test	Top	Bottom
C #9411 (Spls. 1-11)	0	0
Total Depth		**95**

Remarks: Rec'd. 3/73

Core #C 9411 (0' - 0') Received: March 1, 1973

Owner Address: ,
Add'l loc. info: FALSE
Elev updated - ABL

Permit Date: **Permit #:**

COMPANY owner
FARM Bridge FA R25&75,Il.River
DATE DRILLED October 1, 1971 **NO.** 6-prelim
ELEVATION 454GL **COUNTY NO.** 24802
LOCATION SE SW NW
LATITUDE 40.588073 **LONGITUDE** -89.660552
COUNTY Peoria **API 121432480200** **13 - 7N - 7E**

ILLINOIS STATE GEOLOGICAL SURVEY

Engineering Test	Top	Bottom
Total Depth		51

Permit Date: **Permit #:**

COMPANY IL Dept. of Transportation

FARM Bridge over Illinois River at Pekin

DATE DRILLED September 30, 1971 **NO.** 4-prelim

ELEVATION 450GL **COUNTY NO.** 25259

LOCATION

LATITUDE 40.587184 **LONGITUDE** -89.659272

COUNTY Peoria **API 121432525900** **13 - 7N - 7E**

ILLINOIS STATE GEOLOGICAL SURVEY

Engineering Test	Top	Bottom
Total Depth		**96**

Permit Date: **Permit #:**

COMPANY IL Dept. of Transportation
FARM Bridge over Illinois River @ Pekin
DATE DRILLED October 1, 1971 **NO.** 5-prelim
ELEVATION 445GL **COUNTY NO.** 25260
LOCATION
LATITUDE 40.587184 **LONGITUDE** -89.659272
COUNTY **Peoria** **API** **121432526000** **13 - 7N - 7E**

ILLINOIS STATE GEOLOGICAL SURVEY

Engineering Test	Top	Bottom
Total Depth		96

Permit Date: **Permit #:**

COMPANY IL Dept. of Transportation
FARM Bridge over Illinois River @ Pekin
DATE DRILLED November 1, 1971 **NO.** 7-prelim
ELEVATION 436GL **COUNTY NO.** 25261
LOCATION
LATITUDE 40.587184 **LONGITUDE** -89.659272
COUNTY Peoria **API** 121432526100 13 - 7N - 7E

ILLINOIS STATE GEOLOGICAL SURVEY

Engineering Test	Top	Bottom
Total Depth		92

Permit Date: **Permit #:**

COMPANY IL Dept. of Transportation

FARM Bridge over Illinois River @ Pekin

DATE DRILLED November 1, 1971 **NO.** 8-prelim

ELEVATION 437GL **COUNTY NO.** 25262

LOCATION

LATITUDE 40.587184 **LONGITUDE** -89.659272

COUNTY **Peoria** **API** **121432526200** **13 - 7N - 7E**

ILLINOIS STATE GEOLOGICAL SURVEY

Engineering Test	Top	Bottom
Total Depth		92

Permit Date: **Permit #:**

COMPANY IL Dept. of Transportation
FARM Bridge over Illinois River @ Pekin
DATE DRILLED November 1, 1971 **NO.** 9-prelim
ELEVATION 437GL **COUNTY NO.** 25263
LOCATION
LATITUDE 40.587184 **LONGITUDE** -89.659272
COUNTY Peoria **API** 121432526300 13 - 7N - 7E

ILLINOIS STATE GEOLOGICAL SURVEY

Engineering Test	Top	Bottom
Total Depth		35

Permit Date: **Permit #:**

COMPANY IL Dept. of Transportation
FARM Bridge over Illinois River @ Pekin
DATE DRILLED November 1, 1971 **NO.** STH-1
ELEVATION 436GL **COUNTY NO.** 25264
LOCATION
LATITUDE 40.587184 **LONGITUDE** -89.659272
COUNTY Peoria **API** 121432526400 13 - 7N - 7E

ILLINOIS STATE GEOLOGICAL SURVEY

Semi-Private Water Well	Top	Bottom
clay	0	20
Total Depth		**20**

Casing: 6" SDR 21 from -1' to 11'
36" CONCRETE WELL TILE from 11' to 20'

Grout: HOLE PLUG from 10 to 11.

Grout: PEA GRAVEL from 11 to 20.

Water from clay at 4' to 20'.

Owner Address: 8710 S. Cargill Rd. Pekin, IL

Address of well: same as above

Location source: Location from permit

Permit Date: July 2, 2001 **Permit #:**

COMPANY Greenfield, Edward K.

FARM Cargill Fertilizer

DATE DRILLED August 17, 2001 **NO.**

ELEVATION 0 **COUNTY NO.** 34240

LOCATION SW SE NE

LATITUDE 40.588081 **LONGITUDE** -89.664793

COUNTY Peoria **API 121433424000** **14 - 7N - 7E**

ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
topsoil	0	2
brown clay	2	9
tan clay	9	14
gray clay	14	34
gravel	34	35
light gray shale	35	79
dark gray shale	79	98
Total Depth		**98**

Grout: BENTONITE from 0 to 98.

Water from DRY HOLE at ' to '.

Owner Address: PO Box 876 Pekin, IL

Address of well: 8710 S. Cargill Rd.
Peoria, IL

Location source: Location from permit

Permit Date: October 2, 2017 **Permit #:** 143-025

COMPANY Layten, James

FARM The Mosaic Company

DATE DRILLED December 12, 2017 **NO.** -1

ELEVATION **COUNTY NO.** 35660

LOCATION NW NW SW

LATITUDE 40.586327 **LONGITUDE** -89.679076

COUNTY Peoria **API 121433566000** **14 - 7N - 7E**

ILLINOIS STATE GEOLOGICAL SURVEY

Water Well for Commercial Operation	Top	Bottom
topsoil	0	2
brown clay	2	7
tan clay	7	16
gray clay	16	38
gravel	38	39
light gray shale	39	76
dark gray shale	76	88
hard gray shale	88	149
white shale	149	209
black shale	209	229
sandstone	229	246
light gray shale	246	265
shale w/ seams of sandstone	265	300
Total Depth		**300**

Casing: 6" SDR 21 from -3' to 88'
4" SCH 40 SLOTTED from 80' to 300'

Grout: BENSEAL from 6 to 300.

Water from sandstone & shale at 80' to 300'.
Static level 5' below casing top which is 3' above GL
Pumping level 105' when pumping at 5 gpm for hours

Permanent pump installed at 140'
on February 12, 2018, with a capacity of 5 gpm

Remarks: Driller's Estimated Well Yield 5 gpm

Owner Address: PO Box 876 Pekin, IL

Address of well: 8710 S. Cargill Rd.
Peoria, IL 61607

Location source: Location from permit

Permit Date: October 2, 2017 **Permit #:** 143-025

COMPANY Layten, James
FARM The Mosaic Company
DATE DRILLED December 14, 2017 **NO.** 2
ELEVATION **COUNTY NO.** 35665
LOCATION NW NW SW
LATITUDE 40.586327 **LONGITUDE** -89.679076
COUNTY Peoria **API 121433566500** **14 - 7N - 7E**

ILLINOIS STATE GEOLOGICAL SURVEY

Monitoring	Top	Bottom
silty clayey fine sand	0	14
lake clay with sand stringers	14	23
sand & gravel (coarsens downward)	23	118
Total Depth		**118**

Casing: 2" PVC from 0' to 108'
2" PVC SCREEN from 108' to 118'

Screen: 10' of 2" diameter .01 slot

Grout: NEAT CEMENT from 0 to 19.

Water from at 22' to '.
Static level 22' below casing top which is 0' above GL

Remarks: bedrock not encountered

Owner Address: ,

Address of well: Conservation Rd.

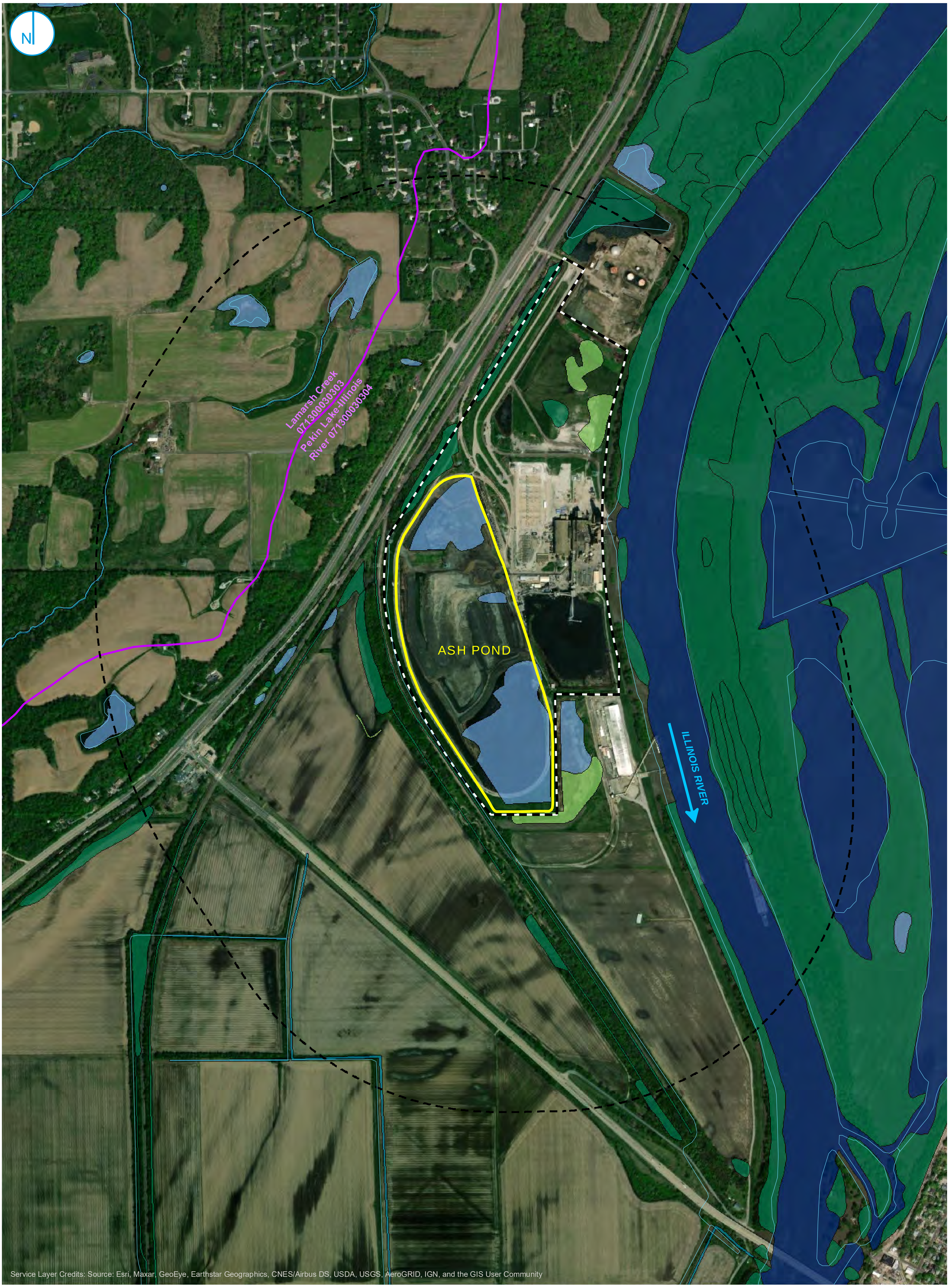
Add'l loc. info: FALSE
Tim Soldwedel Lake

Location source: Location from the driller

Permit Date: **Permit #:** none

COMPANY Wright's Drilling
FARM State of Illinois
DATE DRILLED November 20, 1998 **NO.** TH-3
ELEVATION 450 **COUNTY NO.** 23443
LOCATION SW SW SW
LATITUDE 40.58296 **LONGITUDE** -89.655159
COUNTY **Tazewell** **API** **121792344300** **27 - 25N - 5W**

SURFACE WATERS



SURFACE WATERBODY
WATERSHED BOUNDARY (HUC 12)
PART 845 REGULATED UNIT (SUBJECT UNIT)
1000 METER UNIT BUFFER
PROPERTY BOUNDARY

0 500 1,000 Feet

NATIONAL WETLANDS INVENTORY
FRESHWATER EMERGENT WETLAND
FRESHWATER FORESTED/SHRUB WETLAND
FRESHWATER POND
LAKE
OTHER
RIVERINE

SOURCES: USGS, USFWS

SURFACE WATERBODIES

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

FIGURE B-3

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

SURFACE WATER FEATURES WITHIN 1,000 METERS
DESKTOP STUDY
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, IL

HUC	Surface Water ID	Distance from Unit (meters)	Physical Orientation to Unit	Hydraulic Orientation to Unit	Classification Code	Size (acres)	Notes
--	Freshwater Emergent Wetland 2	381	NE	Downgradient	PEM1C	3.02	--
--	Freshwater Emergent Wetland 3	442	NE	Downgradient	PEM1C	3.24	--
--	Freshwater Forested/Shrub Wetland 1	43	NW	Downgradient	PFO1A	4.35	--
--	Freshwater Forested/Shrub Wetland 10	817	N	Downgradient	PFO1C	5.81	--
--	Freshwater Forested/Shrub Wetland 2	64	W	Downgradient	PFO1Ax	3.42	--
--	Freshwater Forested/Shrub Wetland 3	244	N	Downgradient	PFO1C	4.60	--
--	Freshwater Forested/Shrub Wetland 4	128	W	Downgradient	PFO1A	1.29	--
--	Freshwater Forested/Shrub Wetland 5	104	W	Downgradient	PFO1C	3.86	--
--	Freshwater Forested/Shrub Wetland 6	485	W	Downgradient	PFO1C	0.09	--
--	Freshwater Forested/Shrub Wetland 7	314	SE	Upgradient	PFO1C	1.68	--
--	Freshwater Forested/Shrub Wetland 8	320	NE	Downgradient	PFO1C	1.31	--
--	Freshwater Forested/Shrub Wetland 9	272	N	Downgradient	PFO1C	4.61	--
--	Freshwater Pond	201	W	Downgradient	PUBFx	0.4	--
--	Freshwater Pond	351	W	Downgradient	PUBGx	0.61	--
--	Freshwater Pond	534	W	Downgradient	PUBGx	0.22	--
--	Freshwater Pond	631	N	Downgradient	PUBGh	3.72	--
--	Freshwater Pond	799	NW	Downgradient	PUBGh	3.18	--
--	Freshwater Pond	966	W	Downgradient	PUBGh	3.51	--
07130003	Lake (Illinois River)	335	E	Upgradient	--	16,202.80	Staff gauge installed 8.7 river miles downstream of site. USGS 05568500 ILLINOIS RIVER AT KINGSTON MINES, IL
--	Pekin Lake	805	E	Upgradient	--	64.00	--
--	Worley Lake	805	E	Upgradient	--	64.00	--

[O: CJC 03/26/21; C: LDC 09/16/21]

Notes:
-- = not applicable
E = east
HUC = Hydrologic Unit Code
N = north
NE = northeast
NW = northwest
SE = southeast
USGS = United States Geological Survey
W = west

ENDANGERED / THREATENED SPECIES

PEORIA COUNTY THREATENED AND ENDANGERED SPECIES

DESKTOP STUDY

EDWARDS POWER PLANT

ASH POND

BARTONVILLE, IL

Scientific Name	Common Name	Status	Number of Occurances	Last Observed
Acipenser fulvescens	Lake Sturgeon	LE	3	6/22/2016
Agalinis skinneriana	Pale False Foxglove	LT	1	7/13/2011
Apalone mutica	Smooth Softshell	LT	2	9/18/2007
Boltonia decurrens	Decurrent False Aster	LT	5	9/13/2019
Bombus affinis	Rusty Patched Bumble Bee	LE	6	7/19/2016
Corallorhiza maculata	Spotted Coral-root Orchid	LE	1	6/1/2007
Cypripedium parviflorum	Small Yellow Lady's Slipper	LE	1	4/28/2012
Elliptio crassidens	Elephant-ear	LE	1	8/19/2012
Filipendula rubra	Queen-of-the-prairie	LT	1	8/5/2011
Fundulus dispar	Starhead Topminnow	LT	1	7/5/1989
Ixobrychus exilis	Least Bittern	LT	1	6/19/2004
Lanius ludovicianus	Loggerhead Shrike	LE	1	7/27/2006
Lepomis miniatus	Redspotted Sunfish	LT	1	10/28/2010
Lepomis symmetricus	Bantam Sunfish	LT	1	10/14/1998
Monarda clinopodia	White Bergamot	LT	1	7/13/1964
Myotis septentrionalis	Northern Long-eared Myotis	LT	2	6/7/2016
Myotis sodalis	Indiana Bat	LE	1	8/9/2017
Pandion haliaetus	Osprey	LT	4	5/1/2020
Poliocitellus franklinii	Franklin's Ground Squirrel	LT	1	7/19/2017
Quadrula metanevra	Monkeyface	LT	2	6/26/2012
Rallus elegans	King Rail	LE	1	5/26/1988
Reginaia ebenus	Ebonyshell	LE	1	8/4/2012
Speyeria idalia	Regal Fritillary	LT	1	7/14/1961
Viburnum molle	Arrowwood	LT	2	7/1/2017

[O: CJC 03/26/21; C: LDC 09/16/21]

Notes:
- -- = not provided/cannot be determined
- LE = listed endangered
- LT = listed threatened

APPENDIX C
BORING LOGS AND WELL CONSTRUCTION LOGS

2021 RAMBOLL BORING LOGS

RAMBOLL

SOIL BORING LOG INFORMATION

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Edwards Power Station		AW-12

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Russ Gordon Cascade Drilling	1/7/2021	1/7/2021	Mini Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
AW-12	Feet (NAVD88)	441.16 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,429,585.53 N, 2,436,922.88 E E/Ⓦ
1/4 of 1/4 of Section , T 7 N, R 7 E

Lat 40° 35' 27.828"
Long -89° 39' 40.8"

Local Grid Location: Feet ☐ N ☐ S; Feet ☐ E ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	72 72		0–2.2	0 - 2.2' **SILT:** ML, very dark grayish brown (10YR 3/2), roots (5-10%), clay (0-5%), sand (0-5%), gravel (0-5%), moist.	ML									CS= Core Sample
			2.2–6.2	2.2 - 6.2' **SILTY CLAY:** CL/ML, very dark grayish brown (10YR 3/2), sand (0-5%), stiff, medium plasticity, moist.	CL/ML				1.5 (3), 1 (4), 1 (5)					
2 CS	48 48		6	6' - 6.2' layer of gravelly clay, wet.					0.75					
			6.2–10.4	6.2 - 10.4' **SILTY CLAY:** CL/ML, dark gray (10YR 4/1), sand (0-5%), gravel (0-5%), organic material (0-5%), firm to stiff, medium plasticity, moist to wet.	CL/ML				0.75 (7), 1 (8), 1 (9)					
3 CS	120 84		10.4–18.4	10.4 - 18.4' **LEAN CLAY:** CL, dark grayish brown (10YR 4/2), dark yellowish brown (10YR 4/4) mottling (0-5%), sand (0-5%), gravel (0-5%), stiff, medium plasticity, moist.	CL				1 (11), 1 (13)					
			14	14' dark yellowish brown (10YR 4/4) mottling (30-45%).					1					

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
Sat Wb	Ramboll 234 W. Florida Street, Milwaukee,WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

Boring Number AW-12

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
4 CS	120 120		16–18	10.4 - 18.4' **LEAN CLAY:** CL, dark grayish brown (10YR 4/2), dark yellowish brown (10YR 4/4) mottling (0-5%), sand (0-5%), gravel (0-5%), stiff, medium plasticity, moist. *(continued)*	CL				1 1					
5 CS	120 120		19–23	18.4 - 23.8' **SILTY CLAY:** CL/ML, dark gray (10YR 4/1), sand (0-5%), organic material (0-5%), gravel (0-5%), very soft to soft, medium plasticity, moist.	CL/ML				0.25 0.25 0.5					
			24–26	23.8 - 27' **SILTY CLAY:** CL/ML, gray (10YR 6/1), sand (0-5%), shells (0-5%), firm to stiff, medium plasticity, moist.	CL/ML				1 1 1 0.5					
			27–29	27 - 30' **WELL-GRADED GRAVEL WITH SAND:** (GW)s, dark gray (10YR 4/1), fine to coarse gravel, wet.	(GW)s									
6 CS	60 60		30–34	30 - 35' **Weathered SHALE Bedrock** BDX (SH), gray (10YR 5/1).	BDX (SH)									
			35	35' End of Boring.										

SOIL BORING LOG INFORMATION

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Edwards Power Station		AW-13

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dave Gordon Cascade Drilling	1/9/2021	1/9/2021	Mini Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
AW-13	Feet (NAVD88)	438.67 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,428,600.70 N, 2,436,267.19 E E/W
1/4 of 1/4 of Section , T 7 N, R 7 E
Lat 40° 35' 18.134"
Long -89° 39' 49.372"
Local Grid Location ☐ N ☐ S Feet ☐ E ☐ W Feet

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	240 135		0 - 0.9	0 - 0.9' **FILL, SILT WITH GRAVEL:** (ML)g, brown (10YR 4/3), clay (5-15%), sand (5-15%), no dilatancy, low toughness, non-plastic, wet.	(FILL) (ML)g									CS= Core Sample
			0.9 - 2.6	0.9 - 2.6' **SILT:** ML, dark brown (10YR 3/3) to dark olive brown (2.5Y 3/3), clay (15-30%), sand (5-15%), yellowish brown (10YR 5/4) sand seams, no dilatancy, medium toughness, low plasticity.	ML									
			2.6 - 5.5	2.6 - 5.5' **LEAN CLAY WITH SAND:** (CL)s, yellowish brown (10YR 5/4), dark gray (10YR 4/1) mottling (5-15%), silt (5-15%), no to slow dilatancy, low toughness, low to medium plasticity.	(CL)s									
			5.5 - 15	5.5 - 20' **LEAN CLAY:** CL, dark gray (10YR 4/1), yellowish brown (10YR 5/4) mottling (0-5%), silt (15-30%), no dilatancy, low toughness, medium plasticity. 7.8' wet.	CL									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm Ramboll
234 W. Florida Street, Milwaukee,WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

Boring Number AW-13

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			16–19	5.5 - 20' **LEAN CLAY:** CL, dark gray (10YR 4/1), yellowish brown (10YR 5/4) mottling (0-5%), silt (15-30%), no dilatancy, low toughness, medium plasticity. *(continued)* 19' very dark gray (5Y 3/1), shells (0-5%), organic material (0-5%).	CL									
2 CS	60 60		20–23	20 - 23.6' **SILTY CLAY:** CL/ML, dark gray (10YR 4/1), yellowish brown (10YR 5/4) mottling (0-5%), shells (0-5%), organic material (0-5%), no dilatancy, low toughness, low plasticity.	CL/ML									
3 CS	60 60		24–27	23.6 - 27.3' **SILT:** ML, dark gray (10YR 4/1), clay (15-30%), no dilatancy, low toughness, low plasticity.	ML									
			28	27.3 - 29' **Weathered SHALE Bedrock** BDX (SH), gray (5Y 6/1) to greenish gray (GLEY 1 6/1).	BDX (SH)									
			29–30	29 - 30' **SHALE:** BDX (SH), gray (5Y 6/1).	BDX (SH)									
			30	30' End of Boring.										

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SOIL BORING LOG INFORMATION

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Edwards Power Station		AW-13A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dave Gordon Cascade Drilling	1/9/2021	1/9/2021	Mini Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD88)	Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E E /(W)
1/4 of 1/4 of Section , T 7 N, R 7 E
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ S Feet ☐ E ☐ W Feet

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 51		0 – 1.9	0 - 1.9' **FILL, SILT WITH GRAVEL:** (ML)g, brown (10YR 4/3), clay (5-15%), sand (5-15%), no dilatancy, low toughness, non-plastic, moist.	(FILL) (ML)g									CS= Core Sample
			1.9 – 2.7	1.9 - 2.7' **FILL, POORLY-GRADED GRAVEL:** GP, dark olive brown (2.5Y 3/3), fine gravel, sand (5-15%), silt (0-5%), dry.	(FILL) GP									
			2.7 – 5.0	2.7 - 5' **SILT:** ML, dark brown (10YR 3/3) to dark olive brown (2.5Y 3/3), clay (15-30%), sand (5-15%), yellowish brown (10YR 5/4) sand seams, no dilatancy, medium toughness, low plasticity, moist.	ML									
2 SH	24 24		5.0 – 7.0	5 - 7' **LEAN CLAY:** CL.	CL					25.2	30	16	69.7	SH= Shelby Tube sample
			7.0	7' End of Boring.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
[signature]	Ramboll 234 W. Florida Street, Milwaukee,WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Edwards Power Station		AW-14

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dave Gordon Cascade Drilling	1/8/2021	1/8/2021	Mini Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
AW-14	Feet (NAVD88)	436.83 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,428,201.15 N, 2,435,739.93 E E/Ⓦ
1/4 of 1/4 of Section , T 7 N, R 7 E
Lat 40° 35' 14.215"
Long -89° 39' 56.236"
Local Grid Location ☐N ☐S Feet ☐E ☐W Feet

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	120 120		0–2.2	0 - 2.2' **SILT WITH SAND:** (ML)s, very dark grayish brown (10YR 3/2) to dark grayish brown (10YR 4/2), gravel (5-15%), roots (0-5%), no dilatancy, low toughness, non-plastic, moist to wet.	(ML)s									CS= Core Sample
			2.2–3.7	2.2 - 3.7' **SILT:** ML, dark grayish brown (10YR 4/2), very dark grayish brown (10YR 3/2) mottling (15-30%), yellowish brown (10YR 5/6) mottling (0-5%), clay (15-30%), sand (0-5%), stiff, no dilatancy, low toughness, low plasticity, moist.	ML				1.5					
			3.7–	3.7 - 27' **LEAN CLAY:** CL, dark gray (10YR 4/1), silt (5-30%), shells (0-5%), organic material (0-5%).	CL				0.25 0.25					
2 CS	120 101		10											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm Ramboll
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Boring Number AW-14

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			16	3.7 - 27' **LEAN CLAY:** CL, dark gray (10YR 4/1), silt (5-30%), shells (0-5%), organic material (0-5%). *(continued)*										
			18	18' organic material (5-15%).										
3 CS	60 60		20	20' slow dilatancy.										
			21		CL									
4 CS	120 84		25											
			27	27 - 28' **Weathered SHALE Bedrock** BDX (SH), dark grayish brown (10YR 4/2), clay (15-30%), shells (0-5%), gravel (0-5%).	BDX (SH)									
			28	28 - 35' **SHALE:** BDX (SH), dark gray (10YR 4/1) to gray (10YR 6/1), dry.	BDX (SH)									
			35	35' End of Boring.										

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Edwards Power Station		AW-15

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dave Gordon Cascade Drilling	1/8/2021	1/8/2021	Mini Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
AW-15	Feet (NAVD88)	438.95 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,428,445.04 N, 2,435,405.11 E E/Ⓦ
1/4 of 1/4 of Section , T 7 N, R 7 E

Lat 40° 35' 16.644"
Long -89° 40' 0.557"

Local Grid Location
Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	240 167		0 - 0.6	0 - 0.6' **POORLY-GRADED SAND:** SP, dark grayish brown (10YR 4/2), fine to medium sand, gravel (5-15%), silt (5-15%), roots (0-5%), moist.	SP									CS= Core Sample
			0.6 - 13.5	0.6 - 13.5' **SILT:** ML, dark grayish brown (10YR 4/2), dark yellowish brown (10YR 4/6) to dark brown (7.5YR 3/4) mottling (15-30%), clay (15-30%), sand (5-15%), shells (0-5%), no dilatancy, medium toughness, low plasticity, moist, blocky.	ML									
			11	11' dark yellowish brown (10YR 4/6) to dark brown (7.5YR 3/4) mottling (5-15%).										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm Ramboll
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Boring Number AW-15

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			14	13.5 - 14' **LEAN CLAY:** CL, dark gray (10YR 4/1) to (5Y 4/1), silt (15-30%), sand (0-5%), shells (0-5%), no to slow dilatancy, low toughness, medium plasticity, moist.	CL									
			15–17	14 - 17' **SILTY CLAY:** CL/ML, dark gray (10YR 4/1) to (5Y 4/1), sand (0-5%), shells (0-5%), no to slow dilatancy, low toughness, medium plasticity, wet.	CL/ML									
			17–20	17 - 20' **LEAN CLAY:** CL, dark gray (10YR 4/1) to (5Y 4/1), silt (15-30%), sand (0-5%), shells (0-5%), no to slow dilatancy, low toughness, medium plasticity, wet. 19.5' moist.	CL									
2 SH	24 24		20–22	20 - 22' **FAT CLAY:** CH.	CH					27.9	57	38	98	SH= Shelby Tube sample
3 CS	156 156		22–35.8	22 - 35.8' **LEAN CLAY:** CL, dark gray (10YR 4/1) to (5Y 4/1), silt (15-30%), sand (0-5%), shells (0-5%), no to slow dilatancy, low toughness, medium plasticity, moist. 26.5' organic material (0-5%). 28' - 29' organic material (5-15%). 34' piece of wood 1" long.	CL									
4 CS	60 60		35–36											

Boring Number AW-15

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			37	35.8 - 36.9' **Weathered SHALE Bedrock** BDX (SH), dark gray (10YR 4/1) to gray (10YR 6/1). *(continued)*	BDX (SH)									
			38 39	36.9 - 40' **SHALE:** BDX (SH), gray (10YR 6/1), dry.	BDX (SH)									
			40	40' End of Boring.										

SOIL BORING LOG INFORMATION

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Edwards Power Station		AW-15C

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dave Gordon Cascade Drilling	1/7/2021	1/8/2021	Mini Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
AW-15C	Feet (NAVD88)	437.62 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,428,458.08 N, 2,435,388.24 E E/W
1/4 of 1/4 of Section , T 7 N, R 7 E
Lat 40° 35' 16.774"
Long -89° 40' 0.775"
Local Grid Location ☐N ☐S Feet ☐E ☐W Feet

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	120 120		0	0 - 4.4' **CLAYEY SILT** ML/CL, grayish brown (10YR 5/2), brown (10YR 4/3) mottling (0-5%), roots (0-5%), gravel (0-5%), stiff, no to slow dilatancy, low toughness, low plasticity, moist.					1.5					CS= Core Sample
			2	1.8' brown (10YR 4/3) mottling (15-20%), strong brown (7.5YR 5/6) mottling (0-5%).	ML/CL				1.5					
			4.4	4.4 - 8' **LEAN CLAY:** CL, dark grayish brown (10YR 4/2), grayish brown (10YR 5/2) mottling (0-15%), dark yellowish brown (10YR 4/6) mottling (0-5%), no to slow dilatancy, low toughness, medium plasticity, moist, light gray (7.5YR 7/1) sand seams (0-5%) with strong brown (7.5YR 4/6) mottling, 1/16" thick light gray (7.5YR 7/1) sand seams (0-5%), strong brown (7.5YR 4/6) mottling, 1/16" diameter.	CL				1.5 2.5					
			7.5	7.5' organic material (0-15%), shells (0-5%).										
			8	8 - 30.2' **SILTY CLAY:** CL/ML, dark grayish brown (10YR 4/2), dark gray (10YR 4/1) (5-15%), yellowish brown (10YR 5/8) mottling (5-15%), sand (5-15%), organic material (0-15%), shells (0-5%).					0.75					
			9.5	9.5' no sand, gray (10YR 4/1) mottling (0-5%).										
2 CS	120 120		10		CL/ML				0.5					

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature [signature]

Firm Ramboll
234 W. Florida Street, Milwaukee,WI 53204
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Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
				8 - 30.2' **SILTY CLAY:** CL/ML, dark grayish brown (10YR 4/2), dark gray (10YR 4/1) (5-15%), yellowish brown (10YR 5/8) mottling (5-15%), sand (5-15%), organic material (0-15%), shells (0-5%). *(continued)*										
			13						0.25					
			14											
			15						0.25					
			16											
			17	17.2' - 19' organic material (5-15%).					0.25					
			18											
			19						0.25					
3 CS	120 116		20	20' organic material (0-5%), no mottling.										
			21	21.4' light brownish gray (10YR 6/2) mottling (0-5%), silt seams <1/16".	CL/ML				0.25					
			22											
			23						0.25					
			24											
			25						0.25					
			26											
			27						0.25					
			28											
			29						0.25					
4 CS	120 113		30	30.2 - 40' **Weathered SHALE Bedrock** BDX (SH), gray (2.5Y 5/1), highly decomposed, dry.										
			31		BDX (SH)									
			32											

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Boring Number AW-15C

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			33–40	30.2 - 40' **Weathered SHALE Bedrock** BDX (SH), gray (2.5Y 5/1), highly decomposed, dry. *(continued)* 36.6' dark grayish brown (10YR 4/2) to gray (5Y 6/1).	BDX (SH)									
5 CS	60 46		40	40 - 100' **SHALE:** BDX (SH), dark grayish brown (10YR 4/2) to gray (5Y 6/1).	BDX (SH)									
6 CS	84 84		45–52											

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
7 CS	240 211		53–72	40 - 100' **SHALE:** BDX (SH), dark grayish brown (10YR 4/2) to gray (5Y 6/1). *(continued)* 52' greenish gray (GLEY 1 5/1) to gray (5Y 6/1) laminations. 57.2 - 57.3' light brownish gray (10YR 6/2) concretion. 69.5 - 69.6' light brownish gray (10YR 6/2) concretion.	BDX (SH)									

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
8 CS	240 48			40 - 100' **SHALE:** BDX (SH), dark grayish brown (10YR 4/2) to gray (5Y 6/1). *(continued)*										
			73											
			74											
			75											
			76											
			77											
			78											
			79											
			80											
			81											
			82	82' dark greenish gray (GLEY 1 4/1).	BDX (SH)									
			83											
			84											
			85											
			86											
			87											
			88											
			89											
			90											
			91											
			92											

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
9 CS	96 46		93 94 95 96 97 98 99 100	40 - 100' **SHALE:** BDX (SH), dark grayish brown (10YR 4/2) to gray (5Y 6/1). *(continued)*	BDX (SH)									
				100' End of Boring.										

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Edwards Power Station		AW-15S

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dave Gordon Cascade Drilling	1/8/2021	1/8/2021	Mini Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
AW-15S	Feet (NAVD88)	437.92 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,428,441.60 N, 2,435,399.83 E E/W
1/4 of 1/4 of Section , T 7 N, R 7 E
Lat 40° 35' 16.61"
Long -89° 40' 0.626"
Local Grid Location ☐ N ☐ S Feet ☐ E ☐ W Feet

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	240 200		0	0 - 12' **SILT:** ML, dark grayish brown (10YR 4/2), brown (10YR 4/3) mottling (5-15%), clay (15-30%), roots (0-5%), wood (0-5%), sand (0-5%), very soft to very stiff, slow to no dilatancy, low toughness, low plasticity, moist.										CS= Core Sample
			1						0.5					
			2											
			3						0.25					
			4											
			5						0.5					
			6		ML									
			7						3					
			8											
			9											
			10	10' dark gray (10YR 4/1), dark grayish brown (10YR 4/2) mottling (30-45%), dark brown (7.5YR 3/3) mottling (0-5%).										
			11	11' dark grayish brown (10YR 4/2), wood (5-15%).					1.5					
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
[signature]	Ramboll 234 W. Florida Street, Milwaukee,WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

Boring Number AW-15S

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			13	12 - 20' **LEAN CLAY:** CL, dark gray (10YR 4/1) to (5Y 4/1), shells (0-5%), organic material (0-5%), soft, slow dilatancy, low toughness, medium plasticity, moist to wet.					0.5					
			14	14' moist.										
			15											
			16		CL									
			17											
			18											
			19											
			20	20' End of Boring.										

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SOIL BORING LOG INFORMATION

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Edwards Power Station		AW-16

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Adam Jochimsen Cascade Drilling	1/7/2021	1/8/2021	Mini Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
AW-16	Feet (NAVD88)	459.45 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,428,987.30 N, 2,435,130.53 E E/W
1/4 of 1/4 of Section , T 7 N, R 7 E
Lat 40° 35' 22.018"
Long -89° 40' 4.077"
Local Grid Location: Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 57		0–5	0 - 5' **FILL, SILT WITH SAND:** (ML)s, grayish brown (10YR 5/2), ash (5-10%), gravel (0-5%), stiff, slow dilatancy, low toughness, non-plastic, moist to dry.	(FILL) (ML)s				1.25					7-inch override casing set at 20 feet below ground surface
2 CS	60 60		5–10	5 - 16.8' ASH, very dark gray (10YR 3/1), silt to sand sized grains, slag-like material (0-5%), subangular to subrounded, loose, dry to moist.	(FILL) ASH									CS= Core Sample
3 CS	120 92		10–12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13–16	5 - 16.8' ASH, very dark gray (10YR 3/1), silt to sand sized grains, slag-like material (0-5%), subangular to subrounded, loose, dry to moist. *(continued)*	(FILL) ASH									
			17	16.8 - 58.5' **SILTY CLAY:** CL/ML, grayish brown (10YR 5/2), brown (7.5YR 4/4) mottling (15-20%), shells (0-5%), sand (0-5%), gravel (0-5%), stiff to firm, slow dilatancy, low to medium toughness, medium plasticity, moist.	CL/ML				1.25					
			19						2.25					
4 CS	120 88		20											
			21						0.75					
			22	22.1' dark gray (10YR 4/1), organic material (0-5%).										
			23						0.75					
			25						2					
			27						1.75					
			29						2.5					
5 CS	60 40		30											
			31						1.5					

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Boring Number AW-16

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			33	16.8 - 58.5' **SILTY CLAY:** CL/ML, grayish brown (10YR 5/2), brown (7.5YR 4/4) mottling (15-20%), shells (0-5%), sand (0-5%), gravel (0-5%), stiff to firm, slow dilatancy, low to medium toughness, medium plasticity, moist. *(continued)*					1.5					
			34	34' brown (7.5YR 4/4) mottling, stiff.										
6 CS	60 60		35						1.75					
			36											
			37						1.5					
			38	38' dark grayish green (5GY 4/2), no mottling.										
			39						1.25					
7 CS	60 60		40											
			41						1.25					
			42		CL/ML									
			43						1.5					
			44											
8 CS	60 60		45	45' organic material (5-10%).					1.25					
			46											
			47						1					
			48											
			49						1					
9 CS	60 58		50											
			51						0.75					
			52											

RAMBOLL

Boring Number AW-16

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			53	16.8 - 58.5' **SILTY CLAY:** CL/ML, grayish brown (10YR 5/2), brown (7.5YR 4/4) mottling (15-20%), shells (0-5%), sand (0-5%), gravel (0-5%), stiff to firm, slow dilatancy, low to medium toughness, medium plasticity, moist. *(continued)*					0.75					
			54											
10 CS	60 60		55		CL/ML				0.75					
			56											
			57						0.75					
			58											
			59	58.5 - 60' **Weathered SHALE Bedrock** BDX (SH), gray (10YR 5/1).	BDX (SH)				0.5					
11 CS	36 36		60	60 - 63' **SHALE:** BDX (SH), black (10YR 2/1).										
			61		BDX (SH)									
			62											
			63	63' End of Boring.										

RAMBOLL

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Edwards Power Station		AW-17

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Adam Jochimsen Cascade Drilling	1/8/2021	1/8/2021	Mini Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
AW-17	Feet (NAVD88)	459.69 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,429,801.14 N, 2,434,680.17 E E/W
1/4 of 1/4 of Section , T 7 N, R 7 E
Lat 40° 35' 30.085"
Long -89° 40' 9.855"
Local Grid Location ☐ N ☐ S Feet ☐ E ☐ W Feet

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 60		0–4.7	0 - 4.7' ASH, grayish brown (10YR 5/2), sand to gravel sized grains, subangular to subrounded medium to fine-grained sand, silt (5-10%), loose, moist.	(FILL) ASH									7-inch override casing set at 20 feet below ground surface
2 CS	120 65		4.7–6.3	4.7 - 6.3' **FILL, SILTY CLAY:** CL/ML, grayish brown (10YR 5/2), sand (5-10%), very soft, rapid dilatancy, low toughness, medium to low plasticity, moist to wet.	(FILL) CL/ML				0.25					CS= Core Sample
			6.3–7.8	6.3 - 7.8' ASH, grayish brown (10YR 5/2), sand to gravel sized grains, subangular to subrounded medium to coarse-grained sand, loose moist.	(FILL) ASH				2.25					
			7.8–10.0	7.8 - 33.7' **SILTY CLAY:** CL/ML, grayish brown (10YR 5/2), brown (7.5YR 4/4) mottling (25-30%), organic material (0-10%), shells (0-5%), sand (0-5%), stiff to very stiff, slow dilatancy, low toughness, medium plasticity, moist.	CL/ML				2.5					

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
[signature]	Ramboll 234 W. Florida Street, Milwaukee,WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

RAMBOLL

Boring Number AW-17

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			10.5	7.8 - 33.7' **SILTY CLAY:** CL/ML, grayish brown (10YR 5/2), brown (7.5YR 4/4) mottling (25-30%), organic material (0-10%), shells (0-5%), sand (0-5%), stiff to very stiff, slow dilatancy, low toughness, medium plasticity, moist. *(continued)*										
			11.0						2					
			11.5											
			12.0											
			12.5	12.2' -12.3 strong brown (7.5YR 4/6) layer of oxidation.										
			13.0						2.25					
			13.5											
			14.0											
			14.5											
			15.0	14.7' gray (10YR 5/1), no mottling, silt seams <1/16" thick (0-5%), firm, moist.										
3 CS	120 114		15.5						1.5					
			16.0											
			16.5											
			17.0						1.5					
			17.5											
			18.0											
			18.5		CL/ML									
			19.0						1					
			19.5											
			20.0	20' brown (7.5YR 4/4) mottling (10-15%).										
			20.5											
			21.0						0.75					
			21.5											
			22.0											
			22.5											
			23.0						0.75					
			23.5											
			24.0											
			24.5											
4 CS	60 60		25.0						0.75					
			25.5											
			26.0											
			26.5											

Boring Number AW-17

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			27.0	7.8 - 33.7' **SILTY CLAY:** CL/ML, grayish brown (10YR 5/2), brown (7.5YR 4/4) mottling (25-30%), organic material (0-10%), shells (0-5%), sand (0-5%), stiff to very stiff, slow dilatancy, low toughness, medium plasticity, moist. *(continued)* 26.8' - 27.6' dark gray (10YR 4/1), organic material (10-15%), very stiff.					3.25					
			29.0						2.5					
5 CS	60 60		30.0		CL/ML									
			31.0						1.25					
			33.0						1.25					
			34.0	33.7 - 38' **CLAYEY SILT** ML/CL, yellowish brown (10YR 5/4), gray (10YR 6/1) mottling (5-15%), organic material (5-10%), sand (0-5%), firm, slow dilatancy, low toughness, low plasticity, moist.										
6 CS	60 58		35.0						0.75					
			36.0		ML/CL									
			37.0						0.75					
			38.0	38 - 55.1' **SILTY CLAY:** CL/ML, dark gray (10YR 4/1) to gray (10YR 5/1), shells (0-5%), organic material (0-5%), firm, slow dilatancy, low toughness, medium plasticity, moist.										
			39.0						0.75					
7 CS	120 109		40.0											
			40.5		CL/ML									
			41.0						0.75					
			43.0						0.75					

Boring Number AW-17

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			43.5	38 - 55.1' **SILTY CLAY:** CL/ML, dark gray (10YR 4/1) to gray (10YR 5/1), shells (0-5%), organic material (0-5%), firm, slow dilatancy, low toughness, medium plasticity, moist. *(continued)*										
			45.0						0.75					
			47.0						0.75					
			48.5	48.2' organic material (5-10%).										
			49.0		CL/ML				0.75					
8 CS	84 70		50.0											
			51.0						0.75					
			53.0						0.75					
			54.0						0.75					
			55.0	54.7' - 55.1' gravel (0-5%).										
			55.1	55.1 - 57' **SHALE:** BDX (SH), gray (10YR 6/1), dry.	BDX (SH)									
			57.0	57' End of Boring.										

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SOIL BORING LOG INFORMATION

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Edwards Power Station		AW-18

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Adam Jochimsen Cascade Drilling	1/8/2021	1/9/2021	Mini Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
AW-18	Feet (NAVD88)	460.28 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,430,290.97 N, 2,434,561.45 E E/W
1/4 of 1/4 of Section , T 7 N, R 7 E

Lat 40° 35' 34.932"
Long -89° 40' 11.358"

Local Grid Location ☐ N ☐ S Feet ☐ E ☐ W Feet

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 56		0–1	0 - 1.4' **FILL, POORLY-GRADED SAND WITH GRAVEL:** (SP)g, brown (10YR 4/3), subrounded to rounded, medium sand, loose, moist.	(FILL) (SP)g									7-inch override casing set at 10 feet below ground surface
			2–4	1.4 - 7.4' ASH, very dark gray (10YR 3/1), silt sized grains, moist to wet.	(FILL) ASH									
2 CS	60 56		5–6											CS= Core Sample
			7	6.8' sand and gravel (10-15%).					2.5					
			8–9	7.4 - 34.2' **SILTY CLAY:** CL/ML, grayish brown (10YR 5/2), brown (7.5YR 4/4) mottling, (10-20%), shells (0-5%), organic material (0-5%), firm to very stiff, slow dilatancy, low toughness, medium plasticity, moist.	CL/ML				2.25					
3 CS	120 73		10–12						1.75					

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
[signature]	Ramboll 234 W. Florida Street, Milwaukee,WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13	7.4 - 34.2' **SILTY CLAY:** CL/ML, grayish brown (10YR 5/2), brown (7.5YR 4/4) mottling, (10-20%), shells (0-5%), organic material (0-5%), firm to very stiff, slow dilatancy, low toughness, medium plasticity, moist. *(continued)*					1.75					
			14											
			15						1.75					
			16											
			17						1.5					
			18											
			19						1.75					
4 CS	120 77		20											
			21						0.75					
			22		CL/ML									
			23						0.75					
			24											
			25						0.75					
			26											
			27						0.75					
			28											
			29						0.5					
5 CS	60 51		30											
			31	31.4' organic material (5-10%).					0.75					
			32											

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			33	7.4 - 34.2' **SILTY CLAY:** CL/ML, grayish brown (10YR 5/2), brown (7.5YR 4/4) mottling, (10-20%), shells (0-5%), organic material (0-5%), firm to very stiff, slow dilatancy, low toughness, medium plasticity, moist. *(continued)*	CL/ML				2.5					
			34											
6 CS	60 46		35	34.2 - 39.4' **CLAYEY SILT** ML/CL, gray (10YR 5/1), brown (7.5YR 4/4) mottling (15-20%), shells (0-5%), firm to very stiff, slow dilatancy, low toughness, low plasticity, moist.					2.5					
			36											
			37		ML/CL				1.25					
			38											
			39						0.75					
7 CS	60 58		40	39.4 - 49.8' **SILTY CLAY:** CL/ML, dark gray (10YR 4/1), organic material (5-10%), shells (0-5%), firm, slow dilatancy, low toughness, medium plasticity, moist.										
			41						0.75					
			42											
			43						0.75					
			44											
8 CS	60 60		45		CL/ML				0.75					
			46											
			47						0.75					
			48											
			49						0.75					
9 CS	60 60		50	49.8 - 55' **SHALE:** BDX (SH), gray (10YR 6/1), dry.										
			51		BDX (SH)									
			52											

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Boring Number AW-18

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			53 54 55	49.8 - 55' **SHALE:** BDX (SH), gray (10YR 6/1), dry. *(continued)*	BDX (SH)									
				55' End of Boring.										

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SOIL BORING LOG INFORMATION

Facility/Project Name: Edwards Power Station	License/Permit/Monitoring Number:	Boring Number: AW-19

Boring Drilled By: Name of crew chief (first, last) and Firm: Adam Jochimsen, Cascade Drilling	Date Drilling Started: 1/9/2021	Date Drilling Completed: 1/9/2021	Drilling Method: Mini Sonic
Common Well Name: AW-19	Final Static Water Level: Feet (NAVD88)	Surface Elevation: 458.53 Feet (NAVD88)	Borehole Diameter: 6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,431,161.80 N, 2,434,584.70 E E/W
1/4 of 1/4 of Section , T 7 N, R 7 E
Lat 40° 35' 43.536"
Long -89° 40' 10.993"
Local Grid Location ☐ N ☐ S Feet ☐ E ☐ W Feet

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	120 111		0–2	0 - 1.8' **FILL, POORLY-GRADED SAND WITH GRAVEL:** (SP)g, brown (10YR 5/3), subrounded to subangular, coarse to medium sand, loose, moist.	(FILL) (SP)g									7-inch override casing set at 10 feet below ground surface
			2–7	1.8 - 7.1' ASH, very dark gray (10YR 3/1), silt sized grains, soft, moist to wet.	(FILL) ASH				0.25 (3.2 ft), 0.25 (5.2 ft), 0.25 (7.2 ft)					CS= Core Sample
2 CS	60 47		7–12	7.1 - 23.6' **SILTY CLAY:** CL/ML, gray (10YR 5/1), yellowish brown (10YR 5/6) mottling (5-10%), shells (0-5%), organic material (0-5%), very stiff, slow dilatancy, medium toughness, high plasticity, moist.	CL/ML				2.5 (9.2 ft), 2.25 (11.2 ft)					

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm Ramboll
234 W. Florida Street, Milwaukee,WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

Boring Number AW-19

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13	7.1 - 23.6' **SILTY CLAY:** CL/ML, gray (10YR 5/1), yellowish brown (10YR 5/6) mottling (5-10%), shells (0-5%), organic material (0-5%), very stiff, slow dilatancy, medium toughness, high plasticity, moist. *(continued)*					2.5					
			14											
3 CS	60 43		15						2.25					
			16											
			17						2.25					
			18		CL/ML									
			19						2					
4 CS	60 46		20											
			21						2.5					
			22											
			23						2.25					
			24	23.6 - 35' **FAT CLAY:** CH, dark gray (10YR 4/1), very dark gray (10YR 3/1) and yellowish brown (10YR 5/6) mottling (5-10%), organic material (0-5%), shells (0-5%), gravel (0-5%), stiff, slow dilatancy, medium toughness, medium to high plasticity, moist.										
5 CS	60 39		25						2.5					
			26											
			27						2.5					
			28		CH									
			29						2.5					
6 CS	60 41		30											
			31						2.25					
			32											

RAMBOLL

Boring Number AW-19

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			33 34	23.6 - 35' **FAT CLAY:** CH, dark gray (10YR 4/1), very dark gray (10YR 3/1) and yellowish brown (10YR 5/6) mottling (5-10%), organic material (0-5%), shells (0-5%), gravel (0-5%), stiff, slow dilatancy, medium toughness, medium to high plasticity, moist. *(continued)*	CH				2.5					
7 CS	60 60		35 36 37 38 39 40	35 - 40.2' **SILTY CLAY:** CL/ML, light brownish gray (10YR 6/2) to grayish brown (10YR 5/2), gravel (0-5%), sand (0-5%), soft, slow dilatancy, low toughness, medium plasticity, moist to wet.	CL/ML				0.5 0.5 0.25					
8 CS	36 36		41	40.2 - 41.5' **Weathered SHALE Bedrock** BDX (SH), gray (10YR 6/1) to light yellowish brown (10YR 6/4).	BDX (SH)									
			42 43	41.5 - 43' **SHALE:** BDX (SH), gray (10YR 6/1).	BDX (SH)									
				43' End of Boring.										

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SOIL BORING LOG INFORMATION

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Edwards Power Station		AW-20

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Adam Jochimsen Cascade Drilling	1/10/2021	1/10/2021	Mini Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
AW-20	Feet (NAVD88)	459.08 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,431,539.96 N, 2,434,807.43 E E/W
1/4 of 1/4 of Section , T 7 N, R 7 E

Lat 40° 35' 47.26"
Long -89° 40' 8.078"

Local Grid Location: Feet ☐N ☐S Feet ☐E ☐W

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 47		0	0 - 0.5' **FILL, POORLY-GRADED SAND WITH GRAVEL:** (SP)g, grayish brown (10YR 5/2), subrounded to subangular, coarse to medium sand, loose, wet.	(FILL) (SP)g									7-inch override casing set at 10 feet below ground surface
			0.5	0.5 - 6.2' ASH, very dark gray (10YR 3/1), silt sized grains, loose, moist.	(FILL) ASH									
2 CS	60 54		5											CS= Core Sample
			6.2	6.2 - 8.9' ASH, very dark gray (10YR 3/1), sand to gravel sized grains, subangular to angular, clinkers (0-5%), slag-like material (0-5%), moist.	(FILL) ASH									
			8.9	8.9 - 15' **SILTY CLAY:** CL/ML, dark grayish brown (10YR 4/2) to grayish brown (10YR 5/2), yellowish brown (10YR 5/6) mottling (5-15%), sand (0-5%), gravel (0-5%), stiff, slow to no dilatancy, low to medium toughness, medium to high plasticity, moist.	CL/ML			1.5						
3 CS	60 60		10											
			11					1.25						

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	Ramboll 234 W. Florida Street, Milwaukee,WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

Boring Number AW-20

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13	8.9 - 15' **SILTY CLAY:** CL/ML, dark grayish brown (10YR 4/2) to grayish brown (10YR 5/2), yellowish brown (10YR 5/6) mottling (5-15%), sand (0-5%), gravel (0-5%), stiff, slow to no dilatancy, low to medium toughness, medium to high plasticity, moist. *(continued)*	CL/ML			1.25						
4 SH	24 24		15	15 - 17' **LEAN CLAY:** CL.	CL			1.25		35.1	47	29	92.2	SH= Shelby Tube
5 CS	96 96		17	17 - 19.6' **SILTY CLAY:** CL/ML, dark grayish brown (10YR 4/2) to grayish brown (10YR 5/2), yellowish brown (10YR 5/6) mottling (5-15%), sand (0-5%), gravel (0-5%), stiff, slow to no dilatancy, low to medium toughness, medium to high plasticity, moist.	CL/ML			1.25						
			19					0.75						
			20	19.6 - 40.8' **SILTY CLAY:** CL/ML, gray (10YR 5/1), shells (0-5%), sand (0-5%), organic material (0-5%), firm to stiff, slow dilatancy, low toughness, medium to high plasticity, moist.	CL/ML									
			21					0.75						
			23					0.75						
			24	23.8' - 30' dark gray (10YR 4/1), organic material (10-15%), stiff.										
6 CS	60 57		25					2.25						
			27					2.25						
			29					0.75						
7 CS	60 60		30											
			31					0.75						

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Boring Number AW-20

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			33	19.6 - 40.8' **SILTY CLAY:** CL/ML, gray (10YR 5/1), shells (0-5%), sand (0-5%), organic material (0-5%), firm to stiff, slow dilatancy, low toughness, medium to high plasticity, moist. *(continued)* 33.2' gray (10YR 5/1), brown (7.5YR 4/4) mottling (10-20%), gravel (0-5%), medium toughness, high plasticity.	CL/ML			1.25						
			34											
8 CS	60 60		35					1						
			36											
			37					0.75						
			38											
			39					0.75						
9 CS	36 36		40	39.7' - 39.9' interbedded sand seams with silt and clay laminations, moist. 40' grayish brown (10YR 5/2).										
			41	40.8 - 43' **Weathered SHALE Bedrock** BDX (SH), gray (10YR 6/1) to yellowish brown (10YR 5/6).	BDX (SH)									
			42											
			43	43' End of Boring.										

RAMBOLL

SOIL BORING LOG INFORMATION

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Edwards Power Station		AW-21

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Adam Jochimsen Cascade Drilling	1/10/2021	1/10/2021	Mini Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
AW-21	Feet (NAVD88)	458.28 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,431,842.41 N, 2,435,132.32 E E/Ⓦ
1/4 of 1/4 of Section , T 7 N, R 7 E

Lat 40° 35' 50.23"
Long -89° 40' 3.844"

Local Grid Location: Feet ☐ N ☐ S; Feet ☐ E ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 49		0	0 - 0.5' **FILL, CLAYEY SILT** ML/CL, dark brown (10YR 3/3), loose, moist.	(FILL) ML/CL									7-inch override casing set at 10 feet below ground surface
			1	0.5 - 9.1' ASH, dark gray (10YR 4/1) to very dark gray (10YR 3/1), silt sized grains, soft, moist.	(FILL) ASH				0.25					
			3						0.25					
2 CS	60 60		5						0.25					CS= Core Sample
			7						0.25					
			9	9.1 - 35.4' **SILTY CLAY:** CL/ML, grayish brown (10YR 5/2) to gray (10YR 5/1), brown (7.5YR 4/4) mottling (15-20%), shells (0-5%), sand (0-5%), gravel (0-5%), stiff to very stiff, slow dilatancy, medium to low toughness, medium to high plasticity, moist.	CL/ML				2					
3 CS	60 49		11						1.25					
			13						1.75					
			14.3	14.3' - 15' dark gray (10YR 4/1), organic material (5-10%), high plasticity, moist.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
[signature]	Ramboll 234 W. Florida Street, Milwaukee,WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

SOIL BORING LOG INFORMATION SUPPLEMENT

RAMBOLL

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
4 CS	60 47			9.1 - 35.4' **SILTY CLAY:** CL/ML, grayish brown (10YR 5/2) to gray (10YR 5/1), brown (7.5YR 4/4) mottling (15-20%), shells (0-5%), sand (0-5%), gravel (0-5%), stiff to very stiff, slow dilatancy, medium to low toughness, medium to high plasticity, moist. *(continued)*					1.25					
			16											
			17						1.75					
			18											
			19						1.25					
5 CS	60 50		20											
			21						0.5					
			22											
			23						2.25					
			24											
6 CS	60 54		25		CL/ML				3					
			26											
			27						1.25					
			28											
			29						1.75					
7 CS	60 60		30	29.8' - 31.5' dark gray (10YR 4/1), organic material (5-10%).										
			31						1.25					
			32	31.5' grayish brown (10YR 5/2), yellowish brown (10YR 5/6) mottling (10-15%).										
			33						0.75					
			34											
8 CS	36 36		35						1					
			36	35.4 - 38' **Weathered SHALE Bedrock** BDX (SH), gray (10YR 6/1) to brownish yellow (10YR 6/6).										
			37		BDX (SH)									
			38	38' End of Boring.										

SOIL BORING LOG INFORMATION

Facility/Project Name	License/Permit/Monitoring Number	Boring Number	
Edwards Power Station		AW-22	
Boring Drilled By: Name of crew chief (first, last) and Firm	**Date Drilling Started**	**Date Drilling Completed**	**Drilling Method**
Russ Gordon Cascade Drilling	1/7/2021	1/8/2021	Mini Sonic
Common Well Name	**Final Static Water Level**	**Surface Elevation**	**Borehole Diameter**
AW-22	Feet (NAVD88)	460.30 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,431,677.07 N, 2,435,397.38 E E/Ⓦ
1/4 of 1/4 of Section , T 7 N, R 7 E

Lat 40° 35' 48.582"
Long -89° 40' 0.42"

Local Grid Location: Feet ☐ N ☐ S; Feet ☐ E ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 60		0–1.6	0 - 1.6' **FILL, SILTY CLAY:** CL/ML, dark grayish brown (10YR 4/2), gravel (0-5%), sand (0-5%), stiff to very stiff, low plasticity, moist.	(FILL) CL/ML				2.5					7-inch override casing set at 20 feet below ground surface
			1.6–14.6	1.6 - 14.6' ASH, dark gray (10YR 4/1), silt sized grians, sand (0-5%), moist to wet.	(FILL) ASH				1.5					
2 CS	60 28		5.5	5.5' brown (10YR 5/3), gravel (15-25%).										CS= Core Sample
3 CS	120 84		10	10' very dark gray (10YR 3/1), sand (0-5%) wet.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: S.A. Wb

Firm Ramboll
234 W. Florida Street, Milwaukee, WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

Boring Number AW-22

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
				1.6 - 14.6' ASH, dark gray (10YR 4/1), silt sized grians, sand (0-5%), moist to wet. *(continued)*										
			13		(FILL) ASH									
			14											
			15	14.6 - 30' **LEAN CLAY:** CL, dark grayish brown (10YR 4/2), gravel (0-5%), stiff to very stiff, low to medium plasticity, moist.					2.5					
			16						3					
			17						3					
			18											
			19											
4 CS	120 120		20											
			21						1					
			22		CL				1					
			23						1.5					
			24	24' yellowish brown (10YR 5/4), stiff, medium plasticity, moist.					1.5					
			25											
			26						1					
			27						1					
			28						1.5					
			29						1					
5 SH	24 24		30	30 - 32' **CLAYEY SAND:** SC.						23.2	22	9	42.6	SH= Shelby Tube sample
			31		SC									
			32											

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Boring Number AW-22

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
6 CS	96 96		33	32 - 34' **SILTY CLAY:** CL/ML, grayish brown (10YR 5/2), yellowish brown mottling (0-5%), sand (0-5%), organic material (0-5%), very soft, medium to high plasticity, moist.	CL/ML				0.25					
			34	34 - 40' **SILTY CLAY:** to **LEAN CLAY:** CL/ML, dark gray (10YR 4/1), sand (0-5%), very soft to soft, medium plasticity, moist.	CL/ML				0.25					
			35	34.8' - 35' layer of silt, wet.					0.5					
			36						0.5					
			37	36.8' - 37.2' layer of silt, wet.					1					
			38	38' - 38.4' layer of fine sand, wet.					0.5					
			39	39.1' - 39.5 layer of fine sand, wet.					0.5					
7 CS	60 60		40	40 - 41.6' **CLAYEY SAND:** SC, dark gray (10YR 4/1), fine sand, shells (5-10%), wet.	SC				0.25					
			41											
			42	41.6 - 45' **LEAN CLAY:** CL, dark gray (10YR 4/1), shells (0-5%), soft, medium plasticity, moist.	CL				0.5					
			43						0.5					
			44						0.5					
8 CS	60 60		45	45 - 47.5' **LEAN CLAY:** CL, very dark grayish brown (10YR 3/2), sand (0-5%), shells (0-5%), stiff, medium plasticity, moist.	CL				1.5					
			46						1					
			47											
			48	47.5 - 50' **Weathered SHALE Bedrock** BDX (SH), gray (10YR 5/1).	BDX (SH)									
			49											
			50	50' End of Boring.										

SOIL BORING LOG INFORMATION

Facility/Project Name	License/Permit/Monitoring Number	Boring Number	
Edwards Power Station		XPW01	
Boring Drilled By: Name of crew chief (first, last) and Firm	**Date Drilling Started**	**Date Drilling Completed**	**Drilling Method**
Russ Gordon Cascade Drilling	1/8/2021	1/8/2021	Mini Sonic
Common Well Name	**Final Static Water Level**	**Surface Elevation**	**Borehole Diameter**
	Feet (NAVD88)	Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E E /W (W circled)
1/4 of 1/4 of Section , T 7 N, R 7 E
Lat ___° ___' ___"
Long ___° ___' ___"
Local Grid Location ☐ N ☐ S Feet; ☐ E ☐ W Feet

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 60		0–5	0 - 7.8' ASH, dark gray (10YR 4/1), silt to sand and gravel sized grains, moist. 3' grayish brown (10YR 5/2). 5.8' dark gray (10YR 4/1).	(FILL) ASH									CS= Core Sample
2 CS	60 60		5–10	7.8 - 10' **FILL, LEAN CLAY WITH GRAVEL:** (CL)g, brown (10YR 5/3), brick (0-5%), sand (0-5%), low plasticity, moist.	(FILL) (CL)g				2					
3 CS	60 60		10–15	10 - 12.8' ASH, dark gray (10YR 4/1), silt to sand and gravel sized grains, brick (15-25%), moist to wet.	(FILL) ASH									
				12.8 - 15' ASH, dark gray (10YR 4/1), silt to sand sized grains, wet.	(FILL) ASH									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: [signature] | Firm: Ramboll, 234 W. Florida Street, Milwaukee,WI 53204 | Tel: (414) 837-3607 Fax: (414) 837-3608

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
4 SH	24 0		15 - 17	15 - 17' ASH, No Recovery.	(FILL) ASH									SH= Shelby Tube sample
5 CS	36 36		17 - 19	17 - 19' ASH, dark gray (10YR 4/1), silt sized grains, sand (0-5%), wet.	(FILL) ASH									
			19 - 20	19 - 20' ASH, dark gray (10YR 4/1), silt to sand sized grains, gravel (0-5%), wet.	(FILL) ASH									
6 SH	24 24		20 - 22	20 - 22' ASH, sand to silt sized grains.	(FILL) ASH					43.7	51		31.1	
7 CS	36 36		22 - 25	22 - 25' ASH, very dark gray (10YR 3/1) to black (10YR 2/1), silt to sand sized grains, slag-like material (15-25%).	(FILL) ASH									
8 CS	60 0		25 - 30	25 - 30' ASH, No Recovery.	(FILL) ASH									
9 CS	60 0		30 - 35	30 - 35' ASH, No Recovery.	(FILL) ASH									
10 CS	60 0		35 - 40	35 - 40' ASH, No Recovery.	(FILL) ASH									

RAMBOLL

Boring Number XPW01

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
11 CS	60 60		41, 42	40 - 43' ASH, dark gray (10YR 4/1) to black (10YR 2/1), silt to sand sized grains, wet.	(FILL) ASH									
12 CS	72 72		43, 44, 45, 46, 47, 48, 49, 50	43 - 50' **FAT CLAY:** CH, dark grayish brown (10YR 4/2), organic material (0-5%), sand (0-5%), soft to stiff, high plasticity, moist.	CH				0.5 0.5 0.5 0.5 0.5 0.5 0.5					
			51	50 - 51' **Weathered SHALE Bedrock** BDX (SH).	BDX (SH)									
				51' End of Boring.										

RAMBOLL

SOIL BORING LOG INFORMATION

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Edwards Power Station		XPW01A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Russ Gordon Cascade Drilling	1/8/2021	1/9/2021	Mini Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
XPW01A	Feet (NAVD88)	460.99 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,431,483.28 N, 2,435,242.39 E E/W
1/4 of 1/4 of Section , T 7 N, R 7 E

Lat 40° 35' 46.676"
Long -89° 40' 2.443"

Local Grid Location: Feet ☐ N ☐ S; Feet ☐ E ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0–7.8	0 - 7.8' ASH, Blind drill to 35 feet below ground surface (ft bgs). See XPW01 boring log for detailed lithologies.	(FILL) ASH									
			7.8–10	7.8 - 10' **FILL, LEAN CLAY WITH GRAVEL:** (CL)g.	(FILL) (CL)g									
			10–12	10 - 12.8' ASH.	(FILL) ASH									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: [signature]

Firm Ramboll
234 W. Florida Street, Milwaukee, WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

Boring Number XPW01A

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
				10 - 12.8' ASH. *(continued)*	(FILL) ASH									
			13	12.8 - 15' ASH.	(FILL) ASH									
			14											
			15	15 - 17' ASH.	(FILL) ASH									
			16											
			17	17 - 19' ASH.	(FILL) ASH									
			18											
			19	19 - 20' ASH.	(FILL) ASH									
			20	20 - 22' ASH.	(FILL) ASH									
			21											
			22	22 - 25' ASH.	(FILL) ASH									
			23											
			24											
			25	25 - 30' ASH.	(FILL) ASH									
			26											
			27											
			28											
			29											
			30	30 - 35' ASH.	(FILL) ASH									
			31											
			32											

Boring Number XPW01A

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			33, 34	30 - 35' ASH. *(continued)*	(FILL) ASH									
1 NR	60 0		35	35 - 40' ASH, No Recovery.	(FILL) ASH									NR= No Recovery
2 MC	24 24		40	40 - 42' ASH, silt sized grains.	(FILL) ASH					35.1	60	17	86.3	MC= Modified California sample
			42	42 - 43' s(ML), Blind drill to 43 ft bgs. See XPW01 boring log for detailed lithologies.	(FILL) s(ML)									
			43	43' End of Boring.										

SOIL BORING LOG INFORMATION

Facility/Project Name: Edwards Power Station	License/Permit/Monitoring Number:	Boring Number: XPW02

Boring Drilled By: Name of crew chief (first, last) and Firm: Russ Gordon, Cascade Drilling	Date Drilling Started: 1/9/2021	Date Drilling Completed: 1/9/2021	Drilling Method: Mini Sonic
Common Well Name: XPW02	Final Static Water Level: Feet (NAVD88)	Surface Elevation: 471.16 Feet (NAVD88)	Borehole Diameter: 6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,430,769.44 N, 2,434,978.01 E E/W
1/4 of 1/4 of Section , T 7 N, R 7 E
Lat 40° 35' 39.636"
Long -89° 40' 5.923"
Local Grid Location: ☐ N ☐ S Feet; ☐ E ☐ W Feet

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 60		0	0 - 9.2' **FILL, SANDY SILT WITH GRAVEL:** s(ML)g, grayish brown (10YR 5/2), moist.	(FILL) s(ML)g									CS= Core Sample
2 CS	60 60		5											
			9.2	9.2 - 10' ASH, very dark gray (10YR 3/1), silt sized grains, sand (0-5%), slag-like material (0-5%), moist.	(FILL) ASH									
3 SH	24 24		10	10 - 12' ASH, silt sized grains.	(FILL) ASH					45.1	52	5	71.4	SH= Shelby Tube sample

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: St Wb	Firm: Ramboll, 234 W. Florida Street, Milwaukee, WI 53204. Tel: (414) 837-3607 Fax: (414) 837-3608

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
4 CS	36 36			12 - 12.8' **FILL, SANDY SILT WITH GRAVEL:** s(ML)g, grayish brown (10YR 5/2), moist.	(FILL) s(ML)g									
			13	12.8 - 20' ASH, very dark gray (10YR 3/1), silt sized grains, sand (0-5%), slag-like material (0-5%), moist.										
			14											
5 CS	60 60		15											
			16		(FILL) ASH									
			17											
			18											
			19											
6 SH	24 0		20	20 - 22' ASH, No Recovery.										
			21		(FILL) ASH									
7 MC	24 24		22	22 - 35' ASH, very dark gray (10YR 3/1), silt sized grains, sand (0-5%), slag-like material (0-5%), wet.						33.4	38	8	95.9	MC= Modified California sample
			23											
8 CS	72 72		24											
			25											
			26											
			27		(FILL) ASH									
			28											
			29											
9 CS	60 60		30											
			31											
			32											

Boring Number XPW02

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			33, 34	22 - 35' ASH, very dark gray (10YR 3/1), silt sized grains, sand (0-5%), slag-like material (0-5%), wet. *(continued)*	(FILL) ASH									
10 MC	24 0		35, 36	35 - 37' ASH, No Recovery.	(FILL) ASH									
11 MC	24 0		37, 38	37 - 39' ASH, No Recovery.	(FILL) ASH									
12 CS	12 0		39	39 - 40' ASH, No Recovery.	(FILL) ASH									
13 CS	60 60		40, 41, 42, 43, 44	40 - 46.5' ASH, very dark gray (10YR 3/1), silt to sand sized grains, wet.	(FILL) ASH									
14 MC	24 18		45, 46							41.7	39	6	62.5	Clay encountered in last 6 inches of sample liner.
			47	46.5 - 47' **LEAN CLAY:** CL.	CL									
				47' End of Boring.										

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Edwards Power Station		XPW03

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Russ Gordon Cascade Drilling	1/9/2021	1/10/2021	Mini Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
XPW03	Feet (NAVD88)	462.62 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 1,429,703.68 N, 2,435,574.02 E E/(W)
1/4 of 1/4 of Section , T 7 N, R 7 E
Lat 40° 35' 29.072"
Long -89° 39' 58.275"
Local Grid Location: Feet ☐N ☐S Feet ☐E ☐W

Facility ID	County	State	Civil Town/City/ or Village
	Peoria	IL	Peoria

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 60		0	0 - 10' ASH, dark gray (10YR 4/1), silt to sand sized grains, gravel (0-5%), moist.										CS= Core Sample
2 CS	60 60		5	4.7' very dark gray (10YR 3/1).	(FILL) ASH									
3 MC	24 24		10	10 - 12' ASH, silt sized grains.	(FILL) ASH					43.8	36	7	72.4	MC= Modified California sample

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
St Wb	Ramboll 234 W. Florida Street, Milwaukee,WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

RAMBOLL

Boring Number XPW03

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
4 CS	36 36		13, 14	12 - 15' ASH, very dark gray (10YR 3/1), silt to sand sized grains, gravel (0-5%), loose, wet.	(FILL) ASH									
5 CS	60 60		15, 16, 17, 18, 19	15 - 28' ASH, dark gray (10YR 4/1), sand to silt sized grians, loose, wet.	(FILL) ASH									
6 CS	60 60		20, 21, 22, 23, 24											
7 CS	60 60		25, 26, 27											
			28, 29	28 - 37.6' ASH, dark gray (10YR 4/1), sand to silt and gravel sized grains, coal (15-25%), loose, wet.	(FILL) ASH									
8 CS	60 34		30, 31, 32											

Boring Number XPW03

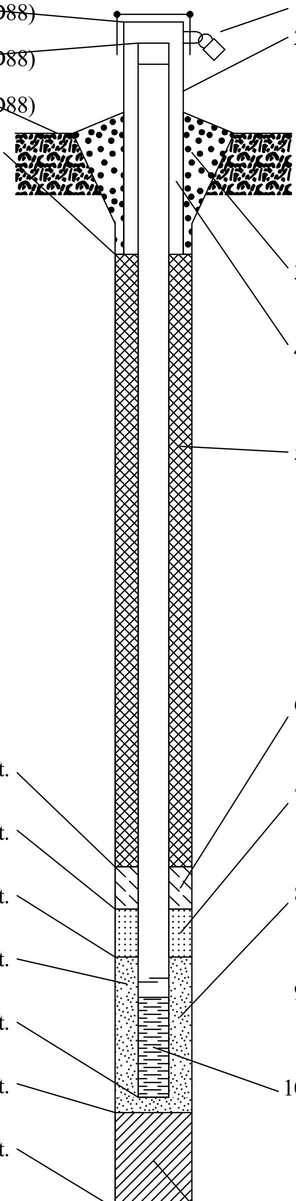
Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
9 CS	60 60		33–37	28 - 37.6' ASH, dark gray (10YR 4/1), sand to silt and gravel sized grains, coal (15-25%), loose, wet. *(continued)*	(FILL) ASH									
			38–40	37.6 - 40' **FAT CLAY:** CH, dark gray (10YR 4/1), soft, high plasticity, moist.	CH				0.5					
				40' End of Boring.										

2021 RAMBOLL WELL CONSTRUCTION LOGS

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name Edwards Power Station	Local Grid Location of Well ______ft. ☐ N. ☐ S. ______ft. ☐ E. ☐ W.	Well Name
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 40° 35' 27.8" Long. -89° 39' 40.8" or	AW-12
Facility ID	St. Plane 1,429,586 ft. N, 2,436,923 ft. E. E /(W)	Date Well Installed 01/07/2021
Type of Well Well Code 72/dp	Section Location of Waste/Source ____1/4 of ____ 1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Russ Gordon Cascade Drilling
Distance from Waste/ Source ft. / State IL	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known / Gov. Lot Number	



A. Protective pipe, top elevation 444.31 ft. (NAVD88)

B. Well casing, top elevation 443.80 ft. (NAVD88)

C. Land surface elevation 441.2 ft. (NAVD88)

D. Surface seal, bottom 439.2 ft. (NAVD88) or 2.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☒ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐
Hollow Stem Auger ☐
Mini Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐
Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ______

17. Source of water (attach analysis, if required):
Potable Water from Site - City of Peoria

E. Bentonite seal, top 419.2 ft. (NAVD88) or 22.0 ft.

F. Fine sand, top ______ ft. (NAVD88) or ______ ft.

G. Filter pack, top 417.2 ft. (NAVD88) or 24.0 ft.

H. Screen joint, top 415.2 ft. (NAVD88) or 26.0 ft.

I. Well bottom 410.2 ft. (NAVD88) or 31.0 ft.

J. Filter pack, bottom 409.7 ft. (NAVD88) or 31.5 ft.

K. Borehole, bottom 406.2 ft. (NAVD88) or 35.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.

1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel ☒
Other ☐
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Bollards
3. Surface seal: Bentonite ☐
Concrete ☒
Other ☐
4. Material between well casing and protective pipe:
Bentonite ☐
Sand Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
b. ____Lbs/gal mud weight . . . Bentonite-sand slurry ☐
c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
d. ____% Bentonite . . . Bentonite-cement grout ☐
e. 3.491 Ft^3 volume added for any of the above
f. How installed: Tremie ☐
Tremie pumped ☒
Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
c. ______ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
a. Not Applicable
b. Volume added 0 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. P.W. Gillibrand, Industrial Sand
b. Volume added 1.233 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒
Flush threaded PVC schedule 80 ☐
Other ☐
10. Screen material: Schedule 40 PVC
a. Screen Type: Factory cut ☒
Continuous slot ☐
Other ☐
b. Manufacturer Johnson Screens
c. Slot size: 0.010 in.
d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☐
Formation Materials Other ☒

I hereby certify that the information on this form is true and correct to the best of my knowledge. Date Modified: 5/19/2021

Signature	Firm	
Sd Wb	Ramboll 234 W. Florida Street, Milwaukee,WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name	Local Grid Location of Well	Well Name
Edwards Power Station	______ft. ☐ N. ☐ S. ______ft. ☐ E. ☐ W.	
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒	AW-13
	Lat. 40° 35' 18.1" Long. -89° 39' 49.4" or	
Facility ID	St. Plane 1,428,601 ft. N, 2,436,267 ft. E. E / (W)	Date Well Installed 01/09/2021
	Section Location of Waste/Source	
Type of Well: Well Code 72/dp	____1/4 of ____1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Dave Gordon
Distance from Waste/Source ____ ft. / State IL	Location of Well Relative to Waste/Source: u ☐ Upgradient; s ☐ Sidegradient; d ☐ Downgradient; n ☐ Not Known / Gov. Lot Number	Cascade Drilling

A. Protective pipe, top elevation 441.67 ft. (NAVD88)

B. Well casing, top elevation 441.26 ft. (NAVD88)

C. Land surface elevation 438.7 ft. (NAVD88)

D. Surface seal, bottom 436.7 ft. (NAVD88) or 2.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☒ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐
Hollow Stem Auger ☐
Mini Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐
Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ______

17. Source of water (attach analysis, if required):
Potable Water from Site - City of Peoria

E. Bentonite seal, top 418.7 ft. (NAVD88) or 20.0 ft.

F. Fine sand, top ______ ft. (NAVD88) or ______ ft.

G. Filter pack, top 415.7 ft. (NAVD88) or 23.0 ft.

H. Screen joint, top 413.7 ft. (NAVD88) or 25.0 ft.

I. Well bottom 408.7 ft. (NAVD88) or 30.0 ft.

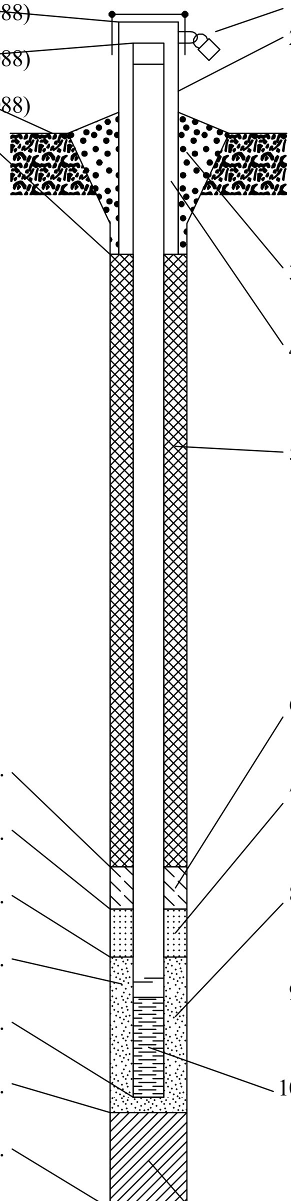
J. Filter pack, bottom 408.7 ft. (NAVD88) or 30.0 ft.

K. Borehole, bottom 408.7 ft. (NAVD88) or 30.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 5.0 ft.
   c. Material: Steel ☒ Other ☐
   d. Additional protection? ☒ Yes ☐ No
   If yes, describe: Bollards
3. Surface seal: Bentonite ☐ Concrete ☒ Other ☐
4. Material between well casing and protective pipe: Bentonite ☐ Sand Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
   b. ____Lbs/gal mud weight . . . Bentonite-sand slurry ☐
   c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
   d. ____% Bentonite . . . Bentonite-cement grout ☐
   e. 3.142 Ft^3 volume added for any of the above
   f. How installed: Tremie ☐ Tremie pumped ☒ Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
   c. ______ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
   a. Not Applicable
   b. Volume added 0 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
   a. P.W. Gillibrand, Industrial Sand
   b. Volume added 1.222 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ Flush threaded PVC schedule 80 ☐ Other ☐
10. Screen material: Schedule 40 PVC
   a. Screen Type: Factory cut ☒ Continuous slot ☐ Other ☐
   b. Manufacturer Johnson Screens
   c. Slot size: 0.010 in.
   d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☒ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge. Date Modified: 5/19/2021

Signature: Seth Wb

Firm: Ramboll
234 W. Florida Street, Milwaukee, WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name: Edwards Power Station	Local Grid Location of Well: ____ft. ☐ N. ☐ S. ____ft. ☐ E. ☐ W.	Well Name
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 40° 35' 14.2" Long. -89° 39' 56.2" or	AW-14
Facility ID	St. Plane 1,428,201 ft. N, 2,435,740 ft. E. E /Ⓦ	Date Well Installed: 01/08/2021
Type of Well: Well Code 72/dp	Section Location of Waste/Source: ____1/4 of ____1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W	Well Installed By: (Person's Name and Firm): Dave Gordon, Cascade Drilling
Distance from Waste/Source ft. / State: IL	Location of Well Relative to Waste/Source: u ☐ Upgradient; s ☐ Sidegradient; d ☐ Downgradient; n ☐ Not Known / Gov. Lot Number	

A. Protective pipe, top elevation 439.99 ft. (NAVD88)

B. Well casing, top elevation 439.40 ft. (NAVD88)

C. Land surface elevation 436.8 ft. (NAVD88)

D. Surface seal, bottom 434.8 ft. (NAVD88) or 2.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☒ MH ☐ CL ☒ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐ Hollow Stem Auger ☐ Other ☒ Mini Sonic

15. Drilling fluid used: Water ☒ 0 2 Air ☐ Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

17. Source of water (attach analysis, if required): Potable Water from Site - City of Peoria

E. Bentonite seal, top 418.8 ft. (NAVD88) or 18.0 ft.

F. Fine sand, top ____ ft. (NAVD88) or ____ ft.

G. Filter pack, top 415.3 ft. (NAVD88) or 21.5 ft.

H. Screen joint, top 412.8 ft. (NAVD88) or 24.0 ft.

I. Well bottom 407.8 ft. (NAVD88) or 29.0 ft.

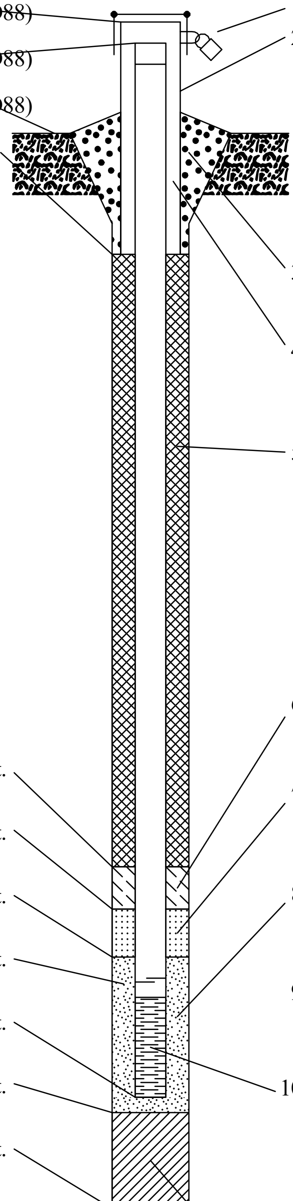
J. Filter pack, bottom 405.8 ft. (NAVD88) or 31.0 ft.

K. Borehole, bottom 401.8 ft. (NAVD88) or 35.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 5.0 ft.
   c. Material: Steel ☒ Other ☐
   d. Additional protection? ☒ Yes ☐ No
   If yes, describe: Bollards
3. Surface seal: Bentonite ☐ Concrete ☒ Other ☐
4. Material between well casing and protective pipe: Bentonite ☐ Other ☒ Sand
5. Annular space seal: a. Granular/Chipped Bentonite ☐
   b. ____Lbs/gal mud weight . . . Bentonite-sand slurry ☐
   c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
   d. ____% Bentonite . . . Bentonite-cement grout ☐
   e. 2.793 Ft^3 volume added for any of the above
   f. How installed: Tremie ☐ Tremie pumped ☒ Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
   c. ____ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
   a. Not Applicable
   b. Volume added 0 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
   a. P.W. Gillibrand, Industrial Sand
   b. Volume added 1.571 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ Flush threaded PVC schedule 80 ☐ Other ☐
10. Screen material: Schedule 40 PVC
   a. Screen Type: Factory cut ☒ Continuous slot ☐ Other ☐
   b. Manufacturer Johnson Screens
   c. Slot size: 0.010 in.
   d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☐ Other ☒ Bentonite Chips

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Date Modified: 5/19/2021

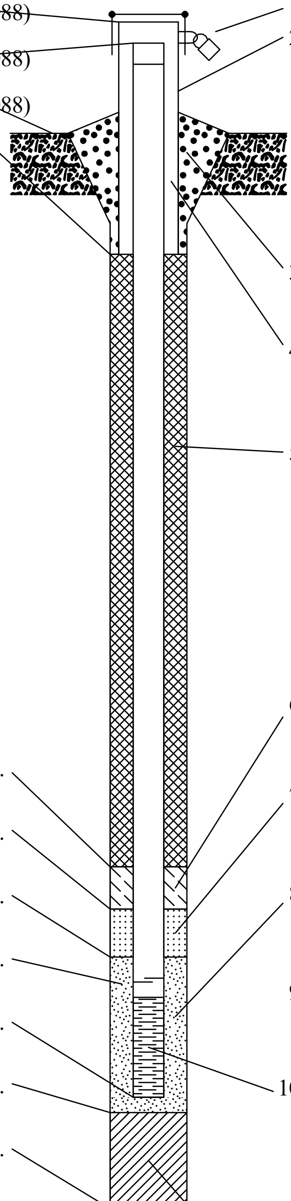
Signature: [signature]

Firm: Ramboll
234 W. Florida Street, Milwaukee, WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name	Local Grid Location of Well	Well Name
Edwards Power Station	____ft. ☐ N. ☐ S. ____ft. ☐ E. ☐ W.	AW-15
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 40° 35' 16.6" Long. -89° 40' 0.6" or	
Facility ID	St. Plane 1,428,445 ft. N, 2,435,405 ft. E. E /Ⓦ	Date Well Installed 01/08/2021
Type of Well: Well Code 72/dp	Section Location of Waste/Source: ____1/4 of ____ 1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Dave Gordon, Cascade Drilling
Distance from Waste/Source ft. — State IL	Location of Well Relative to Waste/Source: u ☐ Upgradient, s ☐ Sidegradient, d ☐ Downgradient, n ☐ Not Known — Gov. Lot Number	



A. Protective pipe, top elevation 442.02 ft. (NAVD88)

B. Well casing, top elevation 441.51 ft. (NAVD88)

C. Land surface elevation 439.0 ft. (NAVD88)

D. Surface seal, bottom 437.0 ft. (NAVD88) or 2.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☒ MH ☐ CL ☒ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐ Hollow Stem Auger ☐ Mini Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐ Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

17. Source of water (attach analysis, if required): Potable Water from Site - City of Peoria

E. Bentonite seal, top 411.0 ft. (NAVD88) or 28.0 ft.

F. Fine sand, top ____ ft. (NAVD88) or ____ ft.

G. Filter pack, top 408.0 ft. (NAVD88) or 31.0 ft.

H. Screen joint, top 406.0 ft. (NAVD88) or 33.0 ft.

I. Well bottom 401.0 ft. (NAVD88) or 38.0 ft.

J. Filter pack, bottom 399.0 ft. (NAVD88) or 40.0 ft.

K. Borehole, bottom 399.0 ft. (NAVD88) or 40.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.

1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 5.0 ft.
   c. Material: Steel ☒ Other ☐
   d. Additional protection? ☒ Yes ☐ No — If yes, describe: Bollards
3. Surface seal: Bentonite ☐ Concrete ☒ Other ☐
4. Material between well casing and protective pipe: Bentonite ☐ Sand Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
   b. ____Lbs/gal mud weight . . . Bentonite-sand slurry ☐
   c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
   d. ____% Bentonite . . . Bentonite-cement grout ☐
   e. 4.538 Ft^3 volume added for any of the above
   f. How installed: Tremie ☐ Tremie pumped ☒ Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
   c. ____ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
   a. Not Applicable
   b. Volume added 0 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
   a. K & E Well Gravel #7
   b. Volume added 1.571 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ Flush threaded PVC schedule 80 ☐ Other ☐
10. Screen material: Schedule 40 PVC
    a. Screen Type: Factory cut ☒ Continuous slot ☐ Other ☐
    b. Manufacturer Johnson Screens
    c. Slot size: 0.010 in.
    d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☐ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge. Date Modified: 5/19/2021

Signature	Firm	
[signature]	Ramboll 234 W. Florida Street, Milwaukee,WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name: Edwards Power Station	Local Grid Location of Well: ____ft. ☐ N. ☐ S. ____ft. ☐ E. ☐ W.	Well Name
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 40° 35' 16.8" Long. -89° 40' 0.8" or	AW-15C
Facility ID	St. Plane 1,428,458 ft. N, 2,435,388 ft. E. E /Ⓦ	Date Well Installed: 01/08/2021
Type of Well: Well Code 72/dp	Section Location of Waste/Source: ____1/4 of ____ 1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Dave Gordon, Cascade Drilling
Distance from Waste/Source ____ ft. / State IL	Location of Well Relative to Waste/Source: u ☐ Upgradient; s ☐ Sidegradient; d ☐ Downgradient; n ☐ Not Known / Gov. Lot Number	

A. Protective pipe, top elevation 440.67 ft. (NAVD88)

B. Well casing, top elevation 440.02 ft. (NAVD88)

C. Land surface elevation 437.6 ft. (NAVD88)

D. Surface seal, bottom 435.6 ft. (NAVD88) or 2.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐
Hollow Stem Auger ☐
Mini Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐
Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

17. Source of water (attach analysis, if required):
Potable Water from Site - City of Peoria

E. Bentonite seal, top 400.6 ft. (NAVD88) or 37.0 ft.

F. Fine sand, top ____ ft. (NAVD88) or ____ ft.

G. Filter pack, top 396.6 ft. (NAVD88) or 41.0 ft.

H. Screen joint, top 394.6 ft. (NAVD88) or 43.0 ft.

I. Well bottom 389.6 ft. (NAVD88) or 48.0 ft.

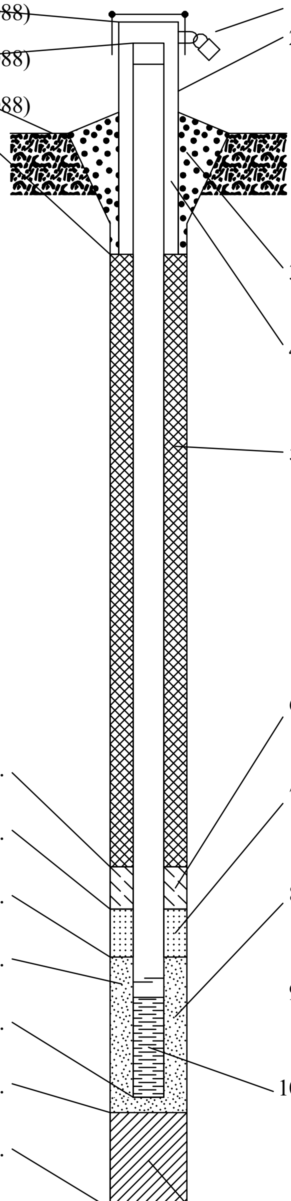
J. Filter pack, bottom 385.6 ft. (NAVD88) or 52.0 ft.

K. Borehole, bottom 337.6 ft. (NAVD88) or 100.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 5.0 ft.
   c. Material: Steel ☒ Other ☐
   d. Additional protection? ☒ Yes ☐ No
   If yes, describe: Bollards
3. Surface seal: Bentonite ☐ Concrete ☒ Other ☐
4. Material between well casing and protective pipe: Bentonite ☐ Sand Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
   b. ____Lbs/gal mud weight . . . Bentonite-sand slurry ☐
   c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
   d. ____% Bentonite . . . Bentonite-cement grout ☐
   e. 6.109 Ft^3 volume added for any of the above
   f. How installed: Tremie ☐ Tremie pumped ☒ Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
   c. ____ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
   a. Not Applicable
   b. Volume added 0 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
   a. K & E Well Gravel #7
   b. Volume added 0.873 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ Flush threaded PVC schedule 80 ☐ Other ☐
10. Screen material: Schedule 40 PVC
    a. Screen Type: Factory cut ☒ Continuous slot ☐ Other ☐
    b. Manufacturer Johnson Screens
    c. Slot size: 0.010 in.
    d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☐ Bentonite Grout Other ☒

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Date Modified: 5/19/2021

Signature [signature]

Firm Ramboll
234 W. Florida Street, Milwaukee, WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name Edwards Power Station	Local Grid Location of Well ______ft. ☐ N. ☐ S. ______ft. ☐ E. ☐ W.	Well Name
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 40° 35' 16.6" Long. -89° 40' 0.6" or	AW-15S
Facility ID	St. Plane 1,428,442 ft. N, 2,435,400 ft. E. E/Ⓦ	Date Well Installed 01/08/2021
Type of Well Well Code 71/dw	Section Location of Waste/Source ____1/4 of ____1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Dave Gordon
Distance from Waste/Source ft. / State IL	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known / Gov. Lot Number	Cascade Drilling

A. Protective pipe, top elevation 441.29 ft. (NAVD88)

B. Well casing, top elevation 440.71 ft. (NAVD88)

C. Land surface elevation 437.9 ft. (NAVD88)

D. Surface seal, bottom 436.9 ft. (NAVD88) or 1.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☒ MH ☐ CL ☒ CH ☐
Bedrock ☐

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐
Hollow Stem Auger ☐
Mini Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐
Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ______

17. Source of water (attach analysis, if required):
Potable Water from Site - City of Peoria

E. Bentonite seal, top 436.9 ft. (NAVD88) or 1.0 ft.

F. Fine sand, top ______ ft. (NAVD88) or ______ ft.

G. Filter pack, top 431.9 ft. (NAVD88) or 6.0 ft.

H. Screen joint, top 429.9 ft. (NAVD88) or 8.0 ft.

I. Well bottom 419.9 ft. (NAVD88) or 18.0 ft.

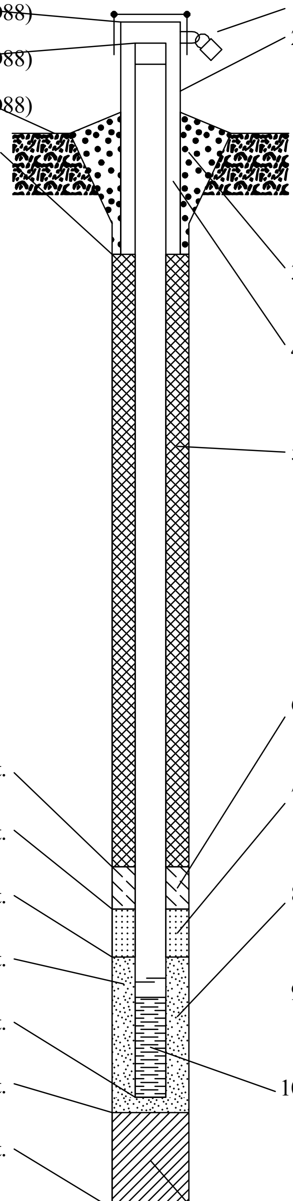
J. Filter pack, bottom 417.9 ft. (NAVD88) or 20.0 ft.

K. Borehole, bottom 417.9 ft. (NAVD88) or 20.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 5.0 ft.
   c. Material: Steel ☒ Other ☐
   d. Additional protection? ☒ Yes ☐ No
   If yes, describe: Bollards
3. Surface seal: Bentonite ☐ Concrete ☒ Other ☐
4. Material between well casing and protective pipe:
   Bentonite ☐
   Sand Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
   b. ____Lbs/gal mud weight . . . Bentonite-sand slurry ☐
   c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
   d. ____% Bentonite . . . Bentonite-cement grout ☐
   e. 0.873 Ft^3 volume added for any of the above
   f. How installed: Tremie ☐ Tremie pumped ☒ Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
   c. ______ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
   a. Not Applicable
   b. Volume added 0 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
   a. P.W. Gillibrand, Industrial Sand
   b. Volume added 2.443 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒
   Flush threaded PVC schedule 80 ☐
   Other ☐
10. Screen material: Schedule 40 PVC
   a. Screen Type: Factory cut ☒ Continuous slot ☐ Other ☐
   b. Manufacturer Johnson Screens
   c. Slot size: 0.010 in.
   d. Slotted length: 10.0 ft.
11. Backfill material (below filter pack): None ☐ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Date Modified: 5/19/2021

Signature	Firm	
[signature]	Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name	Local Grid Location of Well	Well Name
Edwards Power Station	______ft. ☐ N. ☐ S. ______ft. ☐ E. ☐ W.	
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒	AW-16
	Lat. 40° 35' 22.0" Long. -89° 40' 4.1" or	
Facility ID	St. Plane 1,428,987 ft. N, 2,435,131 ft. E. E / (W)	Date Well Installed: 01/07/2021
Type of Well: Well Code 72/dp	Section Location of Waste/Source: ____1/4 of ____ 1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Adam Jochimsen, Cascade Drilling
Distance from Waste/Source ft. / State IL	Location of Well Relative to Waste/Source: u ☐ Upgradient; s ☐ Sidegradient; d ☐ Downgradient; n ☐ Not Known / Gov. Lot Number	

A. Protective pipe, top elevation 462.46 ft. (NAVD88)

B. Well casing, top elevation 461.79 ft. (NAVD88)

C. Land surface elevation 459.5 ft. (NAVD88)

D. Surface seal, bottom 457.5 ft. (NAVD88) or 2.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☒ MH ☐ CL ☒ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐; Hollow Stem Auger ☐; Mini Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐; Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ______

17. Source of water (attach analysis, if required):
Potable Water from Site - City of Peoria

E. Bentonite seal, top 409.5 ft. (NAVD88) or 50.0 ft.

F. Fine sand, top ______ ft. (NAVD88) or ______ ft.

G. Filter pack, top 407.0 ft. (NAVD88) or 52.5 ft.

H. Screen joint, top 404.5 ft. (NAVD88) or 55.0 ft.

I. Well bottom 399.5 ft. (NAVD88) or 60.0 ft.

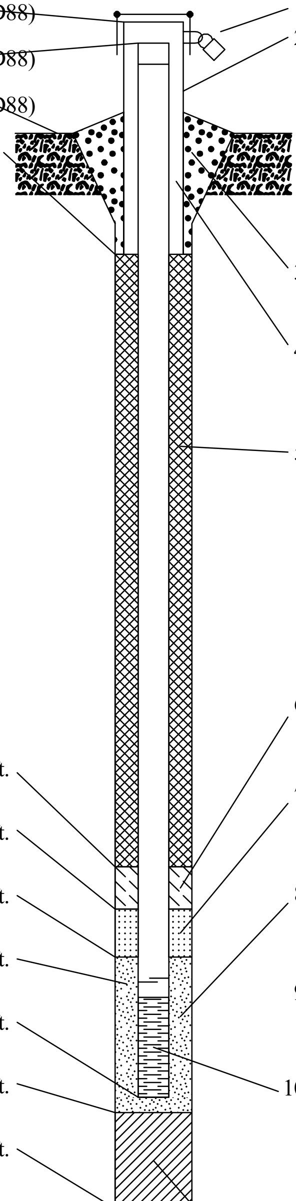
J. Filter pack, bottom 396.5 ft. (NAVD88) or 63.0 ft.

K. Borehole, bottom 396.5 ft. (NAVD88) or 63.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 5.0 ft.
   c. Material: Steel ☒; Other ☐
   d. Additional protection? ☒ Yes ☐ No
   If yes, describe: Bollards
3. Surface seal: Bentonite ☐; Concrete ☒; Other ☐
4. Material between well casing and protective pipe: Bentonite ☐; Sand Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
   b. ____Lbs/gal mud weight . . . Bentonite-sand slurry ☐
   c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
   d. ____% Bentonite . . . Bentonite-cement grout ☐
   e. 8.378 Ft^3 volume added for any of the above
   f. How installed: Tremie ☐; Tremie pumped ☒; Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
   c. ______ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
   a. Not Applicable
   b. Volume added 0 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
   a. K & E Well Gravel #7
   b. Volume added 1.833 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒; Flush threaded PVC schedule 80 ☐; Other ☐
10. Screen material: Schedule 40 PVC
    a. Screen Type: Factory cut ☒; Continuous slot ☐; Other ☐
    b. Manufacturer Johnson Screens
    c. Slot size: 0.010 in.
    d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☐; Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Date Modified: 5/19/2021

Signature: [signature]

Firm: Ramboll
234 W. Florida Street, Milwaukee, WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name: Edwards Power Station	Local Grid Location of Well: ____ ft. ☐ N. ☐ S. ____ ft. ☐ E. ☐ W.	Well Name
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 40° 35' 30.1" Long. -89° 40' 9.9" or	AW-17
Facility ID	St. Plane 1,429,801 ft. N, 2,434,680 ft. E. E/Ⓦ	Date Well Installed: 01/08/2021
Type of Well: Well Code 72/dp	Section Location of Waste/Source: ____ 1/4 of ____ 1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Adam Jochimsen Cascade Drilling
Distance from Waste/Source: ft. / State: IL	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known / Gov. Lot Number	

A. Protective pipe, top elevation 462.76 ft. (NAVD88)

B. Well casing, top elevation 462.10 ft. (NAVD88)

C. Land surface elevation 459.7 ft. (NAVD88)

D. Surface seal, bottom 457.7 ft. (NAVD88) or 2.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☒ MH ☐ CL ☒ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐
Hollow Stem Auger ☐
Mini Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐
Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

17. Source of water (attach analysis, if required):
Potable Water from Site - City of Peoria

E. Bentonite seal, top 412.7 ft. (NAVD88) or 47.0 ft.

F. Fine sand, top ____ ft. (NAVD88) or ____ ft.

G. Filter pack, top 410.7 ft. (NAVD88) or 49.0 ft.

H. Screen joint, top 408.7 ft. (NAVD88) or 51.0 ft.

I. Well bottom 403.7 ft. (NAVD88) or 56.0 ft.

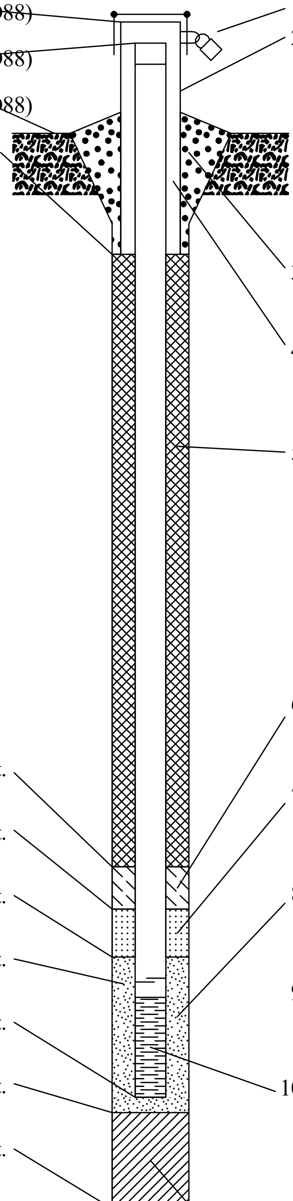
J. Filter pack, bottom 403.7 ft. (NAVD88) or 56.0 ft.

K. Borehole, bottom 402.7 ft. (NAVD88) or 57.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel ☒
Other ☐
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Bollards

3. Surface seal: Bentonite ☐
Concrete ☒
Other ☐

4. Material between well casing and protective pipe:
Bentonite ☐
Sand Other ☒

5. Annular space seal: a. Granular/Chipped Bentonite ☐
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐
c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
d. ____ % Bentonite . . . Bentonite-cement grout ☐
e. 7.854 Ft^3 volume added for any of the above
f. How installed: Tremie ☐
Tremie pumped ☒
Gravity ☐

6. Bentonite seal: a. Bentonite granules ☐
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
c. ____ Other ☐

7. Fine sand material: Manufacturer, product name & mesh size
a. Not Applicable
b. Volume added 0 ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. K & E Well Gravel #7
b. Volume added 1.2 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒
Flush threaded PVC schedule 80 ☐
Other ☐

10. Screen material: Schedule 40 PVC
a. Screen Type: Factory cut ☒
Continuous slot ☐
Other ☐
b. Manufacturer Johnson Screens
c. Slot size: 0.010 in.
d. Slotted length: 5.0 ft.

11. Backfill material (below filter pack): None ☐
Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge. Date Modified: 5/19/2021

Signature	Firm	
[signature]	Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

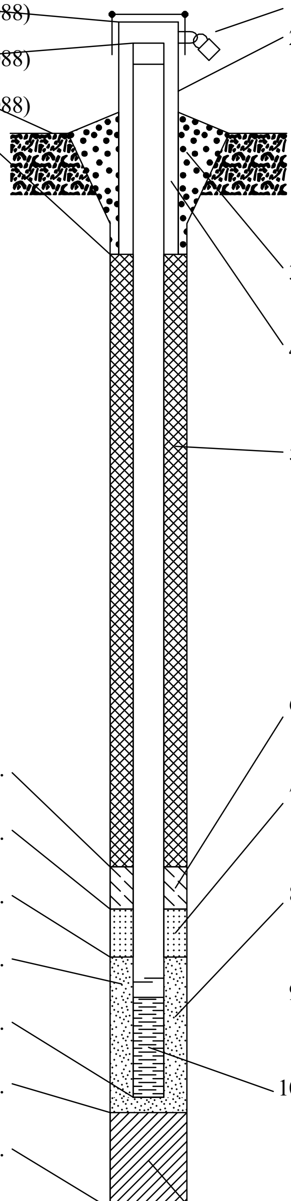
Facility/Project Name	Local Grid Location of Well	Well Name
Edwards Power Station	____ft. ☐ N. ☐ S. ____ft. ☐ E. ☐ W.	
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 40° 35' 34.9" Long. -89° 40' 11.4" or	AW-18
Facility ID	St. Plane 1,430,291 ft. N, 2,434,561 ft. E. E /(W)	Date Well Installed 01/09/2021
Type of Well Well Code 72/dp	Section Location of Waste/Source ____1/4 of ____ 1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Adam Jochimsen
Distance from Waste/ Source ft. / State IL	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known / Gov. Lot Number	Cascade Drilling

A. Protective pipe, top elevation 463.32 ft. (NAVD88)

B. Well casing, top elevation 462.65 ft. (NAVD88)

C. Land surface elevation 460.3 ft. (NAVD88)

D. Surface seal, bottom 458.3 ft. (NAVD88) or 2.0 ft.



12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☒ MH ☐ CL ☒ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐
Hollow Stem Auger ☐
Mini Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐
Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

17. Source of water (attach analysis, if required):
Potable Water from Site - City of Peoria

E. Bentonite seal, top 418.3 ft. (NAVD88) or 42.0 ft.

F. Fine sand, top ____ ft. (NAVD88) or ____ ft.

G. Filter pack, top 416.3 ft. (NAVD88) or 44.0 ft.

H. Screen joint, top 414.3 ft. (NAVD88) or 46.0 ft.

I. Well bottom 409.3 ft. (NAVD88) or 51.0 ft.

J. Filter pack, bottom 409.3 ft. (NAVD88) or 51.0 ft.

K. Borehole, bottom 405.3 ft. (NAVD88) or 55.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.

1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 5.0 ft.
   c. Material: Steel ☒ Other ☐
   d. Additional protection? ☒ Yes ☐ No
   If yes, describe: Bollards
3. Surface seal: Bentonite ☐ Concrete ☒ Other ☐
4. Material between well casing and protective pipe: Bentonite ☐
   Sand Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
   b. ____Lbs/gal mud weight . . . Bentonite-sand slurry ☐
   c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
   d. ____% Bentonite . . . Bentonite-cement grout ☐
   e. 6.981 Ft^3 volume added for any of the above
   f. How installed: Tremie ☐ Tremie pumped ☒ Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
   c. ____ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
   a. Not Applicable
   b. Volume added 0 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
   a. P.W. Gillibrand, Industrial Sand
   b. Volume added 1.134 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒
   Flush threaded PVC schedule 80 ☐
   Other ☐
10. Screen material: Schedule 40 PVC
    a. Screen Type: Factory cut ☒ Continuous slot ☐ Other ☐
    b. Manufacturer Johnson Screens
    c. Slot size: 0.010 in.
    d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☐ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Date Modified: 5/19/2021

Signature	Firm	
[signature]	Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name Edwards Power Station	Local Grid Location of Well ______ft. ☐ N. ☐ S. ______ft. ☐ E. ☐ W.	Well Name
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 40° 35' 43.5" Long. -89° 40' 11.0" or	AW-19
Facility ID	St. Plane 1,431,162 ft. N, 2,434,585 ft. E. E /Ⓦ	Date Well Installed 01/09/2021
Type of Well Well Code 72/dp	Section Location of Waste/Source ____1/4 of ____ 1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Adam Jochimsen Cascade Drilling
Distance from Waste/Source ft. | State IL	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known | Gov. Lot Number	

A. Protective pipe, top elevation 461.14 ft. (NAVD88)

B. Well casing, top elevation 460.74 ft. (NAVD88)

C. Land surface elevation 458.5 ft. (NAVD88)

D. Surface seal, bottom 456.5 ft. (NAVD88) or 2.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☒ MH ☐ CL ☒ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐
Hollow Stem Auger ☐
Mini Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐
Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ______

17. Source of water (attach analysis, if required):
Potable Water from Site - City of Peoria

E. Bentonite seal, top 427.5 ft. (NAVD88) or 31.0 ft.

F. Fine sand, top ______ ft. (NAVD88) or ______ ft.

G. Filter pack, top 425.5 ft. (NAVD88) or 33.0 ft.

H. Screen joint, top 423.5 ft. (NAVD88) or 35.0 ft.

I. Well bottom 418.5 ft. (NAVD88) or 40.0 ft.

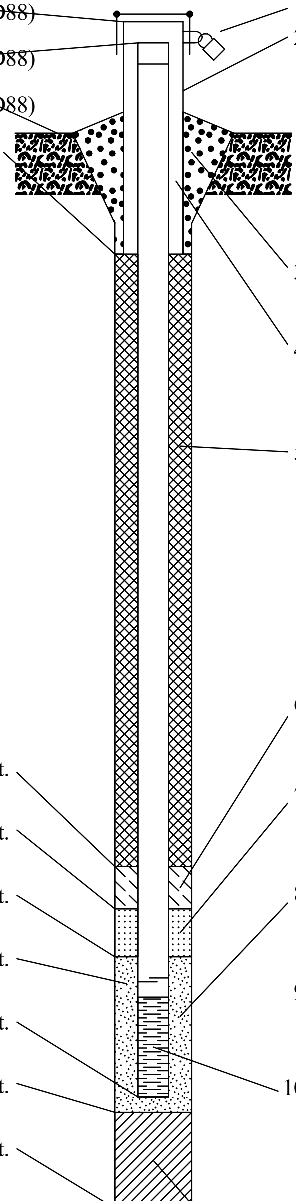
J. Filter pack, bottom 418.5 ft. (NAVD88) or 40.0 ft.

K. Borehole, bottom 415.5 ft. (NAVD88) or 43.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 5.0 ft.
c. Material: Steel ☒
Other ☐
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Bollards
3. Surface seal: Bentonite ☐
Concrete ☒
Other ☐
4. Material between well casing and protective pipe:
Bentonite ☐
Sand Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
b. ______Lbs/gal mud weight . . . Bentonite-sand slurry ☐
c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
d. ______% Bentonite . . . Bentonite-cement grout ☐
e. 5.061 Ft^3 volume added for any of the above
f. How installed: Tremie ☐
Tremie pumped ☒
Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
c. ______ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
a. Not Applicable
b. Volume added 0 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. P.W. Gillibrand, Industrial Sand
b. Volume added 1.156 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒
Flush threaded PVC schedule 80 ☐
Other ☐
10. Screen material: Schedule 40 PVC
a. Screen Type: Factory cut ☒
Continuous slot ☐
Other ☐
b. Manufacturer Johnson Screens
c. Slot size: 0.010 in.
d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☐
Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Date Modified: 5/19/2021

Signature	Firm	
[signature]	Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name Edwards Power Station	Local Grid Location of Well ______ ft. ☐ N. ☐ S. ______ ft. ☐ E. ☐ W.	Well Name
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 40° 35' 47.3" Long. -89° 40' 8.1" or	AW-20
Facility ID	St. Plane 1,431,540 ft. N, 2,434,807 ft. E. E /(W)	Date Well Installed 01/10/2021
Type of Well Well Code 72/dp	Section Location of Waste/Source ____ 1/4 of ____ 1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Adam Jochimsen Cascade Drilling
Distance from Waste/ Source ft. | State IL	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known | Gov. Lot Number	

A. Protective pipe, top elevation 461.57 ft. (NAVD88)

B. Well casing, top elevation 461.48 ft. (NAVD88)

C. Land surface elevation 459.1 ft. (NAVD88)

D. Surface seal, bottom 457.1 ft. (NAVD88) or 2.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☒ MH ☐ CL ☒ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐
Hollow Stem Auger ☐
Mini Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐
Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ______

17. Source of water (attach analysis, if required):
Potable Water from Site - City of Peoria

E. Bentonite seal, top 427.1 ft. (NAVD88) or 32.0 ft.

F. Fine sand, top ______ ft. (NAVD88) or ______ ft.

G. Filter pack, top 425.1 ft. (NAVD88) or 34.0 ft.

H. Screen joint, top 422.6 ft. (NAVD88) or 36.5 ft.

I. Well bottom 417.6 ft. (NAVD88) or 41.5 ft.

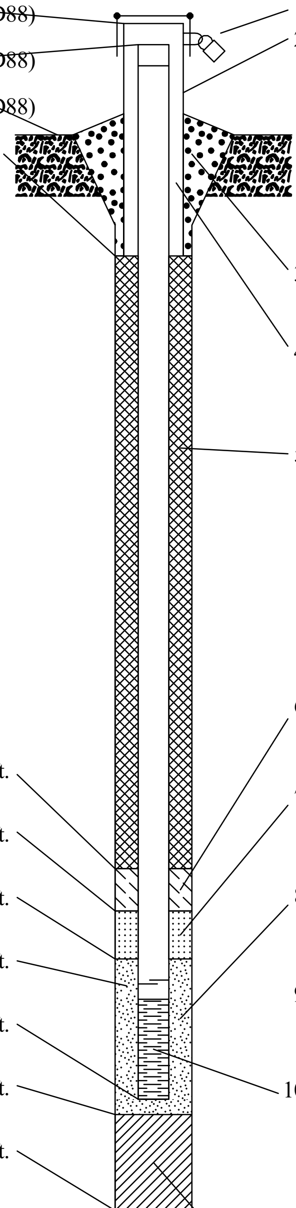
J. Filter pack, bottom 417.6 ft. (NAVD88) or 41.5 ft.

K. Borehole, bottom 416.1 ft. (NAVD88) or 43.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 5.0 ft.
   c. Material: Steel ☒ Other ☐
   d. Additional protection? ☒ Yes ☐ No
   If yes, describe: Bollards
3. Surface seal: Bentonite ☐ Concrete ☒ Other ☐
4. Material between well casing and protective pipe: Bentonite ☐
   Sand Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
   b. ______ Lbs/gal mud weight . . . Bentonite-sand slurry ☐
   c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
   d. ______ % Bentonite . . . Bentonite-cement grout ☐
   e. 5.236 Ft^3 volume added for any of the above
   f. How installed: Tremie ☐ Tremie pumped ☒ Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
   c. ______ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
   a. Not Applicable
   b. Volume added 0 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
   a. P.W. Gillibrand, Industrial Sand
   b. Volume added 1.276 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒
   Flush threaded PVC schedule 80 ☐
   Other ☐
10. Screen material: Schedule 40 PVC
    a. Screen Type: Factory cut ☒ Continuous slot ☐ Other ☐
    b. Manufacturer Johnson Screens
    c. Slot size: 0.010 in.
    d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☐ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge. Date Modified: 5/19/2021

Signature [signature]

Firm Ramboll
234 W. Florida Street, Milwaukee, WI 53204
Tel: (414) 837-3607
Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name: Edwards Power Station

Local Grid Location of Well: ______ ft. ☐ N. ☐ S. ______ ft. ☐ E. ☐ W.

Well Name: AW-21

Facility License, Permit or Monitoring No.:

Local Grid Origin ☐ (estimated: ☐) or Well Location ☒

Lat. 40° 35' 50.2" Long. -89° 40' 3.8" or

St. Plane 1,431,842 ft. N, 2,435,132 ft. E. E/Ⓦ

Facility ID:

Date Well Installed: 01/10/2021

Section Location of Waste/Source: ____1/4 of ____ 1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W

Type of Well: Well Code 72/dp

Well Installed By: (Person's Name and Firm): Adam Jochimsen, Cascade Drilling

Distance from Waste/Source: ft.

State: IL

Location of Well Relative to Waste/Source: u ☐ Upgradient; s ☐ Sidegradient; d ☐ Downgradient; n ☐ Not Known

Gov. Lot Number:

A. Protective pipe, top elevation 460.84 ft. (NAVD88)

B. Well casing, top elevation 460.61 ft. (NAVD88)

C. Land surface elevation 458.3 ft. (NAVD88)

D. Surface seal, bottom 456.3 ft. (NAVD88) or 2.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☒ MH ☐ CL ☒ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐; Hollow Stem Auger ☐; Mini Sonic: Other ☒

15. Drilling fluid used: Water ☒ 0 2; Air ☐; Drilling Mud ☐ 0 3; None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ______

17. Source of water (attach analysis, if required): Potable Water from Site - City of Peoria

E. Bentonite seal, top 430.3 ft. (NAVD88) or 28.0 ft.

F. Fine sand, top ______ ft. (NAVD88) or ______ ft.

G. Filter pack, top 428.3 ft. (NAVD88) or 30.0 ft.

H. Screen joint, top 426.3 ft. (NAVD88) or 32.0 ft.

I. Well bottom 421.3 ft. (NAVD88) or 37.0 ft.

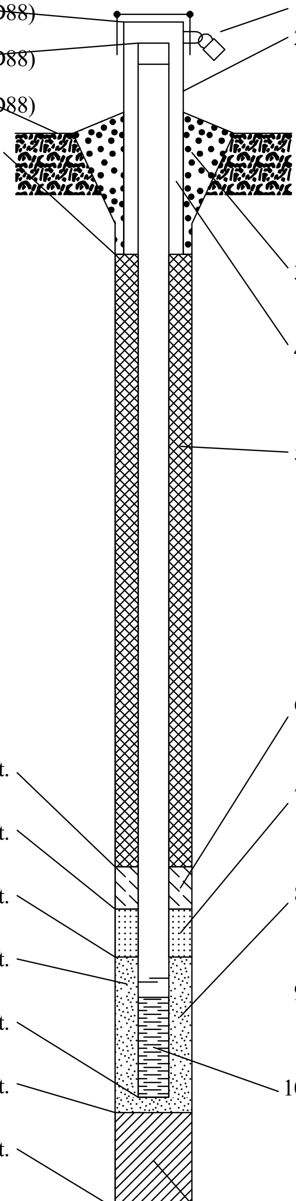
J. Filter pack, bottom 421.3 ft. (NAVD88) or 37.0 ft.

K. Borehole, bottom 420.3 ft. (NAVD88) or 38.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 5.0 ft.
   c. Material: Steel ☒; Other ☐
   d. Additional protection? ☒ Yes ☐ No. If yes, describe: Bollards
3. Surface seal: Bentonite ☐; Concrete ☒; Other ☐
4. Material between well casing and protective pipe: Bentonite ☐; Sand: Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
   b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐
   c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
   d. ____ % Bentonite . . . Bentonite-cement grout ☐
   e. 4.538 Ft^3 volume added for any of the above
   f. How installed: Tremie ☐; Tremie pumped ☒; Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
   c. ______ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
   a. Not Applicable
   b. Volume added 0 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
   a. P.W. Gillibrand, Industrial Sand
   b. Volume added 1.2 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒; Flush threaded PVC schedule 80 ☐; Other ☐
10. Screen material: Schedule 40 PVC
   a. Screen Type: Factory cut ☒; Continuous slot ☐; Other ☐
   b. Manufacturer: Johnson Screens
   c. Slot size: 0.010 in.
   d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☐; Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Date Modified: 5/19/2021

Signature: [signature]

Firm: Ramboll, 234 W. Florida Street, Milwaukee, WI 53204

Tel: (414) 837-3607
Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name: Edwards Power Station	Local Grid Location of Well: ______ft. ☐ N. ☐ S. ______ft. ☐ E. ☐ W.	Well Name
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 40° 35' 48.6" Long. -89° 40' 0.4" or	AW-22
Facility ID	St. Plane 1,431,677 ft. N, 2,435,397 ft. E. E /Ⓦ	Date Well Installed: 01/08/2021
Type of Well: Well Code 72/dp	Section Location of Waste/Source: ____1/4 of ____ 1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Russ Gordon, Cascade Drilling
Distance from Waste/Source: ft. / State: IL	Location of Well Relative to Waste/Source: u ☐ Upgradient, s ☐ Sidegradient, d ☐ Downgradient, n ☐ Not Known / Gov. Lot Number	

A. Protective pipe, top elevation 463.90 ft. (NAVD88)

B. Well casing, top elevation 463.19 ft. (NAVD88)

C. Land surface elevation 460.3 ft. (NAVD88)

D. Surface seal, bottom 458.3 ft. (NAVD88) or 2.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☒ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐
Hollow Stem Auger ☐
Mini Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐
Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ______

17. Source of water (attach analysis, if required):
Potable Water from Site - City of Peoria

E. Bentonite seal, top 420.3 ft. (NAVD88) or 40.0 ft.

F. Fine sand, top ______ ft. (NAVD88) or ______ ft.

G. Filter pack, top 418.3 ft. (NAVD88) or 42.0 ft.

H. Screen joint, top 416.3 ft. (NAVD88) or 44.0 ft.

I. Well bottom 411.3 ft. (NAVD88) or 49.0 ft.

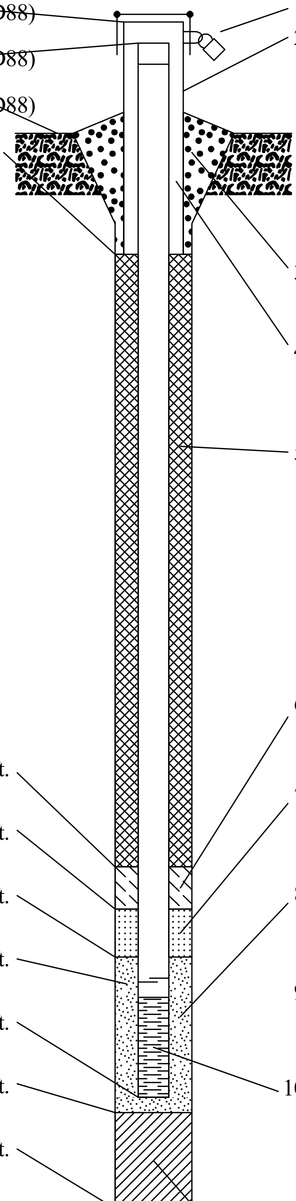
J. Filter pack, bottom 411.3 ft. (NAVD88) or 49.0 ft.

K. Borehole, bottom 410.3 ft. (NAVD88) or 50.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 5.0 ft.
   c. Material: Steel ☒ Other ☐
   d. Additional protection? ☒ Yes ☐ No
   If yes, describe: Bollards
3. Surface seal: Bentonite ☐ Concrete ☒ Other ☐
4. Material between well casing and protective pipe: Bentonite ☐ Sand Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
   b. ____Lbs/gal mud weight . . . Bentonite-sand slurry ☐
   c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
   d. ____% Bentonite . . . Bentonite-cement grout ☐
   e. 6.632 Ft^3 volume added for any of the above
   f. How installed: Tremie ☐ Tremie pumped ☒ Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
   c. ______ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
   a. Not Applicable
   b. Volume added 0 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
   a. P.W. Gillibrand, Industrial Sand
   b. Volume added 1.2 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒
   Flush threaded PVC schedule 80 ☐
   Other ☐
10. Screen material: Schedule 40 PVC
   a. Screen Type: Factory cut ☒ Continuous slot ☐ Other ☐
   b. Manufacturer Johnson Screens
   c. Slot size: 0.010 in.
   d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☐ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge. Date Modified: 5/19/2021

Signature	Firm	
[signature]	Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name: Edwards Power Station	Local Grid Location of Well: ____ft. ☐ N. ☐ S. ____ft. ☐ E. ☐ W.	Well Name: XPW01A
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 40° 35' 46.7" Long. -89° 40' 2.4" or	
Facility ID	St. Plane 1,431,483 ft. N, 2,435,242 ft. E. E/Ⓦ	Date Well Installed: 01/09/2021
Type of Well: Well Code 72/dp	Section Location of Waste/Source: ____1/4 of ____1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Russ Gordon, Cascade Drilling
Distance from Waste/Source ft. / State: IL	Location of Well Relative to Waste/Source: u ☐ Upgradient; s ☐ Sidegradient; d ☐ Downgradient; n ☐ Not Known / Gov. Lot Number	

A. Protective pipe, top elevation 464.42 ft. (NAVD88)

B. Well casing, top elevation 464.16 ft. (NAVD88)

C. Land surface elevation 461.0 ft. (NAVD88)

D. Surface seal, bottom 459.0 ft. (NAVD88) or 2.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☒
SM ☐ SC ☐ ML ☒ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐
Hollow Stem Auger ☐
Mini Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐
Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

17. Source of water (attach analysis, if required):
Potable Water from Site - City of Peoria

E. Bentonite seal, top 432.0 ft. (NAVD88) or 29.0 ft.

F. Fine sand, top ____ ft. (NAVD88) or ____ ft.

G. Filter pack, top 430.0 ft. (NAVD88) or 31.0 ft.

H. Screen joint, top 428.0 ft. (NAVD88) or 33.0 ft.

I. Well bottom 418.0 ft. (NAVD88) or 43.0 ft.

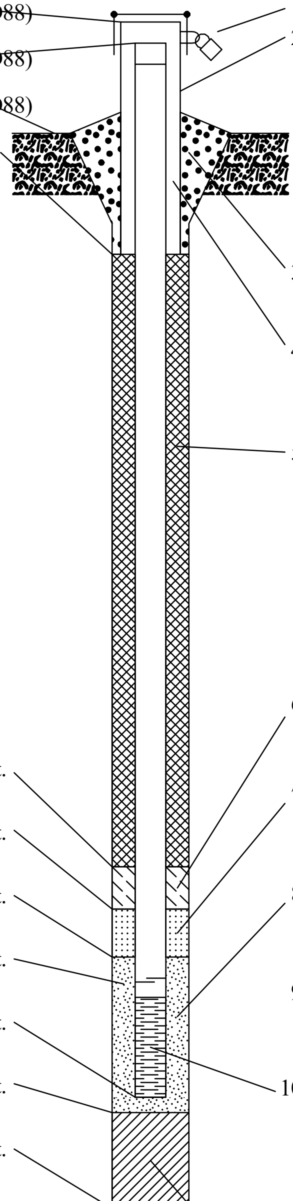
J. Filter pack, bottom 418.0 ft. (NAVD88) or 43.0 ft.

K. Borehole, bottom 418.0 ft. (NAVD88) or 43.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 5.0 ft.
   c. Material: Steel ☒ Other ☐
   d. Additional protection? ☒ Yes ☐ No
   If yes, describe: Bollards
3. Surface seal: Bentonite ☐ Concrete ☒ Other ☐
4. Material between well casing and protective pipe: Bentonite ☐ Sand Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
   b. ____Lbs/gal mud weight . . . Bentonite-sand slurry ☐
   c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
   d. ____% Bentonite . . . Bentonite-cement grout ☐
   e. 4.712 Ft^3 volume added for any of the above
   f. How installed: Tremie ☐ Tremie pumped ☒ Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
   c. ____ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
   a. Not Applicable
   b. Volume added 0 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
   a. P.W. Gillibrand, Industrial Sand
   b. Volume added 2.094 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒
   Flush threaded PVC schedule 80 ☐
   Other ☐
10. Screen material: Schedule 40 PVC
   a. Screen Type: Factory cut ☒ Continuous slot ☐ Other ☐
   b. Manufacturer Johnson Screens
   c. Slot size: 0.010 in.
   d. Slotted length: 10.0 ft.
11. Backfill material (below filter pack): None ☐ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge. Date Modified: 5/19/2021

Signature	Firm	
St Wb	Ramboll, 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607, Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name: Edwards Power Station	Local Grid Location of Well: ____ ft. ☐ N. ☐ S. ____ ft. ☐ E. ☐ W.	Well Name: XPW02
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 40° 35' 39.6" Long. -89° 40' 5.9" or St. Plane 1,430,769 ft. N, 2,434,978 ft. E. E / (W)	Date Well Installed: 01/09/2021
Facility ID	Section Location of Waste/Source: ____ 1/4 of ____ 1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Russ Gordon, Cascade Drilling
Type of Well: Well Code 72/dp	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number
Distance from Waste/Source ____ ft. / State IL		

A. Protective pipe, top elevation 474.46 ft. (NAVD88)

B. Well casing, top elevation 473.79 ft. (NAVD88)

C. Land surface elevation 471.2 ft. (NAVD88)

D. Surface seal, bottom 469.2 ft. (NAVD88) or 2.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☒
SM ☐ SC ☐ ML ☒ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐ Hollow Stem Auger ☐ Mini Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐ Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

17. Source of water (attach analysis, if required): Potable Water from Site - City of Peoria

E. Bentonite seal, top 439.2 ft. (NAVD88) or 32.0 ft.

F. Fine sand, top ____ ft. (NAVD88) or ____ ft.

G. Filter pack, top 437.2 ft. (NAVD88) or 34.0 ft.

H. Screen joint, top 435.2 ft. (NAVD88) or 36.0 ft.

I. Well bottom 425.2 ft. (NAVD88) or 46.0 ft.

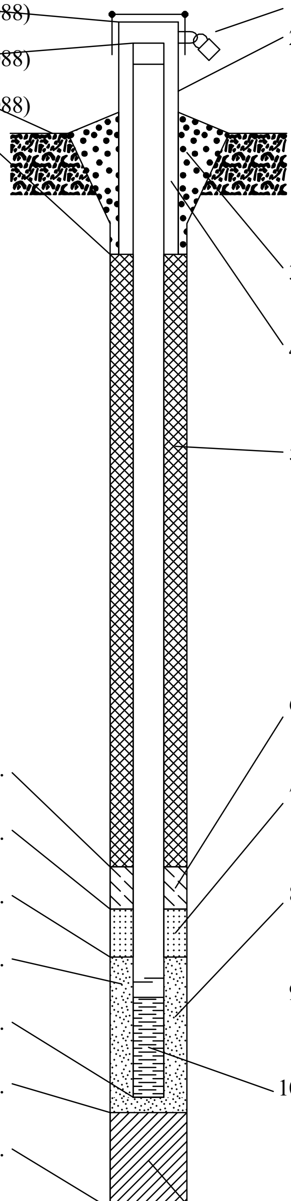
J. Filter pack, bottom 425.2 ft. (NAVD88) or 46.0 ft.

K. Borehole, bottom 424.2 ft. (NAVD88) or 47.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 5.0 ft.
   c. Material: Steel ☒ Other ☐
   d. Additional protection? ☒ Yes ☐ No
   If yes, describe: Bollards
3. Surface seal: Bentonite ☐ Concrete ☒ Other ☐
4. Material between well casing and protective pipe: Bentonite ☐ Sand Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
   b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐
   c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
   d. ____ % Bentonite . . . Bentonite-cement grout ☐
   e. 5.236 Ft^3 volume added for any of the above
   f. How installed: Tremie ☐ Tremie pumped ☒ Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
   c. ____ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
   a. Not Applicable
   b. Volume added 0 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
   a. P.W. Gillibrand, Industrial Sand
   b. Volume added 2.073 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ Flush threaded PVC schedule 80 ☐ Other ☐
10. Screen material: Schedule 40 PVC
   a. Screen Type: Factory cut ☒ Continuous slot ☐ Other ☐
   b. Manufacturer Johnson Screens
   c. Slot size: 0.010 in.
   d. Slotted length: 10.0 ft.
11. Backfill material (below filter pack): None ☐ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Date Modified: 5/19/2021

Signature: Sdt Wb

Firm: Ramboll, 234 W. Florida Street, Milwaukee, WI 53204

Tel: (414) 837-3607
Fax: (414) 837-3608

RAMBOLL

MONITORING WELL CONSTRUCTION

Facility/Project Name Edwards Power Station	Local Grid Location of Well ______ft. ☐ N. ☐ S. ______ft. ☐ E. ☐ W.	Well Name
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. 40° 35' 29.1" Long. -89° 39' 58.3" or	XPW03
Facility ID	St. Plane 1,429,704 ft. N, 2,435,574 ft. E. E /(W)	Date Well Installed 01/10/2021
Type of Well Well Code 72/dp	Section Location of Waste/Source ____1/4 of ____ 1/4 of Sec. ____, T. 7 N, R. 7 ☒ E ☐ W	Well Installed By: (Person's Name and Firm) Russ Gordon Cascade Drilling
Distance from Waste/ Source ft. / State IL	Location of Well Relative to Waste/Source u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known / Gov. Lot Number	

A. Protective pipe, top elevation 466.56 ft. (NAVD88)

B. Well casing, top elevation 466.04 ft. (NAVD88)

C. Land surface elevation 462.6 ft. (NAVD88)

D. Surface seal, bottom 460.6 ft. (NAVD88) or 2.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☒
SM ☐ SC ☐ ML ☒ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis attached? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐
Hollow Stem Auger ☐
Mini Sonic Other ☒

15. Drilling fluid used: Water ☒ 0 2 Air ☐
Drilling Mud ☐ 0 3 None ☐

16. Drilling additives used? ☐ Yes ☒ No

Describe ______

17. Source of water (attach analysis, if required):
Potable Water from Site - City of Peoria

E. Bentonite seal, top 439.6 ft. (NAVD88) or 23.0 ft.

F. Fine sand, top ______ ft. (NAVD88) or ______ ft.

G. Filter pack, top 437.6 ft. (NAVD88) or 25.0 ft.

H. Screen joint, top 435.6 ft. (NAVD88) or 27.0 ft.

I. Well bottom 425.6 ft. (NAVD88) or 37.0 ft.

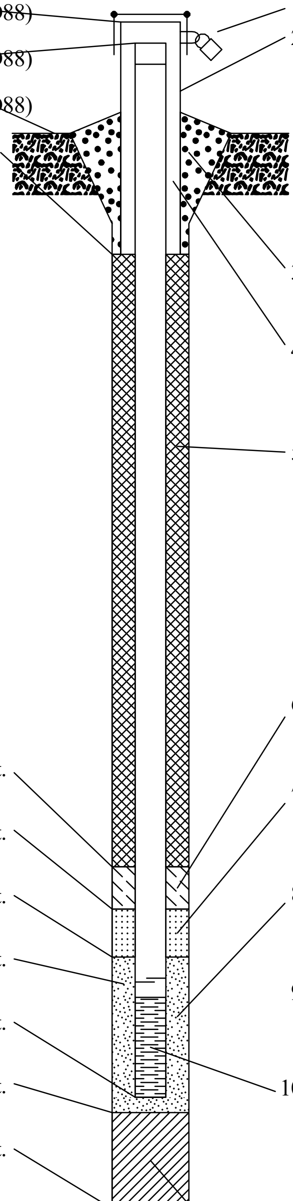
J. Filter pack, bottom 425.6 ft. (NAVD88) or 37.0 ft.

K. Borehole, bottom 422.6 ft. (NAVD88) or 40.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.07 in.



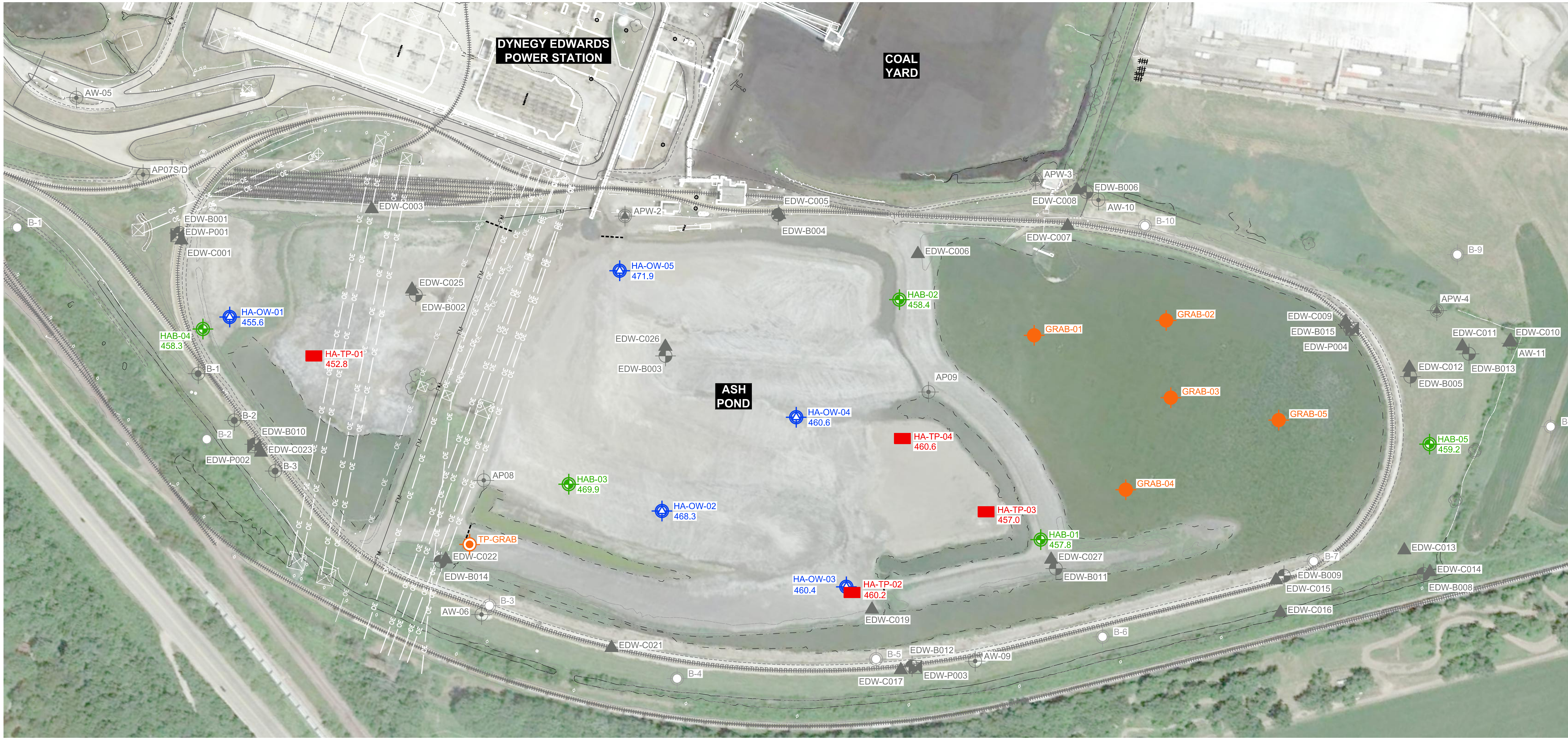
1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 5.0 ft.
   c. Material: Steel ☒ Other ☐
   d. Additional protection? ☒ Yes ☐ No
   If yes, describe: Bollards
3. Surface seal: Bentonite ☐ Concrete ☒ Other ☐
4. Material between well casing and protective pipe:
   Bentonite ☐
   Sand Other ☒
5. Annular space seal: a. Granular/Chipped Bentonite ☐
   b. ____Lbs/gal mud weight . . . Bentonite-sand slurry ☐
   c. 9.6 Lbs/gal mud weight . . . Bentonite slurry ☒
   d. ____% Bentonite . . . Bentonite-cement grout ☐
   e. 3.665 Ft^3 volume added for any of the above
   f. How installed: Tremie ☐ Tremie pumped ☒ Gravity ☐
6. Bentonite seal: a. Bentonite granules ☐
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒
   c. ______ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
   a. Not Applicable
   b. Volume added 0 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
   a. P.W. Gillibrand, Industrial Sand
   b. Volume added 2.029 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒
   Flush threaded PVC schedule 80 ☐
   Other ☐
10. Screen material: Schedule 40 PVC
   a. Screen Type: Factory cut ☒ Continuous slot ☐ Other ☐
   b. Manufacturer Johnson Screens
   c. Slot size: 0.010 in.
   d. Slotted length: 10.0 ft.
11. Backfill material (below filter pack): None ☐ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Date Modified: 5/19/2021

Signature	Firm	
St Wb	Ramboll 234 W. Florida Street, Milwaukee, WI 53204	Tel: (414) 837-3607 Fax: (414) 837-3608

PRE-2021 BORING LOGS



LEGEND

HAB-04 458.3 — DESIGNATION, LOCATION, AND GROUND SURFACE ELEVATION OF TEST BORINGS PERFORMED BY STRATA EARTH SERVICES, LLC. OF PALATINE, ILLINOIS DURING THE PERIOD 27 NOVEMBER 2017 TO 8 DECEMBER 2018.

HA-OW-01 455.6 — DESIGNATION, LOCATION, AND GROUND SURFACE ELEVATION OF OBSERVATION WELLS INSTALLED BY STRATA EARTH SERVICES, LLC. OF PALATINE, ILLINOIS DURING THE PERIOD 7 DECEMBER 2017 TO 8 DECEMBER 2018.

GRAB-04 — DESIGNATION AND APPROXIMATE LOCATION OF OF GRAB SAMPLES COLLECTED BY STRATA EARTH SERVICES, LLC. OF PALATINE, ILLINOIS ON 4 DECEMBER 2017.

TP-GRAB — DESIGNATION AND APPROXIMATE LOCATION OF TEST PIT GRAB SAMPLES COLLECTED BY HALEY & ALDRICH ON 19 JANUARY 2018.

HA-TP-01 452.8 — DESIGNATION, LOCATION, AND GROUND SURFACE ELEVATION OF TEST PITS PERFORMED AND GRAB SAMPLES COLLECTED BY HEADWATERS, INC. OF SOUTH JORDAN, UTAH DURING THE PERIOD 12 DECEMBER 2017 TO 13 DECEMBER 2017.

EDW-B014 — DESIGNATION AND APPROXIMATE LOCATIONOF TEST BORINGS PERFORMED BY STRATA EARTH SERVICES, INC. OF PALATINE, ILLINOIS FOR AECOM DURING THE PERIOD 3 TO 13 SEPTEMBER AND 5 NOVEMBER 2015.

EDW-C021 — DESIGNATION AND APPROXIMATE LOCATION OF CONE PENETROMETERS SOUNDING PERFORMED BY CONETEC, INC. OF NEW BERLIN, NEW JERSEY DURING THE PERIOD 19 TO 29 AUGUST 2015.

EDW-P002 — DESIGNATION AND APPROXIMATE LOCATIONOF PIEZOMETERS INSTALLED BY STRATA EARTH SERVICES, INC. OF PALATINE, ILLINOIS FOR AECOM DURING THE PERIOD 4 SEPTEMBER AND 4 TO 5 NOVEMBER 2015.

B-3 — DESIGNATION AND APPROXIMATE LOCATION OF TEST BORINGS PERFORMED BY GEOTECHNOLOGY, INC. OF COLLINSVILLE, ILLINOIS ON 19 JULY 2010.

APW-2 — EXISTING GEOTECHNOLOGY 2010 MONITORING WELL.

AW-06 — EXISTING HANSON 2015 MONITORING WELL.

B-4 — DESIGNATION AND APPROXIMATE LOCATION OF HISTORIC TEST BORINGS PERFORMED BY REITZ & JENS IN 2003.

NOTES

1. BACKGROUND IMAGE PROVIDED BY GOOGLE EARTH PRO, DATED 16 JUNE 2016.
2. ELEVATIONS INDICATED IN THIS DRAWING ARE IN FEET AND REFER TO NAVD88 DATUM. HORIZONTAL DATUM IS NAD83 ILLINOIS STATE PLANE WEST ZONE, US FOOT.
3. TECHNICAL MONITORING OF SUBSURFACE EXPLORATIONS SHOWN IN GREEN, BLUE, RED, AND ORANGE WAS PERFORMED BY HALEY & ALDRICH DURING THE PERIOD 27 NOVEMBER TO 13 DECEMBER 2017.
4. AS-DRILLED LOCATIONS AND GROUND SURFACE ELEVATIONS OF EXPLORATIONS WERE DETERMINED IN THE FIELD BY OPTICAL SURVEY BY MAURER-STUTZ, INC. OF PEORIA, ILLINOIS.

0 300 600
SCALE IN FEET

HALEY ALDRICH

DYNEGY EDWARDS POWER STATION
7800 SOUTH CILCO LANE
BARTONVILLE, ILLINOIS

DRAFT

SUBSURFACE EXPLORATION LOCATIONS PLAN

SCALE: AS SHOWN
FEBRUARY 2018

FIGURE 2

VARI, KATALIN Printed: 2/8/2018 12:00 PM Layout: .
G:\129319-DYNEGY POND CLOSURES\CAD\FIGURES\GEOTEC\129319_003_FIG-2_EXPL LOC.DWG

HALEY ALDRICH

TEST BORING REPORT

DRAFT

Boring No. HAB-01

Project	Edwards Power Station, Bartonville, Illinois	File No.	129319-003
Client	Dynegy	Sheet No.	1 of 3
Contractor	Strata Earth Services, LLC	Start	30 November 2017
		Finish	30 November 2017
		Driller	K. Diehl
		H&A Rep.	C. Giusti

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	-	Rig Make & Model: Detrich D-120 ATV
Inside Diameter (in.)	4	1 3/8	-	Bit Type: Roller Bit; Drill Mud: None
Hammer Weight (lb)	-	140	-	Casing: Augers to 17 ft
Hammer Fall (in.)	-	30	-	Hoist/Hammer: Winch Automatic Hammer; PID Make & Model:

Elevation 457.8
Datum NGVD 88
Location N 1,429,282.52 E 2,435,251.74

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
0																
	8 8 8	S1 10	3.5 5.0		ML	Medium dense gray to black SILT (ML), no structure, moist, PP=0.5 tons/ft ^{2}						100				
5						-FLY ASH-										
	1 WOH 1 WOH	S2, S3 24	7.5 9.5		ML	Similar to S1, except very loose, wet, and tan bedding						100				
					ML	Very loose tan SILT (ML), no structure, wet, PP=0.5 tons/ft ^{2}						100				
10	P U S H	U1 10	10.0 12.0		ML	Similar to S3						100				
	2 1 2	S4 20	13.5 15.0		ML	Very loose gray to black SILT with sand (ML), some gray/sandy bedding, wet, becoming silt at bottom 8.0 in.					15	85				
15	P U S H	U2 17.5	15.0 17.0		ML	Similar to S4						100				
						Note: Switched to rotary drilling with water at 17.0 ft.										
	WOH WOH WOH	S5, S6 24	18.5 20.5		ML	Very loose gray to black SILT (ML), 1.0 in. bed tan silt at 19.5 ft, wet, PP=0 tons/ft ^{2}, tan from 19.8 ft to 20.5 ft						100				
20																

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
11/30/17		0	7.5	9.5	5.5

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 58.8
Rock Cored (ft) -
Samples 14S, 5U

Boring No. HAB-01

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Plasticity**: N - Nonplastic L - Low M - Medium H - High
Toughness: L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

***Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**
Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

TEST BORING REPORT

DRAFT

Boring No. HAB-01
File No. 129319-003
Sheet No. 2 of 3

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20	WOH															
	WOR WOR WOH	S7 24	23.5 25.0		ML	Very loose gray to black SILT (ML), no structure, wet, PP=0 tons/ft ^{2} -FLY ASH-						100				
25	P U S H	U3 24	25.0 27.0		ML	Similar to S7					1	99				
	WOH WOH 1 WOH	S8 24	28.5 30.5		ML	Similar to S7, except contains sandy pockets					5	95				
30																
	1 WOH WOH WOH	S9 24	33.5 35.5		ML	Very loose gray to black SILT (ML), no structure, wet, PP=0 tons/ft ^{2}						100				
35																
	WOR WOR WOR	S10 24	38.5 40.0		ML	Similar to S9, except with some light gray to tan bedding						100				
40																
				415.8 42.0		Note: Driller estimated strata change at 42.0 ft.										
	WOR WOH WOH 1	S11 24	43.5 45.5		OH	Very soft olive-brown organic SILT (OH), varved, moist to wet, trace organic material and shell fragments						100		M	H	H
45	P U S H	U4 24	45.5 47.5		OH	Similar to S11 -ALLUVIAL DEPOSITS-				1	3	96				
	WOH 2 2 2	S12 24	47.5 49.5		OH	Similar to S11, except soft						100				

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. HAB-01

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
50	WOR WOH WOH 3	S13 24	49.5 51.5		OH	Similar to S11						100				
						-ALLUVIAL DEPOSITS-										
	P U S H	U5 24	51.5 53.5	406.3 51.5	CH	Olive-brown fat CLAY (CH), wet					1	99				
55																
				400.8 57.0												
	68/3.5	S14 2.5	58.5 58.8	399.0 58.8	CL	Hard gray lean CLAY (CL), laminated, dry to moist						100		H	M	L
						-WEATHERED BEDROCK-										

BOTTOM OF EXPLORATION AT 58.8 FT

Note: PP=Pocket Penetrometer.

HALEY ALDRICH

TEST BORING REPORT

DRAFT

Boring No. HAB-02

Project	Edwards Power Station, Bartonville, Illinois
Client	Dynegy
Contractor	Strata Earth Services, LLC

File No.	129319-003
Sheet No.	1 of 2
Start	30 November 2017
Finish	01 December 2017
Driller	K. Diehl
H&A Rep.	C. Giusti
Elevation	458.4
Datum	NGVD 88
Location	N 1,429,903.58 E 2,435,764.03

	Casing	Sampler	Barrel
Type	HSA	S	-
Inside Diameter (in.)	4	1 3/8	-
Hammer Weight (lb)	-	140	-
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures

Rig Make & Model: Detrich D-120 ATV
Bit Type: Roller Bit
Drill Mud: None
Casing: Augers to 17 ft
Hoist/Hammer: Winch Automatic Hammer
PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0																
	3 2 3	S1 16	3.5 5.0		ML	Loose gray to black SILT (ML), no structure, moist, PP=0.5 tons/ft^2						100				
5																
						-FLY ASH-										
	2 1 1	S2 18	8.5 10.0		ML	Similar to S1, except very loose and wet, PP=0 tons/ft^2						100				
10						Note: Final hammer blow caused sampler to penetrate 18.0 in.										
	P U S H	U1 0	11.0 13.0			No recovery, shelby tube.										
	1 WOH WOH	S3 4	13.5 15.0		ML	Similar to S1, except very loose and wet with cinders and traces of sand				5	5	90				
15	P U S H	U2 0	15.0 17.0			No recovery, shelby tube.										
						Note: Switch to rotary drilling with water at 17.0 ft.										
	1 WOH WOH	S4 24	18.5 20.5		ML	Very loose gray SILT (ML), 1.0 in. tan bed at 19.5 ft, wet, trace sand pockets, PP=0 tons/ft^2					5	95				
20																

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
11/30/17		0	8.5	10.0	5.0

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft)	38.5
Rock Cored (ft)	-
Samples	8S, 5U

Boring No. HAB-02

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Plasticity**: N - Nonplastic L - Low M - Medium H - High
Toughness: L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

***Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20	WOH															
	P U S H	U3 24	20.5 22.5		ML	Similar to S4 -FLY ASH-					5	95				
	1 WOH WOH WOH	S5 14	23.5 25.5		ML	Similar to S4						100				
25				432.4 26.0		Note: Driller noted change in drilling at 26.0 ft. -ALLUVIAL DEPOSITS-										
	WOH WOH WOH 2	S6 24	28.5 30.5		CH	Very soft olive-gray to gray-brown fat CLAY (CH), varved, moist to wet, trace organics and shell fragments						100		M	H	H
30	P U S H	U4 18	30.5 32.5		CH	Similar to S6						100				
	WOH 2 2 3	S7 24	32.5 34.5		CH	Soft olive-gray to gray-brown fat CLAY (CH), varved, some red-brown mottling, moist to wet, trace organics and shell fragments, PP=0.25 tons/ft ^{2}						100		M	H	H
35	WOH WOH 3 2	S8 24	34.5 36.5		CH	Similar to S7						100				
	P U S H	U5 24	36.5 38.5	419.9 38.5	CH	Similar to S7						100				
						BOTTOM OF EXPLORATION AT 38.5 FT Note: PP=Pocket Penetrometer.										

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

TEST BORING REPORT

DRAFT

Boring No. HAB-03

Project	Edwards Power Station, Bartonville, Illinois	File No.	129319-003
Client	Dynegy	Sheet No.	1 of 5
Contractor	Strata Earth Services, LLC	Start	27 November 2017
		Finish	29 November 2017
		Driller	K. Diehl
		H&A Rep.	C. Giusti

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	-	Rig Make & Model: Detrich D-120 ATV
Inside Diameter (in.)	4	1 3/8	-	Bit Type: Roller Bit; Drill Mud: None
Hammer Weight (lb)	-	140	-	Casing: Augers to 17.5 ft
Hammer Fall (in.)	-	30	-	Hoist/Hammer: Winch Automatic Hammer; PID Make & Model:

Elevation 469.9
Datum NGVD 88
Location N 1,430,619.71 E 2,434,935.46

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Toughness	Plasticity	Strength
0																
	1 1 2	S1 18	3.5 5.0		ML	Very loose light brown SILT with sand (ML), moist					20	80				
5						-FLY ASH-										
10																
	1 WOH 1	S2 18	10.5 12.0		ML	Similar to S1, except contains tan to light brown mottling, PP=0.5 tons/ft ^{2}					20	80				
	P U S H	U1 15	12.0		ML	Very loose light brown SILT with sand (ML), moist, contains tan to light brown mottling					20	80				
15	12 16 17	S3 16	14.0 15.5		ML	Dense dark brown and black SILT (ML), dry, PP=3 tons/ft ^{2}					5	95				
	P U S H	U2 24	15.5 17.5		ML	Similar to S3					5	95				
						Note: Switched to rotary drilling with water at 17.5 ft.										
20																

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
11/27/17		0	41	43	40
11/30/17			0		15

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 118.0
Rock Cored (ft) -
Samples 33S, 4U

Boring No. HAB-03

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

***Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Toughness	Plasticity	Strength
20																
	1 WOH WOH 2	S4 24	23.0 25.0		ML	Very loose gray to black SILT (ML) -FLY ASH-					5	95				
25	1 WOH 5 7	S5 24	25.0 27.0		ML	Similar to S4, except loose					5	95				
	2 4 4 4	S6 13	27.0 29.0	443.4 26.5	SP-SM	Loose gray to black poorly graded SAND with silt (SP-SM), mps 4 mm -BOTTOM ASH-		10	10	10	60	10				
30	1 1 2 2	S7, S8 17	29.0 31.0	440.9 29.0	SP-SM	Very loose gray to black poorly graded SAND with silt (SP-SM), mps 4 mm, contains cinders, contains 12.0 in. thick layer of fly ash from 30.0 ft to 31.0 ft			60	20	10	10				
	1 1 3 6	S9 17	31.0 33.0	438.9 31.0	SP	Very loose to loose gray to black poorly graded SAND (SP), mps 5 mm		5	60	15	15	5				
	2 2 4 5	S0 23	33.0 35.0		SP	Loose gray to black poorly graded SAND (SP), mps 3 mm		15	75	5	5					
35	2 4 6 18	S11 18	35.0 37.0		SP	Loose gray to black poorly graded SAND (SP), some cementation, contains cinders			20	60	20					
	26 26 19 36	S12 15	37.0 39.0		SP	Dense gray to black poorly graded SAND (SP), mps 3 mm Note: Drilling fluid additive added at 37.0 ft.			5	5	75	5				
40	19 17 40 35	S13 18	39.0 41.0		SP	Similar to S12, except hard with greater cinder content and some cementation, PP=3 tons/ft ^{2}			5	5	75	5				
	10 6 6 4	S14 18	41.0 43.0		SP	Similar to S12, except medium dense			5	5	75	5				
				427.9 42.0	ML	Medium dense gray-brown SILT (ML), at 42.0 ft -FLY ASH-					5	95				
	WOH WOH WOH WOH	S15 11	43.0 45.0		ML	Very loose gray-brown SILT (ML), PP=0 tons/ft ^{2}					5	95				
45	WOR WOR 1 2	S16 21	45.0 47.0		ML	Similar to S15					10	90				
	1 WOH 1 2	S17 23	47.0 49.0		ML	Similar to S15, except with interbedded black poorly graded medium SAND					5	95				
	1	S18	49.0		ML	Similar to S15, except with interbedded black poorly graded SAND and					5	95				

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

TEST BORING REPORT

DRAFT

Boring No. HAB-03
File No. 129319-003
Sheet No. 3 of 5

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
50	WOH WOH 2	24	51.0			contains cinders, mps 10 mm										
	1 1 2 3	S19 23	51.0 53.0		ML	Very loose gray-brown SILT with sand (ML), contains cinders -FLY ASH-					20	80				
	WOH 1 WOH WOH	S20 24	53.0 55.0		ML	Similar to S19					20	80				
55	P U S H	U3 24	55.0 57.0		ML	Top 1.0 ft similar to S19					20	80				
				413.9 56.0	CH	Bottom 1.0 ft gray fat CLAY (CH), wet					1	99				
	WOH 4 4 4	S21 24	57.0 59.0		CH	Medium stiff gray fat CLAY (CH), varved, tan to brown mottling, moist to wet, trace organics, PP=0.75 tons/ft ^{2} -ALLUVIAL DEPOSITS-						100				
	12 6 8 16	S22 24	59.0 61.0		CH	Similar to S21, except stiff						100				
60				409.4 60.5												
	P U S H	U4 16	61.0 62.5		CL	Olive-gray lean CLAY with gravel (CL), mps 25 mm, moist, PP=1.5 tons/ft ^{2}	12	13	4	5	6	60		H	M	H
	53 75/2"	S23 8	63.0 64.1	406.9 63.0	CH	Hard olive-gray fat CLAY (CH), laminated, moist to dry, PP=>4.5 tons/ft ^{2}						100		H	M	H
65						-DECOMPOSED ROCK-										
	12 26 74	S24 10	68.5 70.0		CL	Similar to S23						100				
70																
	75/3"	S25 3	73.5 73.8		CL	Hard olive gray lean CLAY (CL), laminated, moist to dry, PP=>4.5 tons/ft ^{2}						100		H	M	H
75																
	75/3"	S26 3	78.5		CL	Similar to S25						100				

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

DRAFT

Boring No. HAB-03
File No. 129319-003
Sheet No. 4 of 5

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
			78.8													
80																
	60/3.5"	S27 3.5	83.5 83.8		CL	Similar to S25						100				
85						-DECOMPOSED ROCK-										
	60/3.5"	S28 3	88.5 88.8		CL	Similar to S25						100				
90																
	60/3.5"	S29 3	93.5 93.8		CL	Similar to S25						100				
95																
	68/4"	S30 10	98.5 99.3		CL	Similar to S25						100				
100																
	60/4"	S31 3	103.5 103.8		CL	Similar to S25						100				
105																
	70/4"	S32	108.5									100				

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. HAB-03

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
		3	108.8		CL	Similar to S25										
110																
						-DECOMPOSED ROCK-										
						Note: Driller notes hard drilling at 112.0 ft										
	100/1"	S33 0	113.5 113.6			No recovery. Note: Spoon refusal at depth 113.6 ft.										
115																
				351.9 118.0		BOTTOM OF EXPLORATION AT 118.0 ft										
						Note: PP=Pocket Penetrometer.										

HALEY ALDRICH

TEST BORING REPORT

DRAFT

Boring No. HAB-04

Project	Edwards Power Station, Bartonville, Illinois	File No.	129319-003
Client	Dynegy	Sheet No.	1 of 1
Contractor	Strata Earth Services, LLC	Start	05 December 2017
		Finish	05 December 2017
		Driller	K. Diehl
		H&A Rep.	C. Giusti

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	-	Rig Make & Model: Detrich D-120 ATV
Inside Diameter (in.)	4	1 3/8	-	Bit Type: Roller Bit Drill Mud: None
Hammer Weight (lb)	-	140	-	Casing: Auger
Hammer Fall (in.)	-	30	-	Hoist/Hammer: Winch Automatic Hammer PID Make & Model:

Elevation 458.3
Datum NGVD 88
Location N 1,431,767.36 E 2,434,995.09

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0						-FLY ASH-										
	10 9 7 7	S1, S2 24	2.0 4.0		ML	Medium dense gray to black SILT (ML), no structure, moist, PP=3.5 tons/ft ^{2}						100				
				454.5 3.8												
5	P U S H	U1 21	4.0 6.0		CH	Stiff brown fat CLAY (CH), varved, some red-brown mottling, moist, PP=2.5 tons/ft ^{2}				1	2	97		M	H	H
						-ALLUVIAL DEPOSITS-										
10	1 3 3 3	S3 20	8.5 10.5		CH	Medium stiff olive-gray fat CLAY (CH), varved, red-brown mottling, moist, PP=0.75 tons/ft ^{2}						100		M	H	H
	1 2 2 3	S4 24	10.5 12.5		CH	Soft olive-gray fat CLAY (CH), varved, brown mottling, moist, trace organics and shell pockets, sand at 12.4 ft, PP=0.5 tons/ft ^{2}					5	95		M	H	H
	P U S H	U2 24	12.5 14.5		CH	Similar to S4					5	95				
15	3 5 7 4	S5 24	14.5 16.5		CH	Stiff olive-brown to olive-gray fat CLAY (CH), varved, moist, trace organics, PP=1.0 tons/ft ^{2}						100		H	H	H
				441.8 16.5		BOTTOM OF EXPLORATION AT 16.5 FT Note: PP=Pocket Penetrometer.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/5/17		0	14.5	16.5	DRY

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 16.5
Rock Cored (ft) -
Samples 5S, 2U

Boring No. HAB-04

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Plasticity**: N - Nonplastic L - Low M - Medium H - High
Toughness: L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

***Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**
Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

TEST BORING REPORT

DRAFT

Boring No. HAB-05

Project	Edwards Power Station, Bartonville, Illinois	File No.	129319-003
Client	Dynegy	Sheet No.	1 of 2
Contractor	Strata Earth Services, LLC	Start	04 December 2017
		Finish	06 December 2017
		Driller	K. Diehl
		H&A Rep.	C. Giusti

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	-	Rig Make & Model: Detrich D-120 ATV
Inside Diameter (in.)	4	1 3/8	-	Bit Type: Roller Bit; Drill Mud: None
Hammer Weight (lb)	-	140	-	Casing: Auger; Hoist/Hammer: Winch Automatic Hammer
Hammer Fall (in.)	-	30	-	PID Make & Model:

Elevation 459.2
Datum NGVD 88
Location N 1,428,320.25 E 2,435,895.55

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	3 5 7 11	S1 22	0.0 2.0		ML	Medium dense brown SILT with sand (ML), mps 5 mm, no structure, moist, contains roots and organics, PP=1.0 tons/ft ^{2}					10	90				
						-FILL-										
	5 17 56	S2 18	3.5 5.0		ML	Similar to S1, except very dense					10	90				
				455.0 4.2	ML	Very dense gray to black SILT (ML), PP=3.0 tons/ft ^{2}					10	90				
5	3 34 45	S3, S4 18	5.0 6.5		ML	Very dense to hard brown SILT with sand (ML), no structure, moist					10	90				
	13 15 20 16	S5 *	6.5 8.5	453.2 6.0	ML	Dense to very dense gray to black SILT (ML), no structure, dry to moist, PP=2.0 tons/ft ^{2}					5	95				
						-FLY ASH-										
10	P U S H	U1 14	8.5 10.5		ML	Similar to S4					5	95				
	P U S H	U2 15	10.5 12.5		ML	Similar to S4					5	95				
				447.7 11.5	SP- SM	Gray to black poorly graded SAND with silt (SP-SM), mps 5 mm, no structure, wet, PP=0.0 tons/ft ^{2}			10	10	70	10				
						-BOTTOM ASH-										
15	1 1 1 1	S6 12	13.5 15.5		SP- SM	Very loose gray to black poorly graded SAND with silt (SP-SM), mps 5 mm, no structure, wet, PP=0.0 tons/ft ^{2}			10	10	70	10				
20	1 1 WOH	S7 20	18.5 20.5	440.7 18.5	SP	Very loose gray to black poorly graded SAND (SP) mps 6 mm, no structure, wet, PP=0.0 tons/ft ^{2}			10	20	70					

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/4/17		0	13.5	15.5	15

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 41.5
Rock Cored (ft) -
Samples 15S, 4U

Boring No. HAB-05

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

***Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20	1															
				437.2 22.0		Note: Driller noted resistance change at 22.0 ft -FILL-										
	5 9 12 13	S8 12	23.5 25.5		CH	Very stiff olive-brown to gray-brown fat CLAY (CH), no structure, moist, PP=1.5-2.0 tons/ft ^{2}						100		H	H	H
25	1 1 2 3	S9 6	25.5 27.5		CH	Similar to S8, except soft and light brown, PP=1.0 tons/ft ^{2}						100				
	2 3 4 5	S10 6	27.5 29.5		CH	Similar to S8, except medium stiff and light brown with gray mottling						100				
30	2 2 2 3	S11 20	29.5 31.5		CH	Very soft to soft light brown fat CLAY (CH), gray-brown mottling, moist, PP=0.5 tons/ft ^{2}						100		M	H	H
	1 2 3 3	S12, S13 24	31.5 33.5		CH	Similar to S11, except medium stiff						100				
				427.2 32.0	CH	Medium stiff olive-gray fat CLAY (CH), varved, moist, trace organics, PP=1.25 tons/ft ^{2} -ALLUVIAL DEPOSITS-						100				
	1 2 2 3	S14 22	33.5 35.5		CH	Soft olive-gray fat CLAY (CH), varved, moist, trace organics						100		M	H	H
35	P U S H	U3 24	35.5 37.5		CH	Similar to S14					1	99				
	2 2 3 3	S15 22	37.5 39.5		CH	Similar to S14, except medium stiff with shell fragments, PP=1.0 tons/ft ^{2}						100				
40	P U S H	U4 24	39.5 41.5		CH	Similar to S14						100				
				417.7 41.5		BOTTOM OF EXPLORATION AT 41.5 FT Note: PP=Pocket Penetrometer.										

TEST BORING REPORT

DRAFT

Boring No. HA-OW-01

Project	Edwards Power Station, Bartonville, Illinois
Client	Dynegy
Contractor	Strata Earth Services, LLC

File No.	129319-003
Sheet No.	1 of 2
Start	07 December 2017
Finish	08 December 2017
Driller	K. Diehl
H&A Rep.	C. Giusti
Elevation	455.6
Datum	NGVD 88
Location	N 1,431,706.38 E 2,435,045.27

	Casing	Sampler	Barrel
Type	HSA	S	-
Inside Diameter (in.)	4	1 3/8	-
Hammer Weight (lb)	-	140	-
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures

- Rig Make & Model: Detrich D-120 ATV
- Bit Type: Roller Bit
- Drill Mud: None
- Casing: Auger to 30.5 ft
- Hoist/Hammer: Winch Automatic Hammer
- PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
0																
5	2 3 3 3	S1 22	3.5 5.5		ML	Loose light brown to black SILT with sand (ML), no structure, moist, PP=1.5 tons/ft^2 -FILL-					20	80				
10	WOH WOH WOH WOH	S2 24	8.5 10.5		ML	Very loose gray to black SILT (ML), no structure, wet, contains fine sand pockets, PP=0.0 tons/ft^2					5	95				
	WOH WOH WOH WOH	S3 24	10.5 12.5		ML	Similar to S2						100				
	WOH WOH 4 2	S4 24	12.5 14.5	442.1 13.5	SM	Loose gray to black silty SAND (SM), no structure, moist to wet, PP=1.0 tons/ft^2 -BOTTOM ASH-				10	70	20				
15	1 1 2 2	S5 13	14.5 16.5	441.1 14.5	ML	Very loose gray to black SILT (ML), no structure, wet, contains fine sand pockets, PP=0.0 tons/ft^2 -FLY ASH-					5	95				
	3 1 WOH 2	S6 6	16.5 18.5		ML	Similar to S5					10	90				
20	3 7 8 11	S7 12	18.5 20.5	436.6 19.0	CH	Stiff dark brown to gray fat CLAY (CH), varved, moist, contains organics, PP=3.25 tons/ft^2 -ALLUVIAL DEPOSITS-						100		H	H	H

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/7/17		0	8.5	8.5	6
12/11/17	8:00	96	18.0	18.0	4.79

Sample ID

- O - Open End Rod
- T - Thin Wall Tube
- U - Undisturbed Sample
- S - Split Spoon Sample

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

Summary

Overburden (ft)	34.5
Rock Cored (ft)	-
Samples	10S, 4U

Boring No. HA-OW-01

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

***Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

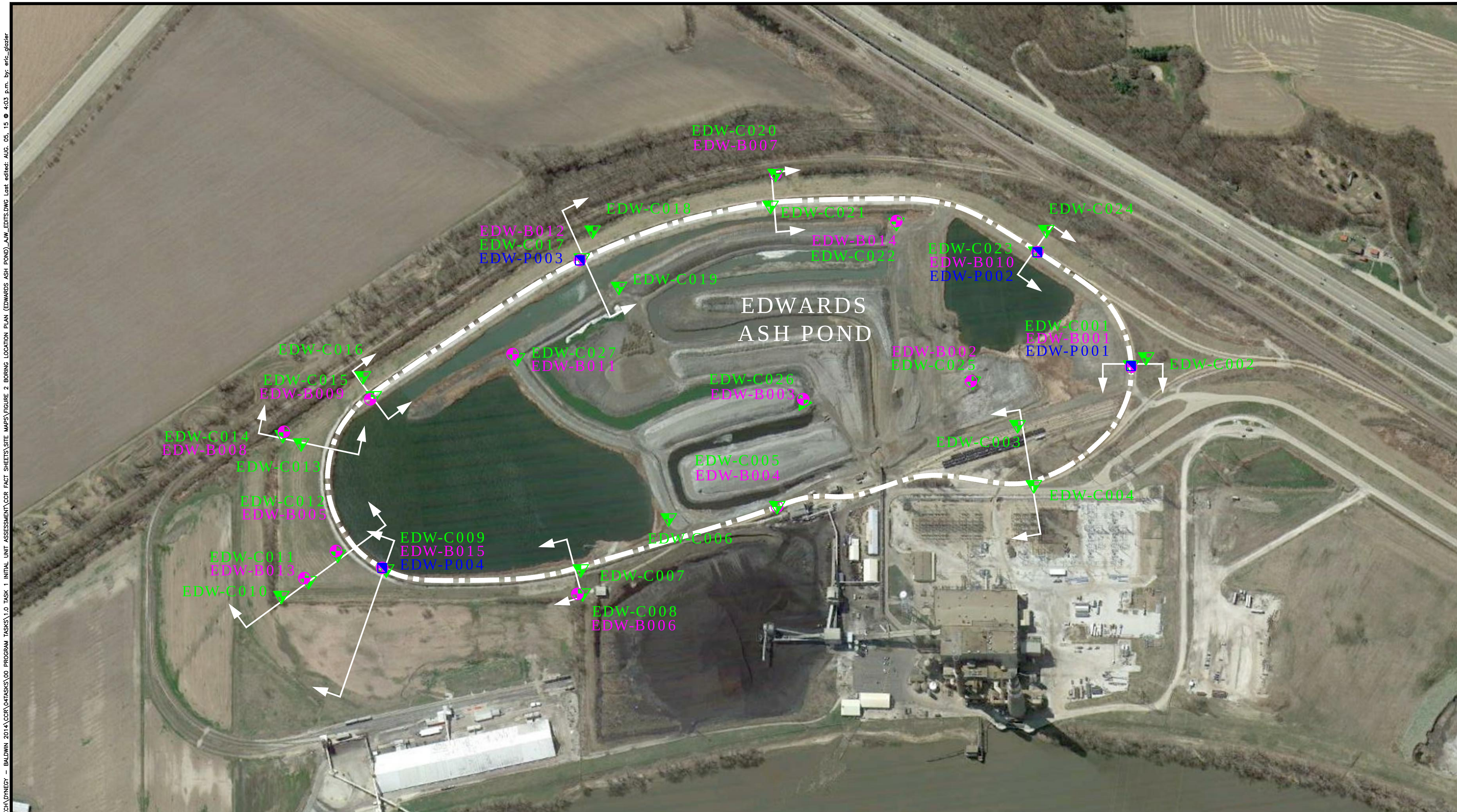
TEST BORING REPORT

DRAFT

Boring No. HA-OW-01
File No. 129319-003
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Well Diagram	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20																	
	2 4 5 6	S8 11	20.5 22.5			CH	Stiff dark brown to gray fat CLAY (CH), varved, some light brown mottling, moist, contains organics, PP=1.0 tons/ft^2 -ALLUVIAL DEPOSITS-						100		H	H	H
	P U S H	U1 16	22.5 24.5			CH	Similar to S8						100				
25	2 2 3 3	S9 12	24.5 26.5		431.1 24.5	CL	Medium stiff olive-gray and yellow-brown lean CLAY (CL), mottled, moist, contains organics, PP=1.0 tons/ft^2						100		M	H	H
	P U S H	U2 10	26.5 28.5				Note: Shelby tube discarded due to low recovery.				2	2	96				
	P U S H	U3 15	28.5 30.5			CL	Similar to S9 Note: Switched to rotary drilling with water at 30.5 ft.						100				
30	WOH 2 2 4	S10 23	30.5 32.5		425.1 30.5	CH	Soft gray fat CLAY (CH), varved, moist, contains organic and shell fragments, PP=1.25 tons/ft^2						100		M	H	H
	P U S H	U4 23	32.5 34.5		423.1 32.5	ML	Light brown to tan sandy SILT with gravel (ML), moist		20	10	10	10	50				
					421.1 34.5		BOTTOM OF EXPLORATION 34.5 FT Note: PP=Pocket Penetrometer. Installed observation well in completed borehole.										

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.



XXX–X###

EXPLORATION METHOD (B=BORING, C=CPT, P=PIEZOMETER)

ID NUMBER

STATION ABBREVIATION

LEGEND

PROPOSED BORING LOCATION

PROPOSED CPT LOCATION

PROPOSED PIEZOMETER LOCATION

PROPOSED CROSS SECTION LOCATION

CCR UNIT BERM ALIGNMENT

SOURCE:
MAP PROVIDED BY GOOGLE EARTH PRO 2015

N

0 400

APPROXIMATE SCALE FEET

DYNEGY, INC	PROJECT NO. 60440202
AECOM	
DRN. BY: djd July 2015 DSGN. BY: eg CHKD. BY: eg	Edwards Ash Pond Field Investigation Plan
FIG. NO.	1

File: \\URSSTLOUIS\STLOUIS\PROJECTS\GEOTECH\DYNEGY – BALDWIN 2014\CCR\04TASKS\00 PROGRAM TASKS\1.0 TASK 1 INITIAL UNIT ASSESSMENT\CCR FACT SHEETS\SITE MAPS\FIGURE 2 BORING LOCATION PLAN (EDWARDS ASH POND)_AJW_EDITS.DWG Last edited: AUG. 05, 15 @ 4:03 p.m. by: eric_glazier

PRIVILEGED & CONFIDENTIAL - ATTORNEY CLIENT PRIVILEGED

Project: Edwards Power Station	**Log of Boring EDW-B001**
Project Location: Bartonville, Illinois	Sheet 1 of 2
Project Number: 60440202	

Date(s) Drilled	**11/05/2015 to 11/05/2015**	Logged By	**Robert Weseljak**	Checked By	**AJW**
Drilling Method	**Mud Rotary**	Drill Bit Size/Type	**3 7/8" Tricone Roller Bit**	Borehole Depth	**51.0 ft**
Drill Rig Type	**Mobile B-57 Truck Mounted**	Drilling Contractor	**Strata Earth Services**	Surface Elevation	**460 ft**
Borehole Backfill	**Portland Cement and Bentonite**	Sampling Method(s)	**Split Spoon/3" Thin Walled Tube**	Hammer Data	**Automatic, 140 lbs, 30" drop**
		Groundwater Level(s)	**ft on**		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
460	0		SS-1	2 6 8	61		460.0 / 0.0 Stiff, dry, gray mottled with brown, lean CLAY (CL).					3.0			
			SS-2	3 4 5	94		457.5 / 2.5 Stiff, moist, brown mottled with gray and black, lean CLAY (CL), trace shell fragments.					3.0			
455	5		SS-3	3 3 3	75		Becomes medium stiff.					1.0			
			ST-4	200 psi	100										*Pushed shelby tube from 7.0 to 9.0 feet*
450	10		SS-5	3 3 6	83		450.0 / 10.0 Stiff, moist, grayish black, lean CLAY (CL), trace organics.					1.0 1.5			
445	15		SS-6	1 3 5	78							1.25			
440	20		SS-7	1 6 7	100		440.0 / 20.0 Stiff, moist, very dark gray to grayish black with some brown, lean CLAY (CL).					1.5 2.5			
435	25		SS-8	WOH WOH 2	100		435.0 / 25.0 Very soft, wet, brown mottled with gray, sandy lean CLAY (CL).					1.0 0.5			
430	30						430.0 / 30.0								

Elevation (feet)	Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	Elevation (feet)	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
430	30							Soft, wet, gray, silty lean CLAY (CL-ML).									*Pushed shelby tube from 30.0 to 32.0 feet*
			ST-9	150 psi	100									1.25			
425	35						425.0	Loose, wet, gray, silty SAND (SM), trace wood fragments.	35.0								
			SS-10	2 2 4	100		424.2	Medium stiff, moist, gray, lean CLAY (CL).	35.8					0.5 1.0			
420	40		SS-11	50/3"	100		420.0	CLAYSTONE: Brown and gray, weathered, hard.	40.0								
415	45		SS-12	50/2"													
							414.0	SILTSTONE: Thin to medium bedding, fresh, argillaceous.	46.0								*Run 1 - Start 13:46, End 14:00*
			Run 1	16.7	36.7												
410	50						409.0	End of Boring at 51 ft	51.0								*Boring backfilled with Portland Cement and bentonite*
405	55																
400	60																
395	65																

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B002

Sheet 1 of 2

Date(s) Drilled	09/03/2015 to 09/03/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	52.5 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	457 ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	7.5 ft on 9/3/2015		

Elevation (feet)	Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
457.0	0		SS-1	7 6 8	89		Medium dense, moist, dark brown, FLY ASH [Fill].	38.4							
455															
454.5	2.5		SS-1	3 2 2	100		Loose, moist, dark gray, FLY ASH [Fill].	62.4							
	5		ST-3	150 psi	62.5			66.6		65	29				*Pushed shelby tube from 5.0 to 7.0 feet*
450															
449.5	7.5 ▽		SS-4	WOR	100		Very loose, wet, black, FLY ASH [Fill].	79.0							
	10		ST-5		55			76.9	90.8 94.3 91.2	17	NP				*10.0 feet switch to mud rotary Pushed shelby tube from 10.0 to 12.0 feet*
445							Becomes dark gray.								
							Hard layer at tip of tube.								
	15		SS-6	1 2 3	100		Becomes loose.	52.5							
440															
437.0	20		SS-7	12 17 2	37		Medium dense, wet, dark gray, FLY ASH [Fill], with cementous layers.	67.8							
435															
432.0	25		SS-8	1 WOH WOH	100		Very loose, wet, dark gray, FLY ASH [Fill].	63.9							
430															
	30														

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B002

Elevation (feet)	Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
426.5	30.5		SS-9	WOR WOH WOH	100		With clay.	126.1							
							Very soft, wet, brown, lean CLAY (CL), with sand.	31.1				0.5			
422.0	35.0		ST-10	100 psi	100		Very soft, gray, lean CLAY (CL), with sand, trace shells.	31.6		36	18	0.25			
	40		SS-11	WOH WOH WOH	100			42.9				0.75			
	45		SS-12	WOH WOH 2	100		Grades with trace organics.	57.7				0.25			
410.0	47.0						SHALE: Light gray, silt sized.								
	50		SS-13	50/3"	100			11.1							
404.5	52.5						End of Boring at 52.5 ft								*Boring backfilled with bentonite and cement fluid*

Elevation scale: 425, 420, 415, 410, 405, 400, 395. Depth scale: 30, 35, 40, 45, 50, 55, 60, 65.

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B003

Date(s) Drilled	09/03/2015 to 09/03/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	60.5 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	460 ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	7 ft on 9/3/2015		

Elevation (feet)	Depth (feet)	SAMPLES: Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
460	0				460.0 / 0.0								
		SS-1	7 7 7	83	Medium dense, moist, dark gray, FLY ASH [Fill].	44.4							
		SS-2	3 2 2	100	Becomes loose.	27.3							
455	5				455.0 / 5.0								
		SS-3	1 WOH 2		Very soft, moist, lean CLAY (CL) with ash, sand, and organics.	37.2							
					452.5 / 7.5								
		ST-4	<100 psi	100	Ash, dark gray [Fill].	55.5							*Pushed shelby tube from 7.5 to 9.5 feet*
450	10	SS-5	WOR WOR WOR	67		50.6							*10.0 feet: Switch to mud rotary*
					447.0 / 13.0								
					Very dense, dark gray, moist, fine to coarse ASH with sand and gravel, slightly cemented [Fill].								*13.0 feet: Hard drilling*
445	15	SS-6	26 37 29	100		29.7							
					Becomes very loose, dark gray, fine.								
440	20	SS-7	1 1 1	100		42.1							
435	25	ST-8	100 psi	100	Grades with sand.	54.9							*Pushed shelby tube from 25.0 to 27.0 feet*
430	30												

Elevation (feet)	Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Material Description	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	Remarks
430	30	ST	ST-9	100 psi	100	Varved FLY ASH.	71.7	91.2 92.9 92.0						*Pushed shelby tube from 30.0 to 32.0 feet*
425	35	SS	SS-10	WOR WOR WOR	100		51.9 43.0							
423.5	36.5					Very soft, moist, brown to gray, silty CLAY (CL), trace sand, shells, and organics.								
420	40	SS	SS-11	WOH WOH WOR	100		31.6				.75			
415.0	45.0	ST	ST-12	100 psi	100	Soft, moist, dark gray, fat CLAY (CH) with sand.	46.0				1.0			*Pushed shelby tube from 45.0 to 47.0 feet*
410.0	50.0	SS	SS-13	1 2 3	100	Medium stiff, moist, brownish to greenish, gray, lean CLAY (CL), with sand.	55.4				1.0			
406.0	54.0					SHALE, gray, weathered, silt sized.								
405	55	SS	SS-14	11 50/5"	100		23.3 9.8							
400	60	SS	SS-15	50/3"	100		7.1							
399.5	60.5					End of Boring at 60.5 ft								*Boring backfilled with bentonite and cement fluid*
395	65													

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B003A

Date(s) Drilled	09/03/2015 to 09/03/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	9.5 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
Boring Location (ft NAD83)	5' East of EDW-B003	Groundwater Level(s)	7 ft on 9/3/2015		

Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
0						0.0 Offset boring to attempt shelby tube at 7.5 feet								
7						∇								
7.5–9.5	Shelby tube	ST-1		0										*Pushed shelby tube from 7.5 to 9.5 feet*
9.5						9.5 End of Boring at 9.5 ft								*Boring backfilled with bentonite and cement fluid*

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B004

Date(s) Drilled	09/11/2015 to 09/11/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	60.3 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
0						0.0								
		SS-1	16 12 15	83	6" stone at surface.	0.5	18.9							
					Medium dense, moist, dark gray, ASH [Fill].									
		SS-2	3 2 2	100		3.5	28.5 20.1							
					Becomes dark gray to dark brown, trace silty clay, sand and gravel.									
5		SS-3	2 2 4	77							1.25			
		SS-4	2 3 4	100			21.6				2.0			
10		SS-5	2 2 2	67			21.5				2.0			*10.0 feet: Switch to mud rotary*
						12.5								
		SS-6	2 2 2	100	Soft, wet, brown mottled, silty CLAY (CL), trace sand and gravel.		25.4				1.25			
15		SS-7	2 3 3	77			25.8				1.25			
20		SS-8	WOH 2 3	89	Grades brown, with sand.		31.3				.75			
25		SS-9	2 2 3	89		26.0	23.0 19.5							
					Medium stiff, wet, brown, clayey SAND (SC).	26.5								
					Medium stiff, wet, dark gray to gray, silty CLAY (CL), trace sand.									
30						30.0								

AECOM

Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
30	SS	SS-10	2 7 6	89		Stiff, gray, wet, lean CLAY (CL), with sand, and organics.	19.7				4.0			
35	ST	ST-11		100		35.0 Stiff, wet, gray mottled, lean CLAY (CL) with sand.	20.1				1.25			*Pushed shelby tube from 36.0 to 38.0 feet*
40	SS	SS-12	2 3 3	89		40.0 Stiff, wet, brown mottled, lean CLAY (CL), trace sand.	30.0				1.75			
45	SS	SS-13	2 3 5	83		45.0 Medium stiff, wet, dark gray, lean CLAY (CL).	39.5 35.1				1.25			
50	SS	SS-14	2 2 3	100		50.0 Medium, stiff, wet, gray, lean CLAY (CL) with sand, trace shells and organics.	65.2				1.25			
55	SS	SS-15	3 8 23			56.0 SHALE: Light gray, weathered.	33.4 13.2							*56.5 to 60.0 feet: Solid drilling*
60	SS	SS-16	50/3"	100		60.0 End of Boring at 60.3 ft	8.8							*Boring backfilled with bentonite and cement fluid*
65														

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B005

Date(s) Drilled	09/10/2015 to 09/10/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	53.0 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	8 ft on 9/10/2015		

Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
0		SS-1	4 4 5	95		Medium, stiff, moist, brown, clayey SAND (SC), trace gravel, topsoil, roots and fill.	0.0	45.8				2.0			
		SS-2	9 15 11	100		Medium dense, moist, brown, sandy SILT (ML) with gravel.	2.5	26.0							
5		SS-3	2 2 2	100		Loose, moist, brown, sandy elastic SILT (MH) with clay.	5.0	50.9				1.8			
		SS-4		100		Loose, wet, brown, sandy SILT (ML) with gravel.	▽ 8.0	37.4							
10		SS-5	1 2 5	100		Medium stiff, wet, light brown and gray, clayey SAND (SC) with gravel.	10.0	44.3							*10.0 feet: Switch to mud rotary*
15		SS-6	2 8 10	100		Very stiff, wet, brown, sand SILT (ML) with gravel.	15.0	41.4							
20		SS-7	1 1 1	100		Soft, wet, brown, gravelly CLAY (CL), trace sand.	20.0	51.1							
25		SS-8	2"	100				55.3 47.6							
						Very loose, wet, dark brown ASH [Fill].	26.5								
		SS-9		100				69.3							
30															

Report: GEO_SOIL; File K:\PROJECTS\60440202_DYNEGY CCR EDWARDS\400-TECHNICAL\BORING LOGS\60440202_DYNEGYEDWARDSBORINGLOGS.GPJ; 12/18/2015 9:33:20 AM

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Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
30		SS-9		100			69.3							
35		SS-10	WOR WOH WOH	67		35.0 Very loose, wet, black, ASH, with organic clay [Fill].	37.3							
						38.0 Soft, wet, gray, fat CLAY (CH), trace sand, shells, and organics.								
40		ST-11	150 psi	100			44.8		57	35				*Pushed shelby tube from 41.0 to 43.0 feet*
45		SS-12	WOH 2 2	100		45.0 Soft, wet, dark gray and greenish gray, lean CLAY (CL), with sand, organics and shale.	88.7							
						49.5 SHALE: light gray, weathered.								
50		SS-13	11 18 44	89			15.9 12.8							
						53.0 End of Boring at 53 ft								*Boring backfilled with bentonite and cement fluid*
55														
60														
65														

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B006

Date(s) Drilled	09/08/2015 to 09/08/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	37.0 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
0						0.0								
		SS-1	3 4 6	94		Stiff, moist, dark brown, lean CLAY (CL) with sand and glass.	26.4				3.0			
						2.5								
		SS-2	3 3 3	67		Medium stiff, brown to dark brown lean CLAY (CL), trace sand.	30.1				1.25			
5						5.0								
		SS-3	2 3 4	100		Medium stiff, moist, gray and mottled brown, lean CLAY (CL), trace sand.	24.8		48	29	2.0			
		SS-4	3 4 4	100			26.0				1.5			
10		SS-5	1 2 1	100		Becomes soft.	34.2				1.0			*10.0 feet: Switch to mud rotary*
														Pushed shelby tube from 12.0 to 14.0 feet
						13.0								
		ST-6		100		Soft, moist, gray fat CLAY (CH) with sand and shells.	31.1		62	42	1.25			
15						15.0								
		SS-7	1 1 1	100		Soft, moist, brownish gray, lean CLAY (CL).	40.8				1.0			
20		SS-8	WOH WOH 1	100		Becomes very soft, brown and gray, with sand.	43.4				0.75			
25														
						26.0								
		ST-9		100		Very soft, moist, dark gray, organic SILT (OH).	76.0		72	35	0.75			*Pushed shelby tube from 26.0 to 28.0 feet*
30						30.0								

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B006

Depth (feet)	Samples: Type	Samples: Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
30		SS-10		89		Very soft, moist, gray lean CLAY (CL) with sand, pockets of organics.	31.0	43.4				0.75			
						Very soft, moist, grayish brown, lean CLAY (CL) with sand, silt, and organics.	33.0	19.6							
						SHALE: light gray, weathered.	37.0								
35		SS-11		84				14.2							
						End of Boring at 37 ft									*Boring backfilled with bentonite and cement fluid*

Depth scale: 30, 35, 40, 45, 50, 55, 60, 65

AECOM

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B008

Date(s) Drilled	09/13/2015 to 09/13/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	42.5 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
0		SS-1	3 4 4	100	0.0 Stiff, moist, brown, lean CLAY (CL) with sand and gravel, trace roots.	13.2				4.0			
		SS-2	3 4 6	100		19.5		42	20	4.25			
5		SS-3	2 3 5	67	Becomes medium stiff.	42.3				2.0			
		SS-4	1 3 2	89	7.5 Medium stiff, moist, gray and mottled brown, lean CLAY (CL), trace sand.	22.8				2.5			
10													*10.0 feet: Switch to mud rotary*
		ST-5	150 psi	85	11.0 Medium stiff, moist, brown and gray fat CLAY (CH), trace sand.	33.6		52	33	0.75			
15		SS-6	WOH 1 1	100	15.0 Soft, moist, dark brown, lean CLAY (CL), trace shells.	64.6				0.75			
20		SS-7	WOH WOH WOH	100	Becomes very soft.	44.4				0.75			
25		ST-8	150 psi		24.0 Very soft, moist, dark gray, fat CLAY (CL), trace organics.	68.9		67	36	1.0			
30					30.0								

Depth (feet)	SAMPLES: Type	SAMPLES: Number	SAMPLES: Sampling Resist. OR Core RQD (%)	SAMPLES: Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
30		SS-9	WOH WOH WOH	100		Very soft, moist, gray and brownish gray, lean CLAY (CL), trace sand.	71.4				0.5			
35		SS-10	WOH WOH WOH	100		Trace wood, organics, and shells.	56.9				0.75			
39.0						SHALE: Light gray, slightly weathered.								
40		SS-11	66/4"	100			12.6							*40.0 to 42.5 feet: Solid drilling*
42.5						End of Boring at 42.5 ft								*Boring backfilled with bentonite and cement fluid*
45														
50														
55														
60														
65														

AECOM

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B009

Date(s) Drilled	11/05/2015 to 11/05/2015	Logged By	Robert Weseljak	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	66.5 ft
Drill Rig Type	Mobile B-57 Truck Mounted	Drilling Contractor	Strata Earth Services	Surface Elevation	446 ft
Borehole Backfill	Portland Cement and Bentonite	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Samples

Depth (feet)	Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Pocket Pen. Su (ksf)	Remarks
0.0–1.5	SS-1	11 13 15	100	1.0 1.25	
2.5–4.0	SS-2	2 1 1	67	0.25	
5.5–7.0	SS-3	5 2 5	11		*5.5 feet: Limestone cobbles*
7.5–9.0	SS-4	5 4 4	89	1.0	
11.0–13.0	ST-5	250 psi	75	1.5	*Pushed shelby tube from 11.0 to 13.0 feet Trace gravel in top of tube*
15.0–16.5	SS-6	1 5 5	89	2.0	
20.0–21.5	SS-7	WOH 2 4	94	1.0	
25.0–26.5	SS-8	WOH WOH 3	100	0.5 1.0	

MATERIAL DESCRIPTION

Elevation (feet)	Depth (feet)	Description
446.0	0.0	
445.5	0.5	Medium dense, moist, brown silty SAND (SM).
		Very stiff, moist, gray and brown, sandy SILT (ML).
443.5	2.5	Soft, dry, gray and brown sandy SILT (ML)
441.5	4.5	Concrete from 4.5 to 5.5.
440.5	5.5	Light brown, well graded GRAVEL (GW).
438.5	7.5	Stiff, dry, brownish gray, silty SAND with GRAVEL (SM).
437.5	8.5	Medium dense, moist, black, sandy SILT (ML).
435.0	11.0	Medium stiff, moist, brownish gray, lean CLAY (CL).
431.0	15.0	Medium dense, moist, brown mottled with reddish brown, lean CLAY (CL).
426.0	20.0	Very soft to medium dense, moist to wet, gray, lean CLAY (CL) with shell and wood fragments.
421.0	25.0	Very soft to soft, wet, gray, lean CLAY (CL) with shell fragments.

Columns without entries on this sheet: Natural Moisture Content (%), Total Unit Weight (pcf), Liquid Limit, Plasticity Index, Torvane Su (ksf), TXUU (ksf).

Depth scale 0–30 ft; Elevation scale 445–420 ft.

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B009

Elevation (feet)	Depth (feet)	Sample Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Material Description	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	Remarks
415.5	30.5	SS-9	WOH 7 7	100	Stiff, dry, black, lean CLAY (CL), low plasticity.					1.0 1.25			
		ST-10	125 psi	100	Becomes gray.					1.0			*Pushed shelby tube from 35.0 to 37.0 feet*
406.0	40.0	SS-11	WOH WOH 4	100	Soft, moist to wet, gray, lean CLAY (CL) with shell fragments, low to medium plasticity.					0.5			
		SS-12	WOH 1 4	100						1.0			
396.0	50.0	SS-13	WOH WOH WOH	100	Very soft, wet, gray, SILT (ML) with shell fragments, low plasticity.					1.0			
		SS-14	WOH WOH 17	100						3.0			
390.0	56.0				Medium dense, wet, gray, fine to coarse clayey GRAVEL (GC), trace fine to coarse sand, reddish brown gravel.								
386.0	60.0	SS-15	50/3"	17	CLAYSTONE: Gray.								
		Run 1	0	0									*61.5 feet: Run 1 - Start 7:57, End 8:10*

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B009

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
380			Run 1	0	0		379.5 — 66.5								
							End of Boring at 66.5 ft								
375	70														
370	75														
365	80														
360	85														
355	90														
350	95														
	100														

AECOM

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B010

Date(s) Drilled	09/04/2015 to 09/04/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	45.3 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	459 ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Elevation (feet)	Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Elevation (feet)	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0					459.0		0.0								
		SS	SS-1	10 6 10	56	458.5	Medium dense, moist, brown, SAND (SP) with gravel and clay.	0.5	7.2 17.4 27.9							
							Medium dense, moist, dark gray, fine to coarse ASH [Fill].									
455		SS	SS-2	9 8 8	83				20.9 30.7							
	5	SS	SS-3	3 6 4	100				14.8							
						451.5	Stiff, moist, brown lean CLAY (CL), trace sand and gravel.	7.5								
450		SS	SS-4	3 3 6	78				22.0							
	10					449.0	Medium stiff, moist, brown and mottled gray, lean CLAY (CL), trace sand.	10.0								
		SS	SS-5	2 3 4	78				24.0							
		SS	SS-6	2 2 3	78				28.0							*12.0 feet: Switch to mud rotary*
445	15															
		ST	ST-7	250 psi	83				30.5		48	30				*Pushed shelby tube from 15.0 to 17.0 feet*
440						440.0	Soft, wet, gray, lean CLAY (CL), trace sand and shells.	19.0								
	20	SS	SS-8	1 1 1	83				32.9							
435																
	25	SS	SS-6	WOH WOH 3	89				21.4							
430																
	30															

Elevation (feet)	Depth (feet)	Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Material Description	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	Remarks
	30	ST-10		72		30.0	117.6 118.9 118.6	40	25				*Pushed shelby tube from 30.0 to 32.0 feet*
425	35	SS-11	1 2 3	94	Becomes medium stiff.	28.2							
420 / 419.0	40 / 40.0	SS-12	6 7 50/3.5"	83	Medium dense, wet, brown, fine to coarse silty SAND (SP) with gravel.	17.0							
418.0	41.0				SHALE: Light gray, weathered.								*41.0 to 43.0 feet: Hard drilling*
415 / 413.8	45 / 45.3	SS-13	50/3"	35	End of Boring at 45.25 ft	16.4							*Boring backfilled with bentonite and cement fluid*
410	50												
405	55												
400	60												
395	65												

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B011

Date(s) Drilled	09/12/2015 to 09/12/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	62.0 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	456 ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	7.5 ft on 9/12/2015		

Elevation (feet)	Depth (feet)	Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	MATERIAL DESCRIPTION (Elevation 456.0, Depth 0.0)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
455	0	SS-1	9 12 12	89	Medium dense, moist, dark gray, ASH [Fill].	27.7							
		SS-2	8 9 14	100		16.3							
450	5	SS-3	6 9 9	94		29.4							
		SS-4	2 1 1	100	Becomes loose, wet. (groundwater ∇ at 7.5 ft)	45.3							
445	10	SS-5		84		70.0							10.0 feet: Switch to mud rotary
440	15	SS-6	WOR WOR WOR WOR	100	Becomes very loose.	63.2							
435	20	SS-7		56		84.9							
430	25	SS-8	WOR WOR WOR WOR	89		74.7							
	30												

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B011

Elevation (feet)	Depth (feet)	Sample Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Material Description	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	Remarks
425	30	SS-9	WOR WOR WOR WOR	100		73.7							
420	35	SS-10	WOR WOR WOR WOR	84		93.9							
416.0	40.0	SS-11	WOH 1 2	100	Soft, wet, gray, silty CLAY (CL), trace sand, shells, and organics.	47.9							
411.0	45.0	SS-12	WOR WOR WOH	94	Very soft, wet, gray, fat CLAY (CH), trace sand, shells, and wood.	63.3		63	42				
406.0	50.0	SS-13	WOR WOR WOH	89	Very soft, wet, dark gray and grayish brown, lean CLAY (CL).	62.5							
400	55	SS-14	WOR WOR WOH	100	Grades gray.	52.9							
398.0	58.0				SHALE: Light gray, soft.								*58.0 to 62.0 feet: Solid drilling*
395	60	SS-15	50/3"	100		9.1							
394.0	62.0				End of Boring at 62 ft								*Boring backfilled with bentonite and cement fluid*

Report: GEO_SOIL; File K:\PROJECTS\60440202_DYNEGY CCR EDWARDS\400-TECHNICAL\BORING LOGS\60440202_DYNEGYEDWARDSBORINGLOGS.GPJ; 12/18/2015 9:33:53 AM

AECOM

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B012

Date(s) Drilled	09/09/2015 to 09/09/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	60.0 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	453 ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Elevation (feet)	Depth (feet)	SAMPLES Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0					453.0 / 0.0								
						452.6 Limestone gravel. 0.4								
		SS-1	6 6 4	94		Stiff, moist, brown sandy SILT (ML), trace clay, gravel, and topsoil.	23.0							
450						450.5 / 2.5								
		SS-2	5 4 3	78		Loose, moist, dark brown ASH [Fill].	23.8		28	2				
	5	SS-3	3 4 11	56			26.5							
445		SS-4	10 10 7	89			26.5							
	10	SS-5	2 3 4	89		With clay.	24.7							
						442.0 / 11.0	24.9							
						Stiff, moist, brown to gray, silty CLAY (CL), trace sand, shells, and roots.								
440		SS-6	3 3 6	94			22.0							
	15	SS-7	2 3 4	61		Becomes medium stiff.	24.3		48	29				*15.0 feet: Switch to mud rotary*
435														
	20	ST-8	100 psi	75			23.8							*Pushed shelby tube from 20.0 to 22.0 feet*
430														
	25	SS-9	3 3 3	100			23.2							
425														
	30													

Elevation (feet)	Depth (feet)	Sample Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30	SS-10	2 2 4	61			24.8							
420														
	35	SS-11	2 2 2	100		Becomes soft, trace sand.	28.3							
415														
	40	SS-12	WOH 2 2	100		Becomes soft, trace sand, shells, and organics.	32.2							
410														
	45	SS-13	1 2 3	100			50.2							
406.0	47.0	ST-14		100		Medium stiff, moist, dark gray, fat CLAY (CL).	50.8	104.4 104.9 104.0	54	34				*Pushed shelby tube from 47.0 to 49.0 feet*
405														
404.0	49.0	SS-15	3 2 4	100		Medium stiff, moist, gray and brownish gray, lean CLAY (CL), trace sand.	67.4							
	50													
400														
	55	SS-16	11 21 23	100										
397.5	55.5					Gray broken rock, weathered.	50.5 15.3							
396.0	57.0					Light gray rock, weathered.								
395														
	60	SS-17	50/2.5"	75			17.9							
392.8	60.2					End of Boring at 60 ft								*Boring backfilled with bentonite and cement fluid*
390														
	65													

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B013

Date(s) Drilled	09/11/2015 to 09/11/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	53.0 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
0		SS-1	4 4 7	44		0.0 Medium stiff, moist, dark gray to brown, CLAY (CL) with ASH [Fill].	13.6							
		SS-2	1 3 4	83		2.5 Medium stiff, moist, brown, silty CLAY (CL), trace sand, gravel, and roots.	17.4				2.0			
5														
		SS-3		46			24.3 20.0		49	28				
		SS-4	3 4 6	72		8.0 Stiff, moist, dark gray, silty CLAY (CL), trace sand.	24.3				2.0			
10		SS-5	2 4 7	83			25.4				2.0			*10.0 feet: Switch to mud rotary*
						Gray and mottled brown silty CLAY (CL), trace sand.								
15		SS-6	2 2 4	100		Becomes medium stiff, gray and mottled brown.	25.5		41	29	1.0			
20		SS-7	2 3 3	67			23.5				1.0			
25		SS-8	3 3 4	67		Becomes gray, trace organics.	27.7				1.25			
30						30.0								

Depth (feet)	Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
30	SS-9	1 2 2	94	Medium stiff, moist, brown mottled gray, sandy CLAY (CL), trace silt and shells.		20.2				1.5			
	ST-10		100	Medium stiff, moist, gray and brown lean CLAY (CL) with sand.	32.0	33.3		42	19	1.25			*Pushed shelby tube from 32.0 to 34.0 feet*
35	SS-11	2 2 2	89	Becomes dark gray, trace organics.		58.0				1.0			
40	SS-12	2 2 3	100			54.5				1.25			
45	SS-13	2 2 4	100	Grades with calcium carbonate seams and shells.		66.2				1.75			
				Gravel layer 47.5 feet to 49.0 feet									
50													
				End of Boring at 53 ft	53.0								*Boring backfilled with bentonite and cement fluid*
55													
60													
65													

Elevation (feet)

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B014

Date(s) Drilled	09/12/2015 to 09/12/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	45.5 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	456 ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	5 ft on 9/12/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) 456.0 / Depth (feet) 0.0)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
455	0		SS-1	1 4 10	89		Medium dense, moist, dark gray, ASH [Fill].	28.2							
			SS-2	7 2 1	100		Becomes wet, gray.	40.8							
450	5		ST-3		35		∇								*Pushed shelby tube from 5.0 to 7.0 feet*
			SS-4	1 1 1	100		Becomes light gray.	60.2							
445	10		SS-5		100		Becomes dark gray.	78.7							*10.0 feet: Switch to mud rotary Pushed shelby tube from 10.0 to 12.0 feet*
440	15		ST-6	1/12" 1/12"	100		Becomes light gray.	86.5							
435	20		SS-7	1/12" 1/12"	100			73.1							
430	25		SS-8	WOR WOR WOR	100			48.7							
	30						(426.0 / 30.0)								

Elevation (feet)	Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	Elevation (feet)	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
425	30		SS-9	WOR WOR WOR	67			Very loose, wet, black to gray, ASH with clay [Fill].		31.6							
420	35		SS-10	WOH 1 2	100		421.0	Soft, wet, gray, silty CLAY (CL), trace shells and wood.	35.0								
415	40		SS-11	2 18 34	100		415.5	SHALE: Light gray, weathered.	40.5	27.3 19.6 10.2							*42.0 to 45.0 feet: Solid drilling*
410	45		SS-12	56	100		410.5	End of Boring at 45.5 ft	45.5	14.2							*Boring backfilled with bentonite and cement fluid*
405	50																
400	55																
395	60																
	65																

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B015

Date(s) Drilled	09/10/2015 to 09/10/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	57.0 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	444 ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Elevation (feet)	Depth (feet)	Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
444.0	0.0												
443.6	0.4				Brown gravel.								
		SS-1	5 4 1	72	Medium stiff, moist, gray to brown, sandy CLAY (CL), trace silt.	54.7							
441.5	2.5	SS-2	5 9 13	50	Medium dense, moist, light brown to white, fine to coarse GRAVEL (GP) with sand, trace silt and limestone.	4.5							
440	5	SS-3	6 10 13	39		5.4							
435		SS-4	6 9 7	39		7.2							
	10	SS-5	4 5 6	39		6.5							*10.0 feet: Switch to mud rotary; borehole collapsed*
430		SS-6	10 3 2	11		3.6							
	15	SS-7	4 4 4	39	Some coarse limestone.	8.2							
425	20	SS-8	10 7 9	39		7.8							
420													*23.0 to 25.0 feet: Drove casing with hammer 23.0 to 29.0 feet: Hard drilling*
	25	SS-9	7 4 11	33		8.1							
415	30												

Elevation (feet)	Depth (feet)	Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
413.0	31.0	ST-10	300 psi	100	Medium stiff, wet, gray, sandy CLAY (CL), trace silt, shells, and organics.	20.2	122.2 121.0 119.8	24	11	2.5			*Pushed shelby tube from 31.0 to 33.0 feet*
409.0	35.0	SS-11	WOH 2 3	94	Medium stiff, wet, gray and dark gray lean CLAY (CL)	33.8				1.25			
407.0	37.0	ST-12	175 psi		Soft, wet, dark gray, fat CLAY (CH).	41.0		66	43	1.0			*Pushed shelby tube from 37.0 to 39.0 feet*
405.0	39.0	SS-13	WOH 2 2	100	Soft, wet, brown and gray, lean CLAY (CL).	36.2				1.0			
	45	SS-14	WOH 2 2	83	Grades with sand.	49.4				1.0			
	50	SS-15	3 5 14	22	Grades without sand.	30.9				0.5			
392.0	52.0				SHALE: Light gray, silt sized, weathered.								*52.0 feet: Solid drilling*
	55	SS-16	71/6"	oK		11.0							
387.0	57.0				End of Boring at 57 ft								*Boring backfilled with bentonite and cement fluid*

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B015A

Date(s) Drilled	09/10/2015 to 09/10/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	30.0 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
Boring Location	5' SW of EDW-B015 (ft NAD83)	Groundwater Level(s)	ft on		

Depth (feet)	SAMPLES: Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
0						0.0 Blank power auger to 30.0 feet to confirm 29.0 feet of gravel.								*Offset 5.0 feet west of EDW-B015*
5														*5.0 to 30.0 feet: No cuttings*
														7.0 feet: Borehole collapsed; created a 14" diameter hole with no cuttings
10														
15														
20														*20.0 feet: Groundwater encountered*
25														*Auger hole collapsed and auger removed. No clay on auger.*
30						30.0								

End of Boring at 30 ft

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: 7800 S Cilco Ln, Bartonville, Illinois
Project: 16E0433
DATES: Start: 11/28/2016
Finish: 12/05/2016
WEATHER: Sunny, cool (hi-30s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-550X ATV Drill
Drilling Method: 4¼" Hollow Stem Auger & NX Wireline Rock Core
FIELD STAFF: Driller: C. Dutton
Helper: M. Baetje
Eng/Geo: R. Hasenyager

BOREHOLE ID: AP05D
Well ID: AP05D
Surface Elev: 441.23 ft. MSL
Completion: 58.30 ft. BGS
Station: 1,432,401.77N
2,436,749.16E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin
Township: Hollis
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 6.25 - During drilling
▼ = 13.34 - 01/18/2017
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1A	13/24 *54%*	SS	*1-4 5-5* N=9	27			0–0.6	Black (10YR3/1), moist, soft, CLAY with some silt, trace sand, and trace gravel.		440	
2A	20/24 *83%*	SS	*3-3 4-4* N=7	109			2	Black (10YR2/1), moist, soft, SILT with few clay, trace sand, and trace gravel.		438	
3A	20/24 *83%*	SS	*2-3 4-4* N=7	29			4	Dark yellowish brown (10YR4/4), moist, medium, CLAY with some silt and trace sand.		436	
4A	14/24 *58%*	SS	*1-3 2-3* N=5	33			6 ▼	Gray (10YR5/1), moist, soft, CLAY with some silt and trace sand.		434	
5A	20/24 *83%*	SS	*woh-2 2-2* N=4	40			8			432	
6A	20/24 *83%*	SS	*1-2 2-3* N=4	33			10	Gray (10YR5/1) with 20% yellowish brown (10YR5/6) mottles, moist, soft, CLAY with some silt and trace sand.		430	
7A	18/24 *75%*	SS	*1-2 2-3* N=4	35			12 ▼	Yellowish brown (10YR5/6) with 25% Gray (10YR5/1) mottles, moist, soft, CLAY with some silt and trace sand.		428	
8A	24/24 *100%*	SS	*woh-1 2-2* N=3	27			14	Dark yellowish brown (10YR4/4) with 10% yellowish brown (10YR5/6) mottles, moist, very soft, CLAY with some silt and trace sand.		426	
9A	22/24 *92%*	SS	*1-1 1-2* N=2	26			16			424	
10A	24/24 *100%*	SS	*woh-woh 1-2*	28			18–20	Gray (10YR5/1) with 15% yellowish brown (10YR5/6) mottles, moist, very soft, SILT with few clay, trace sand, and trace shell fragments.		422	

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: 7800 S Cilco Ln, Bartonville, Illinois
Project: 16E0433
DATES: Start: 11/28/2016
Finish: 12/05/2016
WEATHER: Sunny, cool (hi-30s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-550X ATV Drill
Drilling Method: 4¼" Hollow Stem Auger & NX Wireline Rock Core
FIELD STAFF: Driller: C. Dutton
Helper: M. Baetje
Eng/Geo: R. Hasenyager

BOREHOLE ID: AP05D
Well ID: AP05D
Surface Elev: 441.23 ft. MSL
Completion: 58.30 ft. BGS
Station: 1,432,401.77N
2,436,749.16E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin
Township: Hollis
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 6.25 - During drilling
▼ = 13.34 - 01/18/2017
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
11A	24/24 *100%*	SS	*woh-woh 2-2*	28			22	Gray (10YR5/1), moist, very soft, CLAY with some silt, trace sand, and trace shell fragments.		420	
12A	24/24 *100%*	SS	*woh-woh 2-2*	34			24			418	
13A	24/24 *100%*	SS	*woh-woh 1-2*	35			26			416	
14A	24/24 *100%*	SS	*woh-1 2-2* N=3	47			28			414	
15A	23/24 *96%*	SS	*woh-woh 1-2*	73			30			412	
16A	24/24 *100%*	SS	*woh-woh 2-2*	68			32			410	
17A	24/24 *100%*	SS	*woh-woh woh-woh*	64			34			408	
18A	24/24 *100%*	SS	*woh-woh 2-2*	50			36			406	
19A	15/24 *63%*	SS	*woh-1 18-23* N=19	46			38	Medium light gray (N6/1), dry, hard, SILTSTONE with little very fine-grained sand.		404	
19B				5			40			402	

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: 7800 S Cilco Ln, Bartonville, Illinois
Project: 16E0433
DATES: Start: 11/28/2016
Finish: 12/05/2016
WEATHER: Sunny, cool (hi-30s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-550X ATV Drill
Drilling Method: 4¼" Hollow Stem Auger & NX Wireline Rock Core
FIELD STAFF: Driller: C. Dutton
Helper: M. Baetje
Eng/Geo: R. Hasenyager

BOREHOLE ID: AP05D
Well ID: AP05D
Surface Elev: 441.23 ft. MSL
Completion: 58.30 ft. BGS
Station: 1,432,401.77N
2,436,749.16E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin
Township: Hollis
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 6.25 - During drilling
▼ = 13.34 - 01/18/2017
▽ =

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
20	48/53 *91%*	RC		12			42	Medium light gray (N6/1), dry, hard, SILTSTONE with little very fine-grained sand. *[Continued from previous page]*		400, 398	
							44	Grayish brown (10YR5/2), dry, hard, very fine- to medium-grained SANDSTONE.			
21	56/60 *93%*	RC					46, 48	Medium light gray (N6/1), dry, hard, SILTSTONE with little very fine-grained sand.		396, 394, 392	
22	62/60 *103%*	RC					50, 52			390	
								Grayish brown (10YR5/2), dry, hard, very fine- to medium-grained SANDSTONE.		388	
23	54/57 *95%*	RC					54	Medium light gray (N6/1), dry, hard, SILTSTONE with little very fine-grained sand.		386	
							56	Grayish brown (10YR5/2), dry, hard, very fine- to medium-grained SANDSTONE.			
								Medium light gray (N6/1), dry, hard, SILTSTONE with little very fine-grained sand.		384	
	0/14 *0%*	BD					58				

End of Boring = 57.1 ft. BGS

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: 7800 S Cilco Ln, Bartonville, Illinois
Project: 16E0433
DATES: Start: 11/28/2016
Finish: 11/29/2016
WEATHER: Sunny, cool (hi-30s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-550X ATV Drill
Drilling Method: 4¼" Hollow Stem Auger

FIELD STAFF: Driller: C. Dutton
Helper: M. Baetje
Eng/Geo: R. Hasenyager

BOREHOLE ID: AP05S
Well ID: AP05S
Surface Elev: 441.13 ft. MSL
Completion: 38.06 ft. BGS
Station: 1,432,405.64N
2,436,746.64E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin
Township: Hollis
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 6.25 - During drilling
▼ = 5.23 - 01/18/2017
▽ =

SAMPLE: Number	SAMPLE: Recov / Total (in) *% Recovery*	SAMPLE: Type	TESTING: *Blows / 6 in* N - Value **RQD**	TESTING: Moisture (%)	TESTING: Dry Den. (lb/ft^3)	TESTING: Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	0/24 *0%*	BD						Black (10YR3/1), moist, soft, CLAY with some silt, trace sand, and trace gravel.		440	
	0/24 *0%*	BD					2	Black (10YR2/1), moist, soft, SILT with few clay, trace sand, and trace gravel.		438	
	0/24 *0%*	BD					4	Dark yellowish brown (10YR4/4), moist, medium, CLAY with some silt and trace sand.		436	
	0/24 *0%*	BD					6	Gray (10YR5/1), moist, soft, CLAY with some silt and trace sand.		434	
	0/24 *0%*	BD					8			432	
	0/24 *0%*	BD					10	Gray (10YR5/1) with 20% yellowish brown (10YR5/6) mottles, moist, soft, CLAY with some silt and trace sand.		430	
	0/24 *0%*	BD					12	Yellowish brown (10YR5/6) with 25% Gray (10YR5/1) mottles, moist, soft, CLAY with some silt and trace sand.		428	
	0/24 *0%*	BD					14	Dark yellowish brown (10YR4/4) with 10% yellowish brown (10YR5/6) mottles, moist, very soft, CLAY with some silt and trace sand.		426	
	0/24 *0%*	BD					16			424	
	0/24 *0%*	BD					18	Gray (10YR5/1) with 15% yellowish brown (10YR5/6) mottles, moist, very soft, SILT with few clay, trace sand, and trace shell fragments.		422	
							20				

NOTE(S): AP05S drilled approx. 5 ft. north of AP05D.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.	**CONTRACTOR:** Bulldog Drilling, Inc.		
Site: Edwards Power Station	**Rig mfg/model:** CME-550X ATV Drill	**BOREHOLE ID:** AP05S	
Location: 7800 S Cilco Ln, Bartonville, Illinois	**Drilling Method:** 4¼" Hollow Stem Auger	**Well ID:** AP05S	
Project: 16E0433		**Surface Elev:** 441.13 ft. MSL	
DATES: Start: 11/28/2016	**FIELD STAFF: Driller:** C. Dutton	**Completion:** 38.06 ft. BGS	
Finish: 11/29/2016	**Helper:** M. Baetje	**Station:** 1,432,405.64N	
WEATHER: Sunny, cool (hi-30s)	**Eng/Geo:** R. Hasenyager	2,436,746.64E	

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin
Township: Hollis
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 6.25 - During drilling
▼ = 5.23 - 01/18/2017
▽ =

Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	0/24 *0%*	BD						Gray (10YR5/1), moist, very soft, CLAY with some silt, trace sand, and trace shell fragments.		420	
	0/24 *0%*	BD					22			418	
	0/24 *0%*	BD					24			416	
	0/24 *0%*	BD					26			414	
	0/24 *0%*	BD					28			412	
	0/24 *0%*	BD					30			410	
	0/24 *0%*	BD					32			408	
	0/24 *0%*	BD					34			406	
	0/24 *0%*	BD					36	Medium light gray (N6/1), dry, hard, SILTSTONE with little very fine-grained sand.		404	
							38				

End of Boring = 38.06 ft. BGS

NOTE(S): AP05S drilled approx. 5 ft. north of AP05D.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: 7800 S Cilco Ln, Bartonville, Illinois
Project: 16E0433
DATES: Start: 11/30/2016
Finish: 11/30/2016
WEATHER: Overcast, cool (hi-30s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-550X ATV Drill
Drilling Method: 4¼" Hollow Stem Auger
FIELD STAFF: Driller: C. Dutton
Helper: M. Baetje
Eng/Geo: S. Collins

BOREHOLE ID: AP06
Well ID: AP06
Surface Elev: 439.53 ft. MSL
Completion: 25.00 ft. BGS
Station: 1,433,216.94N
2,436,506.21E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin
Township: Hollis
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 2.50 - During drilling
▼ = 4.95 - 01/18/2017
▽ =

SAMPLE			TESTING								
Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft³)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1A	21/24 *88%*	SS	*woh-2 4-5* N=6	25			0–2	Light yellowish brown (10YR6/4), moist, medium, CLAY with some silt, trace sand and trace roots/grass.		438	
2A	20/24 *83%*	SS	*3-3 5-6* N=8	29			2–4	Dark gray (10YR4/1), moist, medium, CLAY with some silt, trace sand and trace roots/grass.		436	
3A	21/24 *88%*	SS	*2-2 3-4* N=5	28			4–8	Gray (10YR5/1), moist, soft, CLAY with some silt, trace sand and trace gravel.		434	
4A	21/24 *88%*	SS	*2-2 2-3* N=4	24						432	
5A	22/24 *92%*	SS	*woh-1 2-3* N=3	35			8–14	Gray (10YR6/1) with 20% yellowish brown (10YR5/6) mottles, moist, very soft, CLAY with some silt and trace sand.		430	
6A	22/24 *92%*	SS	*woh-1 2-2* N=3	39						428	
7A	22/24 *92%*	SS	*woh-woh 1-2*	31						426	
8A	18/24 *75%*	SS	*1-1 2-1* N=3	30			14–20	Gray (10YR6/1), moist, very soft, CLAY with some silt, trace sand and trace shell fragments.		424	
9A	24/24 *100%*	SS	*woh-woh 1-2*	31						422	
10A	21/24 *88%*	SS	*woh-woh woh-1*	32						420	

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: 7800 S Cilco Ln, Bartonville, Illinois
Project: 16E0433
DATES: Start: 11/30/2016
Finish: 11/30/2016
WEATHER: Overcast, cool (hi-30s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-550X ATV Drill
Drilling Method: 4¼" Hollow Stem Auger
FIELD STAFF: Driller: C. Dutton
Helper: M. Baetje
Eng/Geo: S. Collins

BOREHOLE ID: AP06
Well ID: AP06
Surface Elev: 439.53 ft. MSL
Completion: 25.00 ft. BGS
Station: 1,433,216.94N
2,436,506.21E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin
Township: Hollis
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 2.50 - During drilling
▼ = 4.95 - 01/18/2017
▽ =

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
11A	24/24 *100%*	SS	*woh-woh woh-2*	34			22	Gray (10YR6/1), moist, very soft, CLAY with some silt, trace sand and trace shell fragments. *[Continued from previous page]*		418	
12A	18/24 *75%*	SS	*wor-wor wor-wor*	39			24			416	
13A	12/12 *100%*	SS	*woh-woh*	42							

End of Boring = 25.0 ft. BGS

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: 7800 S Cilco Ln, Bartonville, Illinois
Project: 16E0433
DATES: Start: 12/01/2016
Finish: 12/08/2016
WEATHER: Overcast, cool (hi-30s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-550X ATV Drill
Drilling Method: 4¼" Hollow Stem Auger & NX Wireline Rock Core
FIELD STAFF: Driller: C. Dutton
Helper: M. Baetje
Eng/Geo: S. Collins

BOREHOLE ID: AP07D
Well ID: AP07D
Surface Elev: 458.42 ft. MSL
Completion: 65.00 ft. BGS
Station: 1,432,082.31N
2,435,355.39E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin
Township: Hollis
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 26.00 - During drilling
▼ = 52.66 - 01/18/2017
▽ =

Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
1A	13/24 *54%*	SS	*1-4 8-9* N=12	8			0–2.5	White (10YR8/1), moist, medium dense, GRAVEL with some medium- to very coarse-grained sand. [FILL]	458	
2A	19/24 *79%*	SS	*5-4 4-4* N=8	22			2.5–4	Pale brown (10YR6/3), moist, medium, CLAY with some silt and little very fine-grained sand.	456	
3A	18/24 *75%*	SS	*1-3 4-7* N=7	22			4–9	Gray (10YR5/1) with 25% yellowish brown (10YR5/4) mottles, moist, soft, CLAY with some silt and trace very fine-grained sand.	454, 452, 450	
4A	7/24 *29%*	SS	*2-3 4-4* N=7	22						
5A 5B	24/24 *100%*	SS	*1-3 4-4* N=7	27 34			9–14	Dark gray (10YR4/1), moist, soft, CLAY with some silt, trace very fine-grained sand, and trace roots.	448, 446	
6A	24/24 *100%*	SS	*1-2 4-4* N=6	29						
7A	24/24 *100%*	SS	*woh-3 3-6* N=6	27						
8A	24/24 *100%*	SS	*woh-2 2-4* N=4	25			14–16	Gray (10YR5/1) with 30% light yellowish brown (10YR6/4) mottles, moist, soft, CLAY with some silt, trace very fine-grained sand, and trace roots.	444	
9A	23/24 *96%*	SS	*1-3 4-5* N=7	23			16–18	Gray (10YR5/1) with 30% dark gray (10YR4/1) mottles, moist, medium, CLAY with some silt, little very fine-grained sand, and trace roots.	442	
10A	24/24 *100%*	SS	*1-2 3-5* N=5	24			18–20	Gray (10YR5/1) with 30% yellowish brown (10YR5/6) mottles, moist, soft, CLAY with some silt and few very fine-grained sand.	440	

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: 7800 S Cilco Ln, Bartonville, Illinois
Project: 16E0433
DATES: Start: 12/01/2016
Finish: 12/08/2016
WEATHER: Overcast, cool (hi-30s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-550X ATV Drill
Drilling Method: 4¼" Hollow Stem Auger & NX Wireline Rock Core
FIELD STAFF: Driller: C. Dutton
Helper: M. Baetje
Eng/Geo: S. Collins

BOREHOLE ID: AP07D
Well ID: AP07D
Surface Elev: 458.42 ft. MSL
Completion: 65.00 ft. BGS
Station: 1,432,082.31N
2,435,355.39E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin
Township: Hollis
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 26.00 - During drilling
▼ = 52.66 - 01/18/2017
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type
11A	24/24 *100%*	SS	*2-4 5-7* N=9	25		
12A	24/24 *100%*	SS	*2-4 8-8* N=12	26		
12B				22		
13A	24/24 *100%*	SS	*1-2 2-2* N=4	23		
14A	20/24 *83%*	SS	*1-1 2-2* N=3	19		
15A	22/24 *92%*	SS	*woh-woh 1-1*	24		
16A	24/24 *100%*	SS	*woh-1 3-2* N=4	15		
16B				34		
17A	24/24 *100%*	SS	*woh-1 2-2* N=3	28		
18A	24/24 *100%*	SS	*woh-2 4-6* N=6	30		
19A	20/24 *83%*	SS	*1-4 8-26* N=12	31		
19B				17		
20A	10/10 *100%*	SS	*21-50/4"*	15		
	0/14 *0%*	BD				

Depth ft. BGS	Lithologic Description
	Gray (10YR5/1) with 30% yellowish brown (10YR5/6) mottles, moist, soft, CLAY with some silt and few very fine-grained sand. *[Continued from previous page]*
22	Light gray (10YR6/1) with 20% brownish yellow (10YR6/6) mottles, moist, medium dense, very fine- to medium-grained SAND with little clay.
	Dark gray (10YR4/1), moist, stiff, CLAY with some silt, trace sand, trace organic matter.
24	Light gray (10YR6/1) with 20% light yellowish brown (10YR6/4) mottles, moist, very soft, CLAY with some silt and little very fine- to fine-grained sand.
▼ 26	Light yellowish brown (10YR6/4), wet, very loose, very fine- to medium-grained SAND with few silt and trace clay.
30	Gray (10YR5/1), wet, very loose, very fine- to very coarse-grained SAND with little silt and trace small gravel.
	Gray (10YR5/1) with 30% brownish yellow (10YR6/6) mottles, moist, soft, CLAY with some silt and trace sand.
32	Gray (10YR5/1) with 30% light yellowish brown (10YR6/4) mottles, moist, soft, CLAY with some silt and trace sand.
34	Gray (10YR5/1), moist, soft, CLAY with some silt, trace sand, and trace organic matter.
	Gray (10YR5/1), moist, very stiff, SILT with few clay and trace sand (Weathered SILTSTONE).
	Gray (10YR5/1), dense, hard, SHALE.
40	

Depth scale (ft. BGS): 22, 24, 26, 28, 30, 32, 34, 36, 38, 40
Elevation (ft. MSL): 438, 436, 434, 432, 430, 428, 426, 424, 422, 420

Borehole Detail | Remarks

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: 7800 S Cilco Ln, Bartonville, Illinois
Project: 16E0433
DATES: Start: 12/01/2016
Finish: 12/08/2016
WEATHER: Overcast, cool (hi-30s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-550X ATV Drill
Drilling Method: 4¼" Hollow Stem Auger & NX Wireline Rock Core
FIELD STAFF: Driller: C. Dutton
Helper: M. Baetje
Eng/Geo: S. Collins

BOREHOLE ID: AP07D
Well ID: AP07D
Surface Elev: 458.42 ft. MSL
Completion: 65.00 ft. BGS
Station: 1,432,082.31N
2,435,355.39E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin
Township: Hollis
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 26.00 - During drilling
▼ = 52.66 - 01/18/2017
▽ =

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
										418	
21	48/56 *86%*	RC					42	Gray (10YR5/1), dense, hard, SHALE. *[Continued from previous page]*		416	
							44			414	
							46	Light Gray (10YR6/1), dry, very hard, very fine- to medium-grained SANDSTONE.		412	
22	61/60 *102%*	RC					48	Gray (10YR5/1), dense, hard, SHALE.		410	
								Light Gray (10YR6/1), dry, very hard, very fine- to medium-grained SANDSTONE.			
							50			408	
23	62/60 *103%*	RC					52 ▼	Gray (10YR5/1), dense, very hard, SILTSTONE.		406	
							54			404	
							56	Gray (10YR5/1), dense, very hard, SILTSTONE with white (N8/1) calcite crystals.		402	Crystals are authigenic.
24	54/60 *90%*	RC					58	Gray (10YR5/1), dense, very hard, SILTSTONE.		400	
							60				

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: 7800 S Cilco Ln, Bartonville, Illinois
Project: 16E0433
DATES: Start: 12/01/2016
Finish: 12/08/2016
WEATHER: Overcast, cool (hi-30s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-550X ATV Drill
Drilling Method: 4¼" Hollow Stem Auger & NX Wireline Rock Core
FIELD STAFF: Driller: C. Dutton
Helper: M. Baetje
Eng/Geo: S. Collins

BOREHOLE ID: AP07D
Well ID: AP07D
Surface Elev: 458.42 ft. MSL
Completion: 65.00 ft. BGS
Station: 1,432,082.31N
2,435,355.39E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin
Township: Hollis
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 26.00 - During drilling
▼ = 52.66 - 01/18/2017
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
								Gray (10YR5/1), dense, very hard, SILTSTONE. *[Continued from previous page]*		398	
25	66/60 *110%*	RC					62			396	
								Brown (10YR5/3), moist, very hard, very fine- to medium-grained SANDSTONE.			
								Gray (10YR5/1), dense, very hard, SILTSTONE.			
							64	Brown (10YR5/3), moist, very hard, very fine- to medium-grained SANDSTONE.		394	
	0/4 *0%*	BD						Gray (10YR5/1), dense, very hard, SILTSTONE.			

End of Boring = 65.0 feet

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: 7800 S Cilco Ln, Bartonville, Illinois
Project: 16E0433
DATES: Start: 12/02/2016
Finish: 12/02/2016
WEATHER: Overcast, cool (hi-30s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-550X ATV Drill
Drilling Method: 4¼" Hollow Stem Auger

FIELD STAFF: Driller: C. Dutton
Helper: M. Baetje
Eng/Geo: S. Collins

BOREHOLE ID: AP07S
Well ID: AP07S
Surface Elev: 458.31 ft. MSL
Completion: 35.00 ft. BGS
Station: 1,432,078.08N
2,435,357.33E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin
Township: Hollis
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 31.80 - During drilling
▼ = 24.57 - 01/18/2017
▽ =

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	0/24 *0%*	BD					0–2.5	White (10YR8/1), moist, medium dense, GRAVEL with some medium- to very coarse-grained sand. [FILL]		458	
	0/24 *0%*	BD					2			456	
							2.5–4	Pale brown (10YR6/3), moist, medium, CLAY with some silt and little very fine-grained sand.			
	0/24 *0%*	BD					4–9	Gray (10YR5/1) with 25% yellowish brown (10YR5/4) mottles, moist, soft, CLAY with some silt and trace very fine-grained sand.		454	
	0/24 *0%*	BD					6			452	
	0/24 *0%*	BD					8			450	
	0/24 *0%*	BD					9–14	Dark gray (10YR4/1), moist, soft, CLAY with some silt, trace very fine-grained sand, and trace roots.		448	
	0/24 *0%*	BD					12			446	
	0/24 *0%*	BD					14–16	Gray (10YR5/1) with 15% light yellowish brown (10YR6/4) mottles, moist, soft, CLAY with some silt, trace very fine-grained sand, and trace roots.		444	
	0/24 *0%*	BD					16–18	Gray (10YR5/1) with 30% dark gray (10YR4/1) mottles, moist, medium, CLAY with some silt and little very fine-grained sand.		442	
	0/24 *0%*	BD					18–20	Gray (10YR5/1) with 30% yellowish brown (10YR5.6) mottles, moist, soft, CLAY with some silt and few very fine-grained sand.		440	

NOTE(S): AP07S drilled approx. 5 ft. west of AP07D.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: 7800 S Cilco Ln, Bartonville, Illinois
Project: 16E0433
DATES: Start: 12/02/2016
Finish: 12/02/2016
WEATHER: Overcast, cool (hi-30s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-550X ATV Drill
Drilling Method: 4¼" Hollow Stem Auger

FIELD STAFF: Driller: C. Dutton
Helper: M. Baetje
Eng/Geo: S. Collins

BOREHOLE ID: AP07S
Well ID: AP07S
Surface Elev: 458.31 ft. MSL
Completion: 35.00 ft. BGS
Station: 1,432,078.08N
2,435,357.33E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin
Township: Hollis
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 31.80 - During drilling
▼ = 24.57 - 01/18/2017
▽ =

SAMPLE: Number	Recov / Total (in) % Recovery	Type	TESTING: Blows / 6 in N - Value RQD	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	0/24 *0%*	BD					20–22	Gray (10YR5/1) with 30% yellowish brown (10YR5.6) mottles, moist, soft, CLAY with some silt and few very fine-grained sand. *[Continued from previous page]*		438	
	0/24 *0%*	BD					22–23	Light gray (10YR6/1) with 20% brownish yellow (10YR6/6) mottles, moist, medium dense, very fine- to medium-grained SAND with little clay.		436	
							23–24	Dark gray (10YR4/1), moist, stiff, CLAY with some silt, trace sand, trace organic matter.			
	0/24 *0%*	BD					24–26 (▼ 24.57)	Light gray (10YR6/1) with 20% light yellowish brown (10YR6/4) mottles, moist, very soft, very fine- to medium-grained SAND with few silt and trace clay.		434	
	0/24 *0%*	BD					26–30	Light yellowish brown (10YR6/4), wet, very loose, very fine- to medium-grained SAND with few silt and trace clay.		432, 430	
	0/24 *0%*	BD									
	0/24 *0%*	BD					30–31	Gray (10YR5/1), wet, very loose, very fine- to very coarse-grained SAND with little silt and trace small gravel.		428	
							31–32 (▼ 31.80)	Gray (10YR5/1) with 30% brownish yellow (10YR6/6) mottles, moist, soft, very fine- to medium-grained SAND with some silt and trace clay.			
	0/24 *0%*	BD					32–34	Gray (10YR5/1) with 30% light yellowish brown (10YR6/4) mottles, moist, soft, CLAY with some silt and trace sand.		426	
	0/12 *0%*	BD					34–35	Gray (10YR5/1), moist, soft, CLAY with some silt, trace sand, and trace organic matter.		424	

End of Boring = 35.0 feet

NOTE(S): AP07S drilled approx. 5 ft. west of AP07D.

FIELD BORING LOG

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: 7800 S Cilco Ln, Bartonville, Illinois
Project: 16E0433
DATES: Start: 12/06/2016
Finish: 12/06/2016
WEATHER: Overcast, cool (hi-30s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-550X ATV Drill
Drilling Method: 4¼" Hollow Stem Auger

FIELD STAFF: Driller: C. Dutton
Helper: M. Baetje
Eng/Geo: S. Collins

HANSON

BOREHOLE ID: AP08
Well ID: AP08
Surface Elev: 458.10 ft. MSL
Completion: 19.98 ft. BGS
Station: 1,430,854.31N
2,434,861.98E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin
Township: Hollis
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 6.00 - During drilling
▼ = 8.88 - 01/18/2017
▽ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	Blows / 6 in N - Value RQD	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	0/60 0%	BD					0–5	Light yellowish brown (10YR6/4), moist to wet, medium, FLY ASH.			
	0/60 0%	BD					5–10 (▼ 6; ▼ 8.88)				
	0/60 0%	BD					10–15				
	0/60 0%	BD					15–20				

Depth scale: 2, 4, 6, 8, 10, 12, 14, 16, 18
Elevation scale: 456, 454, 452, 450, 448, 446, 444, 442, 440

End of Boring = 20.0 ft. BGS

NOTE(S): AP08 blind drilled in fly ash.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: 7800 S Cilco Ln, Bartonville, Illinois
Project: 16E0433
DATES: Start: 12/06/2016
Finish: 12/07/2016
WEATHER: Overcast, cool (hi-30s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-550X ATV Drill
Drilling Method: 4¼" Hollow Stem Auger

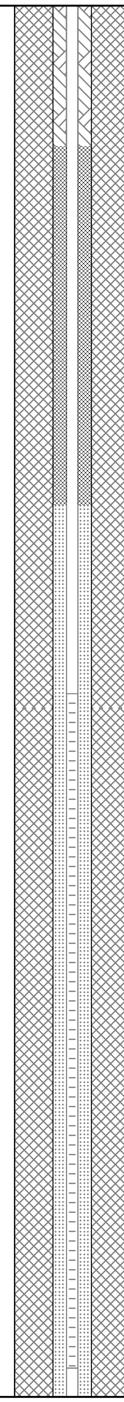
FIELD STAFF: Driller: C. Dutton
Helper: M. Baetje
Eng/Geo: S. Collins

BOREHOLE ID: AP09
Well ID: AP09
Surface Elev: 457.24 ft. MSL
Completion: 19.80 ft. BGS
Station: 1,429,733.15N
2,435,541.77E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin
Township: Hollis
Section 14, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 6.00 - During drilling
▼ = 8.20 - 01/18/2017
▽ =

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	0/60 *0%*	BD					0–5	Light yellowish brown (10YR6/4), moist to wet, medium, FLY ASH.			
	0/60 *0%*	BD					5–10				
	0/60 *0%*	BD					10–15				
	0/60 *0%*	BD					15–19.8				



Depth scale (ft. BGS): 2, 4, 6, 8, 10, 12, 14, 16, 18
Elevation scale (ft. MSL): 456, 454, 452, 450, 448, 446, 444, 442, 440, 438

End of Boring = 19.8 ft. BGS

NOTE(S): AP09 blind drilled in fly ash.

Surface Elevation: 438.02

Datum: msl

Completion Date: 7/27/10

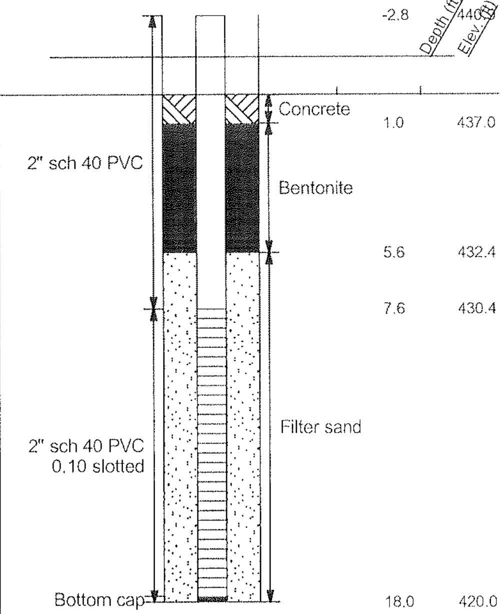
Northing: 1432880.82

Easting: 2435852.39

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
0	FILL			GB1
5				GB2
7.5	Brown, silty CLAY - CL			
10	▽			GB3
15				GB4
18	Shaley LIMESTONE		10-0-0	SS5
18.5	Auger refusal at 18.5 feet.			
20				
25				
30				
35				
40				

WELL DIAGRAM

Stickup
Diameter: 6 inches



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 10 FEET ▽

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM ___ FEET

PH DRILLER JPC LOGGER

CME 550X DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: KSA	Checked by: DTK	App'vd. by: RSP
Date: 8/13/10	Date: 2/17/11	Date: 2/17/11

GEOTECHNOLOGY INC
FROM THE GROUND UP

Ameren Power Plant
Edwards, Illinois

LOG OF BORING: APW-1

Project No. J017150.01

Surface Elevation: 461.80

Datum msl

Completion Date: 7/20/10

Northing: 1430732.11

Easting: 243579.28

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
0	FILL: ash			GB1
5	Black, silty CLAY - CL			GB2
10				GB3
15				GB4
20				GB5
25	Gray, silty CLAY - CL			GB6
30				GB7
35				GB8
40				GB9

WELL DIAGRAM

Stickup
Diameter: 6 inches

Item	Depth (ft)	Elev. (ft)
Top of casing	-3.0	464.8
Concrete	1.0	460.8
Bentonite	37.6	424.2
Filter sand	39.6	422.2

2" sch 40 PVC

2" sch 40 PVC 0.10 slotted

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

LOG OF BORING 2002 WL J017150.01 - EDWARDS.GPJ GTINC 0638301.GPJ 12/13/10

GROUNDWATER DATA

ENCOUNTERED AT 38 FEET ∇

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

PH DRILLER JPC LOGGER

CME 550X DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: KSA	Checked by: DTK	App'vd. by: RBP
Date: 8/13/10	Date: 2/17/11	Date: 2/17/11

GEOTECHNOLOGY INC
FROM THE GROUND UP

Ameren Power Plant
Edwards, Illinois

LOG OF BORING: APW-2

Project No. J017150.01

Surface Elevation: 461.80 Datum msl	Completion Date: 7/20/10 Northing: 1430732.11 Easting: 243579.28	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES	WELL DIAGRAM
DEPTH IN FEET	DESCRIPTION OF MATERIAL				Stickup Diameter: 6 inches Depth (ft) / Elev. (ft)
	Gray, silty CLAY - CL *(continued)*			GB10	2" sch 40 PVC 0.10 slotted; Filter sand
50	Boring terminated at 50 feet.				Bottom cap 50.0 411.8
55					
60					
65					
70					
75					
80					
85					

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 38 FEET ⊻

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

PH DRILLER JPC LOGGER

CME 550X DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: KSA	Checked by: DTK	App'vd. by: KSP
Date: 8/13/10	Date: 2/17/11	Date: 2/17/11

GEOTECHNOLOGY INC
FROM THE GROUND UP

Ameren Power Plant
Edwards, Illinois

CONTINUATION OF
LOG OF BORING: APW-2

Project No. J017150.01

LOG OF BORING 2002 WL J017150.01 - EDWARDS.GPJ GTINC 0638301.GPJ 12/13/10

Surface Elevation: 444.26

Datum msl

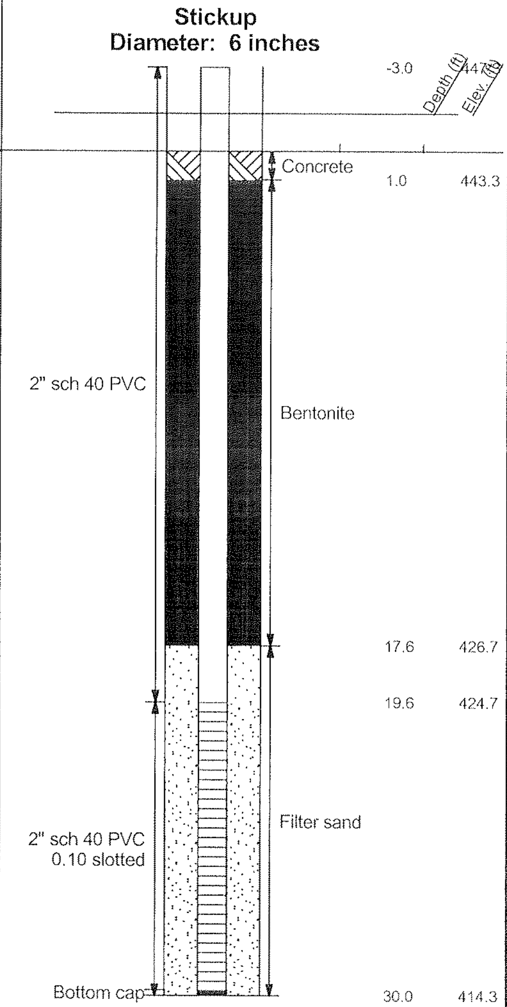
Completion Date: 7/19/10

Northing 1429652.72

Easting 2436225.53

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
0	Black COAL and ash			GB1
5				GB2
10				GB3
12.5	Gray and brown, silty CLAY - CL			
15				GB4
17	▽			
20				GB5
25				GB6
30	Boring terminated at 30 feet.			
35				
40				

WELL DIAGRAM



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 17 FEET ▽

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

PH DRILLER JPC LOGGER

CME 550X DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: KSA	Checked by: DTK	App'vd. by: RSI
Date: 8/13/10	Date: 2/17/11	Date: 2/17/11

GEOTECHNOLOGY INC

FROM THE GROUND UP

Ameren Power Plant
Edwards, Illinois

LOG OF BORING: APW-3

Project No. J017150.01

LOG OF BORING 2002 WL J017150.01 - EDWARDS.GPJ GTINC 0638301.GPJ 12/13/10

Surface Elevation: 473.30

Datum: msl

Completion Date: 7/27/10

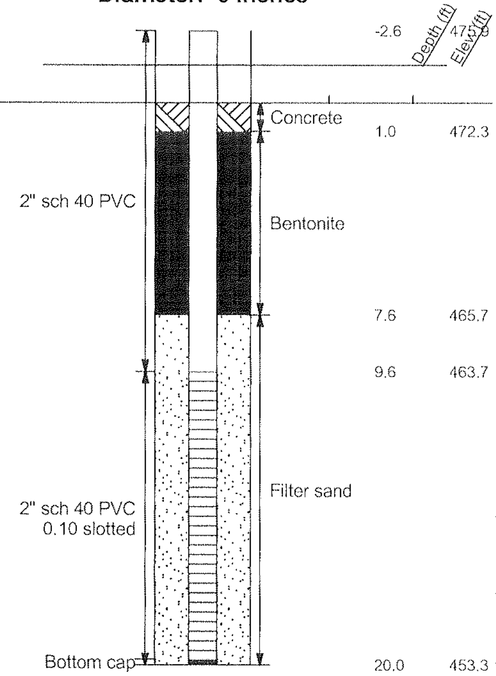
Northing: 1428432.43

Easting: 2436265.52

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
0	FILL			GB1
1	GRAVEL			GB2
5				GB3
7.5	Brown, silty CLAY, trace gravel - CL			
10				GB4
15				GB5
20	Boring terminated at 20 feet.			

WELL DIAGRAM

Stickup Diameter: 6 inches



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 7.5 FEET ∇

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM ___ FEET

PH DRILLER JPC LOGGER

CME 550X DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: KSA	Checked by: DTK	App'vd. by: RBP
Date: 8/13/10	Date: 2/17/11	Date: 2/17/11

GEOTECHNOLOGY INC
FROM THE GROUND UP

Ameren Power Plant
Edwards, Illinois

LOG OF BORING: APW-4

Project No. J017150.01

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: Bartonville, Illinois
Project: 15E0030
DATES: Start: 7/22/2015
Finish: 7/22/2015
WEATHER: Sunny, warm, mid-70s

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: Diedrich D-50
Drilling Method: 4 ¼" HSA, split spoon sampler
FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: S. Keim

BOREHOLE ID: AW-05
Well ID: AW-05
Surface Elev: 440.55 ft. MSL
Completion: 21.10 ft. BGS
Station: 1,432,339.67N
2,435,498.04E

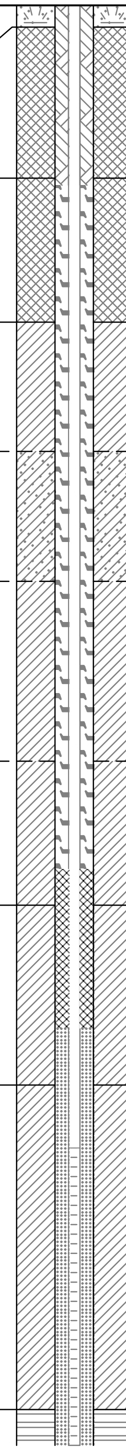
TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin Quadrangle (7½' series)
Township: Hollis Township
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 12.00 - during drilling
▼ = 6.62 - 7/22/15
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type
1A	16/24 *67%*	SS	*2-3 2-7* N=5	20		*2.00*
2A	17/24 *71%*	SS	*5-7 7-7* N=14	21		*2.00*
3A	18/24 *75%*	SS	*2-2 2-2* N=4	23		*0.80*
4A	16/24 *67%*	SS	*2-2 2-2* N=4	22		*0.30*
5A	18/24 *75%*	SS	*2-1 3-2* N=4	31		*1.10*
6A	22/24 *92%*	SS	*1-1 2-2* N=3	31		*0.50*
7A	24/24 *100%*	SS	*2-2 1-1* N=3	52		*0.20*
8-1, 5-2, 8-3, 8-4	24/24 *100%*	SH		32		*0.80*
9A	24/24 *100%*	SS	*1-2 2-4* N=4	32		*0.30*
10A	18/24 *75%*	SS	*1-1 3-14* N=4	39		*0.30*

Depth ft. BGS	Lithologic Description
0 – 0.3	Black (10YR2/1), moist, medium, SILT with few clay and trace very fine- to fine-grained sand, roots.
0.3 – 2.4	FILL - Dark yellowish brown (10YR4/4), moist, stiff, SILT with few clay and trace very fine- to fine-grained sand.
2.4 – 4.4	FILL - Very dark grayish brown (10YR3/2), moist, stiff, silty CLAY with trace very fine-grained sand.
4.4 – 6.2	Dark grayish brown (10YR4/2) with 5% dark yellowish brown (10YR4/6) mottles, moist, medium, silty CLAY with trace fine-grained sand.
6.2 – 8.0	Brown (10YR5/3) with 5% gray (10YR5/1) mottles, moist, soft, CLAY with very fine- to fine-grained sand.
8.0 – 10.5	Gray (10YR5/1) with 15% dark yellowish brown (10YR3/4) mottles, moist, stiff, silty CLAY with trace very fine- to fine-grained sand.
10.5 – 12.5	Gray (10YR5/1) with 15% dark yellowish brown (10YR3/4) mottles, moist, soft, silty CLAY with trace very fine- to fine-grained sand.
12.5 – 15.0	Gray (10YR5/1) with 10% yellowish brown (10YR5/6) mottles, moist, soft, silty CLAY with trace coarse-grained sand.
15.0 – 19.5	Dark gray (10YR4/1), moist, medium, silty CLAY with trace very fine-grained sand.
19.5 – 20	Dark gray (10YR4/1), moist, hard, weathered SHALE.

Borehole Detail



Elevation ft. MSL: 440, 438, 436, 434, 432, 430, 428, 426, 424, 422

Remarks

NOTE(S): AW-05 installed in bore hole.

FIELD BORING LOG

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: Bartonville, Illinois
Project: 15E0030
DATES: Start: 7/22/2015
Finish: 7/22/2015
WEATHER: Sunny, warm, mid-70s

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: Diedrich D-50
Drilling Method: 4 ¼" HSA, split spoon sampler
FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: S. Keim

BOREHOLE ID: AW-05
Well ID: AW-05
Surface Elev: 440.55 ft. MSL
Completion: 21.10 ft. BGS
Station: 1,432,339.67N
2,435,498.04E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin Quadrangle (7½' series)
Township: Hollis Township
Section 11, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 12.00 - during drilling
▼ = 6.62 - 7/22/15
∇ =

SAMPLE			TESTING									
Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	0/5 *0%*	SS	*50/5"*					Dark gray (10YR4/1), moist, hard, weathered SHALE. *[Continued from previous page]*		420	

End of boring = 21.10 feet

NOTE(S): AW-05 installed in bore hole.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: Bartonville, Illinois
Project: 15E0030
DATES: Start: 7/29/2015
Finish: 8/3/2015
WEATHER: Sunny, warm, hi-80s

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: Diedrich D-50
Drilling Method: 4 ¼" HSA, split spoon sampler

FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: S. Keim

BOREHOLE ID: AW-06
Well ID: AW-06
Surface Elev: 459.19 ft. MSL
Completion: 42.25 ft. BGS
Station: 1,430,727.75N
2,434,495.33E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin Quadrangle (7½' series)
Township: Hollis Township
Section 14, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ =
▽ =

SAMPLE			TESTING			
Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type
	24/24 *100%*	BD				
2A	24/24 *100%*	BD		24		
3A	14/24 *58%*	SS	*4-6 29-23* N=35	23		
4A	21/24 *88%*	SS	*14-18 21-26* N=39	29		
5A	20/24 *83%*	SS	*7-7 6-4* N=13	37		
6A	18/24 *75%*	SS	*1-1 3-3* N=4	26		
7A	17/24 *71%*	SS	*2-3 4-5* N=7	22		*1.30*
8A	14/24 *58%*	SS	*1-1 3-3* N=4	22		*0.50*
9A	17/24 *71%*	SS	*4-6 5-6* N=11	23		*0.70*
10A	22/24 *92%*	SS	*2-2 3-4* N=5	21		*1.30*

Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
0–2	GRAVEL FILL	458	
2–3.5	FILL - Dark gray (10YR4/1) and brown (10YR4/3), moist, medium, silty CLAY with trace medium- to coarse-grained sand.	456	sample from cuttings
3.5–8	FILL - Very dark gray (10YR3/1), moist, hard, FLY ASH.	454, 452	
8–10	FILL - Very dark gray (10YR3/1), moist, medium, FLY ASH.	450	
10–11.3	FILL - Very dark gray (10YR3/1), moist, soft, FLY ASH.	448	
11.3–12.8	FILL - Dark gray (10YR4/1), moist, medium, SILT and FLY ASH with few clay and trace coarse-grained sand and small gravel.		
12.8–18	Gray (10YR5/1) and brown (10YR5/3), moist, medium, SILT with few clay and trace medium- to coarse-grained sand and roots.	446, 444, 442	
18–20	Very dark grayish brown (10YR3/2), moist, stiff, silty CLAY with trace very fine- to fine-grained sand.	440	

NOTE(S): AW-06 installed in bore hole. Well was constructed using a pre-packed screen.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: Bartonville, Illinois
Project: 15E0030
DATES: Start: 7/29/2015
Finish: 8/3/2015
WEATHER: Sunny, warm, hi-80s

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: Diedrich D-50
Drilling Method: 4 ¼" HSA, split spoon sampler
FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: S. Keim

BOREHOLE ID: AW-06
Well ID: AW-06
Surface Elev: 459.19 ft. MSL
Completion: 42.25 ft. BGS
Station: 1,430,727.75N
2,434,495.33E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin Quadrangle (7½' series)
Township: Hollis Township
Section 14, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ =
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft³)	Qu (tsf) *Qp (tsf)* Failure Type
11-1						
11-2	12/24 *50%*	SH				*0.80*
11-3						
11-4				20		
12A	18/24 *75%*	SS	*3-4* *6-7* N=10	22		*0.80*
13A	22/24 *92%*	SS	*3-2* *3-3* N=5	24		*0.50*
14-1						
14-2	16/24 *67%*	SH				*0.50*
14-3						
14-4				31		
15A	20/24 *83%*	SS	*2-3* *3-3* N=6	39		*0.80*
	24/24 *100%*	BD				
16A						
17-1				29		
17-2	24/24 *100%*	SH				
17-3						*1.00*
17-4						
18A	16/24 *67%*	SS	*0-3* *3-3* N=6	32		*1.20*
19-1						
19-2	16/24 *67%*	SH				*0.80*
19-3						
19-4				34		
20A	20/24 *83%*	SS	*2-5* *6-6* N=11	29		

Depth ft. BGS	Lithologic Description
to 24	Dark gray (10YR4/1) with 10% dark grayish brown (10YR4/2) mottles, moist, medium, SILT with little clay and trace very fine- to fine-grained sand.
24 – 26	Dark gray (10YR4/1), moist, medium, SILT with few to little clay and trace fine- to medium-grained sand, woody material and shell fragments.
26 – ~31	Dark gray (10YR4/1), moist, medium, SILT with little clay and trace fine- to medium-grained sand and shell fragments.
~31 – ~34.2	Gray (10YR5/1) with 35% yellowish brown (10YR5/6) mottles, moist, stiff, silty CLAY with trace fine-grained sand.
~34.2 – 38	Dark gray (10YR4/1), moist, stiff, silty CLAY with trace very fine-grained sand and roots.
38 – ~39.7	Dark gray (10YR4/1) with 5% olive brown (2.5Y4/3) mottles, moist, stiff, silty CLAY with trace fine- to coarse-grained sand and small gravel, trace roots.
~39.7 –	Gray (10YR4/1) with 15% olive brown (2.5Y4/3) mottles,

Depth scale ft. BGS: 22, 24, 26, 28, 30, 32, 34, 36, 38, 40

Elevation ft. MSL: 438, 436, 434, 432, 430, 428, 426, 424, 422, 420

Borehole Detail | Remarks

NOTE(S): AW-06 installed in bore hole. Well was constructed using a pre-packed screen.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: Bartonville, Illinois
Project: 15E0030
DATES: Start: 7/29/2015
Finish: 8/3/2015
WEATHER: Sunny, warm, hi-80s

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: Diedrich D-50
Drilling Method: 4 ¼" HSA, split spoon sampler

FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: S. Keim

BOREHOLE ID: AW-06
Well ID: AW-06
Surface Elev: 459.19 ft. MSL
Completion: 42.25 ft. BGS
Station: 1,430,727.75N
2,434,495.33E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin Quadrangle (7½' series)
Township: Hollis Township
Section 14, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ =
▽ =

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
21A	4/4 *100%*	SS	*50/4"*	14				moist, stiff, weathered SHALE, slightly laminated.			
								Dark gray (10YR4/1), moist, hard, weathered SHALE.		418	
22A	3/3 *100%*	SS	*50/3"*	13			42				

End of boring = 42.25 feet

NOTE(S): AW-06 installed in bore hole. Well was constructed using a pre-packed screen.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: Bartonville, Illinois
Project: 15E0030
DATES: Start: 7/20/2015
Finish: 7/21/2015
WEATHER: Sunny, warm, hi-70s

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: Diedrich D-50
Drilling Method: 4 ¼" HSA, split spoon sampler

FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: S. Keim

BOREHOLE ID: AW-08
Well ID: AW-08
Surface Elev: 460.66 ft. MSL
Completion: 57.67 ft. BGS
Station: 1,430,641.18N
2,436,732.68E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin Quadrangle (7½' series)
Township: Hollis Township
Section 14, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 30.00 - during drilling
▼ = 10.58 - 7/21/15
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft³)	Qu (tsf) *Qp (tsf)* Failure Type
1A	16/24 *67%*	SS	*4-3 5-7* N=8	15		*3.30*
2A	16/24 *67%*	SS	*4-3 3-4* N=6	25		*3.00*
3A	17/24 *71%*	SS	*1-2 1-2* N=3	16		*2.50*
4A	19/24 *79%*	SS	*5-6 6-6* N=12	22		*1.30*
5A	21/24 *88%*	SS	*1-2 2-2* N=4	28		*2.30*
6A	24/24 *100%*	SS	*1-2 2-3* N=4	37		*0.80*
7A	21/24 *88%*	SS	*3-3 4-4* N=7	27		*0.80*
8-1 8-2 8-3 8-4	8/24 *33%*	SH		24		*0.80*
9A	22/24 *92%*	SS	*2-2 3-4* N=5	30		*0.80*
10A	22/24 *92%*	SS	*2-1 2-1* N=3	42		*0.30*

Depth ft. BGS	Lithologic Description	Elevation ft. MSL
0–2	FILL - Very dark grayish brown (10YR3/2), moist, medium, clayey SILT with trace fine- to coarse-grained sand, trace small gravel.	460
2–3.5	FILL - Gray (10YR5/1), moist, medium, SILT with little clay, trace fine- to coarse-grained sand, trace small gravel.	458
3.5–6	Very dark gray (10YR3/1), moist, soft, silty CLAY with trace fine-grained sand.	456
6–9.3	Gray (10YR5/1) with 30% dark yellowish brown (10YR4/6) mottles, moist, stiff, silty CLAY with trace fine-grained sand.	454, 452
9.3–14	Dark gray (10YR4/1) with 15% dark brown (10YR3/3) mottles, moist, soft, silty CLAY with trace fine-grained sand. (▼ at 10.58)	450, 448
14–16	Dark gray (10YR4/1) with 5% dark yellowish brown (10YR4/6) mottles, moist, medium, very fine- to fine-grained sandy CLAY.	446
16–18	Dark gray (10YR4/1) with 5% dark yellowish brown (10YR4/6) mottles, moist, medium, very fine- to fine-grained sandy CLAY with trace very fine- to fine-grained sand seams (wet).	444
18–20	Dark gray (N4/0), moist, soft, SILT with few clay and slight trace shell fragments.	442

Borehole Detail | Remarks

NOTE(S): AW-08 installed in bore hole.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: Bartonville, Illinois
Project: 15E0030
DATES: Start: 7/20/2015
Finish: 7/21/2015
WEATHER: Sunny, warm, hi-70s

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: Diedrich D-50
Drilling Method: 4 ¼" HSA, split spoon sampler

FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: S. Keim

BOREHOLE ID: AW-08
Well ID: AW-08
Surface Elev: 460.66 ft. MSL
Completion: 57.67 ft. BGS
Station: 1,430,641.18N
2,436,732.68E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin Quadrangle (7½' series)
Township: Hollis Township
Section 14, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 30.00 - during drilling
▼ = 10.58 - 7/21/15
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type
11-1						
11-2	18/24 *75%*	SH				
11-3						
11-4				25		*1.30*
12A	24/24 *100%*	SS	*5-7 14-15* N=21	18		*3.30*
13A	24/24 *100%*	SS	*2-3 4-4* N=7	32		*1.50*
14A	24/24 *100%*	SS	*6-7 7-8* N=14	28		*1.20*
15A	22/24 *92%*	SS	*1-2 3-3* N=5	27		*1.30*
16A	24/24 *100%*	SS	*1-2 2-2* N=4	29		*1.20*
17A	24/24 *100%*	SS	*3-4 6-7* N=10	29		*1.60*
18A	24/24 *100%*	SS	*2-2 2-4* N=4	32		*0.80*
19A	24/24 *100%*	SS	*4-4 5-6* N=9	28		*1.00*
20A	24/24 *100%*	SS	*1-1 1-2* N=2	30		*0.70*

Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
22	Dark gray (10YR4/1), moist, stiff, SILT with trace clay and trace shell fragments.		440	
24	Dark gray (10YR4/1), moist, very stiff, SILT with few clay, trace medium- to coarse-grained sand, slight trace shell fragments.		438	
26	Dark gray (10YR4/1), moist, stiff, SILT with few clay and slight trace very fine- to fine-grained sand.		436 / 434	
28 / ▼ 30 / 32	Dark gray (10YR4/1) with 5% yellowish brown (10YR5/4) mottles, moist, stiff, SILT with few clay and trace fine- to medium-grained sand.		432 / 430 / 428	
34 / 36 / 38	Gray (10YR5/1) with 35% dark yellowish brown (10YR4/4) mottles, moist, medium, SILT with few clay and trace very fine- to fine-grained sand.		426 / 424	
40	Grayish brown (10YR5/2) with 25% yellowish brown (10YR5/4) mottles, moist, medium, SILT with few clay and trace very fine-grained sand.		422	

NOTE(S): AW-08 installed in bore hole.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: Bartonville, Illinois
Project: 15E0030
DATES: Start: 7/20/2015
Finish: 7/21/2015
WEATHER: Sunny, warm, hi-70s

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: Diedrich D-50
Drilling Method: 4 ¼" HSA, split spoon sampler
FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: S. Keim

BOREHOLE ID: AW-08
Well ID: AW-08
Surface Elev: 460.66 ft. MSL
Completion: 57.67 ft. BGS
Station: 1,430,641.18N
2,436,732.68E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin Quadrangle (7½' series)
Township: Hollis Township
Section 14, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 30.00 - during drilling
▼ = 10.58 - 7/21/15
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft³)	Qu (tsf) *Qp (tsf)* Failure Type
21A	24/24 *100%*	SS	*0-0 2-2* N=2	28		*0.30*
22A	24/24 *100%*	SS	*3-2 3-3* N=5	27		*0.20*
23A	24/24 *100%*	SS	*3-3 4-4* N=7	41		*0.50*
24A	24/24 *100%*	SS	*4-5 4-4* N=9	41		*0.30*
25A	24/24 *100%*	SS	*0-0 3-3* N=3	48		*0.20*
26A	24/24 *100%*	SS	*2-2 3-3* N=5	43		*0.30*
27A	24/24 *100%*	SS	*3-3 4-5* N=7	60		*0.50*
28A	24/24 *100%*	SS	*2-4 8-10* N=12	29		*1.00*
29A	11/24 *46%*	SS	*23-50/5"*	20		

Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
42, 44, 46, 48, 50, 52, 54, 56			420, 418, 416, 414, 412, 410, 408, 406, 404	
	Dark gray (10YR4/1) and dark yellowish brown (10YR4/4), moist, soft, SILT with few clay and trace very fine-grained sand.			
	Dark gray (10YR4/1), moist, very soft to medium, SILT with few clay and trace very fine-grained sand and shell fragments.			
	Gray (10YR5/1), moist, stiff, very fine-grained sandy SILT, little clay.			
	Gray (10YR5/1), moist, hard, weathered SHALE.			

End of boring = 57.67 feet

NOTE(S): AW-08 installed in bore hole.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: Bartonville, Illinois
Project: 15E0030
DATES: Start: 7/29/2015
Finish: 8/3/2015
WEATHER: Sunny, warm, lo-80s

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: Diedrich D-50
Drilling Method: 4 ¼" HSA, split spoon sampler

FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: S. Keim

BOREHOLE ID: AW-09
Well ID: AW-09
Surface Elev: 458.32 ft. MSL
Completion: 52.23 ft. BGS
Station: 1,429,340.11N
2,434,856.97E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin Quadrangle (7½' series)
Township: Hollis Township
Section 14, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ =
▽ =

SAMPLE Number	Recov / Total (in) / *% Recovery*	Type	TESTING *Blows / 6 in* / N - Value / **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp* (tsf) / Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
	24/24 *100%*	BD					0–2	GRAVEL FILL	458	
2A	24/24 *100%*	BD		23			2–4	FILL - Dark gray (10YR4/1), very moist, SILT with few clay and gravel.	456	Sample from cuttings
3A	21/24 *88%*	SS	*1-3* *6-9* N=9	29		*0.50*	4	FILL - Yellowish brown (10YR5/4), moist, medium, silty CLAY with trace fine- to coarse-grained sand.	454	
								FILL - Very dark gray (10YR3/1), moist, stiff, FLY ASH.		
4A	19/24 *79%*	SS	*10-13* *14-15* N=27	28			6		452	
5A	22/24 *92%*	SS	*5-5* *5-5* N=10	36			8		450	
6A	18/24 *75%*	SS	*2-3* *3-2* N=6	36			10		448	
7A	20/24 *83%*	SS	*3-4* *7-9* N=11	32			12	FILL - Very dark gray (10YR3/1), moist, medium, FLY ASH.	446	
8A	21/24 *88%*	SS	*2-3* *4-4* N=7	37			14		444	
9A	22/24 *92%*	SS	*3-5* *4-3* N=9	38			16		442	
							18	Very dark gray (10YR3/1), moist, medium, SILT with few clay and trace very fine - to fine-grained sand.	440	
10A	15/24 *63%*	SS	*2-2* *4-4* N=6	26		*1.50*	20	Dark gray (10YR4/1) with 35% yellowish brown (10YR5/6) mottles, moist, medium, SILT with few clay, trace very fine- to fine-grained sand and organics.		

NOTE(S): AW-09 installed in bore hole. Well was constructed using a pre-packed screen.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: Bartonville, Illinois
Project: 15E0030
DATES: Start: 7/29/2015
Finish: 8/3/2015
WEATHER: Sunny, warm, lo-80s

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: Diedrich D-50
Drilling Method: 4 ¼" HSA, split spoon sampler
FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: S. Keim

BOREHOLE ID: AW-09
Well ID: AW-09
Surface Elev: 458.32 ft. MSL
Completion: 52.23 ft. BGS
Station: 1,429,340.11N
2,434,856.97E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin Quadrangle (7½' series)
Township: Hollis Township
Section 14, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ =
▽ =

SAMPLE / TESTING

Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft³)	Qu (tsf) *Qp (tsf)* Failure Type
11A	16/24 *67%*	SS	*1-2 4-5* N=6	24		*2.30*
12A	18/24 *75%*	SS	*7-9 9-9* N=18	26		*1.80*
13-1	21/24 *88%*	SH				*1.80*
13-2						
13-3						*1.80*
13-4				28		
14A	19/24 *79%*	SS	*6-6 5-6* N=11	28		*0.50*
15A	22/24 *92%*	SS	*1-3 3-4* N=6	25		*1.30*
16-1	18/24 *75%*	SH				
16-2						*1.30*
16-3						
16-4				40		
17A	24/24 *100%*	SS	*1-1 3-4* N=4	31		*0.80*
18-1	24/24 *100%*	SH				*0.80*
18-2						*0.80*
18-3						*0.80*
18-4				32		
19A	24/24 *100%*	SS	*1-2 3-3* N=5	36		*0.70*
20A	13/24 *54%*	SS	*3-3 3-3* N=6	34		*0.50*

Lithologic Description

Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
20–22	Grayish brown (10YR5/2), moist, medium, SILT with little clay, trace coarse-grained sand and roots.	438	
22–24.5	Gray (10YR5/1) with 25% yellowish brown (10YR5/6) mottles, moist, stiff, silty CLAY with trace fine-grained sand.	436, 434	
24.5–26	Very dark gray (10YR3/1), moist, stiff, SILT with few clay and trace very fine- to fine-grained sand.		
26–28.7	Dark gray (10YR4/1) with 20% very dark grayish brown (10YR3/2) mottles, moist, medium, SILT with few clay and trace very fine- to fine-grained sand.	432, 430	
28.7–32	Gray (10YR5/1) with 30% dark yellowish brown (10YR4/4) mottles, moist, stiff, SILT with few clay and trace very fine- to fine-grained sand, woody material and shell fragments.	428	
32–33.8	Gray (10YR5/1) with 30% dark yellowish brown (10YR4/4) mottles, moist, medium, SILT with few clay and trace very fine- to fine-grained sand and woody material.	426	
33.8–38	Dark gray (10YR4/1), moist, medium, SILT with little clay and trace very fine-grained sand.	424, 422	
38–40	Dark gray (10YR4/1), moist, medium to stiff, SILT with little clay and trace very fine-grained sand and shell fragments.	420	

NOTE(S): AW-09 installed in bore hole. Well was constructed using a pre-packed screen.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: Bartonville, Illinois
Project: 15E0030
DATES: Start: 7/29/2015
Finish: 8/3/2015
WEATHER: Sunny, warm, lo-80s

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: Diedrich D-50
Drilling Method: 4 ¼" HSA, split spoon sampler
FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: S. Keim

BOREHOLE ID: AW-09
Well ID: AW-09
Surface Elev: 458.32 ft. MSL
Completion: 52.23 ft. BGS
Station: 1,429,340.11N
2,434,856.97E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin Quadrangle (7½' series)
Township: Hollis Township
Section 14, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ =
▽ =

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type
21-1						
21-2	16/24 *67%*	SH				*1.30*
21-3						
21-4				40		
22A	20/24 *83%*	SS	*3-4* *5-5* N=9	52		*0.80*
	24/24 *100%*	SS	*2-3* *3-4* N=6			
23A				81		*0.80*
24-1						
24-2	24/24 *100%*	SH				
24-3						*1.00*
24-4				77		
	24/24 *100%*	SS	*1-3* *3-5* N=6			
25A				41		*0.80*
26-1	11/12 *92%*	SH				*0.50*
26-2				13		
26A	9/12 *75%*	SS	*50-50/3"*			
27A	2/2 *100%*	SS	*50/2"*	14		

Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
41.3 – 50.3	Dark gray (10YR4/1), moist, medium to stiff, SILT with little clay and trace very fine-grained sand and shell fragments. *[Continued from previous page]*	418 – 408	
50.3 – 52.23	Dark gray (10YR4/1), moist, hard, weathered SHALE.	408	

Depth scale: 42, 44, 46, 48, 50, 52. Elevation scale: 418, 416, 414, 412, 410, 408.

End of boring = 52.23 feet

NOTE(S): AW-09 installed in bore hole. Well was constructed using a pre-packed screen.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: Bartonville, Illinois
Project: 15E0030
DATES: Start: 7/23/2015
Finish: 7/23/2015
WEATHER: Sunny, warm, calm, mid-70s

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: Diedrich D-50
Drilling Method: 4 ¼" HSA, split spoon sampler
FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: S. Keim

BOREHOLE ID: AW-10
Well ID: AW-10
Surface Elev: 437.64 ft. MSL
Completion: 32.74 ft. BGS
Station: 1,429,461.05N
2,436,231.40E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin Quadrangle (7½' series)
Township: Hollis Township
Section 14, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 7.00 - during drilling
▼ = 6.68 - 7/23/15
▽ =

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type
1A	16/24 *67%*	SS	*6-5 5-5* N=10	25		
2A	20/24 *83%*	SS	*2-2 2-3* N=4	30		*1.50*
3A	15/24 *63%*	SS	*1-1 3-3* N=4	25		*2.30*
4A	16/24 *67%*	SS	*4-3 4-3* N=7	29		*1.00*
5A	19/24 *79%*	SS	*1-1 2-2* N=3	29		*0.80*
6A	24/24 *100%*	SS	*1-1 1-2* N=2	45		*0.80*
7A	24/24 *100%*	SS	*2-2 2-3* N=4	43		*0.30*
8A	24/24 *100%*	SS	*1-1 1-1* N=2	55		*0.30*
9A	24/24 *100%*	SS	*2-2 2-3* N=4	41		*0.50*
10A	24/24 *100%*	SS	*1-1 1-1* N=2	34		*0.30*

Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
0–2.2	Very dark grayish brown (10YR3/2), moist, very stiff, SILT with few clay and trace very fine- to fine-grained sand and roots.	436	
2.2–6.5	Very dark gray (10YR3/1) with 3% dark yellowish brown (10YR4/4) mottles, moist, stiff , silty CLAY with trace very fine- to fine-grained sand.	434, 432	
6.5–10	Gray (10YR5/1) with 5% dark gray (10YR4/1) and 5% dark yellowish brown (10YR4/4) mottles, moist, medium, silty CLAY with trace fine-grained sand.	430, 428	
10–12.4	Dark gray (10YR4/1) with 5% dark yellowish brown (10YR4/4) mottles, moist, medium, SILT with few clay and trace very fine- to fine-grained sand.	426	
12.4–14	Dark gray (10YR4/1), moist, soft, SILT with few clay and trace very fine-grained sand and shell fragments.	424	
14–20	Dark gray (10YR4/1), moist, soft, SILT with few clay and trace very fine-grained sand, shell fragments, and woody fragments.	422, 420, 418	

NOTE(S): AW-10 installed in bore hole.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: Bartonville, Illinois
Project: 15E0030
DATES: Start: 7/23/2015
Finish: 7/23/2015
WEATHER: Sunny, warm, calm, mid-70s

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: Diedrich D-50
Drilling Method: 4 ¼" HSA, split spoon sampler
FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: S. Keim

BOREHOLE ID: AW-10
Well ID: AW-10
Surface Elev: 437.64 ft. MSL
Completion: 32.74 ft. BGS
Station: 1,429,461.05N
2,436,231.40E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin Quadrangle (7½' series)
Township: Hollis Township
Section 14, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 7.00 - during drilling
▼ = 6.68 - 7/23/15
▽ =

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft³)	Qu (tsf) *Qp (tsf)* Failure Type
11A	24/24 *100%*	SS	*0-0 1-1* N=1	57		*0.30*
12A	24/24 *100%*	SS	*2-1 1-2* N=2	58		*0.30*
13-1, 13-2, 13-3, 13-4	24/24 *100%*	SH		89		*0.80*
14A	24/24 *100%*	SS	*1-1 2-2* N=3	100		*0.30*
15A	24/24 *100%*	SS	*0-1 2-1* N=3	56		*0.50*
16A	24/24 *100%*	SS	*0-6 6-9* N=12	26		*1.80*
17A	9/9 *100%*	SS	*33-50/6"*	18		

Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
22			416	
24			414	
26	Dark gray (10YR4/1), moist, soft, SILT with few clay and trace very fine-grained sand, shell fragments, and woody fragments. *[Continued from previous page]*		412	
28			410	
30			408	
32	Gray (10YR5/1), moist, hard, weathered SHALE.		406	

End of boring = 32.74 feet

NOTE(S): AW-10 installed in bore hole.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: Bartonville, Illinois
Project: 15E0030
DATES: Start: 7/24/2015
Finish: 7/28/2015
WEATHER: Sunny, warm, mid-70s

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: Diedrich D-50
Drilling Method: 4 ¼" HSA, split spoon sampler
FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: R. Hasenyager

BOREHOLE ID: AW-11
Well ID: AW-11
Surface Elev: 437.16 ft. MSL
Completion: 30.00 ft. BGS
Station: 1,428,196.31N
2,436,251.05E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin Quadrangle (7½' series)
Township: Hollis Township
Section 14, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 9.00 - during drilling
▼ = 5.77 - 7/27/15
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft³)	Qu (tsf) *Qp (tsf)* Failure Type
1	10/24 *42%*	SS	*3-4 4-5* N=8	23		*2.80*
2	13/24 *54%*	SS	*2-2 2-2* N=4	26		*0.80*
3	10/24 *42%*	SS	*1-1 2-1* N=3	25		*1.30*
4	14/24 *58%*	SS	*1-2 2-1* N=4	28		*0.50*
5-1						
5-2	24/24 *100%*	SH				
5-3						*0.80*
5-4				40		
6	20/24 *83%*	SS	*1-1 1-1* N=2	53		*0.30*
7	24/24 *100%*	SS	*2-2 2-2* N=4	66		*0.30*
8	24/24 *100%*	SS	*1-1 1-1* N=2	50		*0.30*
9	24/24 *100%*	SS	*1-1 1-1* N=2	56		*0.00*
10	24/24 *100%*	SS	*woh-1 1-1* N=2	61		*0.50*

Depth ft. BGS	Lithologic Description	Elevation ft. MSL
0–2	FILL - Black (10YR2/1), moist, medium, CLAY with some silt and trace sand and small gravel.	436
2–4	Very dark gray (10YR3/1) with 20% dark yellowish brown (10YR4/6) mottles, moist, soft, CLAY with some silt and trace sand.	434
4–7	Gray (10YR5/1) with 30% yellowish brown (10YR5/6) mottles, moist, soft, CLAY swith some silt and trace very fine-grained sand.	432
7–8	Very dark gray (10YR3/1), wet, very soft, SILT with few clay and trace very fine-grained sand.	430
8–13	Gray (10YR5/1) with 10% yellowish brown (10YR5/6) mottles, moist, soft, SILT with few clay and trace very fine-grained sand.	428, 426
13–15	Gray (10YR5/1), moist, soft, SILT with few clay and trace very fine-grained sand.	424
15–20	Gray (10YR5/1), moist, soft, SILT with few clay and trace very fine-grained sand, shell fragments and woody fragments.	422, 420, 418

Borehole Detail | Remarks

NOTE(S): AW-11 installed in bore hole.

FIELD BORING LOG

CLIENT: Natural Resource Technology, Inc.
Site: Edwards Power Station
Location: Bartonville, Illinois
Project: 15E0030
DATES: Start: 7/24/2015
Finish: 7/28/2015
WEATHER: Sunny, warm, mid-70s

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: Diedrich D-50
Drilling Method: 4 ¼" HSA, split spoon sampler
FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: R. Hasenyager

HANSON
BOREHOLE ID: AW-11
Well ID: AW-11
Surface Elev: 437.16 ft. MSL
Completion: 30.00 ft. BGS
Station: 1,428,196.31N
2,436,251.05E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Pekin Quadrangle (7½' series)
Township: Hollis Township
Section 14, **Tier** 7N; **Range** 7E

WATER LEVEL INFORMATION:
▼ = 9.00 - during drilling
▼ = 5.77 - 7/27/15
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
11	22/24 *92%*	SS	*woh-woh 1-1*	61		*0.20*		Gray (10YR5/1), moist, soft, SILT with few clay and trace very fine-grained sand, shell fragments and woody fragments. *[Continued from previous page]*	416	
12	24/24 *100%*	SS	*1-1 1-1* N=2	86		*0.50*	22		414	
13	24/24 *100%*	SS	*1-1 2-1* N=3	84		*0.50*	24		412	
14A	22/24 *92%*	SS	*2-3 5-11* N=8	36		*0.50*	26		410	
14B				11			28	Gray (10YR5/1), wet, loose, very fine- to very coarse-grained SAND with some small to medium gravel.		
15A	24/24 *100%*	SS	*3-39 27-62* N=66	83				Gray (10YR5/1), moist, soft, SILT with few clay and trace very fine-grained sand, shell fragments and woody fragments.	408	
15B				16				Gray (10YR5/1), wet, loose, medium- to very coarse-grained SAND.		
							30	Gray (10YR5/1), moist, hard, weathered SHALE.		

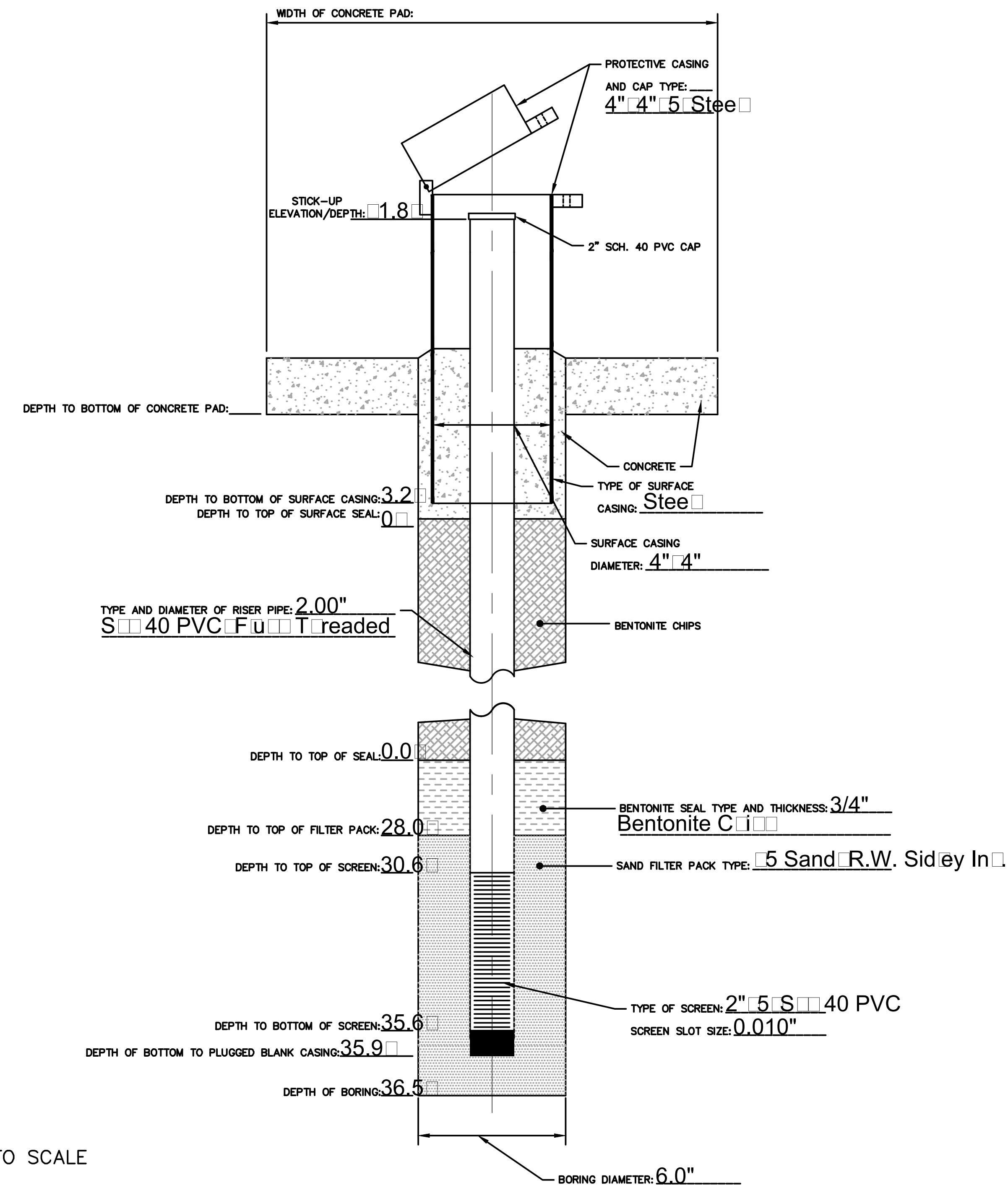
End of boring = 30.00 feet

NOTE(S): AW-11 installed in bore hole.

PRE-2021 PIEZOMETER AND WELL CONSTRUCTION LOGS

Project: Dynegy	Log of Piezometer
Project Location: Pe□in, IL	Sheet 1 of 1
Project Number: 60440202	

Piezometer Location	EDW-P001	Date Installed	11/05/15	Time	5:30 P.M.
Installed By	Jo□□ Ko□n	Observed By	R. We□e□a□	Total Depth	36.5□
Method of Installation	6" Mud Rotary	Drilling Contractor	Strata	Surface Elevation	
Screened Interval	30.6-35.6□	Completion Zone			
Remarks		Groundwater Level(s)	24.64□ro□ to□o□□a□in□		

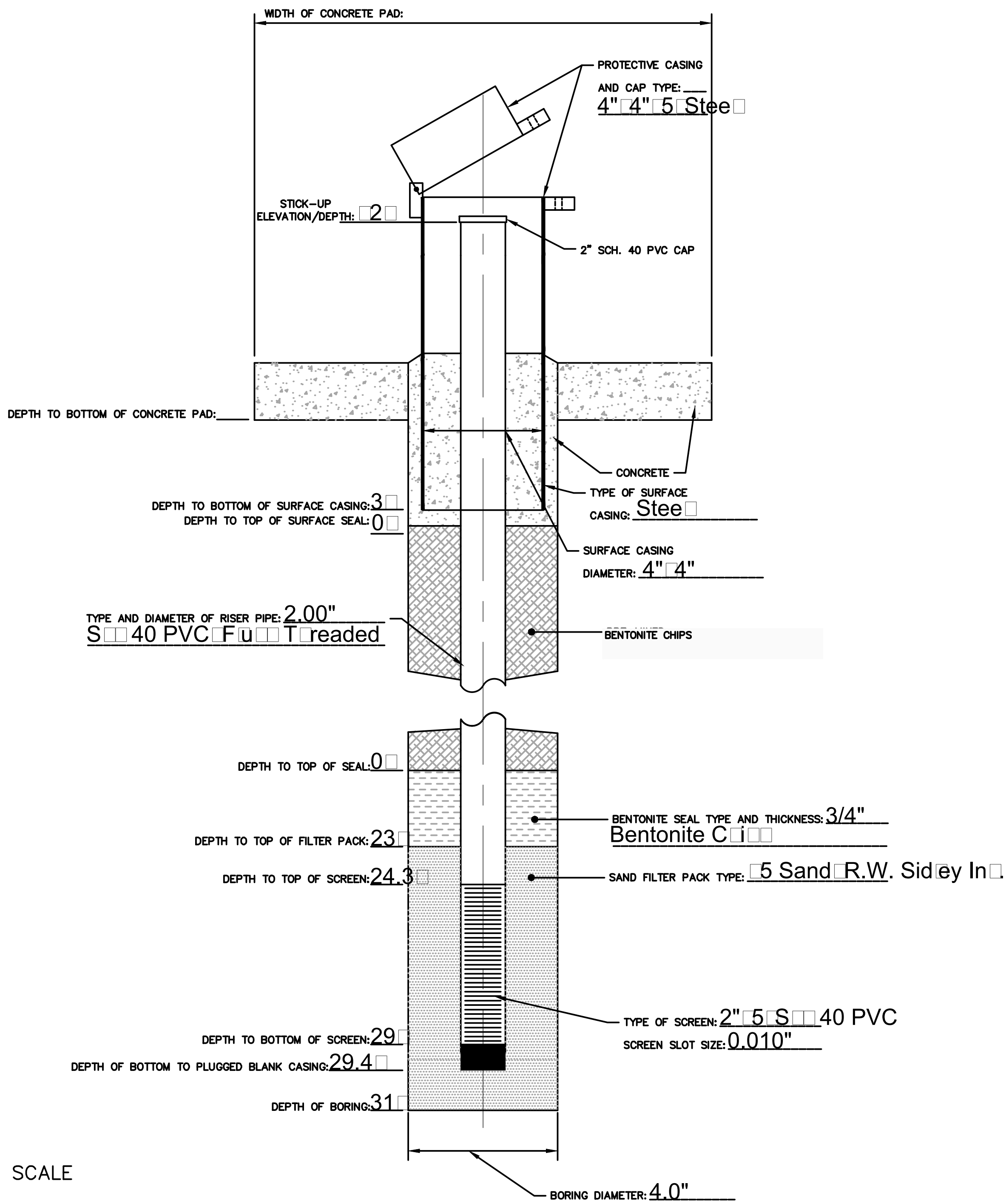


NOT TO SCALE

AECOM

Project: Dynegy	Log of Piezometer
Project Location: Pe□in, IL	
Project Number: 60440202	Sheet 1 of 1

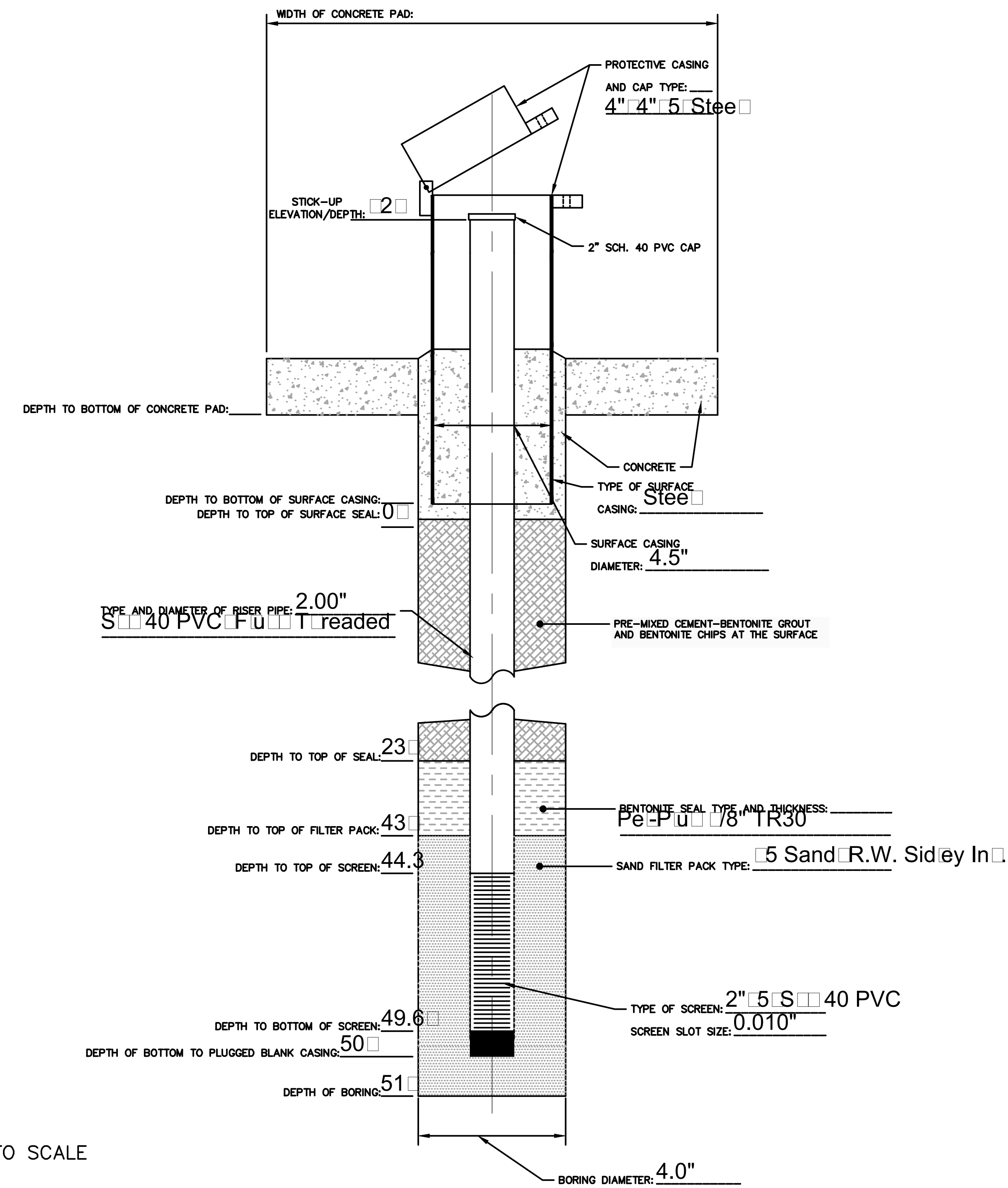
Piezometer Location	EDW-P002	Date Installed	09/04/15	Time	11:00-12:00 P.M.
Installed By	S□ott Ko□en	Observed By	N. Sei□er	Total Depth	31□
Method of Installation	4" Po□er Au□er	Drilling Contractor	Strata	Surface Elevation	
Screened Interval	24-29□	Completion Zone			
Remarks		Groundwater Level(s)	29□A□ter Dri□in□		



NOT TO SCALE

Project: Dynegy Project Location: Pe□in, IL Project Number: 60440202	Log of Piezometer Sheet 1 of 1

Piezometer Location	EDW-P003	Date Installed	09/04/15	Time	3:30-6:00 P.M.
Installed By	S□ott Ko□en	Observed By	N. Sei□er	Total Depth	51□
Method of Installation	3 7/8" Ro□□Bit	Drilling Contractor	Strata	Surface Elevation	
Screened Interval	44.3-49.6□	Completion Zone			
Remarks		Groundwater Level(s)			

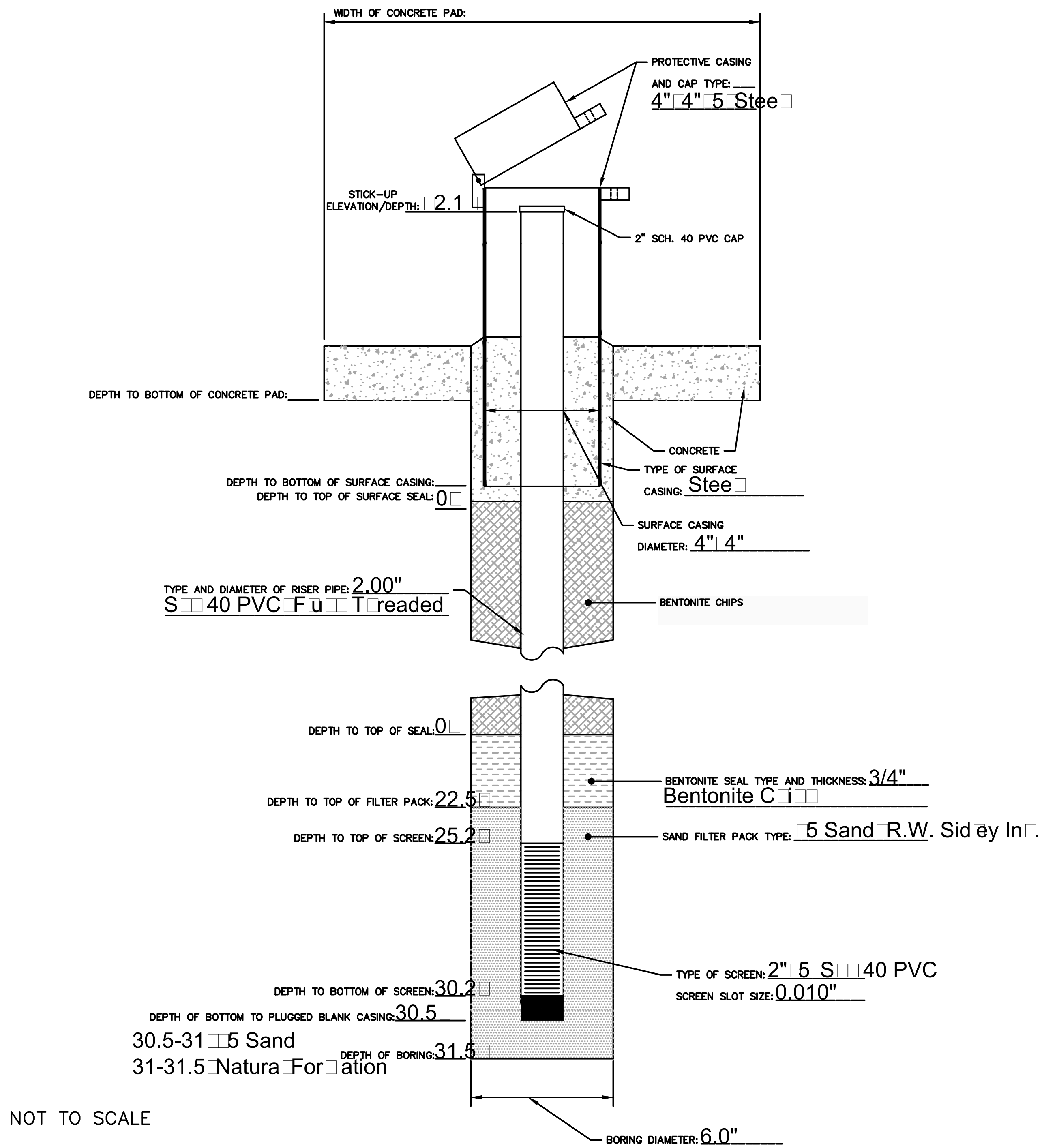


NOT TO SCALE

AECOM

Project: Dynegy	Log of Piezometer
Project Location: Pe□in, IL	
Project Number: 60440202	Sheet 1 of 1

Piezometer Location	EDW-P004	Date Installed	11/04/15	Time	12:00
Installed By	Jo□□ Ko□n	Observed By	R. We□e□a□	Total Depth	31.5□
Method of Installation	6" Mud Rotary	Drilling Contractor	Strata	Surface Elevation	
Screened Interval	25.2-30.2□	Completion Zone			
Remarks		Groundwater Level(s)	14.85 Fro□ To□o□Ca□in□		



Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Peoria Well #: AP05D

Site Name: Edwards Power Station Borehole #: AP05D

State Plane Coordinate: X 2,436,749.2 Y 1,432,401.8 (or) Latitude: 40° 35' 55.667" Longitude: -89° 39' 42.842"

Surveyed By: Andrew D. Canopy IL Registration #: 035-003391

Drilling Contractor: Bulldog Drilling, Inc. Driller: C. Dutton

Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: NX Rock Core Drilling Fluid (Type): Water

Logged By: Rhonald W. Hasenyager Date Started: 11/28/2016 Date Finished: 12/5/2016

Report Form Completed By: Rhonald W. Hasenyager Date: 1/12/2017

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Installation Method: Tremie

Setting Time: +24 hr

Type of Bentonite Seal -- **Granular** (circled) Pellet Slurry (choose one)

Installation Method: Gravity

Setting Time: 15.5 hrs.

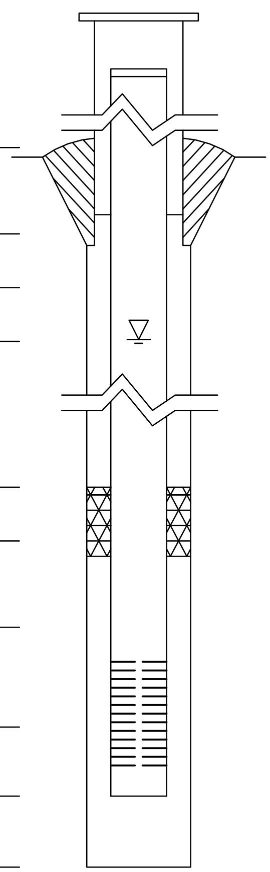
Type of Sand Pack: Quartz sand

Grain Size: 10/20 (sieve size)

Installation Method: Gravity

Type of Backfill Material: Filter sand (if applicable)

Installation Method: Gravity



Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
443.85	-2.62	Top of Protective Casing
443.45	-2.22	Top of Riser Pipe
441.23	0.00	Ground Surface
441.23	0.00	Top of Annular Sealant
427.89	13.34	Static Water Level (After Completion) 1/18/2017
398.03	43.20	Top of Seal
395.83	45.40	Top of Sand Pack
394.14	47.09	Top of Screen
384.54	56.69	Bottom of Screen
384.06	57.17	Bottom of Well
382.93	58.30	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	6.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	5.0
Riser Pipe Length	(feet)	49.32
Bottom of Screen to End Cap	(feet)	0.47
Screen Length (1st slot to last slot)	(feet)	9.60
Total Length of Casing	(feet)	59.39
Screen Slot Size **	(inches)	0.010

**Hand-Slotted Well Screens Are Unacceptable

WELL CONSTRUCTION MATERIALS

(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: Steel
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC	OTHER:
Screen	SS304	SS316	PTFE	PVC	OTHER:

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Peoria Well #: AP05S

Site Name: Edwards Power Station Borehole #: AP05S

State Plane Coordinate: X 2,436,746.6 Y 1,432,405.6 (or) Latitude: 40° 35' 55.705" Longitude: -89° 39' 42.875"

Surveyed By: Andrew D. Canopy IL Registration #: 035-003391

Drilling Contractor: Bulldog Drilling, Inc. Driller: C. Dutton

Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: Hollow Stem Auger Drilling Fluid (Type): ______

Logged By: Rhonald W. Hasenyager Date Started: 11/28/2016 Date Finished: 11/29/2016

Report Form Completed By: Rhonald W. Hasenyager Date: 1/12/2017

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Installation Method: Tremie

Setting Time: +24 hr

Type of Bentonite Seal -- Granular Pellet Slurry (choose one)

Installation Method: Gravity

Setting Time: 55 min.

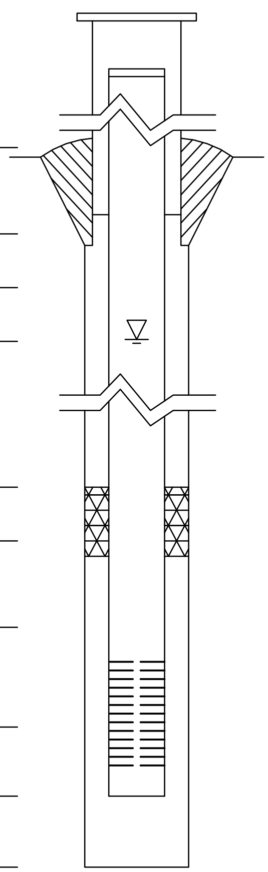
Type of Sand Pack: Quartz sand

Grain Size: 10/20 (sieve size)

Installation Method: Gravity

Type of Backfill Material: n/a (if applicable)

Installation Method: ______



Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
443.92	-2.79	Top of Protective Casing
443.53	-2.40	Top of Riser Pipe
441.13	0.00	Ground Surface
441.13	0.00	Top of Annular Sealant
435.90	5.23	Static Water Level (After Completion) 1/18/2017
411.02	30.11	Top of Seal
409.98	31.15	Top of Sand Pack
408.26	32.87	Top of Screen
403.49	37.64	Bottom of Screen
403.07	38.06	Bottom of Well
403.07	38.06	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	8.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	5.0
Riser Pipe Length	(feet)	35.26
Bottom of Screen to End Cap	(feet)	0.42
Screen Length (1st slot to last slot)	(feet)	4.78
Total Length of Casing	(feet)	40.46
Screen Slot Size **	(inches)	0.010

**Hand-Slotted Well Screens Are Unacceptable

WELL CONSTRUCTION MATERIALS

(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: Steel
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC	OTHER:
Screen	SS304	SS316	PTFE	PVC	OTHER:

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Peoria Well #: AP06

Site Name: Edwards Power Station Borehole #: AP06

State Plane Coordinate: X 2,436,506.2 Y 1,433,216.9 (or) Latitude: 40° 36' 3.736" Longitude: -89° 39' 45.931"

Surveyed By: Andrew D. Canopy IL Registration #: 035-003391

Drilling Contractor: Bulldog Drilling, Inc. Driller: C. Dutton

Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: Hollow Stem Auger Drilling Fluid (Type): ______

Logged By: Scot E. Collins Date Started: 11/30/2016 Date Finished: 11/30/2016

Report Form Completed By: Rhonald W. Hasenyager Date: 1/12/2017

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Installation Method: Tremie

Setting Time: +24 hr

Type of Bentonite Seal -- Granular Pellet Slurry (choose one)

Installation Method: Gravity

Setting Time: 30 min

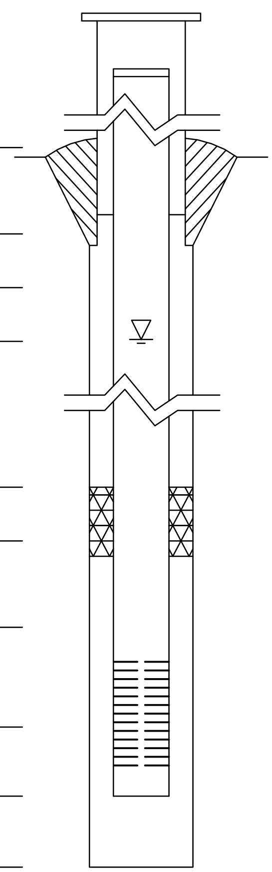
Type of Sand Pack: Quartz sand

Grain Size: 10/20 (sieve size)

Installation Method: Gravity

Type of Backfill Material: n/a (if applicable)

Installation Method: ______



Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
442.35	-2.82	Top of Protective Casing
442.17	-2.64	Top of Riser Pipe
439.53	0.00	Ground Surface
439.53	0.00	Top of Annular Sealant
434.58	4.95	Static Water Level (After Completion) 1/18/2017
422.63	16.90	Top of Seal
421.63	17.90	Top of Sand Pack
419.60	19.93	Top of Screen
414.81	24.72	Bottom of Screen
414.53	25.00	Bottom of Well
414.53	25.00	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	8.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	5.0
Riser Pipe Length	(feet)	22.57
Bottom of Screen to End Cap	(feet)	0.28
Screen Length (1st slot to last slot)	(feet)	4.79
Total Length of Casing	(feet)	27.64
Screen Slot Size **	(inches)	0.010

**Hand-Slotted Well Screens Are Unacceptable

WELL CONSTRUCTION MATERIALS

(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: Steel
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC	OTHER:
Screen	SS304	SS316	PTFE	PVC	OTHER:

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Peoria Well #: AP07D

Site Name: Edwards Power Station Borehole #: AP07D

State Plane Coordinate: X 2,435,355.4 Y 1,432,082.3 (or) Latitude: 40° 35' 52.589" Longitude: -89° 40' 0.934"

Surveyed By: Andrew D. Canopy IL Registration #: 035-003391

Drilling Contractor: Bulldog Drilling, Inc. Driller: C. Dutton

Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: NX Rock Core Drilling Fluid (Type): Water

Logged By: Scot E. Collins Date Started: 12/1/2016 Date Finished: 12/8/2016

Report Form Completed By: Rhonald W. Hasenyager Date: 1/12/2017

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Installation Method: Tremie

Setting Time: +24 hr

Type of Bentonite Seal -- Granular Pellet Slurry (choose one) [Granular selected]

Installation Method: Gravity

Setting Time: 60 min.

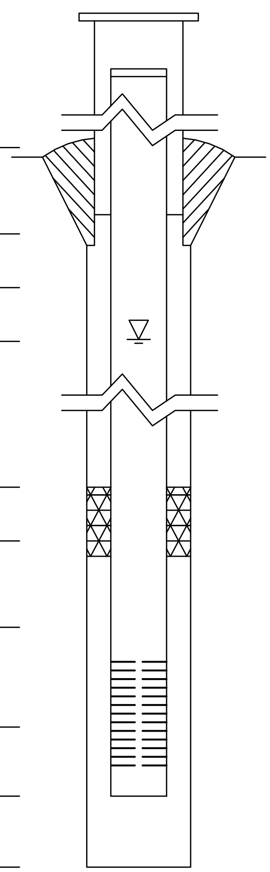
Type of Sand Pack: Quartz sand

Grain Size: 10/20 (sieve size)

Installation Method: Gravity

Type of Backfill Material: n/a (if applicable)

Installation Method: ______



Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
461.22	-2.80	Top of Protective Casing
460.89	-2.47	Top of Riser Pipe
458.42	0.00	Ground Surface
458.42	0.00	Top of Annular Sealant
405.76	52.66	Static Water Level (After Completion) 1/18/2017
418.62	39.80	Top of Seal
405.62	52.80	Top of Sand Pack
403.41	55.01	Top of Screen
393.83	64.59	Bottom of Screen
393.42	65.00	Bottom of Well
393.42	65.00	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	6.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	5.0
Riser Pipe Length	(feet)	57.48
Bottom of Screen to End Cap	(feet)	0.41
Screen Length (1st slot to last slot)	(feet)	9.58
Total Length of Casing	(feet)	67.47
Screen Slot Size **	(inches)	0.010

WELL CONSTRUCTION MATERIALS

(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: Steel
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC (selected)	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC (selected)	OTHER:
Screen	SS304	SS316	PTFE	PVC (selected)	OTHER:

**Hand-Slotted Well Screens Are Unacceptable

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Peoria Well #: AP07S

Site Name: Edwards Power Station Borehole #: AP07S

State Plane Coordinate: X 2,435,357.3 Y 1,432,078.1 (or) Latitude: 40° 35' 52.547" Longitude: -89° 40' 0.909"

Surveyed By: Andrew D. Canopy IL Registration #: 035-003391

Drilling Contractor: Bulldog Drilling, Inc. Driller: C. Dutton

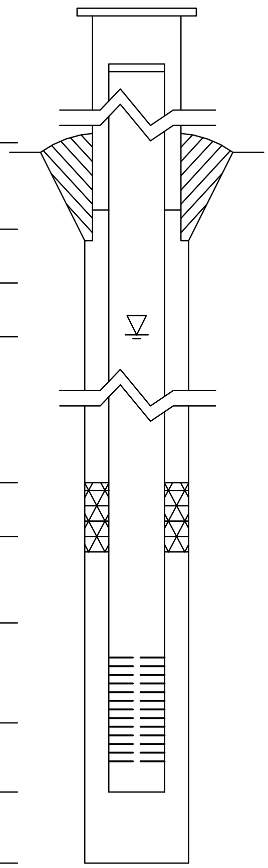
Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: Hollow Stem Auger Drilling Fluid (Type): ______

Logged By: Scot E. Collins Date Started: 12/2/2016 Date Finished: 12/2/2016

Report Form Completed By: Rhonald W. Hasenyager Date: 1/12/2017

ANNULAR SPACE DETAILS



Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Installation Method: Tremie

Setting Time: +24 hr

Type of Bentonite Seal -- Granular Pellet Slurry (choose one) — selected: Granular

Installation Method: Gravity

Setting Time: 33 min.

Type of Sand Pack: Quartz sand

Grain Size: 10/20 (sieve size)

Installation Method: Gravity

Type of Backfill Material: n/a (if applicable)

Installation Method: ______

Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
461.40	-3.09	Top of Protective Casing
461.08	-2.77	Top of Riser Pipe
458.31	0.00	Ground Surface
458.31	0.00	Top of Annular Sealant
433.74	24.57	Static Water Level (After Completion) 1/18/2017
431.41	26.90	Top of Seal
430.31	28.00	Top of Sand Pack
428.36	29.95	Top of Screen
423.57	34.74	Bottom of Screen
423.31	35.00	Bottom of Well
423.31	35.00	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	8.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	5.0
Riser Pipe Length	(feet)	32.72
Bottom of Screen to End Cap	(feet)	0.26
Screen Length (1st slot to last slot)	(feet)	4.79
Total Length of Casing	(feet)	37.77
Screen Slot Size **	(inches)	0.010

**Hand-Slotted Well Screens Are Unacceptable

WELL CONSTRUCTION MATERIALS

(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: Steel
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC (selected)	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC (selected)	OTHER:
Screen	SS304	SS316	PTFE	PVC (selected)	OTHER:

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Peoria Well #: AP08

Site Name: Edwards Power Station Borehole #: AP08

State Plane Coordinate: X 2,434,862.0 Y 1,430,854.3 (or) Latitude: 40° 35' 40.492" Longitude: -89° 40' 7.421"

Surveyed By: Andrew D. Canopy IL Registration #: 035-003391

Drilling Contractor: Bulldog Drilling, Inc. Driller: C. Dutton

Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: Hollow Stem Auger Drilling Fluid (Type): ______

Logged By: Scot E. Collins Date Started: 12/6/2016 Date Finished: 12/6/2016

Report Form Completed By: Rhonald W. Hasenyager Date: 1/12/2017

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite chips

Installation Method: Gravity

Setting Time: +24 hr

Type of Bentonite Seal -- Granular Pellet Slurry (choose one)

Installation Method: ______

Setting Time: ______

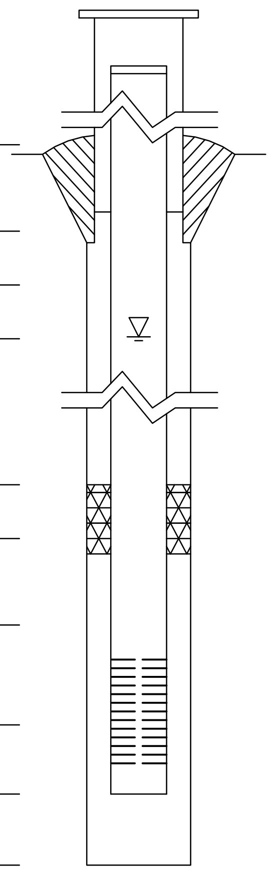
Type of Sand Pack: Quartz sand

Grain Size: 10/20 (sieve size)

Installation Method: Gravity

Type of Backfill Material: n/a (if applicable)

Installation Method: ______



Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
460.97	-2.87	Top of Protective Casing
460.60	-2.50	Top of Riser Pipe
458.10	0.00	Ground Surface
458.10	0.00	Top of Annular Sealant
449.22	8.88	Static Water Level (After Completion) 1/18/2017
n/a	n/a	Top of Seal
450.70	7.40	Top of Sand Pack
448.11	9.99	Top of Screen
438.52	19.58	Bottom of Screen
438.12	19.98	Bottom of Well
438.12	19.98	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	8.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	5.0
Riser Pipe Length	(feet)	12.49
Bottom of Screen to End Cap	(feet)	0.40
Screen Length (1st slot to last slot)	(feet)	9.59
Total Length of Casing	(feet)	22.48
Screen Slot Size **	(inches)	0.010

**Hand-Slotted Well Screens Are Unacceptable

WELL CONSTRUCTION MATERIALS
(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: Steel
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC	OTHER:
Screen	SS304	SS316	PTFE	PVC	OTHER:

Illinois Environmental Protection Agency — Well Completion Report

Site #:
County: Peoria
Well #: AP09

Site Name: Edwards Power Station
Borehole #: AP09

State Plane Coordinate: X 2,435,541.8 Y 1,429,733.2 (or) Latitude: 40° 35' 27.365" Longitude: -89° 39' 58.691"

Surveyed By: Andrew D. Canopy
IL Registration #: 035-003391

Drilling Contractor: Bulldog Drilling, Inc.
Driller: C. Dutton

Consulting Firm: Hanson Professional Services Inc.
Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: Hollow Stem Auger
Drilling Fluid (Type):

Logged By: Scot E. Collins
Date Started: 12/6/2016 Date Finished: 12/7/2016

Report Form Completed By: Rhonald W. Hasenyager
Date: 1/12/2017

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite chips

Installation Method: Tremie

Setting Time: +24 hr

Type of Bentonite Seal -- Granular Pellet Slurry (choose one)

Installation Method:

Setting Time:

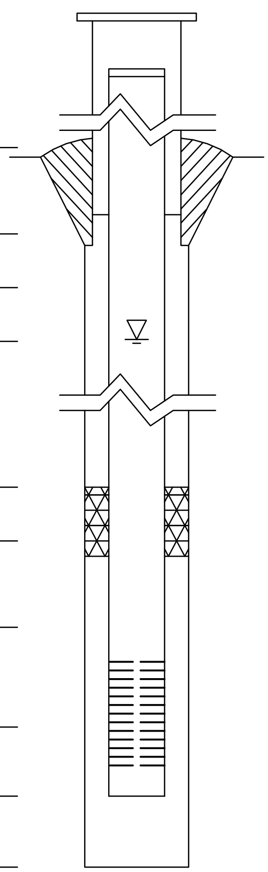
Type of Sand Pack: Quartz sand

Grain Size: 10/20 (sieve size)

Installation Method: Gravity

Type of Backfill Material: n/a (if applicable)

Installation Method:



Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
460.58	-3.34	Top of Protective Casing
460.22	-2.98	Top of Riser Pipe
457.24	0.00	Ground Surface
457.24	0.00	Top of Annular Sealant
449.04	8.20	Static Water Level (After Completion) 1/18/2017
n/a	n/a	Top of Seal
450.14	7.10	Top of Sand Pack
447.45	9.79	Top of Screen
437.85	19.39	Bottom of Screen
437.44	19.80	Bottom of Well
437.44	19.80	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	8.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	5.0
Riser Pipe Length	(feet)	12.77
Bottom of Screen to End Cap	(feet)	0.41
Screen Length (1st slot to last slot)	(feet)	9.60
Total Length of Casing	(feet)	22.78
Screen Slot Size **	(inches)	0.010

**Hand-Slotted Well Screens Are Unacceptable

WELL CONSTRUCTION MATERIALS
(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: Steel
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC	OTHER:
Screen	SS304	SS316	PTFE	PVC	OTHER:

Surface Elevation: 438.02

Datum: msl

Completion Date: 7/27/10

Northing: 1432880.82

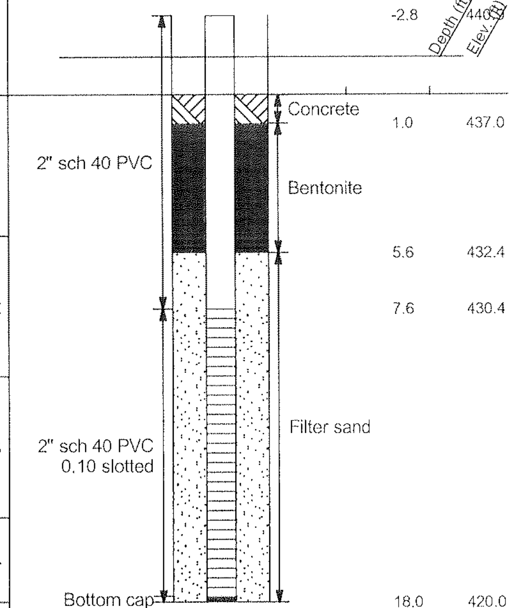
Easting: 2435852.39

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
0–7.6	FILL			GB1
				GB2
7.6–18	Brown, silty CLAY - CL			GB2
10 ▽				GB3
				GB4
18–18.5	Shaley LIMESTONE		10-0-0	SS5
	Auger refusal at 18.5 feet.			

WELL DIAGRAM

Stickup

Diameter: 6 inches



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 10 FEET ▽

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

PH DRILLER JPC LOGGER

CME 550X DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: KSA	Checked by: DTK	App'vd. by: RSP
Date: 8/13/10	Date: 2/17/11	Date: 2/17/11

GEOTECHNOLOGY INC

FROM THE GROUND UP

Ameren Power Plant
Edwards, Illinois

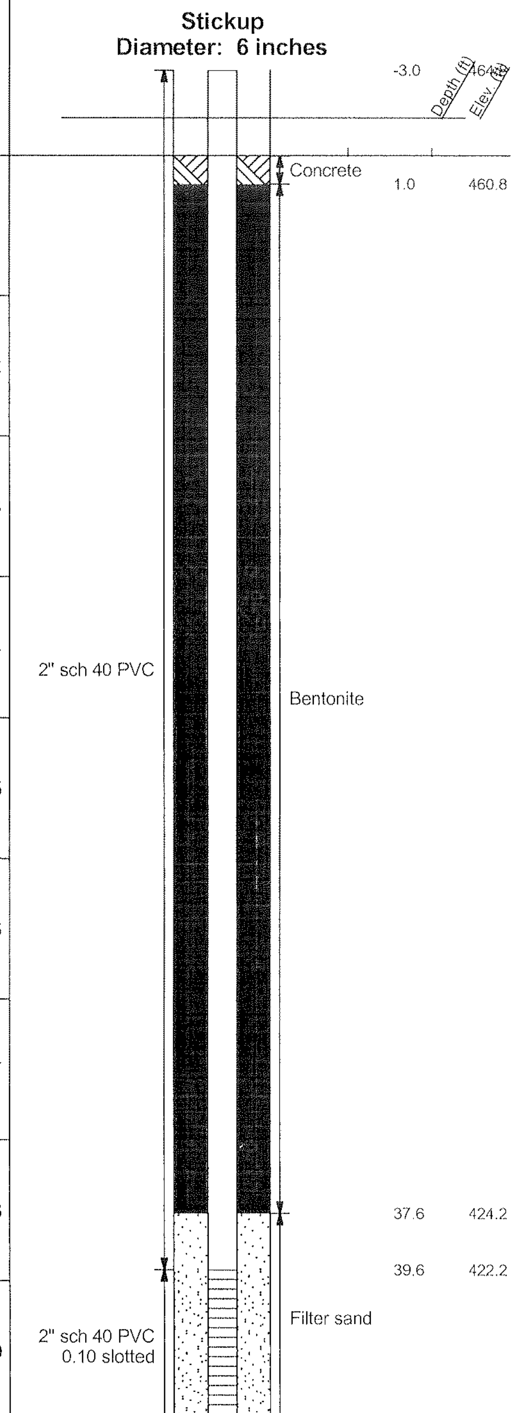
LOG OF BORING: APW-1

Project No. J017150.01

Surface Elevation: 461.80 Datum msl	Completion Date: 7/20/10 Northing: 1430732.11 Easting: 243579.28

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
0	FILL: ash			GB1
5	Black, silty CLAY - CL			GB2
10				GB3
15				GB4
20				GB5
25	Gray, silty CLAY - CL			GB6
30				GB7
35	▽			GB8
40				GB9

WELL DIAGRAM



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 38 FEET ▽

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM ___ FEET
PH DRILLER JPC LOGGER
CME 550X DRILL RIG
HAMMER TYPE Auto

REMARKS:

Drawn by: KSA	Checked by: DTK	App'vd. by: RBP
Date: 8/13/10	Date: 2/17/11	Date: 2/17/11

GEOTECHNOLOGY INC
FROM THE GROUND UP

Ameren Power Plant
Edwards, Illinois

LOG OF BORING: APW-2

Project No. J017150.01

Surface Elevation: 461.80

Datum msl

Completion Date: 7/20/10

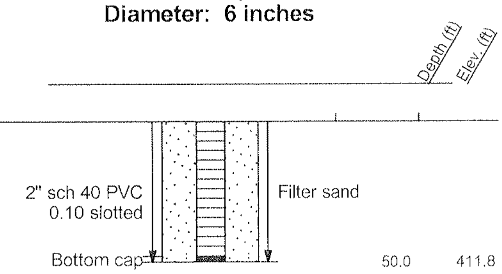
Northing: 1430732.11

Easting: 243579.28

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
	Gray, silty CLAY - CL *(continued)*			GB10
50	Boring terminated at 50 feet.			
55				
60				
65				
70				
75				
80				
85				

WELL DIAGRAM

Stickup
Diameter: 6 inches



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 38 FEET ∇

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM ___ FEET

PH DRILLER JPC LOGGER

CME 550X DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: KSA	Checked by: DTK	App'vd. by: KSP
Date: 8/13/10	Date: 2/17/11	Date: 2/17/11

GEOTECHNOLOGY INC
FROM THE GROUND UP

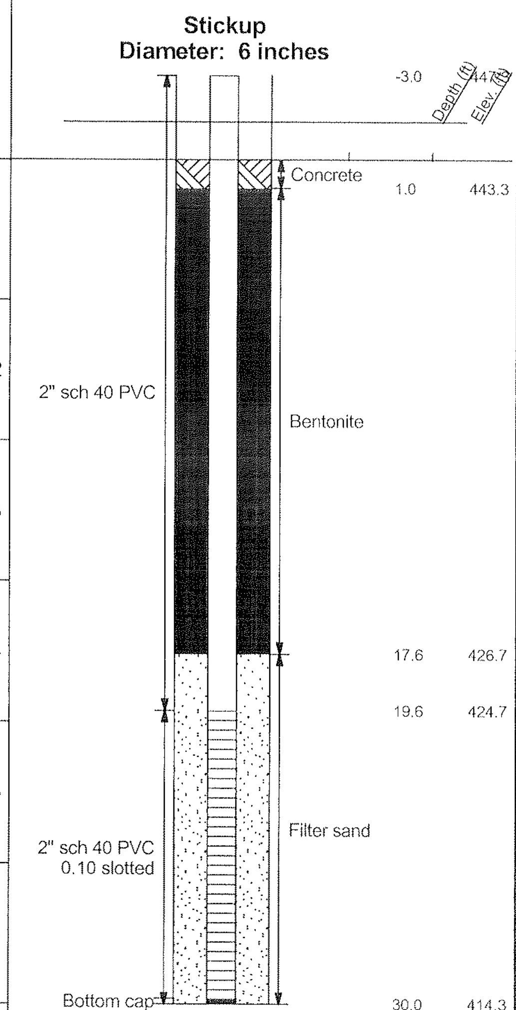
Ameren Power Plant
Edwards, Illinois

CONTINUATION OF
LOG OF BORING: APW-2

Project No. J017150.01

Surface Elevation: 444.26 Datum msl	Completion Date: 7/19/10 Northing 1429652.72 Easting 2436225.53	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
DEPTH IN FEET	DESCRIPTION OF MATERIAL			
0–12.5	Black COAL and ash			GB1, GB2, GB3
12.5–30	Gray and brown, silty CLAY - CL			GB3, GB4, GB5, GB6
30	Boring terminated at 30 feet.			

WELL DIAGRAM



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 17 FEET ∇

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

PH DRILLER JPC LOGGER

CME 550X DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: KSA	Checked by: DTK	App'vd. by: RBI
Date: 8/13/10	Date: 2/17/11	Date: 2/17/11

GEOTECHNOLOGY INC
FROM THE GROUND UP

Ameren Power Plant
Edwards, Illinois

LOG OF BORING: APW-3

Project No. J017150.01

LOG OF BORING 2002 WL J017150.01 - EDWARDS.GPJ GTINC 0638301.GPJ 12/13/10

Surface Elevation: 473.30

Datum msl

Completion Date: 7/27/10

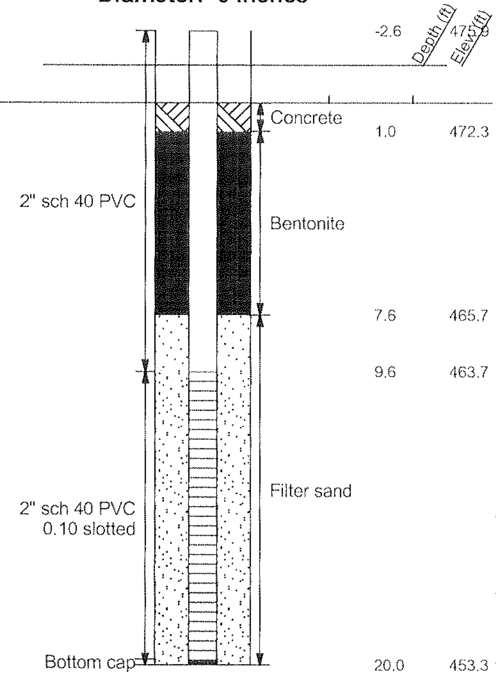
Northing 1428432.43

Easting 2436265.52

WELL DIAGRAM

Stickup
Diameter: 6 inches

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
	FILL			GB1
	GRAVEL			GB2
5				GB3
	Brown, silty CLAY, trace gravel - CL			
10				GB4
15				GB5
20	Boring terminated at 20 feet.			
25				
30				
35				
40				



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 7.5 FEET ⊻

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

PH DRILLER JPC LOGGER

CME 550X DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: KSA	Checked by: DTK	App'vd. by: RBP
Date: 8/13/10	Date: 2/17/11	Date: 2/17/11

GEOTECHNOLOGY INC
FROM THE GROUND UP

Ameren Power Plant
Edwards, Illinois

LOG OF BORING: APW-4

Project No. J017150.01

LOG OF BORING 2002 WL J017150.01 - EDWARDS.GPJ GTINC 0638301.GPJ 12/13/10

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Peoria County Well #: AW-05

Site Name: Edwards Power Station Borehole #: AW-05

State Plane Coordinate: X 2,435,498.0 Y 1,432,339.7 (or) Latitude: ______ Longitude: ______

Surveyed By: Gary C. Rogers IL Registration #: 035-002957

Drilling Contractor: Ramsey Geotechnical Engineering, LLC Driller: B. Williamson

Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: Hollow Stem Auger Drilling Fluid (Type): None

Logged By: Suzanna L. Keim Date Started: 7/22/2015 Date Finished: 7/22/2015

Report Form Completed By: Suzanna L. Keim Date: 7/24/2015

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: High-solids bentonite

Installation Method: Tremie

Setting Time: >48 hours

Type of Bentonite Seal -- Granular Pellet Slurry (choose one)

Installation Method: Gravity

Setting Time: 30 minutes

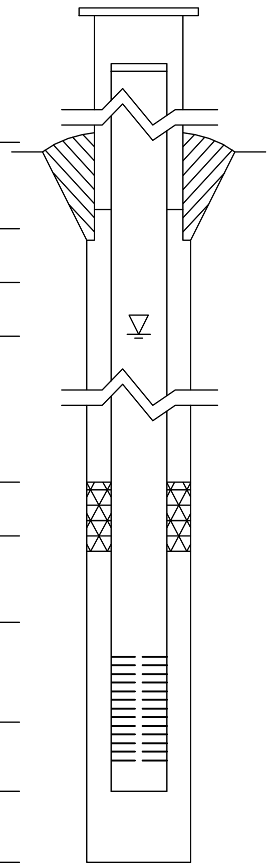
Type of Sand Pack: Quartz Sand

Grain Size: 10-20 (sieve size)

Installation Method: Gravity

Type of Backfill Material: n/a (if applicable)

Installation Method: ______



Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
443.55	-3.00	Top of Protective Casing
443.37	-2.82	Top of Riser Pipe
440.55	0.00	Ground Surface
438.05	2.50	Top of Annular Sealant
431.39	9.16	Static Water Level (After Completion) 9/23/2015
428.55	12.00	Top of Seal
426.35	14.20	Top of Sand Pack
424.68	15.87	Top of Screen
420.08	20.47	Bottom of Screen
419.45	21.10	Bottom of Well
419.45	21.10	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	8.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	5.0
Riser Pipe Length	(feet)	18.69
Bottom of Screen to End Cap	(feet)	0.63
Screen Length (1st slot to last slot)	(feet)	4.60
Total Length of Casing	(feet)	23.92
Screen Slot Size **	(inches)	0.010

WELL CONSTRUCTION MATERIALS
(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: Steel
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC	OTHER:
Screen	SS304	SS316	PTFE	PVC	OTHER:

Well Completion Form (revised 02/06/02)

**Hand-Slotted Well Screens Are Unacceptable

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Peoria County Well #: AW-06

Site Name: Edwards Power Station Borehole #: AW-06

State Plane Coordinate: X 2,434,495.3 Y 1,430,727.7 (or) Latitude: ______ Longitude: ______

Surveyed By: Gary C. Rogers IL Registration #: 035-002957

Drilling Contractor: Ramsey Geotechnical Engineering, LLC Driller: B. Williamson

Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: Hollow Stem Auger Drilling Fluid (Type): None

Logged By: Suzanna L. Keim Date Started: 7/29/2015 Date Finished: 8/3/2015

Report Form Completed By: Suzanna L. Keim Date: 8/5/2015

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: High-solids bentonite

Installation Method: Tremie

Setting Time: >48 hours

Type of Bentonite Seal -- Granular Pellet Slurry (choose one) [Granular circled]

Installation Method: Gravity

Setting Time: 1 hour

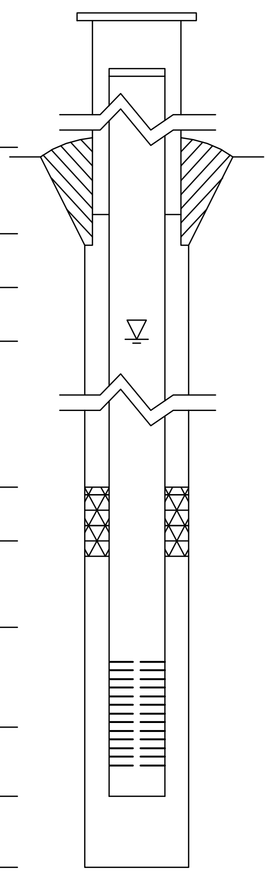
Type of Sand Pack: Quartz Sand

Grain Size: 10-20 (sieve size)

Installation Method: Gravity

Type of Backfill Material: Slough (if applicable)

Installation Method: Cave-in



Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
461.79	-2.60	Top of Protective Casing
461.57	-2.38	Top of Riser Pipe
459.19	0.00	Ground Surface
457.19	2.00	Top of Annular Sealant
432.88	26.31	Static Water Level (After Completion) 9/22/2015
426.89	32.30	Top of Seal
424.69	34.50	Top of Sand Pack
422.59	36.60	Top of Screen
418.10	41.09	Bottom of Screen
417.50	41.69	Bottom of Well
416.94	42.25	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	6.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	5.0
Riser Pipe Length	(feet)	38.98
Bottom of Screen to End Cap	(feet)	0.60
Screen Length (1st slot to last slot)	(feet)	4.49
Total Length of Casing	(feet)	44.07
Screen Slot Size **	(inches)	0.010

WELL CONSTRUCTION MATERIALS

(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: Steel
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC	OTHER:
Screen	SS304	SS316	PTFE	PVC	OTHER:

**Hand-Slotted Well Screens Are Unacceptable

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Peoria County Well #: AW-08

Site Name: Edwards Power Station Borehole #: AW-08

State Plane Coordinate: X 2,436,732.7 Y 1,430,641.2 (or) Latitude: ______ Longitude: ______

Surveyed By: Gary C. Rogers IL Registration #: 035-002957

Drilling Contractor: Ramsey Geotechnical Engineering, LLC Driller: B. Williamson

Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: Hollow Stem Auger Drilling Fluid (Type): None

Logged By: Suzanna L. Keim Date Started: 7/20/2015 Date Finished: 7/21/2015

Report Form Completed By: Suzanna L. Keim Date: 7/24/2015

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: High-solids bentonite

Installation Method: Tremie

Setting Time: >48 hours

Type of Bentonite Seal -- Granular Pellet Slurry (choose one) [Granular circled]

Installation Method: Gravity

Setting Time: 30 minutes

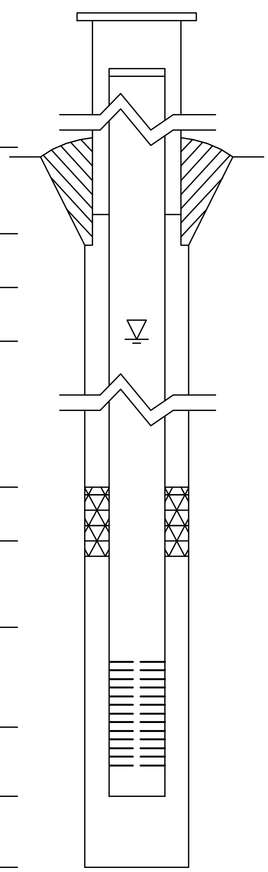
Type of Sand Pack: Quartz Sand

Grain Size: 10-20 (sieve size)

Installation Method: Gravity

Type of Backfill Material: n/a (if applicable)

Installation Method: ______



Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
462.72	-2.06	Top of Protective Casing
462.54	-1.88	Top of Riser Pipe
460.66	0.00	Ground Surface
458.66	2.00	Top of Annular Sealant
441.09	19.57	Static Water Level (After Completion) 9/21/2015
416.16	44.50	Top of Seal
415.16	45.50	Top of Sand Pack
413.11	47.55	Top of Screen
403.47	57.19	Bottom of Screen
402.99	57.67	Bottom of Well
402.99	57.67	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	8.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	5.0
Riser Pipe Length	(feet)	49.43
Bottom of Screen to End Cap	(feet)	0.48
Screen Length (1st slot to last slot)	(feet)	9.64
Total Length of Casing	(feet)	59.55
Screen Slot Size **	(inches)	0.010

**Hand-Slotted Well Screens Are Unacceptable

WELL CONSTRUCTION MATERIALS

(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: Steel
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC (circled)	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC (circled)	OTHER:
Screen	SS304	SS316	PTFE	PVC (circled)	OTHER:

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Peoria County Well #: AW-09

Site Name: Edwards Power Station Borehole #: AW-09

State Plane Coordinate: X 2,434,857.0 Y 1,429,340.1 (or) Latitude: ______ Longitude: ______

Surveyed By: Gary C. Rogers IL Registration #: 035-002957

Drilling Contractor: Ramsey Geotechnical Engineering, LLC Driller: B. Williamson

Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: Hollow Stem Auger Drilling Fluid (Type): None

Logged By: Suzanna L. Keim Date Started: 7/29/2015 Date Finished: 8/3/2015

Report Form Completed By: Suzanna L. Keim Date: 8/7/2015

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: High-solids bentonite

Installation Method: Tremie

Setting Time: >24 hours

Type of Bentonite Seal -- Granular (circled) Pellet Slurry (choose one)

Installation Method: Gravity

Setting Time: 30 minutes

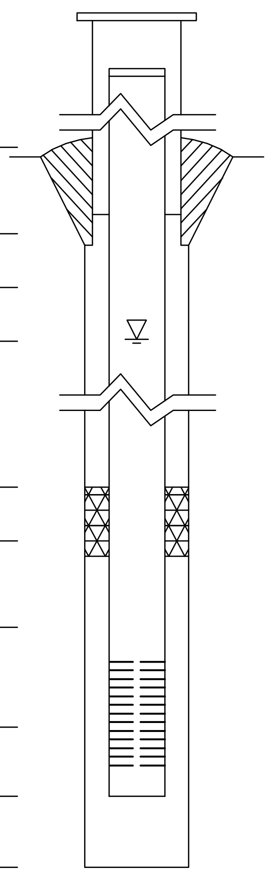
Type of Sand Pack: Quartz Sand

Grain Size: 10-20 (sieve size)

Installation Method: Gravity

Type of Backfill Material: n/a (if applicable)

Installation Method: ______



Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
461.65	-3.33	Top of Protective Casing
461.45	-3.13	Top of Riser Pipe
458.32	0.00	Ground Surface
455.82	2.50	Top of Annular Sealant
432.22	26.10	Static Water Level (After Completion) 9/23/2015
415.12	43.20	Top of Seal
413.22	45.10	Top of Sand Pack
411.18	47.14	Top of Screen
406.70	51.62	Bottom of Screen
406.09	52.23	Bottom of Well
406.09	52.23	Bottom of Borehole

* Referenced to a National Geodetic Datum

WELL CONSTRUCTION MATERIALS

(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: Steel
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC	OTHER:
Screen	SS304	SS316	PTFE	PVC	OTHER:

CASING MEASUREMENTS

Diameter of Borehole	(inches)	6.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	5.0
Riser Pipe Length	(feet)	50.27
Bottom of Screen to End Cap	(feet)	0.61
Screen Length (1st slot to last slot)	(feet)	4.48
Total Length of Casing	(feet)	55.36
Screen Slot Size **	(inches)	0.010

**Hand-Slotted Well Screens Are Unacceptable

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Peoria County Well #: AW-10

Site Name: Edwards Power Station Borehole #: AW-10

State Plane Coordinate: X 2,436,231.4 Y 1,429,461.1 (or) Latitude: ______ Longitude: ______

Surveyed By: Gary C. Rogers IL Registration #: 035-002957

Drilling Contractor: Ramsey Geotechnical Engineering, LLC Driller: B. Williamson

Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: Hollow Stem Auger Drilling Fluid (Type): None

Logged By: Suzanna L. Keim Date Started: 7/23/2015 Date Finished: 7/23/2015

Report Form Completed By: Suzanna L. Keim Date: 7/24/2015

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: High-solids bentonite

Installation Method: Tremie

Setting Time: >48 hours

Type of Bentonite Seal -- Granular Pellet Slurry (choose one)

Installation Method: Gravity

Setting Time: 30 minutes

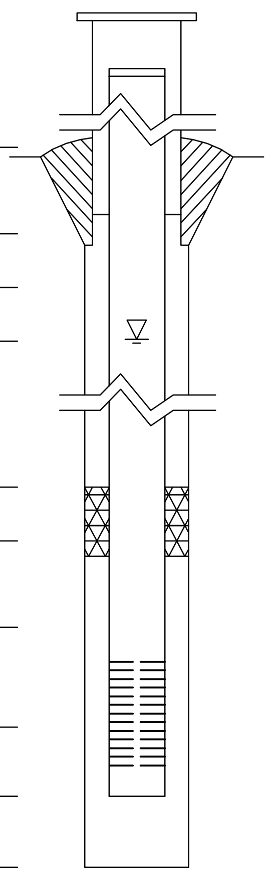
Type of Sand Pack: Quartz Sand

Grain Size: 10-20 (sieve size)

Installation Method: Gravity

Type of Backfill Material: n/a (if applicable)

Installation Method: ______



Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
440.16	-2.52	Top of Protective Casing
439.93	-2.29	Top of Riser Pipe
437.64	0.00	Ground Surface
434.64	3.00	Top of Annular Sealant
436.64	1.00	Static Water Level (After Completion) 9/22/2015
412.14	25.50	Top of Seal
411.49	26.15	Top of Sand Pack
410.02	27.62	Top of Screen
405.41	32.23	Bottom of Screen
404.90	32.74	Bottom of Well
404.90	32.74	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	8.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	5.0
Riser Pipe Length	(feet)	29.91
Bottom of Screen to End Cap	(feet)	0.51
Screen Length (1st slot to last slot)	(feet)	4.61
Total Length of Casing	(feet)	35.03
Screen Slot Size **	(inches)	0.010

**Hand-Slotted Well Screens Are Unacceptable

WELL CONSTRUCTION MATERIALS

(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: Steel
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC	OTHER:
Screen	SS304	SS316	PTFE	PVC	OTHER:

Illinois Environmental Protection Agency — Well Completion Report

Site #:

County: Peoria County

Well #: AW-11

Site Name: Edwards Power Station

Borehole #: AW-11

State Plane Coordinate: X 2,436,251.1 Y 1,428,196.3 (or) Latitude: ____ ____ ____ Longitude: ____ ____ ____

Surveyed By: Gary C. Rogers

IL Registration #: 035-002957

Drilling Contractor: Ramsey Geotechnical Engineering, LLC

Driller: B. Williamson

Consulting Firm: Hanson Professional Services Inc.

Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: Hollow Stem Auger

Drilling Fluid (Type): None

Logged By: Rhonald W. Hasenyager

Date Started: 7/24/2015

Date Finished: 7/28/2015

Report Form Completed By: Suzanna L. Keim

Date: 7/28/2015

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: High-solids bentonite

Installation Method: Tremie

Setting Time: >48 hours

Type of Bentonite Seal -- Granular Pellet Slurry (choose one)

Installation Method: Gravity

Setting Time: 30 minutes

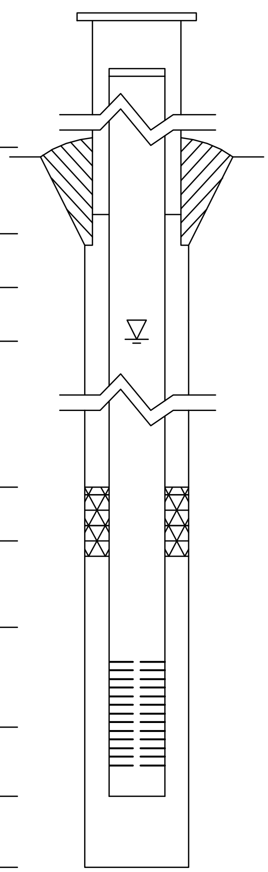
Type of Sand Pack: Quartz Sand

Grain Size: 10-20 (sieve size)

Installation Method: Gravity

Type of Backfill Material: Quartz sand (if applicable)

Installation Method: Gravity



Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
440.08	-2.92	Top of Protective Casing
439.87	-2.71	Top of Riser Pipe
437.16	0.00	Ground Surface
435.16	2.00	Top of Annular Sealant
404.91	32.25	Static Water Level (After Completion) 9/21/2015
416.56	20.60	Top of Seal
414.81	22.35	Top of Sand Pack
412.95	24.21	Top of Screen
408.35	28.81	Bottom of Screen
407.85	29.31	Bottom of Well
407.16	30.00	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	8.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	5.0
Riser Pipe Length	(feet)	26.92
Bottom of Screen to End Cap	(feet)	0.50
Screen Length (1st slot to last slot)	(feet)	4.60
Total Length of Casing	(feet)	32.02
Screen Slot Size **	(inches)	0.010

**Hand-Slotted Well Screens Are Unacceptable

WELL CONSTRUCTION MATERIALS

(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: Steel
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC	OTHER:
Screen	SS304	SS316	PTFE	PVC	OTHER:

APPENDIX D
GEOTECHNICAL LABORATORY REPORTS

TERRACON GEOTECHNICAL LABORATORY REPORTS

March 5, 2021
Revised: May 10, 2021

Mr. Scott Woods
Ramboll Environ U.S. Corporation
333 West Wacker Drive, Ste 2700
Chicago, IL 60606-2872

RE: Laboratory Testing Program for the Edwards Power Station Project – Terracon Project No. 11215017

Dear Mr. Woods,

We are pleased to submit our report pertaining to geotechnical laboratory testing of soil samples in reference to the Edwards Power Station Project. As instructed, Terracon performed the following tests on samples selected by Ramboll:

- Specific Gravity of Soils – ASTM D854
- Water Content of Soil and Rock – ASTM D2216
- Liquid Limit, Plastic Limit and Plasticity Index of Soils – ASTM D4318
- Hydraulic Conductivity of Saturated Porous Materials Using a Flexible-Wall Permeameter – ASTM D5084
- Laboratory Determination of Density (Unit Weight) of Soil Specimens – ASTM D7263
- Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis – ASTM D6913
- Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis – ASTM D7928

The test data included in this report, only represent the samples tested and may not reflect actual site materials and/or conditions. The scope of services provided by Terracon did not include interpretation of the laboratory test data, and therefore, we are not liable for any interpretation performed by others. If you wish us to provide you with this service, we would be happy to discuss this matter with you at your convenience. Any reproduction of this report must be done in its entirety.

We are pleased to have the opportunity to provide you with our testing services. Should you have any questions, or require additional assistance, please feel free to contact us at any time.

Sincerely,
Terracon Consultants, Inc.

William P. Quinn
Department Manager – Laboratory Services

LABORATORY TESTING SUMMARY

PROJECT NAME: Edwards Power Station PROJECT NUMBER: 11215017 CLIENT: Confidential

Boring Number	Sample Number	Depth	Description	USCS	WC %	Dry Density (pcf)	% Gravel	% Sand	% Silt	% Clay	LL	PL	PI	Permeability k (cm/sec)	Specific Gravity
AW-13A	0850	5.0'-7.0'	LIGHT BROWN AND GRAY SANDY LEAN CLAY	CL	25.2	96.5	0.0	30.3	42.4	27.3	30	14	16	4.72E-08	2.661
AW-15	1025	20.0'-22.0'	GRAY FAT CLAY	CH	27.9	85.8	0.0	2.0	43.8	54.2	57	19	38	2.87E-08	2.694
AW-20	0810	15.0'-17.0'	GRAY AND DARK GRAY LEAN CLAY - SAND POCKETS NOTED	CL	35.1	83.9	0.0	7.8	41.3	50.9	47	18	29	7.23E-08	2.690
AW-22	0745	30.0'-32.0'	GRAY, LIGHT GRAY AND LIGHT BROWN CLAYEY SAND	SC	23.2	101.3	0.0	57.4	27.3	15.3	22	13	9	1.74E-07	2.700
XPW-01	1210	20.0'-22.0'	DARK GRAY SILTY SAND	SM	43.7	69.8	0.0	68.9	27.2	3.9	51	53	NP	1.18E-05	2.381
XPW-01A	1530	41.0'-41.5'	DARK GRAY ELASTIC SILT	MH	35.1	71.7	0.0	13.7	64.4	21.9	60	43	17	6.77E-06	2.378
XPW-02	0845	10.0'-12.0'	DARK GRAY AND GRAYISH BROWN ELASTIC SILT WITH SAND	MH	45.1	67.5	0.5	28.1	54.6	16.8	52	47	5	1.20E-05	2.414
XPW-02	0950	22.0'-24.0'	DARK GRAY SILT	ML	33.4	77.1	0.0	4.1	84.0	11.9	38	30	8	2.08E-06	2.335
XPW-02	1245	45.0'-47.0'	GRAYISH BROWN SANDY SILT	ML	41.7	73.5	0.1	37.4	49.7	12.8	39	33	6	1.00E-05	2.397
XPW-03	1500	10.0'-12.0'	DARK GRAY SILT WITH SAND - ROOTS NOTED	ML	43.8	68.0	0.4	27.2	51.3	21.1	36	29	7	3.29E-05	2.388

Terracon

Specific Gravity of Soils
ASTM D854

Terracon
Consulting Engineers & Scientists

SPECIFIC GRAVITY OF SOIL SOLIDS
ASTM D-854
AASHTO T 100

Laboratory Services Group 192 Exchange Blvd. Glendale Heights, Illinois 60139 Ph. (630) 717-4263

Project Number: 11215017
Project Name: Edwards Power Station
Test Date: 3/1/2021

Results Summary

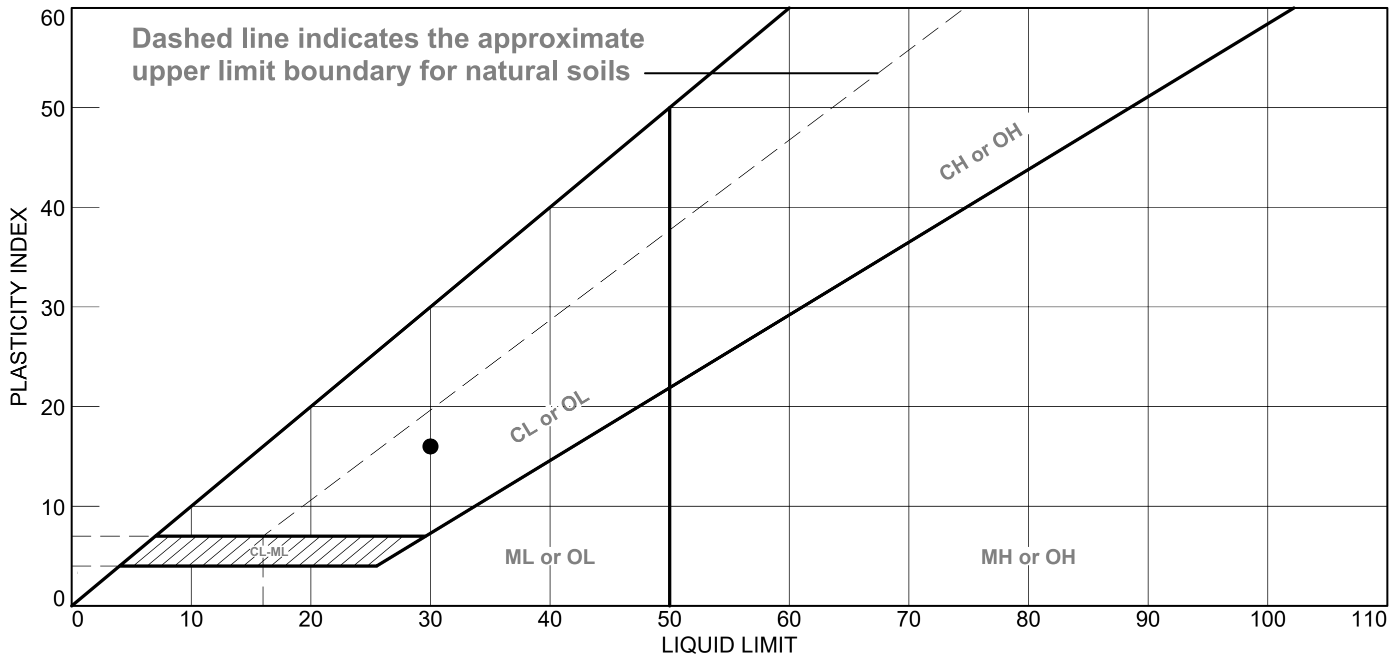
Boring / Sample	Sample Number	Depth (ft)		Specific Gravity (Gs)
AW-13A	0850	5.0'-7.0'		2.661
AW-15	1025	20.0'-22.0'		2.694
AW-20	0810	15.0'-17.0'		2.690
AW-22	0745	30.0'-32.0'		2.700
XPW-01	1210	20.0'-22.0'		2.381
XPW-01A	1530	41.0'-41.5'		2.378
XPW-02	0845	10.0'-12.0'		2.414
XPW-02	0950	22.0'-24.0'		2.335
XPW-02	1245	45.0'-47.0'		2.397
XPW-03	1500	10.0'-12.0'		2.388

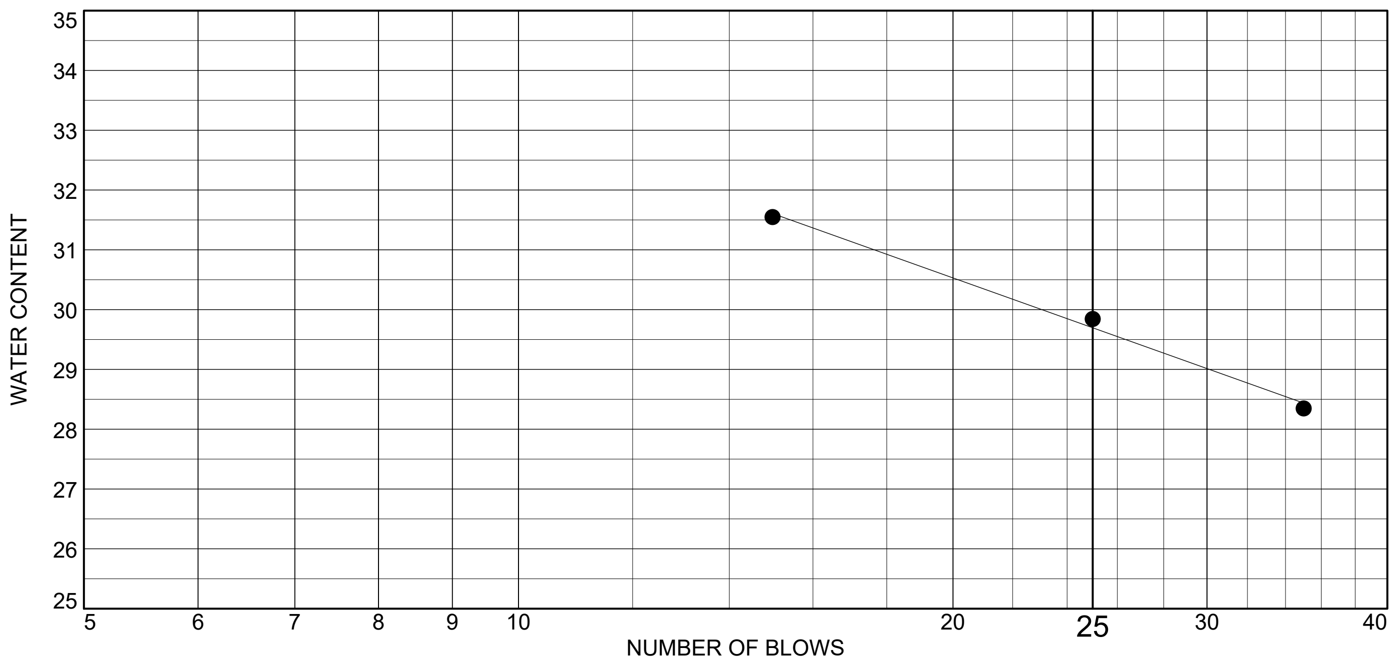
Tested By: SJH Checked By: WPQ

Terracon

Liquid Limit, Plastic Limit and Plasticity Index of Soils
ASTM D4318

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	LIGHT BROWN AND GRAY SANDY LEAN CLAY	30	14	16	99.3	69.7	CL

Project No. 11215017 **Client:** CONFIDENTIAL

Project: EDWARDS POWER STATION

Source of Sample: AW-13A **Depth:** 5.0'-7.0'
Sample Number: 0850

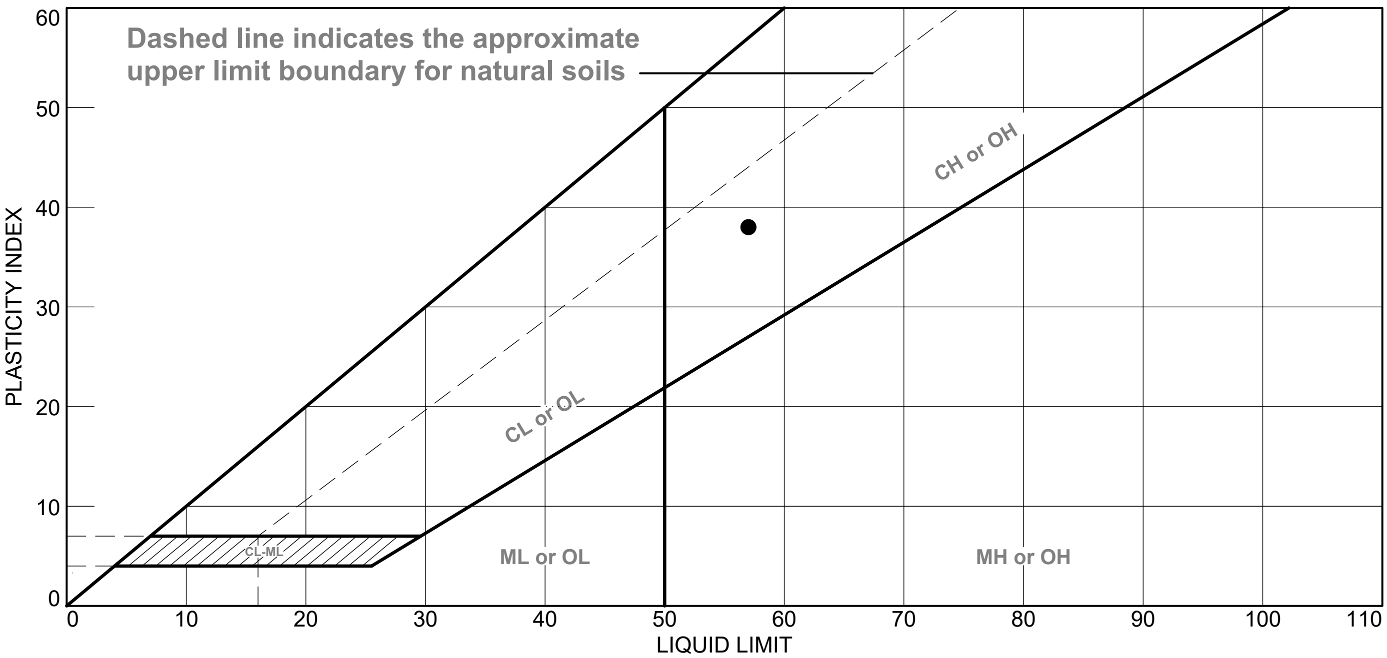
Terracon

Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	GRAY FAT CLAY	57	19	38	99.5	98.0	CH

Project No. 11215017 **Client:** CONFIDENTIAL

Project: EDWARDS POWER STATION

Source of Sample: AW-15 **Depth:** 20.0'-22.0'
Sample Number: 1025

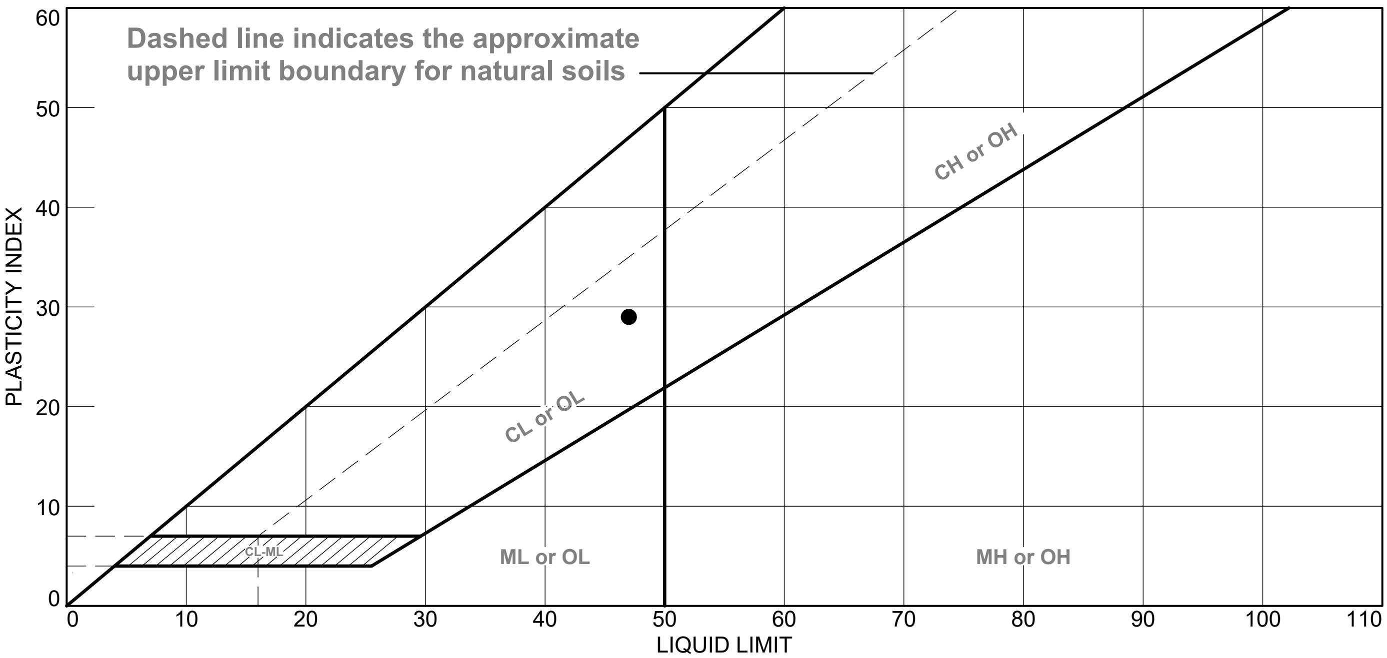
Terracon

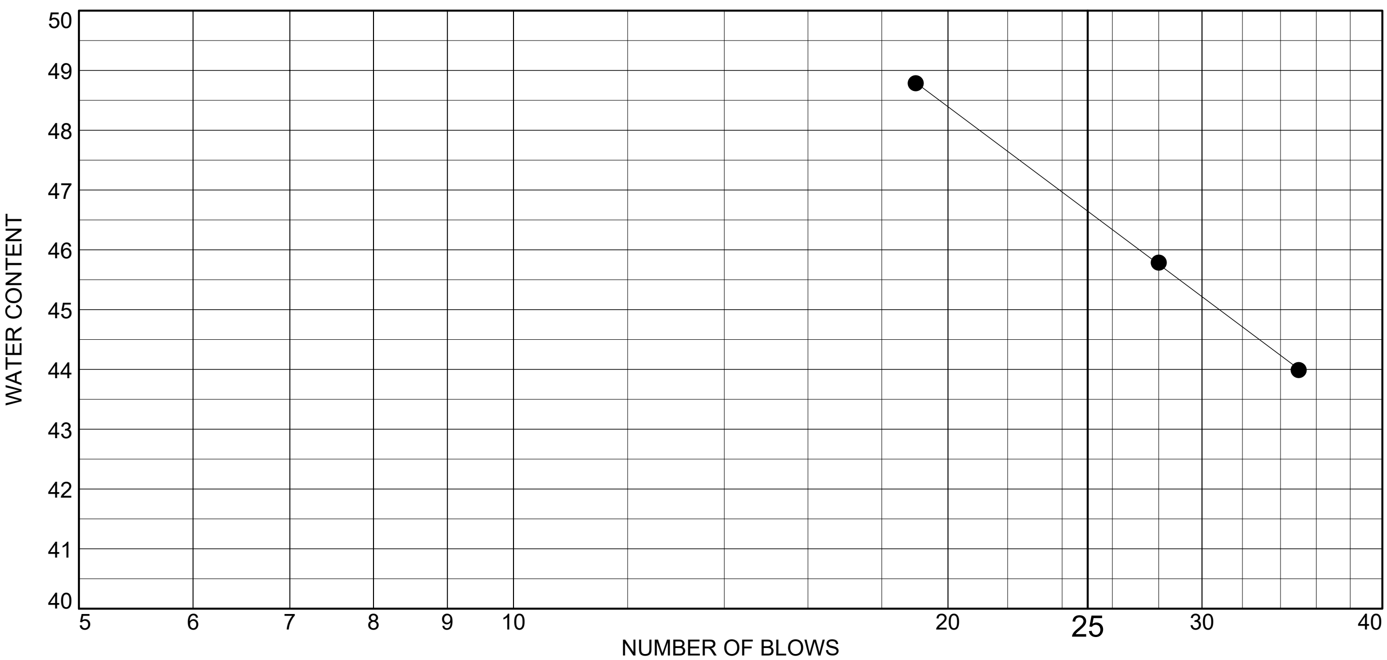
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	GRAY AND DARK GRAY LEAN CLAY - SAND POCKETS NOTED	47	18	29	96.9	92.2	CL

Project No. 11215017 **Client:** CONFIDENTIAL

Project: EDWARDS POWER STATION

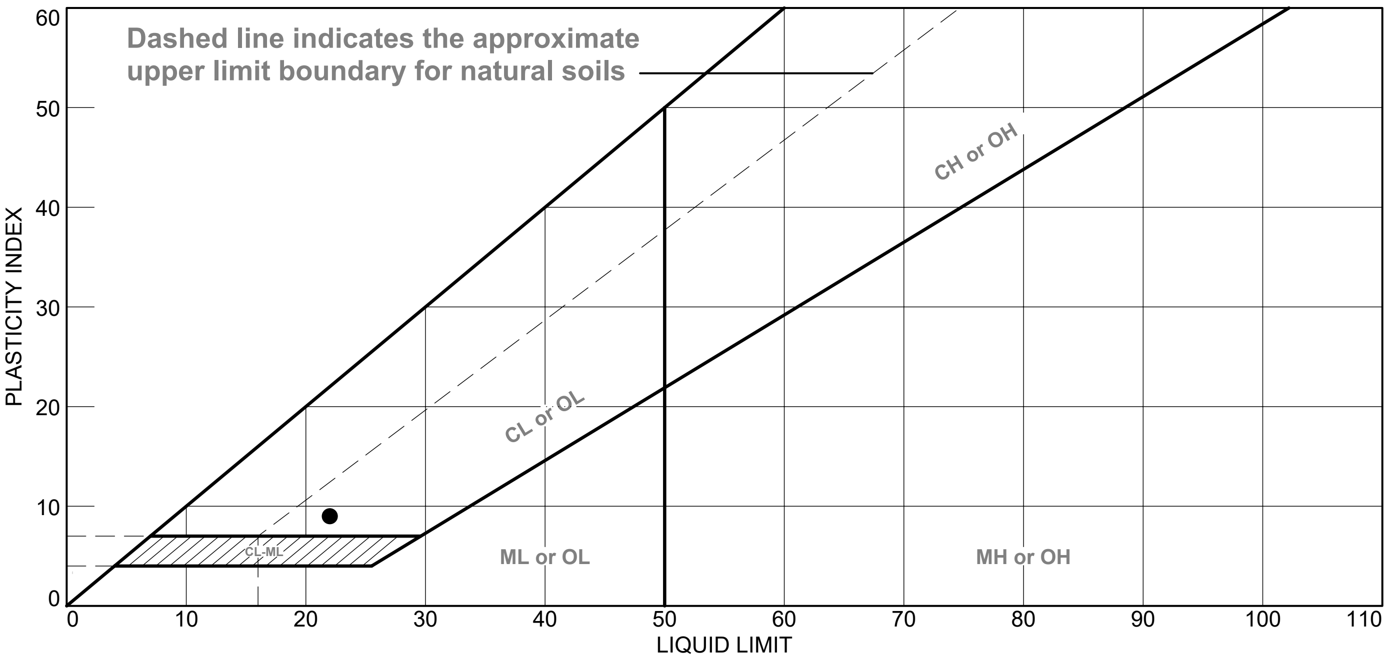
Source of Sample: AW-20 **Depth:** 15.0'-17.0'
Sample Number: 0810

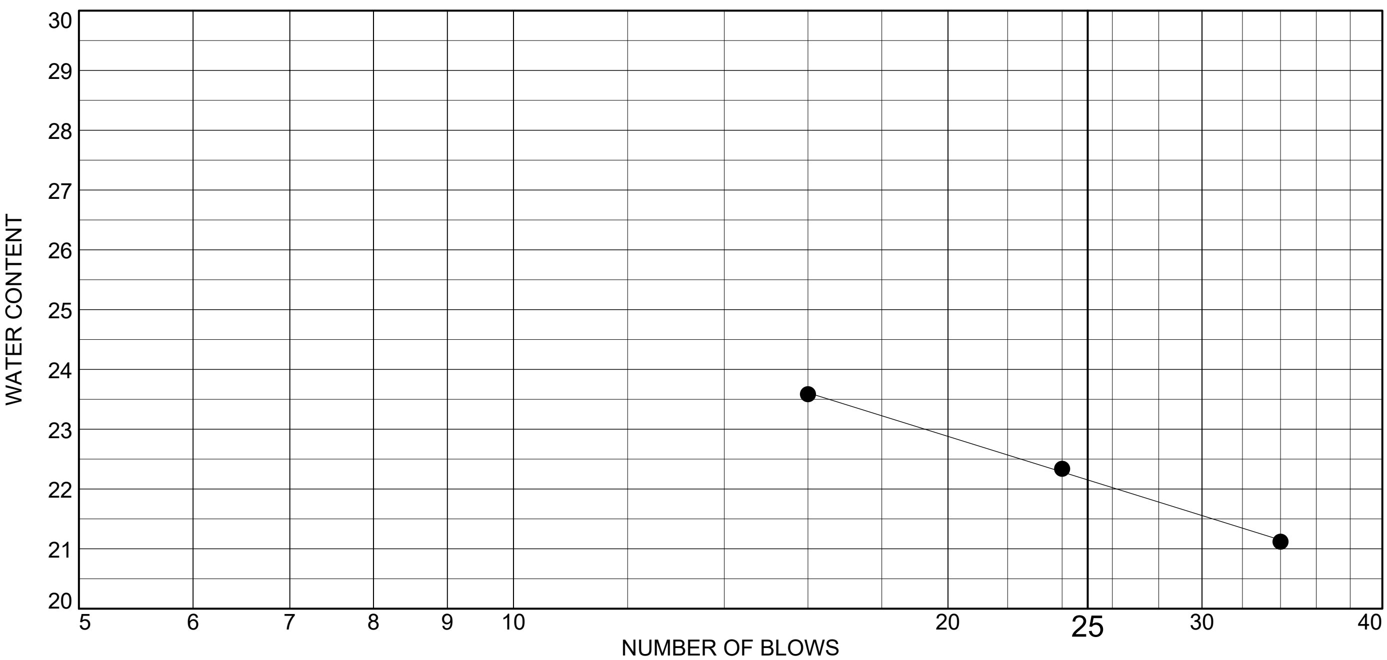
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	GRAY, LIGHT GRAY AND LIGHT BROWN CLAYEY SAND	22	13	9	98.3	42.6	SC

Project No. 11215017 **Client:** CONFIDENTIAL

Project: EDWARDS POWER STATION

Source of Sample: AW-22 **Depth:** 30.0'-32.0'
Sample Number: 0745

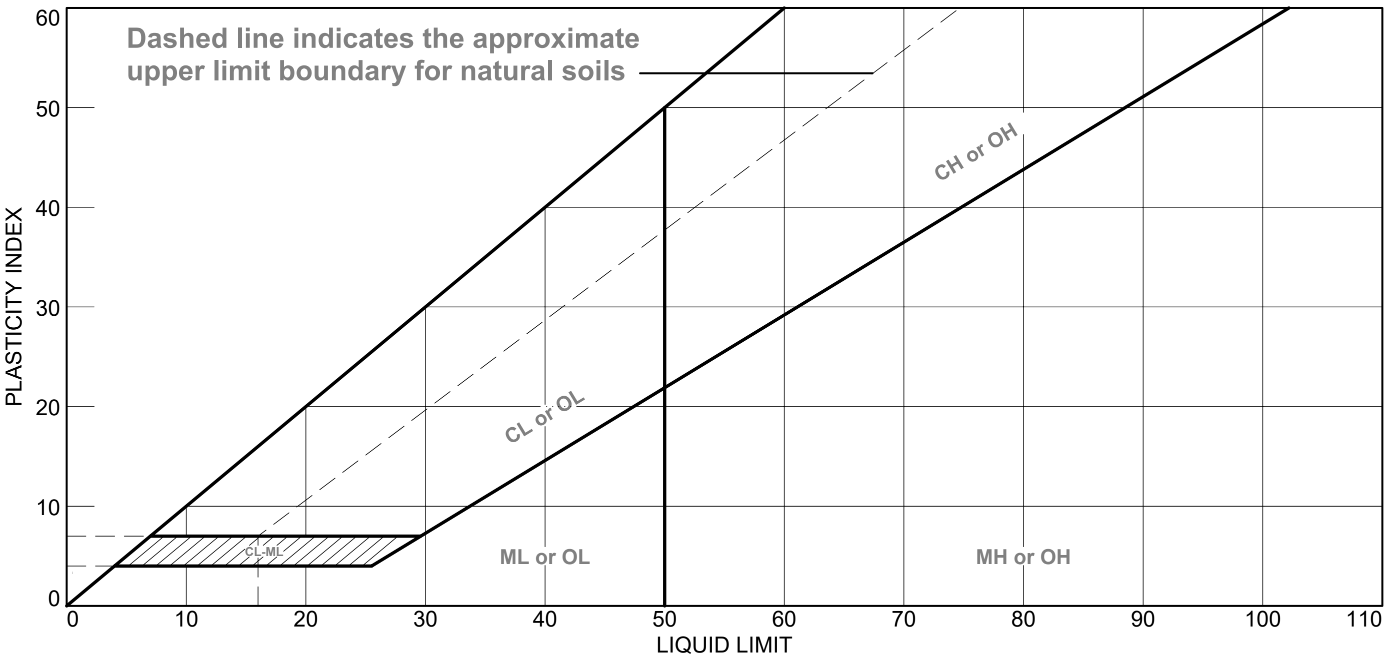
Terracon

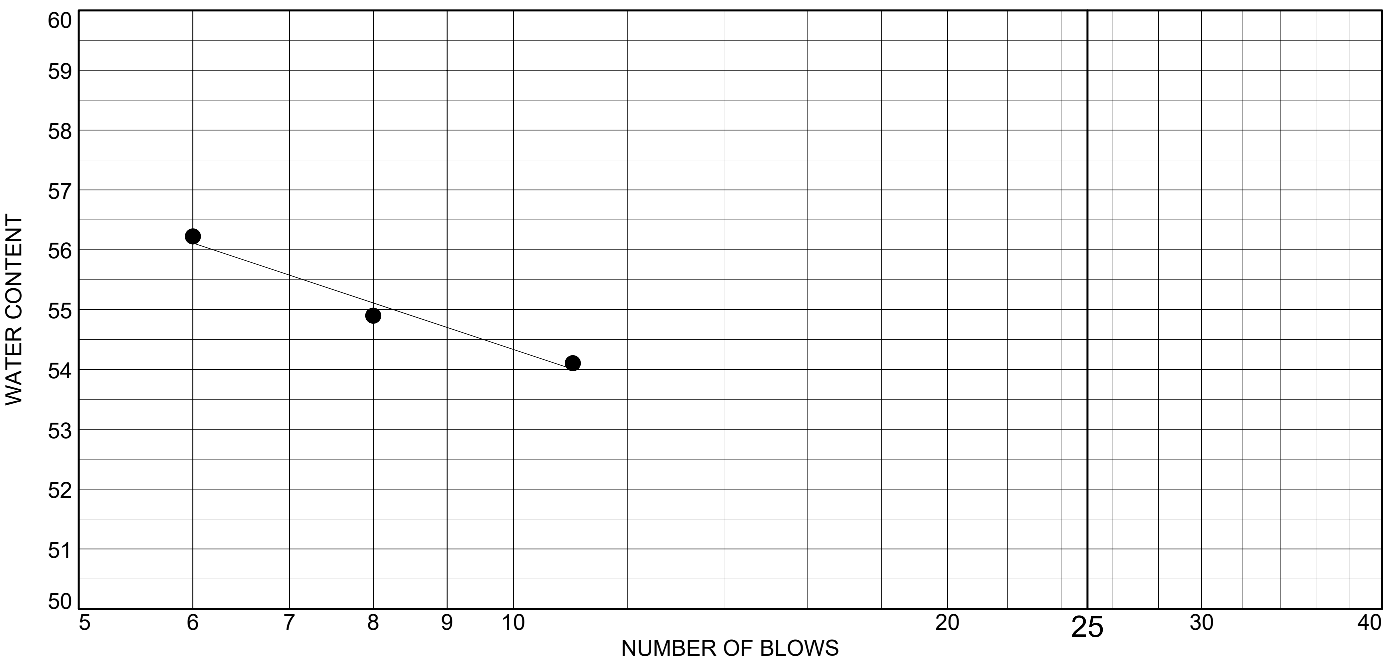
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	DARK GRAY SILTY SAND	51	53	NP	62.1	31.1	SM

Project No. 11215017 **Client:** CONFIDENTIAL

Project: EDWARDS POWER STATION

Source of Sample: XPW-01 **Depth:** 20.0'-22.0'
Sample Number: 1210

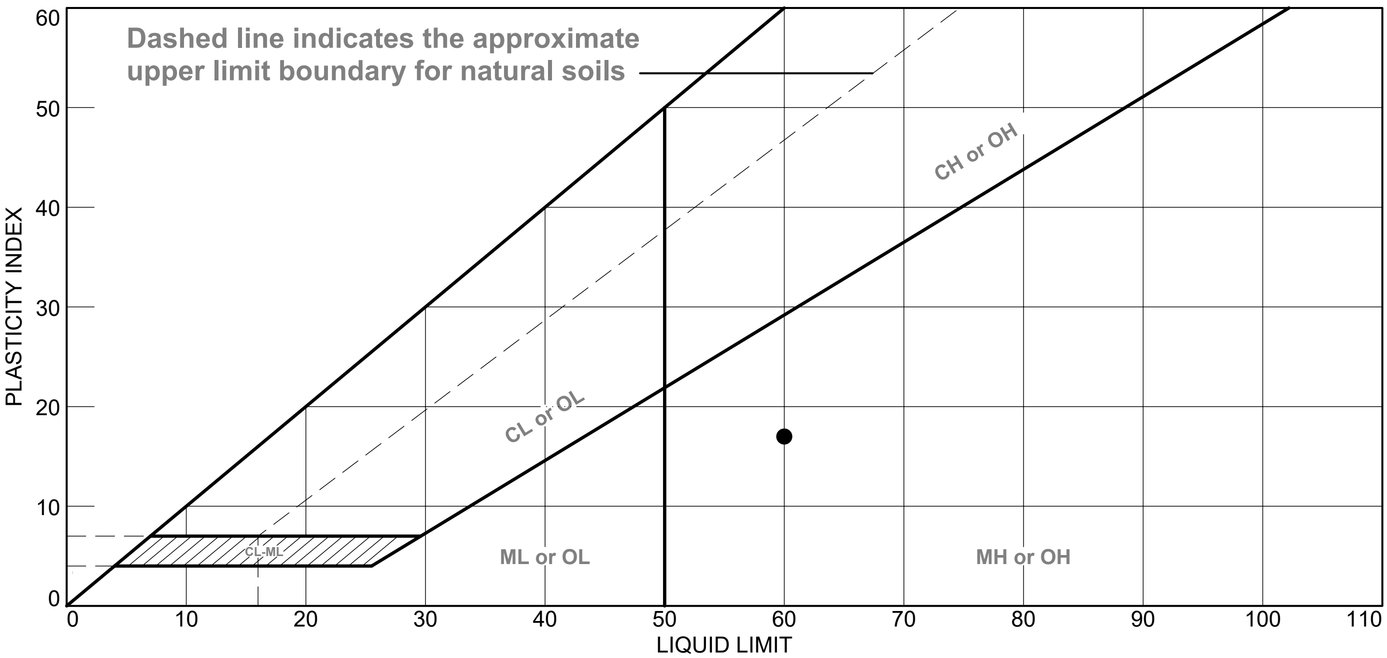
Terracon

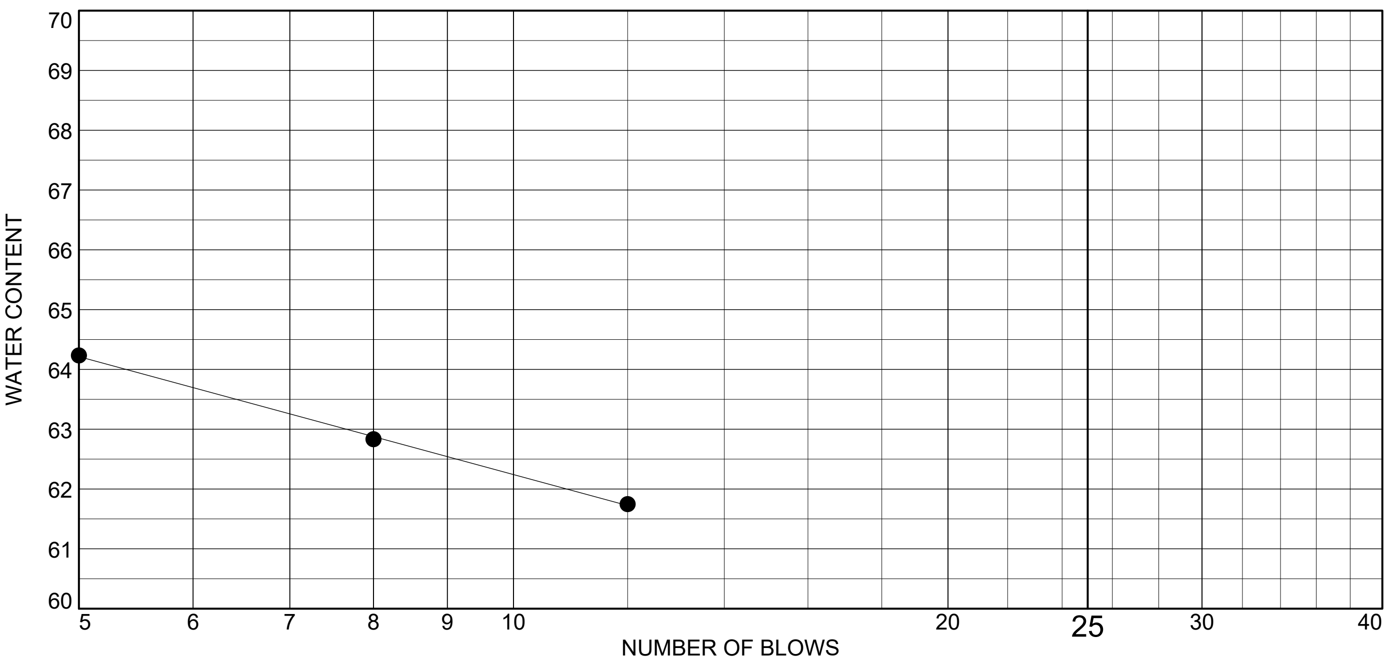
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	DARK GRAY ELASTIC SILT	60	43	17	98.6	86.3	MH

Project No. 11215017 **Client:** CONFIDENTIAL

Project: EDWARDS POWER STATION

Source of Sample: XPW-01A **Depth:** 41.0'-41.5'
Sample Number: 1530

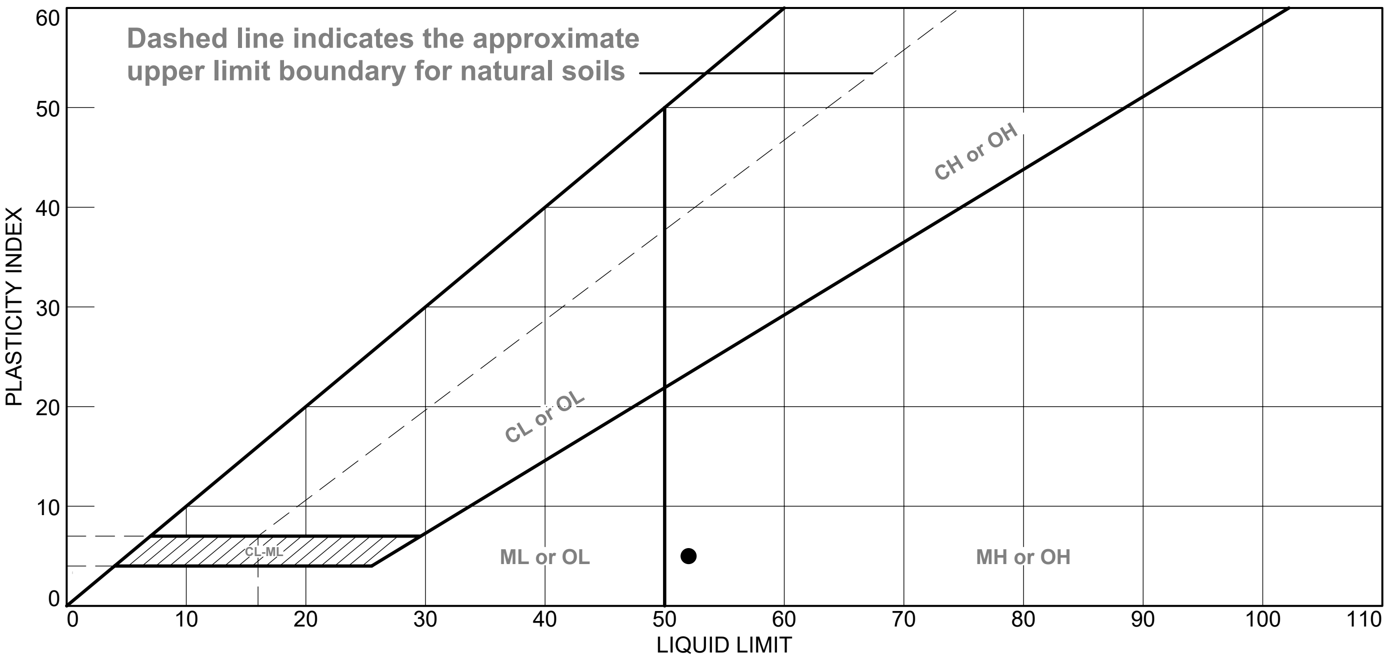
Terracon

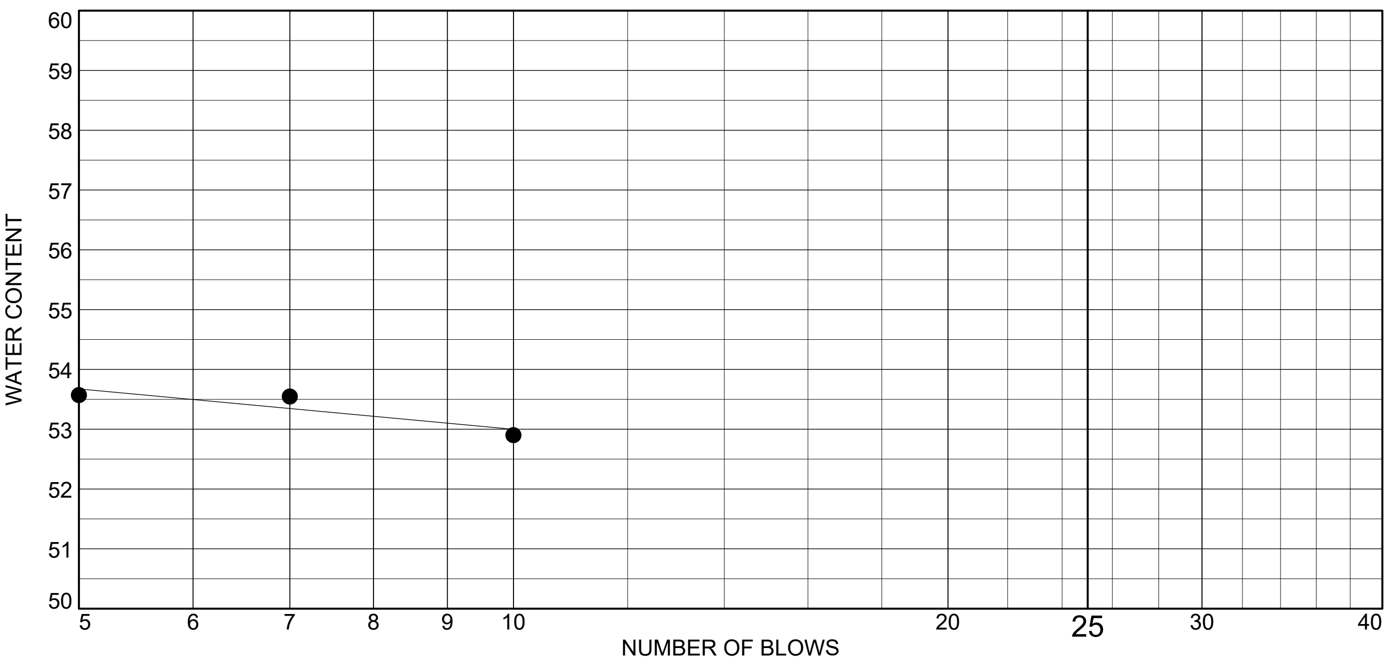
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	DARK GRAY AND GRAYISH BROWN ELASTIC SILT WITH SAND	52	47	5	92.2	71.4	MH

Project No. 11215017 **Client:** CONFIDENTIAL

Project: EDWARDS POWER STATION

Source of Sample: XPW-02 **Depth:** 10.0'-12.0'

Sample Number: 0845

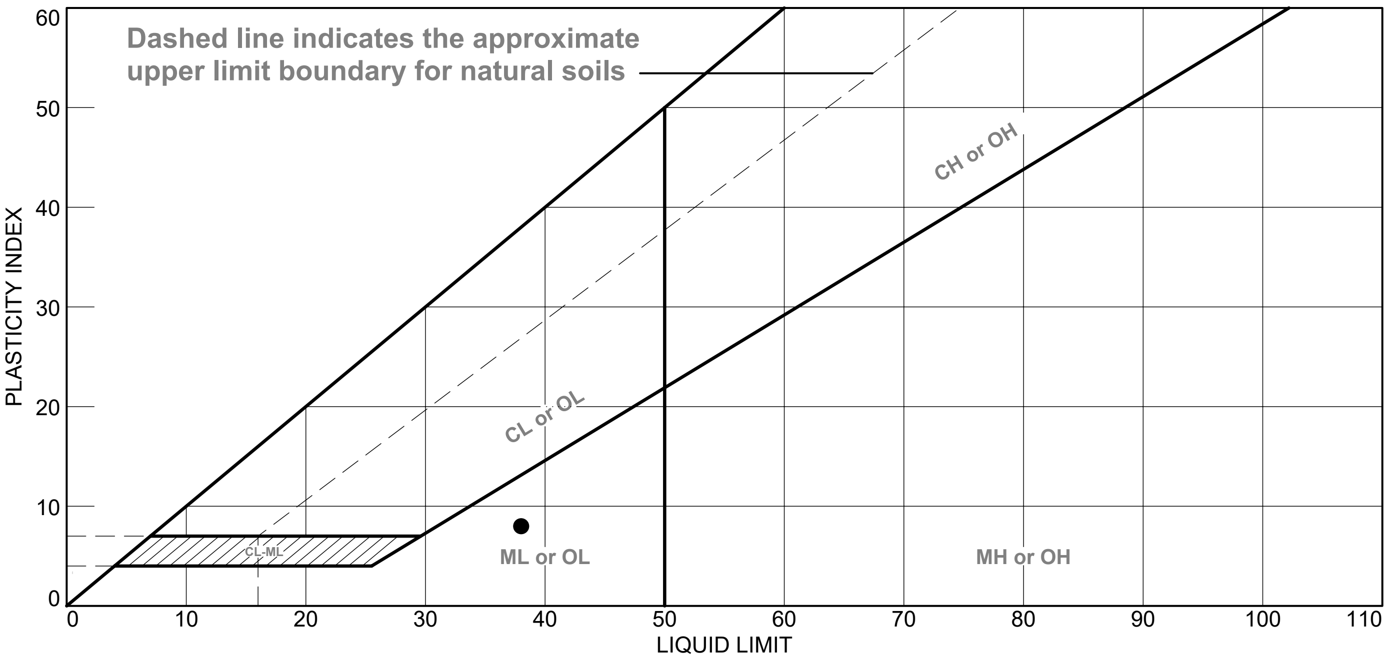
Terracon

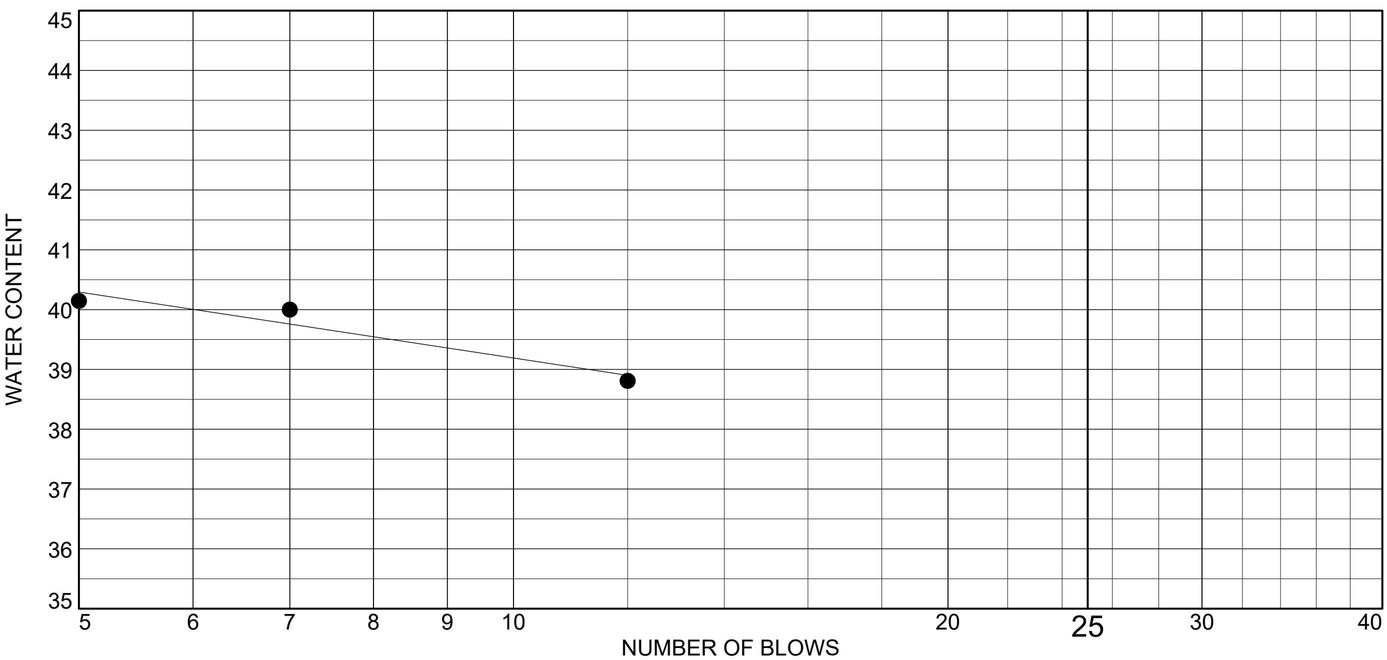
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	DARK GRAY SILT	38	30	8	99.8	95.9	ML

Project No. 11215017 **Client:** CONFIDENTIAL

Project: EDWARDS POWER STATION

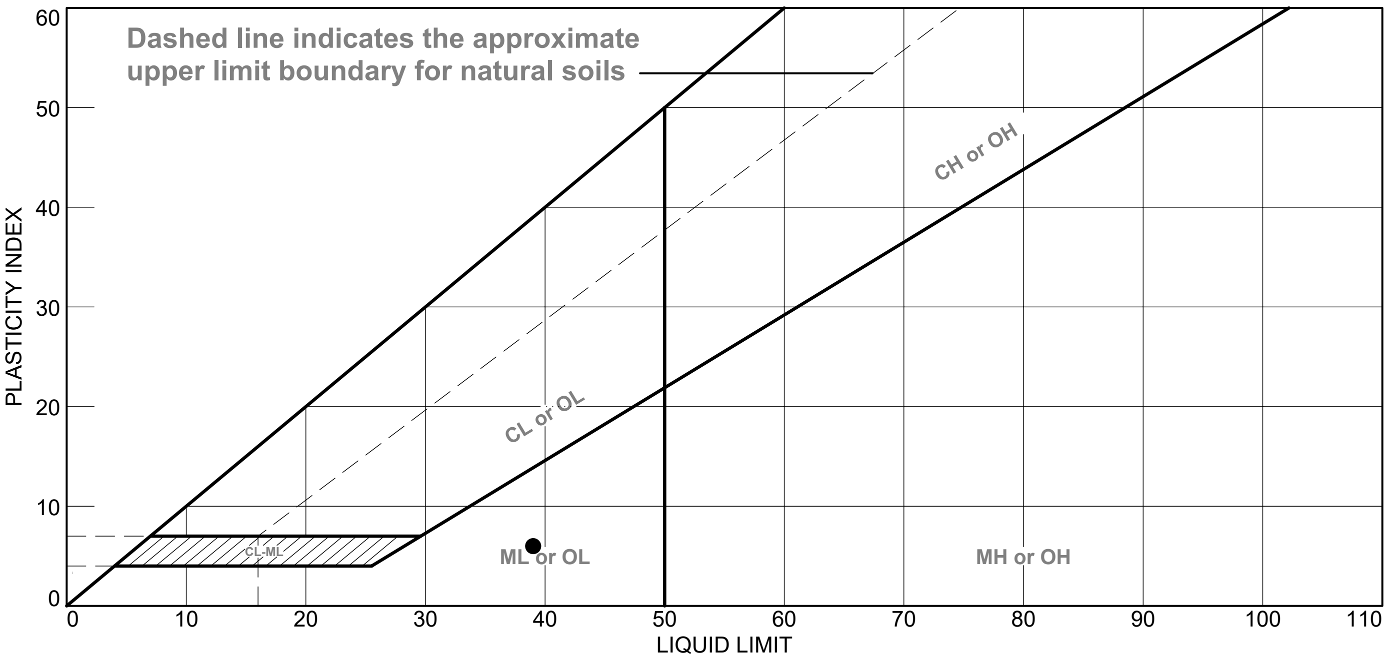
Source of Sample: XPW-02 **Depth:** 22.0'-24.0'
Sample Number: 0950

Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	GRAYISH BROWN SANDY SILT	39	33	6	90.7	62.5	ML

Project No. 11215017 **Client:** CONFIDENTIAL

Project: EDWARDS POWER STATION

Source of Sample: XPW-02 **Depth:** 45.0'-47.0'
Sample Number: 1245

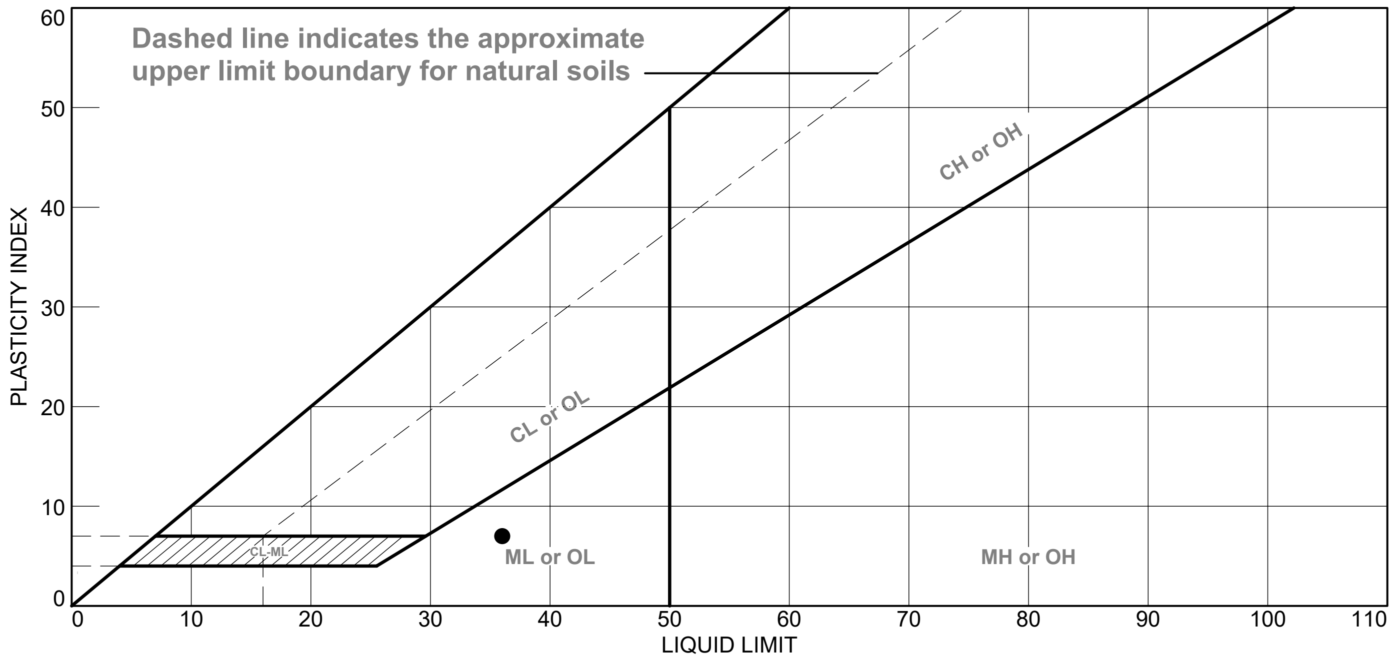
Terracon

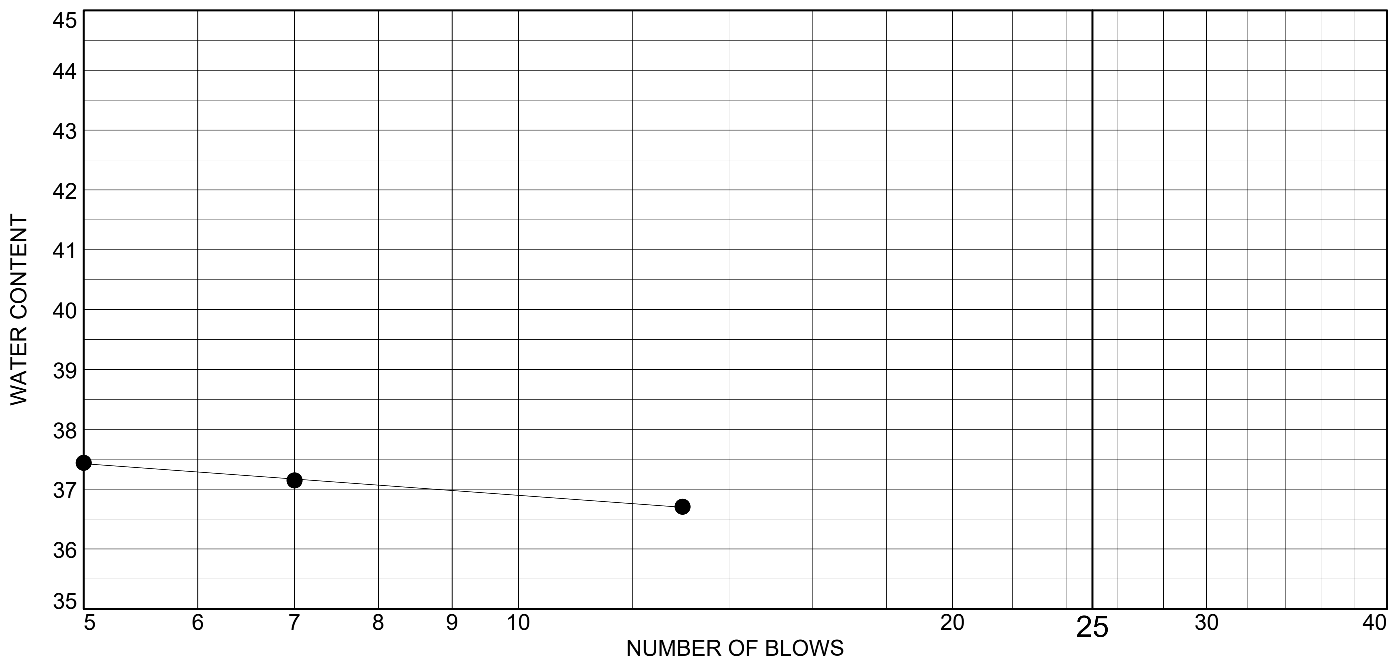
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	DARK GRAY SILT WITH SAND - ROOTS NOTED	36	29	7	89.7	72.4	ML

Project No. 11215017 **Client:** CONFIDENTIAL

Project: EDWARDS POWER STATION

Source of Sample: XPW-03 **Depth:** 10.0'-12.0'
Sample Number: 1500

Remarks:

Figure

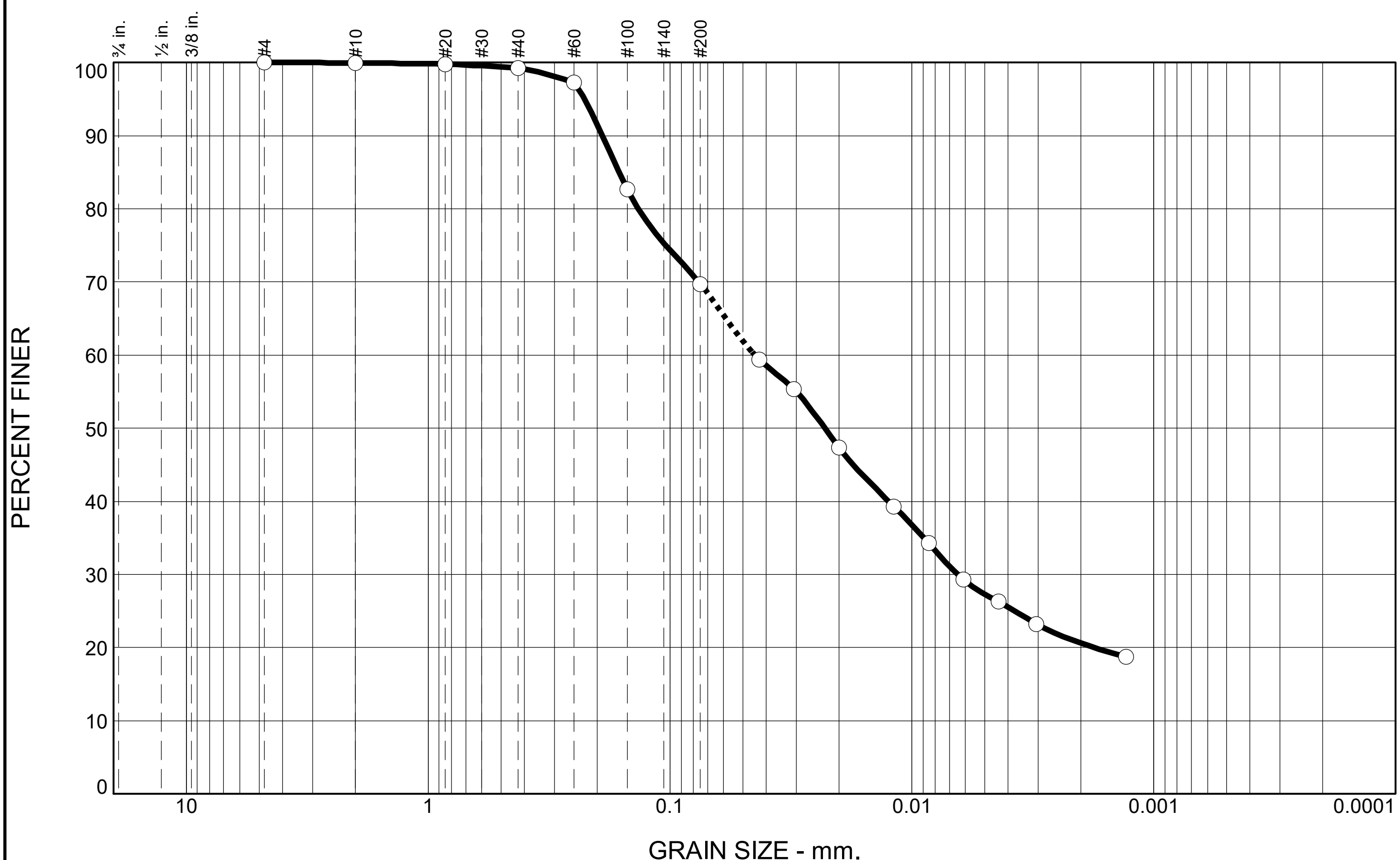
Tested By: DT **Checked By:** WPQ

Terracon

Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
ASTM D6913

Particle-Size Distribution (Gradation) of Fine-Grained Soils
Using the Sedimentation (Hydrometer) Analysis
ASTM D7928

Particle Size Analysis of Soils ASTM D6913 and D7928



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.7	29.6	42.4	27.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#20	99.8		
#40	99.3		
#60	97.3		
#100	82.6		
#200	69.7		
0.0427 mm.	59.4		
0.0307 mm.	55.4		
0.0200 mm.	47.3		
0.0119 mm.	39.3		
0.0085 mm.	34.3		
0.0061 mm.	29.3		
0.0044 mm.	26.3		
0.0031 mm.	23.2		
0.0013 mm.	18.7		

* (no specification provided)

Soil Description

LIGHT BROWN AND GRAY SANDY LEAN CLAY

Atterberg Limits

PL= 14 LL= 30 PI= 16

Coefficients

D_{90}= 0.1902 D_{85}= 0.1626 D_{60}= 0.0446
D_{50}= 0.0229 D_{30}= 0.0065 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(9)

Remarks

F.M.=0.20

Source of Sample: AW-13A **Depth:** 5.0'-7.0'
Sample Number: 0850

Date: 1-29-21

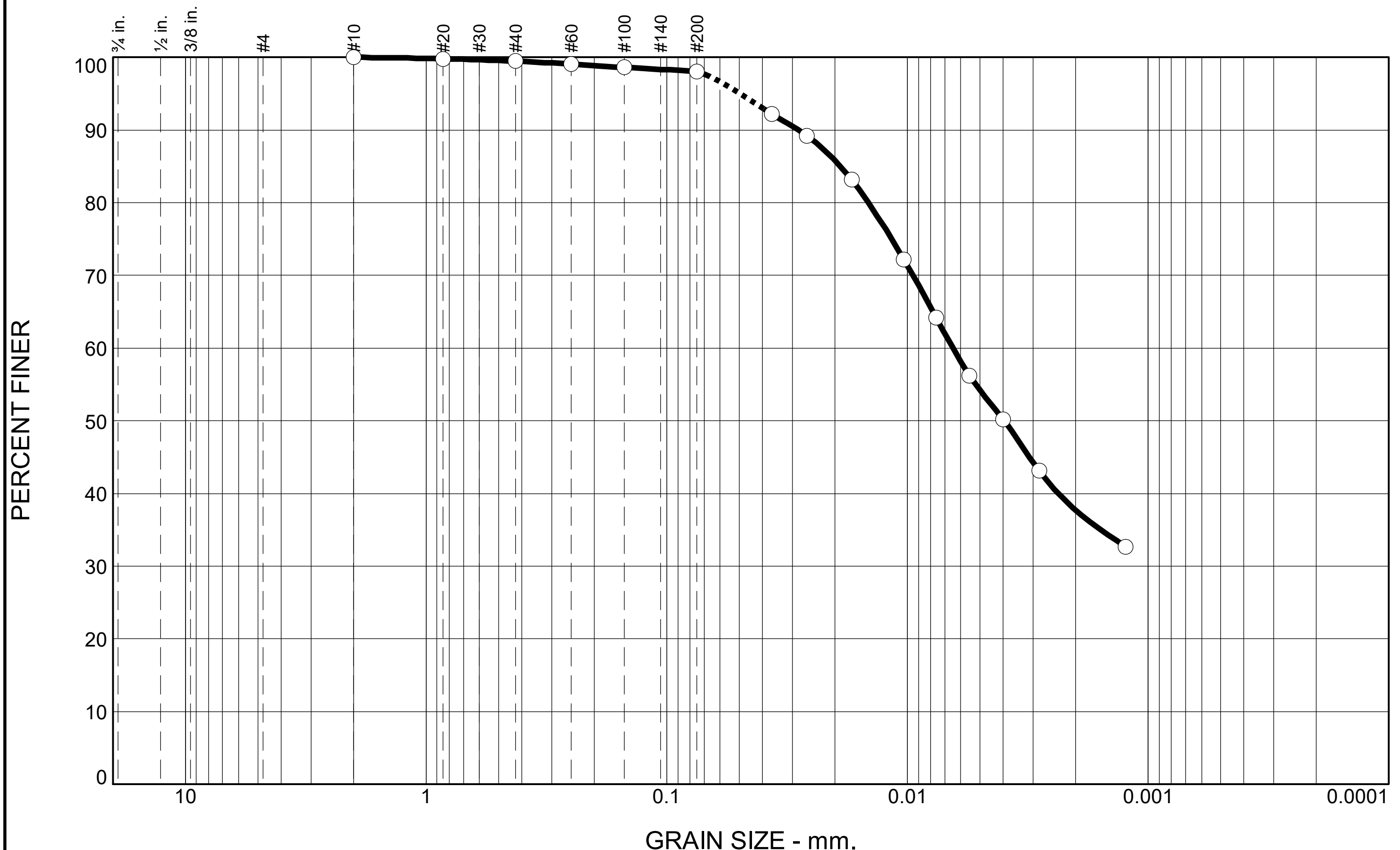
Terracon

Client: CONFIDENTIAL
Project: EDWARDS POWER STATION

Project No: 11215017 **Figure**

Tested By: SJH **Checked By:** WPQ

Particle Size Analysis of Soils ASTM D6913 and D7928



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	1.5	43.8	54.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.8		
#40	99.5		
#60	99.1		
#100	98.6		
#200	98.0		
0.0365 mm.	92.2		
0.0262 mm.	89.2		
0.0171 mm.	83.2		
0.0104 mm.	72.2		
0.0076 mm.	64.2		
0.0055 mm.	56.2		
0.0040 mm.	50.2		
0.0028 mm.	43.2		
0.0012 mm.	32.7		

* (no specification provided)

Soil Description

GRAY FAT CLAY

Atterberg Limits

PL= 19 LL= 57 PI= 38

Coefficients

D_{90}= 0.0285 D_{85}= 0.0190 D_{60}= 0.0065
D_{50}= 0.0040 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(41)

Remarks

F.M.=0.03

Source of Sample: AW-15 **Depth:** 20.0'-22.0'
Sample Number: 1025

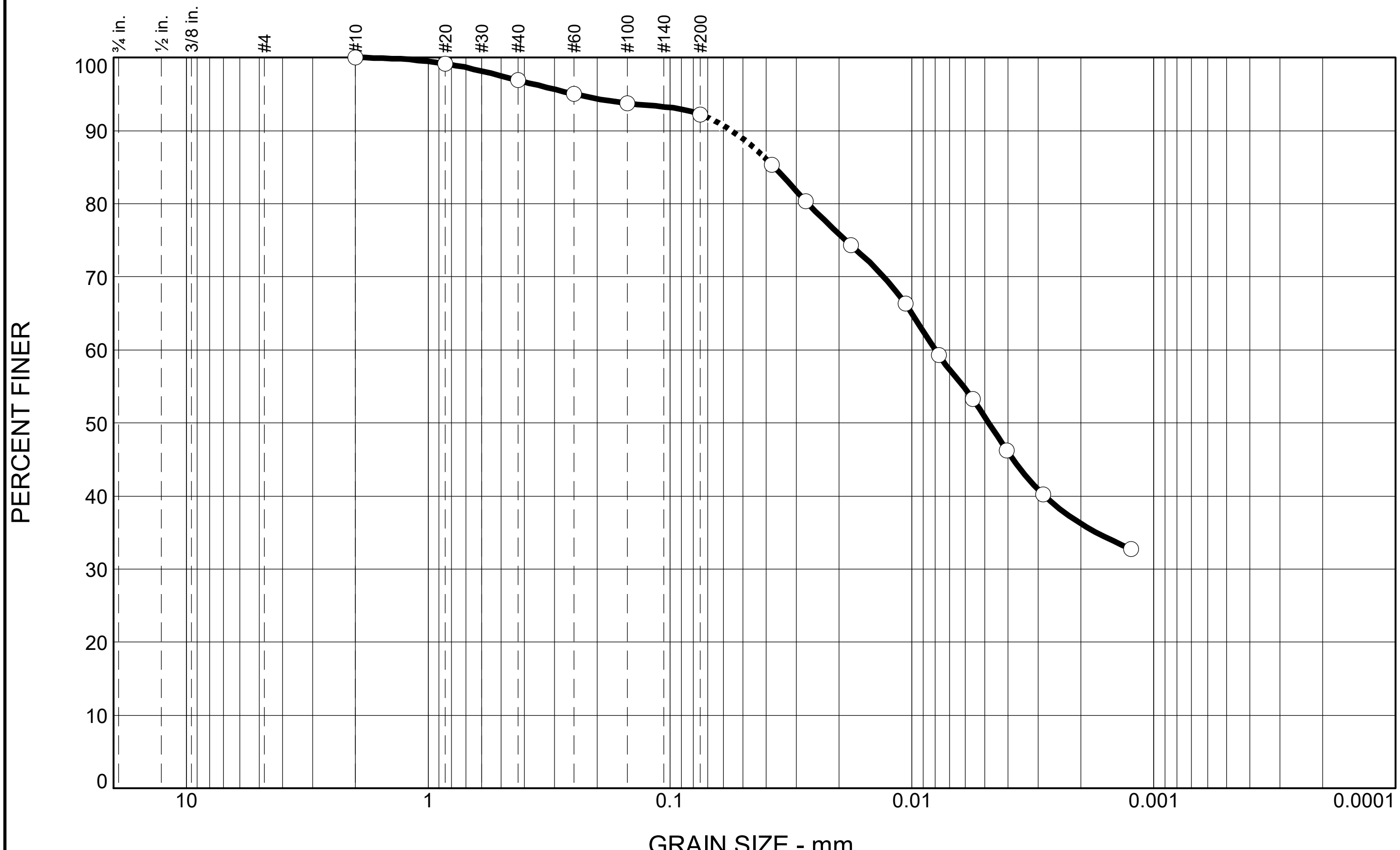
Date: 1-29-21

Terracon

Client: CONFIDENTIAL
Project: EDWARDS POWER STATION
Project No: 11215017 **Figure**

Tested By: SJH **Checked By:** WPQ

Particle Size Analysis of Soils ASTM D6913 and D7928



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	3.1	4.7	41.3	50.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.2		
#40	96.9		
#60	95.1		
#100	93.7		
#200	92.2		
0.0379 mm.	85.3		
0.0274 mm.	80.3		
0.0178 mm.	74.3		
0.0106 mm.	66.3		
0.0077 mm.	59.3		
0.0056 mm.	53.3		
0.0041 mm.	46.3		
0.0029 mm.	40.2		
0.0012 mm.	32.7		

* (no specification provided)

Soil Description

GRAY AND DARK GRAY LEAN CLAY - SAND POCKETS NOTED

Atterberg Limits

PL= 18 LL= 47 PI= 29

Coefficients

D_{90}= 0.0556 D_{85}= 0.0370 D_{60}= 0.0080
D_{50}= 0.0048 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(28)

Remarks

F.M.=0.13

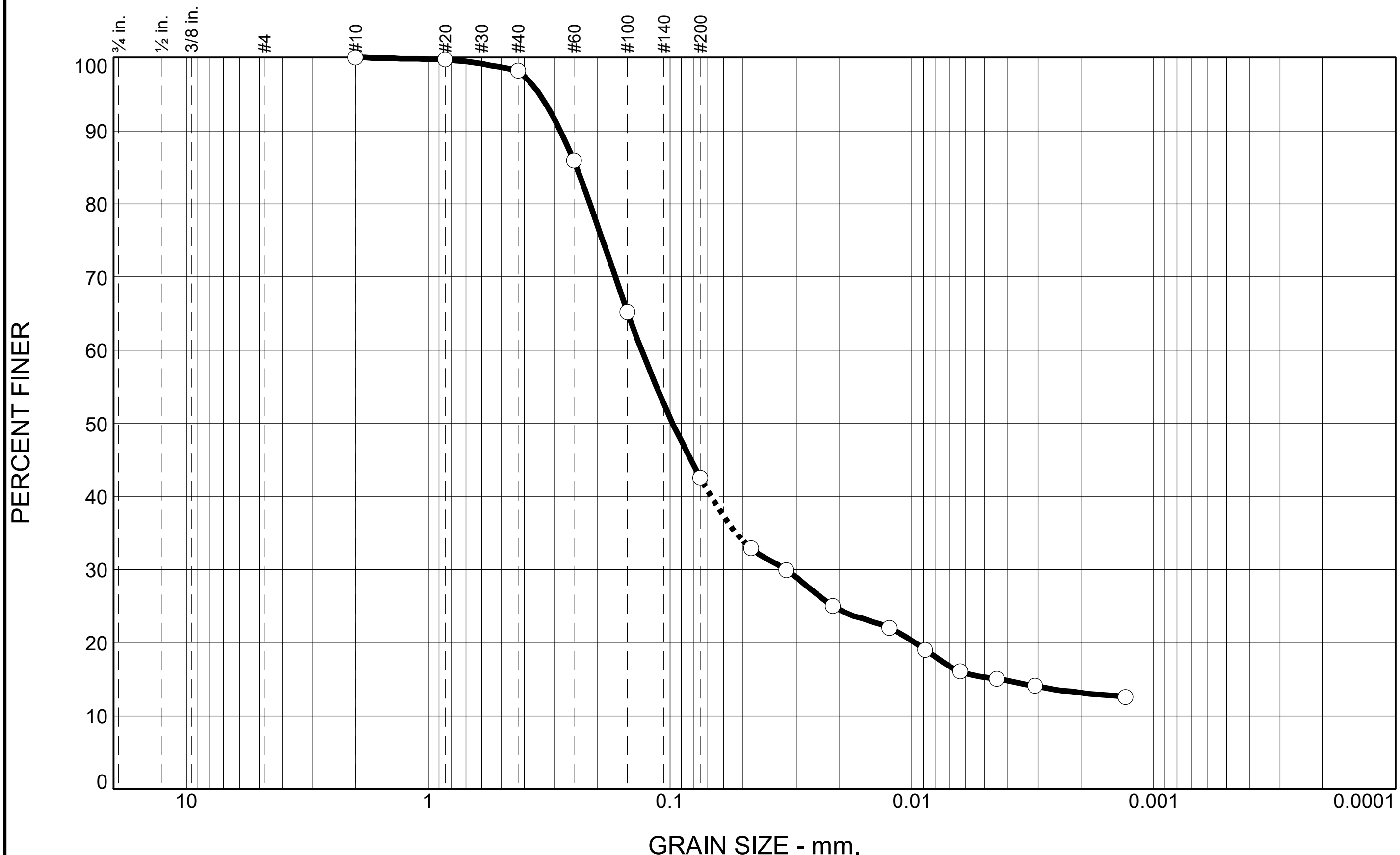
Source of Sample: AW-20 **Depth:** 15.0'-17.0'
Sample Number: 0810 **Date:** 1-29-21

Terracon

Client: CONFIDENTIAL
Project: EDWARDS POWER STATION
Project No: 11215017 **Figure**

Tested By: SJH **Checked By:** WPQ

Particle Size Analysis of Soils ASTM D6913 and D7928



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.7	55.7	27.3	15.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.7		
#40	98.3		
#60	85.9		
#100	65.2		
#200	42.6		
0.0463 mm.	32.9		
0.0331 mm.	29.9		
0.0212 mm.	25.0		
0.0124 mm.	22.0		
0.0088 mm.	19.0		
0.0063 mm.	16.0		
0.0045 mm.	15.1		
0.0031 mm.	14.1		
0.0013 mm.	12.6		

* (no specification provided)

Soil Description

GRAY, LIGHT GRAY AND LIGHT BROWN CLAYEY SAND

Atterberg Limits

PL= 13 LL= 22 PI= 9

Coefficients

D_{90}= 0.2838 D_{85}= 0.2437 D_{60}= 0.1311
D_{50}= 0.0975 D_{30}= 0.0333 D_{15}= 0.0044
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(1)

Remarks

F.M.=0.44

Source of Sample: AW-22 **Depth:** 30.0'-32.0'
Sample Number: 0745

Date: 1-29-21

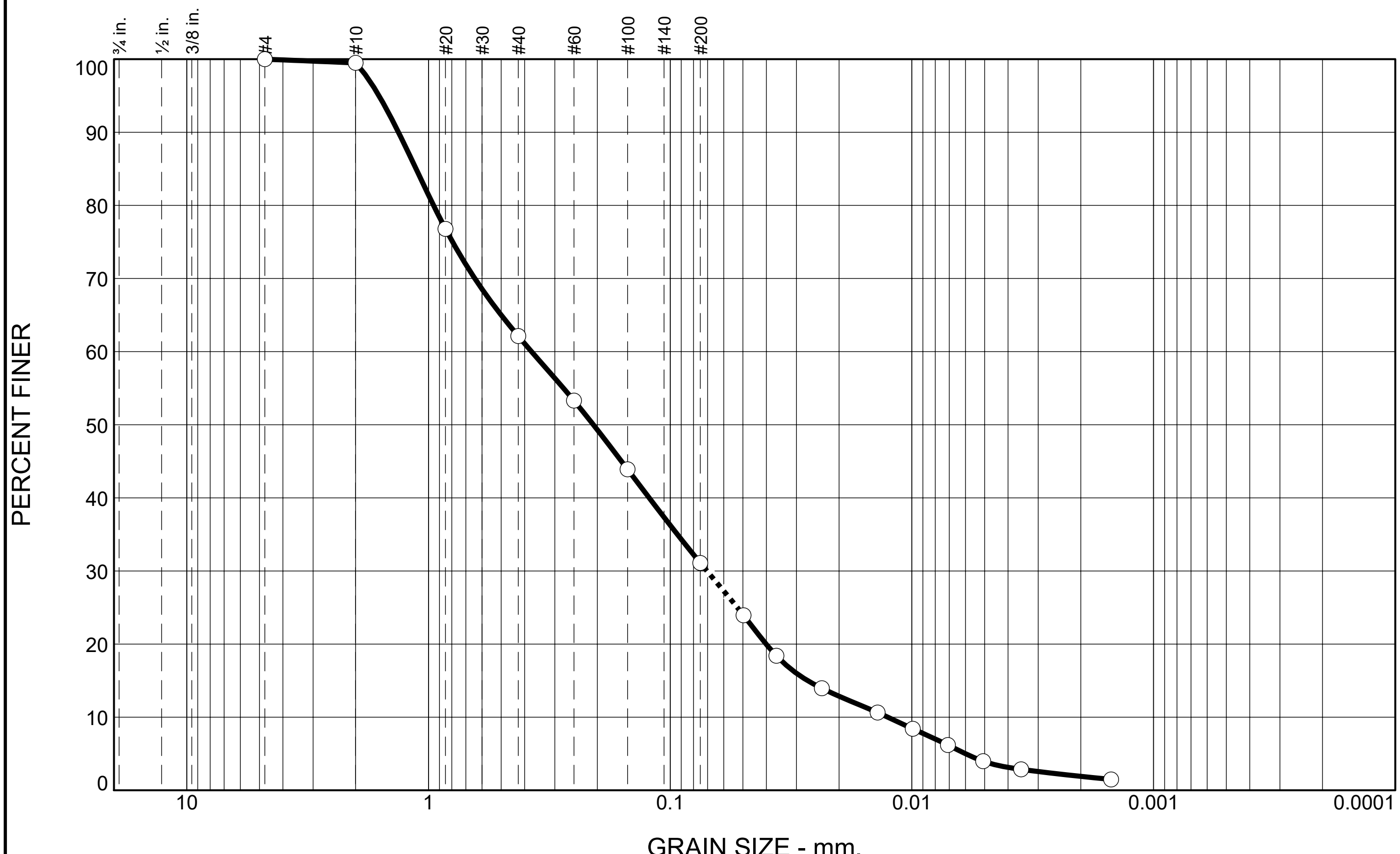
Terracon

Client: CONFIDENTIAL
Project: EDWARDS POWER STATION

Project No: 11215017 **Figure**

Tested By: SJH **Checked By:** WPQ

Particle Size Analysis of Soils ASTM D6913 and D7928



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.5	37.4	31.0	27.2	3.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.5		
#20	76.8		
#40	62.1		
#60	53.3		
#100	43.9		
#200	31.1		
0.0497 mm.	23.9		
0.0363 mm.	18.4		
0.0236 mm.	14.0		
0.0139 mm.	10.6		
0.0099 mm.	8.4		
0.0071 mm.	6.2		
0.0051 mm.	4.0		
0.0035 mm.	2.9		
0.0015 mm.	1.5		

* (no specification provided)

Soil Description

DARK GRAY SILTY SAND

Atterberg Limits

PL= 53 LL= 51 PI= NP

Coefficients

D_{90}= 1.3306 D_{85}= 1.1250 D_{60}= 0.3744
D_{50}= 0.2077 D_{30}= 0.0704 D_{15}= 0.0270
D_{10}= 0.0126 C_u= 29.78 C_c= 1.05

Classification

USCS= SM AASHTO= A-2-5(0)

Remarks

F.M.=1.45

Source of Sample: XPW-01 **Depth:** 20.0'-22.0'
Sample Number: 1210 **Date:** 1-29-21

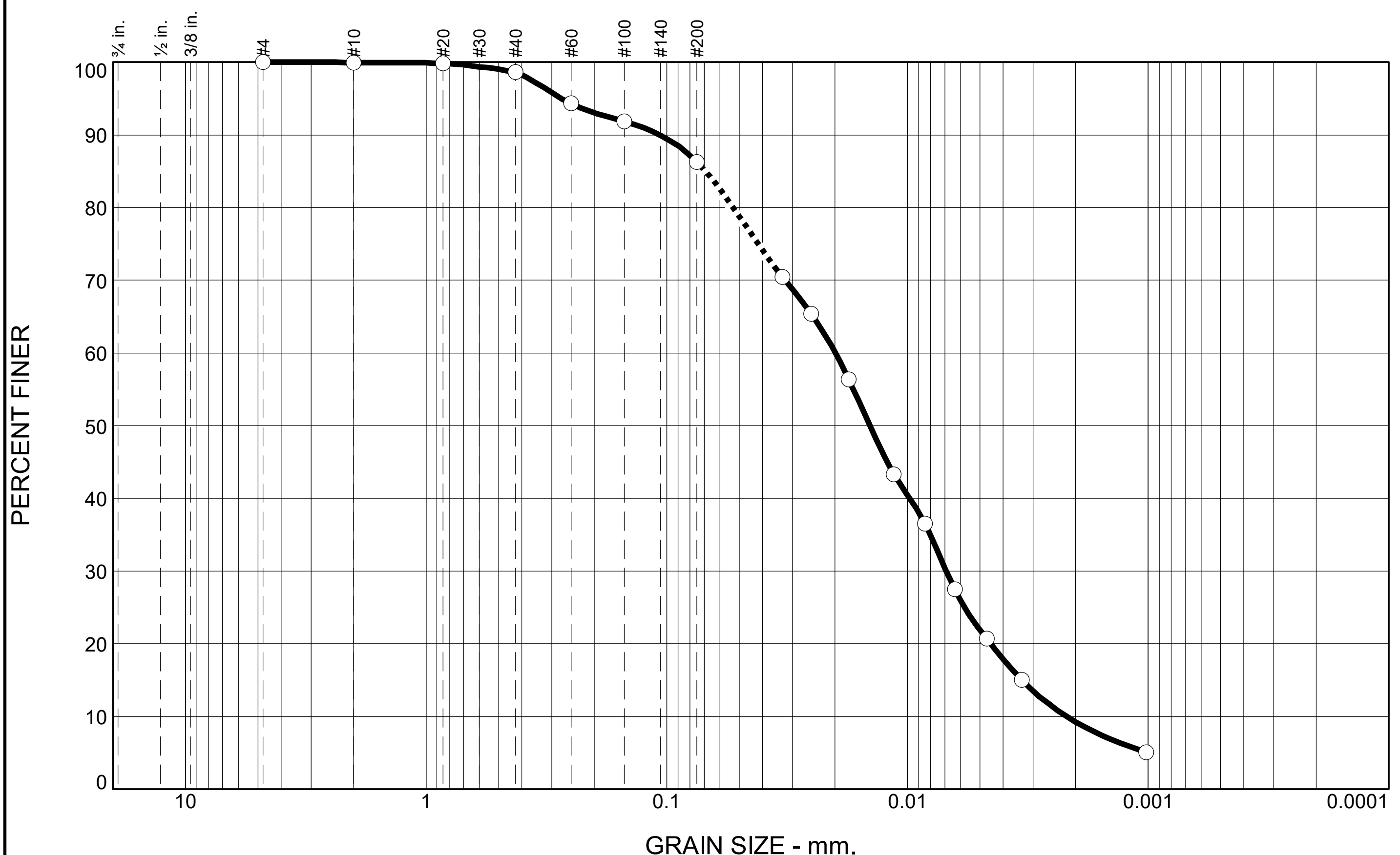
Terracon

Client: CONFIDENTIAL
Project: EDWARDS POWER STATION

Project No: 11215017 **Figure**

Tested By: SJH **Checked By:** WPQ

Particle Size Analysis of Soils ASTM D6913 and D7928



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.4	12.3	64.4	21.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#20	99.9		
#40	98.6		
#60	94.3		
#100	91.9		
#200	86.3		
0.0332 mm.	70.5		
0.0251 mm.	65.4		
0.0175 mm.	56.3		
0.0114 mm.	43.3		
0.0085 mm.	36.6		
0.0064 mm.	27.5		
0.0047 mm.	20.7		
0.0034 mm.	15.1		
0.0010 mm.	5.0		

* (no specification provided)

Soil Description

DARK GRAY ELASTIC SILT

Atterberg Limits

PL= 43 LL= 60 PI= 17

Coefficients

D_{90}= 0.1066 D_{85}= 0.0691 D_{60}= 0.0199
D_{50}= 0.0143 D_{30}= 0.0069 D_{15}= 0.0033
D_{10}= 0.0022 C_u= 9.15 C_c= 1.09

Classification

USCS= MH AASHTO= A-7-5(20)

Remarks

F.M.=0.13

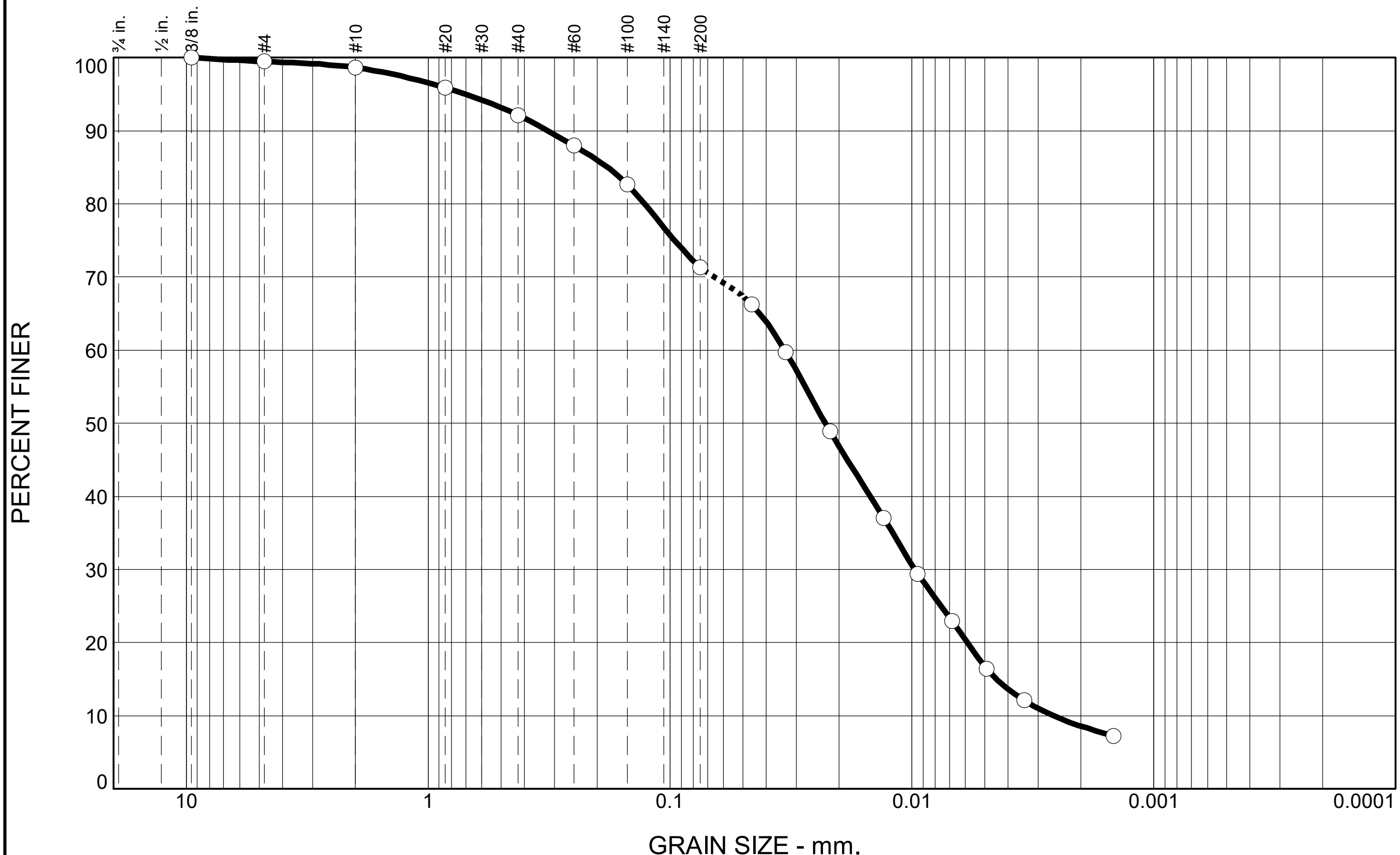
Source of Sample: XPW-01A **Depth:** 41.0'-41.5'
Sample Number: 1530 **Date:** 2-18-21

Terracon

Client: CONFIDENTIAL
Project: EDWARDS POWER STATION
Project No: 11215017 **Figure**

Tested By: SJH **Checked By:** WPQ

Particle Size Analysis of Soils ASTM D6913 and D7928



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.5	0.9	6.4	20.8	54.6	16.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.5		
#10	98.6		
#20	95.9		
#40	92.2		
#60	88.0		
#100	82.6		
#200	71.4		
0.0460 mm.	66.2		
0.0333 mm.	59.7		
0.0218 mm.	48.9		
0.0131 mm.	37.0		
0.0095 mm.	29.4		
0.0068 mm.	22.9		
0.0049 mm.	16.4		
0.0034 mm.	12.1		
0.0015 mm.	7.2		

* (no specification provided)

Soil Description

DARK GRAY AND GRAYISH BROWN ELASTIC SILT WITH SAND

Atterberg Limits

PL= 47 LL= 52 PI= 5

Coefficients

D_{90}= 0.3194 D_{85}= 0.1815 D_{60}= 0.0336
D_{50}= 0.0228 D_{30}= 0.0097 D_{15}= 0.0045
D_{10}= 0.0026 C_u= 12.95 C_c= 1.08

Classification

USCS= MH AASHTO= A-5(7)

Remarks

F.M.=0.38

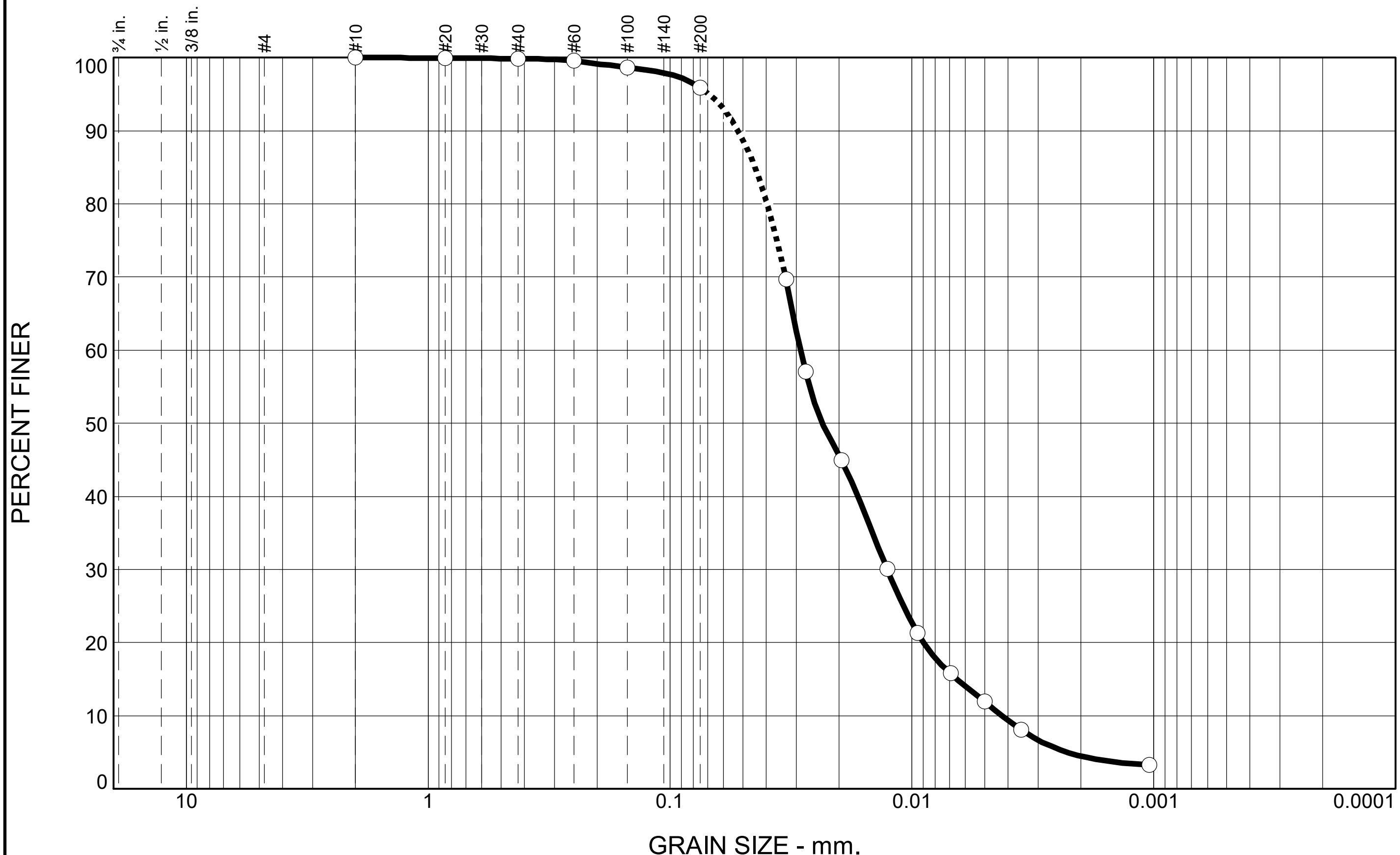
Source of Sample: XPW-02 **Depth:** 10.0'-12.0'
Sample Number: 0845 **Date:** 1-29-21

Terracon

Client: CONFIDENTIAL
Project: EDWARDS POWER STATION
Project No: 11215017 **Figure**

Tested By: SJH **Checked By:** WPQ

Particle Size Analysis of Soils ASTM D6913 and D7928



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	3.9	84.0	11.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.9		
#40	99.8		
#60	99.5		
#100	98.6		
#200	95.9		
0.0331 mm.	69.7		
0.0275 mm.	57.0		
0.0196 mm.	44.9		
0.0127 mm.	30.1		
0.0095 mm.	21.3		
0.0069 mm.	15.8		
0.0050 mm.	11.9		
0.0035 mm.	8.1		
0.0010 mm.	3.2		

* (no specification provided)

Soil Description

DARK GRAY SILT

Atterberg Limits

PL= 30 LL= 38 PI= 8

Coefficients

D_{90}= 0.0522 D_{85}= 0.0446 D_{60}= 0.0289
D_{50}= 0.0234 D_{30}= 0.0126 D_{15}= 0.0065
D_{10}= 0.0042 C_u= 6.82 C_c= 1.30

Classification

USCS= ML AASHTO= A-4(10)

Remarks

F.M.=0.02

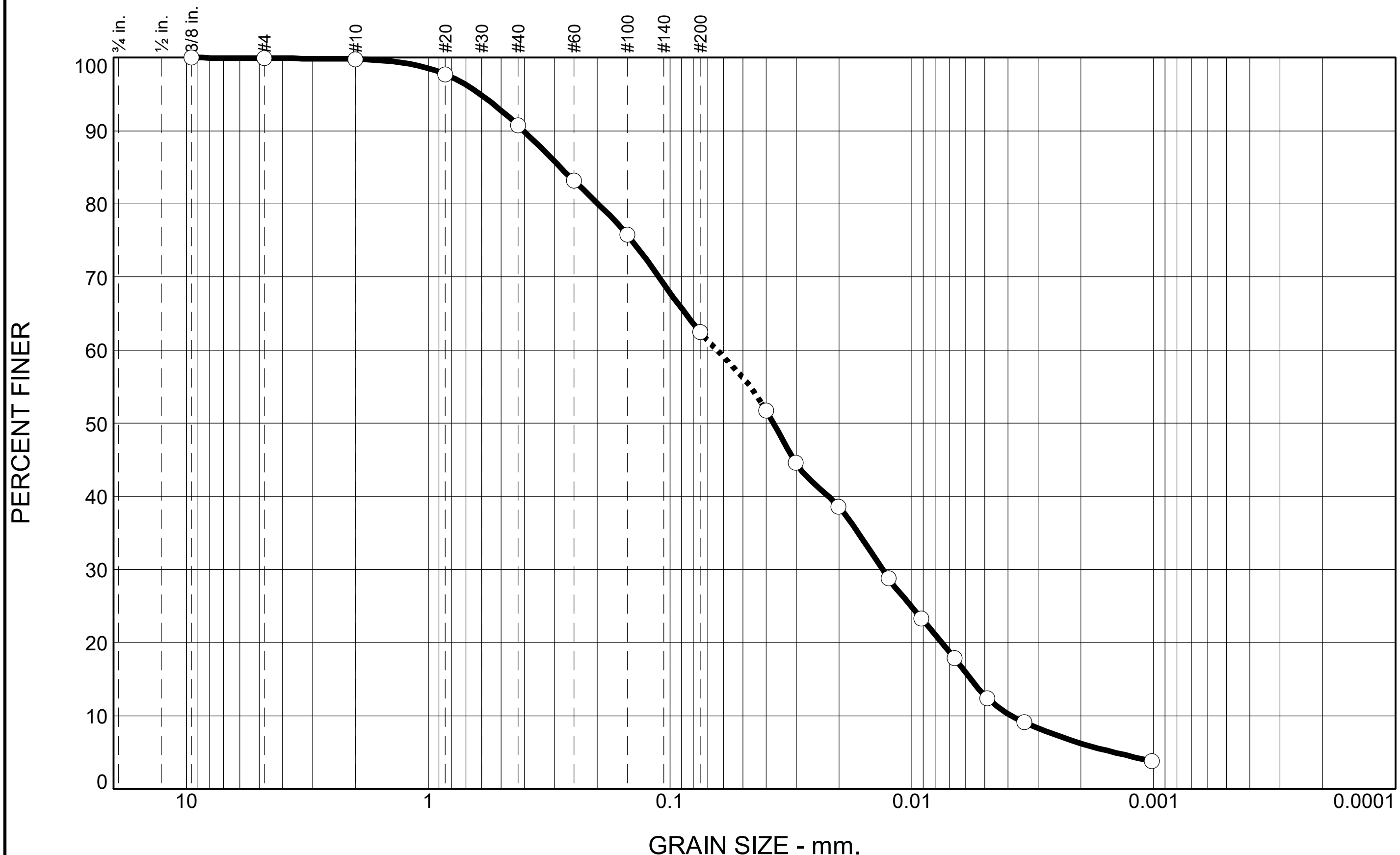
Source of Sample: XPW-02 **Depth:** 22.0'-24.0'
Sample Number: 0950 **Date:** 2-18-21

Terracon

Client: CONFIDENTIAL
Project: EDWARDS POWER STATION
Project No: 11215017 **Figure**

Tested By: SJH **Checked By:** WPQ

Particle Size Analysis of Soils ASTM D6913 and D7928



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.1	0.1	9.1	28.2	49.7	12.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.8		
#20	97.7		
#40	90.7		
#60	83.2		
#100	75.8		
#200	62.5		
0.0400 mm.	51.7		
0.0302 mm.	44.6		
0.0201 mm.	38.6		
0.0125 mm.	28.8		
0.0091 mm.	23.3		
0.0067 mm.	17.9		
0.0049 mm.	12.4		
0.0034 mm.	9.1		
0.0010 mm.	3.8		

* (no specification provided)

Soil Description

GRAYISH BROWN SANDY SILT

Atterberg Limits

PL= 33 LL= 39 PI= 6

Coefficients

D_{90}= 0.4022 D_{85}= 0.2838 D_{60}= 0.0640
D_{50}= 0.0374 D_{30}= 0.0132 D_{15}= 0.0057
D_{10}= 0.0039 C_u= 16.47 C_c= 0.70

Classification

USCS= ML AASHTO= A-4(3)

Remarks

F.M.=0.45

Source of Sample: XPW-02 **Depth:** 45.0'-47.0'
Sample Number: 1245

Date: 2-18-21

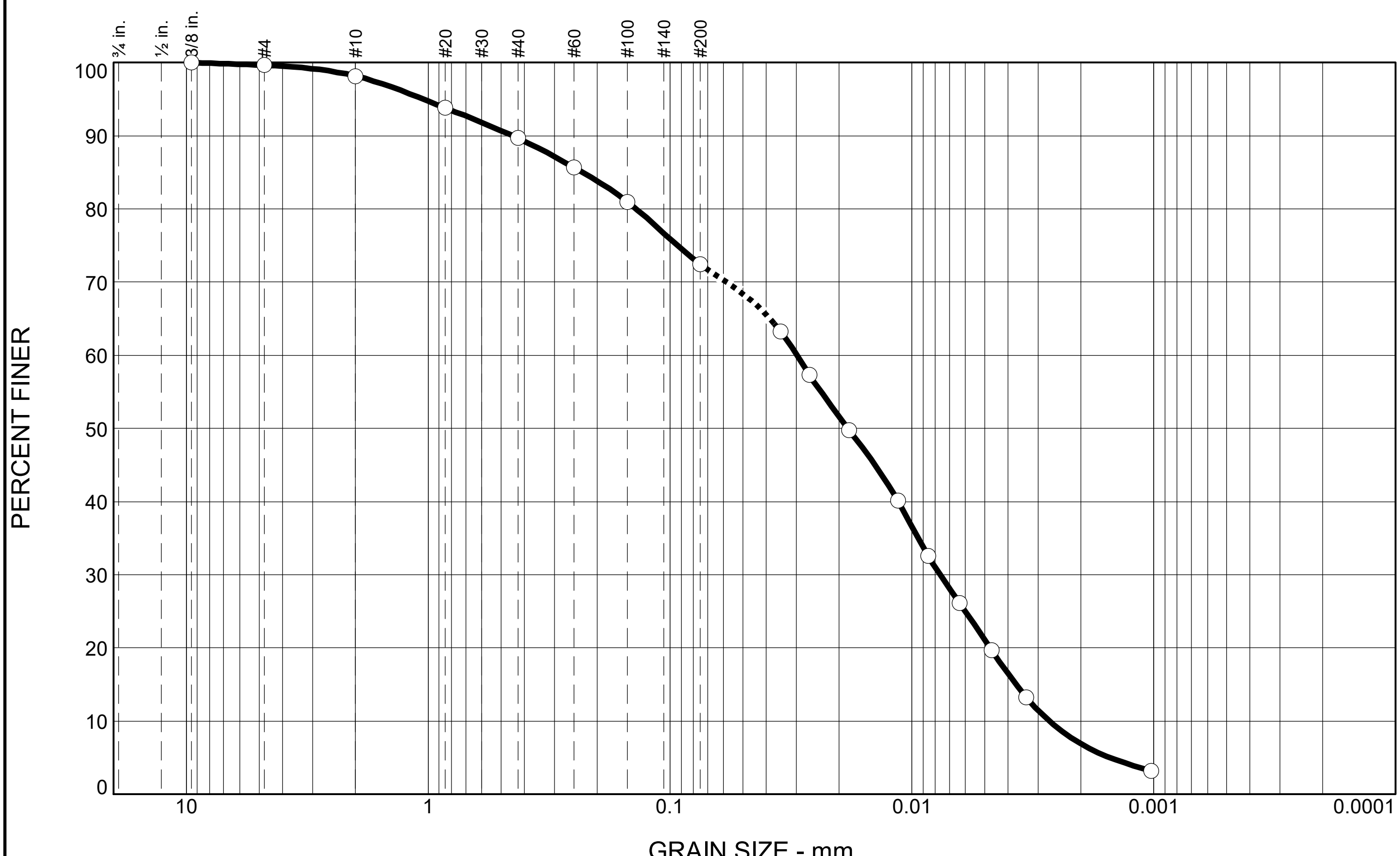
Terracon

Client: CONFIDENTIAL
Project: EDWARDS POWER STATION

Project No: 11215017 **Figure**

Tested By: SJH **Checked By:** WPQ

Particle Size Analysis of Soils ASTM D6913 and D7928



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.4	1.4	8.5	17.3	51.3	21.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.6		
#10	98.2		
#20	93.8		
#40	89.7		
#60	85.7		
#100	81.0		
#200	72.4		
0.0348 mm.	63.2		
0.0265 mm.	57.3		
0.0182 mm.	49.8		
0.0114 mm.	40.1		
0.0086 mm.	32.6		
0.0063 mm.	26.1		
0.0047 mm.	19.7		
0.0034 mm.	13.3		
0.0010 mm.	3.2		

* (no specification provided)

Soil Description

DARK GRAY SILT WITH SAND - ROOTS NOTED

Atterberg Limits

PL= 29 LL= 36 PI= 7

Coefficients

D_{90}= 0.4460 D_{85}= 0.2296 D_{60}= 0.0299
D_{50}= 0.0184 D_{30}= 0.0076 D_{15}= 0.0037
D_{10}= 0.0027 C_u= 11.07 C_c= 0.72

Classification

USCS= ML AASHTO= A-4(5)

Remarks

F.M.=0.46

Source of Sample: XPW-03 **Depth:** 10.0'-12.0'
Sample Number: 1500 **Date:** 2-18-21

Terracon

Client: CONFIDENTIAL
Project: EDWARDS POWER STATION

Project No: 11215017 **Figure**

Tested By: SJH **Checked By:** WPQ

Terracon

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible-Wall Permeameter ASTM D5084

Terracon
Consulting Engineers & Scientists

HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

Laboratory Services Group **192 Exchange Blvd** **Glendale Heights, Illinois 60139** **Ph. (630) 717-4263**

TERRACON PROJECT NO.:	**11215017**	**3/5/2021**
PROJECT NAME:	**EDWARDS POWER STATION**	
CLIENT:	**CONFIDENTIAL**	
LOCATION :	**CONFIDENTIAL**	

SUMMARY OF TEST RESULTS

BORING NO.	AW13A
TIME SAMPLED:	8:50
DEPTH:	5..0'-7.0'
CLASSIFICATION	LIGHT BROWN AND GRAY SANDY LEAN CLAY (CL)

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	96.5	97.7
WATER CONTENT (%)	25.2	25.8
DIAMETER (cm)	7.150	7.153
LENGTH (cm)	9.159	9.038
B VALUE PARAMETER:	0.95	
HYDRAULIC GRADIENT (MAXIMUM)	21.81	
PERCENT SATURATION	98.5	
HYDRAULIC CONDUCTIVITY k (cm/sec)	4.72E-08	

SPECIMEN PHOTO

(Percent saturation calculation is based on final measurements and a measured specific gravity.)

Deaired water was used as the liquid permeant.

Terracon
Consulting Engineers & Scientists

Laboratory Services Group | 192 Exchange Blvd | Glendale Heights, Illinois 60139 | Ph. (630) 717-4263

TERRACON PROJECT NO.: **15205262** **3/5/2021**
PROJECT NAME: **EDWARDS POWER STATION**
CLIENT: **CONFIDENTIAL**
LOCATION : **CONFIDENTIAL**

SUMMARY OF TEST RESULTS

BORING NO. AW15A

TIME SAMPLED: 10:25

DEPTH: 20.0'-22.0'

CLASSIFICATION GRAY FAT CLAY (CH)

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	85.8	86.3
WATER CONTENT (%)	27.9	34.5
DIAMETER (cm)	7.218	7.169
LENGTH (cm)	8.961	9.038
B VALUE PARAMETER:	0.97	
HYDRAULIC GRADIENT (MAXIMUM)	22.29	
PERCENT SATURATION	98.3	
HYDRAULIC CONDUCTIVITY k (cm/sec)	2.87E-08	

SPECIMEN PHOTO

(Percent saturation calculation is based on final measurements and a measured specific gravity.)

Deaired water was used as the liquid permeant.

Terracon
Consulting Engineers & Scientists

Laboratory Services Group | 192 Exchange Blvd | Glendale Heights, Illinois 60139 | Ph. (630) 717-4263

TERRACON PROJECT NO.: **15205262** **3/5/2021**
PROJECT NAME: **EDWARDS POWER STATION**
CLIENT: **CONFIDENTIAL**
LOCATION : **CONFIDENTIAL**

SUMMARY OF TEST RESULTS

BORING NO. AW20

TIME SAMPLED: N/A

DEPTH: 15.0'-17.0'

CLASSIFICATION GRAY AND DARK GRAY LEAN CLAY - SAND POCKETS NOTED

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	83.9	86.6
WATER CONTENT (%)	35.1	34.6
DIAMETER (cm)	7.143	7.212
LENGTH (cm)	9.300	8.830
B VALUE PARAMETER:	0.96	
HYDRAULIC GRADIENT (MAXIMUM)	21.48	
PERCENT SATURATION	99.6	
HYDRAULIC CONDUCTIVITY k (cm/sec)	7.23E-08	

SPECIMEN PHOTO

(Percent saturation calculation is based on final measurements and a measured specific gravity.)

Deaired water was used as the liquid permeant.

Laboratory Services Group **192 Exchange Blvd** **Glendale Heights, Illinois 60139** **Ph. (630) 717-4263**

TERRACON PROJECT NO.:	**11215017**	**3/5/2021**
PROJECT NAME:	**EDWARDS POWER STATION**	
CLIENT:	**CONFIDENTIAL**	
LOCATION :	**CONFIDENTIAL**	

SUMMARY OF TEST RESULTS

BORING NO.	AW22
TIME SAMPLED:	7:45
DEPTH:	5..0'-7.0'
CLASSIFICATION	GRAY, LIGHT GRAY AND LIGHT BROWN CLAYEY SAND (SC)

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	101.3	101.9
WATER CONTENT (%)	23.2	23.9
DIAMETER (cm)	7.141	7.204
LENGTH (cm)	8.463	8.273
B VALUE PARAMETER:	0.99	
HYDRAULIC GRADIENT (MAXIMUM)	23.60	
PERCENT SATURATION	99.0	
HYDRAULIC CONDUCTIVITY k (cm/sec)	1.74E-07	

SPECIMEN PHOTO

(Percent saturation calculation is based on final measurements and a measured specific gravity.)

Deaired water was used as the liquid permeant.

Laboratory Services Group **192 Exchange Blvd** **Glendale Heights, Illinois 60139** **Ph. (630) 717-4263**

TERRACON PROJECT NO.: **11215017** **5/4/2021**
PROJECT NAME: **EDWARDS POWER STATION**
CLIENT: **CONFIDENTIAL**
LOCATION : **CONFIDENTIAL**

SUMMARY OF TEST RESULTS

BORING NO. XPW-01

TIME SAMPLED: 12:10

DEPTH: 20.0'-22.0'

CLASSIFICATION DARK GRAY SILTY SAND

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	69.8	55.7
WATER CONTENT (%)	43.7	69.2
DIAMETER (cm)	7.272	7.183
LENGTH (cm)	6.449	8.273
B VALUE PARAMETER:	0.99	
HYDRAULIC GRADIENT (MAXIMUM)	9.17	
PERCENT SATURATION	99.3	
HYDRAULIC CONDUCTIVITY k (cm/sec)	1.18E-05	

SPECIMEN PHOTO

(Percent saturation calculation is based on final measurements and a measured specific gravity.)

Deaired water was used as the liquid permeant.

HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

Laboratory Services Group **192 Exchange Blvd** **Glendale Heights, Illinois 60139** **Ph. (630) 717-4263**

TERRACON PROJECT NO.:	**11215017**	**5/4/2021**
PROJECT NAME:	**EDWARDS POWER STATION**	
CLIENT:	**CONFIDENTIAL**	
LOCATION :	**CONFIDENTIAL**	

SUMMARY OF TEST RESULTS

BORING NO.	XPW-01A
TIME SAMPLED:	15:30
DEPTH:	40.0'-42.0'
CLASSIFICATION	DARK GRAY ELASTIC SILT

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	71.7	73.1
WATER CONTENT (%)	35.1	42.7
DIAMETER (cm)	6.082	6.072
LENGTH (cm)	10.387	10.221
B VALUE PARAMETER:	0.99	
HYDRAULIC GRADIENT (MAXIMUM)	9.08	
PERCENT SATURATION	99.0	
HYDRAULIC CONDUCTIVITY k (cm/sec)	6.77E-06	

SPECIMEN PHOTO

(Percent saturation calculation is based on final measurements and a measured specific gravity.)

Deaired water was used as the liquid permeant.

Laboratory Services Group | 192 Exchange Blvd | Glendale Heights, Illinois 60139 | Ph. (630) 717-4263

TERRACON PROJECT NO.: **11215017** **5/4/2021**
PROJECT NAME: **EDWARDS POWER STATION**
CLIENT: **CONFIDENTIAL**
LOCATION : **CONFIDENTIAL**

SUMMARY OF TEST RESULTS

BORING NO. XPW-02

TIME SAMPLED: 8:45

DEPTH: 10.0'-12.0'

CLASSIFICATION DARK GRAY AND GRAYISH BROWN ELASTIC SILT WITH SAND

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	67.5	70.1
WATER CONTENT (%)	45.1	47.2
DIAMETER (cm)	7.220	7.150
LENGTH (cm)	8.112	7.973
B VALUE PARAMETER:	0.97	
HYDRAULIC GRADIENT (MAXIMUM)	11.62	
PERCENT SATURATION	99.5	
HYDRAULIC CONDUCTIVITY k (cm/sec)	1.20E-05	

SPECIMEN PHOTO

(Percent saturation calculation is based on final measurements and a measured specific gravity.)

Deaired water was used as the liquid permeant.

Terracon
Consulting Engineers & Scientists

HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

Laboratory Services Group **192 Exchange Blvd** **Glendale Heights, Illinois 60139** **Ph. (630) 717-4263**

TERRACON PROJECT NO.:	**11215017**	**5/4/2021**
PROJECT NAME:	**EDWARDS POWER STATION**	
CLIENT:	**CONFIDENTIAL**	
LOCATION :	**CONFIDENTIAL**	

SUMMARY OF TEST RESULTS

BORING NO.	XPW-02
TIME SAMPLED:	9:50
DEPTH:	22.0'-24.0'
CLASSIFICATION	DARK GRAY SILT

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	77.1	79.6
WATER CONTENT (%)	33.4	35.1
DIAMETER (cm)	6.067	6.076
LENGTH (cm)	11.969	11.556
B VALUE PARAMETER:	0.95	
HYDRAULIC GRADIENT (MAXIMUM)	7.88	
PERCENT SATURATION	99.2	
HYDRAULIC CONDUCTIVITY k (cm/sec)	2.08E-06	

SPECIMEN PHOTO

(Percent saturation calculation is based on final measurements and a measured specific gravity.)

Deaired water was used as the liquid permeant.

Consulting Engineers & Scientists

HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

Laboratory Services Group **192 Exchange Blvd** **Glendale Heights, Illinois 60139** **Ph. (630) 717-4263**

TERRACON PROJECT NO.:	**11215017**	**5/4/2021**
PROJECT NAME:	**EDWARDS POWER STATION**	
CLIENT:	**CONFIDENTIAL**	
LOCATION :	**CONFIDENTIAL**	

SUMMARY OF TEST RESULTS

BORING NO.	XPW-02
TIME SAMPLED:	12:45
DEPTH:	45.0'-47.0'
CLASSIFICATION	GRAYISH BROWN SANDY SILT

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	73.5	78.9
WATER CONTENT (%)	41.7	36.8
DIAMETER (cm)	6.073	5.993
LENGTH (cm)	9.127	8.731
B VALUE PARAMETER:	0.95	
HYDRAULIC GRADIENT (MAXIMUM)	10.33	
PERCENT SATURATION	98.9	
HYDRAULIC CONDUCTIVITY k (cm/sec)	1.00E-05	

SPECIMEN PHOTO

(Percent saturation calculation is based on final measurements and a measured specific gravity.)

Deaired water was used as the liquid permeant.

Terracon
Consulting Engineers & Scientists

HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

Laboratory Services Group **192 Exchange Blvd** **Glendale Heights, Illinois 60139** **Ph. (630) 717-4263**

TERRACON PROJECT NO.: **11215017** **5/4/2021**
PROJECT NAME: **EDWARDS POWER STATION**
CLIENT: **CONFIDENTIAL**
LOCATION : **CONFIDENTIAL**

SUMMARY OF TEST RESULTS

BORING NO. XPW-03

TIME SAMPLED: 15:00

DEPTH: 10.0'-12.0'

CLASSIFICATION DARK GRAY SILT WITH SAND - ROOTS NOTED

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	68.0	70.7
WATER CONTENT (%)	43.8	46.0
DIAMETER (cm)	6.111	6.085
LENGTH (cm)	12.259	11.894
B VALUE PARAMETER:	0.98	
HYDRAULIC GRADIENT (MAXIMUM)	7.69	
PERCENT SATURATION	99.6	
HYDRAULIC CONDUCTIVITY k (cm/sec)	3.29E-05	

SPECIMEN PHOTO

(Percent saturation calculation is based on final measurements and a measured specific gravity.)

Deaired water was used as the liquid permeant.

AECOM
GEOTECHNICAL REPORTS

January 12, 2016

Mr. Matt Ballance, PE
Senior Project Engineer
Dynegy Inc.
1500 Eastport Plaza Drive
Collinsville, Illinois 62234

RE: Geotechnical Data Report for Dynegy Edwards Station; Edwards Ash Pond

Dear Mr. Ballance:

AECOM is pleased to provide this 30% Design Data Package for Edwards Ash Pond Coal Combustion Residuals (CCR) units at the E.D. Edwards Power Station (Bartonsville, IL). The Data Package includes summary tables, field exploration plan, and laboratory data.

At Edwards, the geotechnical exploratory program included the following:

- 14 auger borings
- 22 CPT soundings
- 4 standpipe piezometers

AECOM looks forward to providing continued support to Dynegy and working together on this important program. Please do not hesitate to call the undersigned, if you have any questions or comments on this 30% Design Data Package.

Sincerely,

AECOM

Jeremy M. Thomas, P.E.
Project Manager
jeremy.thomas@aecom.com

Attachments:
Tables
Table 1-1 Exploration Location Table
Table 1-2 Water Level Measurements – Piezometers

Figures
D-01 Exploration Locations
D-02 Cross Section Locations
D-03 Piezometer Locations

Appendices

Appendix A Boring Logs
Appendix B Piezometer Installation Logs
Appendix C CPT Sounding Logs
Appendix D Laboratory Test Results

TABLES

Data Report
E. D. Edwards Station
Tabel 1-1 Exploration Location Table

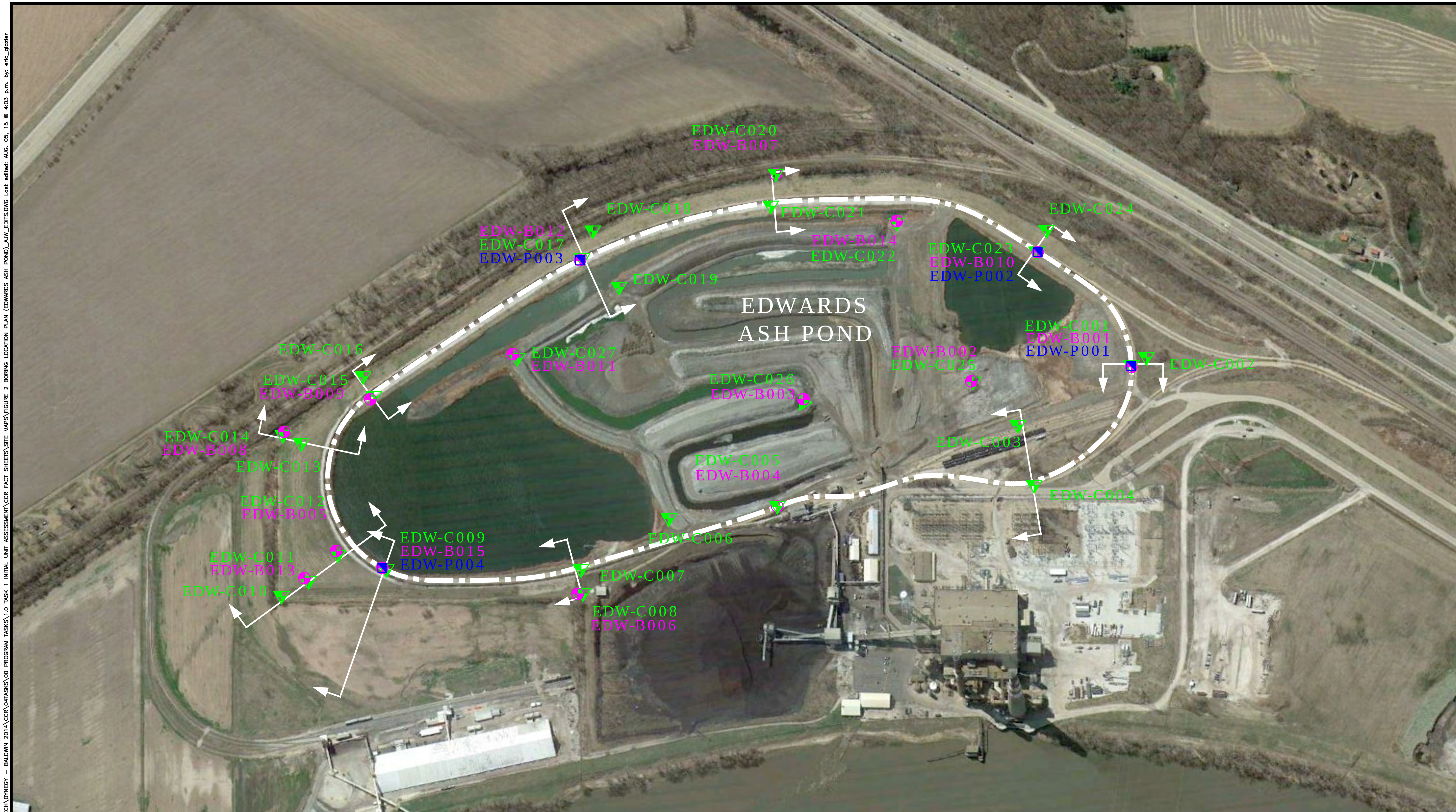
Boring	Depth	Longitude	Latitude	Elevation
EDW-B001	51.0	-89.6671	40.5975	460
EDW-B002	52.5	-89.6671	40.5956	457
EDW-B003	60.5	-89.6668	40.5936	460
EDW-B004	60.3	-89.6652	40.5933	461
EDW-B005	53.0	-89.6643	40.5879	460
EDW-B006	37.0	-89.6638	40.5904	440
EDW-B008	42.5	-89.6662	40.5873	439
EDW-B009	66.5	-89.6667	40.5881	446
EDW-B010	45.3	-89.6691	40.5963	459
EDW-B011	62.0	-89.6675	40.5902	456
EDW-B012	60.0	-89.669	40.5909	453
EDW-B013	53.0	-89.664	40.5875	458
EDW-B014	45.5	-89.6695	40.5947	456
EDW-B015	57.0	-89.6643	40.5884	444
Piezometers	Depth	Longitude	Latitude	Elevation
EDW-P001	36.5	-89.6671	40.5975	460
EDW-P002	31.0	-89.6691	40.5963	459
EDW-P003	51.0	-89.669	40.5909	453
EDW-P004	31.5	-89.6643	40.5884	444
CPT	Depth	Longitude	Latitude	Elevation
EDW-C001	38.9	40.5975	-89.6671	460
EDW-C003	54.6	40.5960	-89.6663	461
EDW-C005	40.0	40.5933	-89.6652	461
EDW-C006	40.0	40.5920	-89.665	473
EDW-C007	54.8	40.5907	-89.6642	461
EDW-C008	33.6	40.5904	-89.6638	441
EDW-C009	52.2	40.5884	-89.6643	444
EDW-C010	30.0	40.5873	-89.6638	442
EDW-C011	47.1	40.5875	-89.664	358
EDW-C012	50.2	40.5879	-89.6643	460
EDW-C013	56.3	40.5875	-89.666	458
EDW-C014	38.2	40.5873	-89.6662	443
EDW-C015	40.0	40.5881	-89.6667	446
EDW-C016	36.9	40.5880	-89.6669	449
EDW-C017	55.9	40.5909	-89.669	453
EDW-C019	53.3	40.5914	-89.6685	462
EDW-C021	49.4	40.5934	-89.6699	452
EDW-C022	20.0	40.5947	-89.6695	456
EDW-C023	40.7	40.5963	-89.6691	459
EDW-C025	20.0	40.5956	-89.6671	457
EDW-C026	14.6	40.5936	-89.6668	460
EDW-C027	40.0	40.5902	-89.6675	456

Table 1-2 Water Level Measurements - Piezometers

Piezometer	Ground Surface Elevation (ft)	Screen Depth Interval (ft)		Water Surface Elevation (ft)		
		Top	Bottom	10/28/2015	11/24/2015	12/17/2015
EDW-P001	461.0	30.0	35.0		436.7	438.9
EDW-P002	459.0	24.3	29.0	449.7	449.8	450.2
EDW-P003	459.6	44.3	49.6	437.3	438.7	439.1
EDW-P004	455.6	25.2	30.2		442.8	442.9

FIGURES

File: \\URSSTLOUIS\STLOUIS\PROJECTS\GEOTECH\DYNEGY - BALDWIN 2014\CCR\04TASKS\00 PROGRAM TASKS\1.0 TASK 1 INITIAL UNIT ASSESSMENT\CCR FACT SHEETS\SITE MAPS\FIGURE 2 BORING LOCATION PLAN (EDWARDS ASH POND)_AJW_EDITS.DWG Last edited: AUG. 05, 15 @ 4:03 p.m. by: eric_glazier



XXX–X### — EXPLORATION METHOD (B=BORING, C=CPT, P=PIEZOMETER); ID NUMBER; STATION ABBREVIATION

LEGEND

- PROPOSED BORING LOCATION
- PROPOSED CPT LOCATION
- PROPOSED PIEZOMETER LOCATION
- PROPOSED CROSS SECTION LOCATION
- CCR UNIT BERM ALIGNMENT

SOURCE:
MAP PROVIDED BY GOOGLE EARTH PRO 2015

N

0 400

APPROXIMATE SCALE FEET

DYNEGY, INC	PROJECT NO. 60440202
AECOM	
DRN. BY: djd July 2015 DSGN. BY: eg CHKD. BY: eg	Edwards Ash Pond Field Investigation Plan — FIG. NO. 1

APPENDIX A

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B001

Date(s) Drilled	11/05/2015 to 11/05/2015	Logged By	Robert Weseljak	Checked By	AJW
Drilling Method	Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	51.0 ft
Drill Rig Type	Mobile B-57 Truck Mounted	Drilling Contractor	Strata Earth Services	Surface Elevation	460 ft
Borehole Backfill	Portland Cement and Bentonite	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Elevation (feet)	Depth (feet)	Sample Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
460	0	SS-1	2 6 8	61	(460.0 / 0.0) Stiff, dry, gray mottled with brown, lean CLAY (CL).					3.0			
		SS-2	3 4 5	94	(457.5 / 2.5) Stiff, moist, brown mottled with gray and black, lean CLAY (CL), trace shell fragments.					3.0			
455	5	SS-3	3 3 3	75	Becomes medium stiff.					1.0			
		ST-4	200 psi	100									*Pushed shelby tube from 7.0 to 9.0 feet*
450	10	SS-5	3 3 6	83	(450.0 / 10.0) Stiff, moist, grayish black, lean CLAY (CL), trace organics.					1.0 1.5			
445	15	SS-6	1 3 5	78						1.25			
440	20	SS-7	1 6 7	100	(440.0 / 20.0) Stiff, moist, very dark gray to grayish black with some brown, lean CLAY (CL).					1.5 2.5			
435	25	SS-8	WOH WOH 2	100	(435.0 / 25.0) Very soft, wet, brown mottled with gray, sandy lean CLAY (CL).					1.0 0.5			
430	30				(430.0 / 30.0)								

Elevation (feet)	Depth (feet)	Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Material Description	Elevation (feet) / Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	Remarks
430	30	ST-9	150 psi	100	Soft, wet, gray, silty lean CLAY (CL-ML).						1.25			*Pushed shelby tube from 30.0 to 32.0 feet*
425	35	SS-10	2 2 4	100	Loose, wet, gray, silty SAND (SM), trace wood fragments.	425.0 / 35.0					0.5 1.0			
					Medium stiff, moist, gray, lean CLAY (CL).	424.2 / 35.8								
420	40	SS-11	50/3"	100	CLAYSTONE: Brown and gray, weathered, hard.	420.0 / 40.0								
415	45	SS-12	50/2"											
		Run 1	16.7	36.7	SILTSTONE: Thin to medium bedding, fresh, argillaceous.	414.0 / 46.0								*Run 1 - Start 13:46, End 14:00*
410	50				End of Boring at 51 ft	409.0 / 51.0								*Boring backfilled with Portland Cement and bentonite*
405	55													
400	60													
395	65													

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B002

Date(s) Drilled	09/03/2015 to 09/03/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	52.5 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	457 ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	7.5 ft on 9/3/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
457.0	0.0	SS-1	7 6 8	89		Medium dense, moist, dark brown, FLY ASH [Fill].	38.4							
455														
454.5	2.5	SS-1	3 2 2	100		Loose, moist, dark gray, FLY ASH [Fill].	62.4							
	5	ST-3	150 psi	62.5			66.6		65	29				*Pushed shelby tube from 5.0 to 7.0 feet*
450														
449.5	7.5 ▽	SS-4	WOR	100		Very loose, wet, black, FLY ASH [Fill].	79.0							
	10	ST-5		55			76.9	90.8 94.3 91.2	17	NP				*10.0 feet switch to mud rotary Pushed shelby tube from 10.0 to 12.0 feet*
445						Becomes dark gray.								
						Hard layer at tip of tube.								
	15	SS-6	1 2 3	100		Becomes loose.	52.5							
440														
437.0	20.0	SS-7	12 17 2	37		Medium dense, wet, dark gray, FLY ASH [Fill], with cementous layers.	67.8							
435														
432.0	25.0	SS-8	1 WOH WOH	100		Very loose, wet, dark gray, FLY ASH [Fill].	63.9							
430														
	30													

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B002

Elevation (feet)	Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Elevation (feet)	Material Description	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	Remarks
	30	SS	SS-9	WOR WOH WOH	100	426.5	With clay.	30.5	126.1							
							Very soft, wet, brown, lean CLAY (CL), with sand.		31.1				0.5			
425																
	35	ST	ST-10	100 psi	100	422.0	Very soft, gray, lean CLAY (CL), with sand, trace shells.	35.0	31.6		36	18	0.25			
420																
	40	SS	SS-11	WOH WOH WOH	100				42.9				0.75			
415																
	45	SS	SS-12	WOH WOH 2	100		Grades with trace organics.		57.7				0.25			
410						410.0	SHALE: Light gray, silt sized.	47.0								
	50	SS	SS-13	50/3"	100				11.1							
405						404.5	End of Boring at 52.5 ft	52.5								*Boring backfilled with bentonite and cement fluid*
	55															
400																
	60															
395																
	65															

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B003

Date(s) Drilled	09/03/2015 to 09/03/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	60.5 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	460 ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	7 ft on 9/3/2015		

Elevation (feet)	Depth (feet)	Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
460	0	SS-1	7 7 7	83	460.0 / 0.0 Medium dense, moist, dark gray, FLY ASH [Fill].	44.4							
		SS-2	3 2 2	100	Becomes loose.	27.3							
455	5	SS-3	1 WOH 2		455.0 / 5.0 Very soft, moist, lean CLAY (CL) with ash, sand, and organics.	37.2							
		ST-4	<100 psi	100	452.5 / 7.5 Ash, dark gray [Fill].	55.5							Pushed shelby tube from 7.5 to 9.5 feet
450	10	SS-5	WOR WOR WOR	67		50.6							10.0 feet: Switch to mud rotary
					447.0 / 13.0 Very dense, dark gray, moist, fine to coarse ASH with sand and gravel, slightly cemented [Fill].								13.0 feet: Hard drilling
445	15	SS-6	26 37 29	100		29.7							
					Becomes very loose, dark gray, fine.								
440	20	SS-7	1 1 1	100		42.1							
435	25	ST-8	100 psi	100	Grades with sand.	54.9							Pushed shelby tube from 25.0 to 27.0 feet
430	30												

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Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B003

Sheet 2 of 2

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
430	30	ST-9	100 psi	100	Varved FLY ASH.	71.7	91.2 92.9 92.0						*Pushed shelby tube from 30.0 to 32.0 feet*
425	35	SS-10	WOR WOR WOR	100		51.9 43.0							
423.5	36.5				Very soft, moist, brown to gray, silty CLAY (CL), trace sand, shells, and organics.								
420	40	SS-11	WOH WOH WOR	100		31.6				.75			
415.0	45.0	ST-12	100 psi	100	Soft, moist, dark gray, fat CLAY (CH) with sand.	46.0				1.0			*Pushed shelby tube from 45.0 to 47.0 feet*
410.0	50.0	SS-13	1 2 3	100	Medium stiff, moist, brownish to greenish, gray, lean CLAY (CL), with sand.	55.4				1.0			
406.0	54.0				SHALE, gray, weathered, silt sized.								
405	55	SS-14	11 50/5"	100		23.3 9.8							
400	60	SS-15	50/3"	100		7.1							
399.5	60.5				End of Boring at 60.5 ft								*Boring backfilled with bentonite and cement fluid*
395	65												

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B003A

Date(s) Drilled	09/03/2015 to 09/03/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	9.5 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
Boring Location (ft NAD83)	5' East of EDW-B003	Groundwater Level(s)	7 ft on 9/3/2015		

Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
0						0.0 Offset boring to attempt shelby tube at 7.5 feet								
7						∇								
7.5–9.5	Shelby tube	ST-1		0										*Pushed shelby tube from 7.5 to 9.5 feet*
9.5						9.5 End of Boring at 9.5 ft								*Boring backfilled with bentonite and cement fluid*

Depth scale: 0, 5, 10, 15, 20, 25, 30

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B004

Date(s) Drilled	09/11/2015 to 09/11/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	60.3 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
0						0.0								
		SS-1	16 12 15	83		6" stone at surface. (0.5) Medium dense, moist, dark gray, ASH [Fill].	18.9							
		SS-2	3 2 2	100		(3.5) Becomes dark gray to dark brown, trace silty clay, sand and gravel.	28.5 20.1							
5		SS-3	2 2 4	77							1.25			
		SS-4	2 3 4	100			21.6				2.0			
10		SS-5	2 2 2	67			21.5				2.0			*10.0 feet: Switch to mud rotary*
		SS-6	2 2 2	100		(12.5) Soft, wet, brown mottled, silty CLAY (CL), trace sand and gravel.	25.4				1.25			
15		SS-7	2 3 3	77			25.8				1.25			
20		SS-8	WOH 2 3	89		Grades brown, with sand.	31.3				.75			
25		SS-9	2 2 3	89		(26.0) Medium stiff, wet, brown, clayey SAND (SC). (26.5) Medium stiff, wet, dark gray to gray, silty CLAY (CL), trace sand.	23.0 19.5							
30						30.0								

Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
30		SS-10	2 7 6	89		Stiff, gray, wet, lean CLAY (CL), with sand, and organics.		19.7				4.0			
35		ST-11		100		Stiff, wet, gray mottled, lean CLAY (CL) with sand.	35.0	20.1				1.25			*Pushed shelby tube from 36.0 to 38.0 feet*
40		SS-12	2 3 3	89		Stiff, wet, brown mottled, lean CLAY (CL), trace sand.	40.0	30.0				1.75			
45		SS-13	2 3 5	83		Medium stiff, wet, dark gray, lean CLAY (CL).	45.0	39.5 35.1				1.25			
50		SS-14	2 2 3	100		Medium, stiff, wet, gray, lean CLAY (CL) with sand, trace shells and organics.	50.0	65.2				1.25			
55		SS-15	3 8 23					33.4 13.2							
						SHALE: Light gray, weathered.	56.0								*56.5 to 60.0 feet: Solid drilling*
60		SS-16	50/3"	100		End of Boring at 60.3 ft	60.0	8.8							*Boring backfilled with bentonite and cement fluid*
65															

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B005

Date(s) Drilled	09/10/2015 to 09/10/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	53.0 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	8 ft on 9/10/2015		

Depth (feet)	SAMPLES: Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Depth (feet)	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
0	SS-1	4 4 5	95	0.0	Medium, stiff, moist, brown, clayey SAND (SC), trace gravel, topsoil, roots and fill.	45.8				2.0			
	SS-2	9 15 11	100	2.5	Medium dense, moist, brown, sandy SILT (ML) with gravel.	26.0							
5	SS-3	2 2 2	100	5.0	Loose, moist, brown, sandy elastic SILT (MH) with clay.	50.9				1.8			
	SS-4		100	8.0 ∇	Loose, wet, brown, sandy SILT (ML) with gravel.	37.4							
10	SS-5	1 2 5	100	10.0	Medium stiff, wet, light brown and gray, clayey SAND (SC) with gravel.	44.3							*10.0 feet: Switch to mud rotary*
15	SS-6	2 8 10	100	15.0	Very stiff, wet, brown, sand SILT (ML) with gravel.	41.4							
20	SS-7	1 1 1	100	20.0	Soft, wet, brown, gravelly CLAY (CL), trace sand.	51.1							
25	SS-8	2"	100			55.3 47.6							
				26.5	Very loose, wet, dark brown ASH [Fill].								
30	SS-9		100			69.3							

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B005

Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
30		SS-9		100			69.3							
35		SS-10	WOR WOH WOH	67		35.0 Very loose, wet, black, ASH, with organic clay [Fill].	37.3							
						38.0 Soft, wet, gray, fat CLAY (CH), trace sand, shells, and organics.								
40		ST-11	150 psi	100			44.8		57	35				*Pushed shelby tube from 41.0 to 43.0 feet*
45		SS-12	WOH 2 2	100		45.0 Soft, wet, dark gray and greenish gray, lean CLAY (CL), with sand, organics and shale.	88.7							
						49.5 SHALE: light gray, weathered.								
50		SS-13	11 18 44	89			15.9 12.8							
						53.0 End of Boring at 53 ft								*Boring backfilled with bentonite and cement fluid*
55														
60														
65														

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B006

Date(s) Drilled	09/08/2015 to 09/08/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	37.0 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
0					0.0								
	SS-1	3 4 6	94		Stiff, moist, dark brown, lean CLAY (CL) with sand and glass.	26.4				3.0			
					2.5								
	SS-2	3 3 3	67		Medium stiff, brown to dark brown lean CLAY (CL), trace sand.	30.1				1.25			
5					5.0								
	SS-3	2 3 4	100		Medium stiff, moist, gray and mottled brown, lean CLAY (CL), trace sand.	24.8		48	29	2.0			
	SS-4	3 4 4	100			26.0				1.5			
10	SS-5	1 2 1	100		Becomes soft.	34.2				1.0			*10.0 feet: Switch to mud rotary*
													Pushed shelby tube from 12.0 to 14.0 feet
					13.0								
	ST-6		100		Soft, moist, gray fat CLAY (CH) with sand and shells.	31.1		62	42	1.25			
15					15.0								
	SS-7	1 1 1	100		Soft, moist, brownish gray, lean CLAY (CL).	40.8				1.0			
20	SS-8	WOH WOH 1	100		Becomes very soft, brown and gray, with sand.	43.4				0.75			
25													
					26.0								
	ST-9		100		Very soft, moist, dark gray, organic SILT (OH).	76.0		72	35	0.75			*Pushed shelby tube from 26.0 to 28.0 feet*
30					30.0								

Depth (feet)	Samples: Type	Samples: Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
30		SS-10		89		Very soft, moist, gray lean CLAY (CL) with sand, pockets of organics.	31.0	43.4				0.75			
						Very soft, moist, grayish brown, lean CLAY (CL) with sand, silt, and organics.	33.0	19.6							
						SHALE: light gray, weathered.	37.0								
35		SS-11		84				14.2							
						End of Boring at 37 ft									*Boring backfilled with bentonite and cement fluid*

40

45

50

55

60

65

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B008

Date(s) Drilled	09/13/2015 to 09/13/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	42.5 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
0	SS	SS-1	3 4 4	100		0.0 Stiff, moist, brown, lean CLAY (CL) with sand and gravel, trace roots.	13.2				4.0			
	SS	SS-2	3 4 6	100			19.5		42	20	4.25			
5	SS	SS-3	2 3 5	67		Becomes medium stiff.	42.3				2.0			
	SS	SS-4	1 3 2	89		7.5 Medium stiff, moist, gray and mottled brown, lean CLAY (CL), trace sand.	22.8				2.5			
10														*10.0 feet: Switch to mud rotary*
	ST	ST-5	150 psi	85		11.0 Medium stiff, moist, brown and gray fat CLAY (CH), trace sand.	33.6		52	33	0.75			
15	SS	SS-6	WOH 1 1	100		15.0 Soft, moist, dark brown, lean CLAY (CL), trace shells.	64.6				0.75			
20	SS	SS-7	WOH WOH WOH	100		Becomes very soft.	44.4				0.75			
25	ST	ST-8	150 psi			24.0 Very soft, moist, dark gray, fat CLAY (CL), trace organics.	68.9		67	36	1.0			
30						30.0								

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B008

Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
30		SS-9	WOH WOH WOH	100		Very soft, moist, gray and brownish gray, lean CLAY (CL), trace sand.	71.4				0.5			
35		SS-10	WOH WOH WOH	100		Trace wood, organics, and shells.	56.9				0.75			
39.0						SHALE: Light gray, slightly weathered.								
40		SS-11	66/4"	100			12.6							*40.0 to 42.5 feet: Solid drilling*
42.5						End of Boring at 42.5 ft								*Boring backfilled with bentonite and cement fluid*
45														
50														
55														
60														
65														

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B009

Date(s) Drilled	11/05/2015 to 11/05/2015	Logged By	Robert Weseljak	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	66.5 ft
Drill Rig Type	Mobile B-57 Truck Mounted	Drilling Contractor	Strata Earth Services	Surface Elevation	446 ft
Borehole Backfill	Portland Cement and Bentonite	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Elevation (feet)	Depth (feet)	Sample Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
446.0–445.5	0.0–0.5	SS-1	11 13 15	100	Medium dense, moist, brown silty SAND (SM).					1.0 1.25			
445.5–443.5	0.5–2.5				Very stiff, moist, gray and brown, sandy SILT (ML).								
443.5–441.5	2.5–4.5	SS-2	2 1 1	67	Soft, dry, gray and brown sandy SILT (ML)					0.25			
441.5–440.5	4.5–5.5				Concrete from 4.5 to 5.5.								
440.5–438.5	5.5–7.5	SS-3	5 2 5	11	Light brown, well graded GRAVEL (GW).								*5.5 feet: Limestone cobbles*
438.5–437.5	7.5–8.5	SS-4	5 4 4	89	Stiff, dry, brownish gray, silty SAND with GRAVEL (SM).					1.0			
437.5–435.0	8.5–11.0				Medium dense, moist, black, sandy SILT (ML).								
435.0–431.0	11.0–15.0	ST-5	250 psi	75	Medium stiff, moist, brownish gray, lean CLAY (CL).					1.5			*Pushed shelby tube from 11.0 to 13.0 feet Trace gravel in top of tube*
431.0–426.0	15.0–20.0	SS-6	1 5 5	89	Medium dense, moist, brown mottled with reddish brown, lean CLAY (CL).					2.0			
426.0–421.0	20.0–25.0	SS-7	WOH 2 4	94	Very soft to medium dense, moist to wet, gray, lean CLAY (CL) with shell and wood fragments.					1.0			
421.0–	25.0–30	SS-8	WOH WOH 3	100	Very soft to soft, wet, gray, lean CLAY (CL) with shell fragments.					0.5 1.0			

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B009

Elevation (feet)	Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
415.5	30.5		SS-9	WOH 7 7	100		Stiff, dry, black, lean CLAY (CL), low plasticity.					1.0 1.25			
	35		ST-10	125 psi	100		Becomes gray.					1.0			Pushed shelby tube from 35.0 to 37.0 feet
406.0	40.0		SS-11	WOH WOH 4	100		Soft, moist to wet, gray, lean CLAY (CL) with shell fragments, low to medium plasticity.					0.5			
	45		SS-12	WOH 1 4	100							1.0			
396.0	50.0		SS-13	WOH WOH WOH	100		Very soft, wet, gray, SILT (ML) with shell fragments, low plasticity.					1.0			
	55		SS-14	WOH WOH 17	100							3.0			
390.0	56.0						Medium dense, wet, gray, fine to coarse clayey GRAVEL (GC), trace fine to coarse sand, reddish brown gravel.								
386.0	60.0		SS-15	50/3"	17		CLAYSTONE: Gray.								
			Run 1	0	0										61.5 feet: Run 1 - Start 7:57, End 8:10
	65														

Elevation scale: 415, 410, 405, 400, 395, 390, 385. Depth scale: 30, 35, 40, 45, 50, 55, 60, 65.

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B009

Elevation (feet)	Depth (feet)	SAMPLES: Type	SAMPLES: Number	SAMPLES: Sampling Resist. OR Core RQD (%)	SAMPLES: Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
380			Run 1	0	0		379.5 / 66.5								
							End of Boring at 66.5 ft								
375	70														
370	75														
365	80														
360	85														
355	90														
350	95														
	100														

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Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B010

Date(s) Drilled	09/04/2015 to 09/04/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	45.3 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	459 ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Elevation (feet)	Depth (feet)	Sample Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
459.0	0.0	SS-1	10 6 10	56	458.5 / 0.5: Medium dense, moist, brown, SAND (SP) with gravel and clay. Medium dense, moist, dark gray, fine to coarse ASH [Fill].	7.2 17.4 27.9							
		SS-2	9 8 8	83		20.9 30.7							
455	5	SS-3	3 6 4	100		14.8							
451.5	7.5	SS-4	3 3 6	78	Stiff, moist, brown lean CLAY (CL), trace sand and gravel.	22.0							
449.0	10.0	SS-5	2 3 4	78	Medium stiff, moist, brown and mottled gray, lean CLAY (CL), trace sand.	24.0							
		SS-6	2 2 3	78		28.0							*12.0 feet: Switch to mud rotary*
	15	ST-7	250 psi	83		30.5		48	30				*Pushed shelby tube from 15.0 to 17.0 feet*
440.0	19.0				Soft, wet, gray, lean CLAY (CL), trace sand and shells.								
	20	SS-8	1 1 1	83		32.9							
	25	SS-6	WOH WOH 3	89		21.4							
430	30												

AECOM

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B010

Elevation (feet)	Depth (feet)	Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Elevation (feet)	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30	ST-10		72				30.0	117.6 118.9 118.6	40	25				*Pushed shelby tube from 30.0 to 32.0 feet*
425															
	35	SS-11	1 2 3	94		Becomes medium stiff.		28.2							
420															
	40	SS-12	6 7 50/3.5"	83	419.0	Medium dense, wet, brown, fine to coarse silty SAND (SP) with gravel.	40.0	17.0							
					418.0	SHALE: Light gray, weathered.	41.0								*41.0 to 43.0 feet: Hard drilling*
415															
	45	SS-13	50/3"	35	413.8	End of Boring at 45.25 ft	45.3	16.4							*Boring backfilled with bentonite and cement fluid*
410															
	50														
405															
	55														
400															
	60														
395															
	65														

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B011

Date(s) Drilled	09/12/2015 to 09/12/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	62.0 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	456 ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	7.5 ft on 9/12/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) 456.0; Depth (feet) 0.0)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0						Medium dense, moist, dark gray, ASH [Fill].								
455			SS-1	9 12 12	89			27.7							
			SS-2	8 9 14	100			16.3							
450	5		SS-3	6 9 9	94			29.4							
			SS-4	2 1 1	100		Becomes loose, wet.	45.3							
445	10		SS-5		84			70.0							*10.0 feet: Switch to mud rotary*
440	15		SS-6	WOR WOR WOR WOR	100		Becomes very loose.	63.2							
435	20		SS-7		56			84.9							
430	25		SS-8	WOR WOR WOR WOR	89			74.7							
	30														

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B011

Elevation (feet)	Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
425	30		SS-9	WOR WOR WOR WOR	100			73.7							
420	35		SS-10	WOR WOR WOR WOR	84			93.9							
416.0	40.0		SS-11	WOH 1 2	100		Soft, wet, gray, silty CLAY (CL), trace sand, shells, and organics.	47.9							
411.0	45.0		SS-12	WOR WOR WOH	94		Very soft, wet, gray, fat CLAY (CH), trace sand, shells, and wood.	63.3		63	42				
406.0	50.0		SS-13	WOR WOR WOH	89		Very soft, wet, dark gray and grayish brown, lean CLAY (CL).	62.5							
400	55		SS-14	WOR WOR WOH	100		Grades gray.	52.9							
398.0	58.0						SHALE: Light gray, soft.								*58.0 to 62.0 feet: Solid drilling*
395	60		SS-15	50/3"	100			9.1							
394.0	62.0						End of Boring at 62 ft								*Boring backfilled with bentonite and cement fluid*
	65														

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B012

Date(s) Drilled	09/09/2015 to 09/09/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	60.0 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	453 ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Elevation (feet)	Depth (feet)	Samples: Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Material Description (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	Remarks
453.0	0.0												
452.6	0.4				Limestone gravel.								
		SS-1	6 6 4	94	Stiff, moist, brown sandy SILT (ML), trace clay, gravel, and topsoil.	23.0							
450.5	2.5				Loose, moist, dark brown ASH [Fill].								
450		SS-2	5 4 3	78		23.8		28	2				
	5	SS-3	3 4 11	56		26.5							
445		SS-4	10 10 7	89		26.5							
	10	SS-5	2 3 4	89	With clay.	24.7							
442.0	11.0				Stiff, moist, brown to gray, silty CLAY (CL), trace sand, shells, and roots.	24.9							
440		SS-6	3 3 6	94		22.0							
	15	SS-7	2 3 4	61	Becomes medium stiff.	24.3		48	29				*15.0 feet: Switch to mud rotary*
435													
	20	ST-8	100 psi	75		23.8							*Pushed shelby tube from 20.0 to 22.0 feet*
430													
	25	SS-9	3 3 3	100		23.2							
425													
	30												

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B012

Elevation (feet)	Depth (feet)	Samples: Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Material Description	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	Remarks
	30	SS-10	2 2 4	61		24.8							
	35	SS-11	2 2 2	100	Becomes soft, trace sand.	28.3							
	40	SS-12	WOH 2 2	100	Becomes soft, trace sand, shells, and organics.	32.2							
	45	SS-13	1 2 3	100		50.2							
406.0	47.0	ST-14		100	Medium stiff, moist, dark gray, fat CLAY (CL).	50.8	104.4 104.9 104.0	54	34				*Pushed shelby tube from 47.0 to 49.0 feet*
404.0	49.0	SS-15	3 2 4	100	Medium stiff, moist, gray and brownish gray, lean CLAY (CL), trace sand.	67.4							
397.5	55.5	SS-16	11 21 23	100	Gray broken rock, weathered.	50.5 15.3							
396.0	57.0				Light gray rock, weathered.								
392.8	60.2	SS-17	50/2.5"	75	End of Boring at 60 ft	17.9							*Boring backfilled with bentonite and cement fluid*

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B013

Date(s) Drilled	09/11/2015 to 09/11/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	53.0 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
0		SS-1	4 4 7	44		Medium stiff, moist, dark gray to brown, CLAY (CL) with ASH [Fill].	0.0	13.6							
		SS-2	1 3 4	83		Medium stiff, moist, brown, silty CLAY (CL), trace sand, gravel, and roots.	2.5	17.4				2.0			
5		SS-3		46				24.3 20.0		49	28				
		SS-4	3 4 6	72		Stiff, moist, dark gray, silty CLAY (CL), trace sand.	8.0	24.3				2.0			
10		SS-5	2 4 7	83				25.4				2.0			*10.0 feet: Switch to mud rotary*
						Gray and mottled brown silty CLAY (CL), trace sand.									
15		SS-6	2 2 4	100		Becomes medium stiff, gray and mottled brown.		25.5		41	29	1.0			
20		SS-7	2 3 3	67				23.5				1.0			
25		SS-8	3 3 4	67		Becomes gray, trace organics.		27.7				1.25			
30							30.0								

AECOM

Report: GEO_SOIL; File K:\PROJECTS\60440202_DYNEGY CCR EDWARDS\400-TECHNICAL\BORING LOGS\60440202_DYNEGYEDWARDSBORINGLOGS.GPJ; 12/18/2015 9:34:04 AM

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B013

Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Elevation (feet)	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
30		SS-9	1 2 2	94		Medium stiff, moist, brown mottled gray, sandy CLAY (CL), trace silt and shells.			20.2				1.5			
		ST-10		100		Medium stiff, moist, gray and brown lean CLAY (CL) with sand.		32.0	33.3		42	19	1.25			*Pushed shelby tube from 32.0 to 34.0 feet*
35		SS-11	2 2 2	89		Becomes dark gray, trace organics.			58.0				1.0			
40		SS-12	2 2 3	100					54.5				1.25			
45		SS-13	2 2 4	100		Grades with calcium carbonate seams and shells.			66.2				1.75			
						Gravel layer 47.5 feet to 49.0 feet										
50																
						End of Boring at 53 ft		53.0								*Boring backfilled with bentonite and cement fluid*
55																
60																
65																

AECOM

Project: Edwards Power Station Project Location: Bartonville, Illinois Project Number: 60440202	**Log of Boring EDW-B014** Sheet 1 of 2

Date(s) Drilled	09/12/2015 to 09/12/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	45.5 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	456 ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	5 ft on 9/12/2015		

Elevation (feet)	Depth (feet)	SAMPLES: Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	MATERIAL DESCRIPTION (Elevation 456.0, Depth 0.0)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0												
455		SS-1	1 4 10	89	Medium dense, moist, dark gray, ASH [Fill].	28.2							
		SS-2	7 2 1	100	Becomes wet, gray.	40.8							
	5				∇								
450		ST-3		35									*Pushed shelby tube from 5.0 to 7.0 feet*
		SS-4	1 1 1	100	Becomes light gray.	60.2							
	10												
445		SS-5		100	Becomes dark gray.	78.7							*10.0 feet: Switch to mud rotary Pushed shelby tube from 10.0 to 12.0 feet*
	15												
440		ST-6	1/12" 1/12"	100	Becomes light gray.	86.5							
	20												
435		SS-7	1/12" 1/12"	100		73.1							
	25												
430		SS-8	WOR WOR WOR	100		48.7							
	30				(Elevation 426.0, Depth 30.0)								

Elevation (feet)	Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
425	30		SS-9	WOR WOR WOR	67		Very loose, wet, black to gray, ASH with clay [Fill].	31.6							
421.0 / 420	35.0		SS-10	WOH 1 2	100		Soft, wet, gray, silty CLAY (CL), trace shells and wood.								
415.5 / 415	40.5		SS-11	2 18 34	100		SHALE: Light gray, weathered.	27.3 19.6 10.2							42.0 to 45.0 feet: Solid drilling
410.5 / 410	45.5		SS-12	56	100		End of Boring at 45.5 ft	14.2							*Boring backfilled with bentonite and cement fluid*
405	50														
400	55														
395	60														
	65														

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B015

Date(s) Drilled	09/10/2015 to 09/10/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	57.0 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	444 ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
		Groundwater Level(s)	ft on		

Elevation (feet)	Depth (feet)	Sample Type / Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Material Description (Elevation / Depth)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	Remarks
444.0	0.0												
443.6	0.4				Brown gravel.								
		SS-1	5 4 1	72	Medium stiff, moist, gray to brown, sandy CLAY (CL), trace silt.	54.7							
441.5	2.5	SS-2	5 9 13	50	Medium dense, moist, light brown to white, fine to coarse GRAVEL (GP) with sand, trace silt and limestone.	4.5							
440													
	5	SS-3	6 10 13	39		5.4							
		SS-4	6 9 7	39		7.2							
435													
	10	SS-5	4 5 6	39		6.5							*10.0 feet: Switch to mud rotary; borehole collapsed*
430		SS-6	10 3 2	11		3.6							
	15	SS-7	4 4 4	39	Some coarse limestone.	8.2							
425													
	20	SS-8	10 7 9	39		7.8							
420													*23.0 to 25.0 feet: Drove casing with hammer 23.0 to 29.0 feet: Hard drilling*
	25	SS-9	7 4 11	33		8.1							
415													
	30												

Elevation (feet)	Depth (feet)	Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30														
413.0	31.0	ST	ST-10	300 psi	100		Medium stiff, wet, gray, sandy CLAY (CL), trace silt, shells, and organics.	20.2	122.2 121.0 119.8	24	11	2.5			*Pushed shelby tube from 31.0 to 33.0 feet*
410															
409.0	35.0	SS	SS-11	WOH 2 3	94		Medium stiff, wet, gray and dark gray lean CLAY (CL)	33.8				1.25			
407.0	37.0	ST	ST-12	175 psi			Soft, wet, dark gray, fat CLAY (CH).	41.0		66	43	1.0			*Pushed shelby tube from 37.0 to 39.0 feet*
405.0	39.0	SS	SS-13	WOH 2 2	100		Soft, wet, brown and gray, lean CLAY (CL).	36.2				1.0			
400	45	SS	SS-14	WOH 2 2	83		Grades with sand.	49.4				1.0			
395	50	SS	SS-15	3 5 14	22		Grades without sand.	30.9				0.5			
392.0	52.0						SHALE: Light gray, silt sized, weathered.								*52.0 feet: Solid drilling*
390	55	SS	SS-16	71/6"	oK			11.0							
387.0	57.0						End of Boring at 57 ft								*Boring backfilled with bentonite and cement fluid*
385	60														
380	65														

Project: Edwards Power Station

Project Location: Bartonville, Illinois

Project Number: 60440202

Log of Boring EDW-B015A

Date(s) Drilled	09/10/2015 to 09/10/2015	Logged By	Norm Seiler	Checked By	AJW
Drilling Method	Power Auger/ Mud Rotary	Drill Bit Size/Type	3 7/8" Tricone Roller Bit	Borehole Depth	30.0 ft
Drill Rig Type	Diedrich D-120 Rubber Tired ATV	Drilling Contractor	Strata Earth Services	Surface Elevation	ft
Borehole Backfill	Bentonite and Cement Fluid	Sampling Method(s)	Split Spoon/3" Thin Walled Tube	Hammer Data	Automatic, 140 lbs, 30" drop
Boring Location	5' SW of EDW-B015 (ft NAD83)	Groundwater Level(s)	ft on		

Depth (feet)	SAMPLES Type	SAMPLES Number	SAMPLES Sampling Resist. OR Core RQD (%)	SAMPLES Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
0						0.0 Blank power auger to 30.0 feet to confirm 29.0 feet of gravel.								*Offset 5.0 feet west of EDW-B015*
5														*5.0 to 30.0 feet: No cuttings*
														7.0 feet: Borehole collapsed; created a 14" diameter hole with no cuttings
10														
15														
20														*20.0 feet: Groundwater encountered*
25														*Auger hole collapsed and auger removed. No clay on auger.*
30						30.0								

End of Boring at 30 ft

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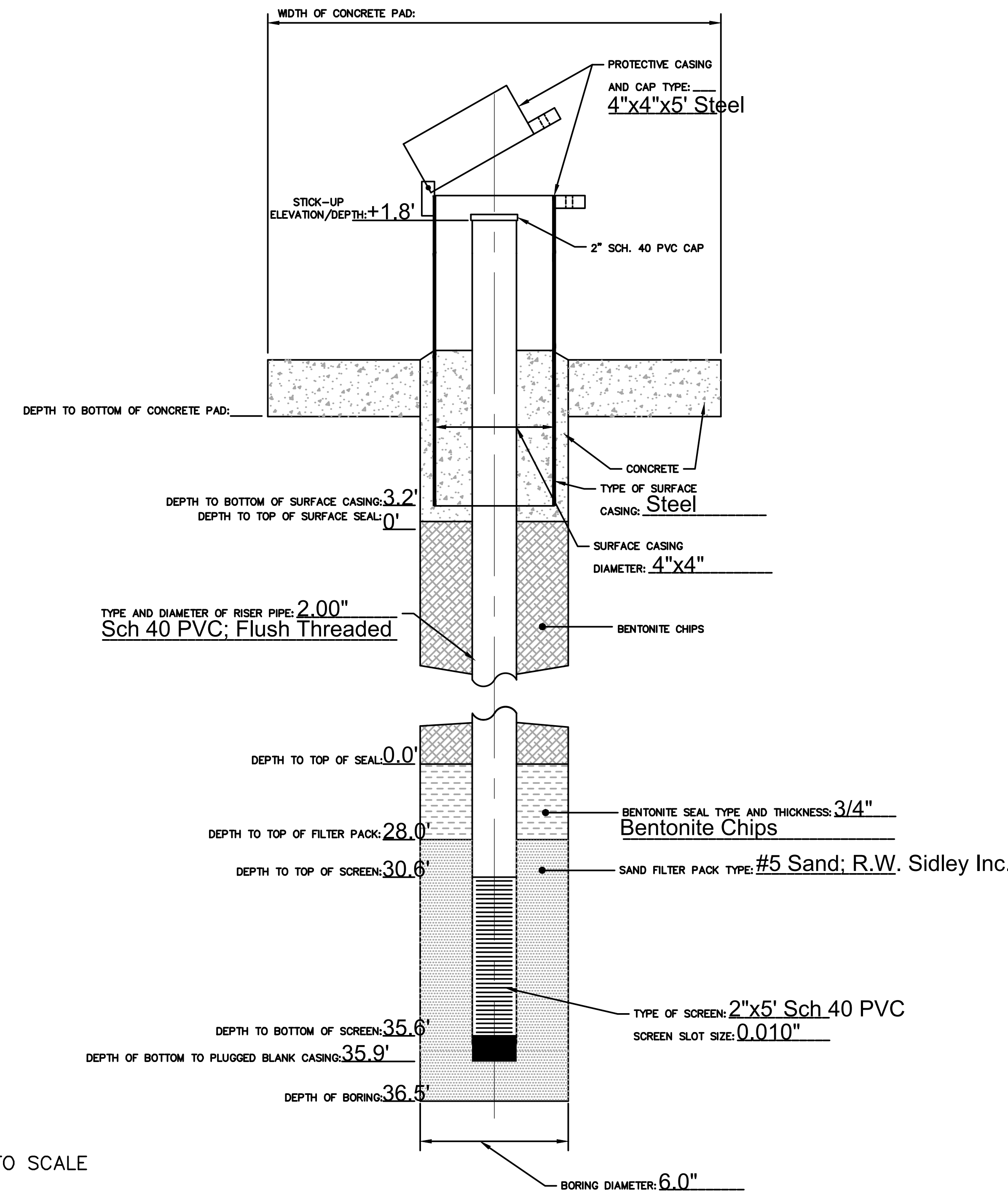
APPENDIX B

Project: Dynegy Project Location: Pekin, IL Project Number: 60440202	Log of Piezometer Sheet 1 of 1

Piezometer Location	EDW-P001	Date Installed	11/05/15	Time	5:30 P.M.
Installed By	Josh Kohn	Observed By	R. Weseljak	Total Depth	36.5'
Method of Installation	6" Mud Rotary	Drilling Contractor	Strata	Surface Elevation	
Screened Interval	30.6-35.6'	Completion Zone			
Remarks		Groundwater Level(s)	24.64' from top of casing		

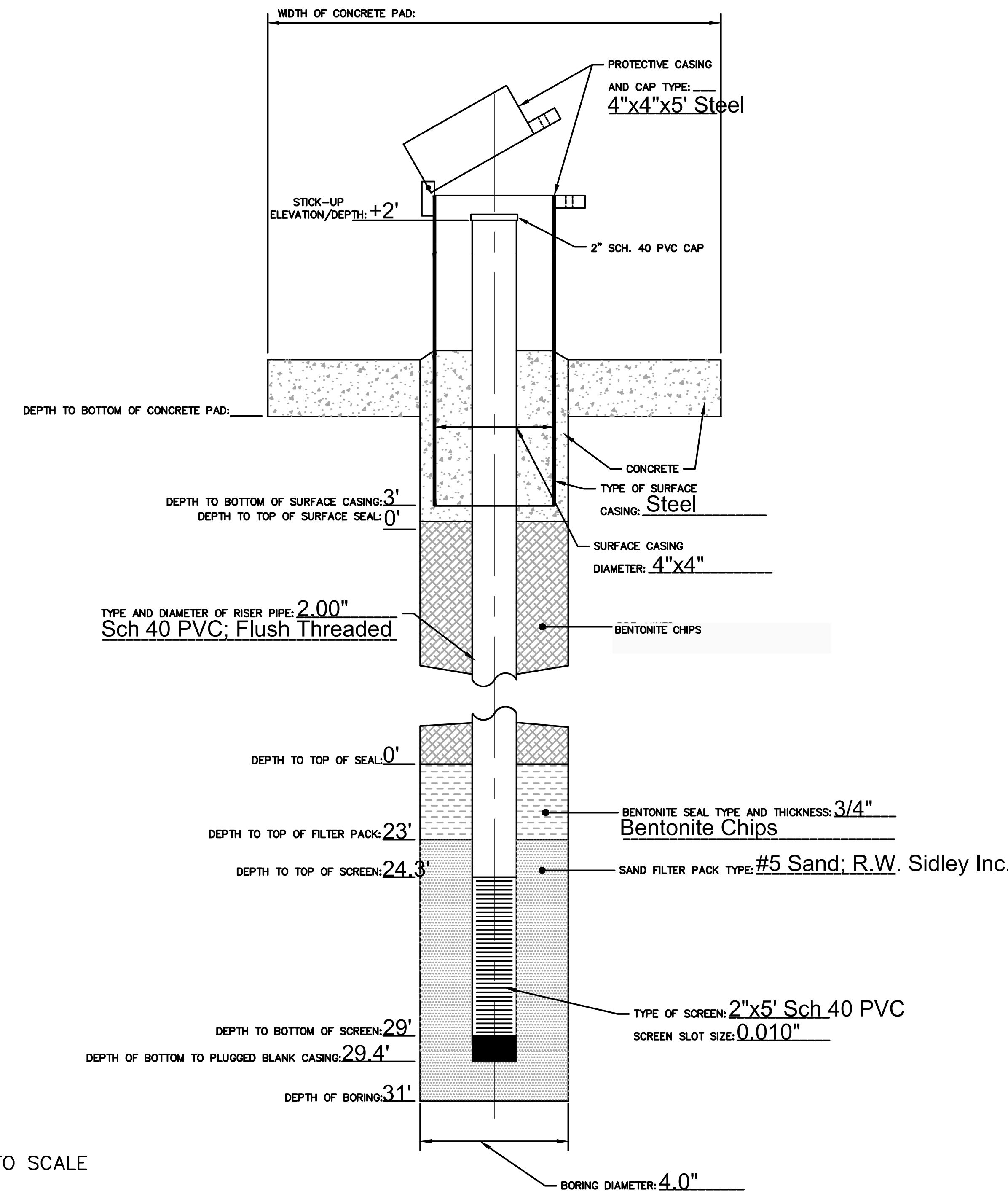


NOT TO SCALE

AECOM

Project: Dynegy	Log of Piezometer
Project Location: Pekin, IL	Sheet 1 of 1
Project Number: 60440202	

Piezometer Location	EDW-P002	Date Installed	09/04/15	Time	11:00-12:00 P.M.
Installed By	Scott Komen	Observed By	N. Seiler	Total Depth	31'
Method of Installation	4" Power Auger	Drilling Contractor	Strata	Surface Elevation	
Screened Interval	24-29'	Completion Zone			
Remarks		Groundwater Level(s)	29' After Drilling		

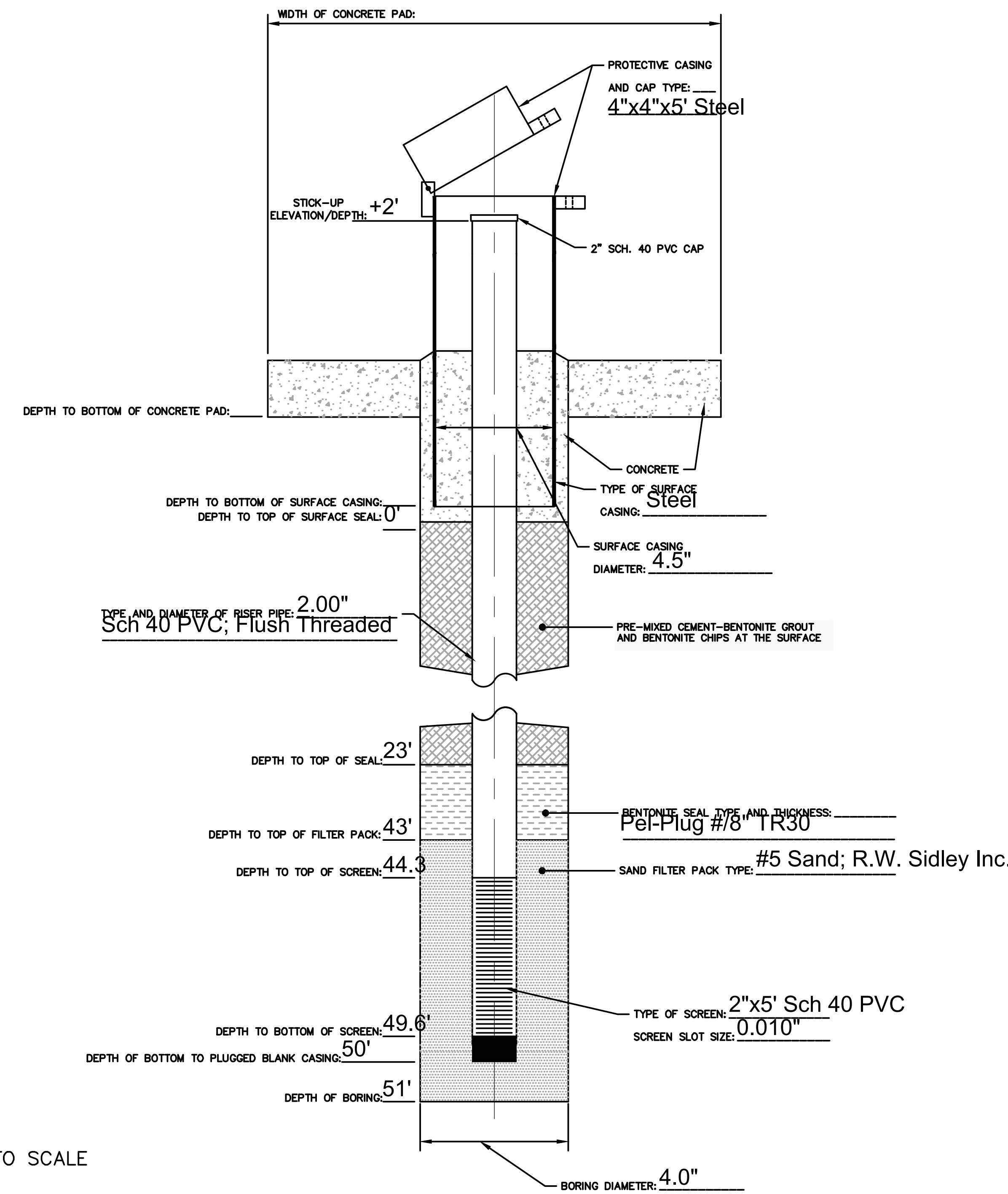


NOT TO SCALE

AECOM

Project: Dynegy	Log of Piezometer
Project Location: Pekin, IL	
Project Number: 60440202	Sheet 1 of 1

Piezometer Location	EDW-P003	Date Installed	09/04/15	Time	3:30-6:00 P.M.
Installed By	Scott Komen	Observed By	N. Seiler	Total Depth	51'
Method of Installation	3 7/8" Rock Bit	Drilling Contractor	Strata	Surface Elevation	
Screened Interval	44.3-49.6'	Completion Zone			
Remarks		Groundwater Level(s)			

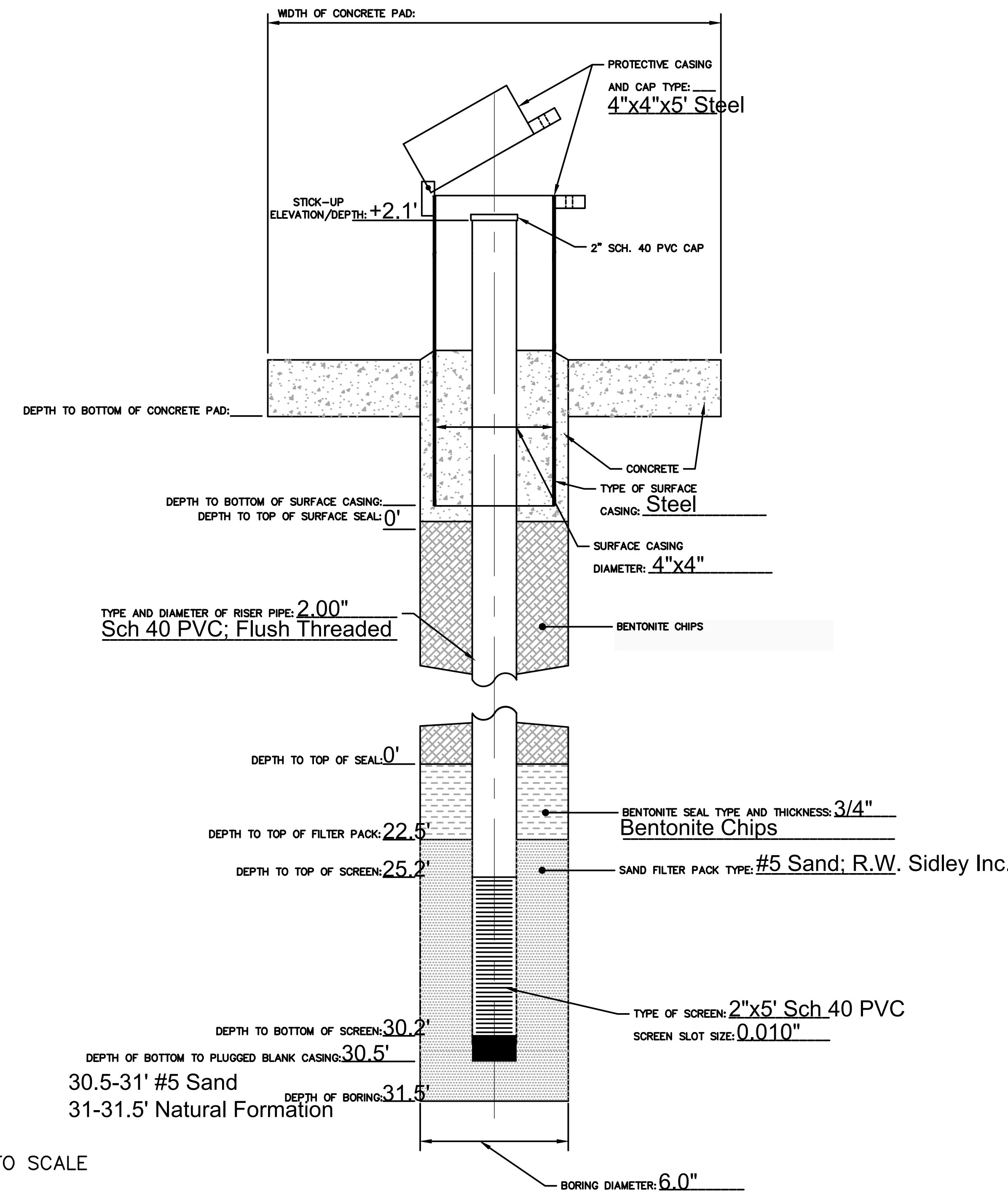


NOT TO SCALE

AECOM

Project: Dynegy	Log of Piezometer
Project Location: Pekin, IL	
Project Number: 60440202	Sheet 1 of 1

Piezometer Location	EDW-P004	Date Installed	11/04/15	Time	12:00
Installed By	Josh Kohn	Observed By	R. Weseljak	Total Depth	31.5'
Method of Installation	6" Mud Rotary	Drilling Contractor	Strata	Surface Elevation	
Screened Interval	25.2-30.2'	Completion Zone			
Remarks		Groundwater Level(s)	14.85 From Top of Casing		



NOT TO SCALE

APPENDIX C

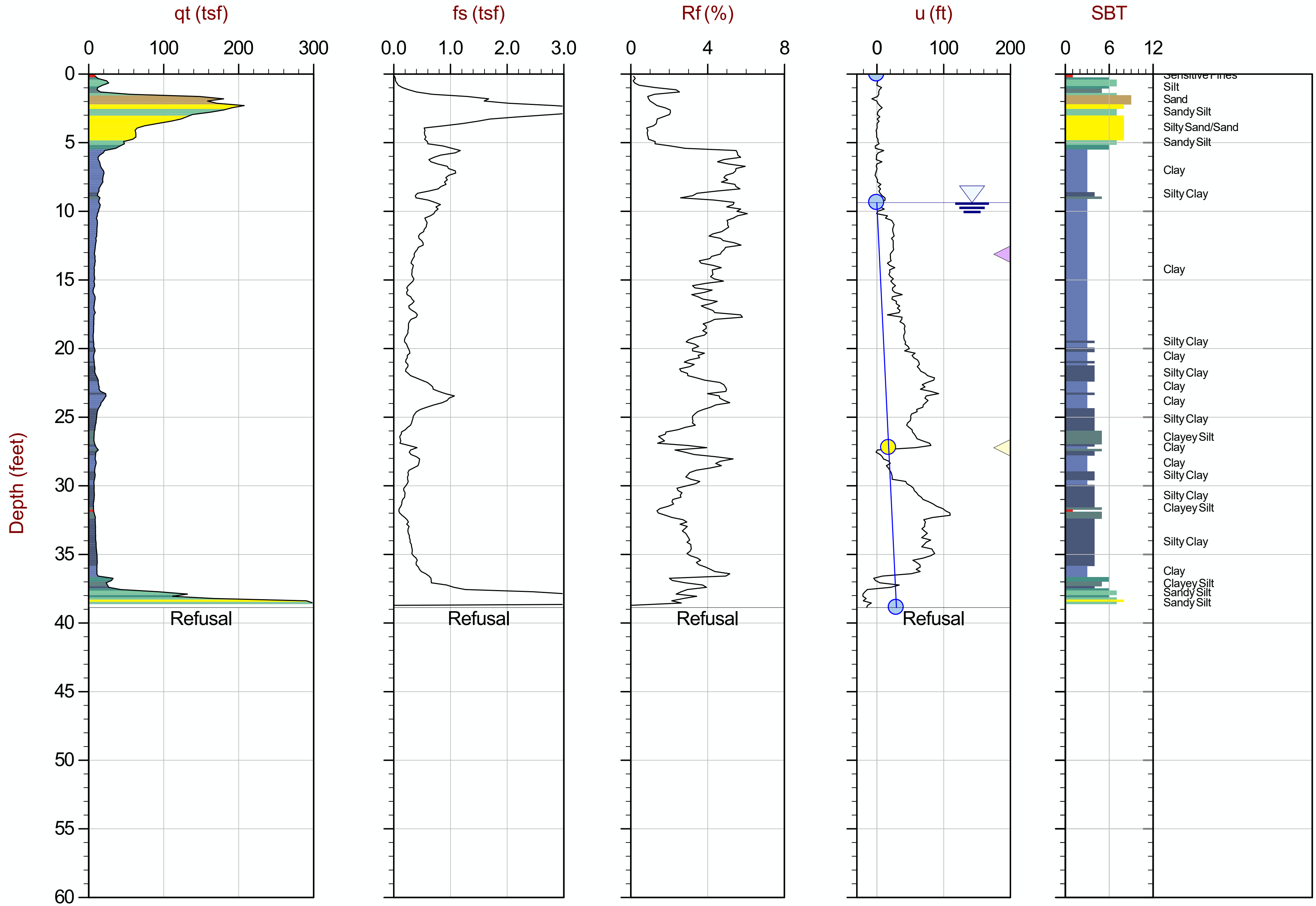
APPENDIX C

CONETEC

AECOM

Job No: 15-53073
Date: 08:19:15 13:46
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C001
Cone: 374:T1500F15U500



Max Depth: 11.850 m / 38.88 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP01.COR

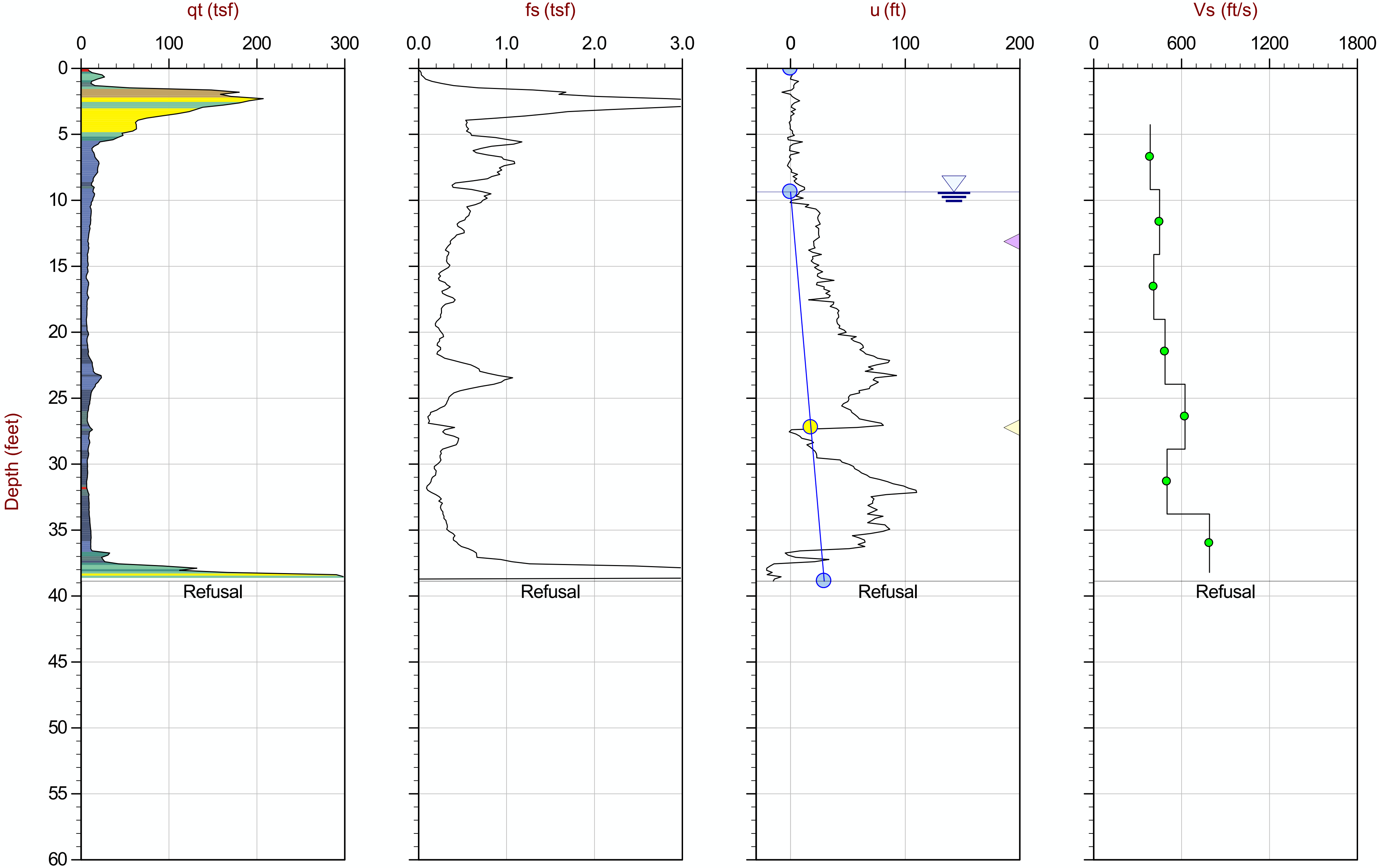
SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4497502m E: 274312m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

AECOM

Job No: 15-53073
Date: 08:19:15 13:46
Site: Edwards Power Station, Peoria, IL
Sounding: EDW-C001
Cone: 374:T1500F15U500



Max Depth: 11.850 m / 38.88 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP01.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4497502m E: 274312m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

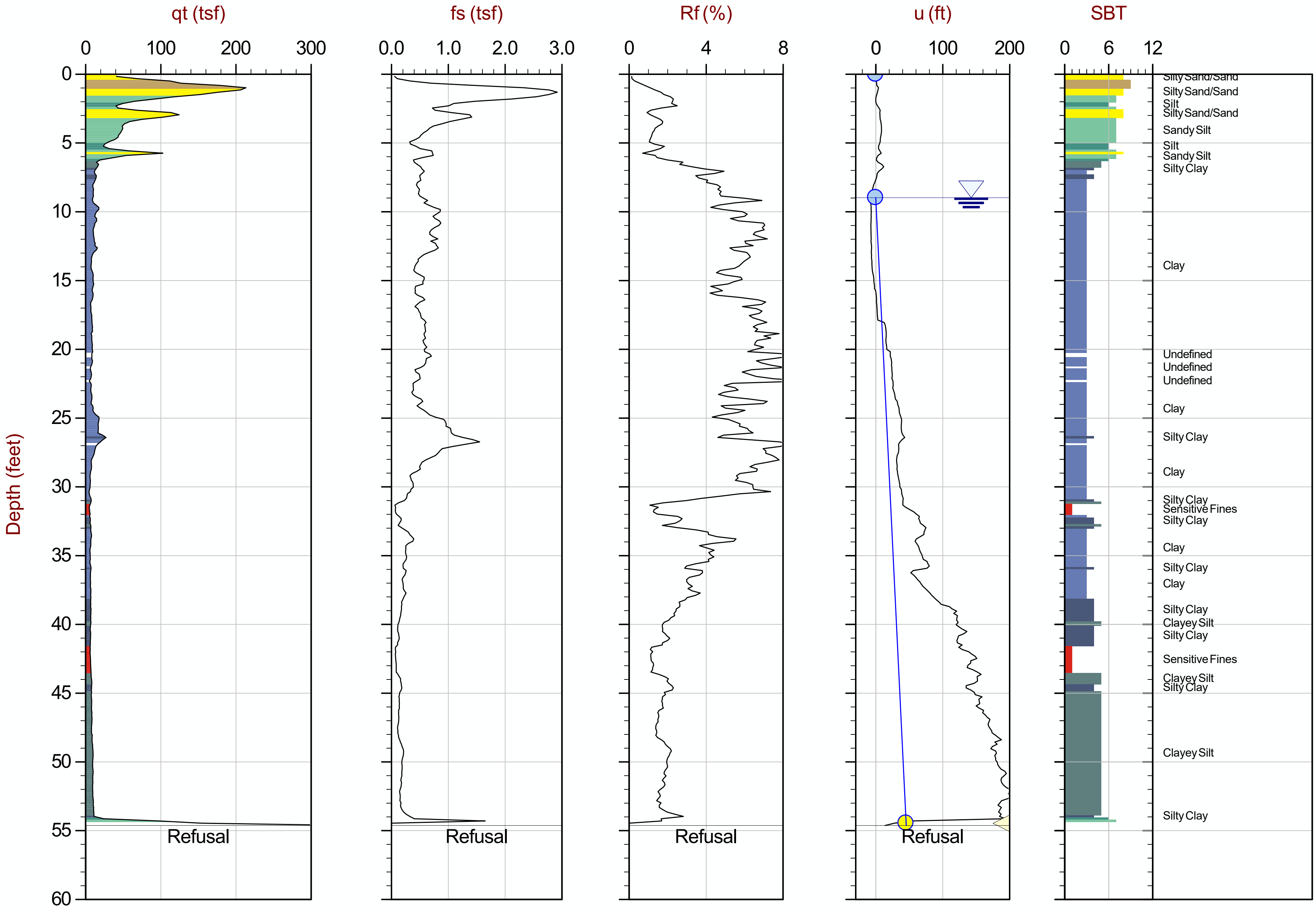
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:27:15 15:22
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C003
Cone: 340:T1500F15U500



Max Depth: 16.650 m / 54.63 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP03.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4497325m E: 274377m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

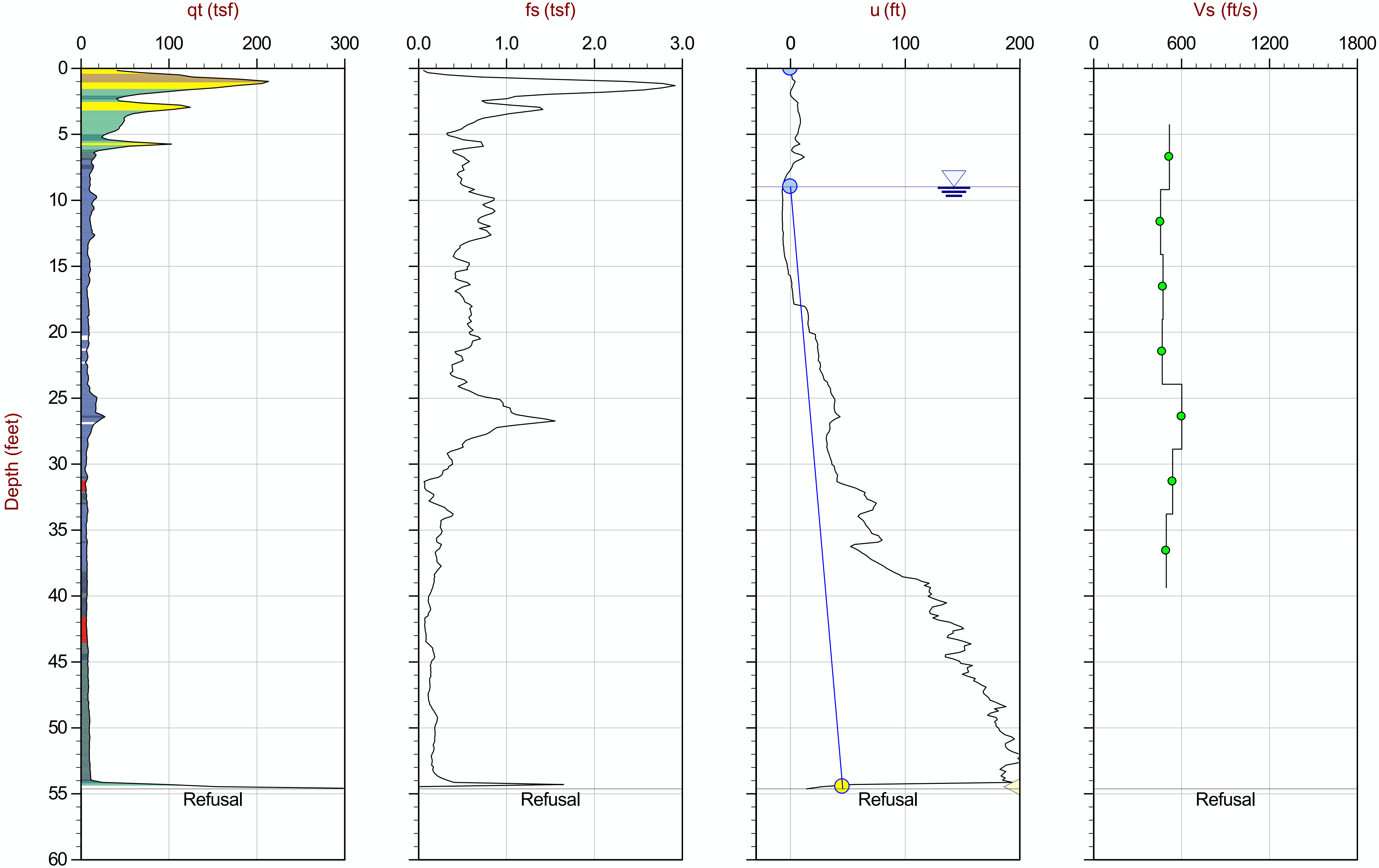
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:27:15 15:22
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C003
Cone: 340:T1500F15U500



Max Depth: 16.650 m / 54.63 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP03.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4497325m E: 274377m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

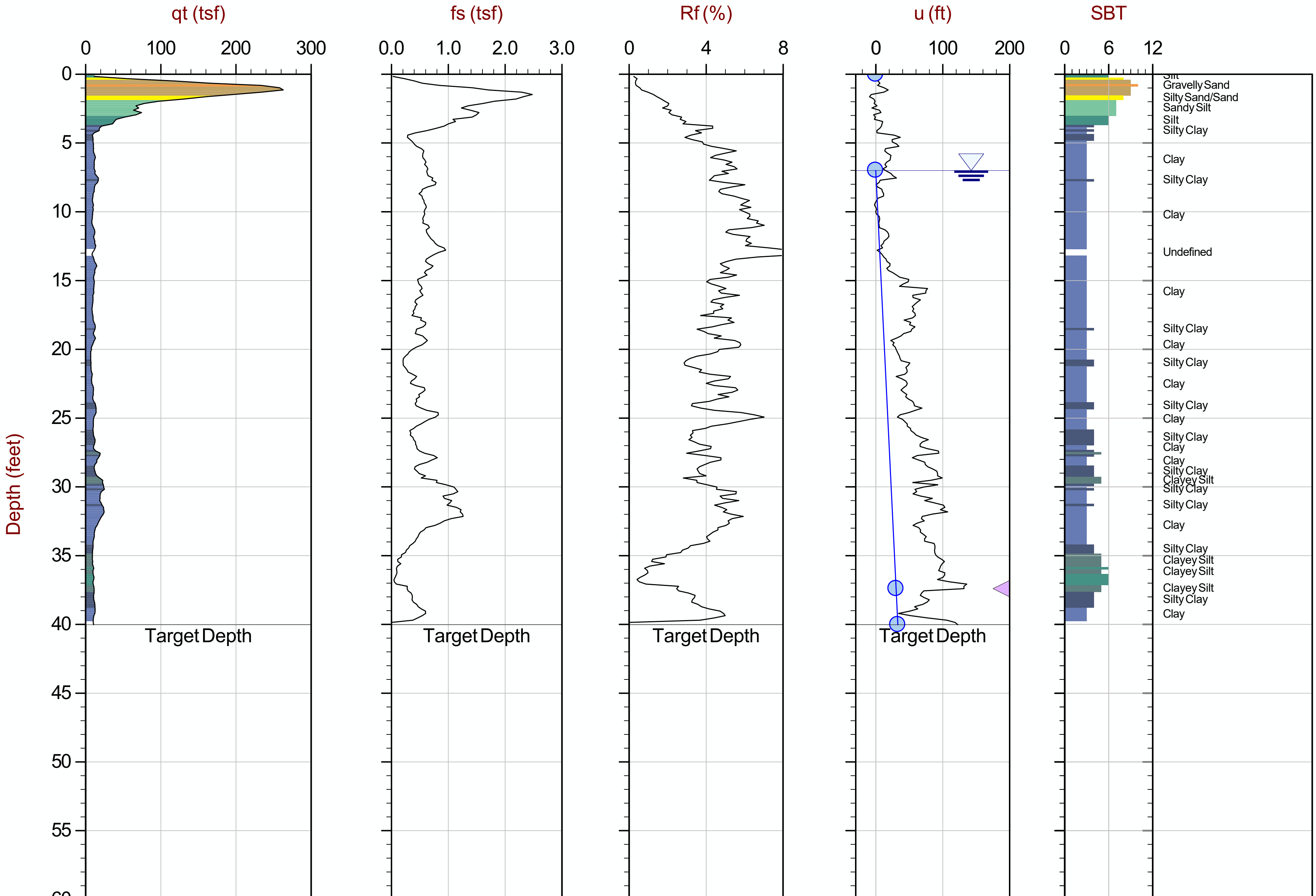
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:26:15 15:05
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C005
Cone: 374:T1500F15U500



Max Depth: 12.200 m / 40.03 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_CP05.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4497026m E: 274468m

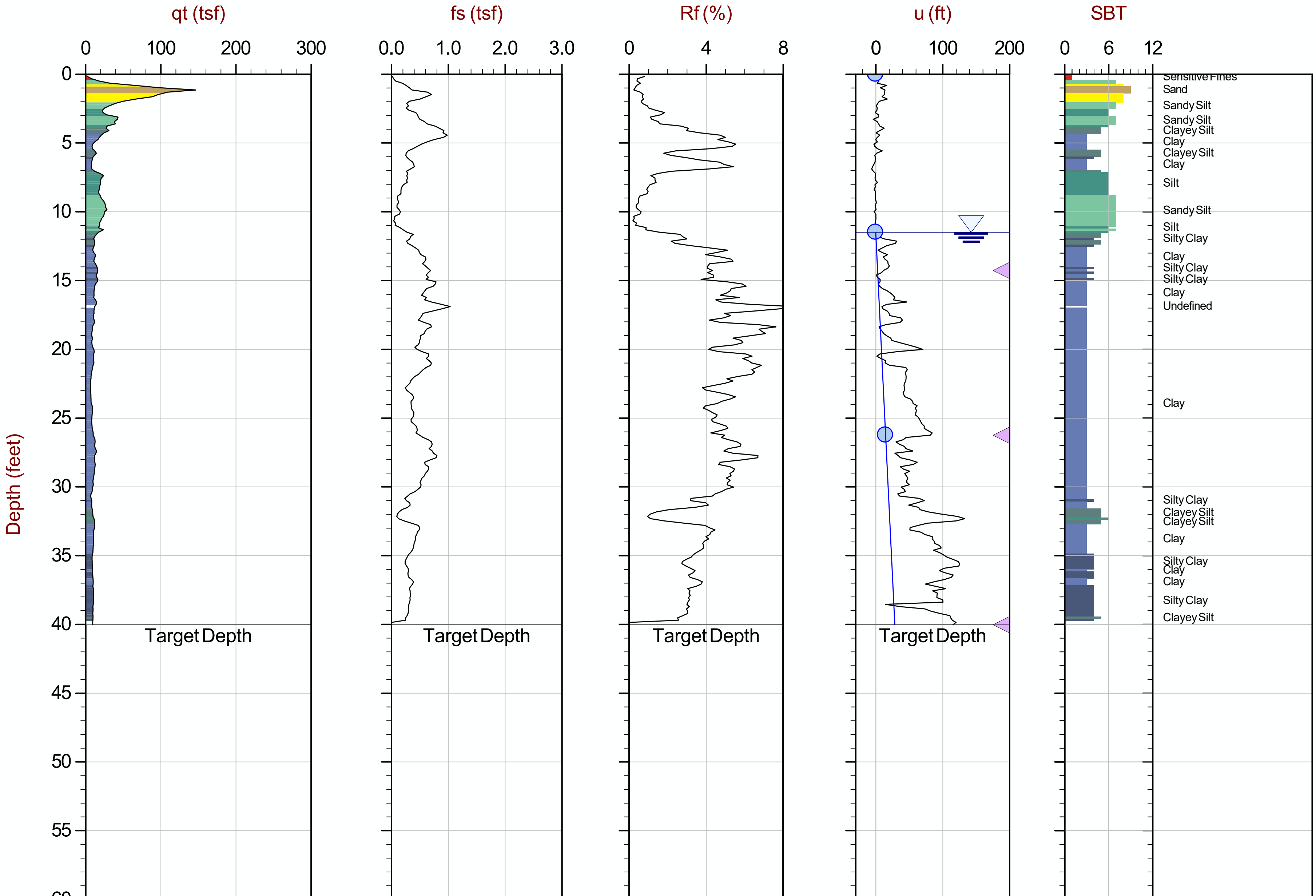
Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:25:15 15:52
Site: Edwards Power Station, Peoria, IL
Sounding: EDW-C006
Cone: 374:T1500F15U500



Max Depth: 12.200 m / 40.03 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

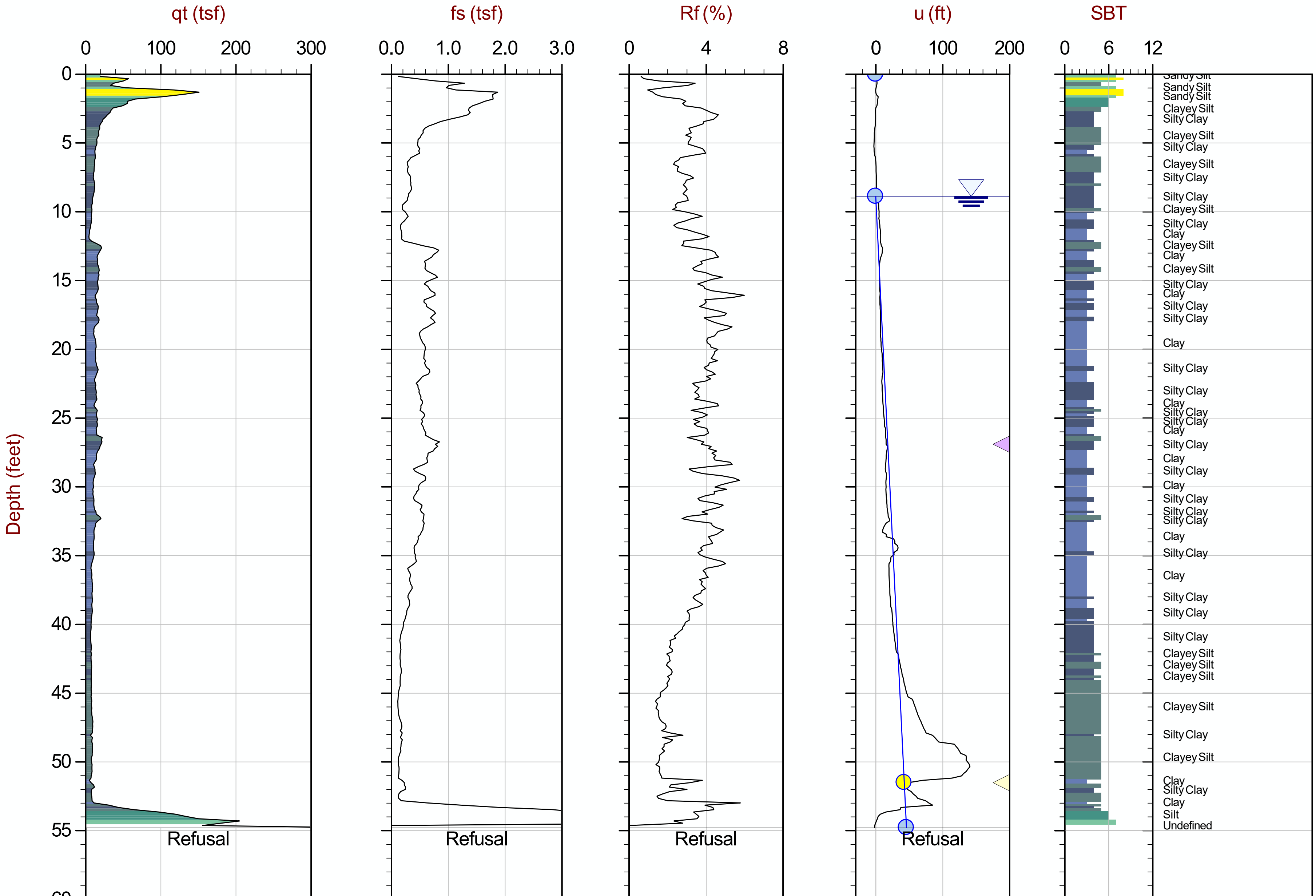
File: 15-53073_CP06.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496880m E: 274500m

Hydrostatic Line · Ueq · Assumed Ueq · PPD, Ueq achieved · PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC	Job No: 15-53073	Sounding: EDW-C007
AECOM	Date: 08:29:15 09:19	Cone: 340:T1500F15U500
	Site: Edwards Power Station, Peoria, Il	



Max Depth: 16.700 m / 54.79 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_CP07.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496736m E: 274551m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

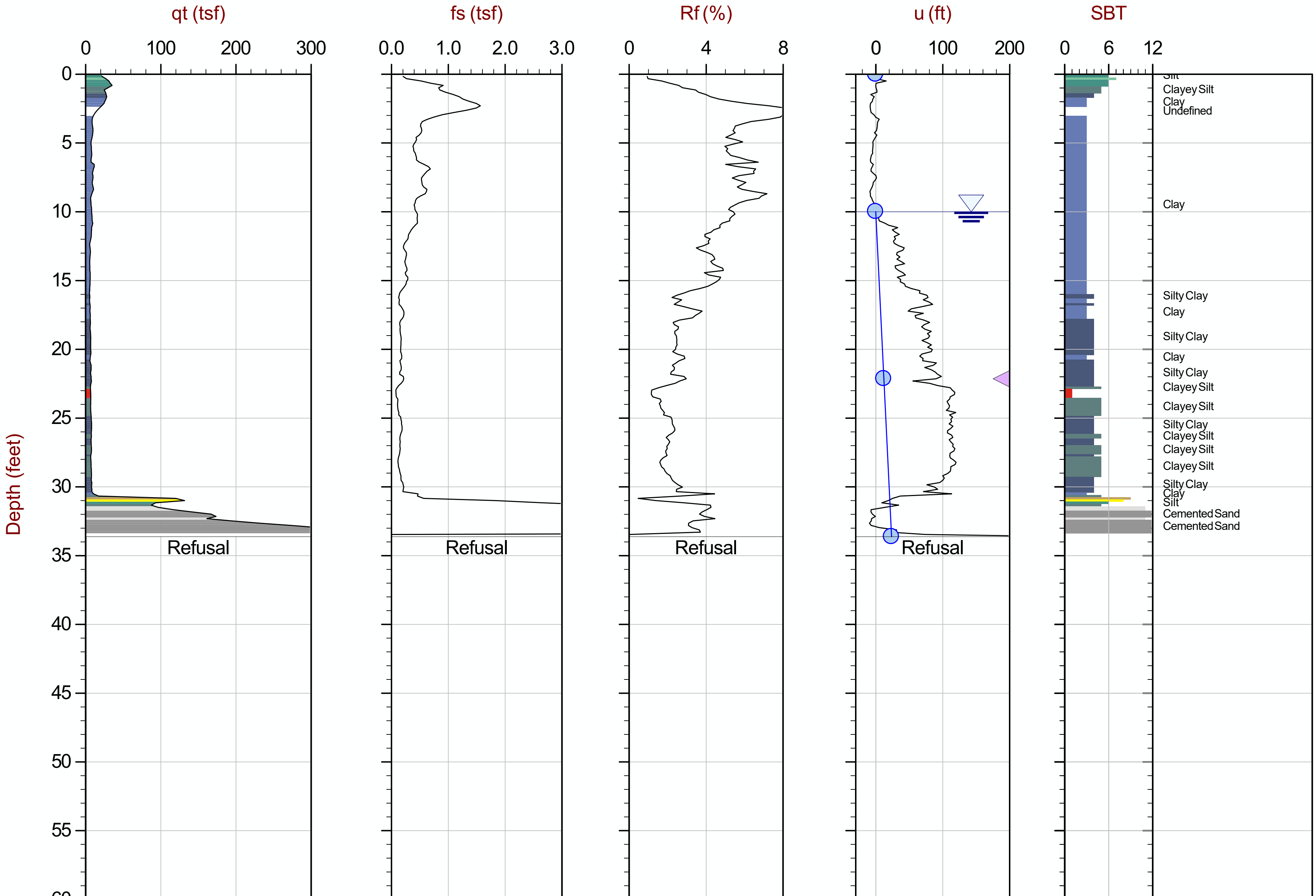
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:27:15 08:50
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C008
Cone: 374:T1500F15U500



Max Depth: 10.250 m / 33.63 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_CP08.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496731m E: 274576m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

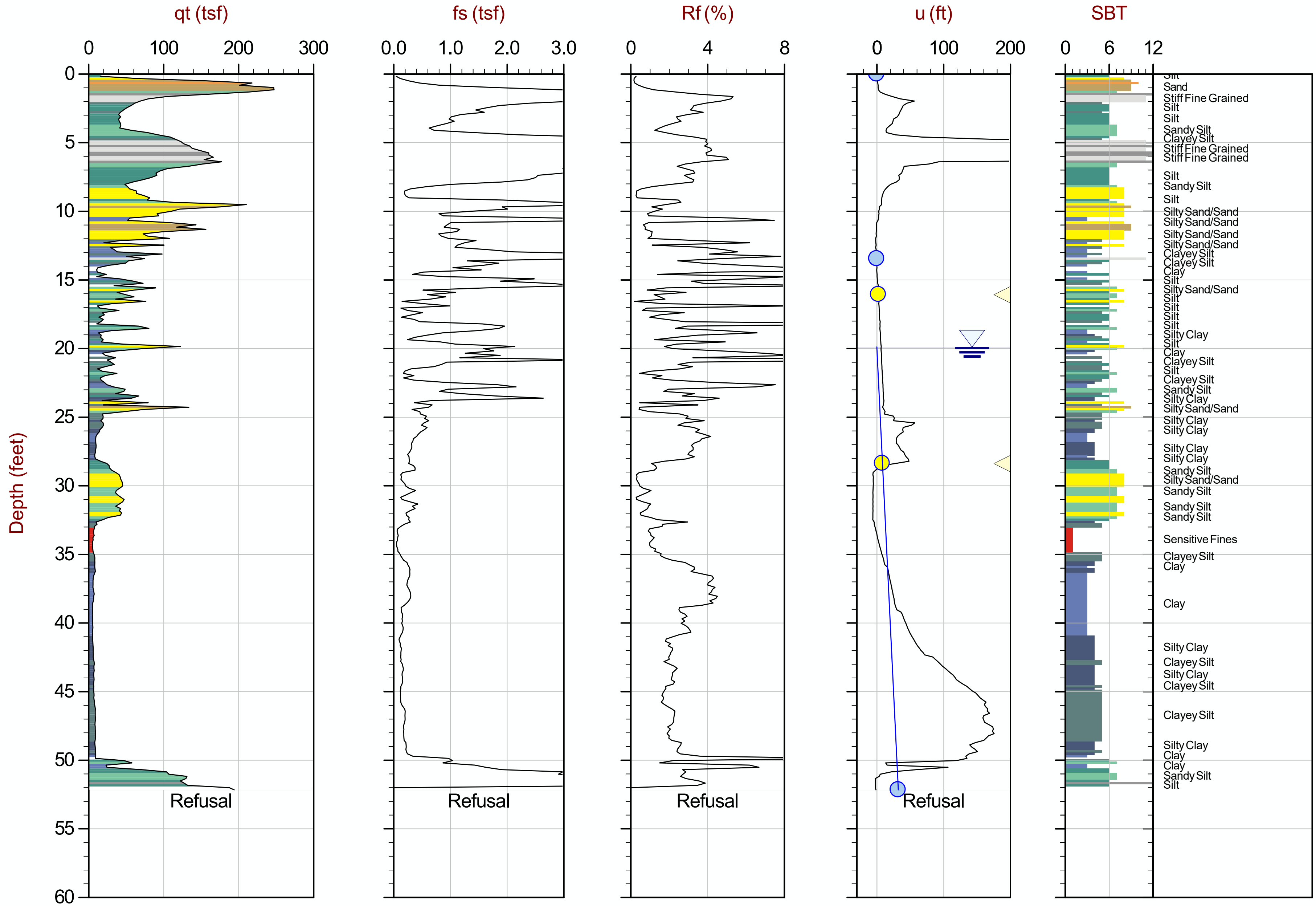
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

ConeTec

AECOM

Job No: 15-53073
Date: 08:28:15 16:08
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C009
Cone: 340:T1500F15U500



Max Depth: 15.900 m / 52.16 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_CP09.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496476m E: 274538m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

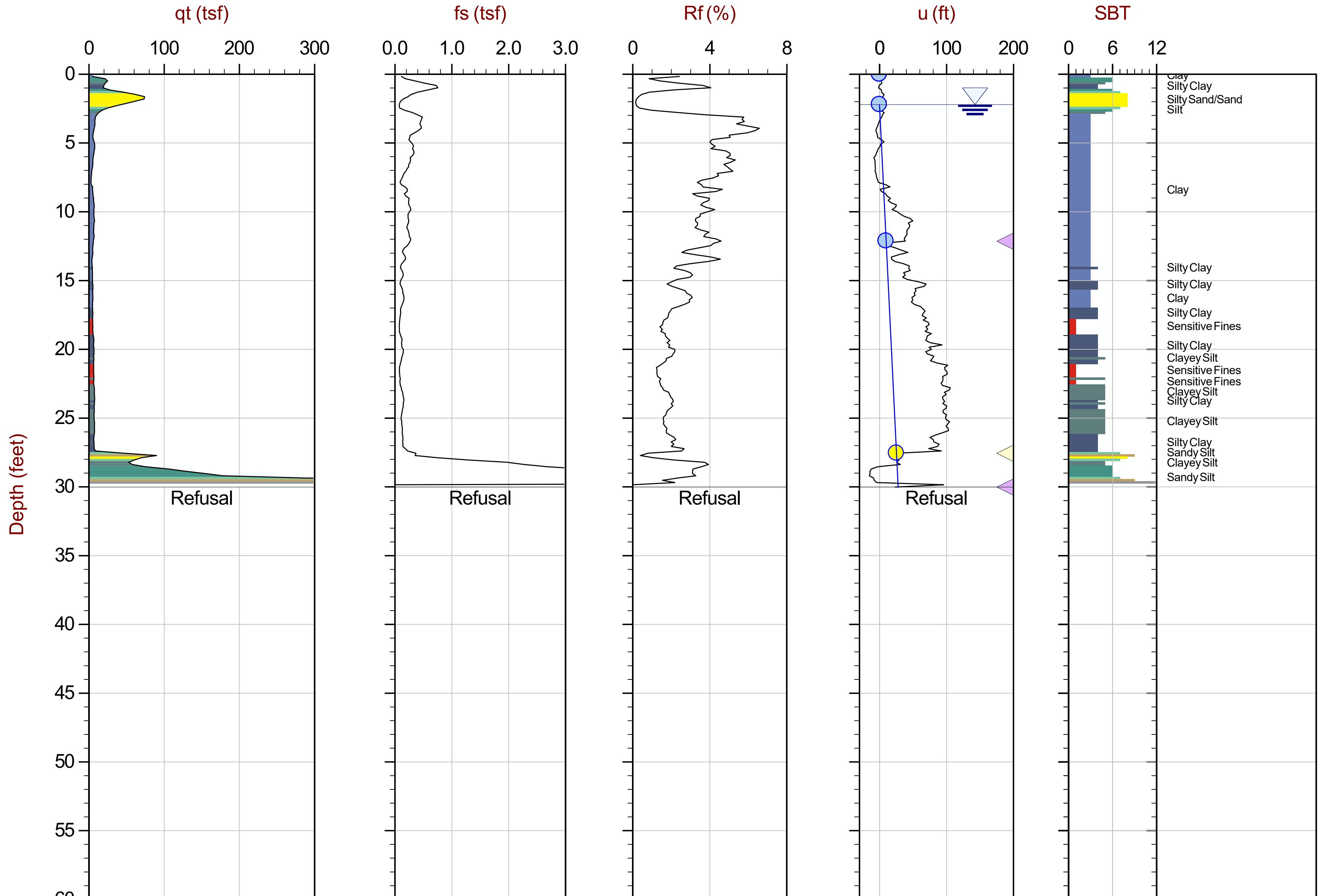
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

ConeTec

AECOM

Job No: 15-53073
Date: 08:27:15 12:10
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C010
Cone: 374:T1500F15U500



Max Depth: 9.150 m / 30.02 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_CP10.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496351m E: 274562m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

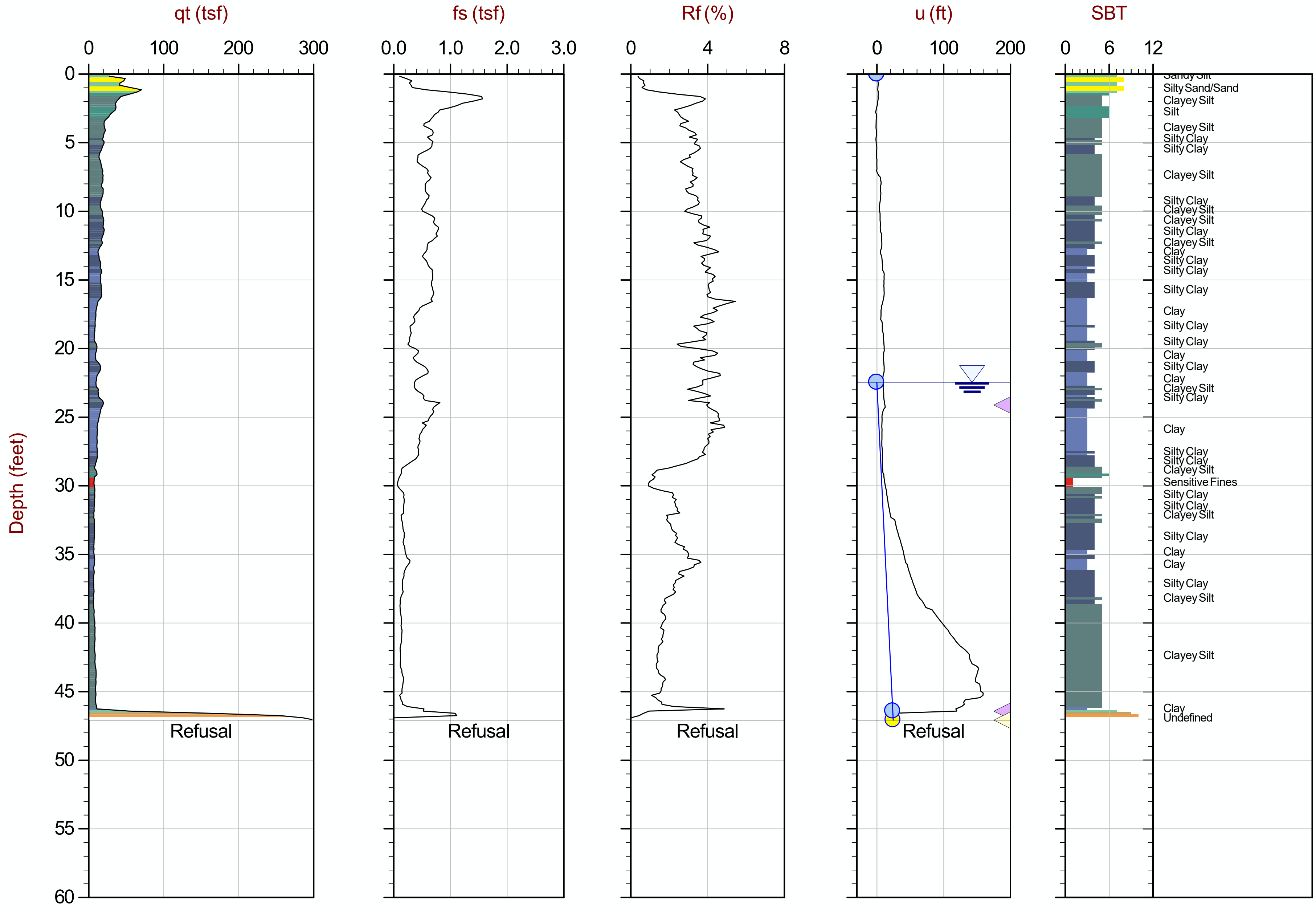
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:28:15 10:19
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C011
Cone: 340:T1500F15U500



Max Depth: 14.350 m / 47.08 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_CP11.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496372m E: 274553m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

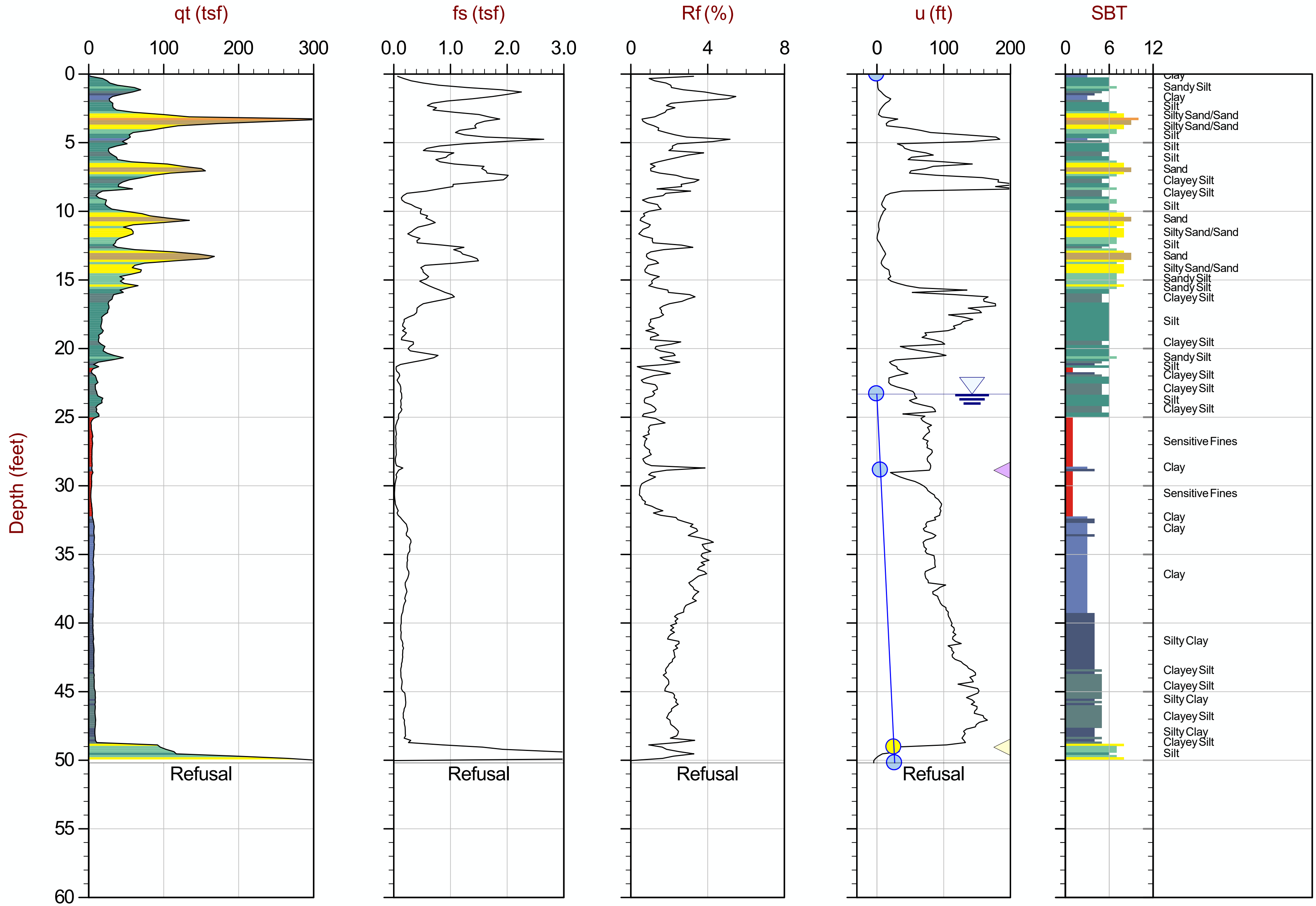
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:28:15 14:27
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C012
Cone: 340:T1500F15U500



Max Depth: 15.300 m / 50.20 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP12.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496424m E: 274524m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

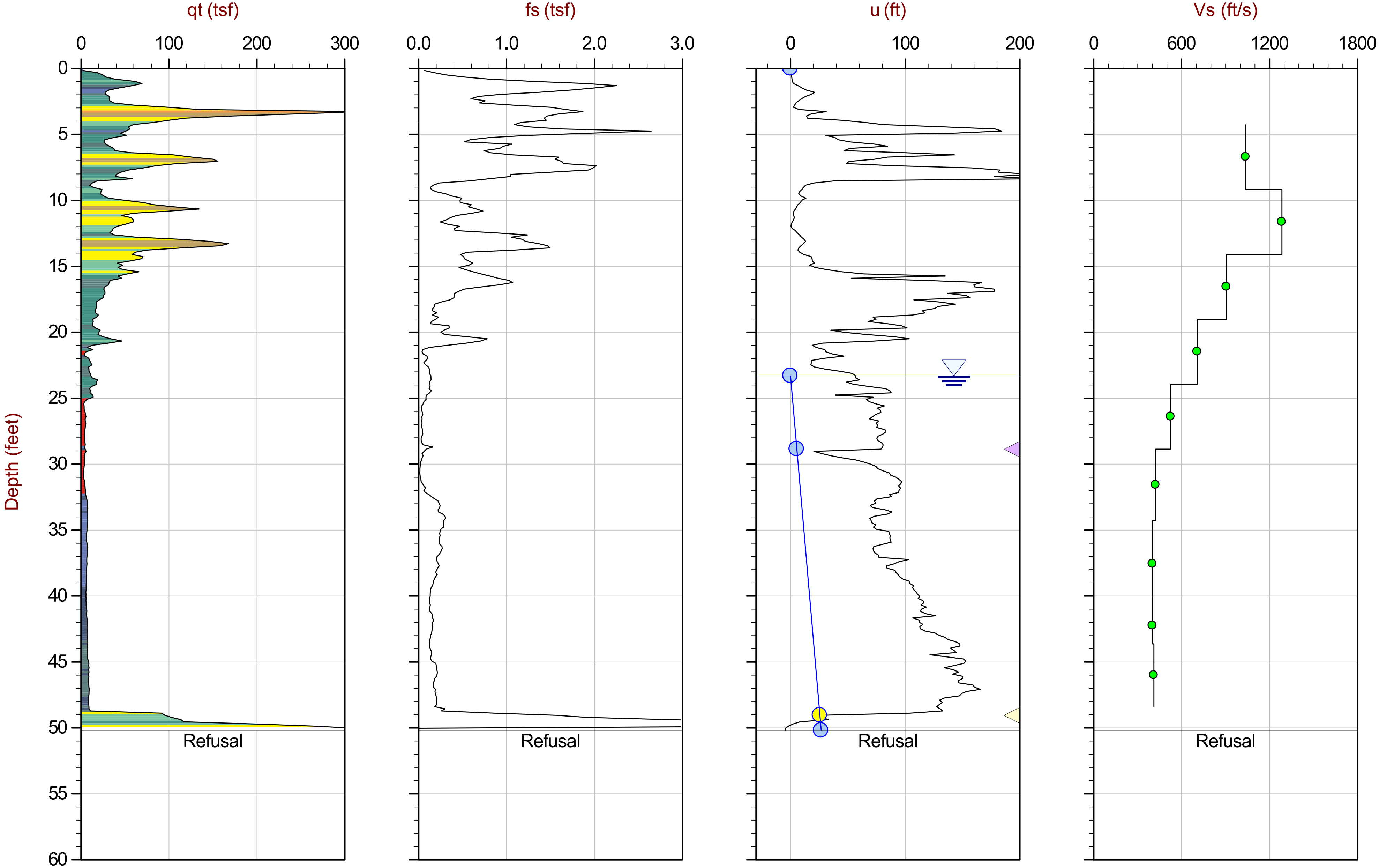
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

ConeTec

AECOM

Job No: 15-53073
Date: 08:28:15 14:27
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C012
Cone: 340:T1500F15U500



Max Depth: 15.300 m / 50.20 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP12.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496424m E: 274524m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

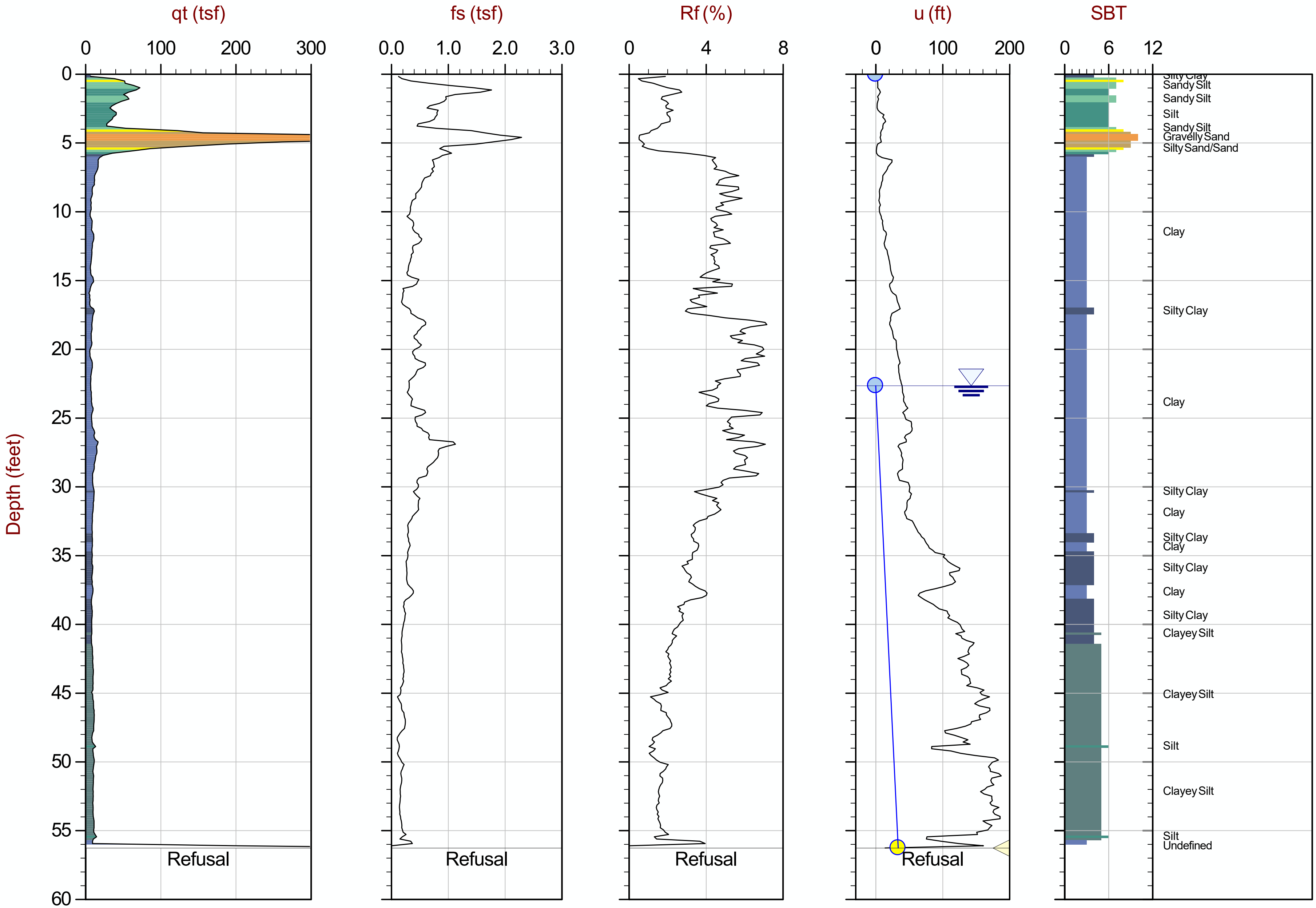
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:28:15 08:45
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C013
Cone: 340:T1500F15U500



Max Depth: 17.150 m / 56.27 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP13.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496386m E: 274376m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

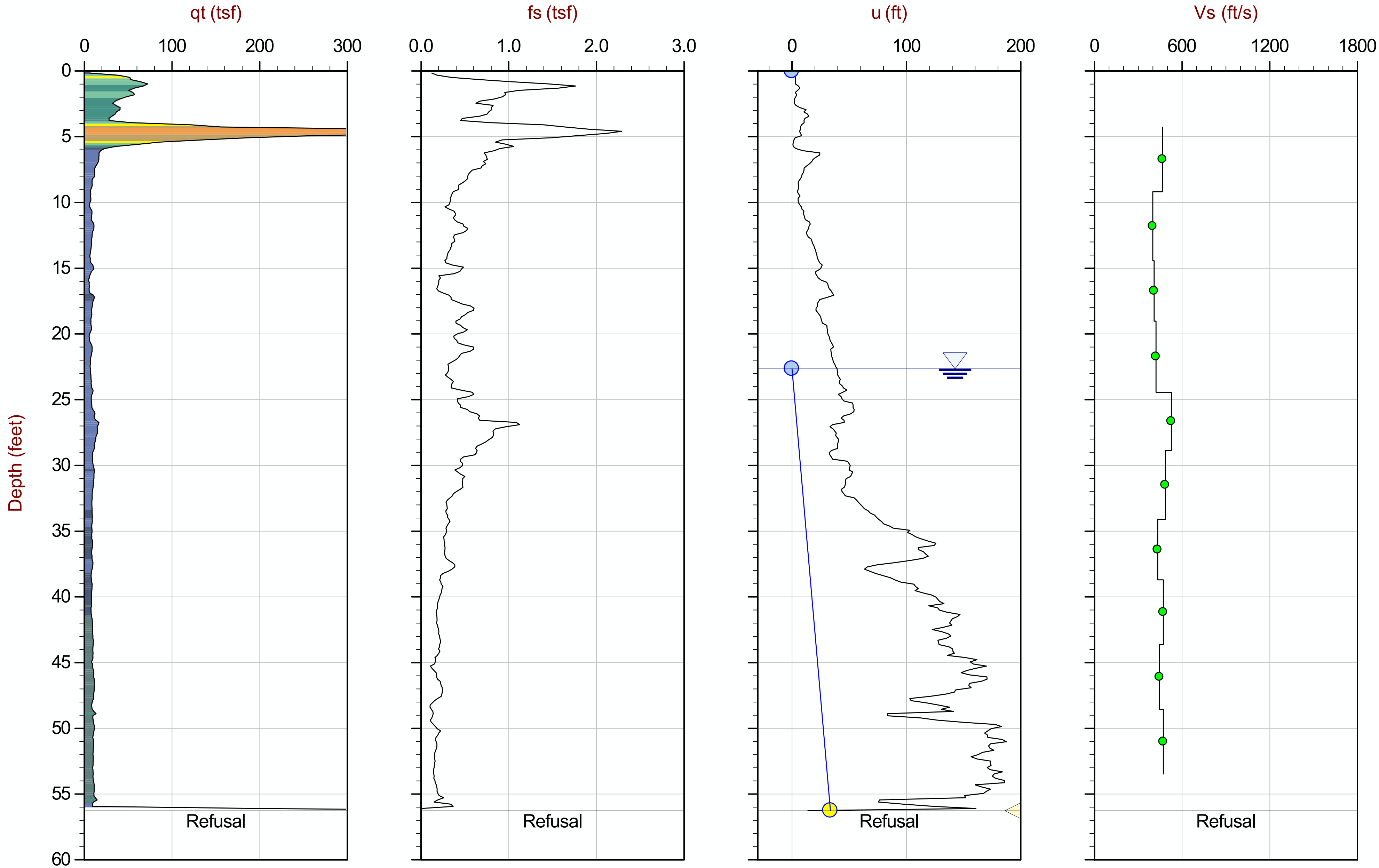
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:28:15 08:45
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C013
Cone: 340:T1500F15U500



Max Depth: 17.150 m / 56.27 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP13.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496386m E: 274376m

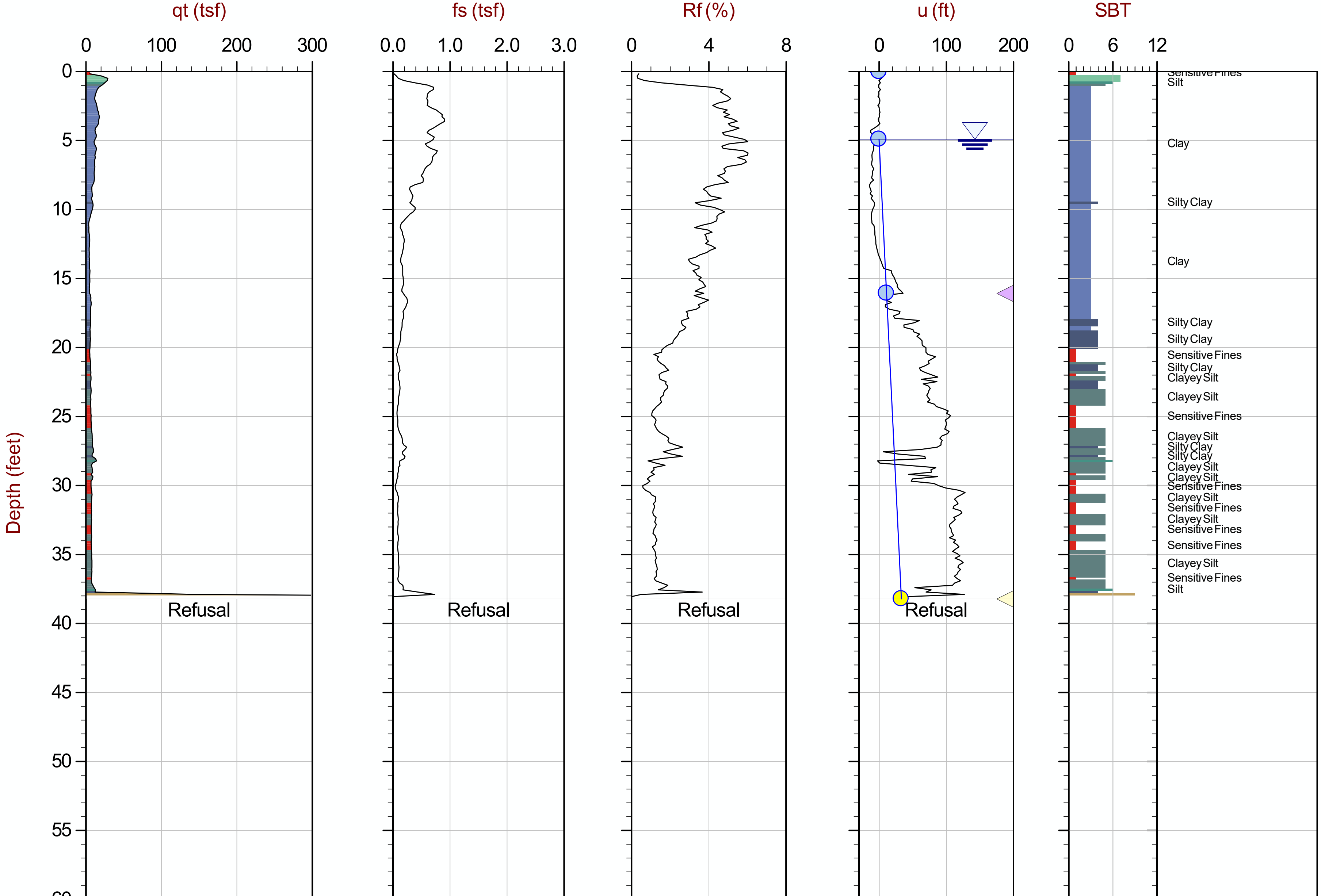
Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

ConeTec

AECOM

Job No: 15-53073
Date: 08:27:15 14:29
Site: Edwards Power Station, Peoria, IL
Sounding: EDW-C014
Cone: 374:T1500F15U500



Max Depth: 11.650 m / 38.22 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_CP14.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496366m E: 274362m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

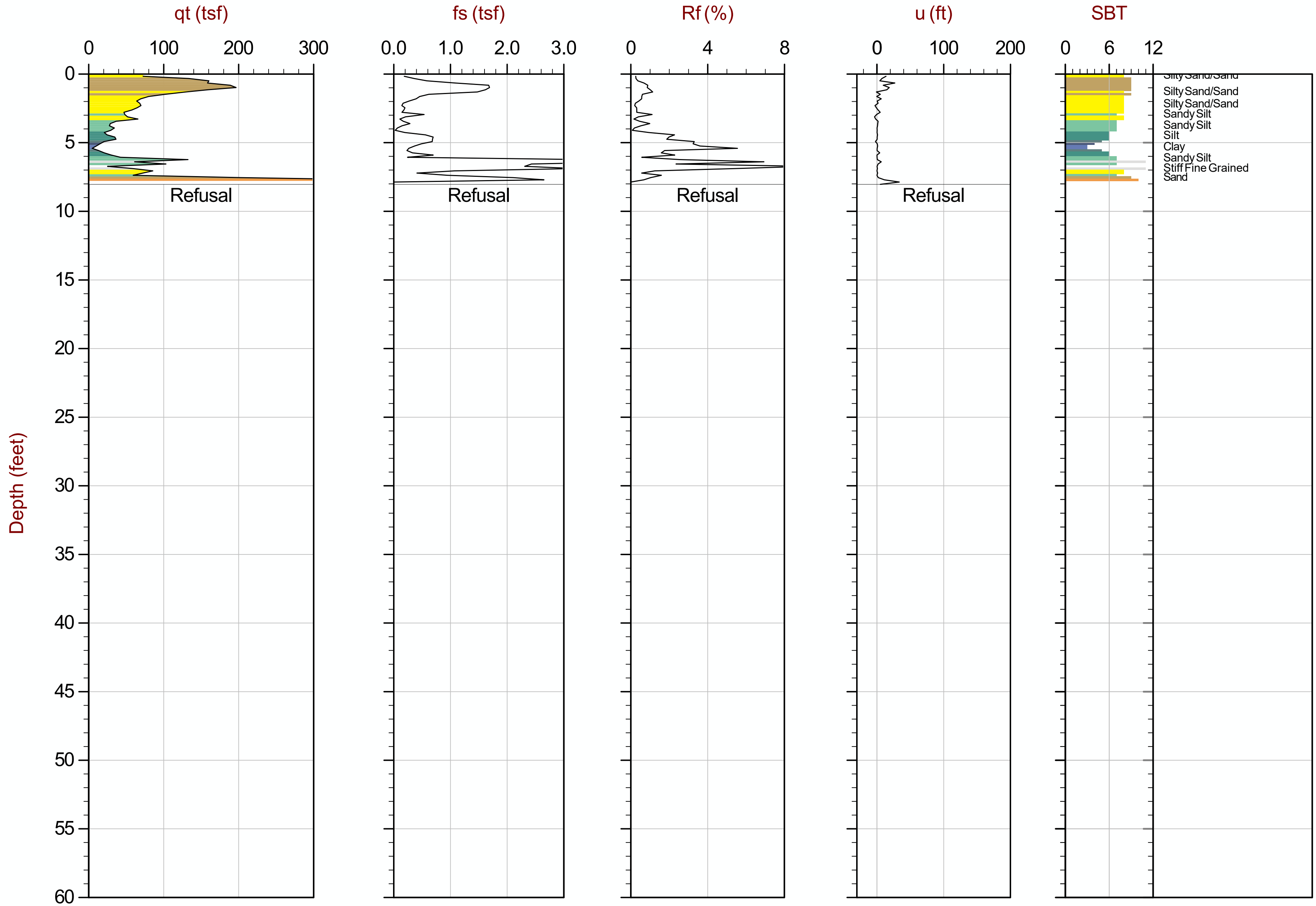
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:19:15 13:31
Site: Edwards Power Station

Sounding: EDW-C015
Cone: 335:T1500F15U500



Max Depth: 2.450 m / 8.04 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP15.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496447m E: 274334m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

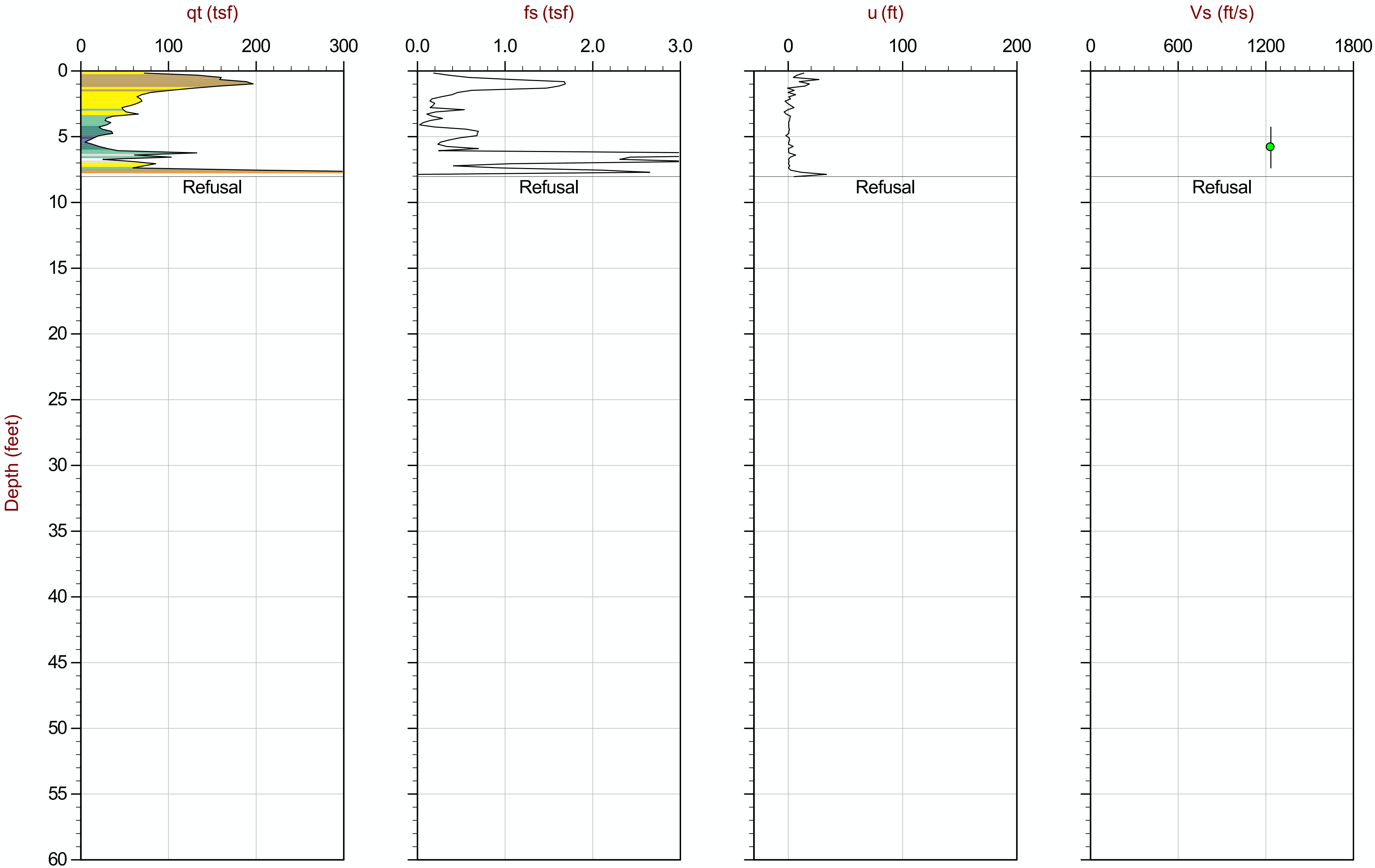
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:19:15 13:31
Site: Edwards Power Station

Sounding: EDW-C015
Cone: 335:T1500F15U500



Max Depth: 2.450 m / 8.04 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP15.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496447m E: 274334m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

AECOM

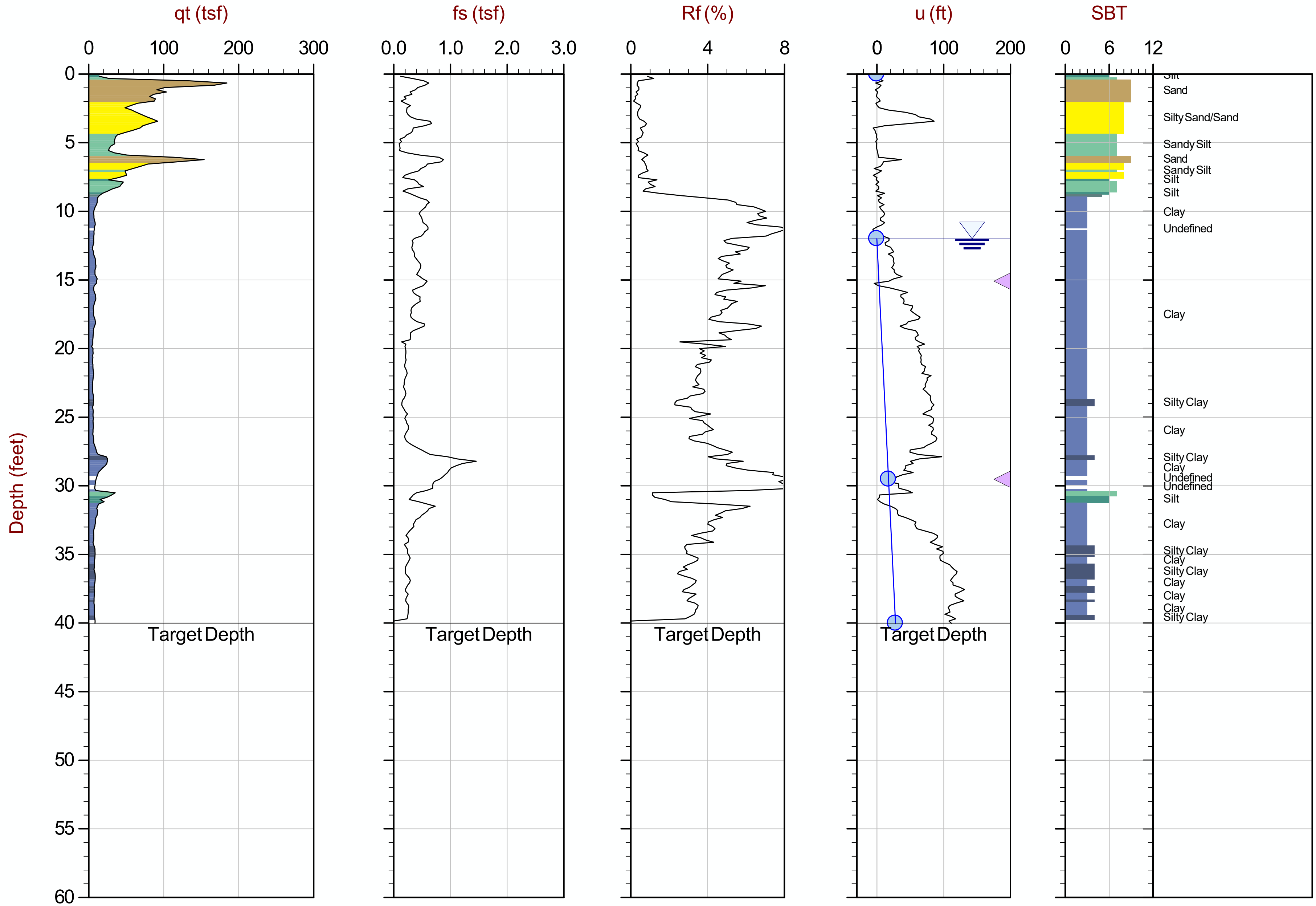
Job No: 15-53073

Date: 08:19:15 14:12

Site: Edwards Power Station

Sounding: EDW-C015A

Cone: 335:T1500F15U500



Max Depth: 12.200 m / 40.03 ft

Depth Inc: 0.050 m / 0.164 ft

Avg Int: Every Point

File: 15-53073_SP15A.COR

SBT: Robertson and Campanella, 1986

Coords: UTM Zone 16 N: 4496435m E: 274342m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

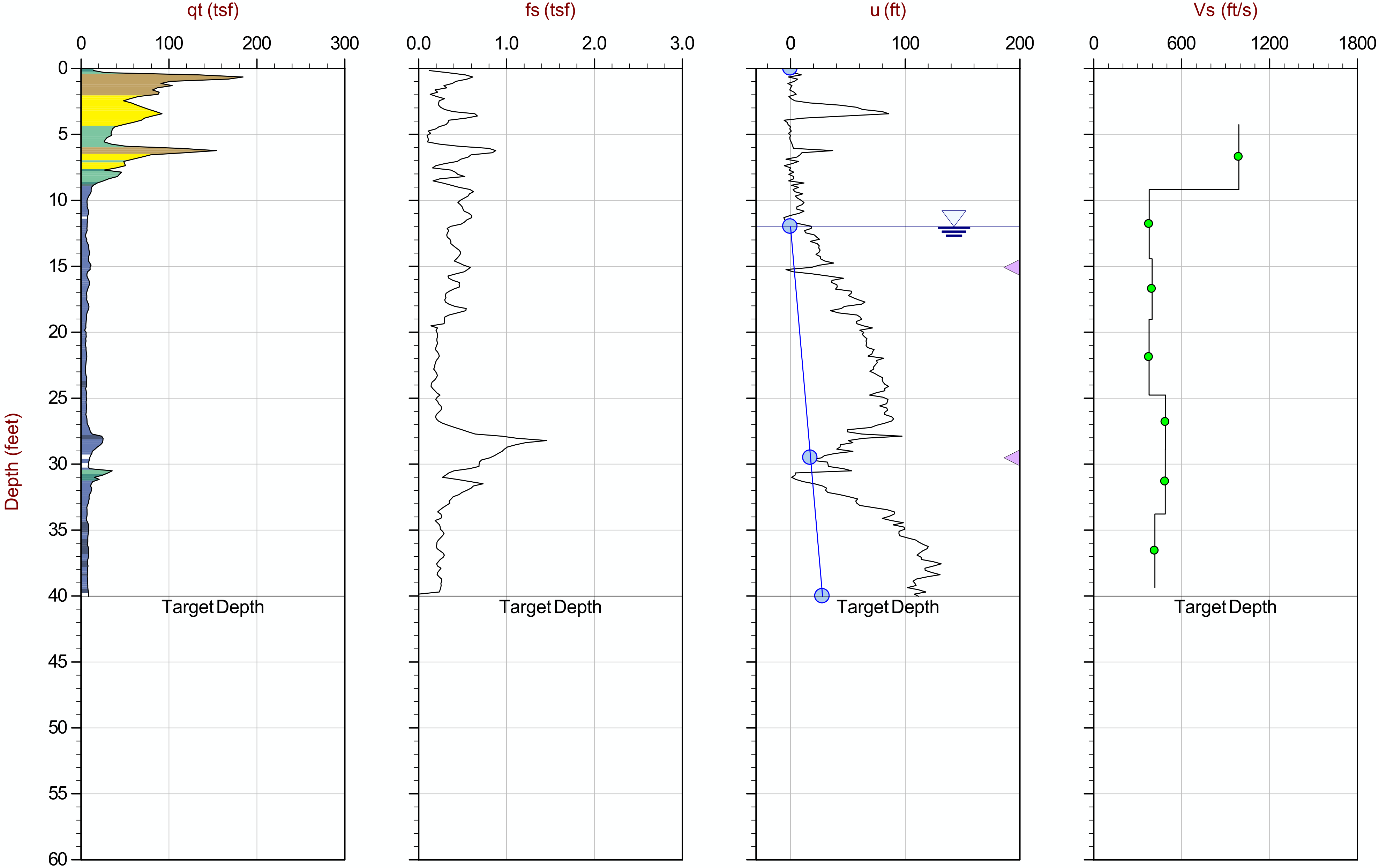
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:19:15 14:12
Site: Edwards Power Station

Sounding: EDW-C015A
Cone: 335:T1500F15U500



Max Depth: 12.200 m / 40.03 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

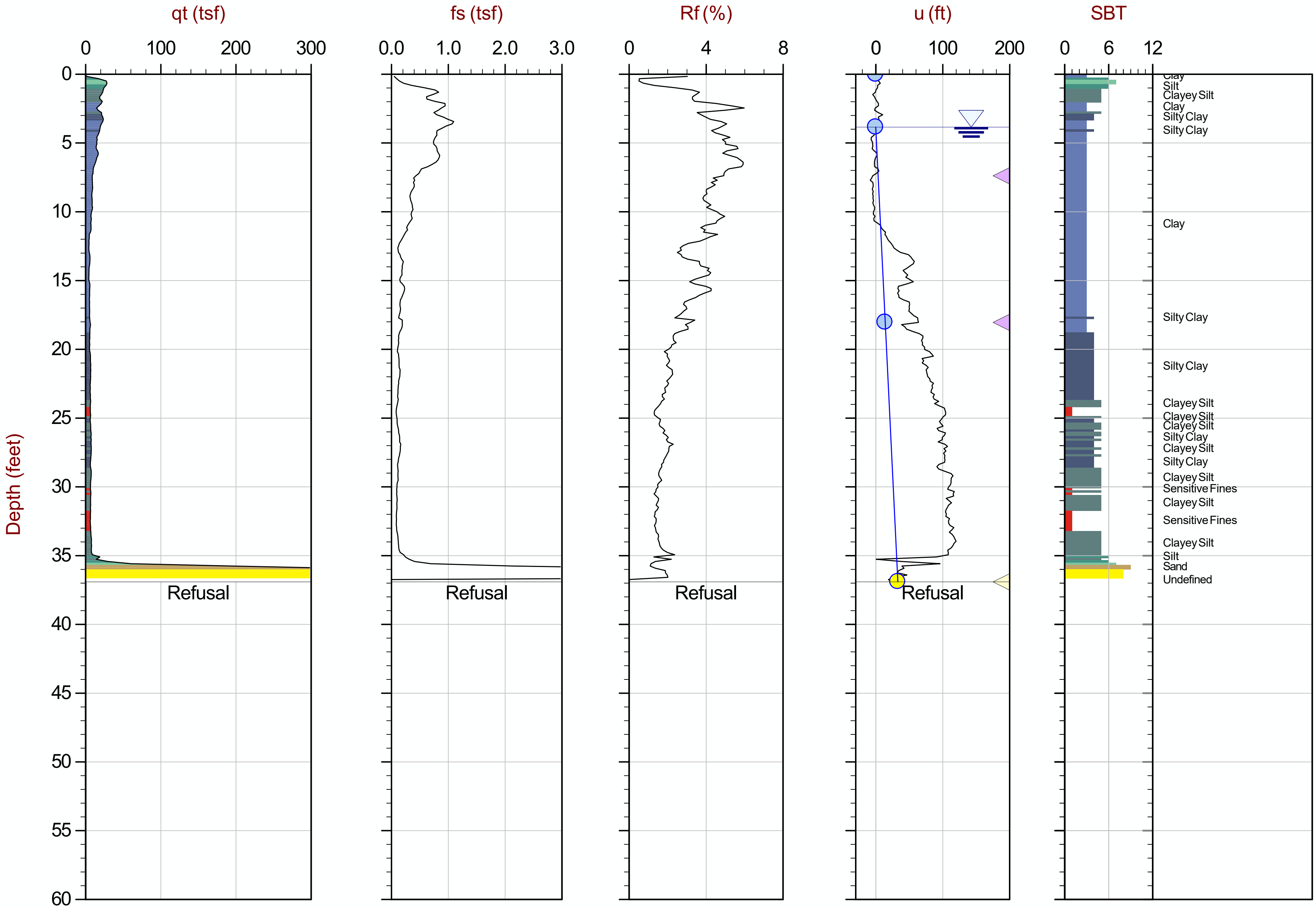
File: 15-53073_SP15A.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496435m E: 274342m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

AECOM	Job No: 15-53073	Sounding: EDW-C016
	Date: 08:28:15 08:46	Cone: 374:T1500F15U500
	Site: Edwards Power Station, Peoria, IL	



Max Depth: 11.250 m / 36.91 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_CP16.COR

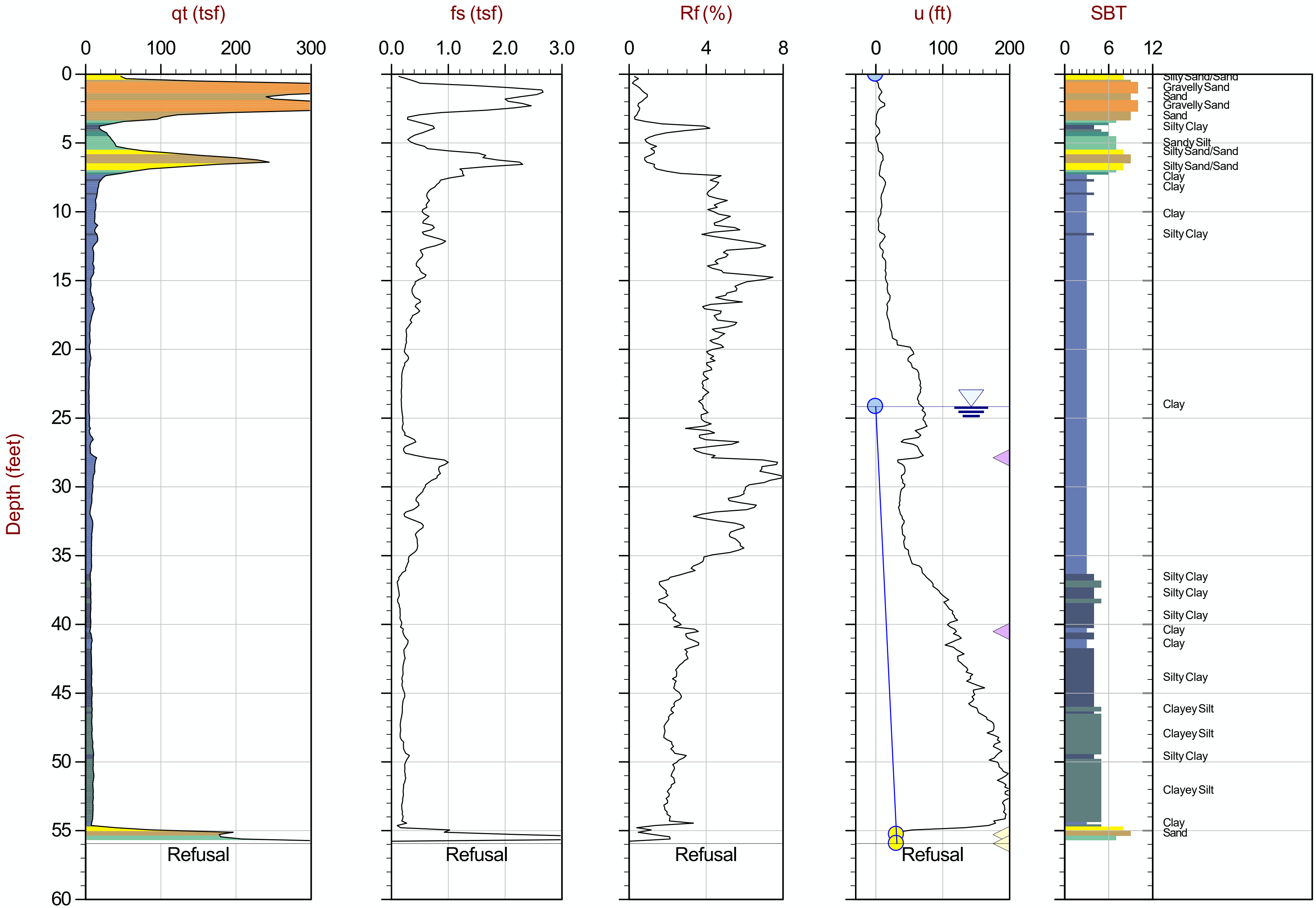
SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496442m E: 274308m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

AECOM

Job No: 15-53073
Date: 08:27:15 11:13
Site: Edwards Power Station, Peoria, Il
Sounding: EDW-C017
Cone: 340:T1500F15U500



Max Depth: 17.050 m / 55.94 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
File: 15-53073_SP17.COR
SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496775m E: 274137m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

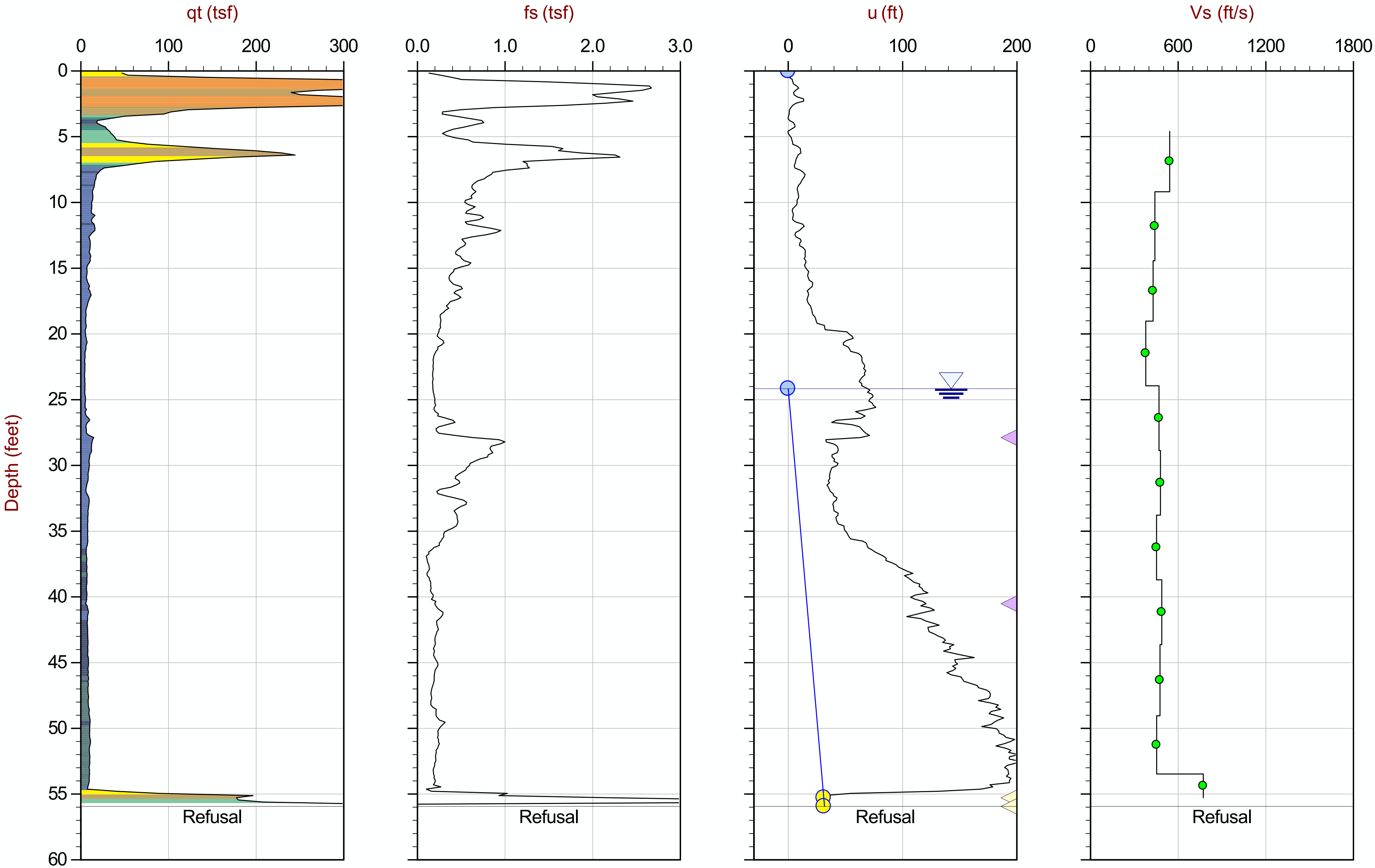
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:27:15 11:13
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C017
Cone: 340:T1500F15U500



Max Depth: 17.050 m / 55.94 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP17.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496775m E: 274137m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

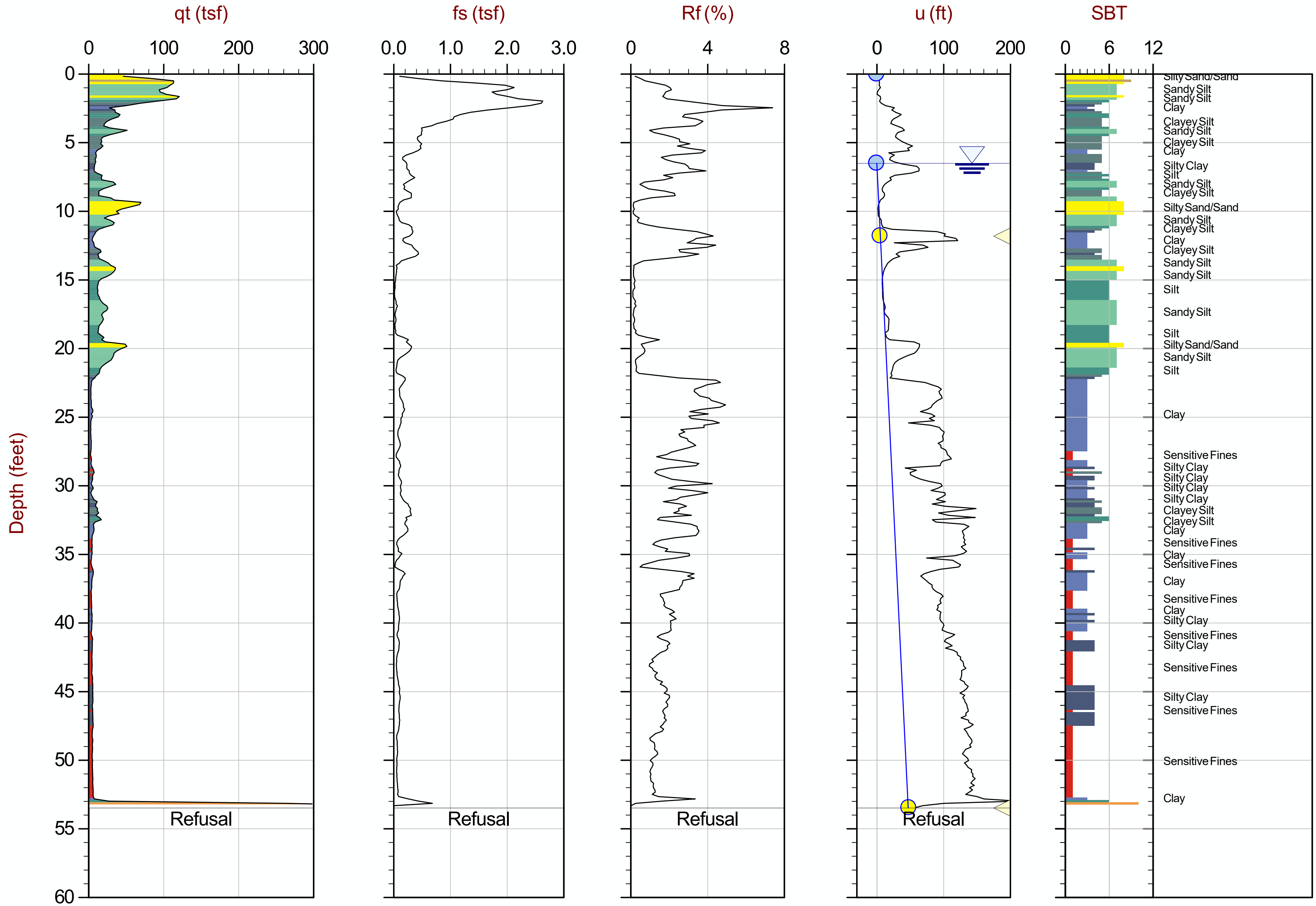
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

ConeTec

AECOM

Job No: 15-53073
Date: 08:27:15 15:23
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C019
Cone: 340:T1500F15U500



Max Depth: 16.300 m / 53.48 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_CP19.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496825m E: 274184m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

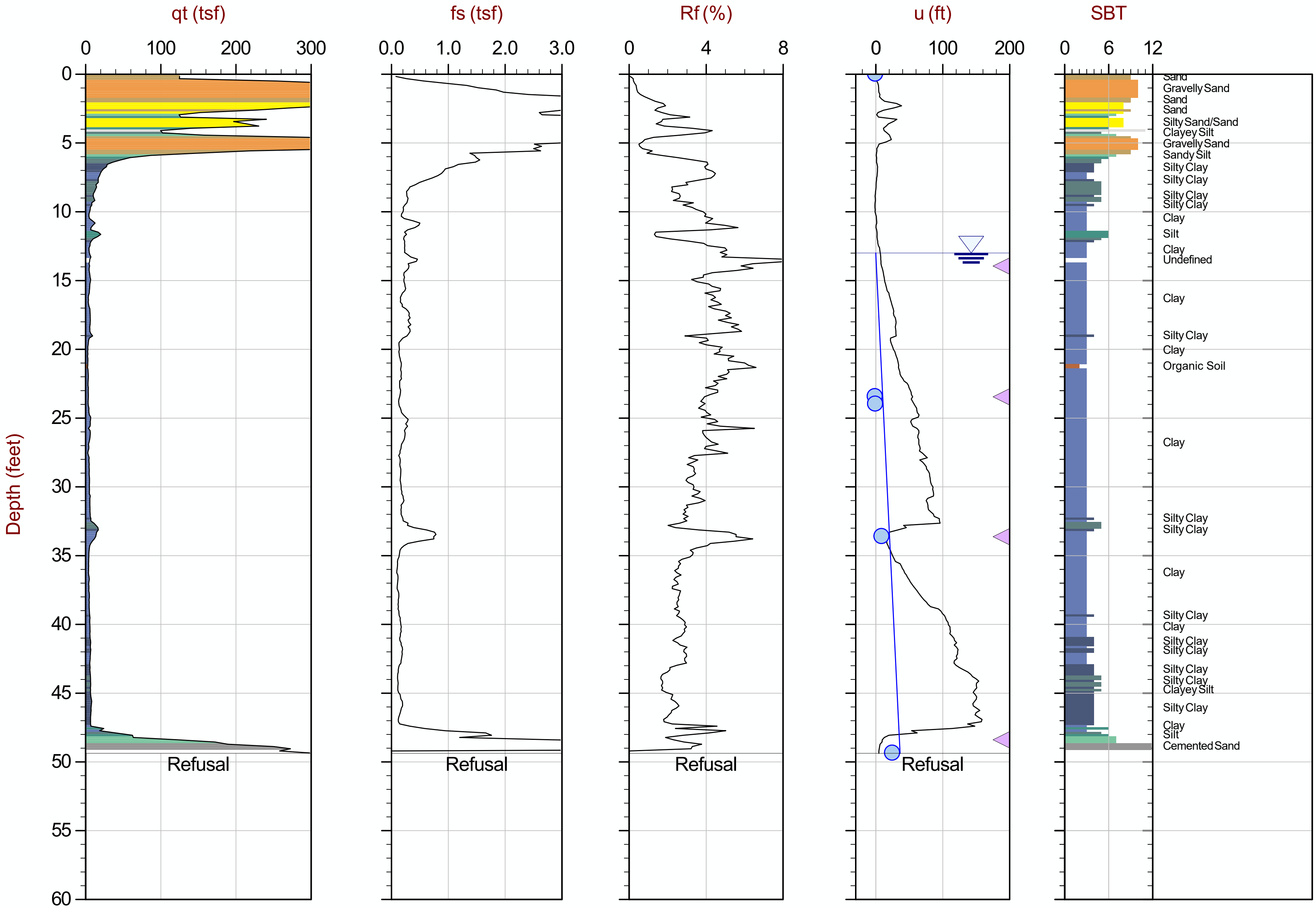
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:27:15 13:27
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C021
Cone: 340:T1500F15U500



Max Depth: 15.050 m / 49.38 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_CP21.COR

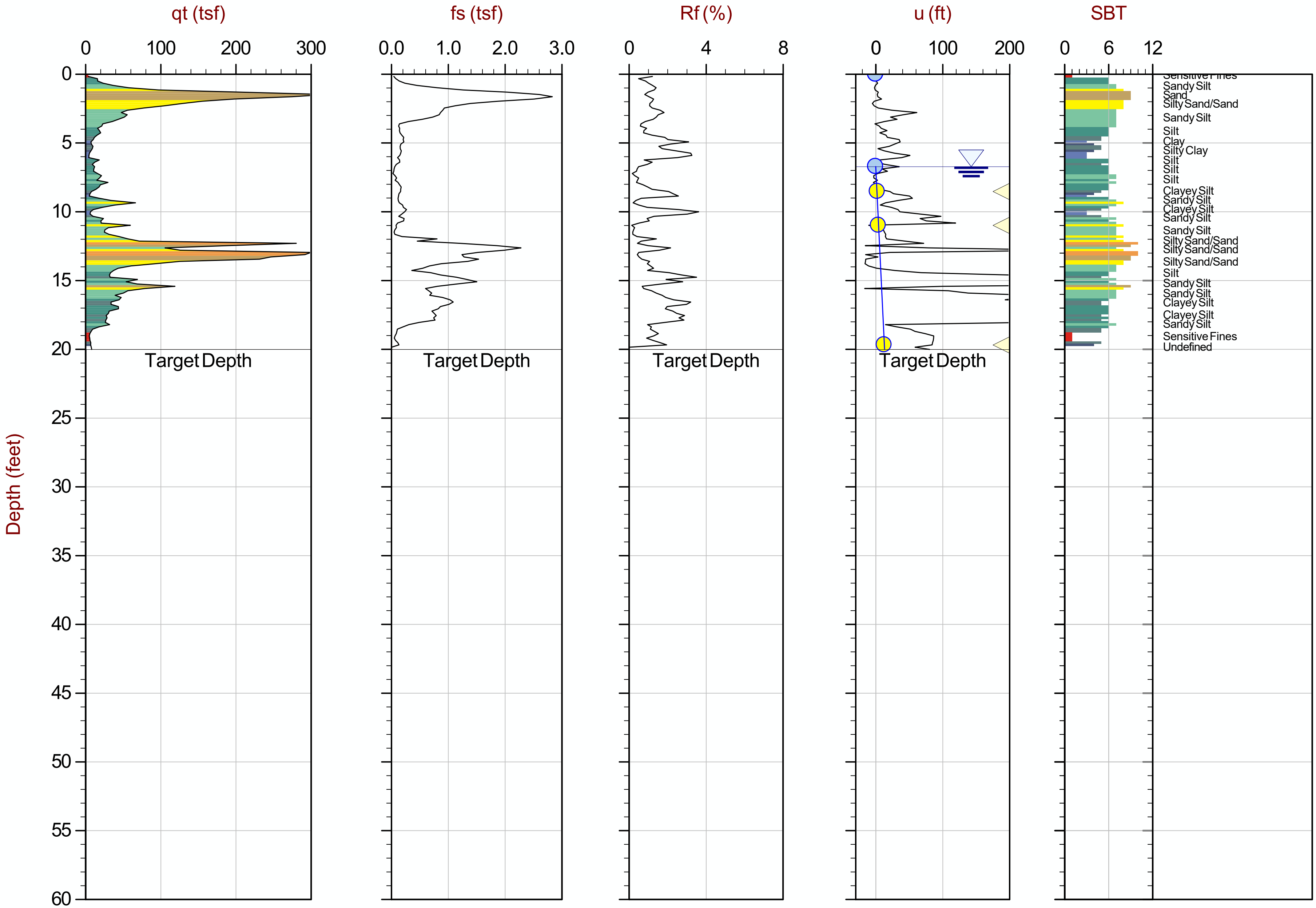
SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4497046m E: 274071m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

AECOM

Job No: 15-53073
Date: 08:26:15 10:35
Site: Edwards Power Station, Peoria, IL
Sounding: EDW-C022
Cone: 374:T1500F15U500



Max Depth: 6.100 m / 20.01 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP22.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4497185m E: 274108m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

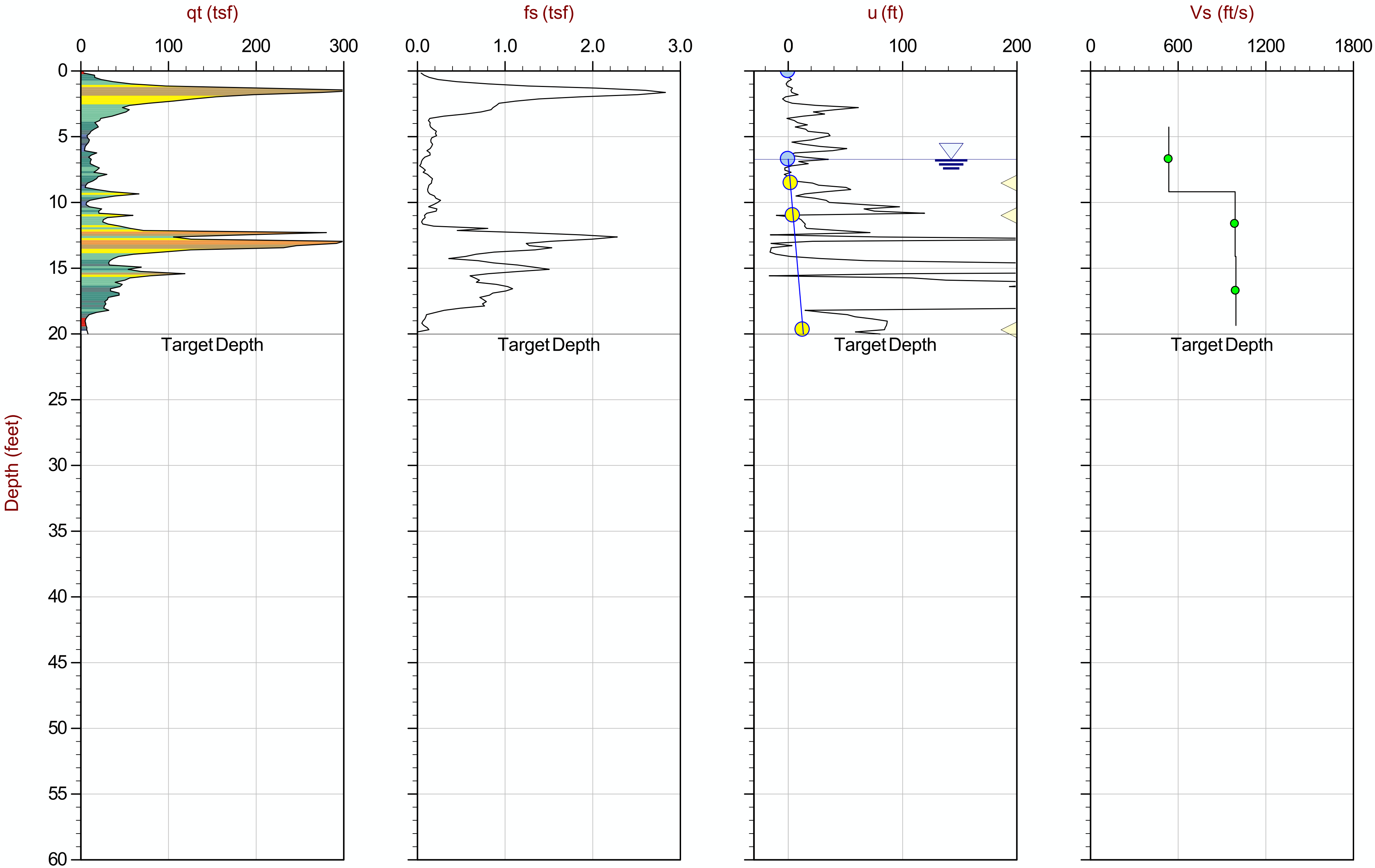
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:26:15 10:35
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C022
Cone: 374:T1500F15U500



Max Depth: 6.100 m / 20.01 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP22.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4497185m E: 274108m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

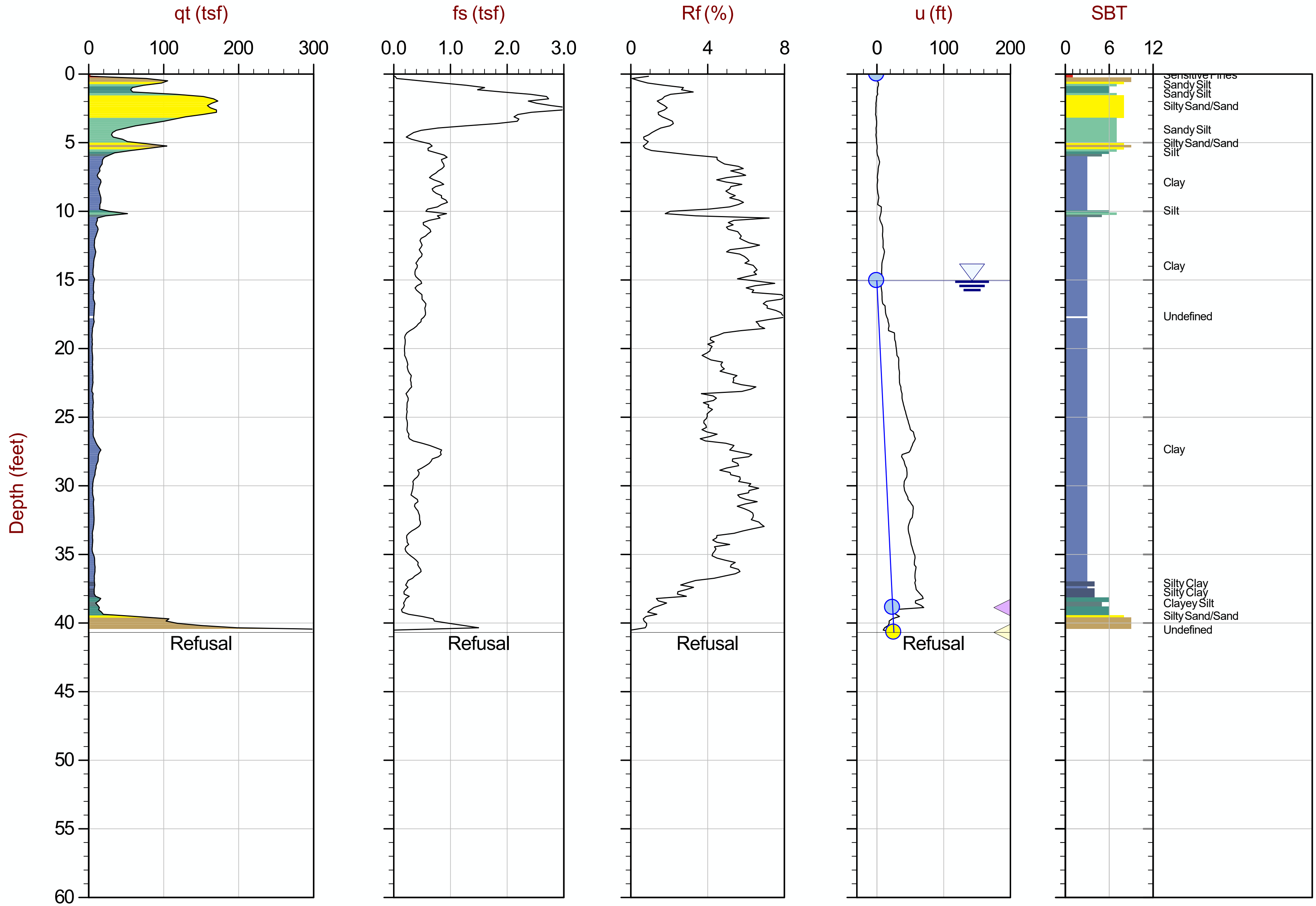
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:27:15 08:52
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C023
Cone: 340:T1500F15U500



Max Depth: 12.400 m / 40.68 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

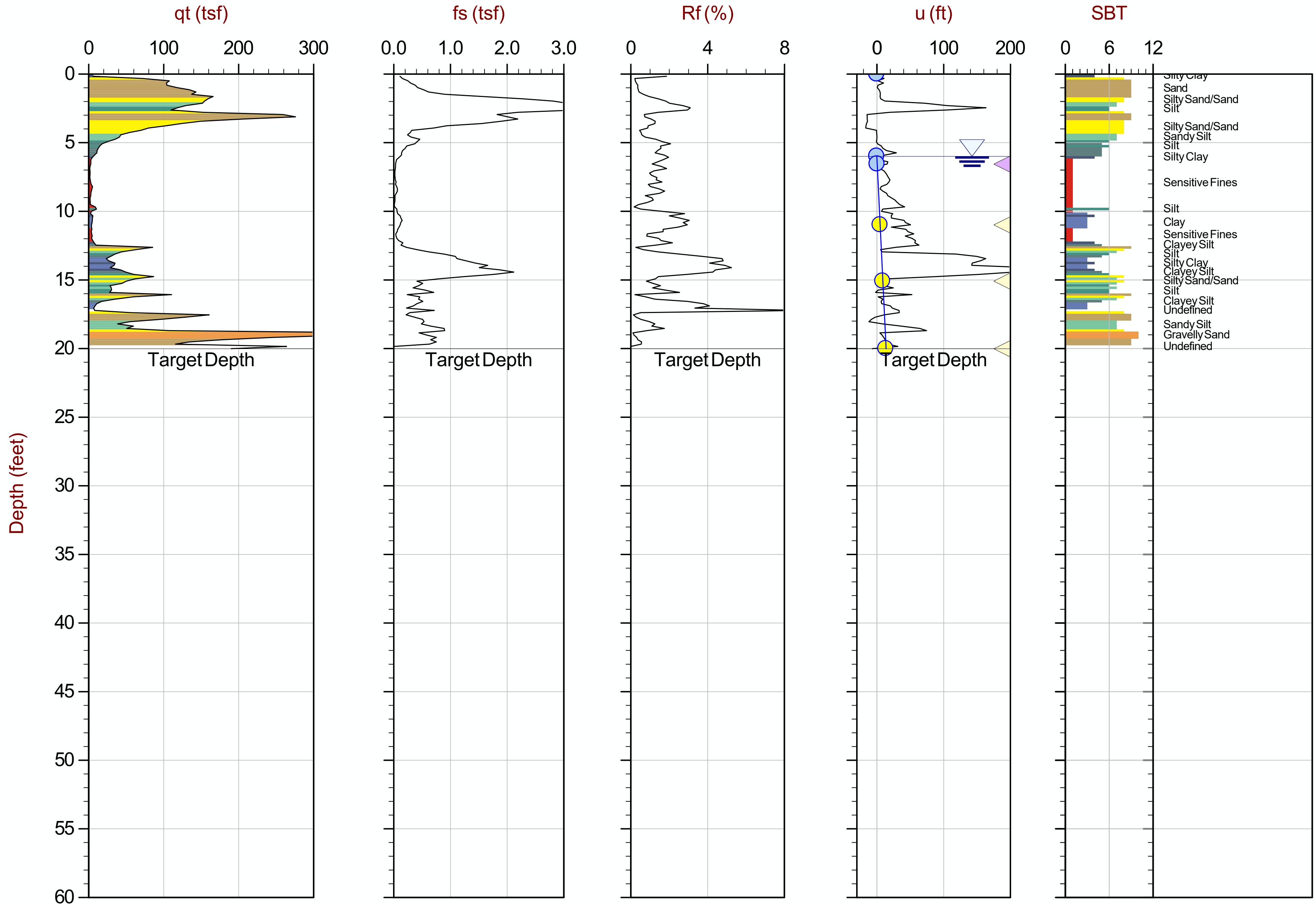
File: 15-53073_CP23.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4497364m E: 274147m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

AECOM	Job No: 15-53073	Sounding: EDW-C025
	Date: 08:25:15 13:44	Cone: 374:T1500F15U500
	Site: Edwards Power Station, Peoria, IL	



Max Depth: 6.100 m / 20.01 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_CP25.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4497285m E: 274315m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

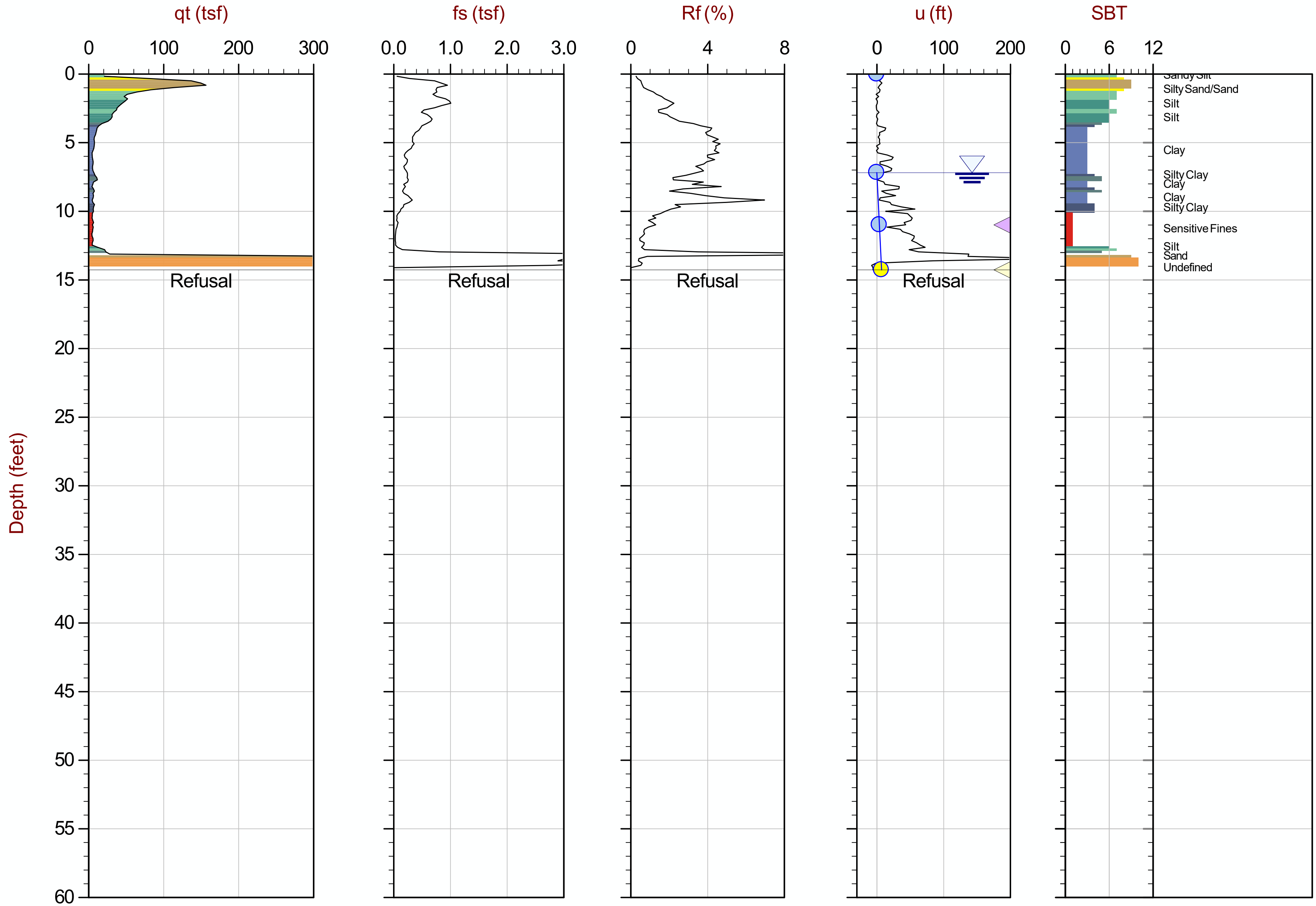
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:26:15 12:20
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C026
Cone: 374:T1500F15U500



Max Depth: 4.350 m / 14.27 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP26.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4497062m E: 274334m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

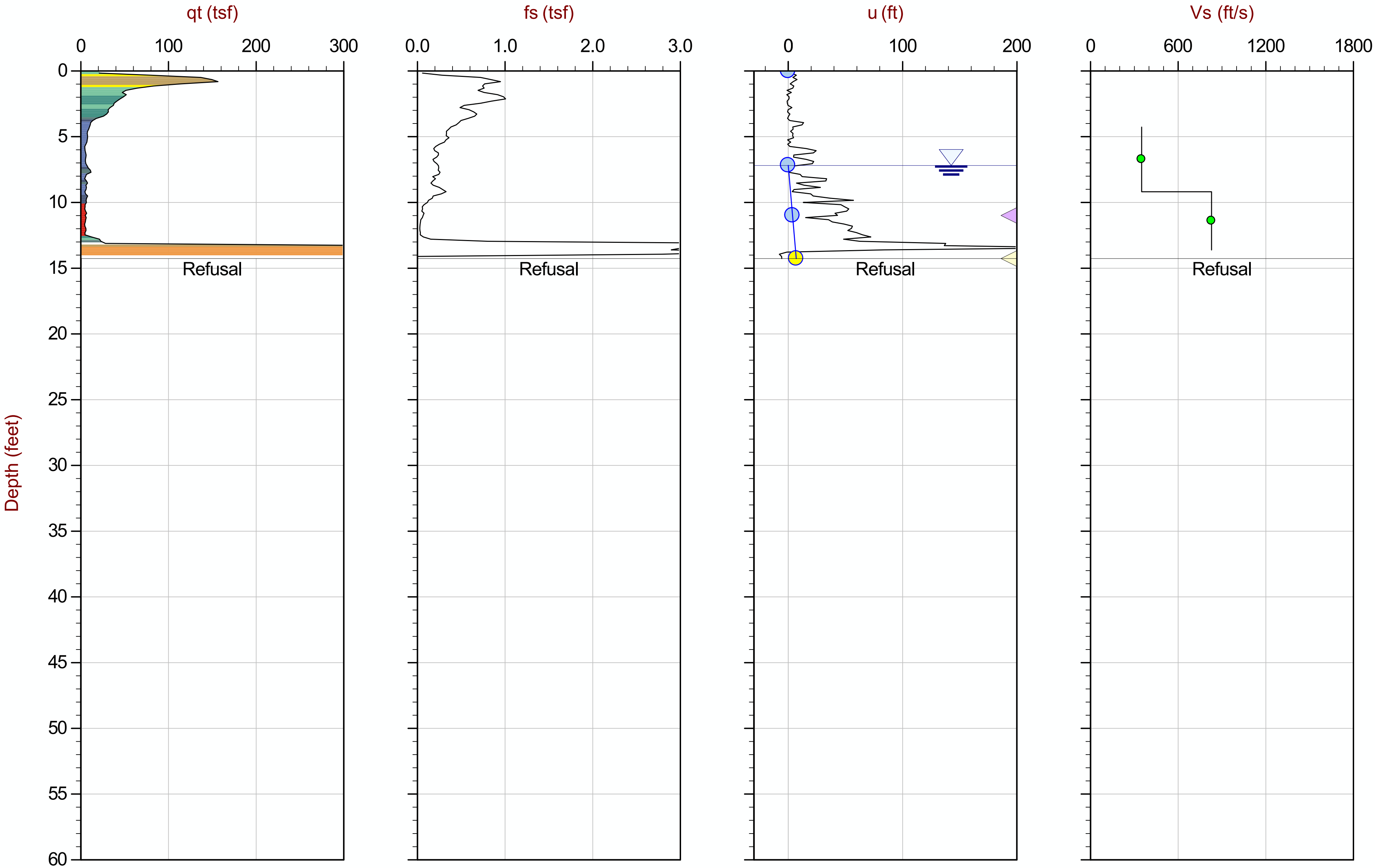
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:26:15 12:20
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C026
Cone: 374:T1500F15U500



Max Depth: 4.350 m / 14.27 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

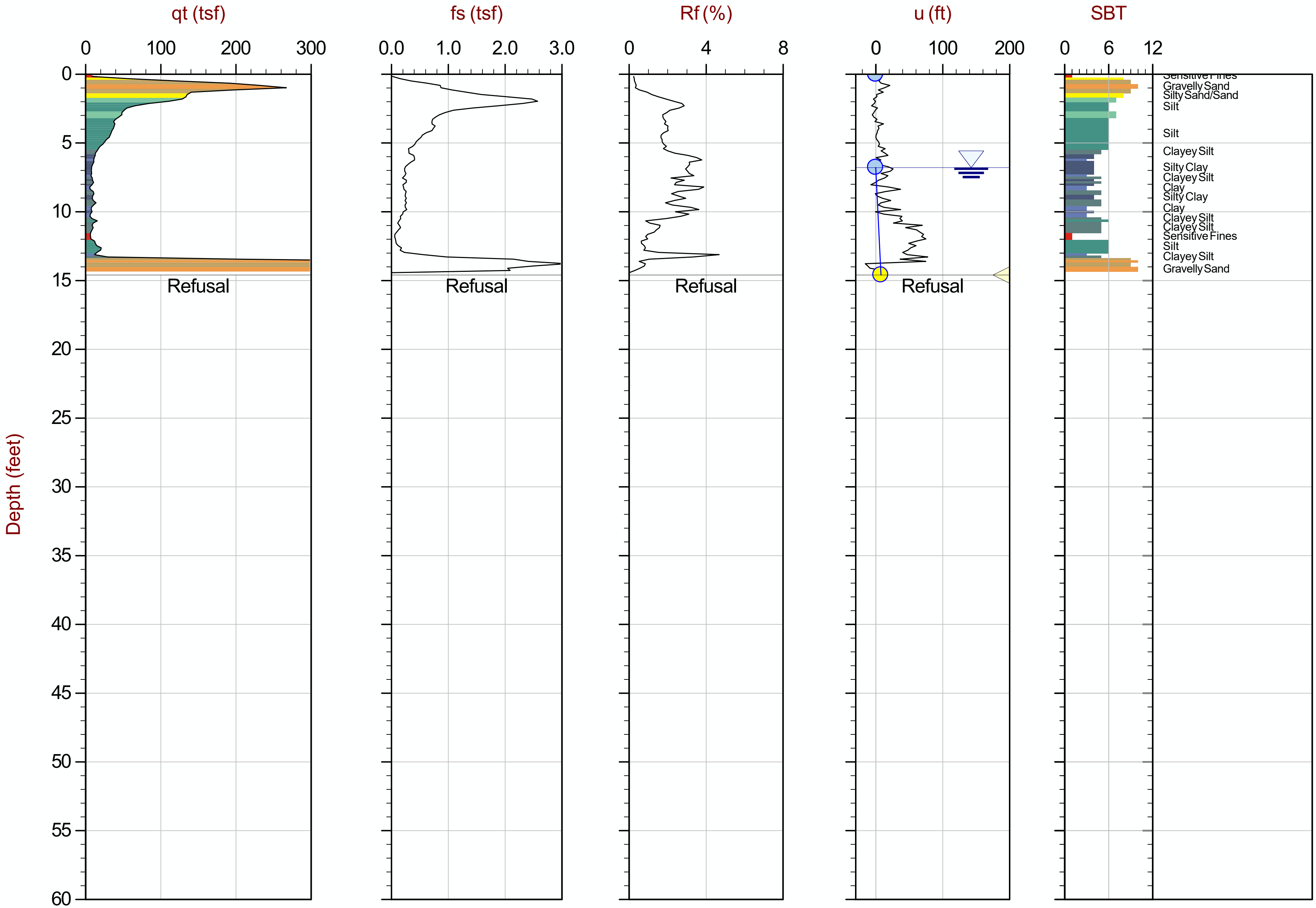
File: 15-53073_SP26.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4497062m E: 274334m

Hydrostatic Line · Ueq · Assumed Ueq · PPD, Ueq achieved · PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

AECOM	Job No: 15-53073	Sounding: EDW-C026B
	Date: 08:26:15 14:00	Cone: 374:T1500F15U500
	Site: Edwards Power Station, Peoria, IL	



Max Depth: 4.450 m / 14.60 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP26B.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4497064m E: 274335m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

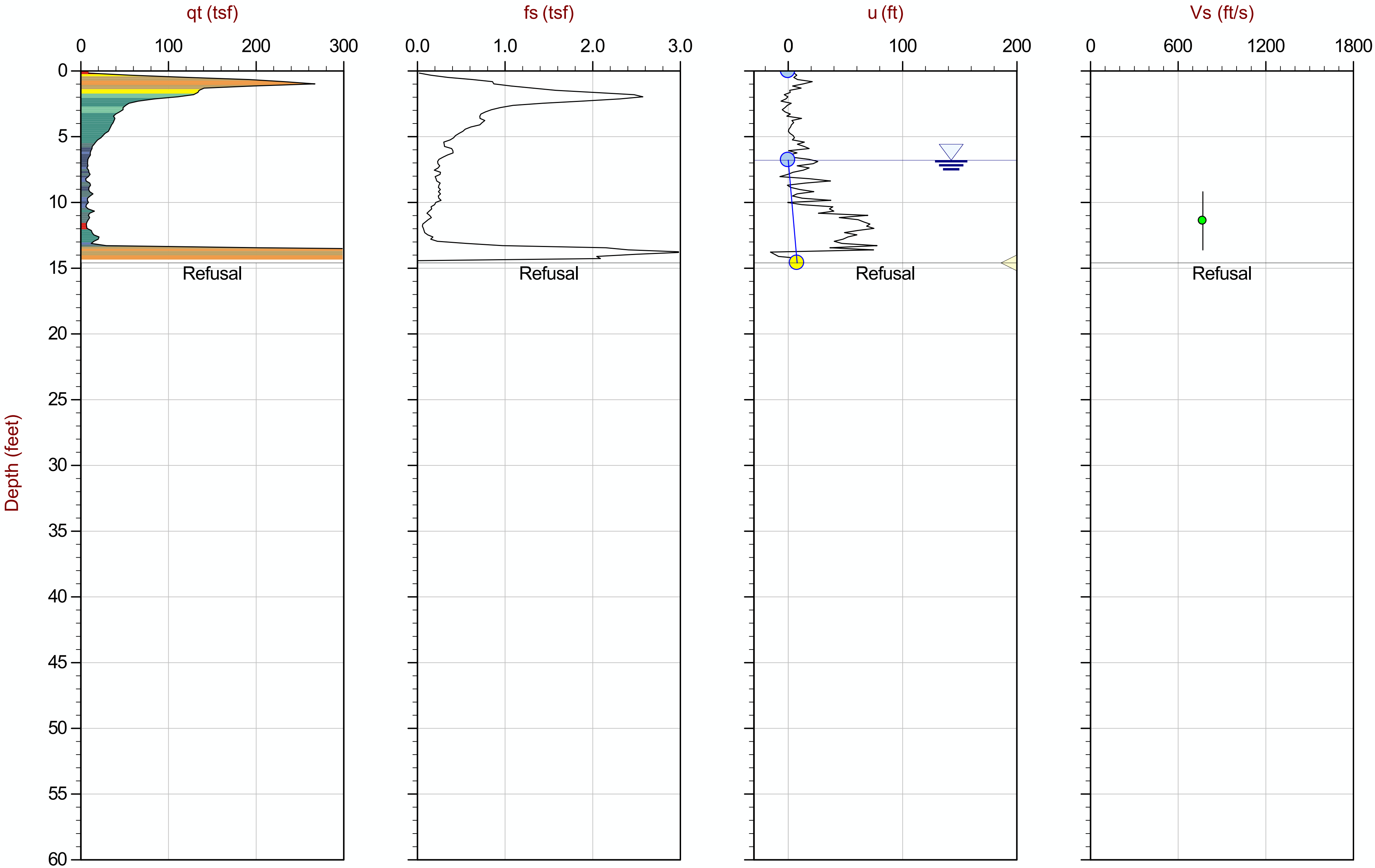
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

ConeTec

AECOM

Job No: 15-53073
Date: 08:26:15 14:00
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C026B
Cone: 374:T1500F15U500



Max Depth: 4.450 m / 14.60 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 15-53073_SP26B.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4497064m E: 274335m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

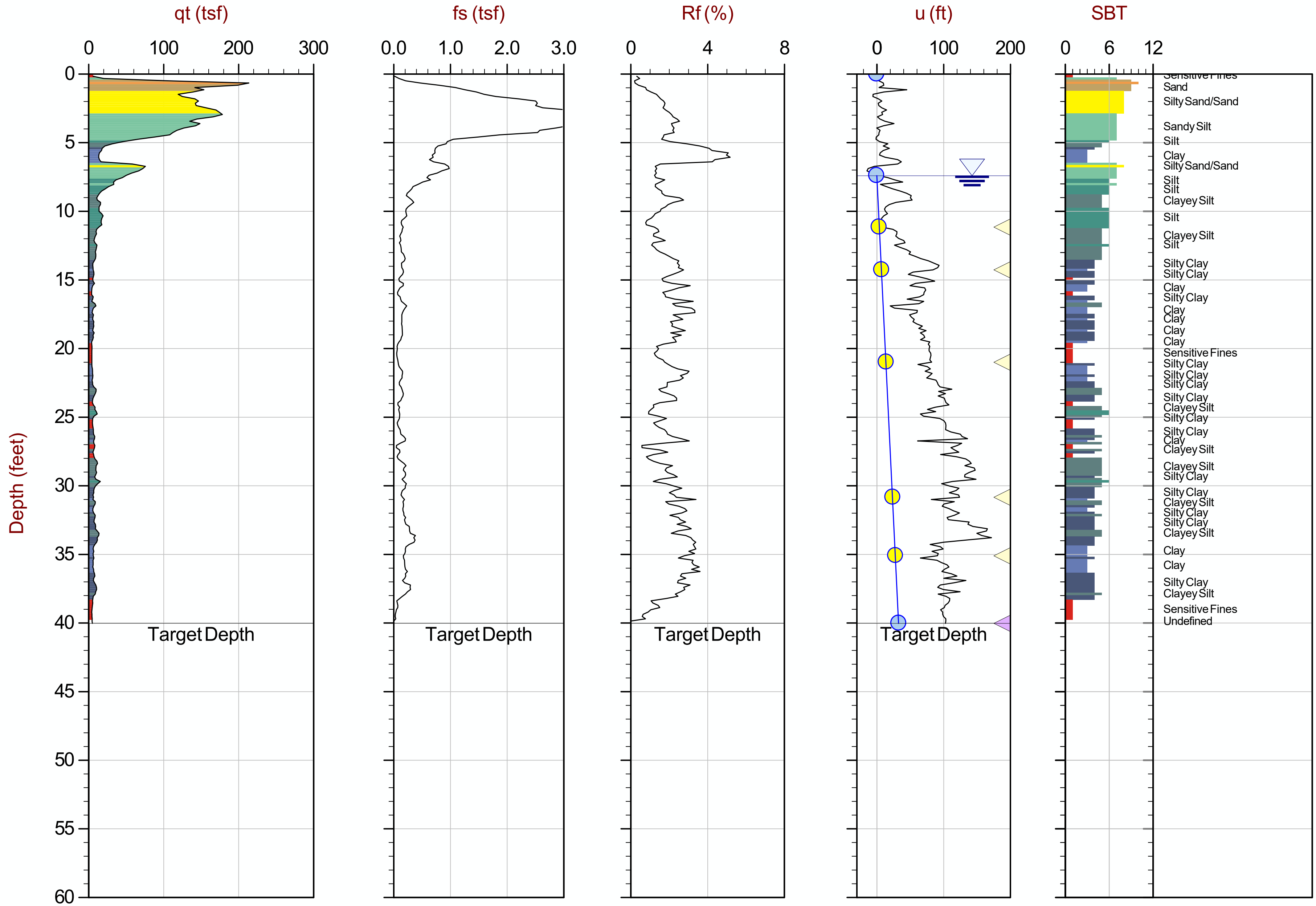
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

AECOM

Job No: 15-53073
Date: 08:25:15 11:00
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C027
Cone: 374:T1500F15U500



Max Depth: 12.200 m / 40.03 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

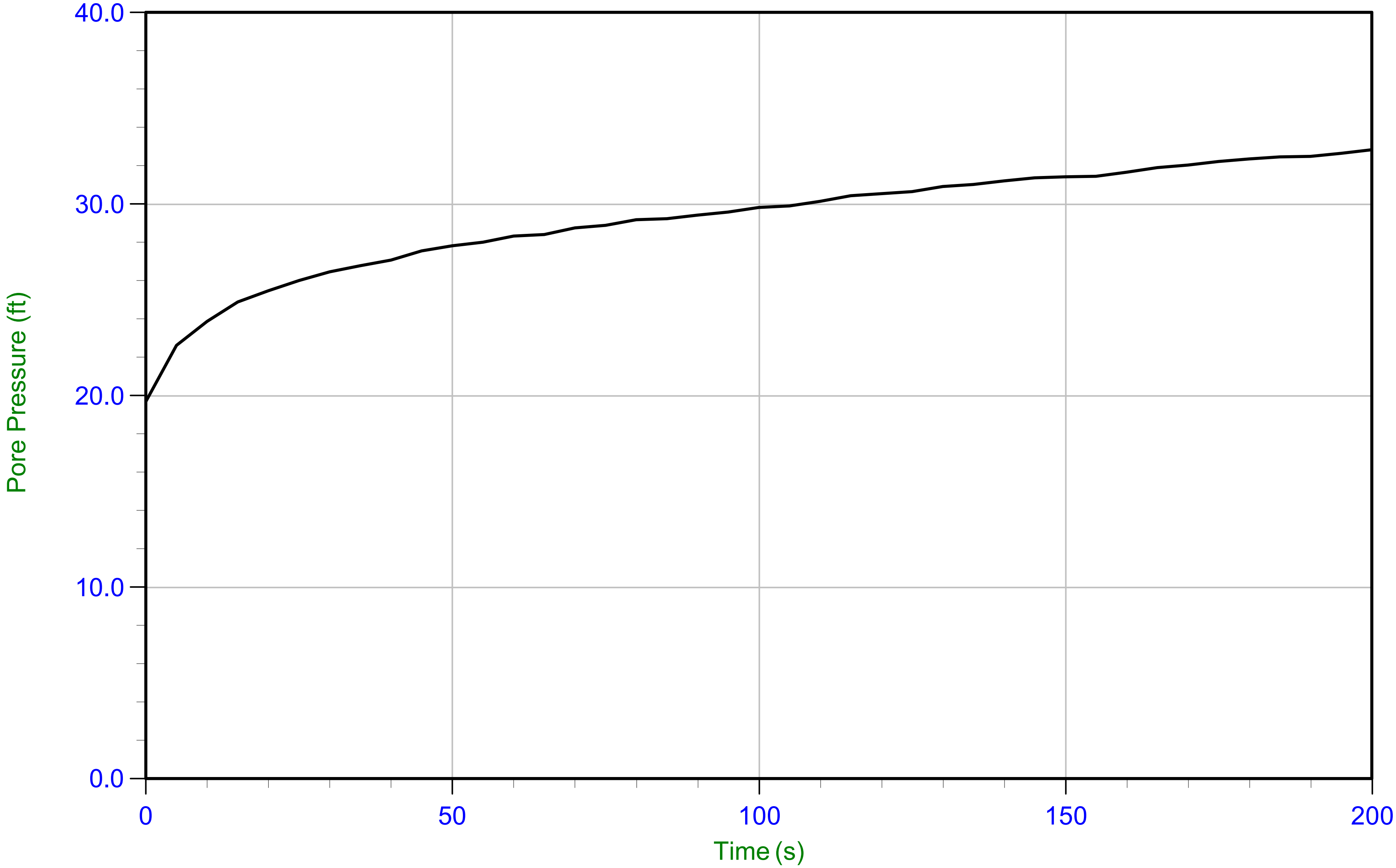
File: 15-53073_CP27.COR

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 16 N: 4496687m E: 274266m

Hydrostatic Line   Ueq   Assumed Ueq   PPD, Ueq achieved   PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

AECOM	Job No: 15-53073 Date: 19-Aug-2015 13:46:01 Site: Edwards Power Station, Peoria, IL	Sounding: EDW-C001 Cone: 374 Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_SP01.PPD
Depth: 4.000 m / 13.123 ft
Duration: 200.0 s

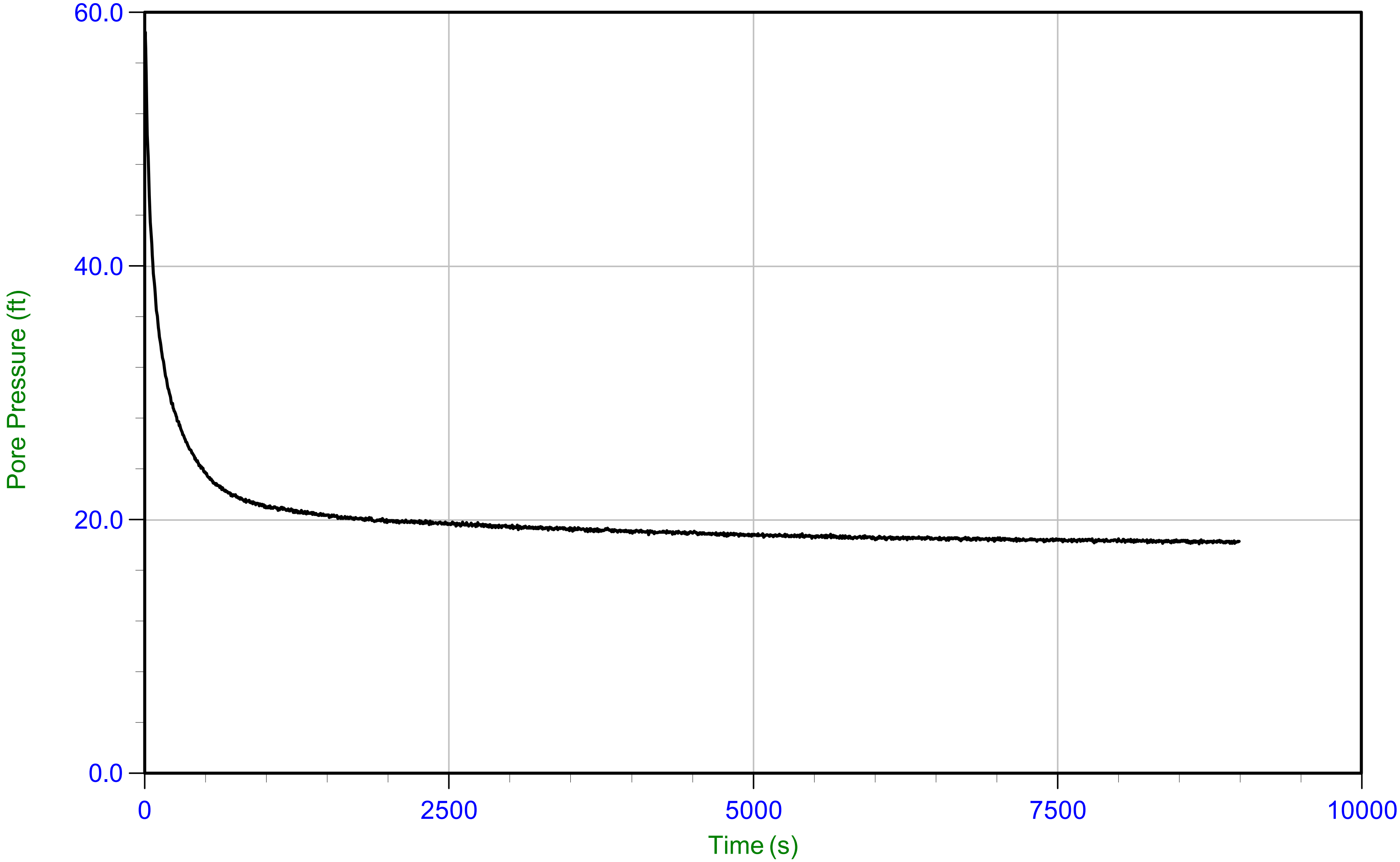
U Min: 19.7 ft
U Max: 32.8 ft

CONETEC

AECOM

Job No: 15-53073
Date: 19-Aug-2015 13:46:01
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C001
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_SP01.PPD
Depth: 8.300 m / 27.231 ft
Duration: 9000.0 s

U Min: 18.1 ft
U Max: 58.5 ft

WT: 2.855 m / 9.367 ft
Ueq: 17.9 ft
U(50): 38.16 ft

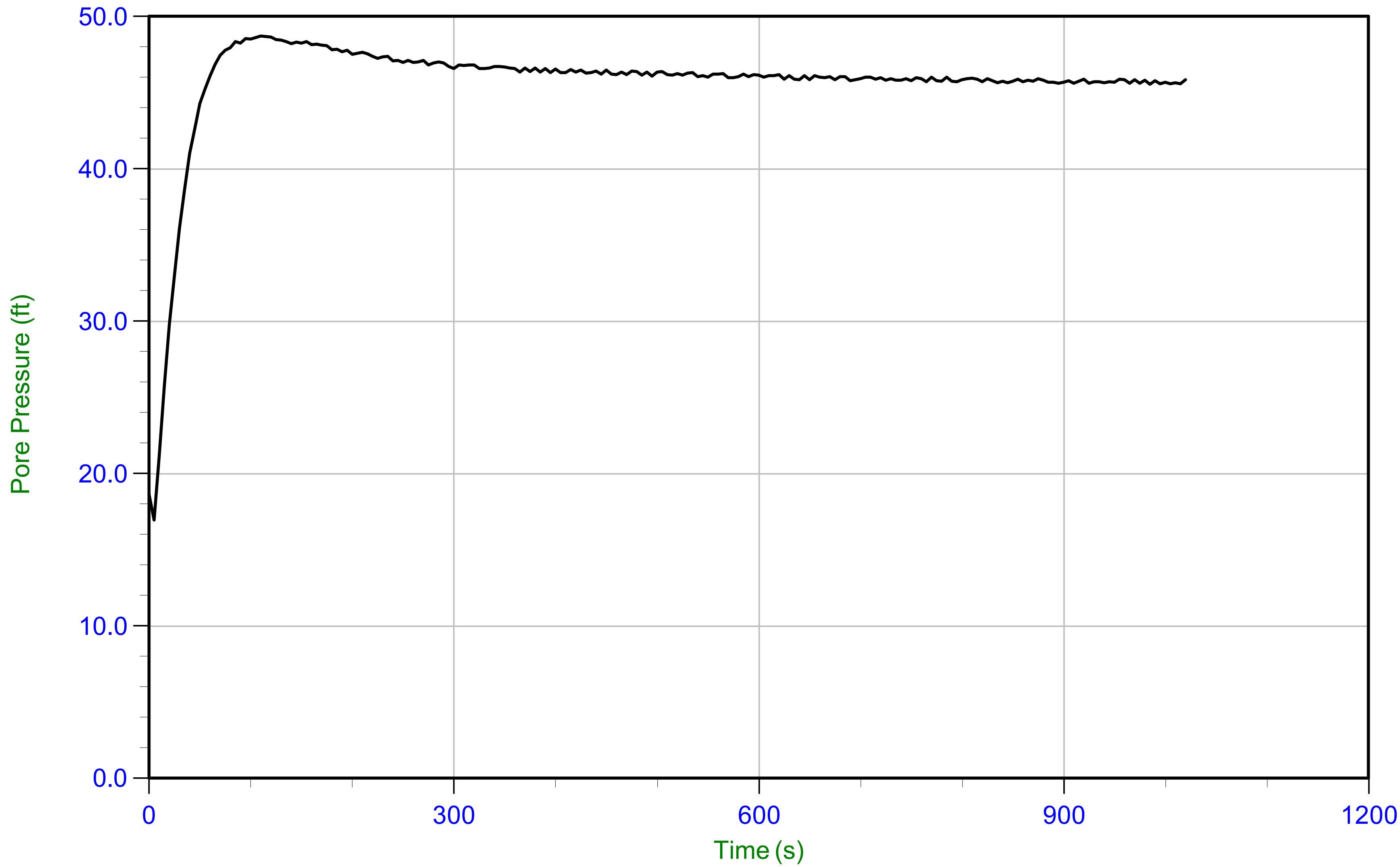
T(50): 80.8 s
Ir: 100
Ch: 8.7 sq cm/min

CONETEC

AECOM

Job No: 15-53073
Date: 25-Aug-2015 14:27:54
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C003
Cone: AD419
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_SP03.PPD
Depth: 16.600 m / 54.461 ft
Duration: 1020.0 s

U Min: 16.9 ft
U Max: 48.7 ft

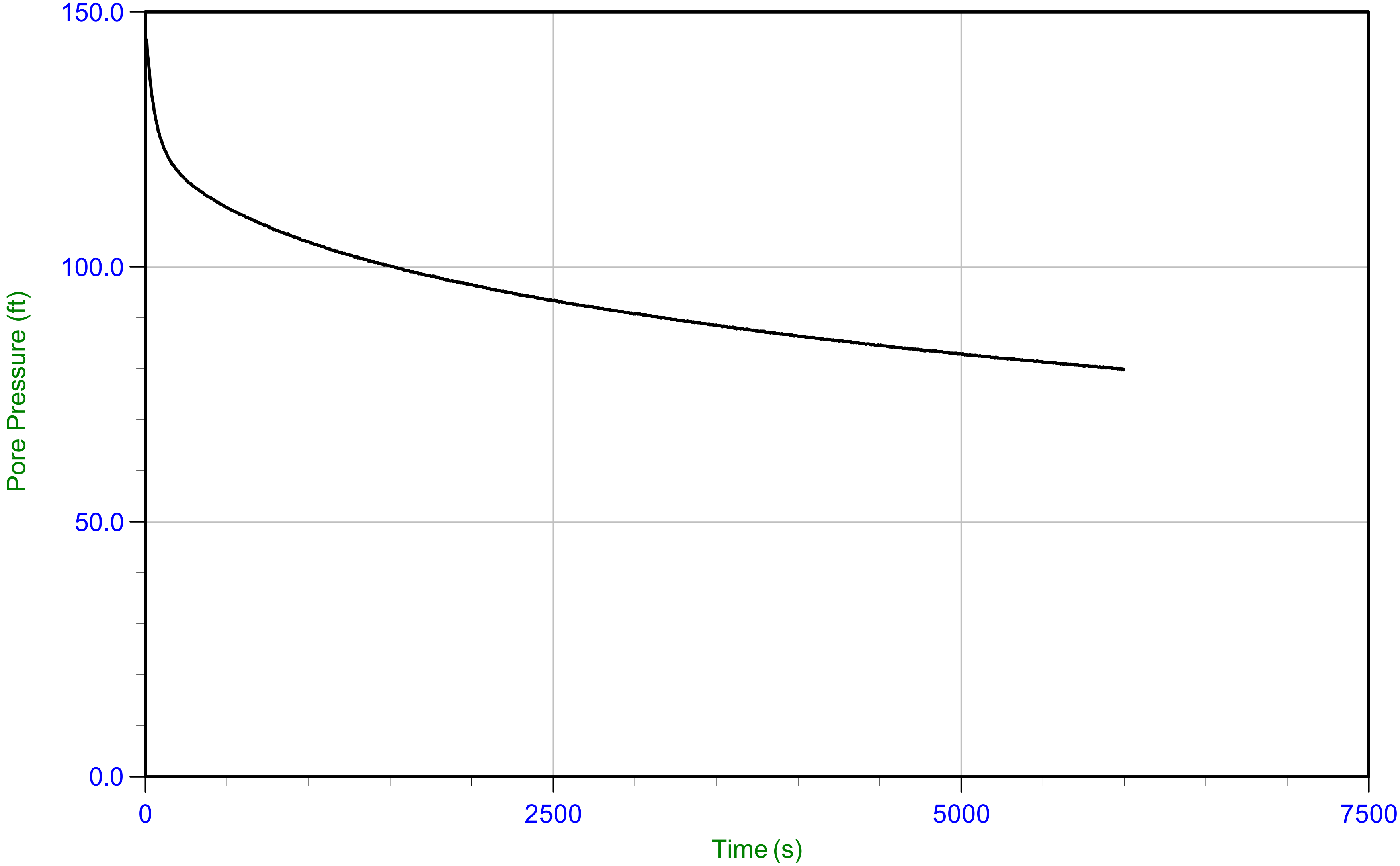
WT: 2.736 m / 8.976 ft
Ueq: 45.5 ft

CONETEC

AECOM

Job No: 15-53073
Date: 26-Aug-2015 15:05:24
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C005
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP05.PPD
Depth: 11.400 m / 37.401 ft
Duration: 6000.0 s

U Min: 79.9 ft
U Max: 144.8 ft

WT: 2.134 m / 7.001 ft
Ueq: 30.4 ft
U(50): 87.59 ft

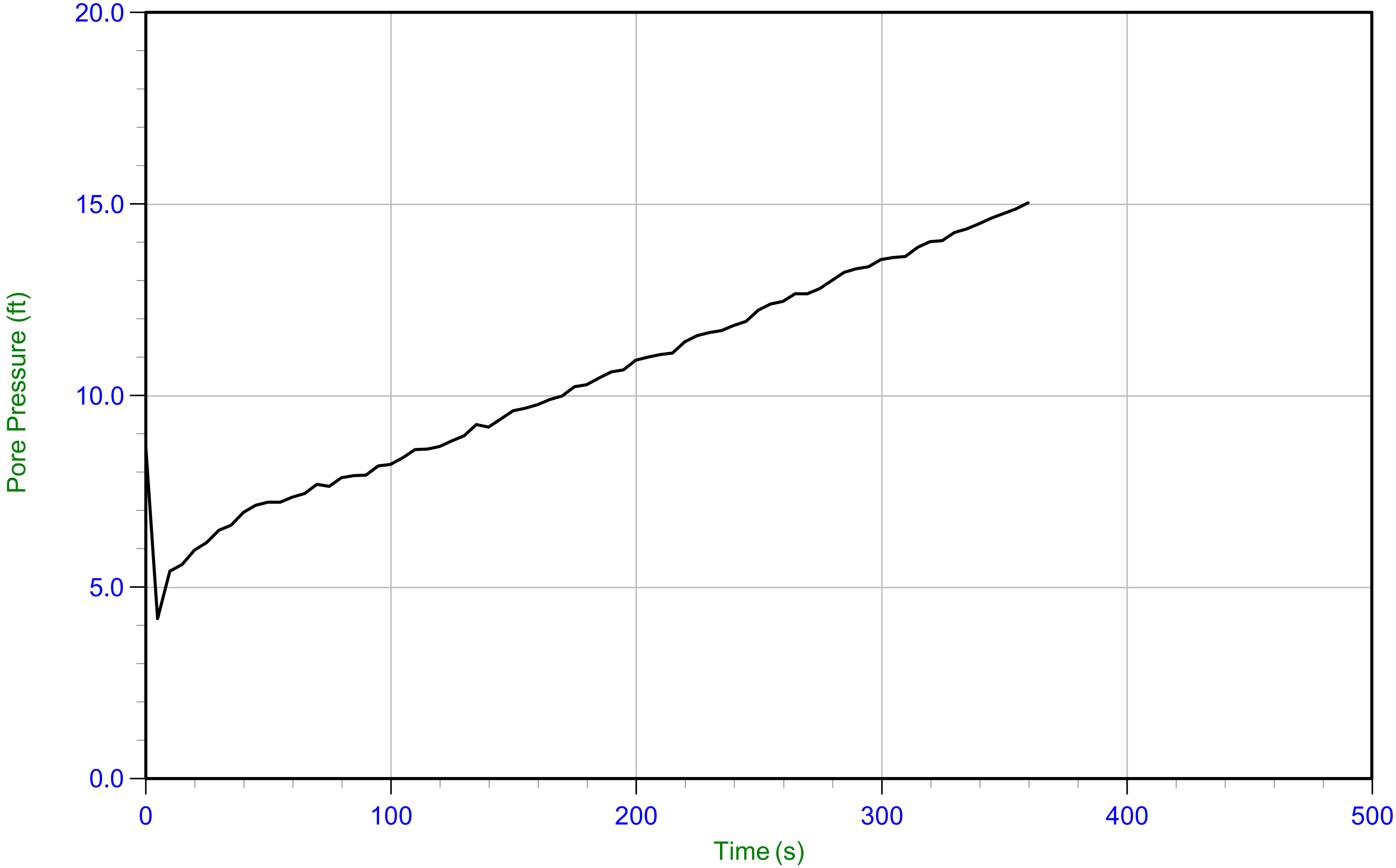
T(50): 3717.5 s
Ir: 100
Ch: 0.2 sq cm/min

CONETEC

AECOM

Job No: 15-53073
Date: 25-Aug-2015 15:52:43
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C006
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

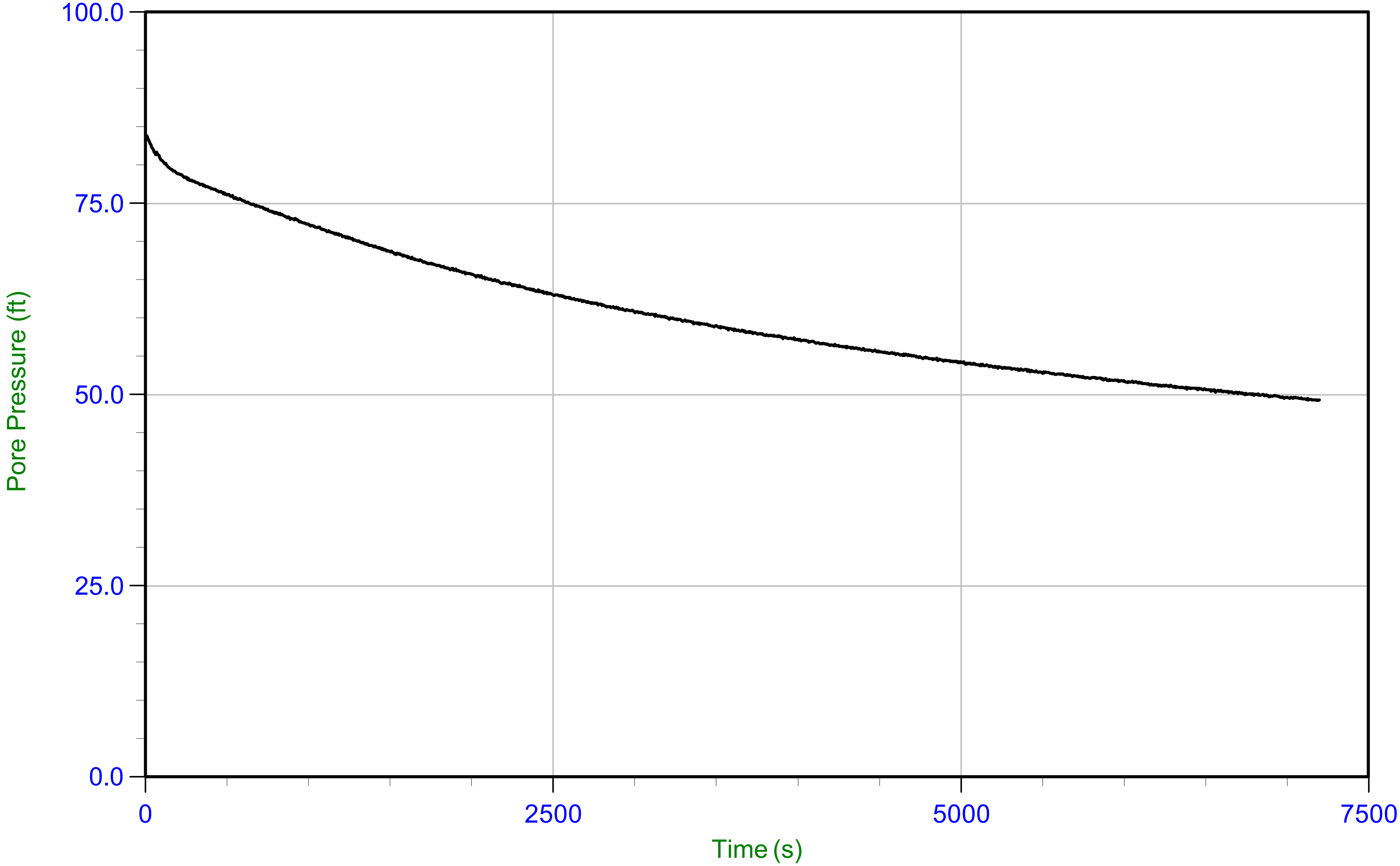
Filename: 15-53073_CP06.PPD
Depth: 4.350 m / 14.271 ft
Duration: 360.0 s

U Min: 4.2 ft
U Max: 15.0 ft

AECOM

Job No: 15-53073
Date: 25-Aug-2015 15:52:43
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C006
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

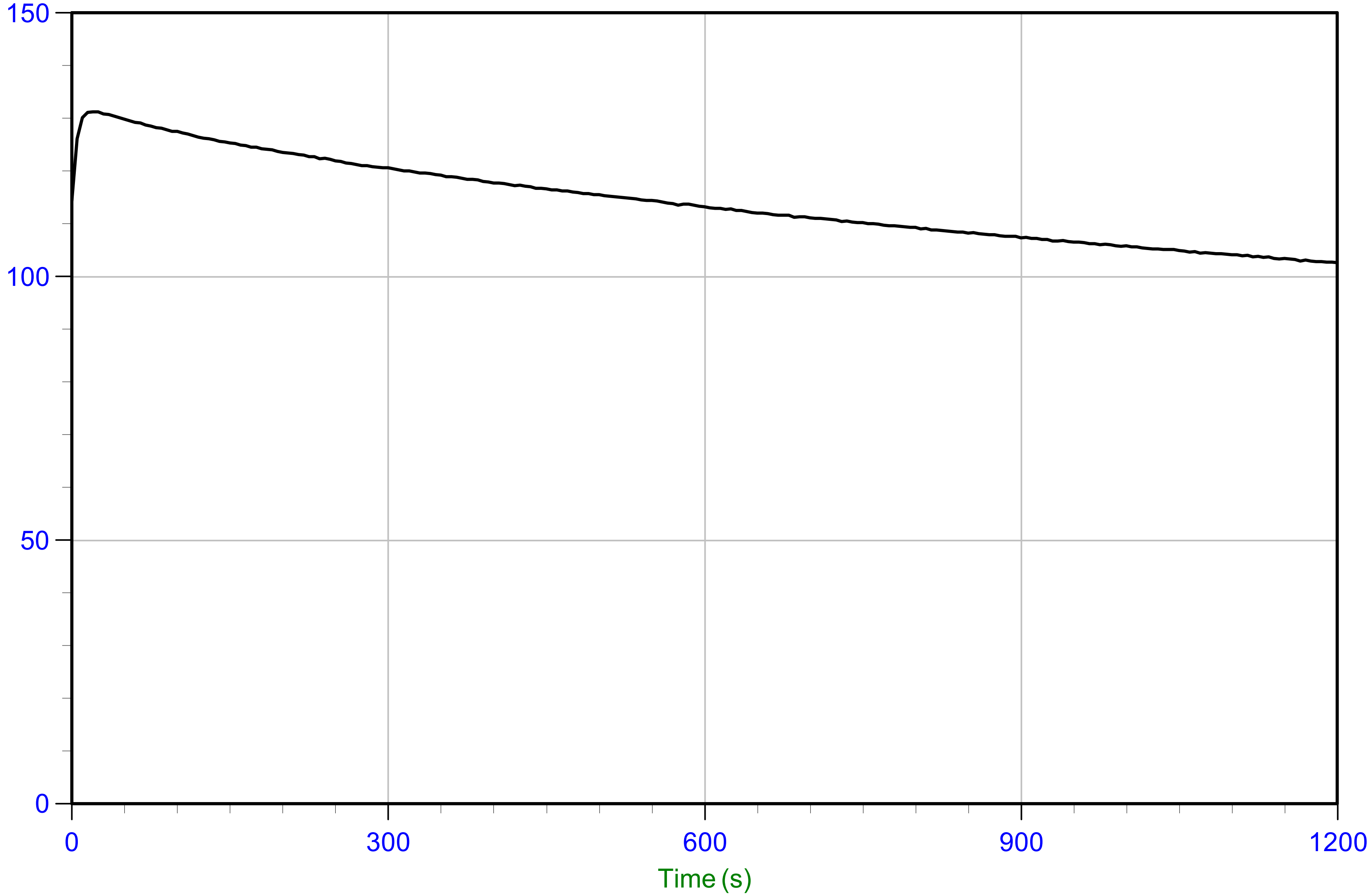
Filename: 15-53073_CP06.PPD
Depth: 8.000 m / 26.246 ft
Duration: 7200.0 s

U Min: 49.2 ft
U Max: 83.8 ft

WT: 3.505 m / 11.499 ft
Ueq: 14.7 ft
U(50): 49.29 ft

T(50): 7113.9 s
Ir: 100
Ch: 0.1 sq cm/min

AECOM	Job No: 15-53073	Sounding: EDW-C006
	Date: 25-Aug-2015 15:52:43	Cone: 374
	Site: Edwards Power Station, Peoria, IL	Cone Area: 15 sq cm



Trace Summary:

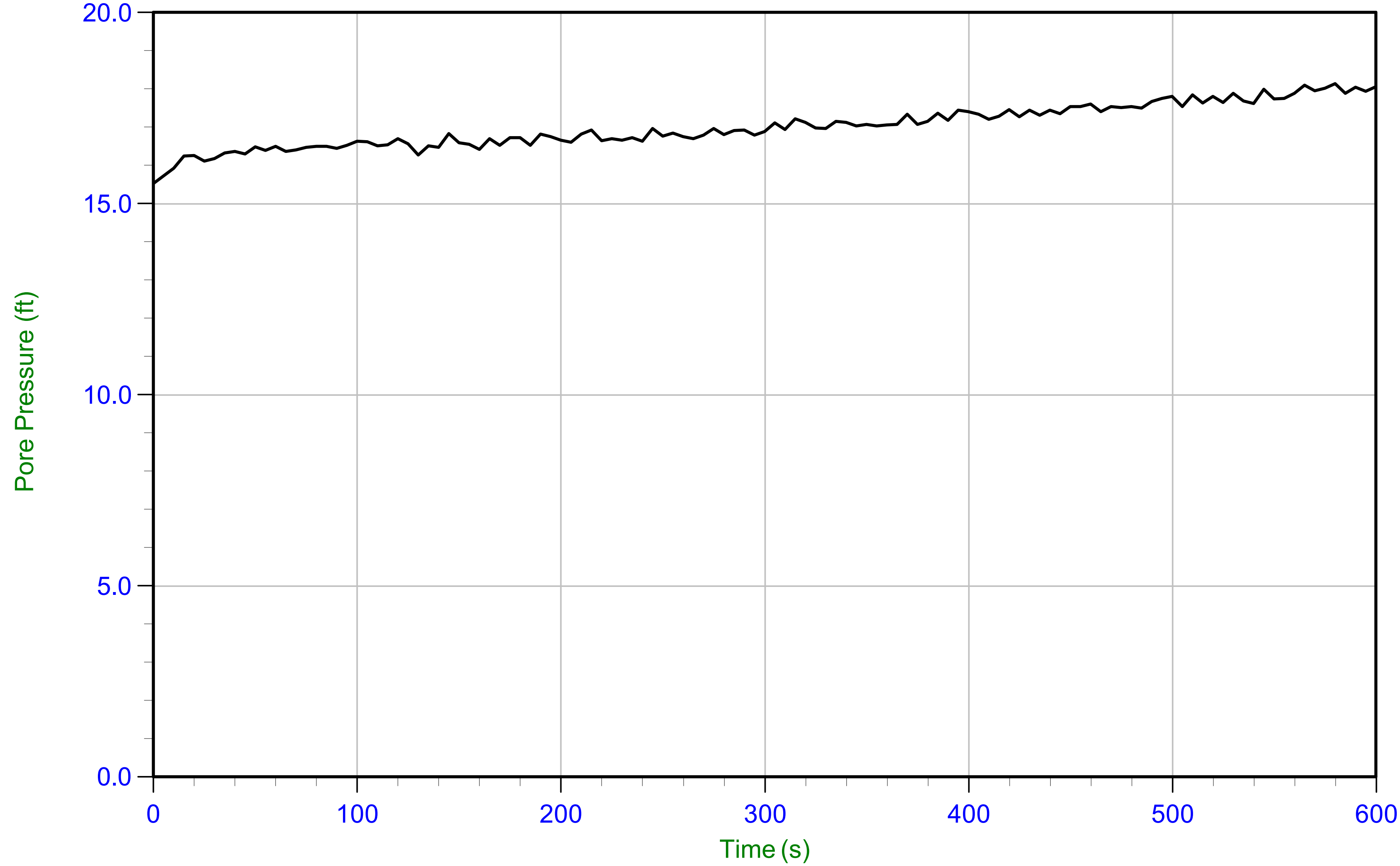
Filename: 15-53073_CP06.PPD	U Min: 102.7 ft
Depth: 12.200 m / 40.026 ft	U Max: 131.3 ft
Duration: 1200.0 s	

CONETEC

AECOM

Job No: 15-53073
Date: 29-Aug-2015 09:19:17
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C007
Cone: AD340
Cone Area: 15 sq cm

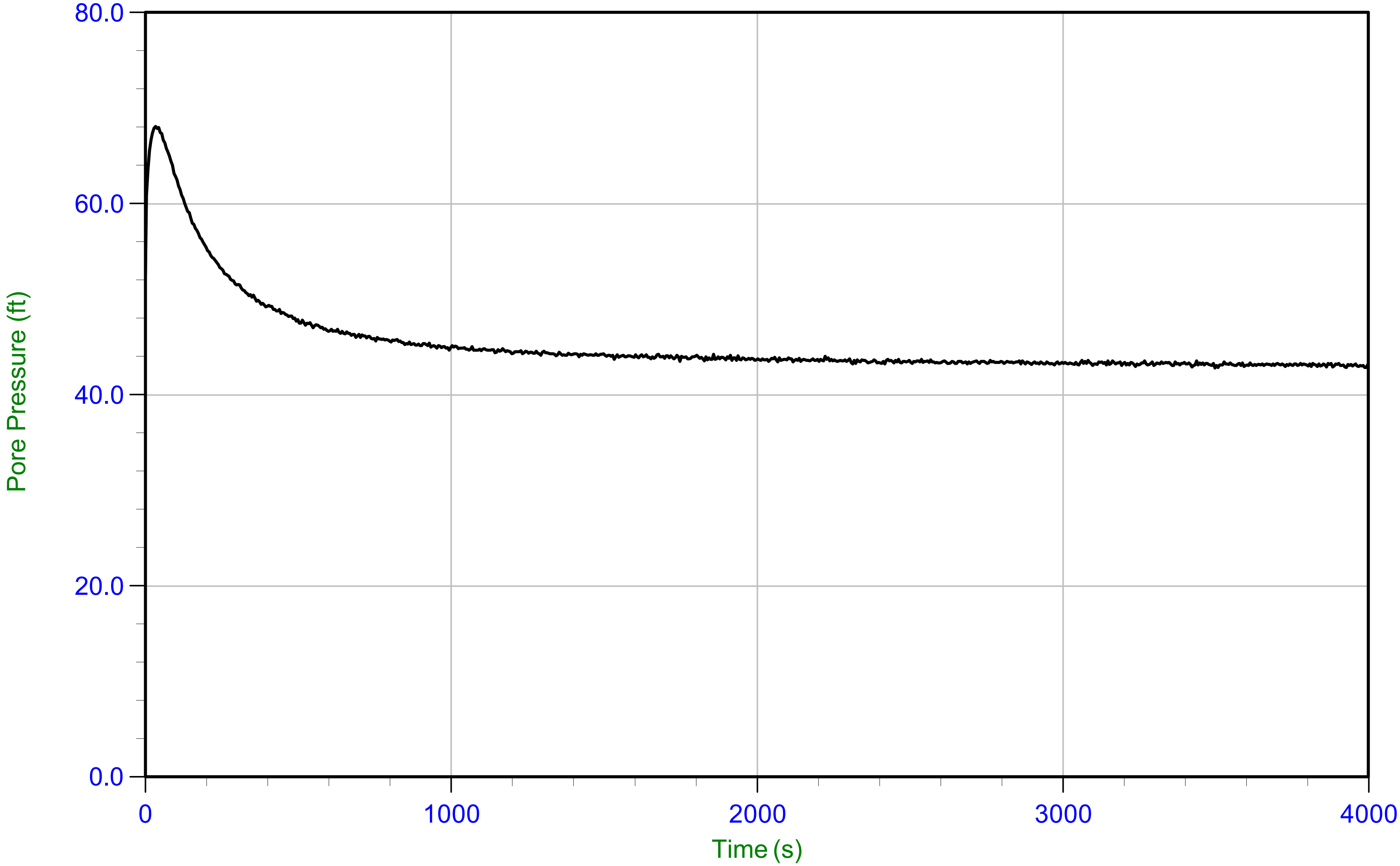


Trace Summary:

Filename: 15-53073_CP07.PPD
Depth: 8.200 m / 26.903 ft
Duration: 600.0 s

U Min: 15.5 ft
U Max: 18.1 ft

CONETEC	AECOM	Job No: 15-53073	Sounding: EDW-C007
		Date: 29-Aug-2015 09:19:17	Cone: AD340
		Site: Edwards Power Station, Peoria, Il	Cone Area: 15 sq cm



Trace Summary:

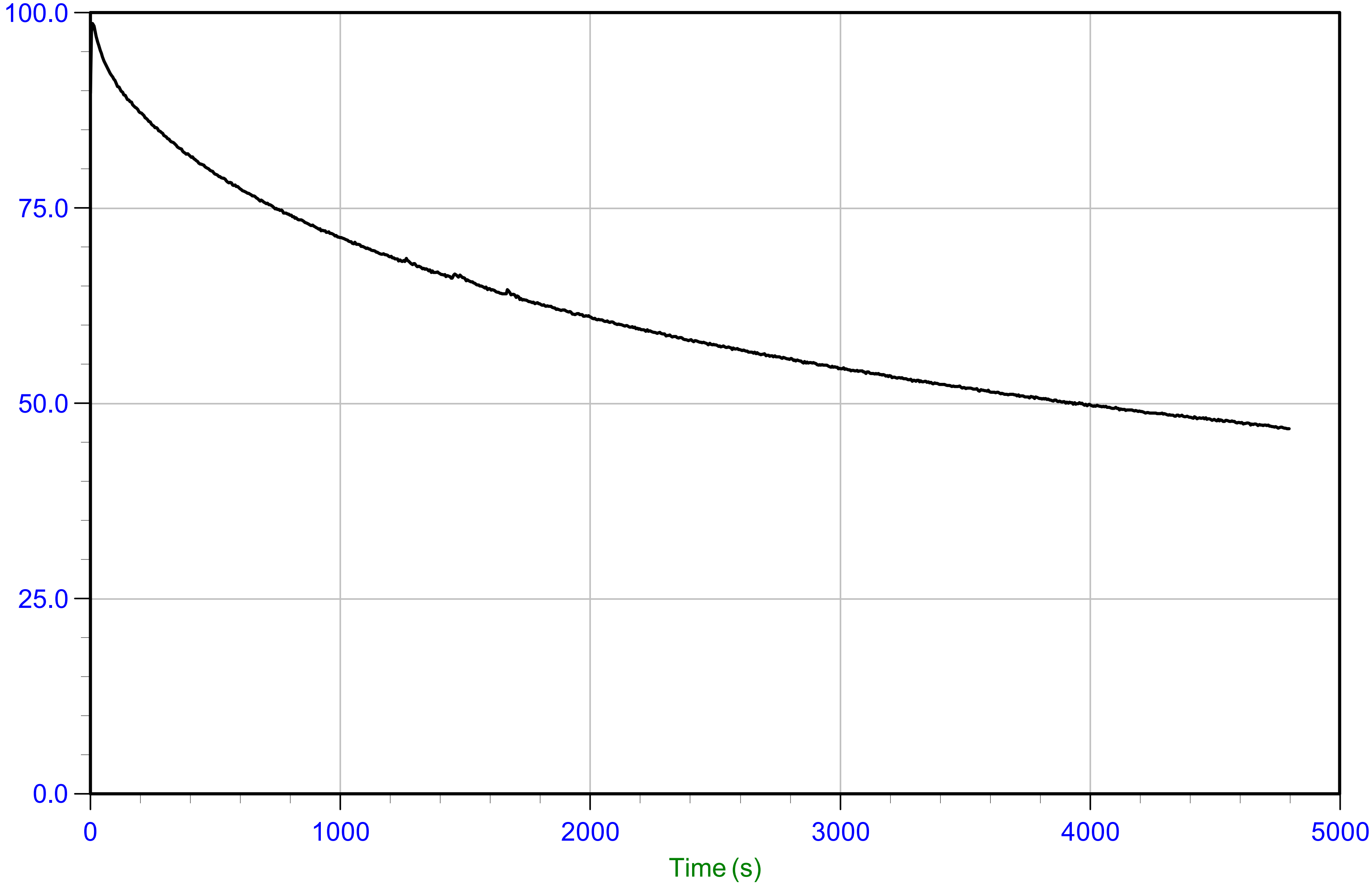
Filename: 15-53073_CP07.PPD	U Min: 42.8 ft	WT: 2.709 m / 8.888 ft	T(50): 166.2 s
Depth: 15.700 m / 51.509 ft	U Max: 68.1 ft	Ueq: 42.6 ft	Ir: 100
Duration: 4000.0 s		U(50): 55.34 ft	Ch: 4.2 sq cm/min

ConeTec

AECOM

Job No: 15-53073
Date: 27-Aug-2015 08:50:17
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C008
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

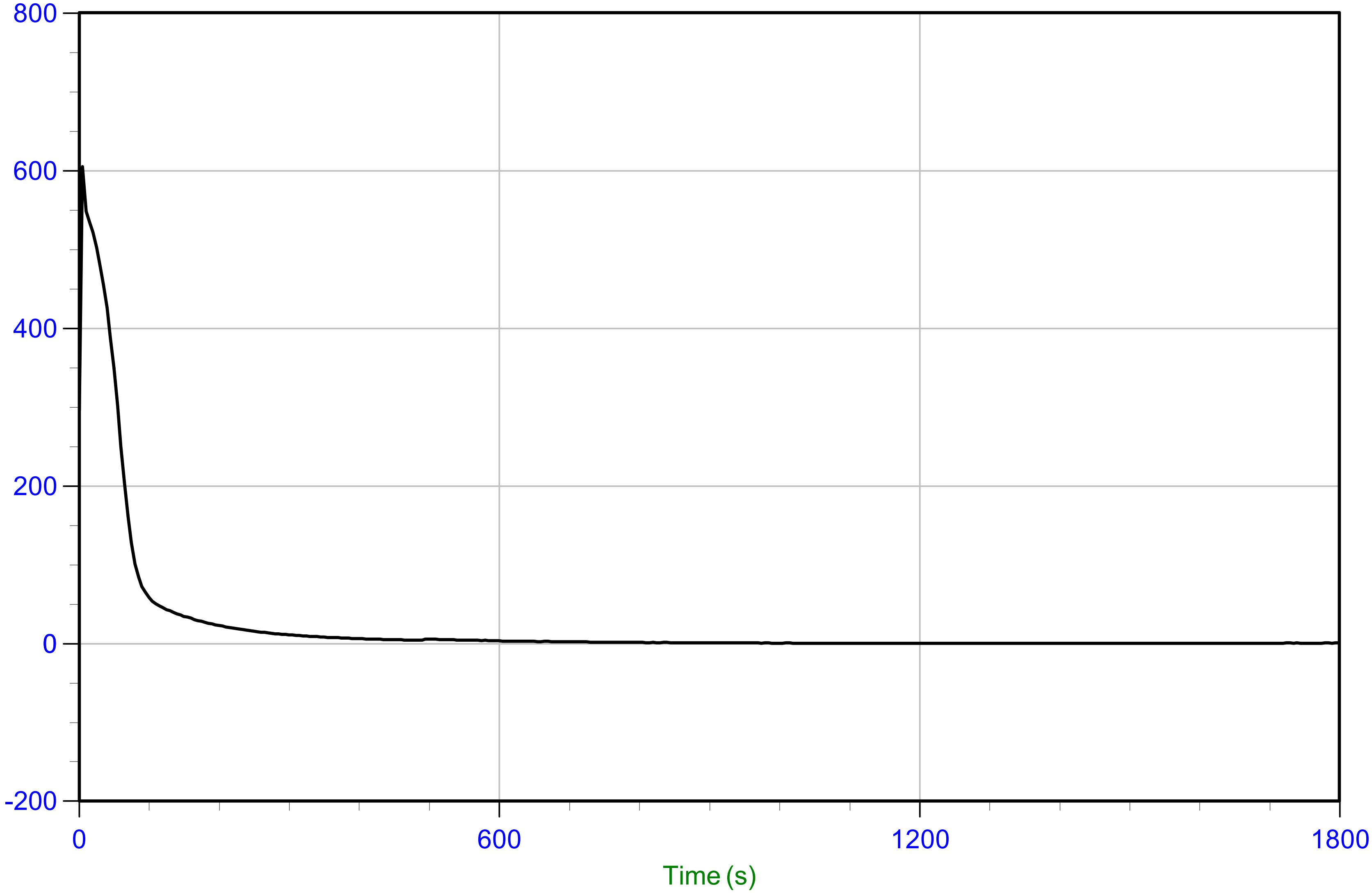
Filename: 15-53073_CP08.PPD
Depth: 6.750 m / 22.145 ft
Duration: 4800.0 s

U Min: 46.8 ft
U Max: 98.7 ft

WT: 3.048 m / 10.000 ft
Ueq: 12.1 ft
U(50): 55.40 ft

T(50): 2835.5 s
Ir: 100
Ch: 0.2 sq cm/min

AECOM	Job No: 15-53073	Sounding: EDW-C008
	Date: 27-Aug-2015 08:50:17	Cone: 374
	Site: Edwards Power Station, Peoria, IL	Cone Area: 15 sq cm



Trace Summary:

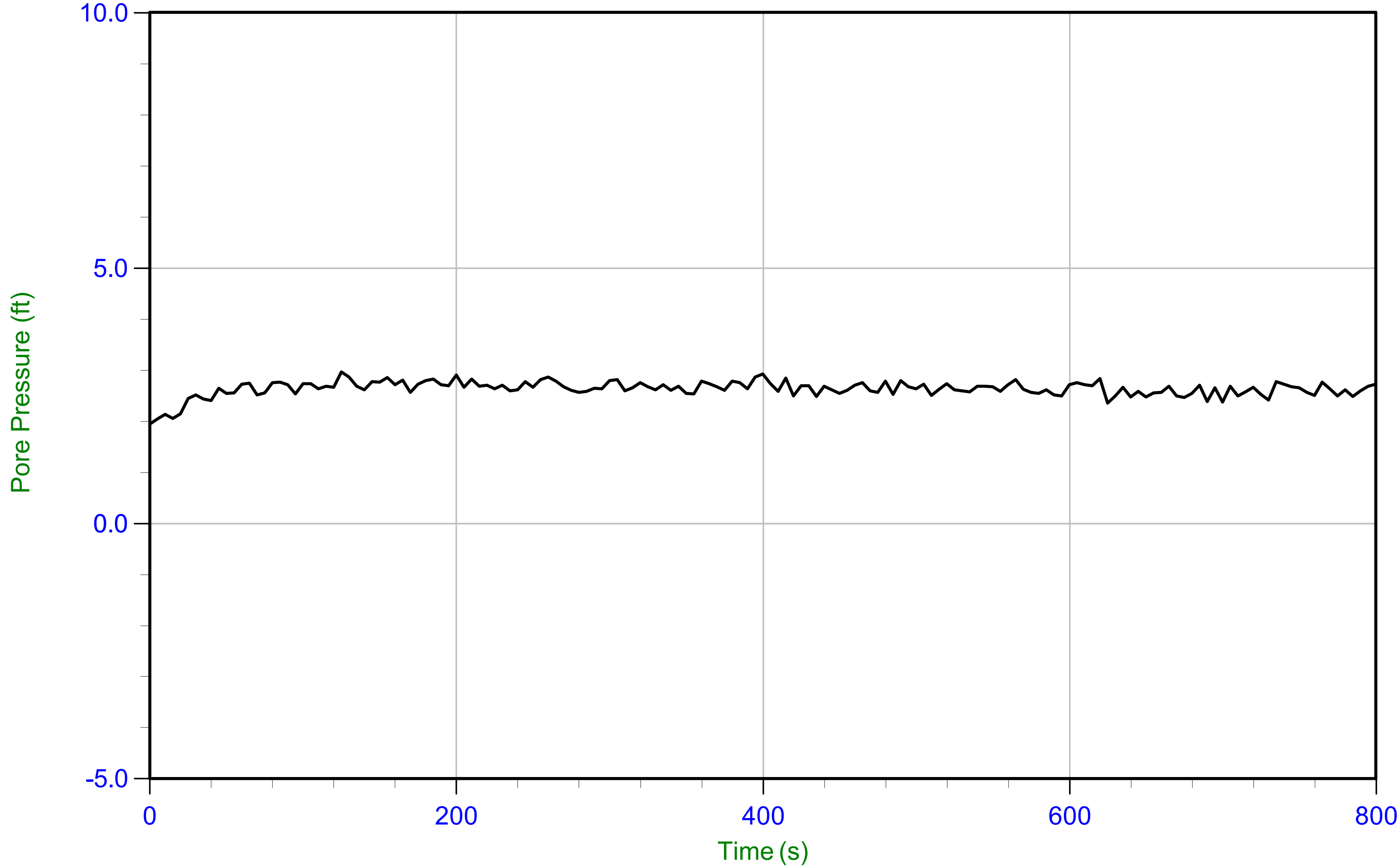
Filename: 15-53073_CP08.PPD	U Min: 0.1 ft
Depth: 10.250 m / 33.628 ft	U Max: 605.2 ft
Duration: 1800.0 s	

CONETEC

AECOM

Job No: 15-53073
Date: 28-Aug-2015 16:08:12
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C009
Cone: AD340
Cone Area: 15 sq cm



Trace Summary:

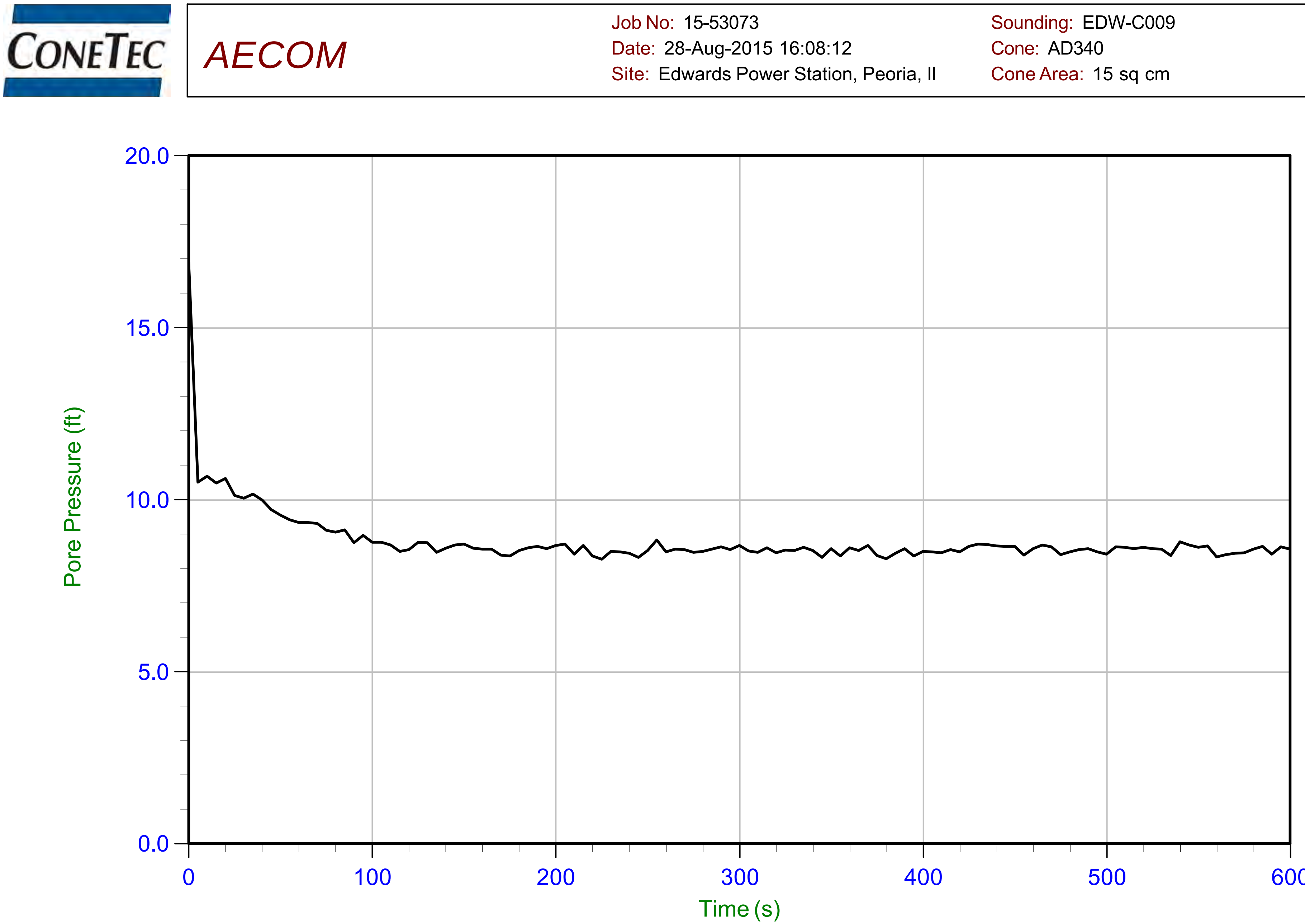
Filename: 15-53073_CP09.PPD
Depth: 4.900 m / 16.076 ft
Duration: 800.0 s

U Min: 1.9 ft
U Max: 3.0 ft

WT: 4.104 m / 13.464 ft
Ueq: 2.6 ft

Job No: 15-53073
Date: 28-Aug-2015 16:08:12
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C009
Cone: AD340
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP09.PPD
Depth: 8.650 m / 28.379 ft
Duration: 600.0 s

U Min: 8.3 ft
U Max: 16.9 ft

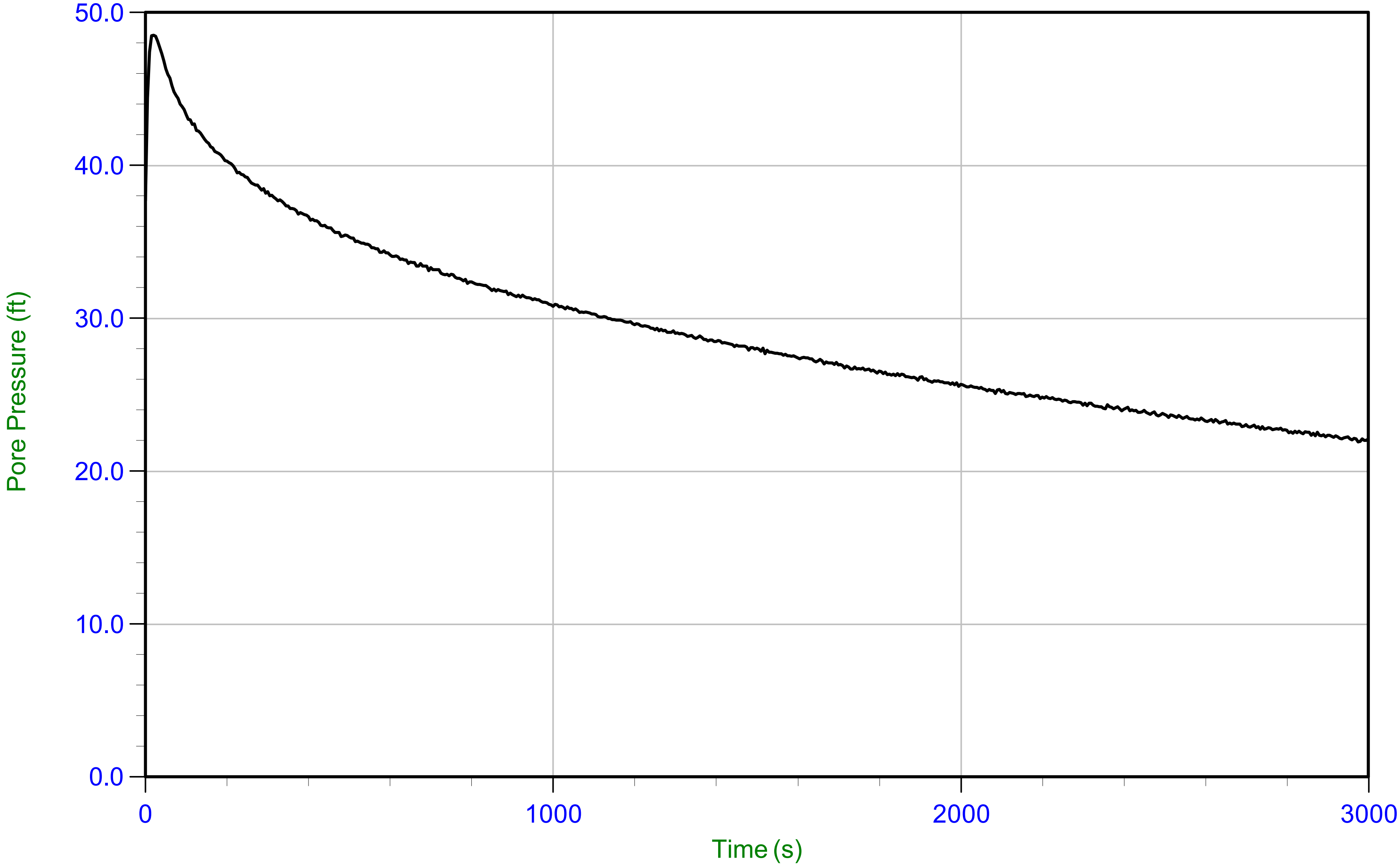
WT: 6.062 m / 19.888 ft
Ueq: 8.5 ft

CONETEC

AECOM

Job No: 15-53073
Date: 27-Aug-2015 12:10:38
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C010
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP10.PPD
Depth: 3.700 m / 12.139 ft
Duration: 3000.0 s

U Min: 21.9 ft
U Max: 48.5 ft

WT: 0.674 m / 2.211 ft
Ueq: 9.9 ft
U(50): 29.22 ft

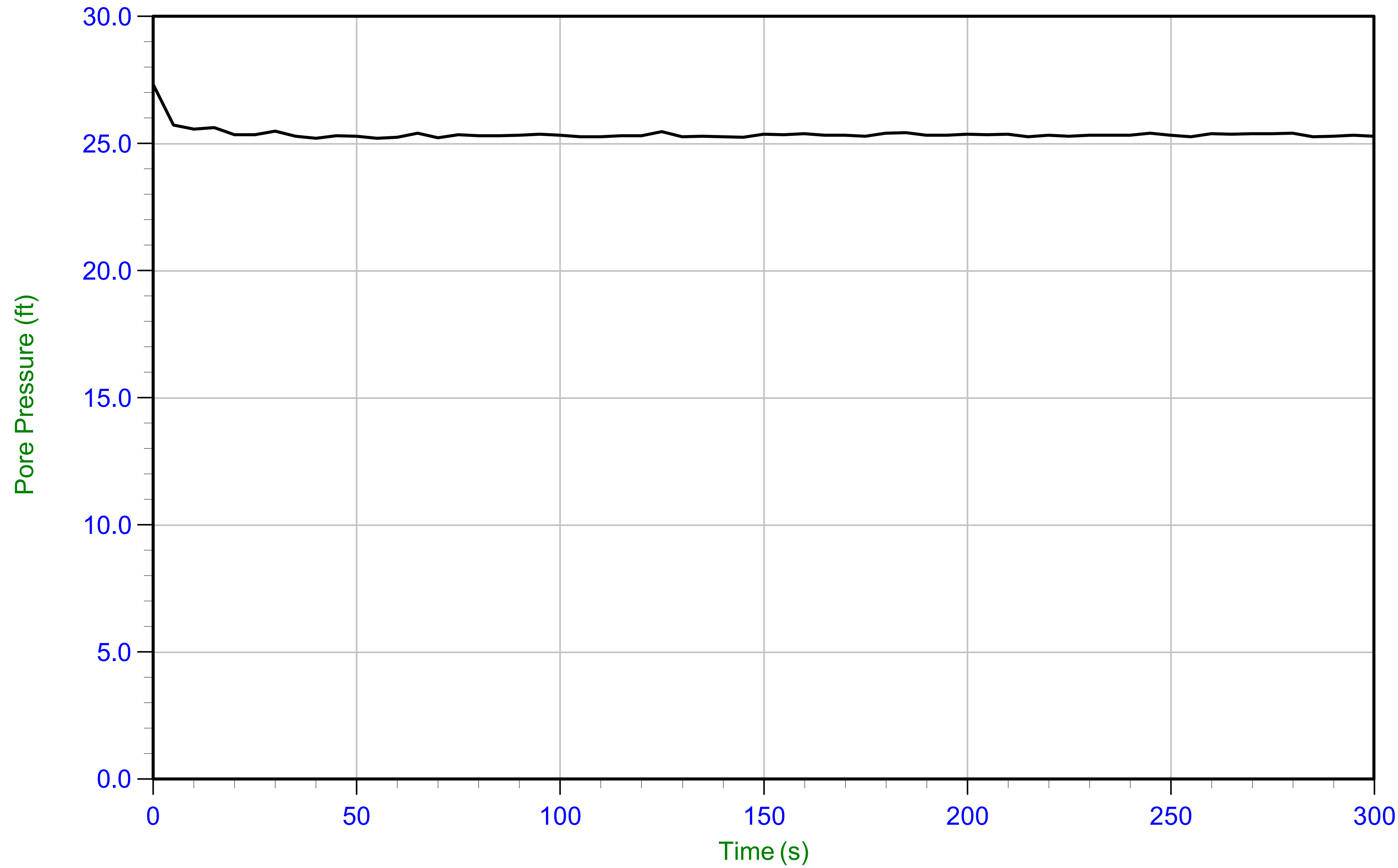
T(50): 1239.4 s
Ir: 100
Ch: 0.6 sq cm/min

CONETEC

AECOM

Job No: 15-53073
Date: 27-Aug-2015 12:10:38
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C010
Cone: 374
Cone Area: 15 sq cm



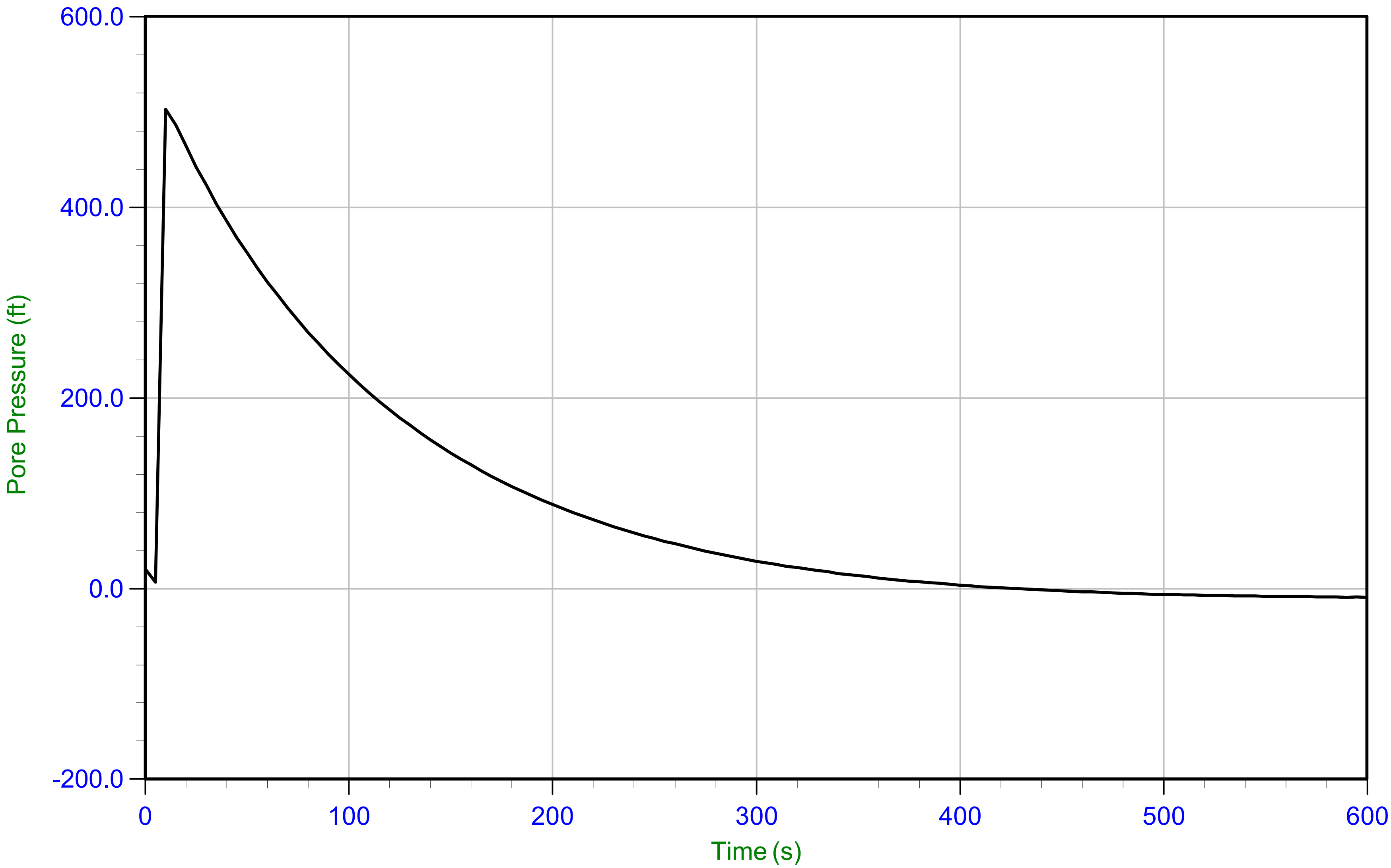
Trace Summary:

Filename: 15-53073_CP10.PPD
Depth: 8.400 m / 27.559 ft
Duration: 300.0 s

U Min: 25.2 ft
U Max: 27.3 ft

WT: 0.674 m / 2.211 ft
Ueq: 25.3 ft

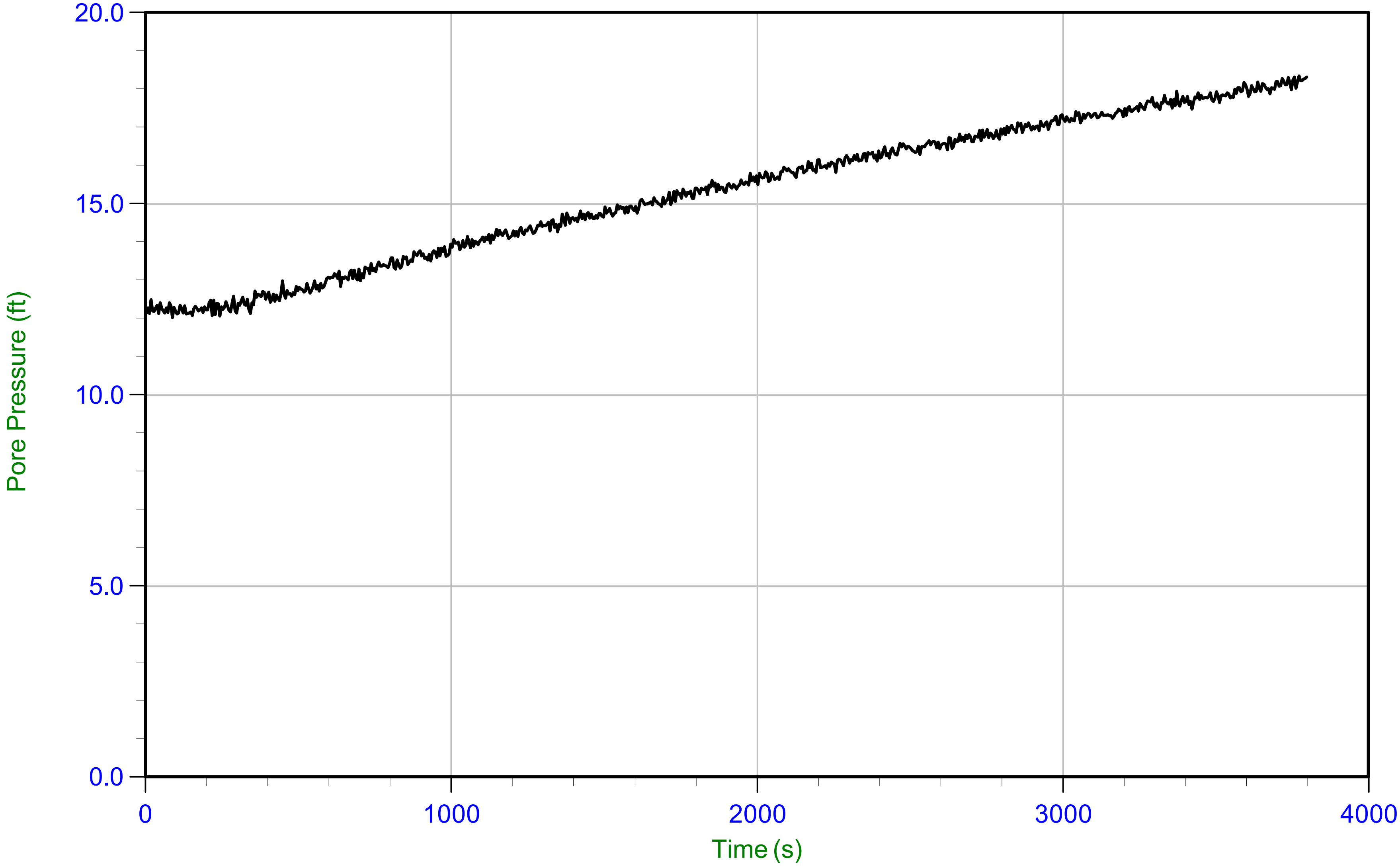
AECOM	Job No: 15-53073	Sounding: EDW-C010
	Date: 27-Aug-2015 12:10:38	Cone: 374
	Site: Edwards Power Station, Peoria, IL	Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP10.PPD	U Min: -9.2 ft	WT: 9.150 m / 30.019 ft	T(50): 77.5 s
Depth: 9.150 m / 30.019 ft	U Max: 502.6 ft	Ueq: 0.0 ft	Ir: 100
Duration: 600.0 s		U(50): 251.28 ft	Ch: 9.1 sq cm/min

AECOM	Job No: 15-53073	Sounding: EDW-C011
	Date: 28-Aug-2015 10:19:26	Cone: AD340
	Site: Edwards Power Station, Peoria, Il	Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP11.PPD
Depth: 7.350 m / 24.114 ft
Duration: 3800.0 s

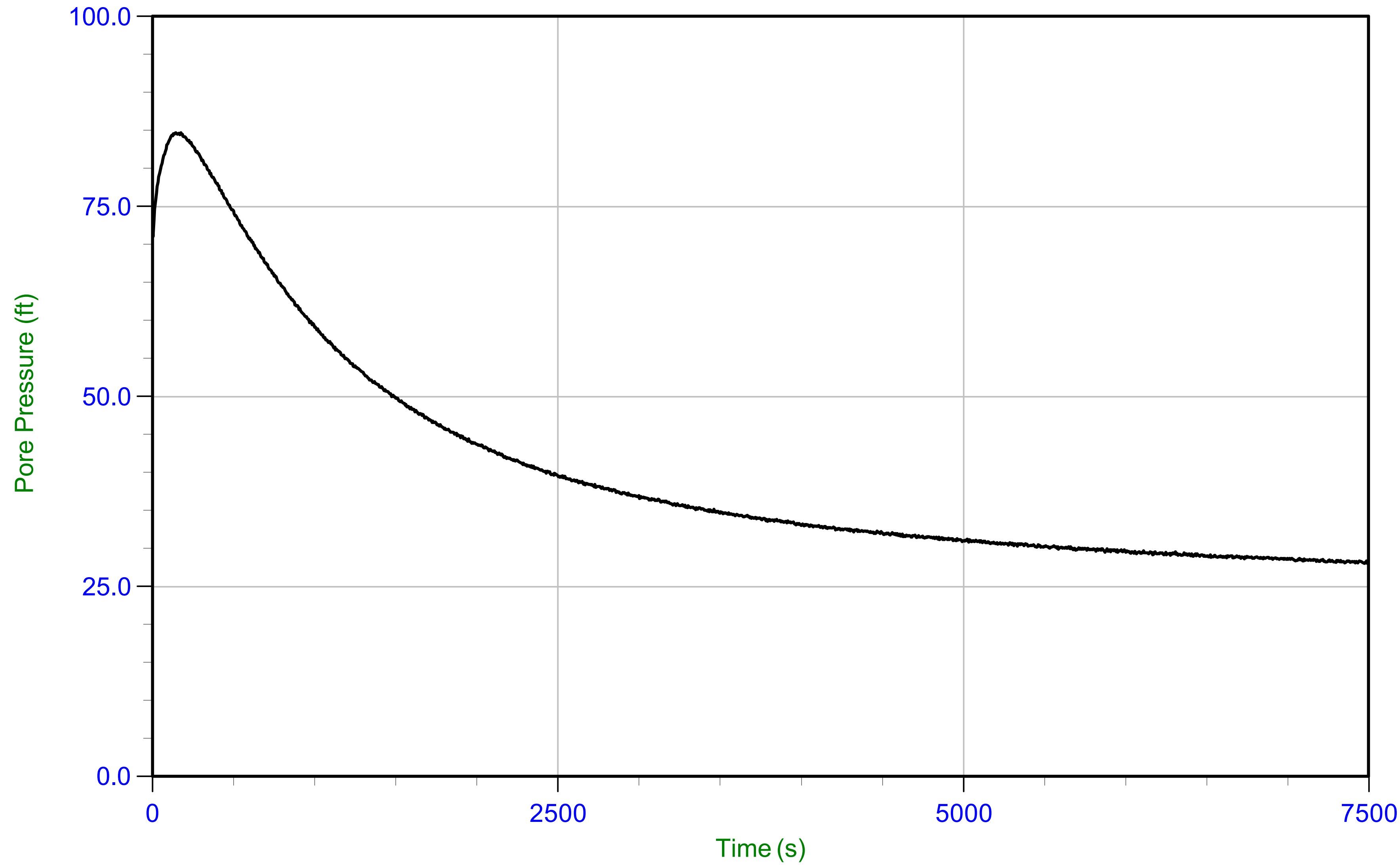
U Min: 12.0 ft
U Max: 18.3 ft

CONETEC

AECOM

Job No: 15-53073
Date: 28-Aug-2015 10:19:26
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C011
Cone: AD340
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP11.PPD
Depth: 14.150 m / 46.423 ft
Duration: 7500.0 s

U Min: 28.0 ft
U Max: 84.7 ft

WT: 6.848 m / 22.467 ft
Ueq: 24.0 ft
U(50): 54.34 ft

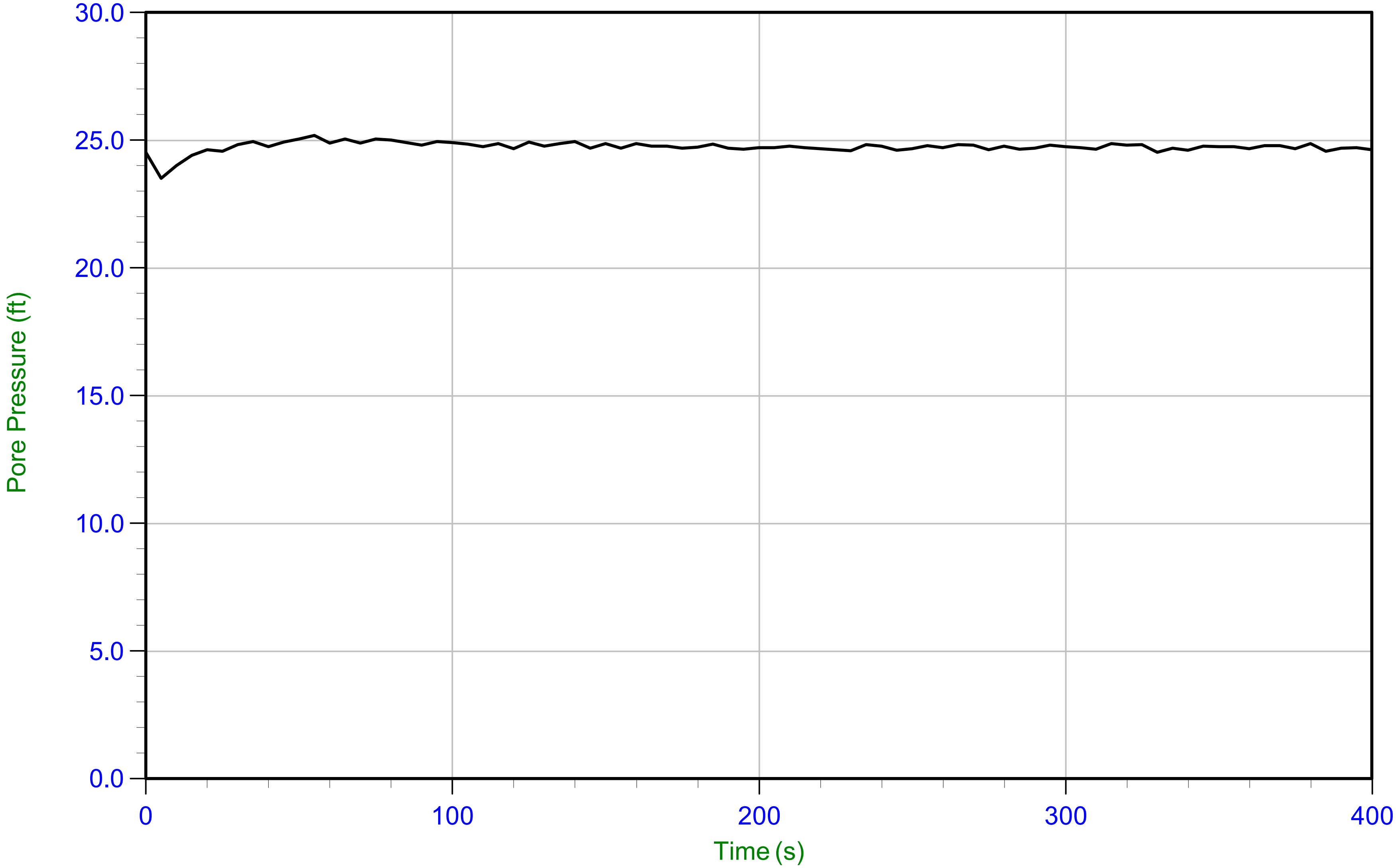
T(50): 1082.1 s
Ir: 100
Ch: 0.6 sq cm/min

CONETEC

AECOM

Job No: 15-53073
Date: 28-Aug-2015 10:19:26
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C011
Cone: AD340
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP11.PPD
Depth: 14.350 m / 47.079 ft
Duration: 400.0 s

U Min: 23.5 ft
U Max: 25.2 ft

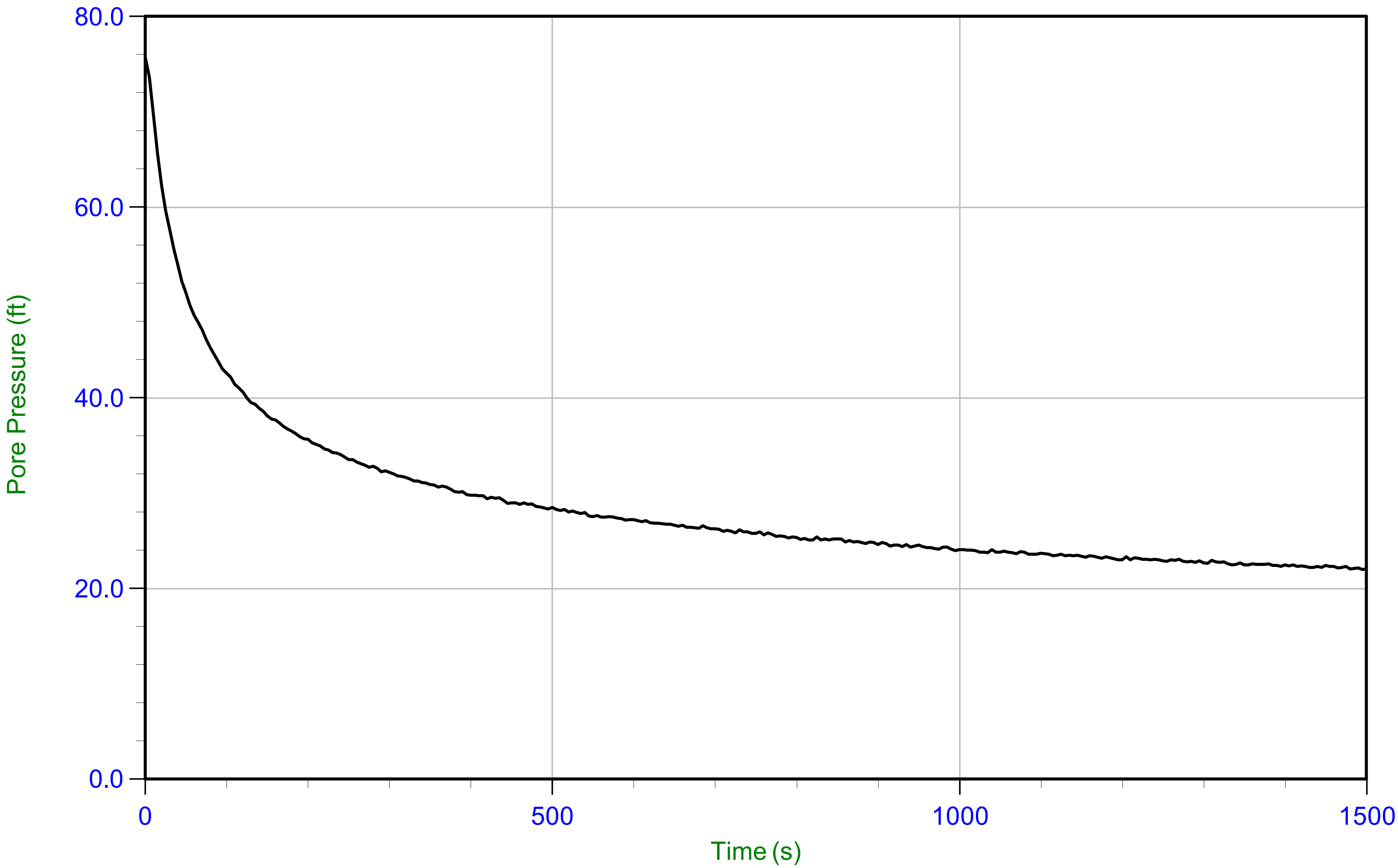
WT: 6.848 m / 22.467 ft
Ueq: 24.6 ft

CONETEC

AECOM

Job No: 15-53073
Date: 28-Aug-2015 14:27:24
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C012
Cone: AD340
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_SP12.PPD
Depth: 8.800 m / 28.871 ft
Duration: 1500.0 s

U Min: 22.0 ft
U Max: 75.7 ft

WT: 7.108 m / 23.320 ft
Ueq: 5.6 ft
U(50): 40.63 ft

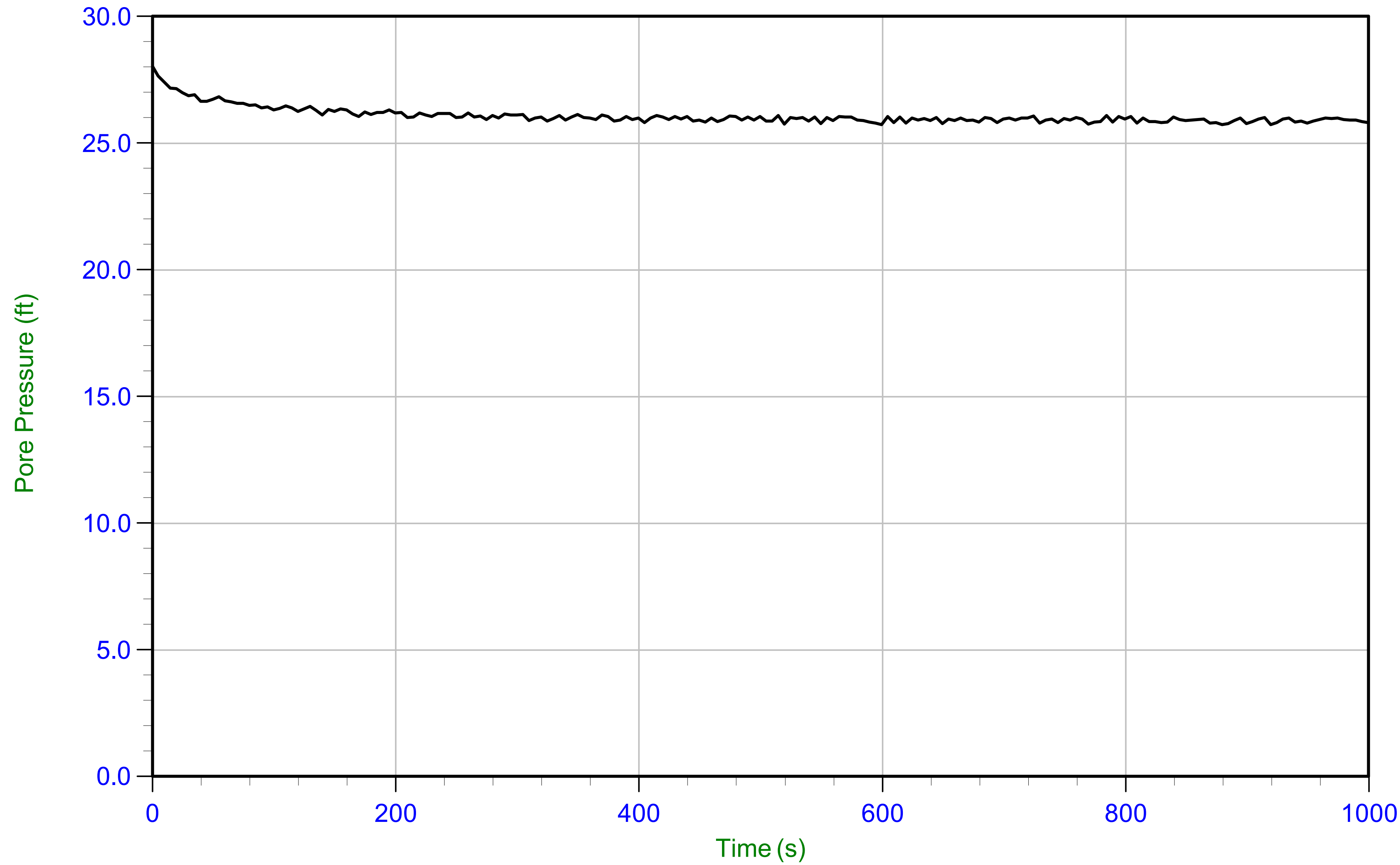
T(50): 119.8 s
Ir: 100
Ch: 5.9 sq cm/min

CONETEC

AECOM

Job No: 15-53073
Date: 28-Aug-2015 14:27:24
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C012
Cone: AD340
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_SP12.PPD
Depth: 14.950 m / 49.048 ft
Duration: 1000.0 s

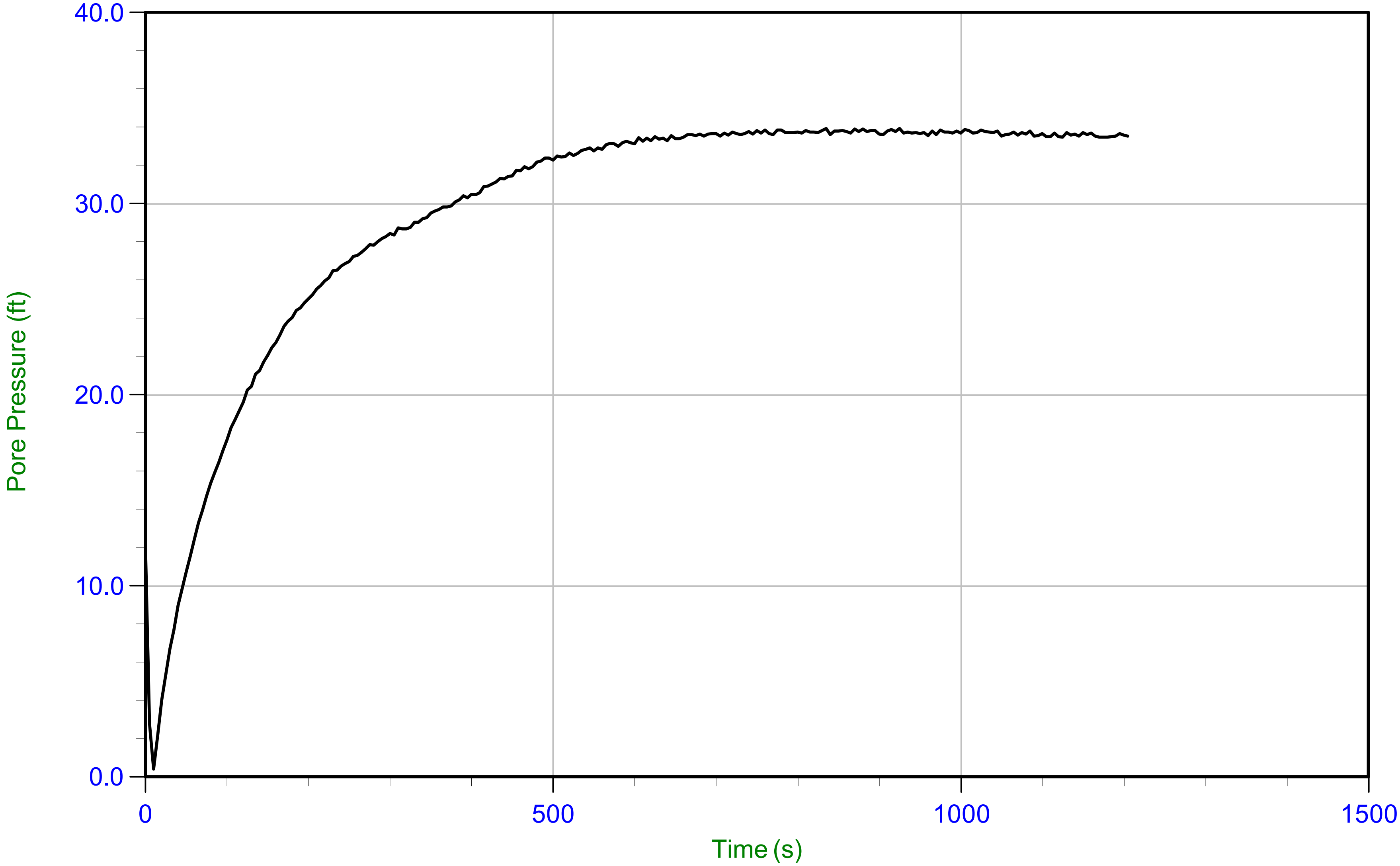
U Min: 25.7 ft
U Max: 28.0 ft

WT: 7.108 m / 23.320 ft
Ueq: 25.7 ft

ConeTec | AECOM

Job No: 15-53073
Date: 28-Aug-2015 08:45:02
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C013
Cone: AD340
Cone Area: 15 sq cm



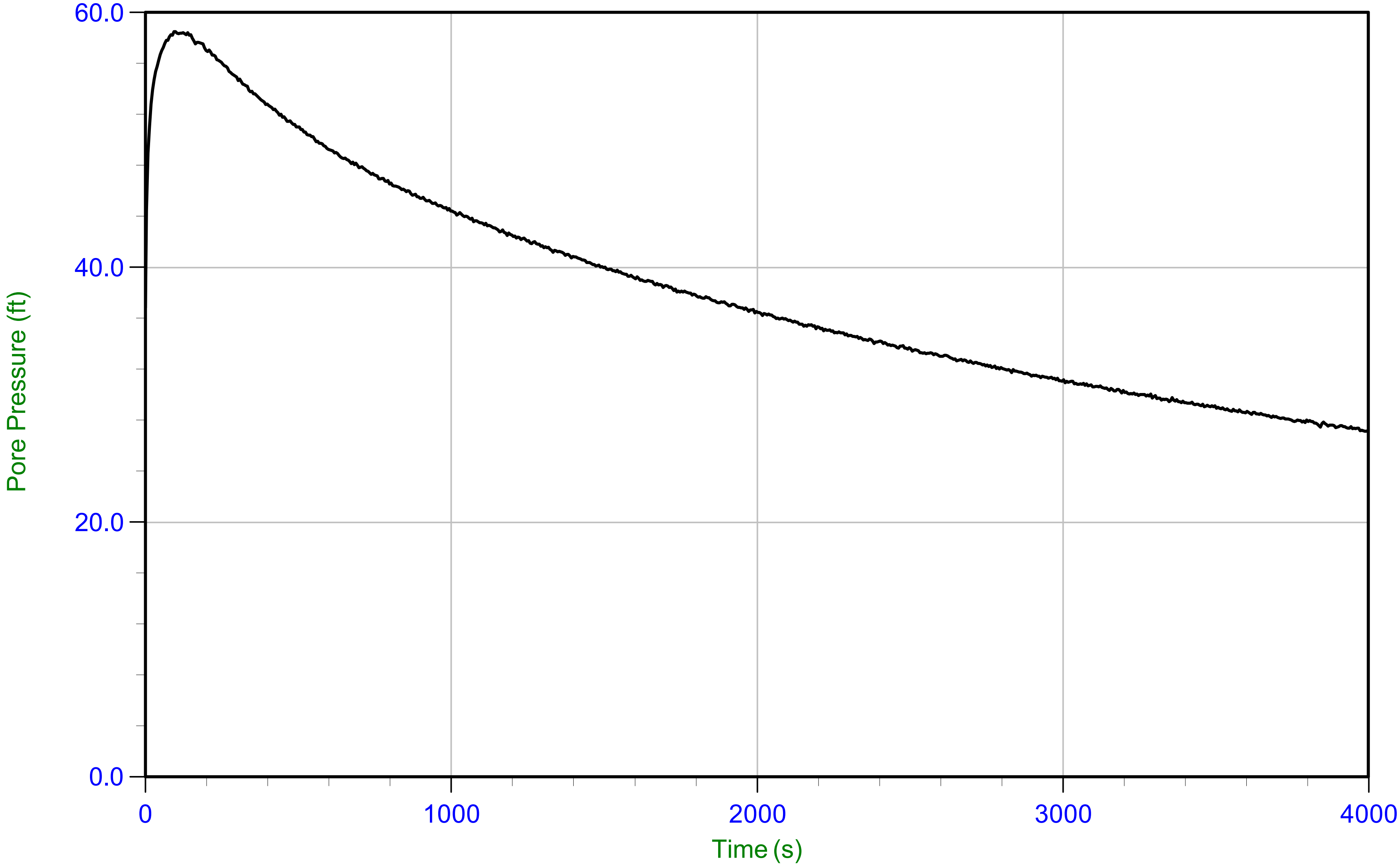
Trace Summary:

Filename: 15-53073_SP13.PPD
Depth: 17.150 m / 56.266 ft
Duration: 1205.0 s

U Min: 0.4 ft
U Max: 33.9 ft

WT: 6.905 m / 22.654 ft
Ueq: 33.6 ft

CONETEC AECOM	Job No: 15-53073 Date: 27-Aug-2015 14:29:59 Site: Edwards Power Station, Peoria, IL	Sounding: EDW-C014 Cone: 374 Cone Area: 15 sq cm



Trace Summary:

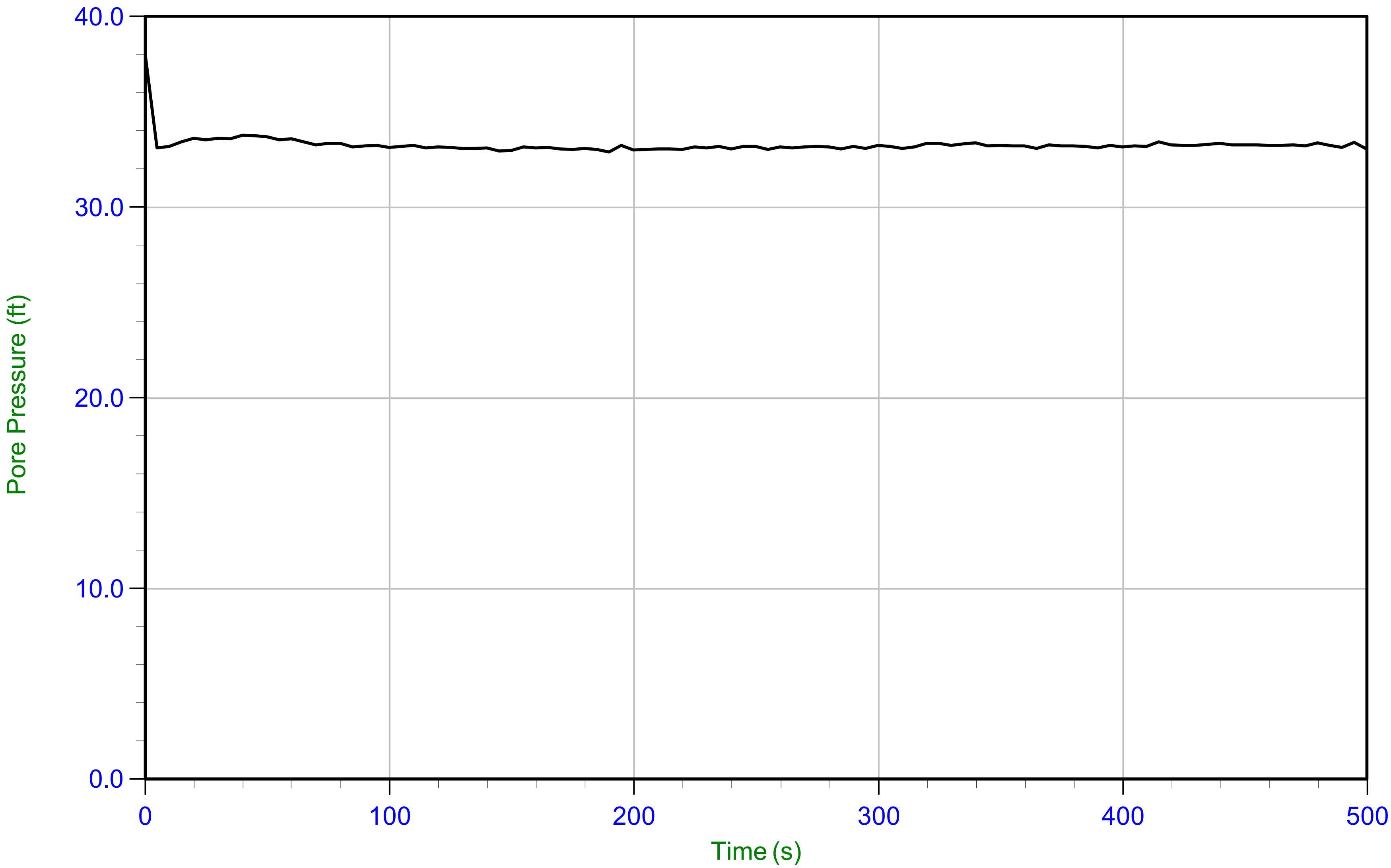
Filename: 15-53073_CP14.PPD	U Min: 27.1 ft	WT: 1.498 m / 4.915 ft	T(50): 2190.4 s
Depth: 4.900 m / 16.076 ft	U Max: 58.5 ft	Ueq: 11.2 ft	Ir: 100
Duration: 4000.0 s		U(50): 34.84 ft	Ch: 0.3 sq cm/min

CONETEC

AECOM

Job No: 15-53073
Date: 27-Aug-2015 14:29:59
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C014
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP14.PPD
Depth: 11.650 m / 38.221 ft
Duration: 500.0 s

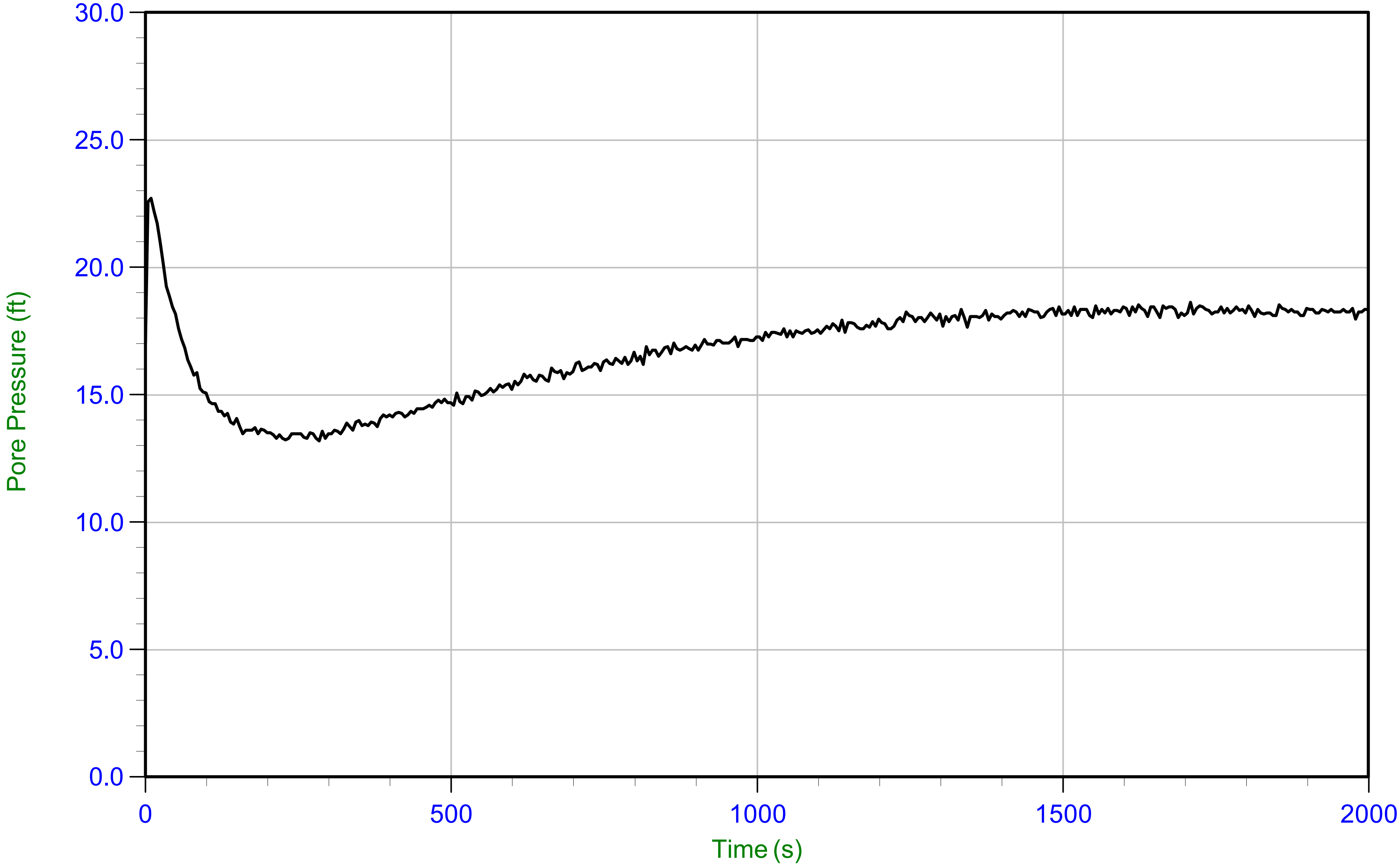
U Min: 32.9 ft
U Max: 38.0 ft

WT: 1.498 m / 4.915 ft
Ueq: 33.3 ft

AECOM

Job No: 15-53073
Date: 19-Aug-2015 14:12:51
Site: Edwards Power Station

Sounding: EDW-C015A
Cone: 335
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_SP15A.PPD
Depth: 4.600 m / 15.092 ft
Duration: 2000.0 s

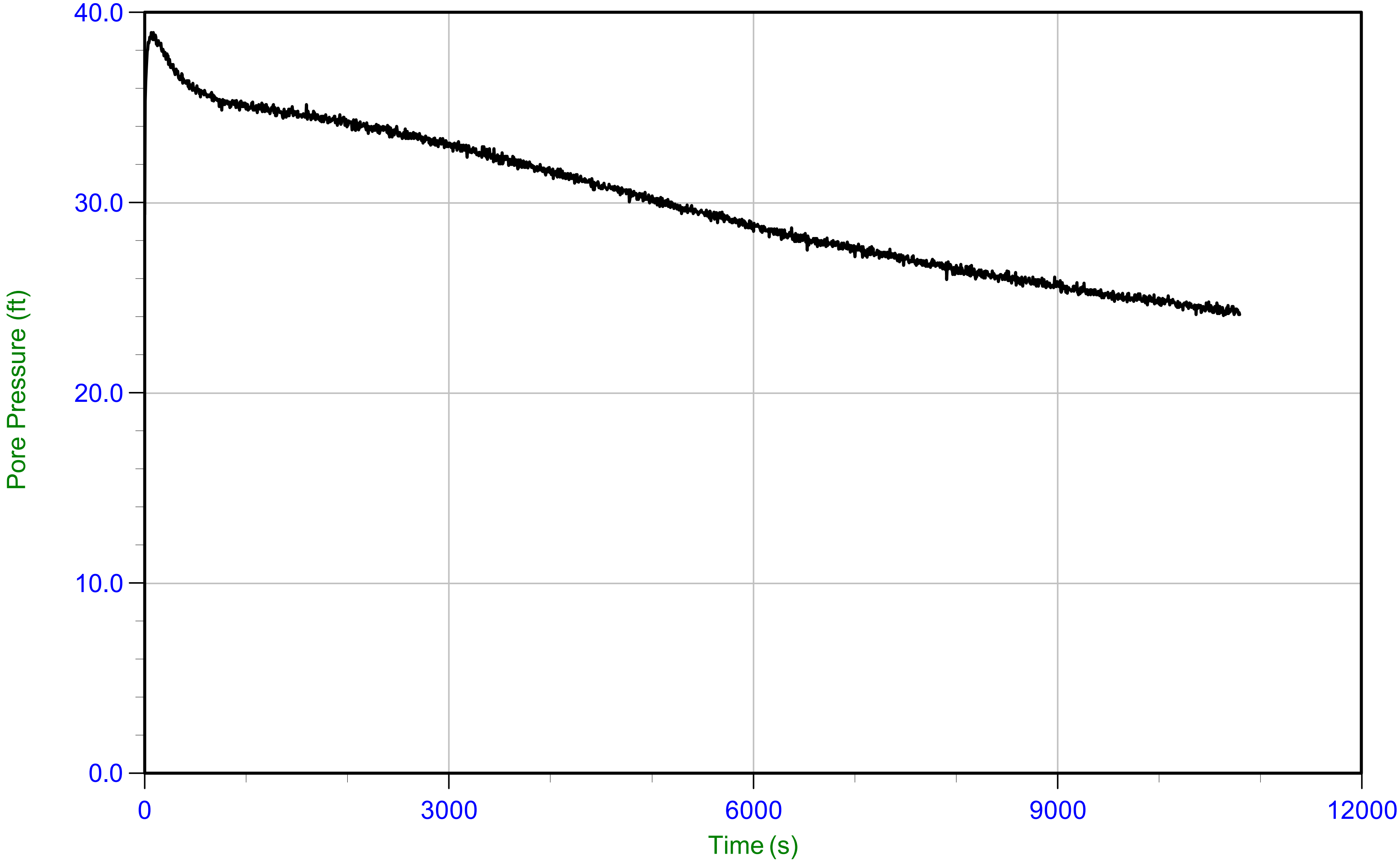
U Min: 13.2 ft
U Max: 22.7 ft

CONETEC

AECOM

Job No: 15-53073
Date: 19-Aug-2015 14:12:51
Site: Edwards Power Station

Sounding: EDW-C015A
Cone: 335
Cone Area: 15 sq cm



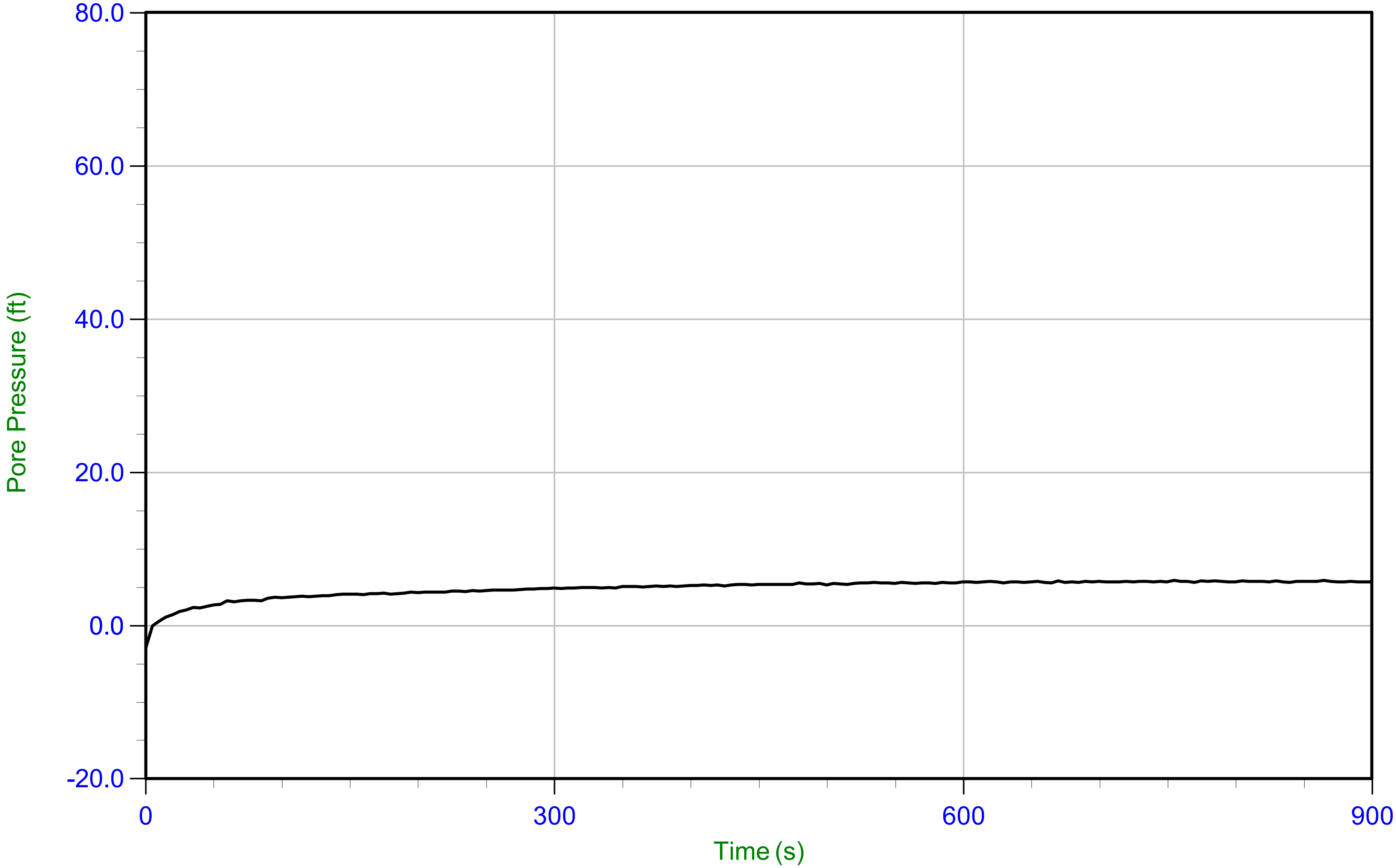
Trace Summary:	Filename: 15-53073_SP15A.PPD	U Min: 24.1 ft	WT: 3.658 m / 12.001 ft	T(50): 6094.6 s
	Depth: 9.000 m / 29.527 ft	U Max: 39.0 ft	Ueq: 17.5 ft	Ir: 100
	Duration: 10800.0 s		U(50): 28.24 ft	Ch: 0.1 sq cm/min

CONETEC

AECOM

Job No: 15-53073
Date: 28-Aug-2015 08:46:01
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C016
Cone: 374
Cone Area: 15 sq cm

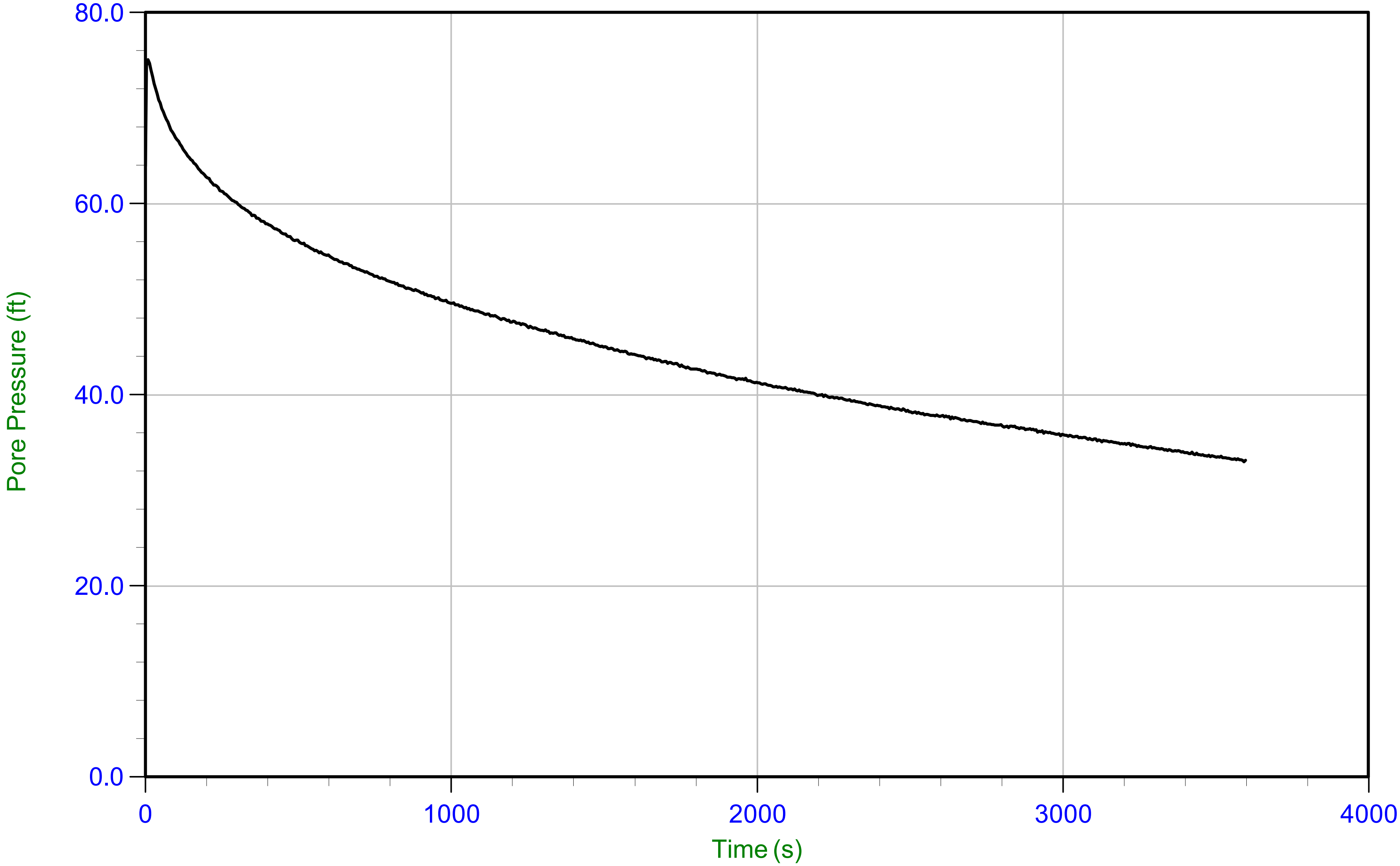


Trace Summary:

Filename: 15-53073_CP16.PPD
Depth: 2.250 m / 7.382 ft
Duration: 900.0 s

U Min: -2.9 ft
U Max: 5.9 ft

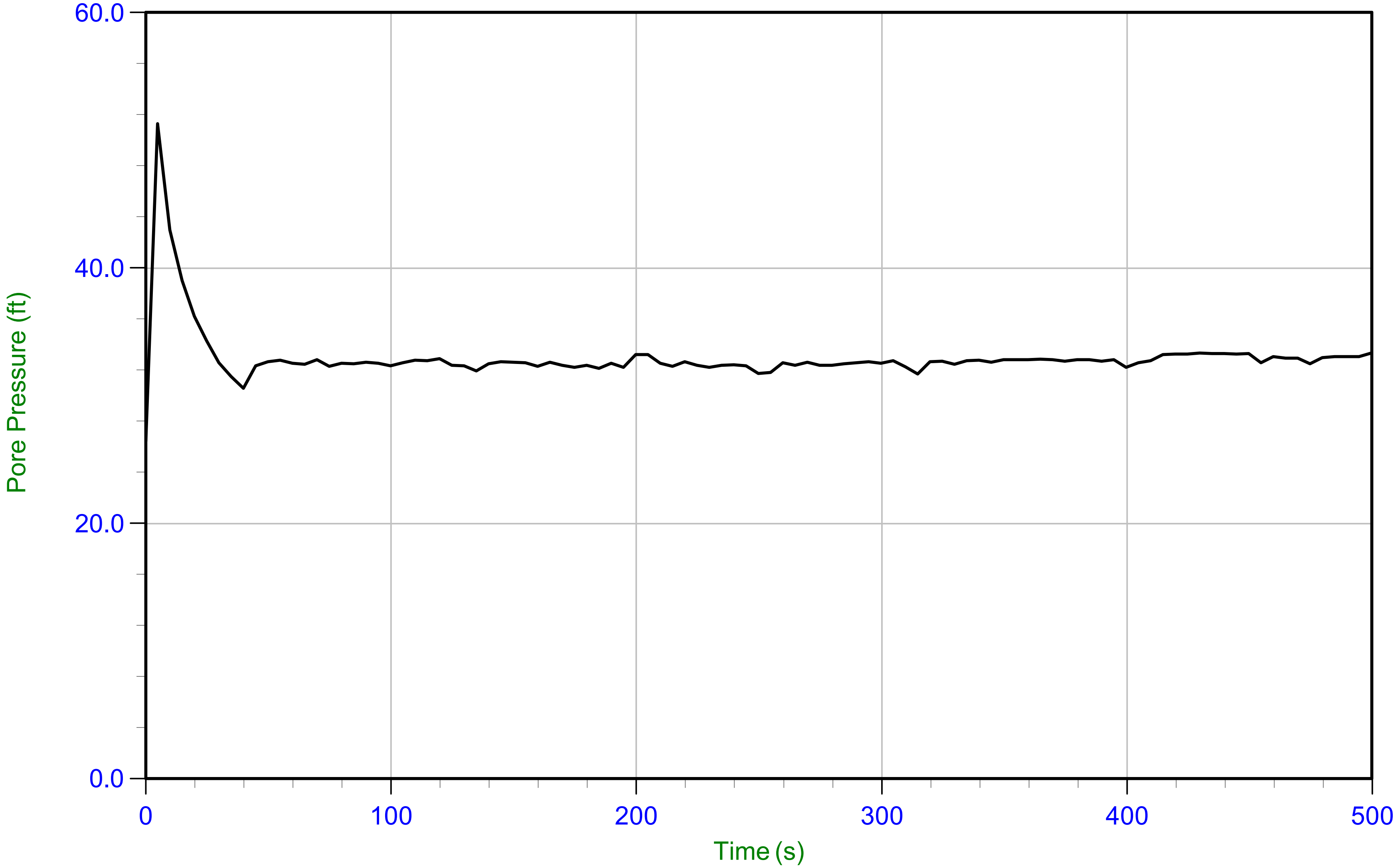
AECOM	Job No: 15-53073	Sounding: EDW-C016
	Date: 28-Aug-2015 08:46:01	Cone: 374
	Site: Edwards Power Station, Peoria, IL	Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP16.PPD	U Min: 33.0 ft	WT: 1.173 m / 3.848 ft	T(50): 1538.2 s
Depth: 5.500 m / 18.044 ft	U Max: 75.1 ft	Ueq: 14.2 ft	Ir: 100
Duration: 3600.0 s		U(50): 44.64 ft	Ch: 0.5 sq cm/min

AECOM	Job No: 15-53073	Sounding: EDW-C016
	Date: 28-Aug-2015 08:46:01	Cone: 374
	Site: Edwards Power Station, Peoria, IL	Cone Area: 15 sq cm



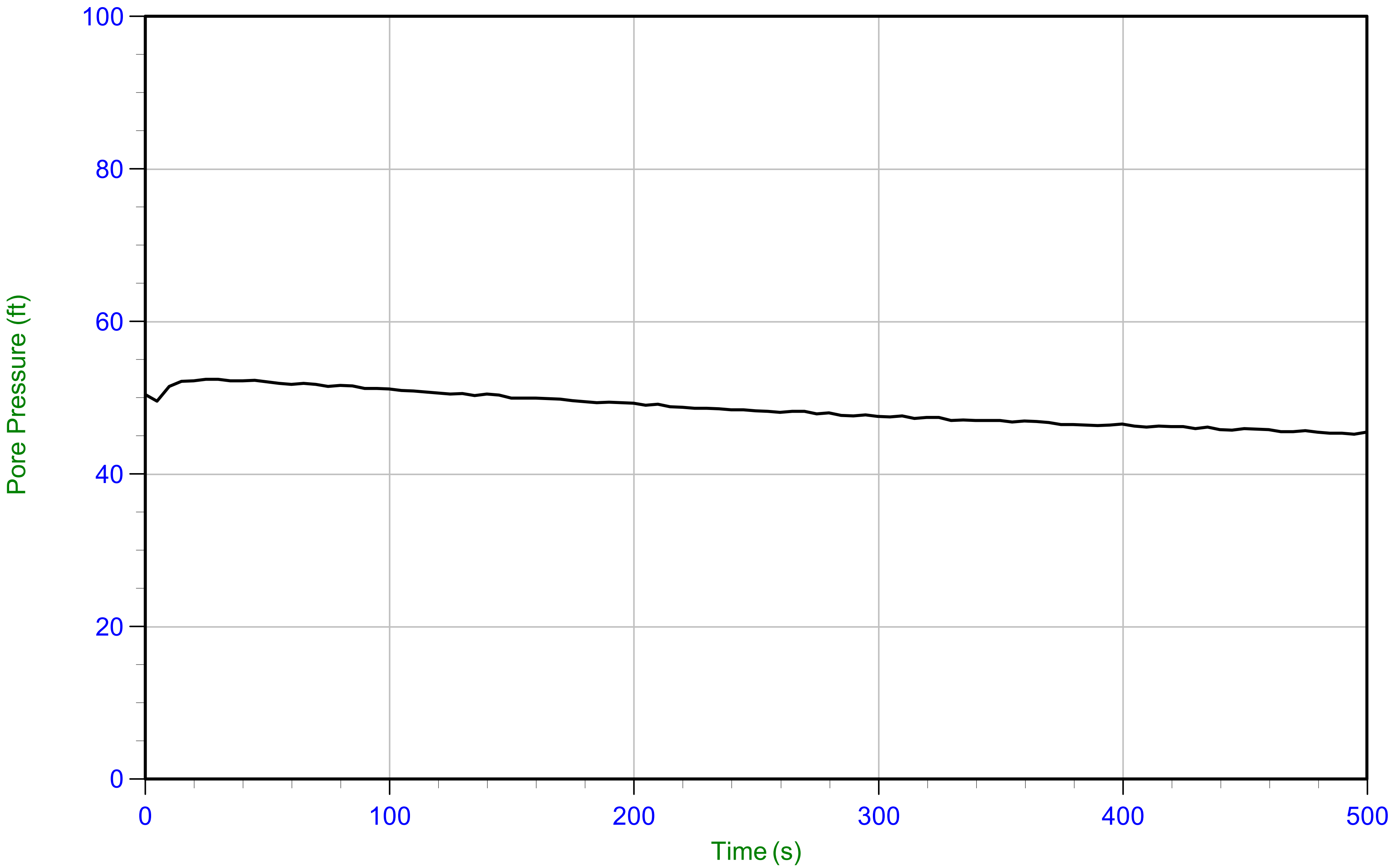
Trace Summary:

Filename: 15-53073_CP16.PPD	U Min: 26.4 ft	WT: 1.173 m / 3.848 ft
Depth: 11.250 m / 36.909 ft	U Max: 51.3 ft	Ueq: 33.1 ft
Duration: 500.0 s		

AECOM

Job No: 15-53073
Date: 27-Aug-2015 11:13:32
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C017
Cone: AD340
Cone Area: 15 sq cm

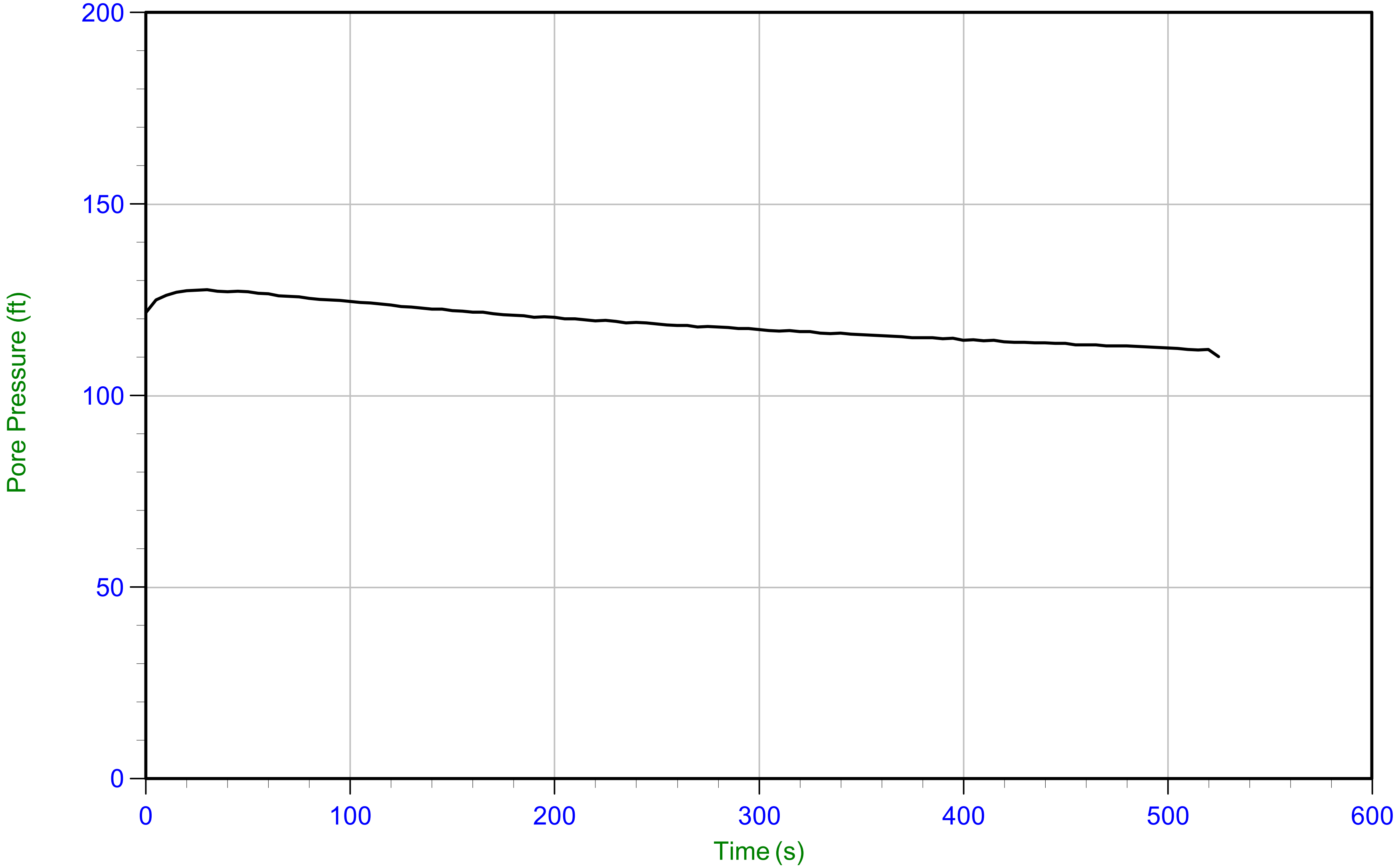


Trace Summary:

Filename: 15-53073_SP17.PPD
Depth: 8.500 m / 27.887 ft
Duration: 500.0 s

U Min: 45.3 ft
U Max: 52.5 ft

AECOM	Job No: 15-53073	Sounding: EDW-C017
	Date: 27-Aug-2015 11:13:32	Cone: AD340
	Site: Edwards Power Station, Peoria, Il	Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_SP17.PPD

Depth: 12.350 m / 40.518 ft

Duration: 525.0 s

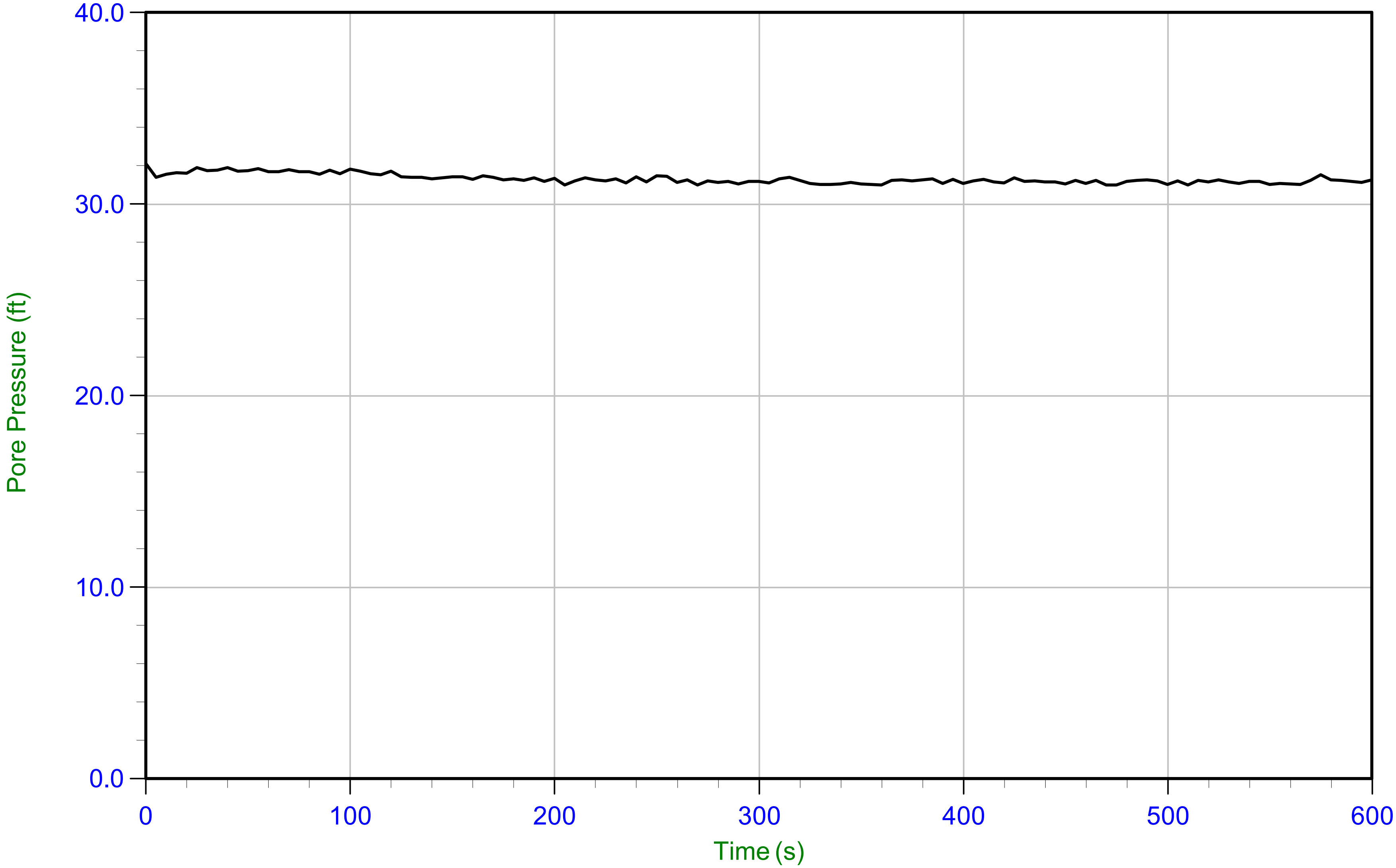
U Min: 110.3 ft

U Max: 127.7 ft

AECOM

Job No: 15-53073
Date: 27-Aug-2015 11:13:32
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C017
Cone: AD340
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_SP17.PPD
Depth: 16.850 m / 55.281 ft
Duration: 600.0 s

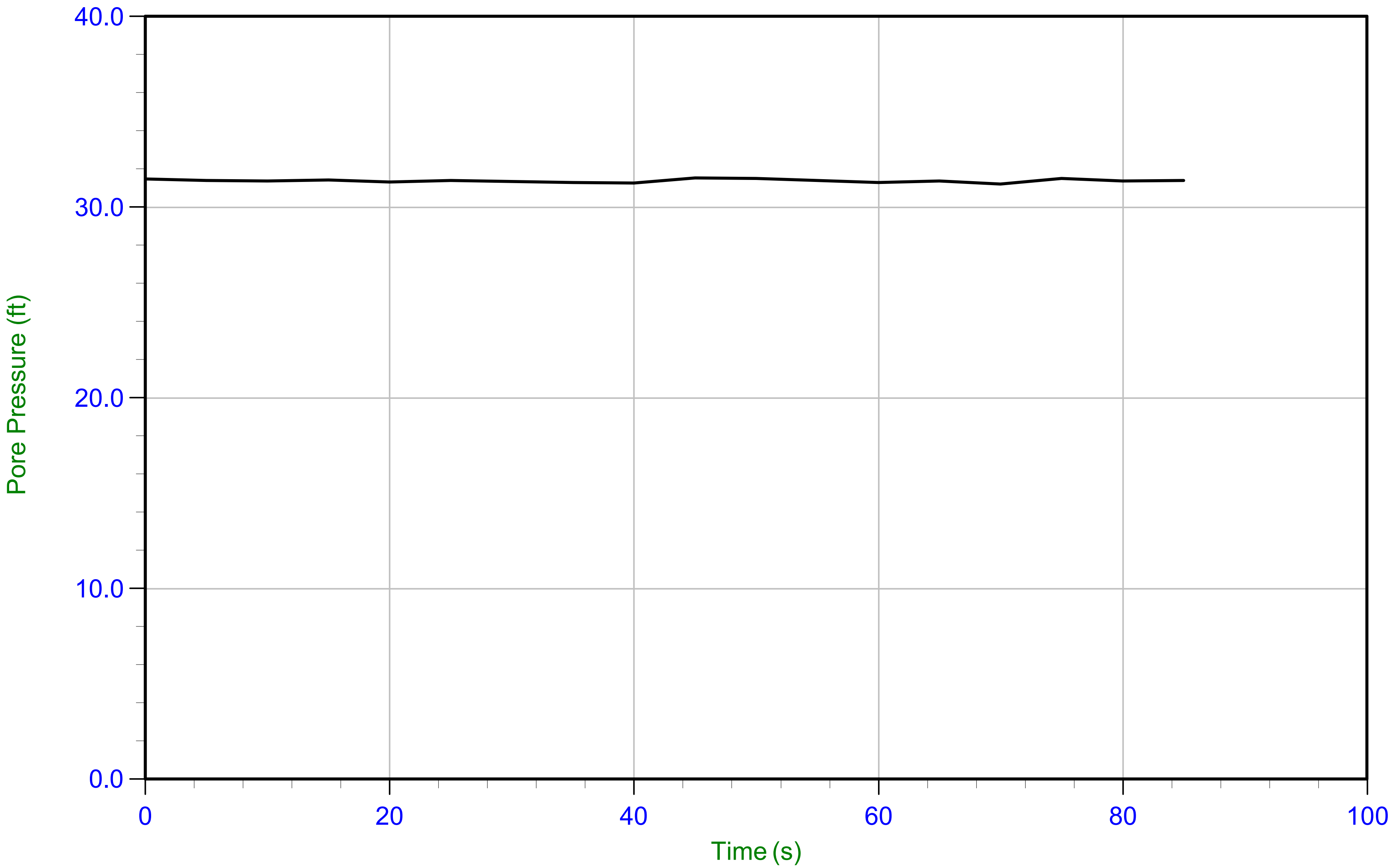
U Min: 31.0 ft
U Max: 32.1 ft

WT: 7.367 m / 24.170 ft
Ueq: 31.1 ft

AECOM

Job No: 15-53073
Date: 27-Aug-2015 11:13:32
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C017
Cone: AD340
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_SP17.PPD
Depth: 17.050 m / 55.938 ft
Duration: 85.0 s

U Min: 31.2 ft
U Max: 31.5 ft

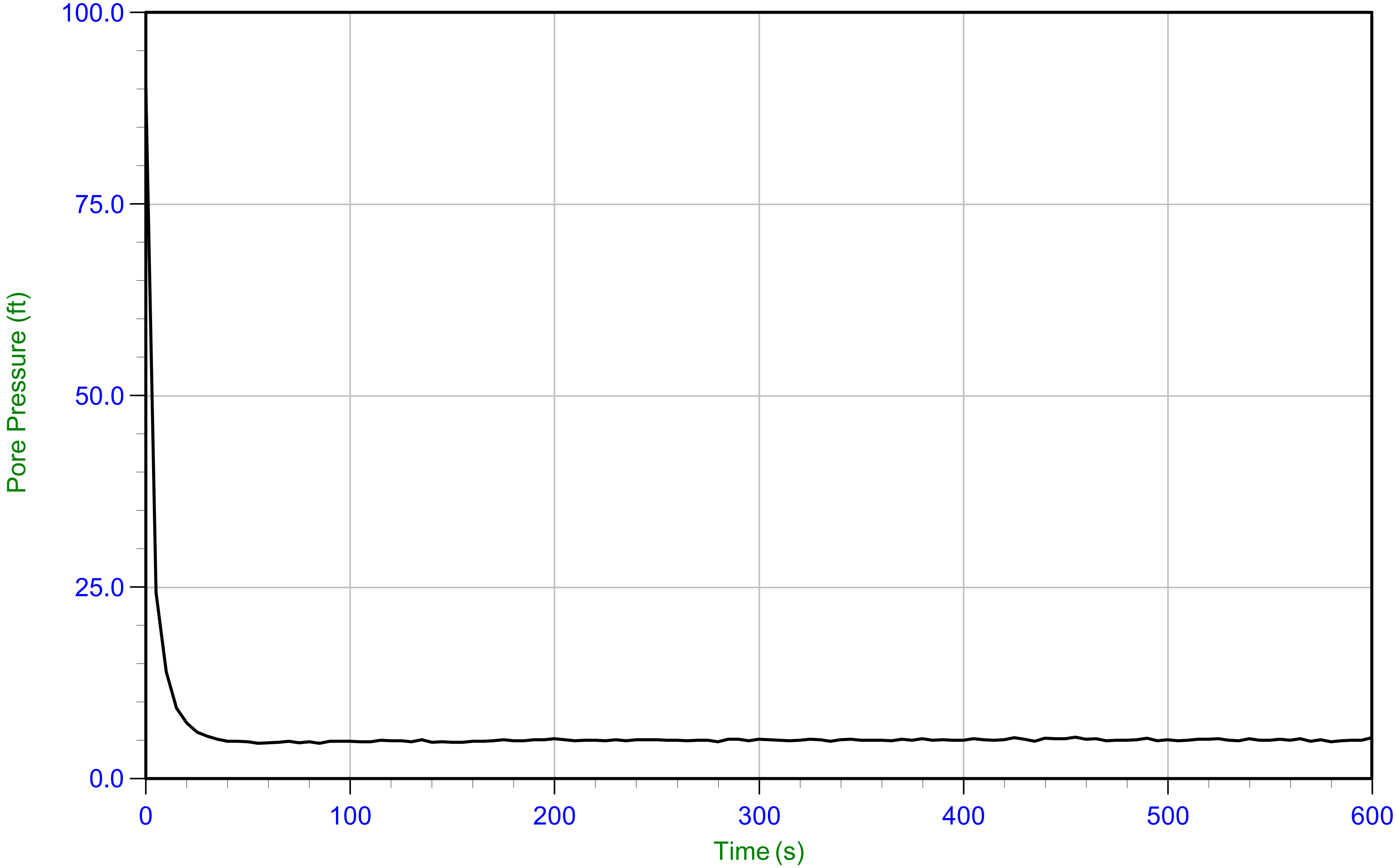
WT: 7.525 m / 24.688 ft
Ueq: 31.2 ft

ConeTec

AECOM

Job No: 15-53073
Date: 25-Aug-2015 11:13:53
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C019
Cone: AD419
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP19.PPD
Depth: 3.600 m / 11.811 ft
Duration: 600.0 s

U Min: 4.7 ft
U Max: 90.3 ft

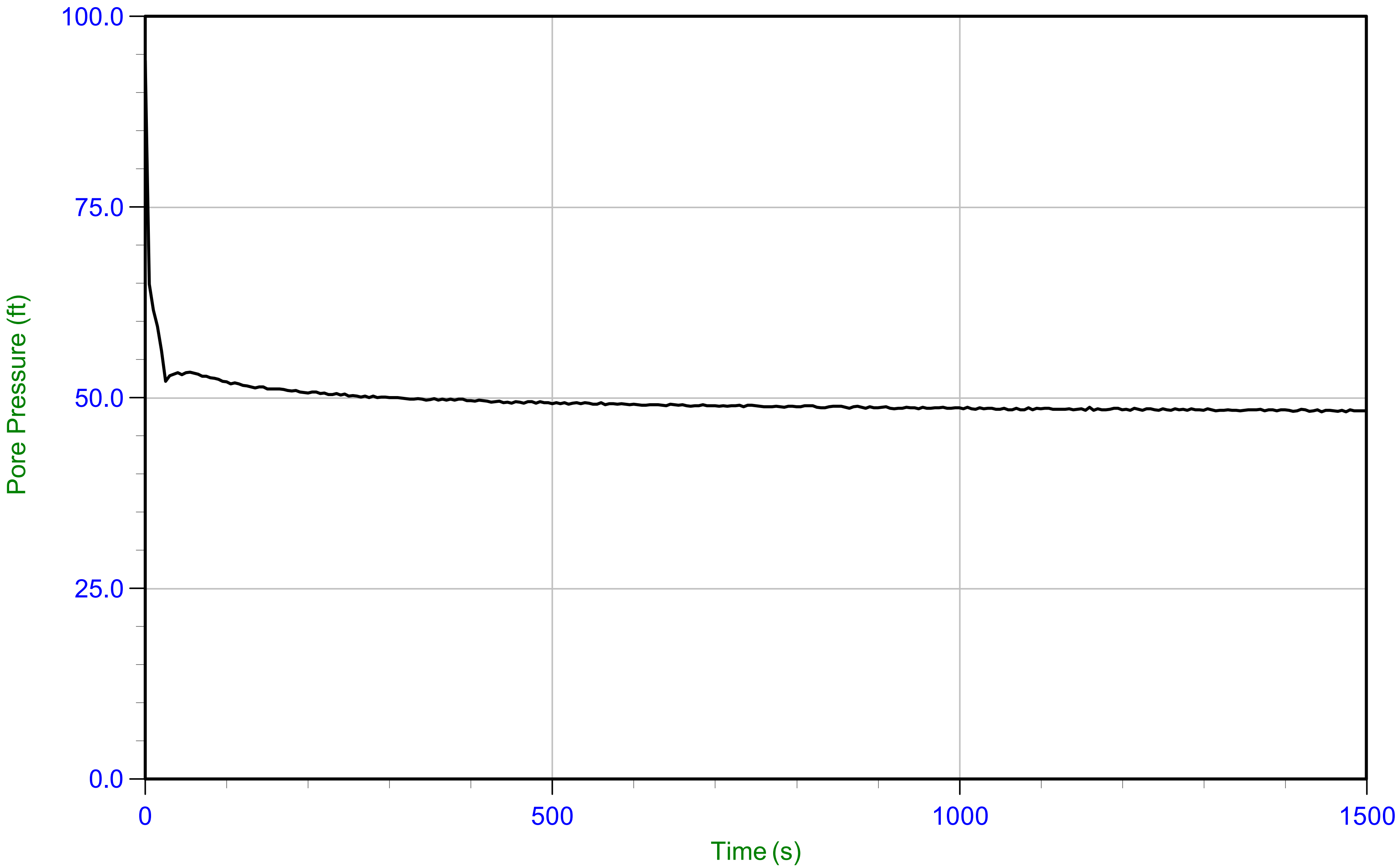
WT: 1.983 m / 6.506 ft
Ueq: 5.3 ft

ConeTec

AECOM

Job No: 15-53073
Date: 25-Aug-2015 11:13:53
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C019
Cone: AD419
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP19.PPD
Depth: 16.300 m / 53.477 ft
Duration: 1500.0 s

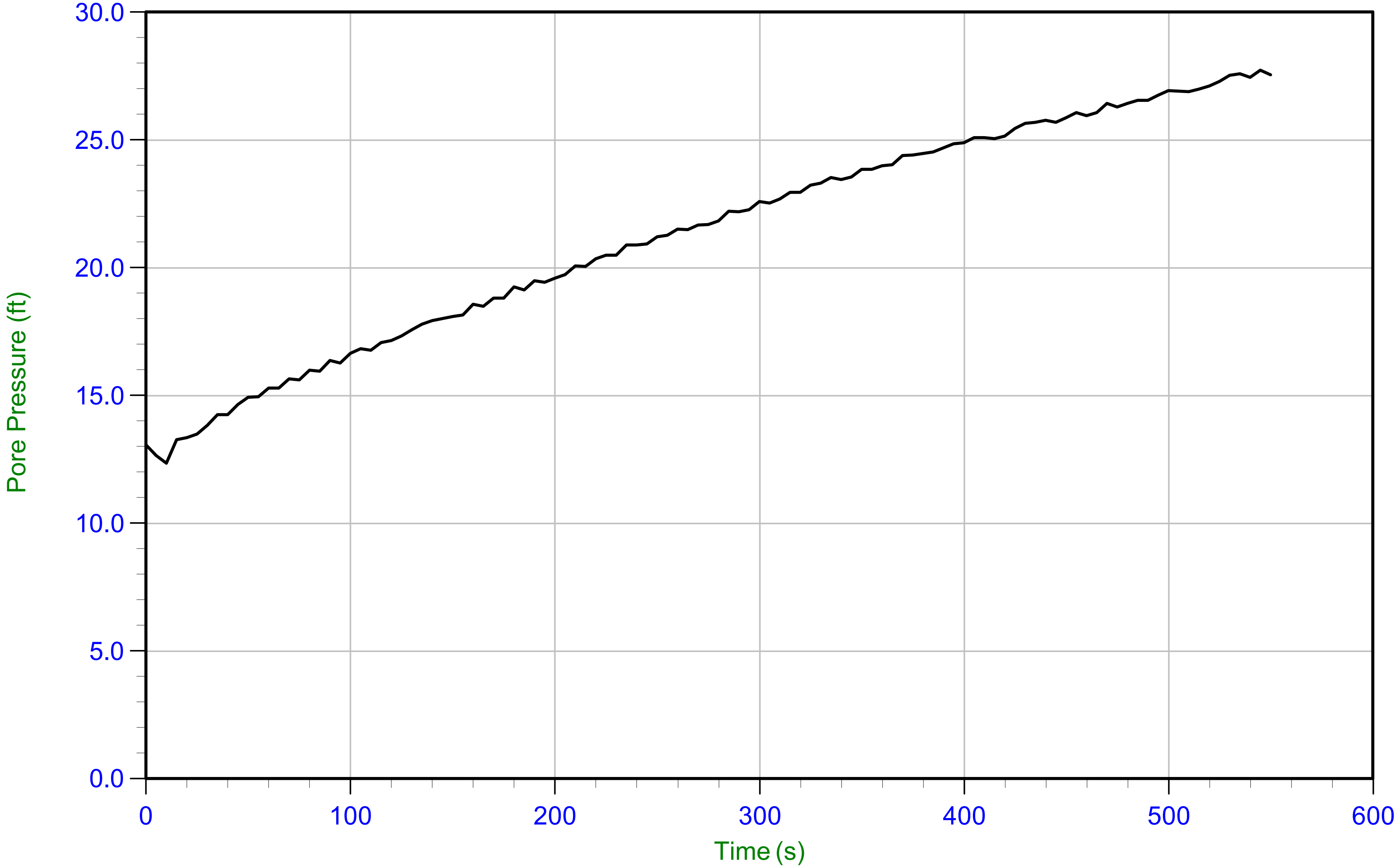
U Min: 48.2 ft
U Max: 94.2 ft

WT: 1.620 m / 5.315 ft
Ueq: 48.2 ft

AECOM

Job No: 15-53073
Date: 26-Aug-2015 10:21:35
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C021
Cone: AD419
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP21.PPD
Depth: 4.250 m / 13.943 ft
Duration: 550.0 s

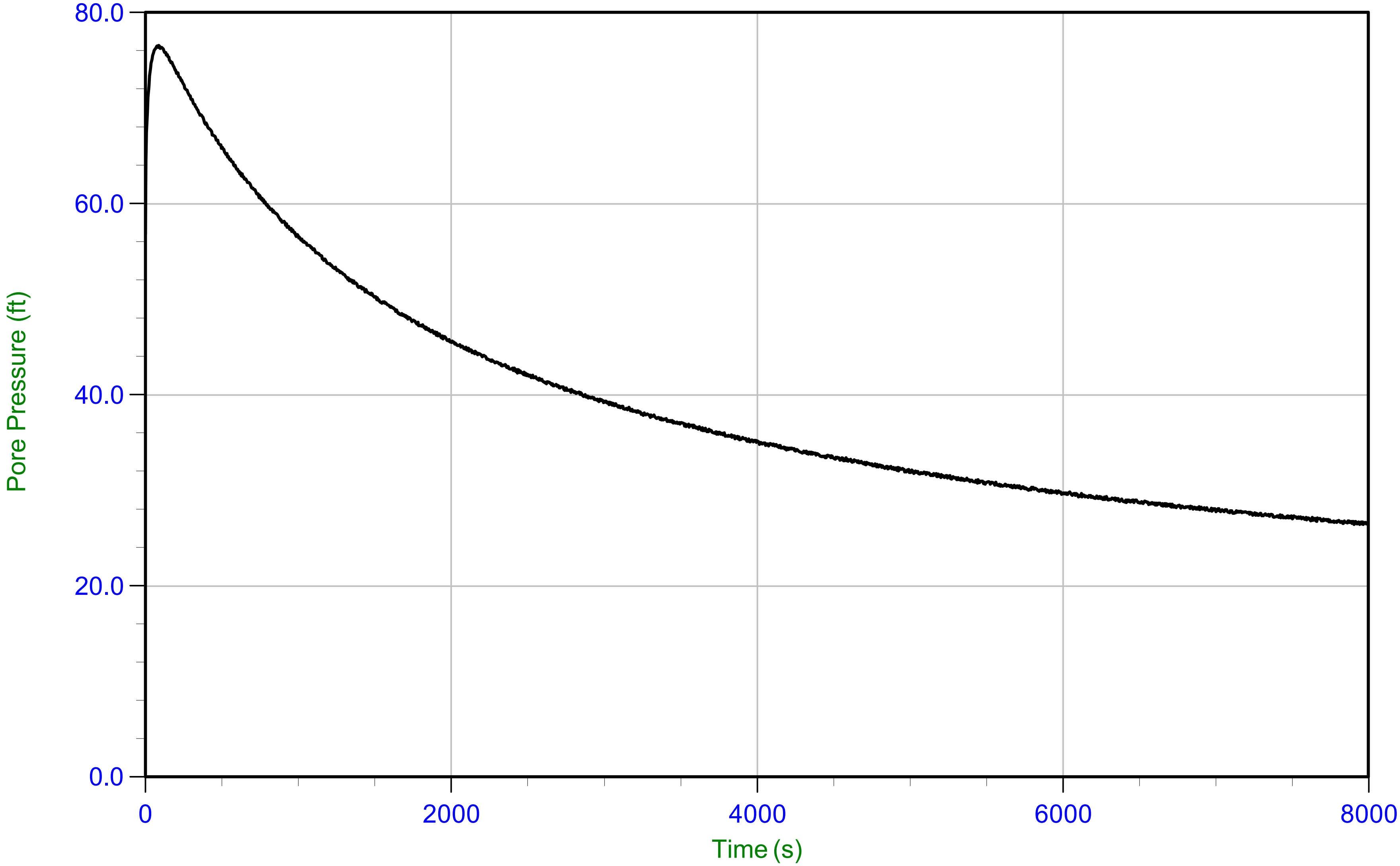
U Min: 12.4 ft
U Max: 27.7 ft

CONETEC

AECOM

Job No: 15-53073
Date: 26-Aug-2015 10:21:35
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C021
Cone: AD419
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP21.PPD
Depth: 7.150 m / 23.458 ft
Duration: 8000.0 s

U Min: 26.4 ft
U Max: 76.5 ft

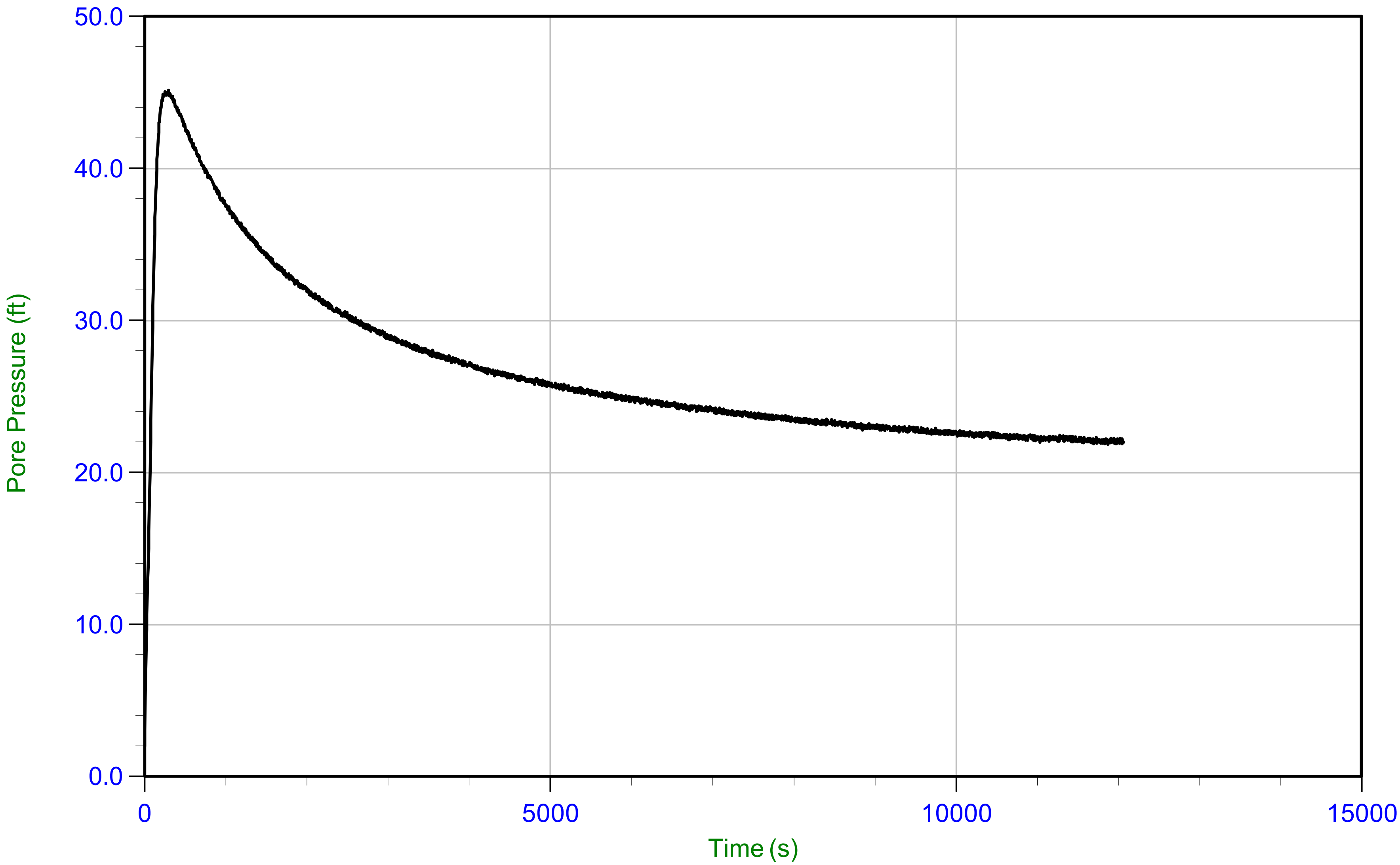
WT: 3.962 m / 13.000 ft
Ueq: 10.5 ft
U(50): 43.50 ft

T(50): 2190.1 s
Ir: 100
Ch: 0.3 sq cm/min

AECOM

Job No: 15-53073
Date: 26-Aug-2015 10:21:35
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C021
Cone: AD419
Cone Area: 15 sq cm



Trace Summary:

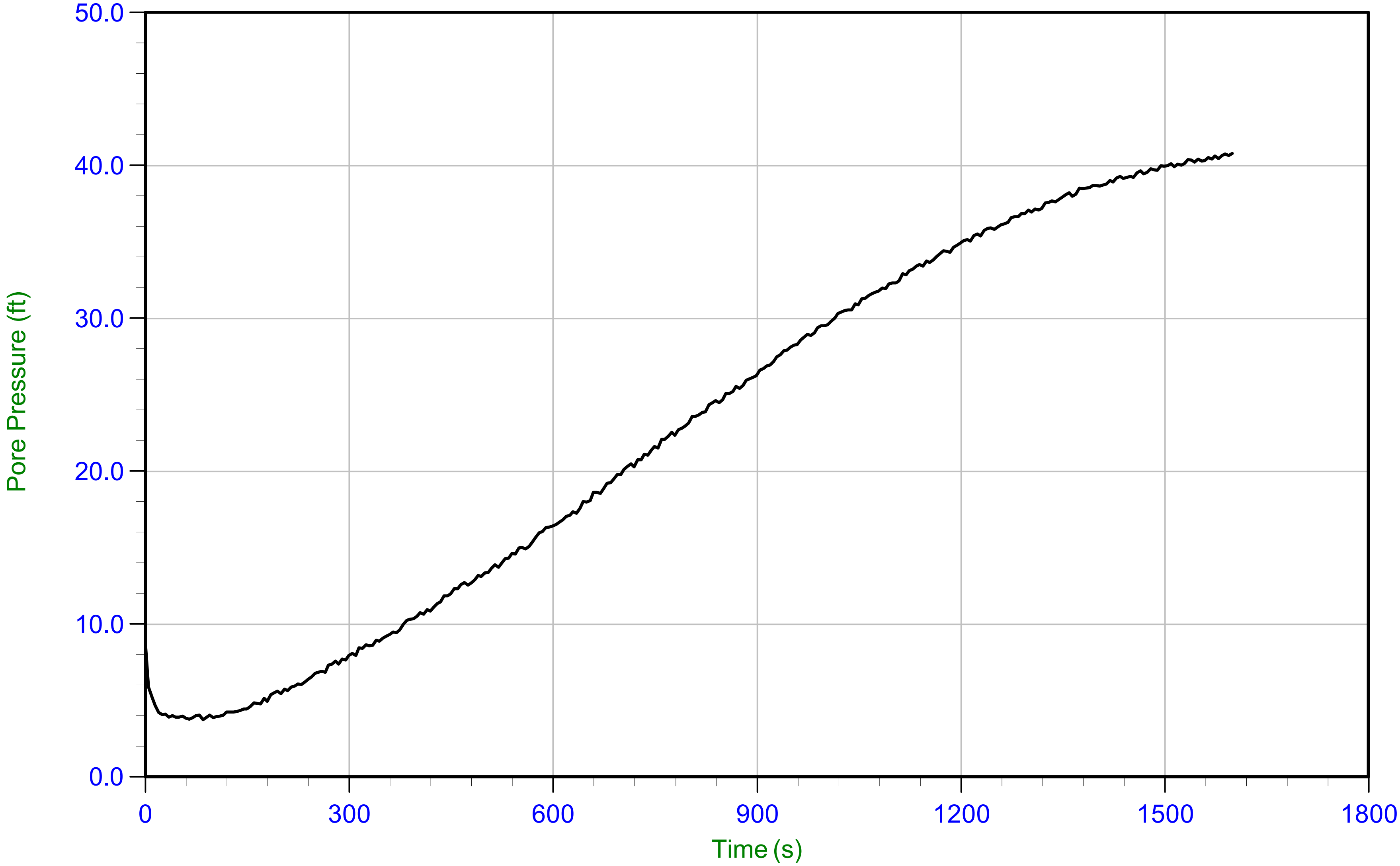
Filename: 15-53073_CP21.PPD
Depth: 10.250 m / 33.628 ft
Duration: 12070.0 s

U Min: 2.0 ft
U Max: 45.1 ft

WT: 3.962 m / 13.000 ft
Ueq: 20.6 ft
U(50): 32.88 ft

T(50): 1449.3 s
Ir: 100
Ch: 0.5 sq cm/min

AECOM	Job No: 15-53073 Date: 26-Aug-2015 10:21:35 Site: Edwards Power Station, Peoria, Il	Sounding: EDW-C021 Cone: AD419 Cone Area: 15 sq cm

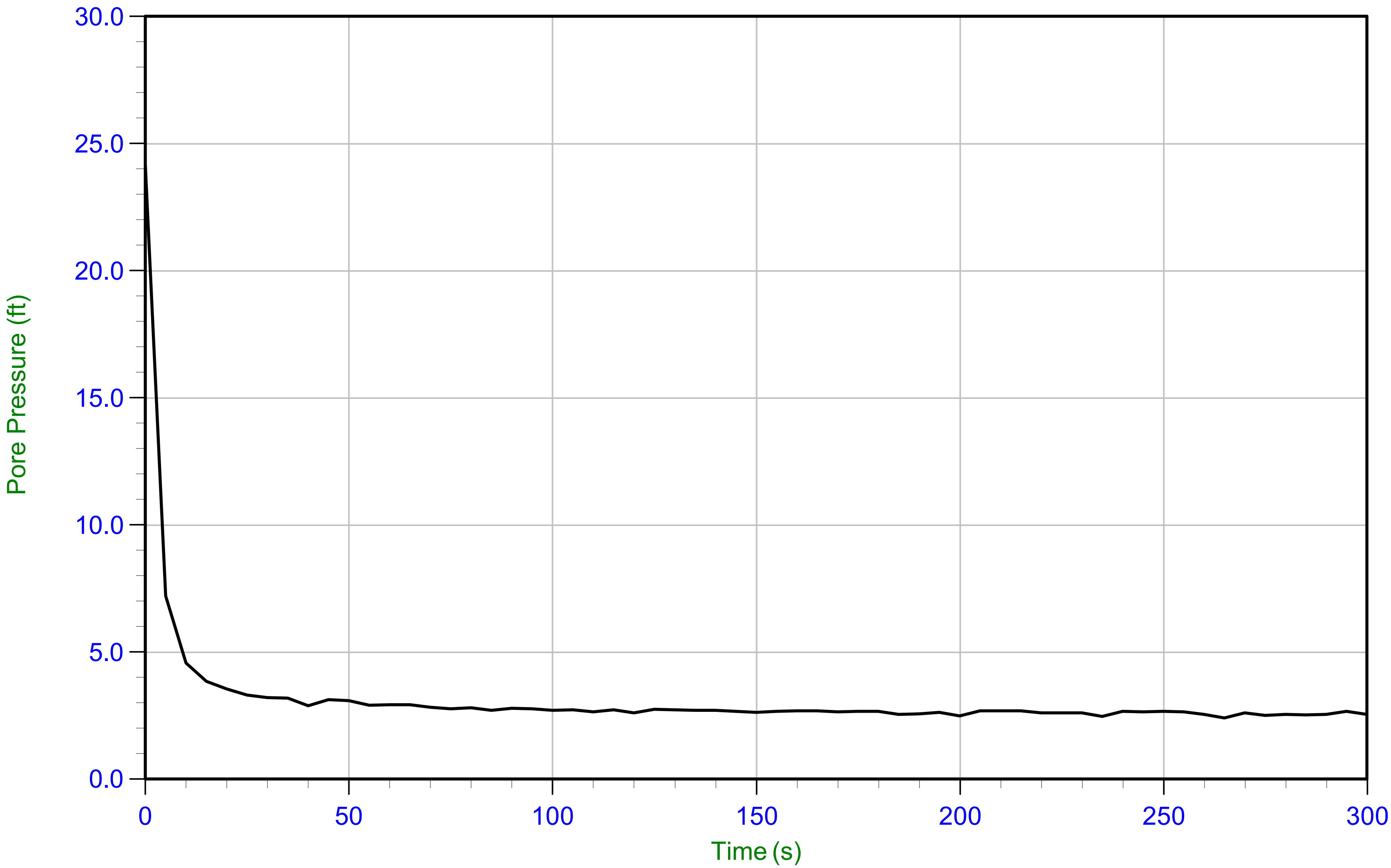


Trace Summary:

Filename: 15-53073_CP21.PPD	U Min: 3.8 ft
Depth: 14.750 m / 48.392 ft	U Max: 40.8 ft
Duration: 1600.0 s	

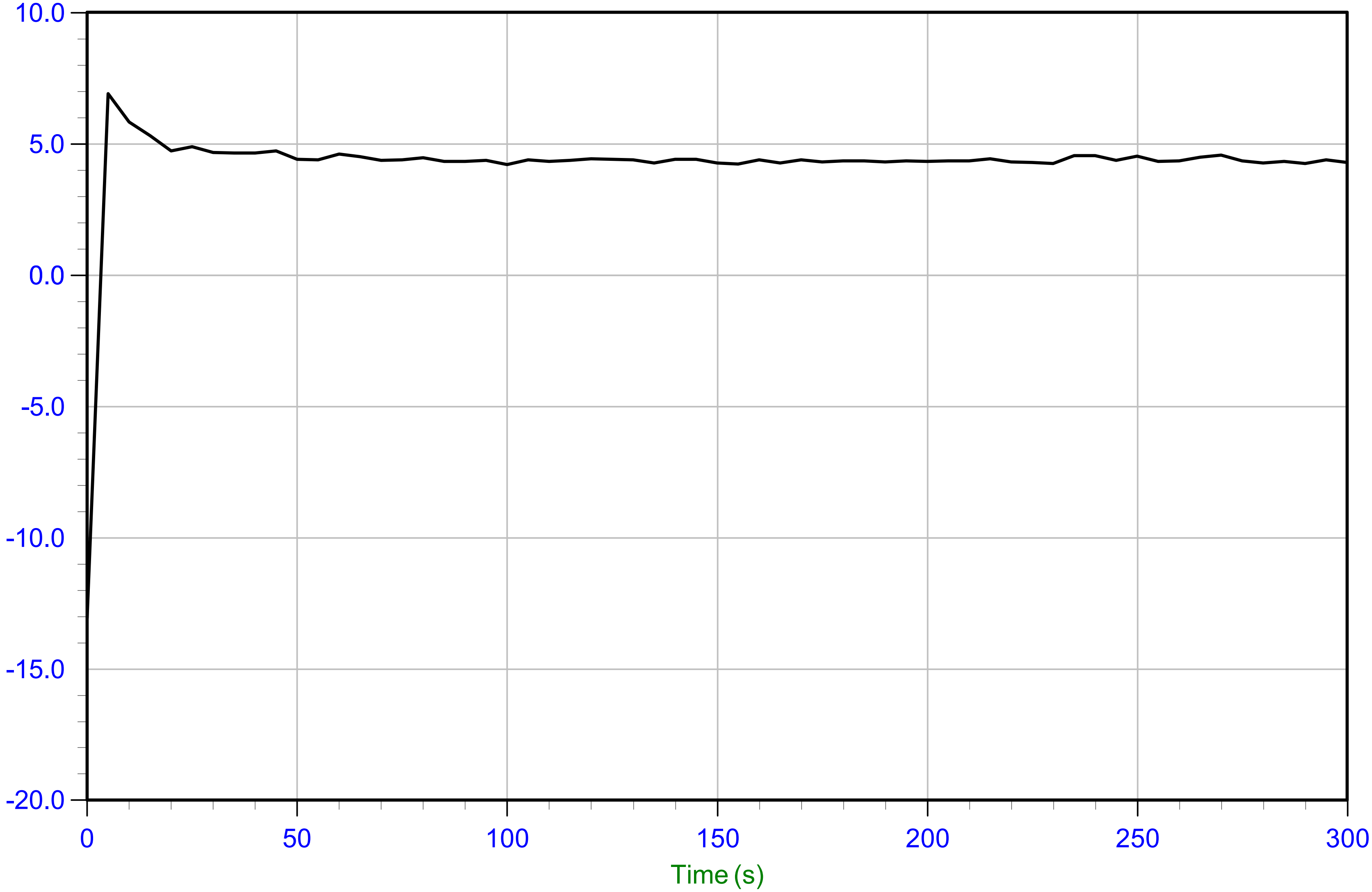
CONETEC | AECOM

Job No: 15-53073
Date: 26-Aug-2015 10:35:11
Site: Edwards Power Station, Peoria, IL
Sounding: EDW-C022
Cone: 374
Cone Area: 15 sq cm



Trace Summary:
Filename: 15-53073_SP22.PPD
Depth: 2.600 m / 8.530 ft
Duration: 300.0 s
U Min: 2.4 ft
U Max: 24.2 ft
WT: 1.870 m / 6.135 ft
Ueq: 2.4 ft

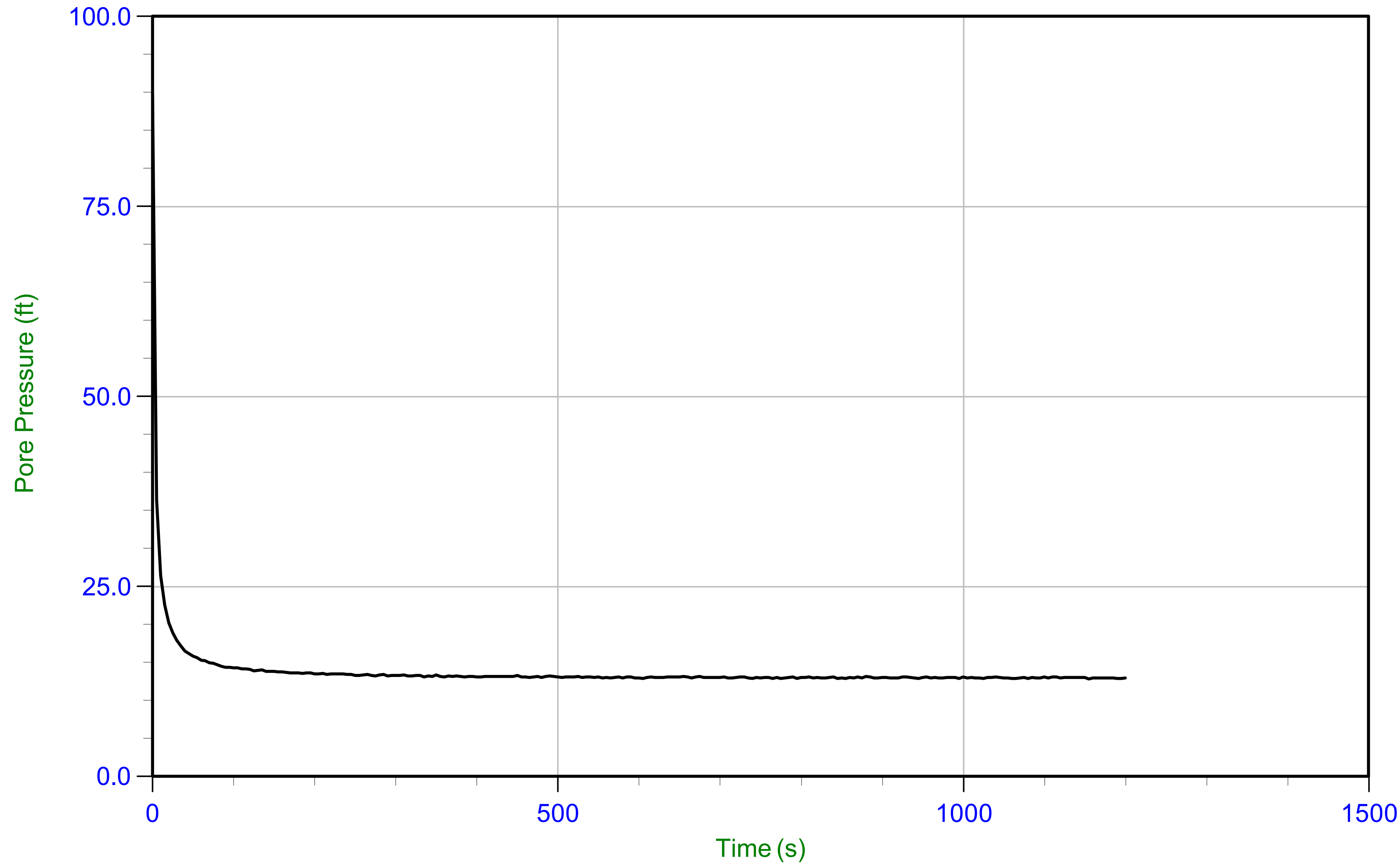
AECOM	Job No: 15-53073	Sounding: EDW-C022
	Date: 26-Aug-2015 10:35:11	Cone: 374
	Site: Edwards Power Station, Peoria, IL	Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_SP22.PPD	U Min: -13.1 ft	WT: 2.048 m / 6.719 ft
Depth: 3.350 m / 10.991 ft	U Max: 6.9 ft	Ueq: 4.3 ft
Duration: 300.0 s		

AECOM	Job No: 15-53073	Sounding: EDW-C022
	Date: 26-Aug-2015 10:35:11	Cone: 374
	Site: Edwards Power Station, Peoria, IL	Cone Area: 15 sq cm



Trace Summary:

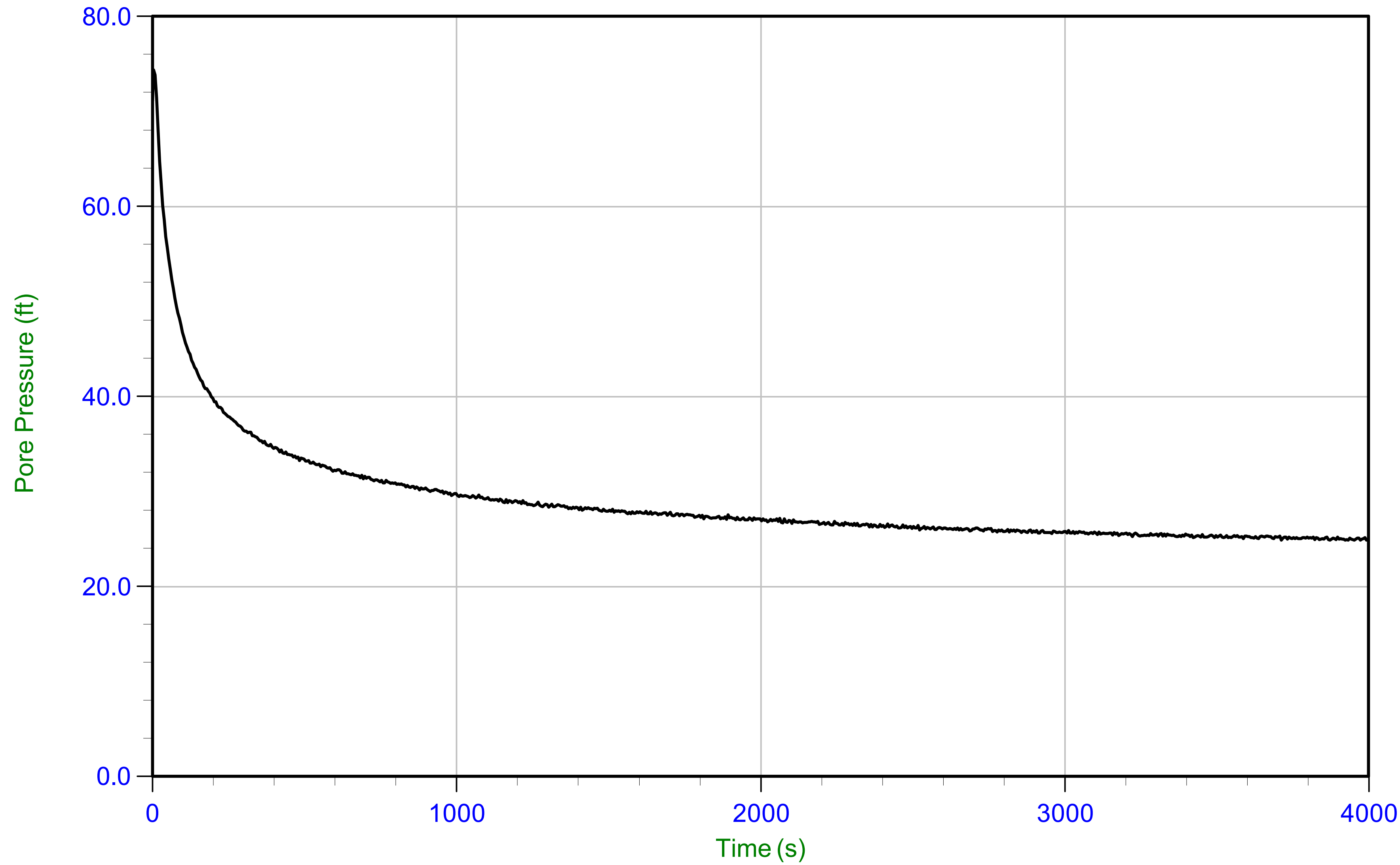
Filename: 15-53073_SP22.PPD	U Min: 12.8 ft	WT: 2.084 m / 6.837 ft
Depth: 6.000 m / 19.685 ft	U Max: 89.8 ft	Ueq: 12.8 ft
Duration: 1200.0 s		

CONETEC

AECOM

Job No: 15-53073
Date: 27-Aug-2015 08:52:49
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C023
Cone: AD340
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP23.PPD
Depth: 11.850 m / 38.877 ft
Duration: 4000.0 s

U Min: 24.9 ft
U Max: 74.4 ft

WT: 4.589 m / 15.056 ft
Ueq: 23.8 ft
U(50): 49.09 ft

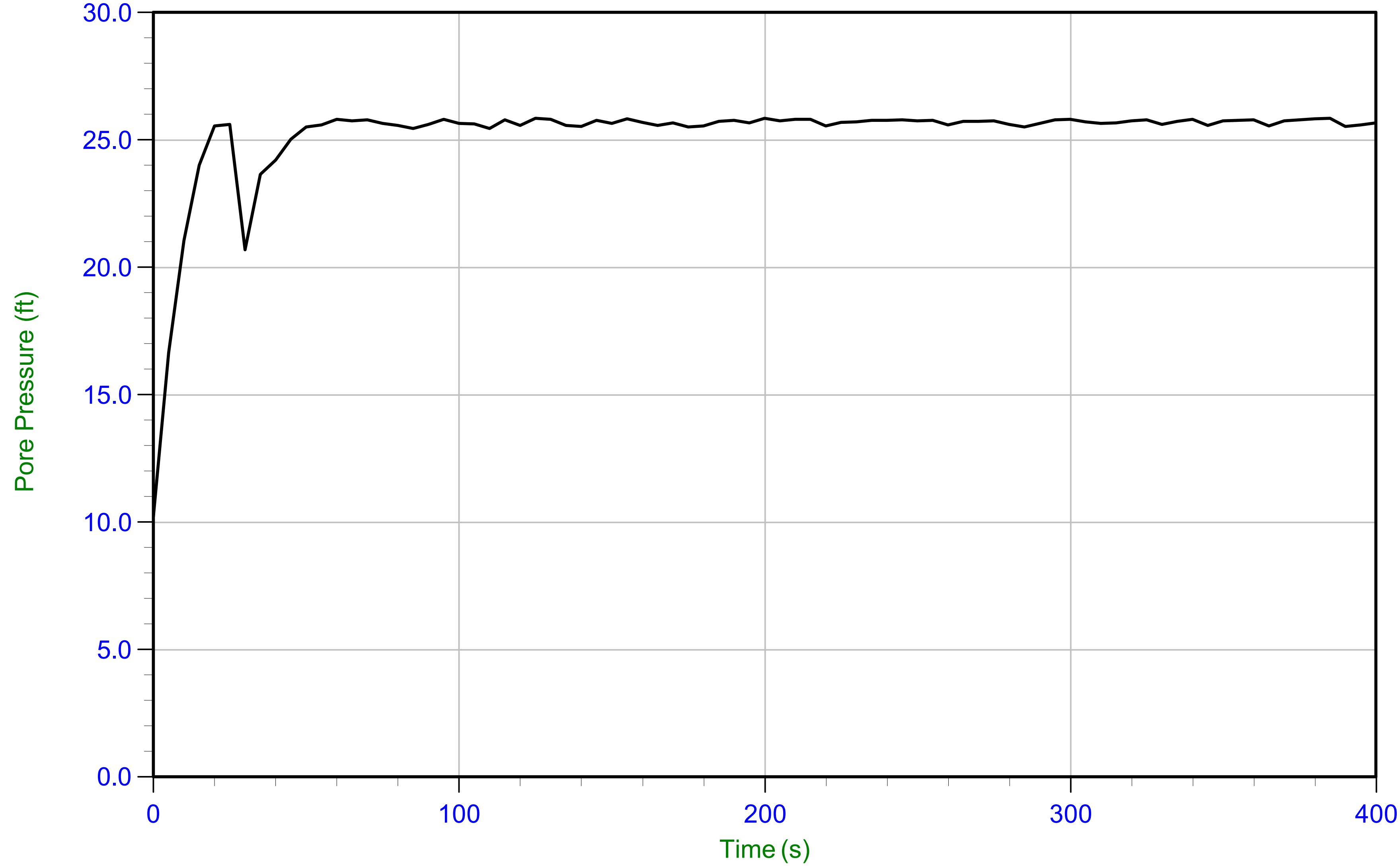
T(50): 77.9 s
Ir: 100
Ch: 9.0 sq cm/min

CONETEC

AECOM

Job No: 15-53073
Date: 27-Aug-2015 08:52:49
Site: Edwards Power Station, Peoria, Il

Sounding: EDW-C023
Cone: AD340
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP23.PPD
Depth: 12.400 m / 40.682 ft
Duration: 400.0 s

U Min: 10.2 ft
U Max: 25.9 ft

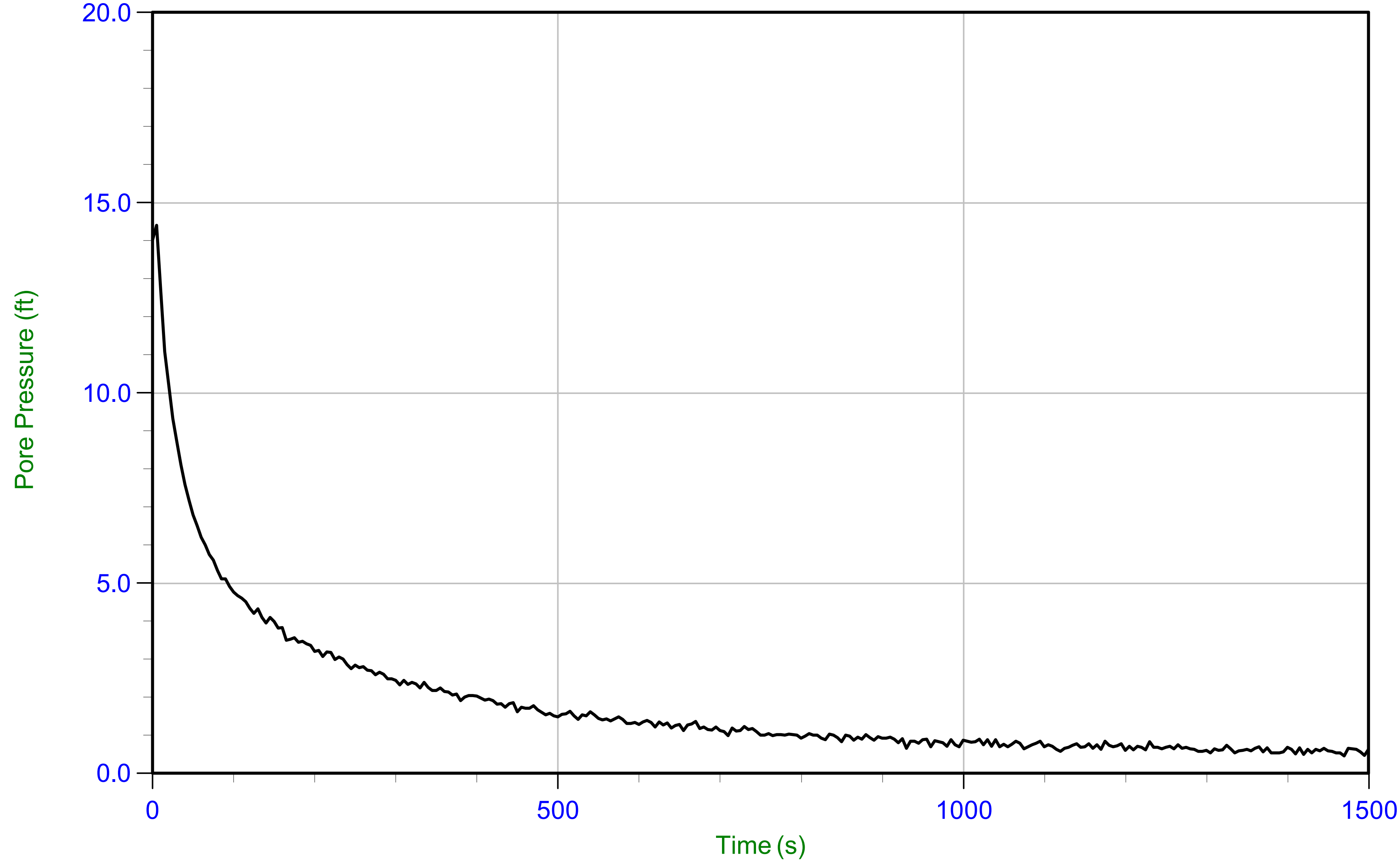
WT: 4.589 m / 15.056 ft
Ueq: 25.6 ft

CONETEC

AECOM

Job No: 15-53073
Date: 25-Aug-2015 13:44:56
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C025
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP25.PPD
Depth: 2.000 m / 6.562 ft
Duration: 1500.0 s

U Min: 0.5 ft
U Max: 14.4 ft

WT: 1.826 m / 5.991 ft
Ueq: 0.6 ft
U(50): 7.49 ft

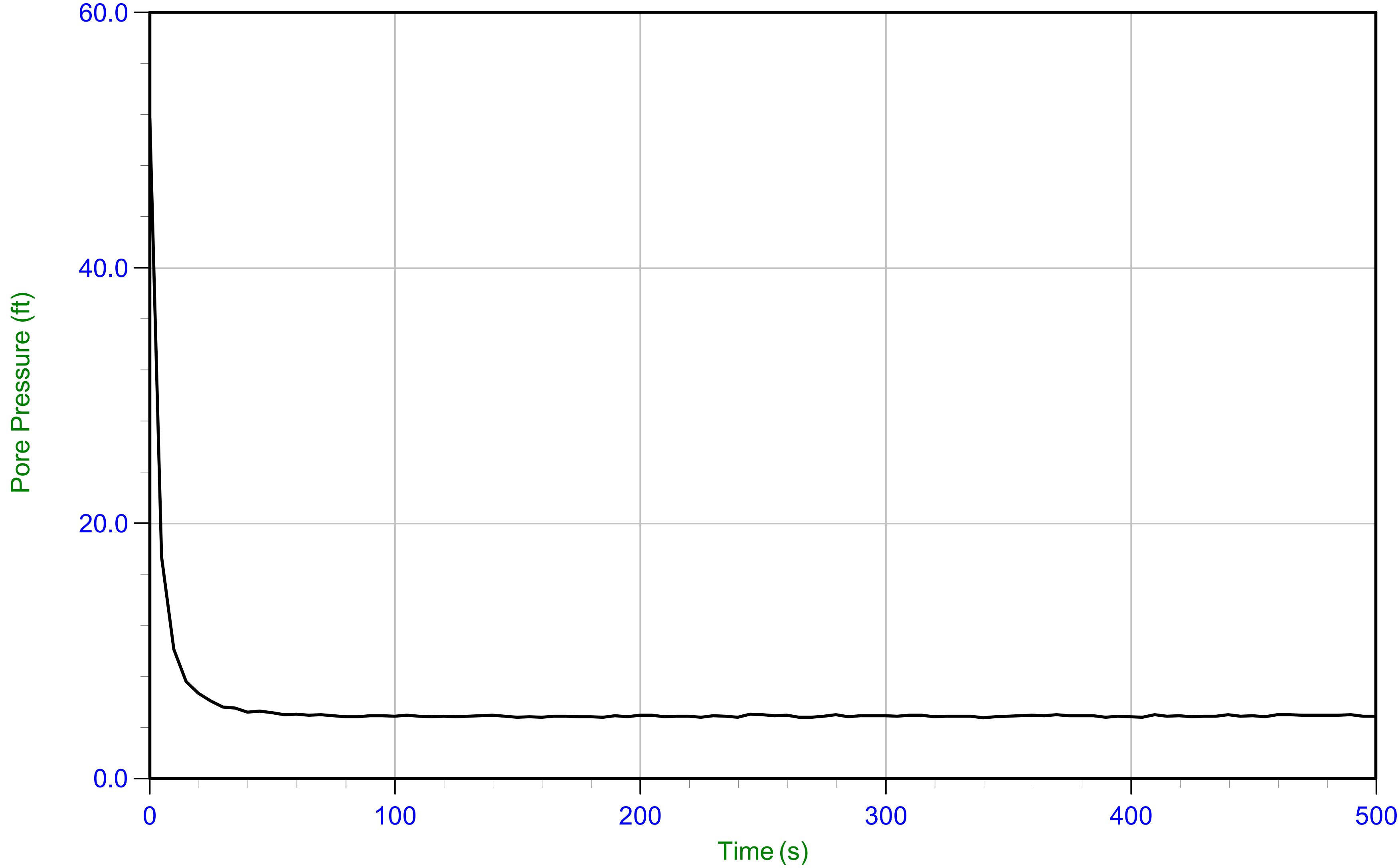
T(50): 36.3 s
Ir: 100
Ch: 19.3 sq cm/min

ConeTec

AECOM

Job No: 15-53073
Date: 25-Aug-2015 13:44:56
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C025
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP25.PPD
Depth: 3.350 m / 10.991 ft
Duration: 500.0 s

U Min: 4.8 ft
U Max: 51.7 ft

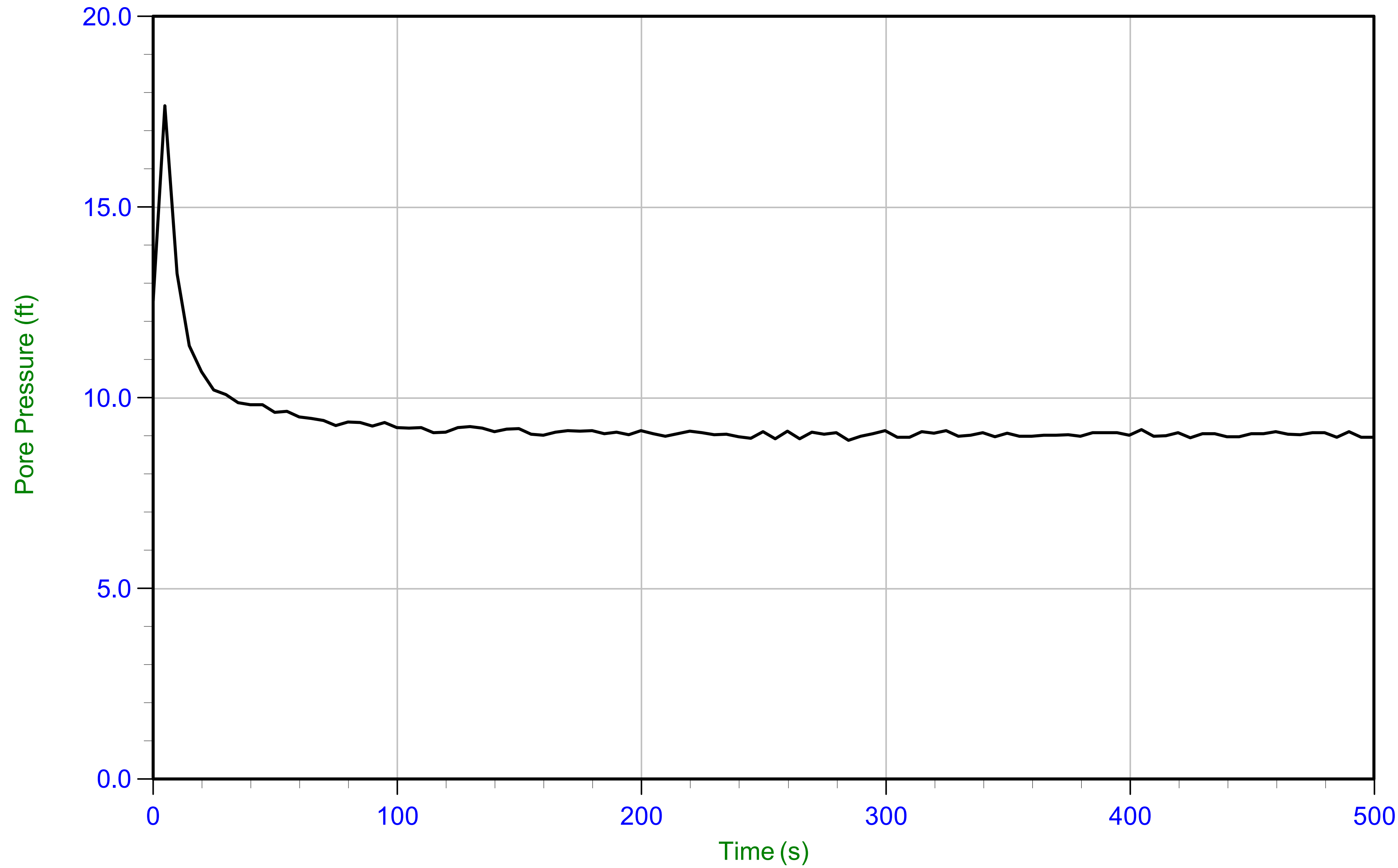
WT: 1.826 m / 5.991 ft
Ueq: 5.0 ft

CONETEC

AECOM

Job No: 15-53073
Date: 25-Aug-2015 13:44:56
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C025
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP25.PPD
Depth: 4.600 m / 15.092 ft
Duration: 500.0 s

U Min: 8.9 ft
U Max: 17.7 ft

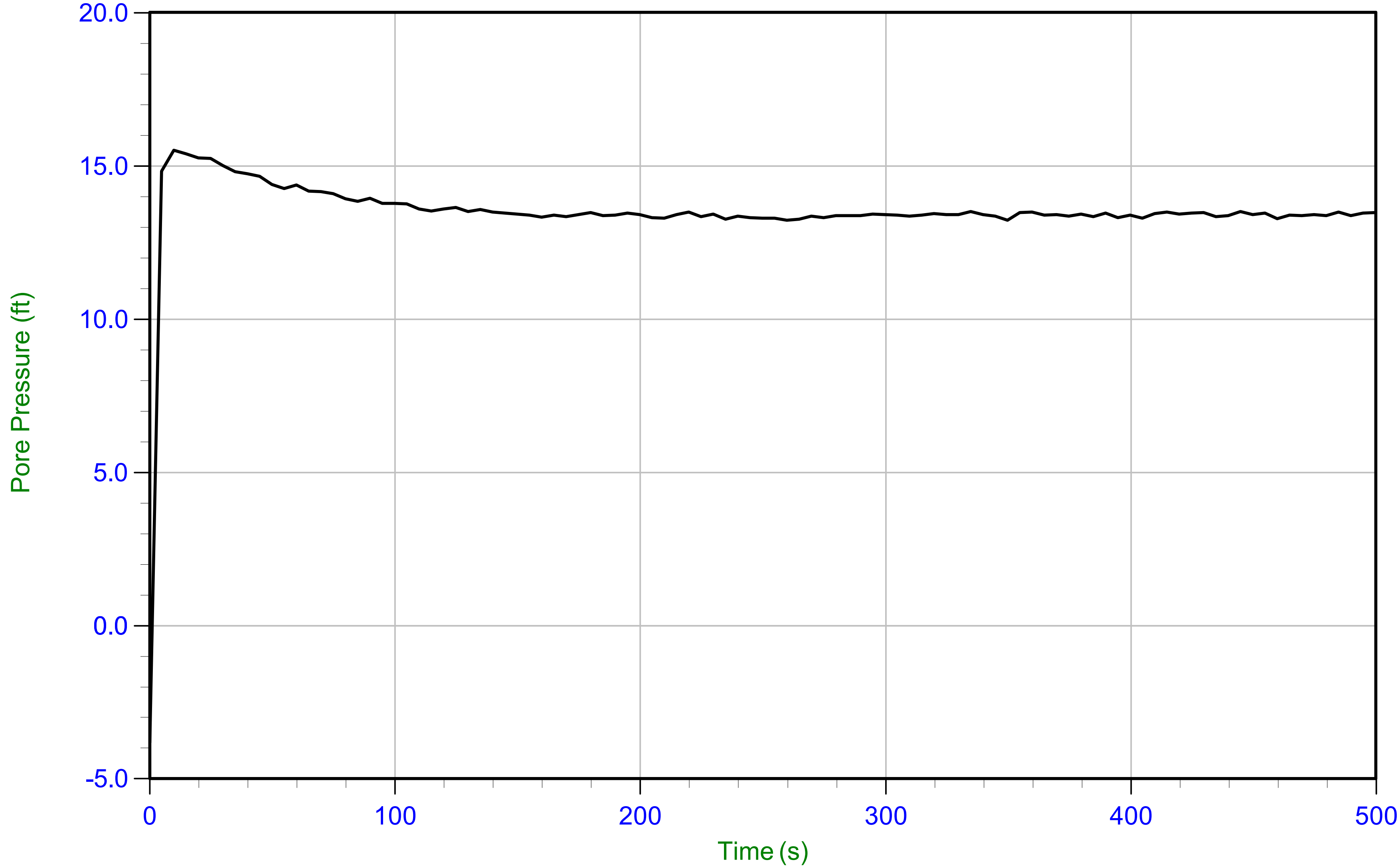
WT: 1.848 m / 6.063 ft
Ueq: 9.0 ft

ConeTec

AECOM

Job No: 15-53073
Date: 25-Aug-2015 13:44:56
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C025
Cone: 374
Cone Area: 15 sq cm



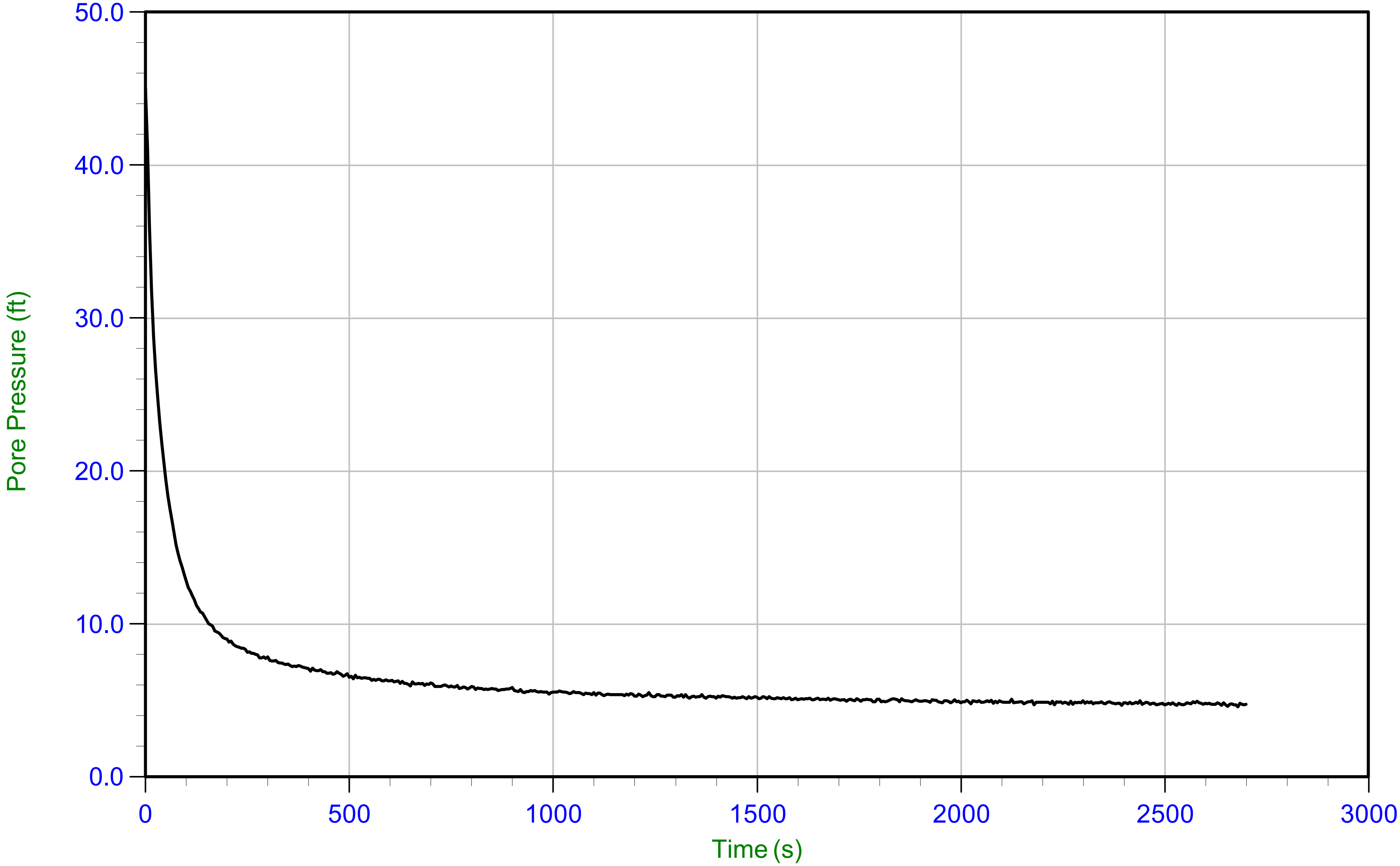
Trace Summary:

Filename: 15-53073_CP25.PPD
Depth: 6.100 m / 20.013 ft
Duration: 500.0 s

U Min: -3.8 ft
U Max: 15.5 ft

WT: 1.962 m / 6.437 ft
Ueq: 13.6 ft

AECOM	Job No: 15-53073	Sounding: EDW-C026
	Date: 26-Aug-2015 12:20:07	Cone: 374
	Site: Edwards Power Station, Peoria, IL	Cone Area: 15 sq cm



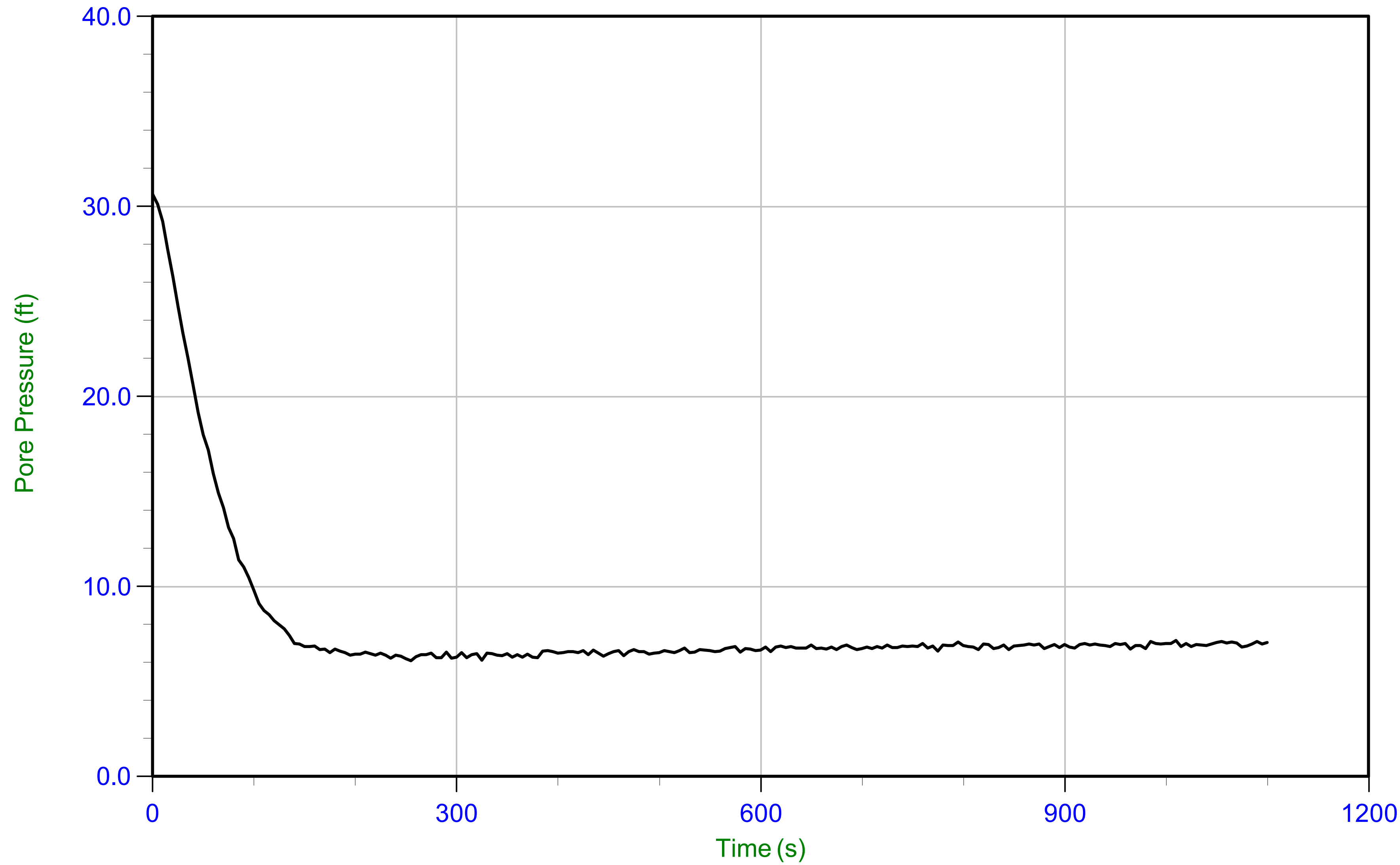
Trace Summary:			
Filename: 15-53073_SP26.PPD	U Min: 4.6 ft	WT: 2.191 m / 7.188 ft	T(50): 31.2 s
Depth: 3.350 m / 10.991 ft	U Max: 45.1 ft	Ueq: 3.8 ft	Ir: 100
Duration: 2700.0 s		U(50): 24.43 ft	Ch: 22.5 sq cm/min

CONETEC

AECOM

Job No: 15-53073
Date: 26-Aug-2015 12:20:07
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C026
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_SP26.PPD
Depth: 4.350 m / 14.271 ft
Duration: 1100.0 s

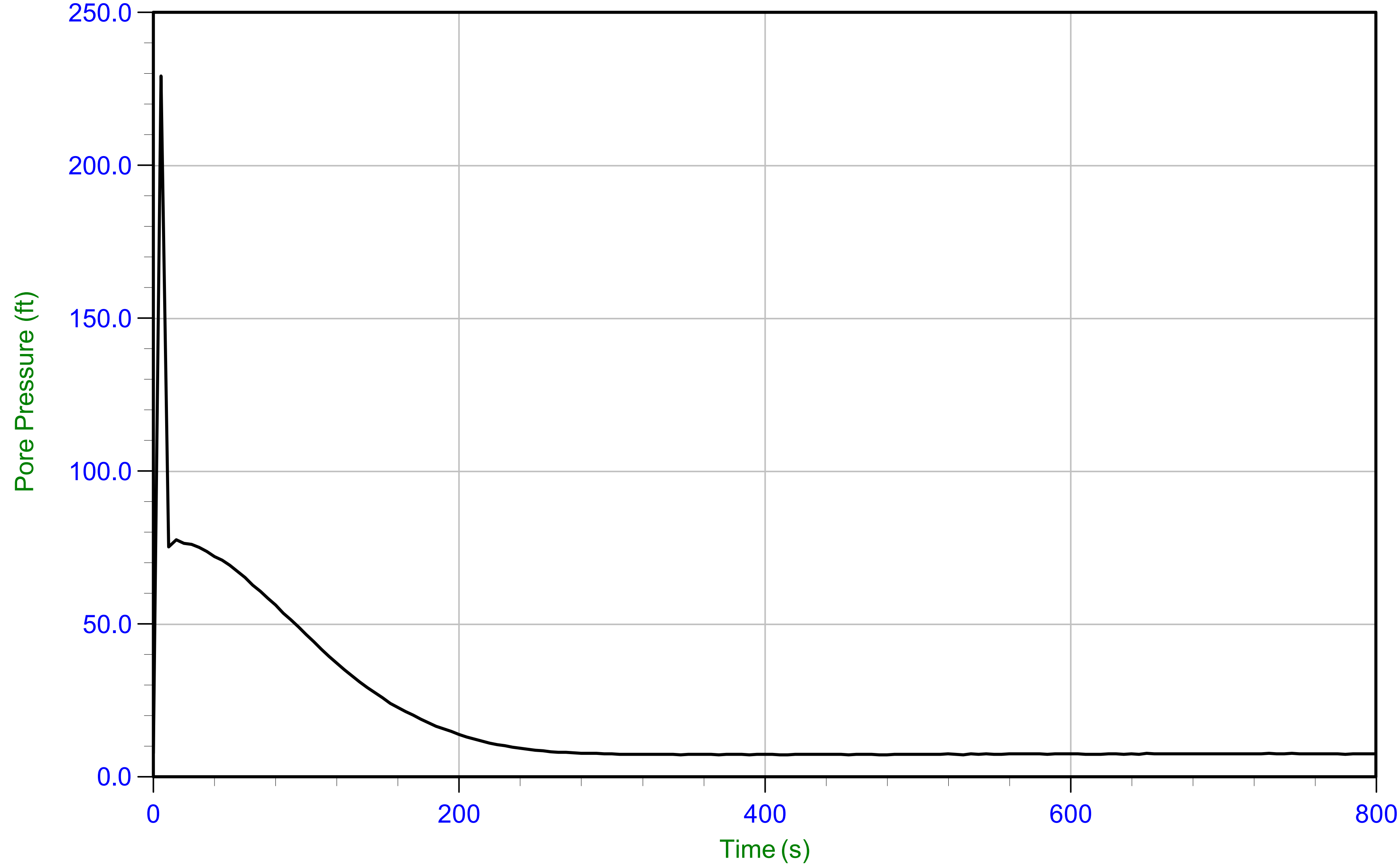
U Min: 6.1 ft
U Max: 30.7 ft

WT: 2.191 m / 7.188 ft
Ueq: 7.1 ft

AECOM

Job No: 15-53073
Date: 26-Aug-2015 14:00:29
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C026B
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_SP26B.PPD
Depth: 4.450 m / 14.600 ft
Duration: 800.0 s

U Min: 7.3 ft
U Max: 229.3 ft

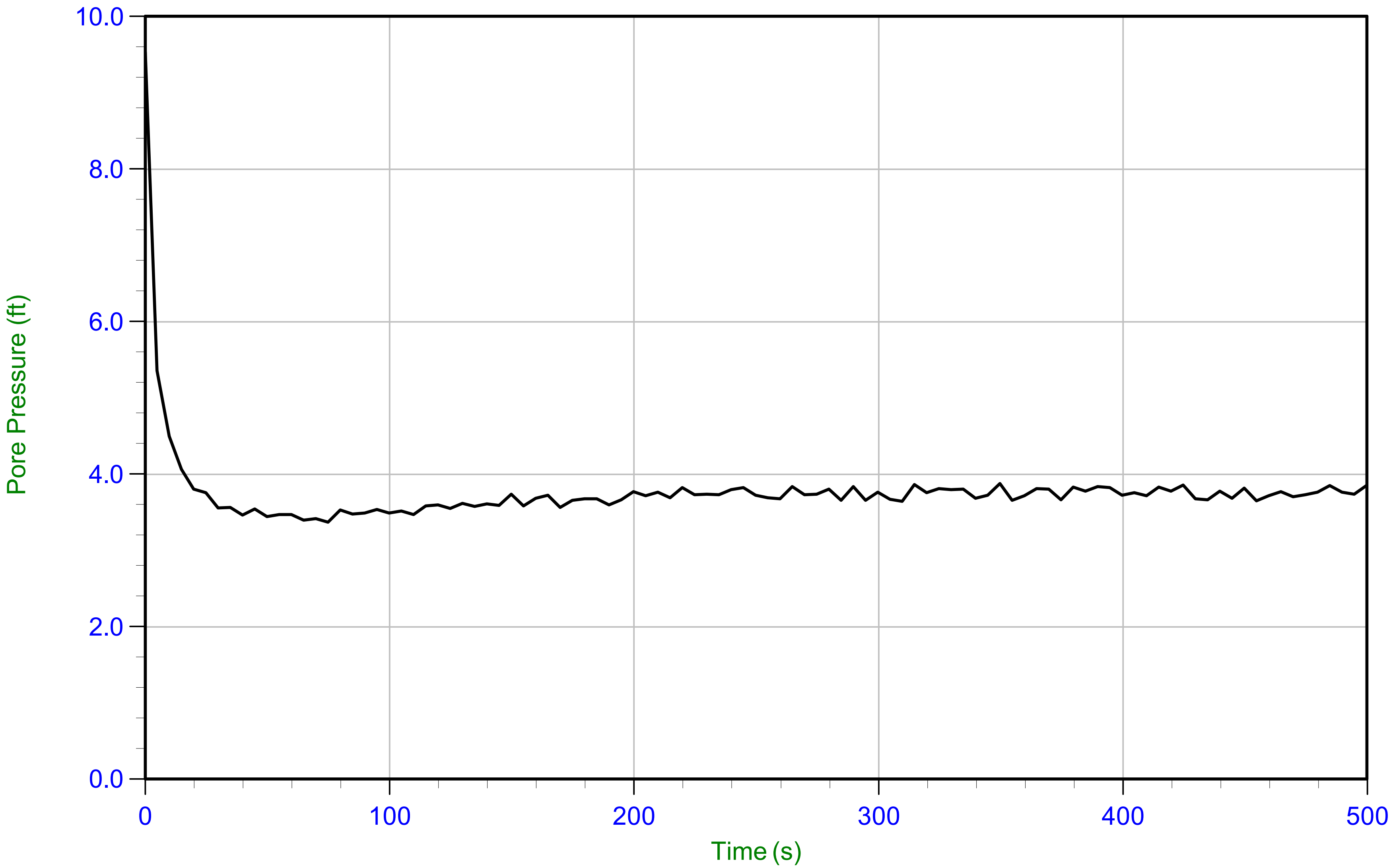
WT: 2.069 m / 6.788 ft
Ueq: 7.8 ft

CONETEC

AECOM

Job No: 15-53073
Date: 25-Aug-2015 11:00:21
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C027
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP27.PPD
Depth: 3.400 m / 11.155 ft
Duration: 500.0 s

U Min: 3.4 ft
U Max: 9.5 ft

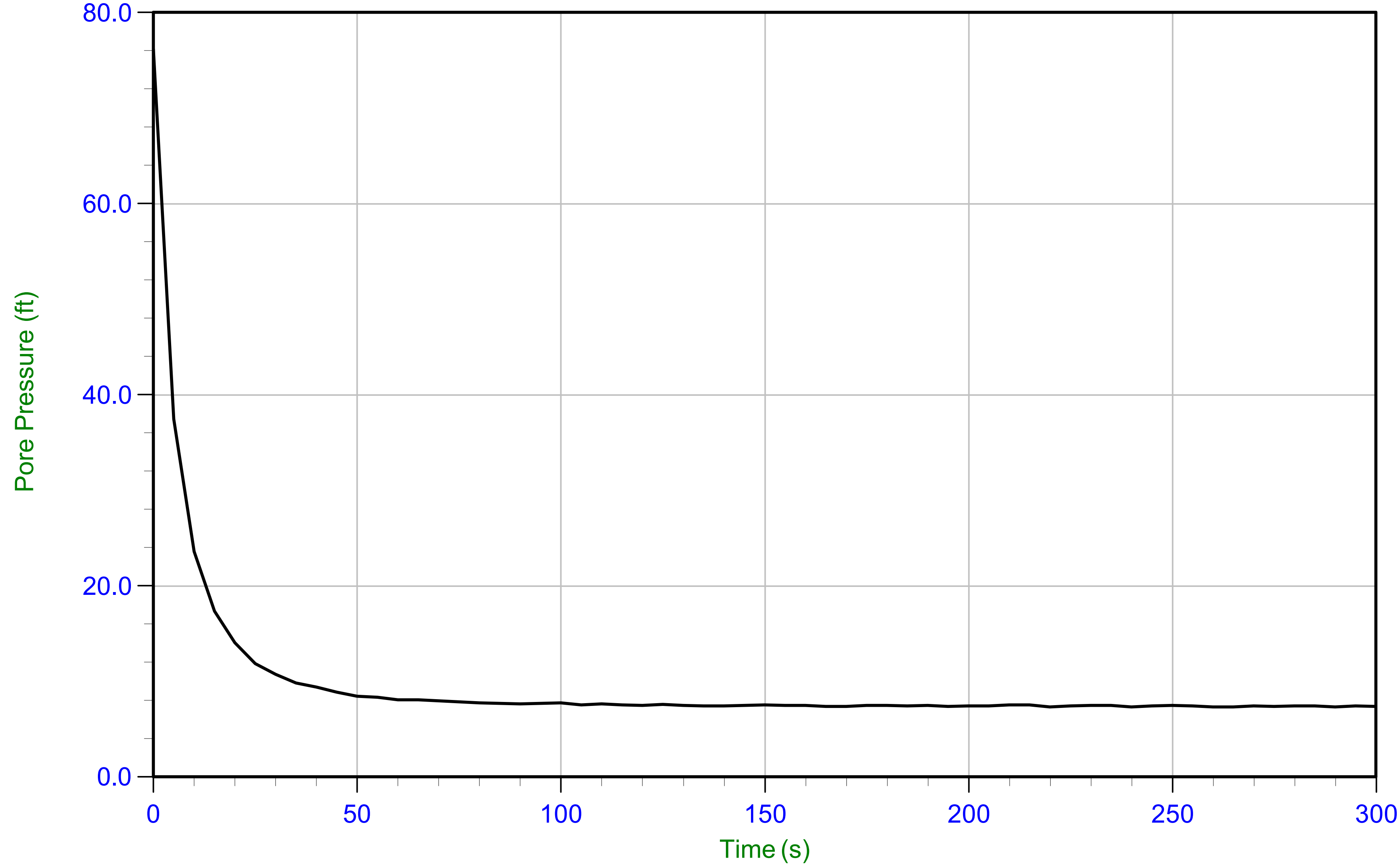
WT: 2.257 m / 7.405 ft
Ueq: 3.7 ft

CONETEC

AECOM

Job No: 15-53073
Date: 25-Aug-2015 11:00:21
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C027
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP27.PPD
Depth: 4.350 m / 14.271 ft
Duration: 300.0 s

U Min: 7.3 ft
U Max: 76.2 ft

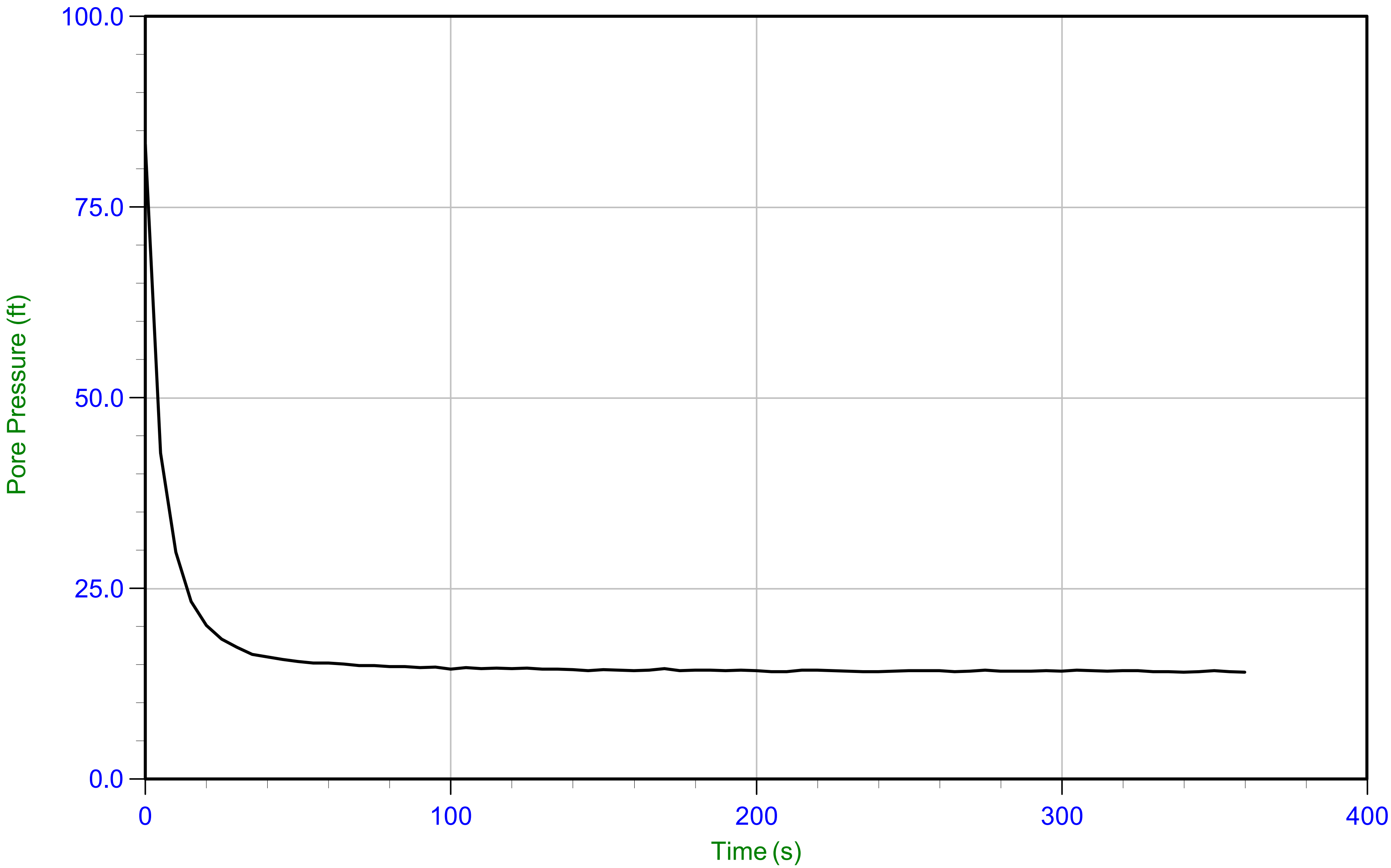
WT: 2.064 m / 6.772 ft
Ueq: 7.5 ft

CONETEC

AECOM

Job No: 15-53073
Date: 25-Aug-2015 11:00:21
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C027
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP27.PPD
Depth: 6.400 m / 20.997 ft
Duration: 360.0 s

U Min: 14.0 ft
U Max: 83.3 ft

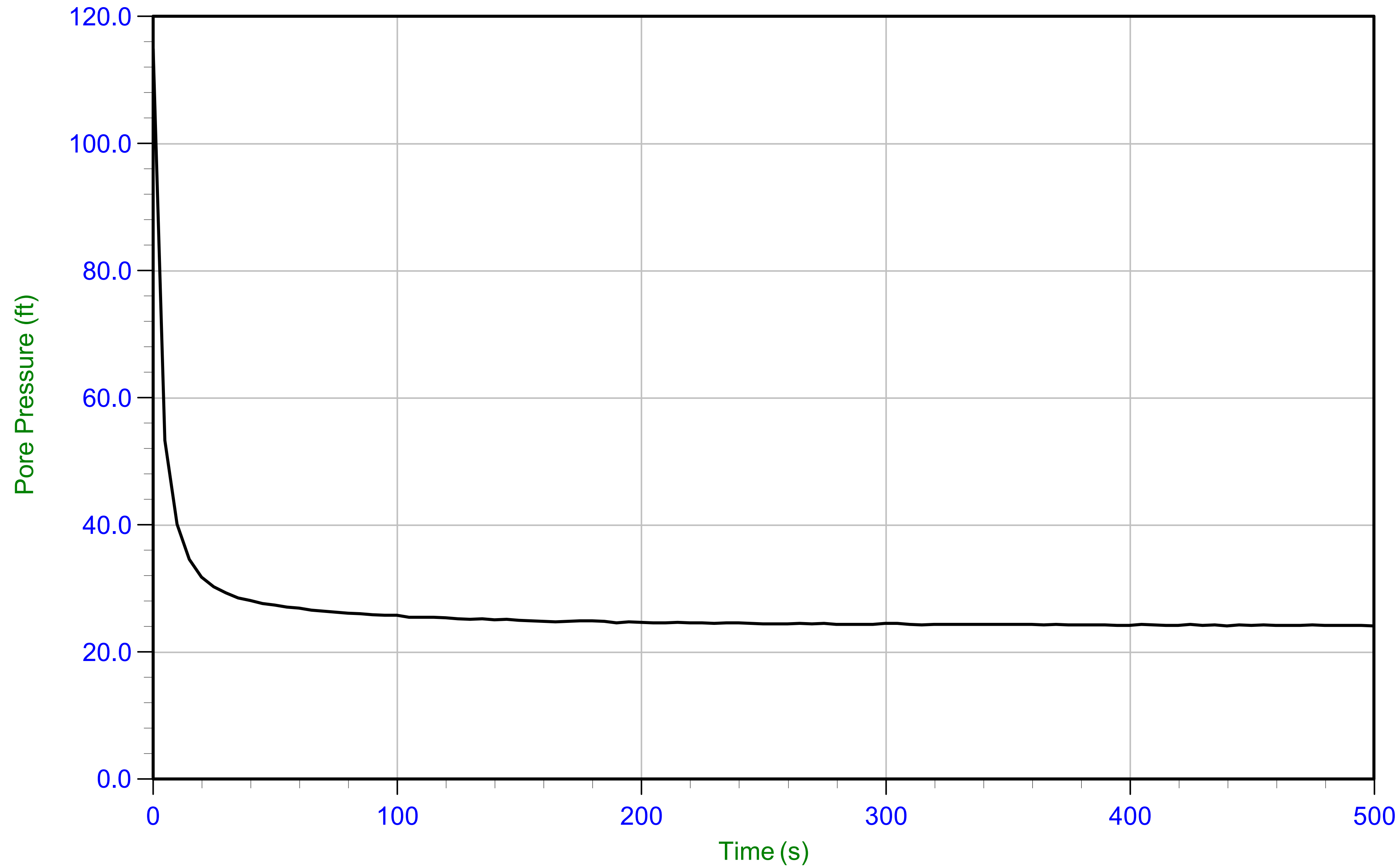
WT: 2.061 m / 6.762 ft
Ueq: 14.2 ft

CONETEC

AECOM

Job No: 15-53073
Date: 25-Aug-2015 11:00:21
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C027
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP27.PPD
Depth: 9.400 m / 30.840 ft
Duration: 500.0 s

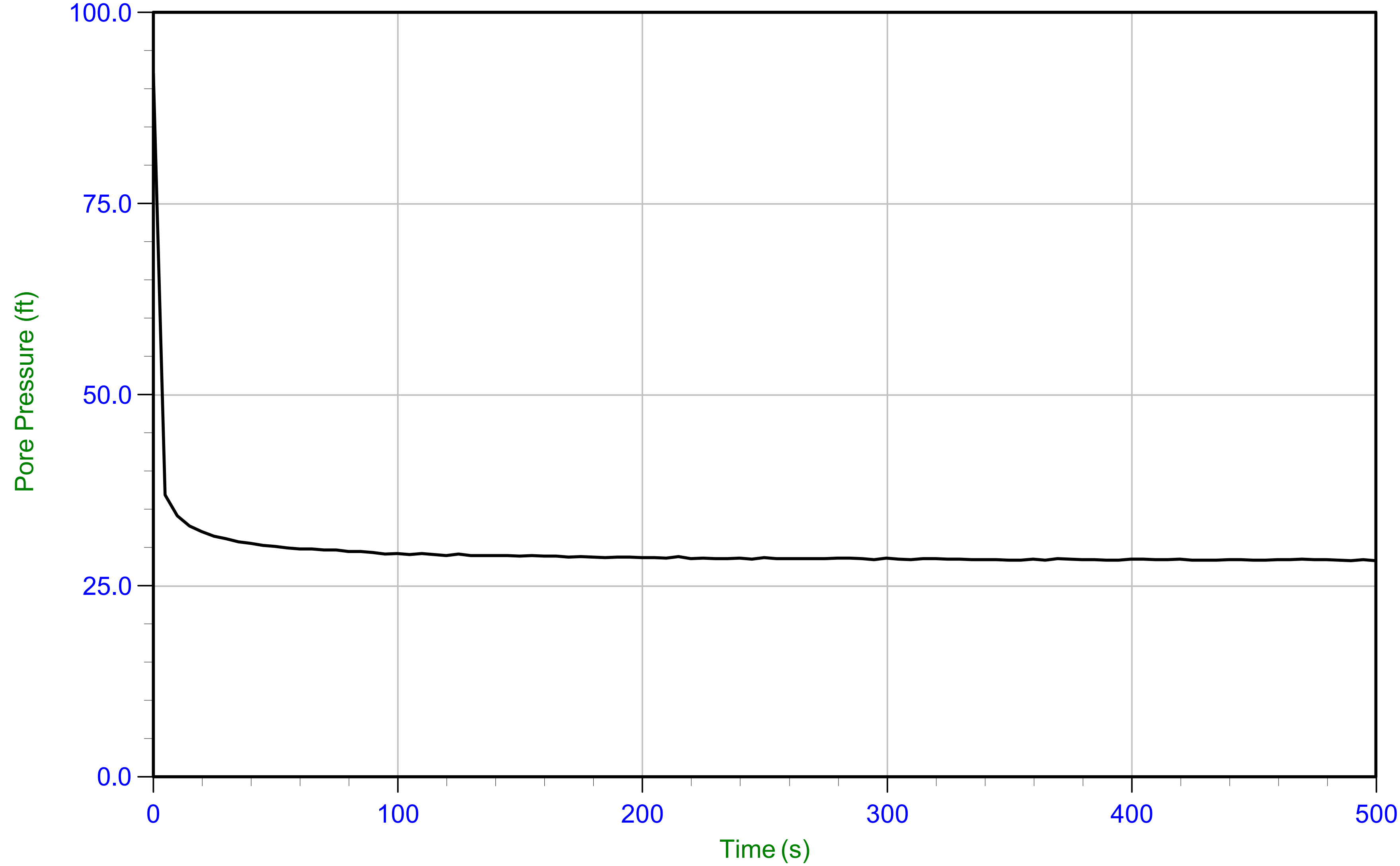
U Min: 24.1 ft
U Max: 114.9 ft

WT: 2.034 m / 6.673 ft
Ueq: 24.2 ft

AECOM

Job No: 15-53073
Date: 25-Aug-2015 11:00:21
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C027
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP27.PPD
Depth: 10.700 m / 35.105 ft
Duration: 500.0 s

U Min: 28.3 ft
U Max: 92.0 ft

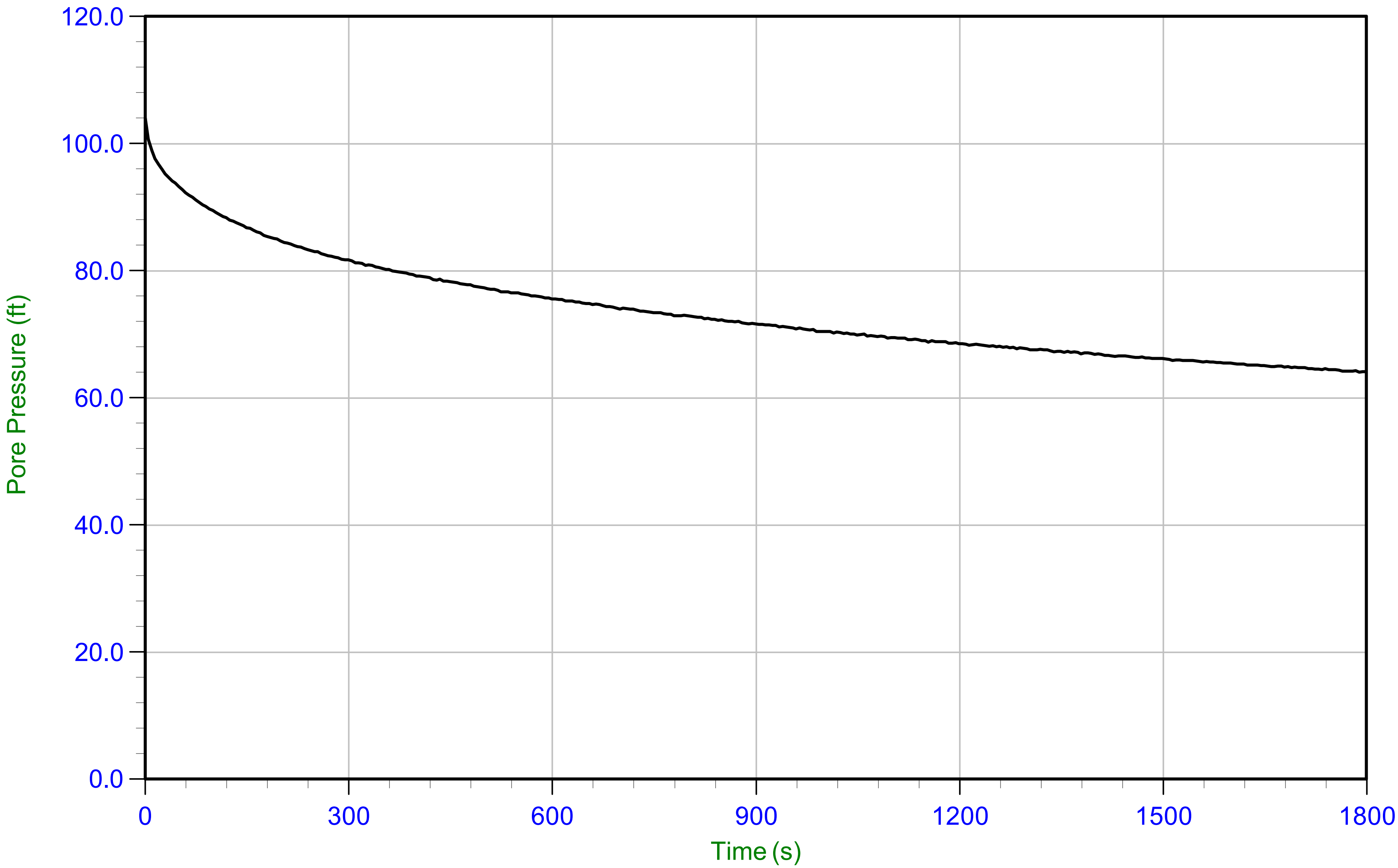
WT: 2.022 m / 6.634 ft
Ueq: 28.5 ft

CONETEC

AECOM

Job No: 15-53073
Date: 25-Aug-2015 11:00:21
Site: Edwards Power Station, Peoria, IL

Sounding: EDW-C027
Cone: 374
Cone Area: 15 sq cm



Trace Summary:

Filename: 15-53073_CP27.PPD
Depth: 12.200 m / 40.026 ft
Duration: 1800.0 s

U Min: 64.1 ft
U Max: 104.0 ft

WT: 2.064 m / 6.772 ft
Ueq: 33.3 ft
U(50): 68.65 ft

T(50): 1184.7 s
Ir: 100
Ch: 0.6 sq cm/min

APPENDIX D

LABORATORY TESTING SUMMARY

PROJECT NAME: Dynergy - Edwards Site PROJECT NUMBER: MR155218 CLIENT: AECOM

Boring Number	Sample Number	Depth	Description	USCS	WC %	Qp (tsf)	% Gravel	% Sand	% Silt	% Clay	LL	PL	PI	Specific Gravity
EDW-B002	S-1	0.0'-1.5'	FILL: OLIVE BROWN TRACE BROWN SILTY SAND WITH GRAVEL	SM	38.4	4.50+								
EDW-B002	S-2	2.5'-4.0'	GRAY SANDY SILT	ML	62.4	3.50								
EDW-B002	S-3	5.0'-7.0'	GREENISH GRAY SANDY SILT	MH	66.6						65	36	29	
EDW-B002	S-4	7.5'-10.0'	DARK GRAY FLY ASH		79.0		0.0	7.4	73.1	19.5				
EDW-B002	S-5	10.0'-12.0'	GRAY TO DARK GRAY VARVED FLY ASH		76.9						17	27	NP	
EDW-B002	S-6	15.0'-16.5'	DARK GRAY FLY ASH		52.5									
EDW-B002	S-7	20.0'-21.5'	DARK GRAY FLY ASH WITH SAND AND GRAVEL		67.8									
EDW-B002	S-8	25.0'-27.0'	DARK GRAY FLY ASH		63.9									2.471
EDW-B002	S-9	30.0'-30.5'	LIGHT GRAY LEAN CLAY WITH ORGANIC POCKETS	CL	126.1	<.25								
EDW-B002	S-9A	30.5'-31.5'	BROWN TO RUST BROWN LEAN CLAY WITH SAND	CL	31.1	0.50								
EDW-B002	S-10	35.0'-37.0'	GRAY LEAN CLAY WITH SAND	CL	31.6						36	18	18	
EDW-B002	S-11	40.0'-41.5'	GRAY LEAN CLAY	CL	42.9	1.00								2.592
EDW-B002	S-12	45.0'-46.5'	GRAY TO DARK GRAY LEAN CLAY WITH SAND	CL	57.7	0.75								
EDW-B002	S-13	50.0'-50.25'	GRAY SILT WITH SAND	ML	11.1	4.50+								
EDW-B003	S-1	0.0'-1.5'	FILL: DARK GRAY FLY ASH WITH SAND		44.4									2.469
EDW-B003	S-2	2.5'-4.0'	FILL: DARK GRAY FLY ASH WITH SAND		27.3	2.00								
EDW-B003	S-3	5.0'-6.5'	FILL: BROWN AND BLACK LEAN CLAY WITH SAND AND ORGANICS	OL	37.2	1.00								
EDW-B003	S-4	7.5'-9.5'	FILL: DARK GRAY FLY ASH		55.5									
EDW-B003	S-5	10.0'-11.5'	FILL: DARK GRAY FLY ASH		50.6		2.3	19.8	56.3	21.6				
EDW-B003	S-6	15.0'-16.5'	FILL: DARK GRAY FLY ASH WITH SAND AND GRAVEL		29.7									2.772
EDW-B003	S-7	20.0'-21.5'	FILL: DARK GRAY FLY ASH WITH SAND AND GRAVEL		42.1									
EDW-B003	S-8	25.0'-27.0'	FILL: DARK GRAY FLY ASH WITH SAND		54.9									
EDW-B003	S-9	30.0'-32.0'	FILL: VERY DARK GRAY VARVED FLY ASH		71.7		0.0	20.6	66.4	13.0				
EDW-B003	S-10	35.0'-36.5'	FILL: DARK GRAY FLY ASH WITH SAND		51.9									
EDW-B003	S-10A	36.5'-37.0'	GRAY LEAN CLAY WITH ORGANIC POCKETS	CL	43.0	2.25								
EDW-B003	S-11	40.0'-41.5'	GRAY TO BROWNISH GRAY LEAN CLAY WITH SAND	CL	31.6	1.25								
EDW-B003	S-12	45.0'-47.0'	DARK GRAY FAT CLAY WITH SAND	CH	46.0						51	17	34	
EDW-B003	S-13	50.0'-51.5'	BROWNISH GRAY TO GREENISH GRAY LEAN CLAY WITH SAND	CL	55.4	0.50								
EDW-B003	S-14	55.0'-55.5'	BLUISH GRAY CLAYEY SILT	ML	23.3	3.50								
EDW-B003	S-14A	55.5'-55.92'	BLUISH GRAY SILT	ML	9.8									
EDW-B003	S-15	60.0'-60.25'	BLUISH GRAY SILT	ML	7.1									

LABORATORY TESTING SUMMARY

PROJECT NAME: Dynergy - Edwards Site PROJECT NUMBER: MR155218 CLIENT: AECOM

Boring Number	Sample Number	Depth	Description	USCS	WC %	Qp (tsf)	% Gravel	% Sand	% Silt	% Clay	LL	PL	PI	Specific Gravity
EDW-B004	S-1	0.0'-1.5'	FILL: DARK GRAY FLY ASH		18.9	4.50+								
EDW-B004	S-2	2.5'-3.5'	FILL: DARK GRAY FLY ASH WITH SAND		28.5	4.00								
EDW-B004	S-2A	3.5'-4.0'	BROWN TO GRAY LEAN CLAY WITH SAND - FLY ASH NOTED	CL	20.1	3.25								
EDW-B004	S-3	5.0'-6.5'	BROWN AND GRAY LEAN CLAY	CL	21.6	1.75								
EDW-B004	S-4	7.5'-9.0'	GRAY AND DARK GRAY LEAN CLAY WITH ORGANICS	CL	23.4	4.00	0.0	9.3	43.3	47.4	37	16	21	
EDW-B004	S-5	10.0'-11.5'	BROWN AND DARK GRAY LEAN CLAY	CL	21.5	2.25								
EDW-B004	S-6	12.5'-14.0'	BROWN AND GRAY LEAN CLAY WITH SAND	CL	25.4	1.25								
EDW-B004	S-7	15.0'-16.5'	DARK GRAY LEAN CLAY	CL	25.8	2.50								
EDW-B004	S-8	20.0'-21.5'	BROWN AND GRAY LEAN CLAY WITH SAND	CL	31.3	1.00								
EDW-B004	S-9	25.0'-26.0'	BROWN AND GRAY LEAN CLAY WITH SAND AND SAND POCKETS	CL	23.0	1.25								
EDW-B004	S-9A	26.0'-26.5'	GRAY AND BROWN CLAYEY SAND	SC	19.5	0.75								
EDW-B004	S-10	30.0'-31.5'	GRAYISH BROWN AND DARK GRAY LEAN CLAY WITH SAND - ORGANIC	CL	19.7	3.75								
EDW-B004	S-11	36.0'-38.0'	BROWN AND GRAYISH BROWN LEAN CLAY WITH SAND	CL	20.1						35	17	18	
EDW-B004	S-12	40.0'-41.5'	BROWN, RUST BROWN AND GRAY LEAN CLAY	CL	30.0	1.25								
EDW-B004	S-13	45.0'-46.0'	GRAY LEAN CLAY	CL	39.5	1.00								
EDW-B004	S-13A	46.0'-46.5'	BROWNISH GRAY LEAN CLAY WITH SAND	CL	35.1									
EDW-B004	S-14	50.0'-51.5'	GRAY LEAN CLAY WITH SAND	CL	65.2	1.75								2.617
EDW-B004	S-15	55.0'-56.5'	BROWN AND BLUISH GRAY LEAN CLAY WITH SAND	CL	33.4	1.25								
EDW-B004	S-15A	56.0'-56.5'	BLUISH GRAY SILT	ML	13.2									
EDW-B004	S-16	60.0'-60.25'	BLUISH GRAY SOFT SHALE		8.8									
EDW-B005	S-1	0.0'-1.5'	FILL: BROWN AND DARK BROWN CLAYEY SAND WITH GRAVEL AND SILT	SC	45.8	4.50								
EDW-B005	S-2	2.5'-4.0'	FILL: BROWN SANDY SILT WITH GRAVEL	ML	26.0									
EDW-B005	S-3	5.0'-6.5'	FILL: BROWN SANDY SILT WITH CLAY CHUNKS	MH	50.9	3.25					61	54	7	
EDW-B005	S-4	8.5'-10.0'	FILL: BROWN SANDY SILT WITH GRAVEL	ML	37.4	4.50+								
EDW-B005	S-5	10.0'-11.5'	FILL: LIGHT BROWN AND GRAY CLAYEY SAND WITH GRAVEL	SC	44.3									
EDW-B005	S-6	15.0'-16.5'	FILL: BROWN SANDY SILT WITH GRAVEL	ML	41.4									
EDW-B005	S-7	20.0'-21.5'	FILL: GRAY FLY ASH		51.1	1.75	3.1	21.3	51.7	23.9				
EDW-B005	S-8	25.0'-26.0'	FILL: BROWNISH GRAY CLAYEY SILT WITH SAND AND GRAVEL	ML	55.3									
EDW-B005	S-8A	26.0'-27.0'	FILL: GRAY AND BLACK ORGANIC SILT	OL	47.6						44	29	15	
EDW-B005	S-9	29.0'-31.0'	FILL: DARK GRAY FLY ASH		69.3									
EDW-B005	S-10	35.0'-36.5'	GRAY AND GRAYISH BLACK LEAN CLAY WITH SAND AND ORGANICS	CL	37.3	1.00								
EDW-B005	S-11	41.0'-43.0'	GRAY FAT CLAY SHELL - ORGANICS NOTED	CH	44.8						57	22	35	
EDW-B005	S-12	45.0'-46.5'	DARK GRAY AND GREENISH GRAY LEAN CLAY WITH SAND - ORGANICS AND SHALE NOTED	CL	88.7	1.00								2.521
EDW-B005	S-13	50.0'-51.0'	BLUISH GRAY CLAYEY SILT	CL-ML	15.9	4.50+								
EDW-B005	S-14	51.0'-51.5'	BLUISH GRAY SOFT SHALE		12.8									

LABORATORY TESTING SUMMARY

PROJECT NAME: Dynergy - Edwards Site PROJECT NUMBER: MR155218 CLIENT: AECOM

Boring Number	Sample Number	Depth	Description	USCS	WC %	Qp (tsf)	% Gravel	% Sand	% Silt	% Clay	LL	PL	PI	Specific Gravity
EDW-B006	S-1	0.0'-1.5'	FILL: DARK BROWN AND DARK GRAY LEAN CLAY WITH SAND AND BRICK	CL	26.4	2.25								
EDW-B006	S-2	2.5'-5.0'	RUST BROWN AND GRAY MOTTLED LEAN CLAY	CL	30.1	1.25								
EDW-B006	S-3	5.0'-6.5'	GRAY AND DARK GRAY LEAN CLAY TRACE SAND	CL	24.8	2.25					48	19	29	
EDW-B006	S-4	7.5'-10.0'	GRAY AND RUST BROWN MOTTLED LEAN CLAY	CL	26.0	2.50								
EDW-B006	S-5	10.0'-11.5'	BROWNISH GRAY LEAN CLAY	CL	34.2	1.25								
EDW-B006	S-6	13.0'-15.0'	GRAY FAT CLAY WITH SAND	CH	31.1						62	20	42	
EDW-B006	S-7	15.0'-16.5'	BROWNISH GRAY LEAN CLAY	CL	40.8	1.00								
EDW-B006	S-8	20.0'-21.5'	BROWN AND GRAY LEAN CLAY WITH SAND	CL	43.4	0.75								
EDW-B006	S-9	26.0'-28.0'	DARK GRAY ORGANIC SILT	OH	76.0						72	37	35	
EDW-B006	S-10	30.0'-31.0'	GRAY LEAN CLAY WITH SAND - ORGANIC POCKETS NOTED	CL	43.4	0.50								
EDW-B006	S-10A	31.0'-31.5'	BLUISH GRAY LEAN CLAY WITH SAND AND SILT	CL	19.6									
EDW-B006	S-11	35.0'-35.42'	BLUISH GRAY SILT WITH SAND	ML	14.2	3.50								
EDW-B008	S-1	0.0'-1.5'	BROWN LEAN CLAY WITH SAND AND GRAVEL	CL	13.2	4.50+								
EDW-B008	S-2	2.5'-4.0'	DARK BROWN LEAN CLAY WITH SAND	CL	19.5	3.75					42	22	20	
EDW-B008	S-3	5.0'-6.5'	DARK GRAY AND RUST BROWN MOTTLED LEAN CLAY WITH SAND	CL	42.3	2.00								
EDW-B008	S-4	7.5'-9.0'	BROWN AND LIGHT GRAY LEAN CLAY WITH SAND	CL	22.8	2.00								
EDW-B008	S-5	11.0'-13.0'	BROWN AND GRAY FAT CLAY WITH SAND	CH	33.6						52	19	33	
EDW-B008	S-6	15.0'-16.5'	GRAY LEAN CLAY WITH SAND	CL	64.6	0.50								
EDW-B008	S-7	20.0'-21.5'	BROWN AND GRAY LEAN CLAY - SHELL NOTED	CL	44.4	0.50								
EDW-B008	S-8	24.0'-26.5'	DARK GRAY FAT CLAY SHELL - ORGANICS NOTED	CH	68.9						67	31	36	
EDW-B008	S-9	30.0'-31.5'	GRAY AND BROWNISH GRAY LEAN CLAY WITH SAND	CL	71.4	0.50								
EDW-B008	S-10	35.0'-36.5'	GRAY LEAN CLAY WITH SAND - WOODCHIPS, ORGANICS AND SHELL NOTED	CL	56.9	0.25								
EDW-B008	S-11	40.0'-40.33'	BLUISH GRAY SILT WITH SOFT SHALE	ML	12.6	3.00								

LABORATORY TESTING SUMMARY

PROJECT NAME: Dynergy - Edwards Site　　PROJECT NUMBER: MR155218　　CLIENT: AECOM

Boring Number	Sample Number	Depth	Description	USCS	WC %	Qp (tsf)	% Gravel	% Sand	% Silt	% Clay	LL	PL	PI	Specific Gravity
EDW-B010	S-1 TOP	0.0'-0.5'	FILL: BROWN SAND WITH GRAVEL	SP	7.2									
EDW-B010	BOTTOM	0.0'-0.5'	FILL: BROWN LEAN CLAY WITH SAND AND GRAVEL	CL	17.4	4.50+								
EDW-B010	S-1A	0.5'-1.5'	FILL: DARK GRAY FLY ASH		27.9									
EDW-B010	S-2	2.5'-3.0'	FILL: DARK GRAY FLY ASH		20.9									
EDW-B010	S-2A	3.0'-4.0'	FILL: DARK GRAY FLY ASH		30.7	4.50								
EDW-B010	S-3	5.0'-6.5'	FILL: DARK BROWN AND DARK GRAY SAND WITH GRAVEL - FLY ASH NOTED	SP	14.8		12.6	54.8	26.0	6.6				
EDW-B010	S-4	7.5'-9.0'	BROWN WITH RUST BROWN STAINS LEAN CLAY WITH SAND	CL	22.0	3.75								
EDW-B010	S-5	10.0'-11.5'	BROWN AND RUST BROWN LEAN CLAY WITH SAND	CL	24.0	2.00								
EDW-B010	S-6	12.5'-14.0'	BROWN LEAN CLAY	CL	28.0	1.25								
EDW-B010	S-7	15.0'-17.0'	BROWN AND GRAY MOTTLED LEAN CLAY	CL	30.5						48	18	30	
EDW-B010	S-8	20.0'-21.5'	GRAY LEAN CLAY	CL	32.9	0.75								
EDW-B010	S-9	25.0'-26.5'	GRAY LEAN CLAY WITH SAND	CL	21.4	0.50								
EDW-B010	S-10	30.0'-32.0'	BLUISH GRAY LEAN CLAY	CL	30.0						40	15	25	
EDW-B010	S-11	35.0'-36.5'	BROWNISH GRAY LEAN CLAY	CL	28.2	1.50								
EDW-B010	S-12	40.0'-41.0'	BROWN, RUST BROWN AND GRAY SILTY SAND WITH GRAVEL	SM	17.0									
EDW-B010	S-13	45.0'-45.25'	BLUISH GRAY CLAYEY SILT - SHALE NOTED	CL-ML	16.4	4.50								
EDW-B011	S-1	0.0'-1.5'	FILL: DARK GRAY FLY ASH		27.7	4.50+								
EDW-B011	S-2	2.5'-4.0'	FILL: DARK GRAY AND BLACK FLY ASH - ASPHALT NOTED		16.3	4.50+								
EDW-B011	S-3	5.0'-6.5'	FILL: GRAY FLY ASH		29.4	4.50+								
EDW-B011	S-4	7.5'-9.0'	FILL: DARK GRAY FLY ASH		45.3	3.00								
EDW-B011	S-5	9.0'-11.0'	FILL: VERY DARK GRAY FLY ASH		70.0		15.5	21.3	46.0	17.2				
EDW-B011	S-6	15.0'-17.0'	FILL: DARK GRAY FLY ASH		63.2									
EDW-B011	S-7	19.5'-21.5'	FILL: GRAY FLY ASH		84.9		0.2	16.7	58.0	25.1				
EDW-B011	S-8	25.0'-27.0'	FILL: DARK GRAY FLY ASH - CLAY NOTED		74.7									2.691
EDW-B011	S-9	30.0'-32.0'	FILL: DARK GRAY FLY ASH		73.7									
EDW-B011	S-10	35.0'-37.0'	FILL: DARK GRAY FLY ASH		93.9									
EDW-B011	S-13	40.0'-41.5'	BROWN AND GRAY LEAN CLAY	CL	47.9	1.00								
EDW-B011	S-14	45.0'-46.5'	GRAYISH BROWN FAT CLAY WITH SAND	CH	63.3	0.50					63	21	42	
EDW-B011	S-15	50.0'-51.5'	DARK GRAY AND GRAYISH BROWN LEAN CLAY	CL	62.5	0.50								
EDW-B011	S-16	55.0'-56.5'	GRAY LEAN CLAY	CL	52.9	0.75								
EDW-B011	S-17	60.0'-60.25'	BLUISH GRAY SOFT SHALE		9.1									

LABORATORY TESTING SUMMARY

PROJECT NAME: Dynergy - Edwards Site | PROJECT NUMBER: MR155218 | CLIENT: AECOM

Boring Number	Sample Number	Depth	Description	USCS	WC %	Qp (tsf)	% Gravel	% Sand	% Silt	% Clay	LL	PL	PI	Specific Gravity
EDW-B012	S-1	0.0'-1.5'	FILL: BROWN SANDY SILT WITH GRAVEL	ML	23.0									
EDW-B012	S-2	2.5'-4.0'	FILL: DARK GRAY FLY ASH		23.8	4.50+					28	26	2	
EDW-B012	S-3	5.0'-6.5'	FILL: DARK GRAY FLY ASH		26.5		0.0	9.6	73.7	16.7				
EDW-B012	S-4	7.5'-9.0'	FILL: DARK GRAY FLY ASH		26.5	4.50								
EDW-B012	S-5	10.0'-11.0'	FILL: DARK BROWN LEAN CLAY WITH SAND - FLY ASH NOTED	CL	24.7	3.75								
EDW-B012	S-5A	11.0'-11.5'	BROWN AND GRAYISH BROWN LEAN CLAY	CL	24.9	2.00								
EDW-B012	S-6	12.5'-14.0'	BROWN LEAN CLAY	CL	22.0	3.50								
EDW-B012	S-7	15.0'-16.5'	BROWN AND RUST BROWN MOTTLED LEAN CLAY	CL	24.3	3.25					48	19	29	
EDW-B012	S-8	20.0'-22.0'	BROWNISH GRAY MOTTHED LEAN CLAY WITH SAND	CL	23.8									
EDW-B012	S-9	25.0'-26.5'	BROWNISH GRAY LEAN CLAY WITH SAND	CL	23.2	1.25								
EDW-B012	S-10	30.0'-31.5'	BROWN AND GRAY LEAN CLAY	CL	24.8	1.50								
EDW-B012	S-11	35.0'-36.5'	RUST BROWN AND GRAY LEAN CLAY WITH SAND	CL	28.3	1.50								
EDW-B012	S-12	40.0'-41.5'	BLUISH GRAY AND BROWNISH GRAY LEAN CLAY	CL	32.2	1.00								
EDW-B012	S-13	45.0'-46.5'	BROWNISH GRAY LEAN CLAY	CL	50.2	1.25								
EDW-B012	S-14	47.0'-49.0'	DARK GRAY FAT CLAY	CH	50.8						54	20	34	
EDW-B012	S-15	49.0'-50.5'	GRAY AND BROWNISH GRAY LEAN CLAY WITH SAND	CL	67.4	1.00								
EDW-B012	S-16	55.0'-55.5'	GRAY LEAN CLAY WITH SAND	CL	50.5	1.75								
EDW-B012	S-16A	55.5'-56.5'	BLUISH GRAY CLAYEY SILT	CL-ML	15.3	4.50								
EDW-B012	S-17	60.0'-60.21'	BLUISH GRAY CLAYEY SILT	CL-ML	17.9	1.50								
EDW-B013	S-1	0.0'-1.5'	FILL: BROWN AND DARK BROWN LEAN CLAY WITH SAND AND GRAVEL	CL	13.6	4.50+								
EDW-B013	S-2	2.5'-4.0'	BROWN AND GRAYISH BROWN LEAN CLAY WITH SAND	CL	17.4	4.50+								
EDW-B013	S-3	6.0'-8.0'	BROWNISH GRAY LEAN CLAY WITH SAND AND GRAVEL	CL	24.3						49	21	28	
EDW-B013	S-4	8.0'-9.5'	DARK GRAY AND RUST BROWN MOTTLED LEAN CLAY	CL	24.3	3.00								
EDW-B013	S-5	10.0'-11.5'	DARK GRAY LEAN CLAY	CL	25.4	2.25								
EDW-B013	S-6	15.0'-16.5'	DARK GRAY AND BROWNISH GRAY LEAN CLAY	CL	25.5	1.50					41	17	24	
EDW-B013	S-7	20.0'-21.5'	BROWN AND DARK GRAY LEAN CLAY	CL	23.5	1.75								
EDW-B013	S-8	25.0'-26.5'	DARK BROWNISH GRAY LEAN CLAY	CL	27.7									
EDW-B013	S-9	30.0'-31.5'	GRAY AND RUST BROWN MOTTLED SANDY LEAN CLAY	CL	20.2	0.50								
EDW-B013	S-10	32.0'-34.0'	GRAY AND BROWN LEAN CLAY WITH SAND	CL	33.3						42	23	19	
EDW-B013	S-11	34.0'-35.5'	DARK GRAY LEAN CLAY	CL	58.0	0.50								
EDW-B013	S-12	40.0'-41.5'	GRAY LEAN CLAY WITH SAND	CL	54.5	1.75								
EDW-B013	S-13	45.0'-46.5'	GRAY LEAN CLAY - CALCIUM CABONATE SEAMS AND SHELL NOTED	CL	66.2	1.25								
EDW-B013	S-3	6.0'-8.0'	BROWNISH GRAY LEAN CLAY WITH SAND AND GRAVEL	CL	20.0									

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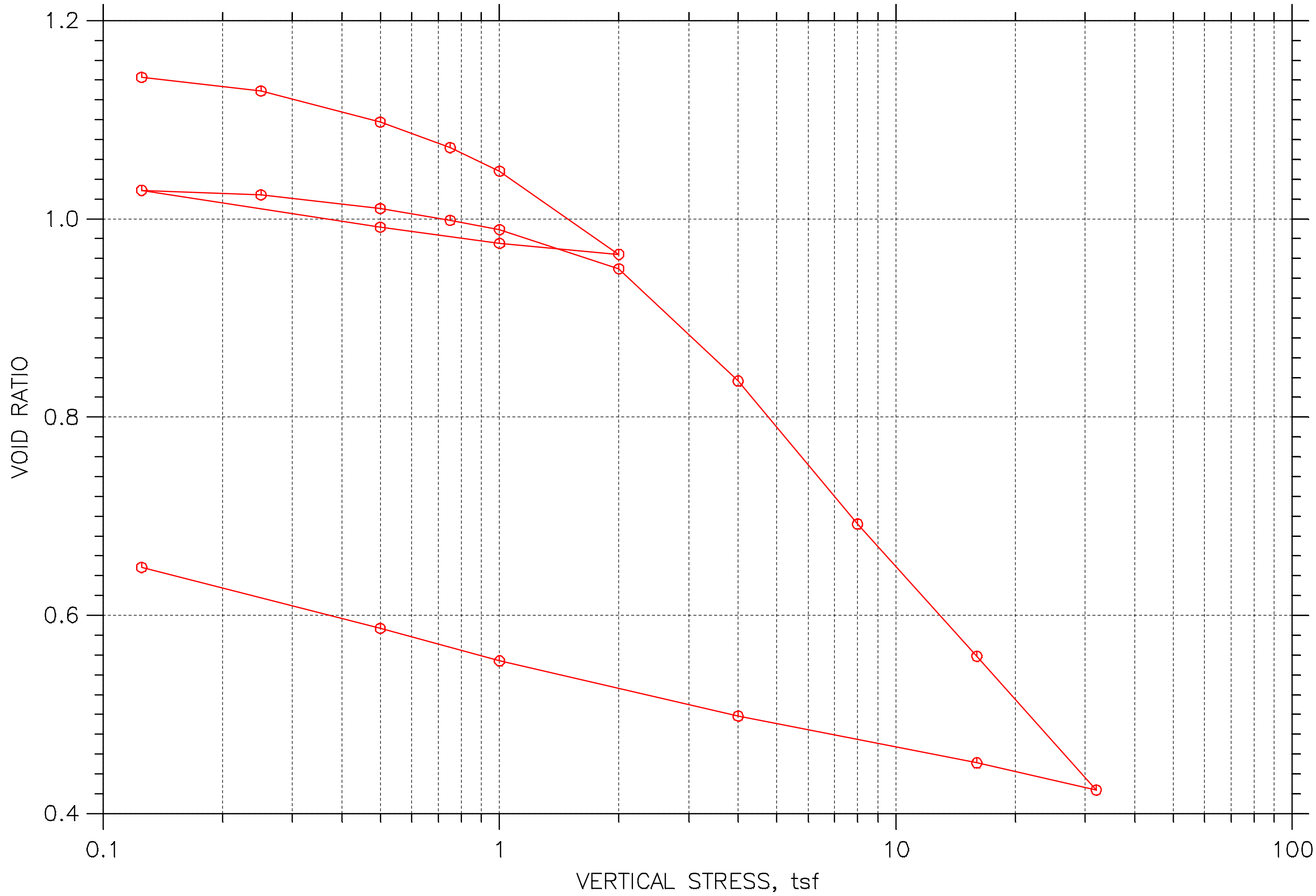
LABORATORY TESTING SUMMARY

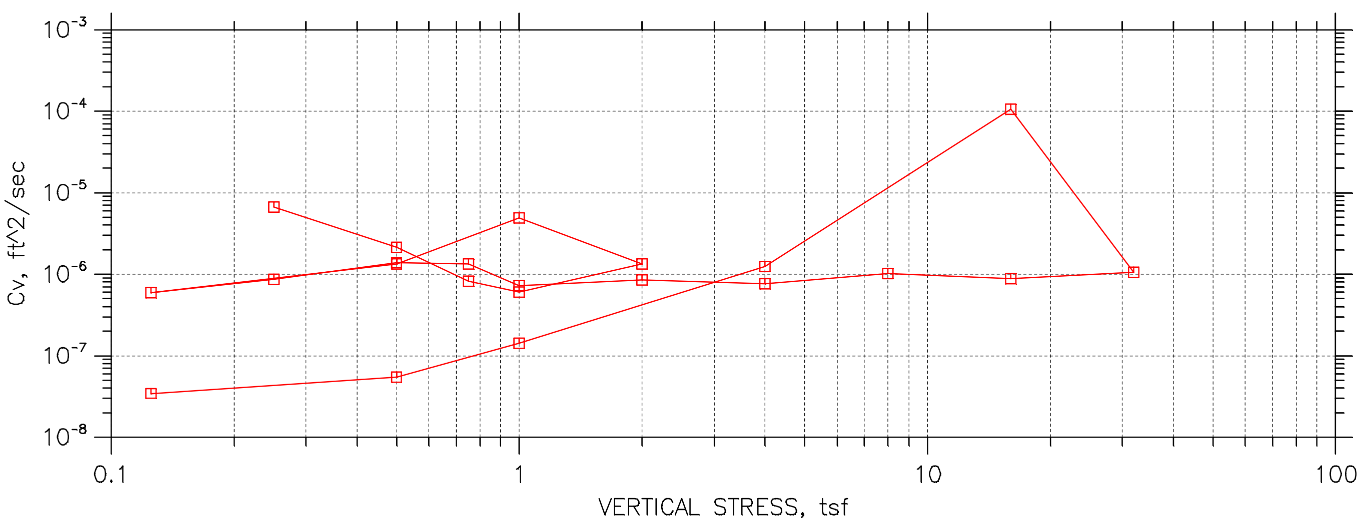
PROJECT NAME: Dynergy - Edwards Site | PROJECT NUMBER: MR155218 | CLIENT: AECOM

Boring Number	Sample Number	Depth	Description	USCS	WC %	Qp (tsf)	% Gravel	% Sand	% Silt	% Clay	LL	PL	PI	Specific Gravity
EDW-B014	S-1	0.0'-1.5'	FILL: DARK GRAY FLY ASH		28.2	4.00								
EDW-B014	S-2	2.5'-3.5'	FILL: DARK GRAY CLAYEY SILT - FLY ASH NOTED	CL-ML	40.8	1.50								
EDW-B014	S-2A	3.5'-4.0'	FILL: GRAY CLAYEY SILT WITH SAND - FLY ASH NOTED	CL-ML	50.0									
EDW-B014	S-4	7.0'-8.5'	FILL: GRAY SILTY SAND WITH GRAVEL - FLY ASH NOTED	SM	60.2		0.0	35.1	45.4	19.5				
EDW-B014	S-6	15.0'-17.0'	FILL: GRAY AND DARK GRAY FLY ASH		78.7	3.50								
EDW-B014	S-7	20.0'-22.5'	FILL: DARK GRAY FLY ASH		86.5	1.50								2.524
EDW-B014	S-8	25.0'-26.7'	FILL: DARK GRAY FLY ASH - CLAY NOTED		73.1									
EDW-B014	S-9	30.0'-31.5'	GRAY AND DARK GRAY LEAN CLAY - ORGANIC POCKETS NOTED	CL	48.7									
EDW-B014	S-10	35.0'-36.7'	GRAY LEAN CLAY	CL	31.6	0.75								
EDW-B014	S-11	40.0'-40.5'	BLUISH GRAY LEAN CLAY WITH SAND AND GRAVEL	CL	27.3	4.00								2.719
EDW-B014	S-11A	40.5'-41.0'	BLUISH GRAY AND GREENISH GRAY SILT WITH SOFT SHALE	ML	19.6	4.50+								
EDW-B014	S-11B	41.0'-41.5'	GRAY SOFT SHALE		10.2									
EDW-B014	S-12	45.0'-45.5'	GRAY SILT WITH SAND	ML	14.5	4.50								
EDW-B015	S-1	0.0'-1.5'	FILL: GRAYISH BROWN SANDY SILT	ML	54.7									
EDW-B015	S-2	2.5'-4.0'	BROWN SAND WITH GRAVEL	SP	4.5									
EDW-B015	S-3	5.0'-6.5'	BROWN SAND WITH GRAVEL	SP	5.4									
EDW-B015	S-4	7.5'-9.0'	BROWN SAND WITH GRAVEL	SP	7.2									
EDW-B015	S-5	10.0'-11.5'	BROWN SAND WITH GRAVEL	SP	6.5									
EDW-B015	S-6	13.0'-14.25'	BROWN AND GRAY GRAVEL	GP	3.6									
EDW-B015	S-7	15.0'-16.5'	LIGHT GRAY GRAVEL WITH SAND - LIMESTONE FRAGMENTS NOTED	GP	8.2									
EDW-B015	S-8	20.0'-21.5'	GRAY GRAVEL WITH SAND	GP	7.8									
EDW-B015	S-9	25.0'-26.5'	LIGHT GRAY GRAVEL WITH SAND AND SILT	GP	8.1									
EDW-B015	S-10	31.0'-33.0'	BROWN AND GRAY MOTTLED SANDY LEAN CLAY WITH GRAVEL	CL	20.2						24	13	11	
EDW-B015	S-11	35.0'-36.5'	GRAY AND DARK GRAY LEAN CLAY	CL	33.8	1.50								
EDW-B015	S-12	37.0'-39.0'	DARK GRAY FAT CLAY	CH	41.0						66	23	43	
EDW-B015	S-13	39.0'-40.5'	BROWN AND GRAY LEAN CLAY	CL	36.2	0.50								
EDW-B015	S-14	45.0'-46.5'	BROWN AND GRAY LEAN CLAY WITH SAND	CL	49.4	1.00								
EDW-B015	S-15	50.0'-51.0'	GRAY LEAN CLAY	CL	30.9	1.50								
EDW-B015	S-16	55.0'-55.5'	BLUISH GRAY SILT - SHALE NOTED	ML	11.0	4.25								

CONSOLIDATION TEST DATA

SUMMARY REPORT





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

CONSOLIDATION TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW-B003
Sample No.: S-12
Test No.: EDW003S12

Location: BARTONVILLE, IL
Tested By: HP
Test Date: 10/26/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: BCM
Depth: 45.0'-47.0'
Elevation: ----

Soil Description: DARK GRAY FAT CLAY WITH SAND CH
Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435

Estimated Specific Gravity: 2.72
Initial Void Ratio: 1.15
Final Void Ratio: 0.65

Liquid Limit: 51
Plastic Limit: 24
Plasticity Index: 27

Initial Height: 1.00 in
Specimen Diameter: 2.50 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	X-14	RING	RING	X-19
Wt. Container + Wet Soil, gm	165.03	249.08	236.35	164.81
Wt. Container + Dry Soil, gm	127.13	213.35	213.35	142.68
Wt. Container, gm	44.81	111.54	111.54	44.72
Wt. Dry Soil, gm	82.32	101.81	101.81	97.96
Water Content, %	46.04	35.09	22.59	22.59
Void Ratio	---	1.15	0.65	---
Degree of Saturation, %	---	83.18	94.86	---
Dry Unit Weight, pcf	---	79.069	103.05	---

CONSOLIDATION TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW-B003
Sample No.: S-12
Test No.: EDW003S12

Location: BARTONVILLE, IL
Tested By: HP
Test Date: 10/26/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: BCM
Depth: 45.0'-47.0'
Elevation: ----

Terracon
Consulting Engineers & Scientists

Soil Description: DARK GRAY FAT CLAY WITH SAND CH
Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435

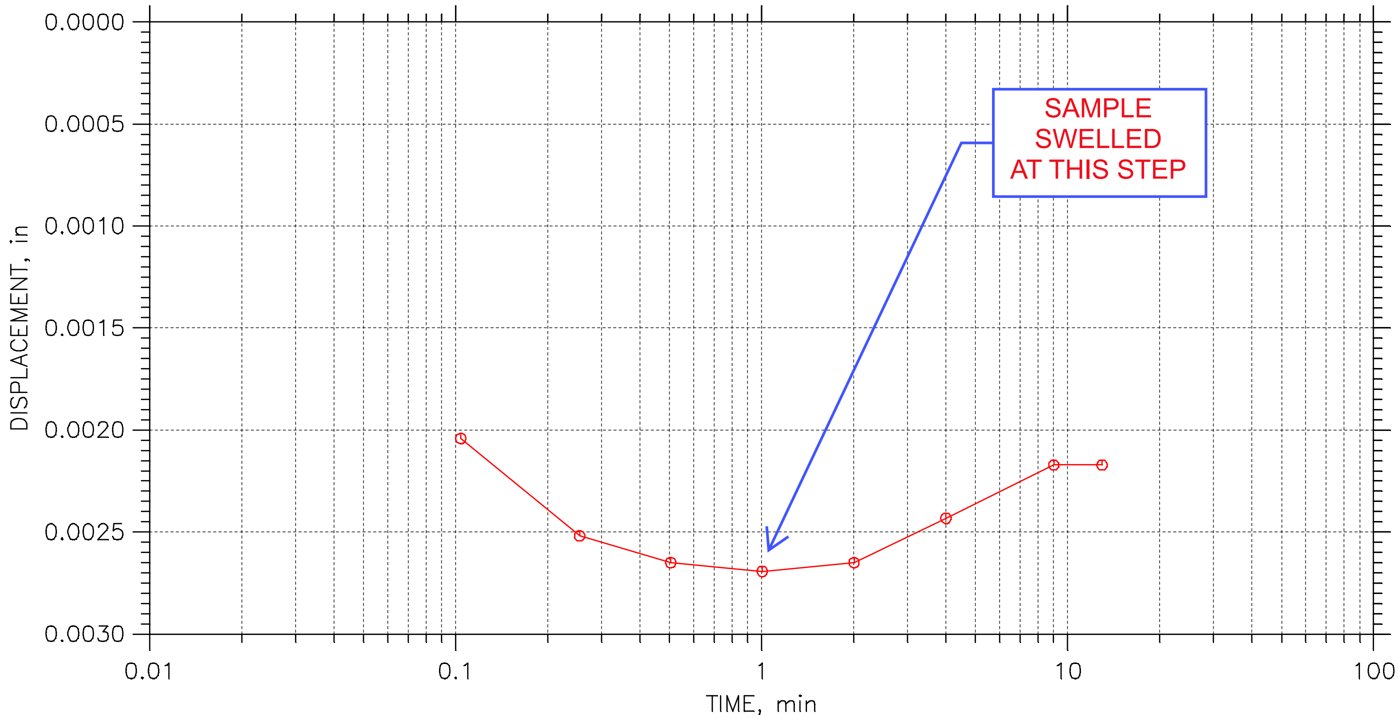
	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. ft^2/sec	Coefficient of Consolidation Log ft^2/sec	Coefficient of Consolidation Ave. ft^2/sec
1	0.125	0.002172	1.143	0.22	0.0	0.0	0.00e+000	0.00e+000	0.00e+000
2	0.25	0.008644	1.129	0.87	1.0	0.6	5.41e-006	8.79e-006	6.69e-006
3	0.5	0.02315	1.098	2.32	3.9	1.2	1.42e-006	4.45e-006	2.15e-006
4	0.75	0.03518	1.072	3.53	6.5	4.7	8.27e-007	1.15e-006	9.61e-007
5	1	0.04617	1.048	4.63	8.6	0.0	6.06e-007	0.00e+000	6.06e-007
6	2	0.08522	0.964	8.54	3.7	0.0	1.33e-006	0.00e+000	1.33e-006
7	1	0.08005	0.975	8.02	1.0	0.0	4.94e-006	0.00e+000	4.94e-006
8	0.5	0.07245	0.992	7.26	3.7	0.0	1.33e-006	0.00e+000	1.33e-006
9	0.125	0.05516	1.029	5.53	8.4	0.0	5.93e-007	0.00e+000	5.93e-007
10	0.25	0.05733	1.024	5.74	5.8	0.0	8.68e-007	0.00e+000	8.68e-007
11	0.5	0.06376	1.010	6.39	3.6	0.0	1.38e-006	0.00e+000	1.38e-006
12	0.75	0.06924	0.999	6.94	3.7	0.0	1.33e-006	0.00e+000	1.33e-006
13	1	0.07358	0.989	7.37	11.4	2.0	4.29e-007	2.42e-006	7.28e-007
14	2	0.09195	0.950	9.21	8.7	2.5	5.48e-007	1.92e-006	8.53e-007
15	4	0.1446	0.836	14.49	5.8	5.7	7.57e-007	7.69e-007	7.63e-007
16	8	0.2117	0.692	21.21	3.8	3.7	1.02e-006	1.04e-006	1.03e-006
17	16	0.2736	0.559	27.42	3.8	3.6	8.62e-007	9.02e-007	8.81e-007
18	32	0.3363	0.424	33.70	2.1	3.1	1.30e-006	8.96e-007	1.06e-006
19	16	0.3237	0.451	32.43	0.0	0.0	1.05e-004	0.00e+000	1.05e-004
20	4	0.3017	0.498	30.23	2.1	0.0	1.25e-006	0.00e+000	1.25e-006
21	1	0.2758	0.554	27.64	20.3	0.0	1.42e-007	0.00e+000	1.42e-007
22	0.5	0.2611	0.586	26.16	78.7	39.4	3.86e-008	7.70e-008	5.14e-008
23	0.125	0.2322	0.648	23.27	93.5	0.0	3.45e-008	0.00e+000	3.45e-008

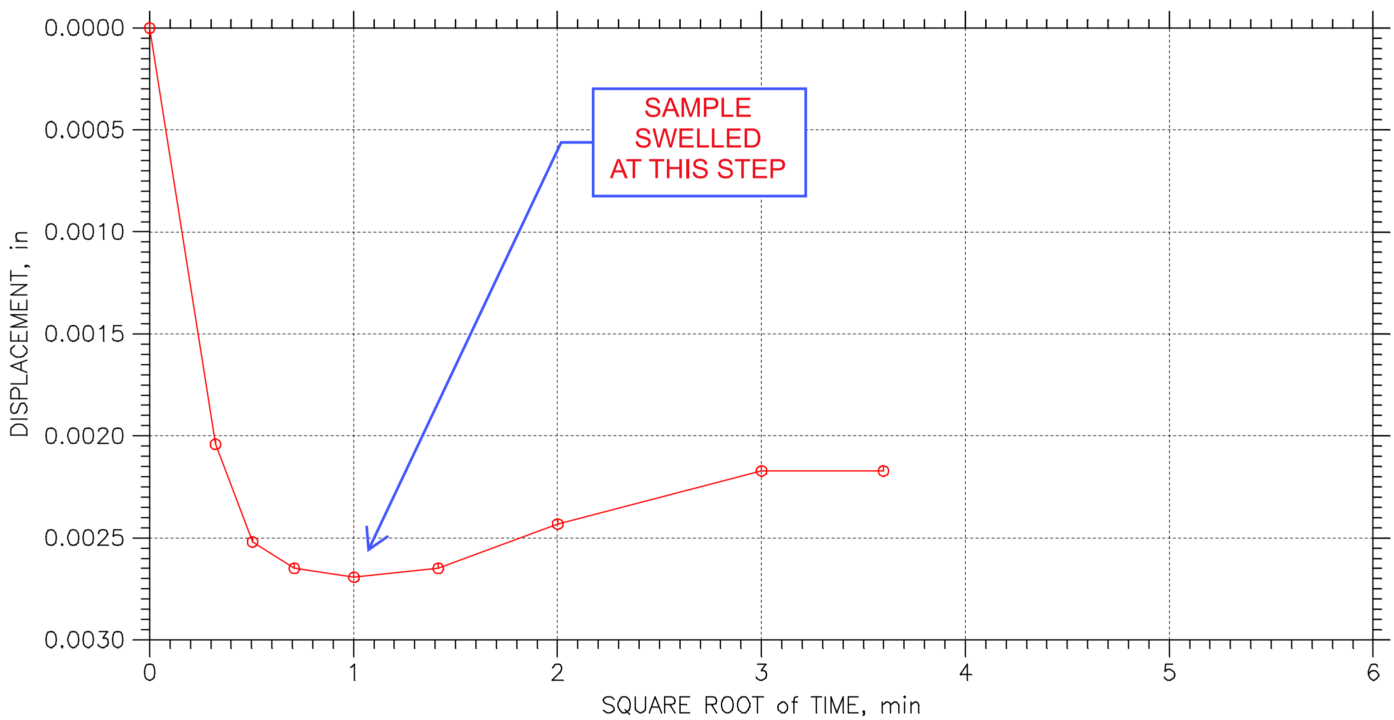
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 1 of 23

Stress: 0.125 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

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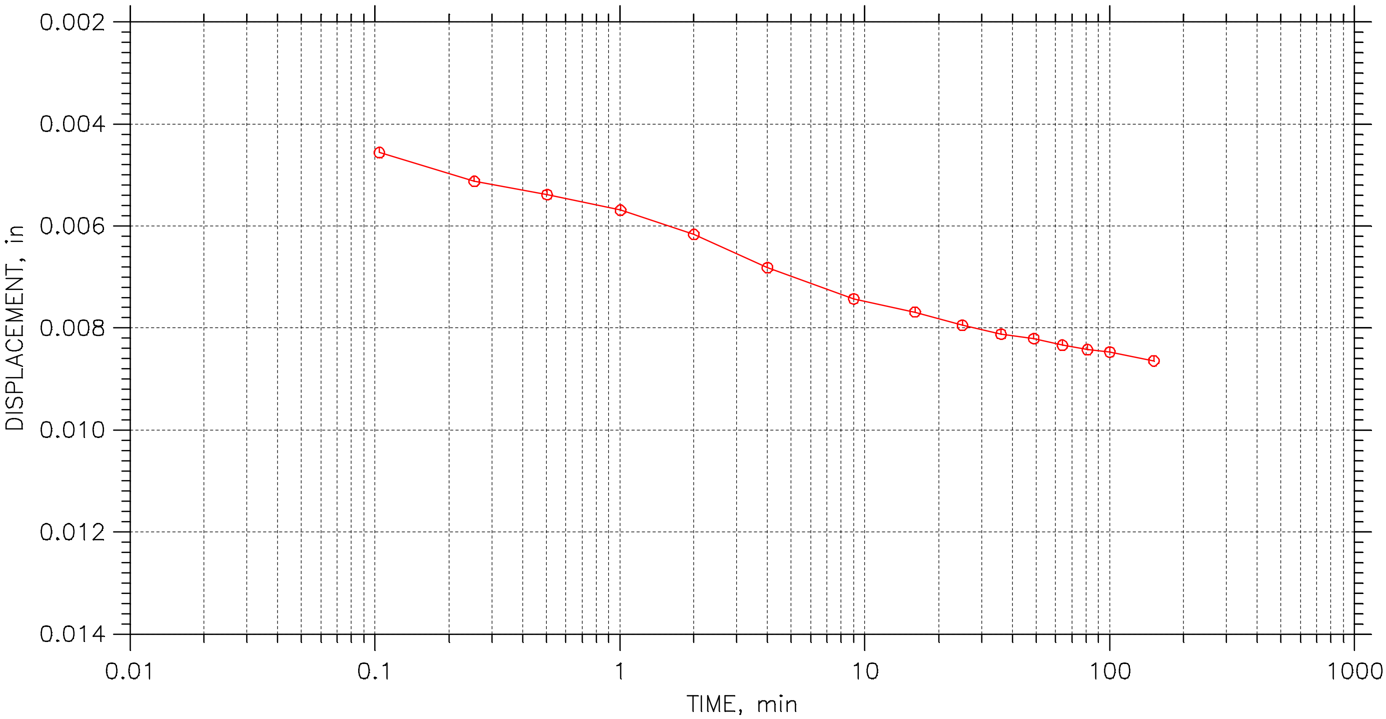
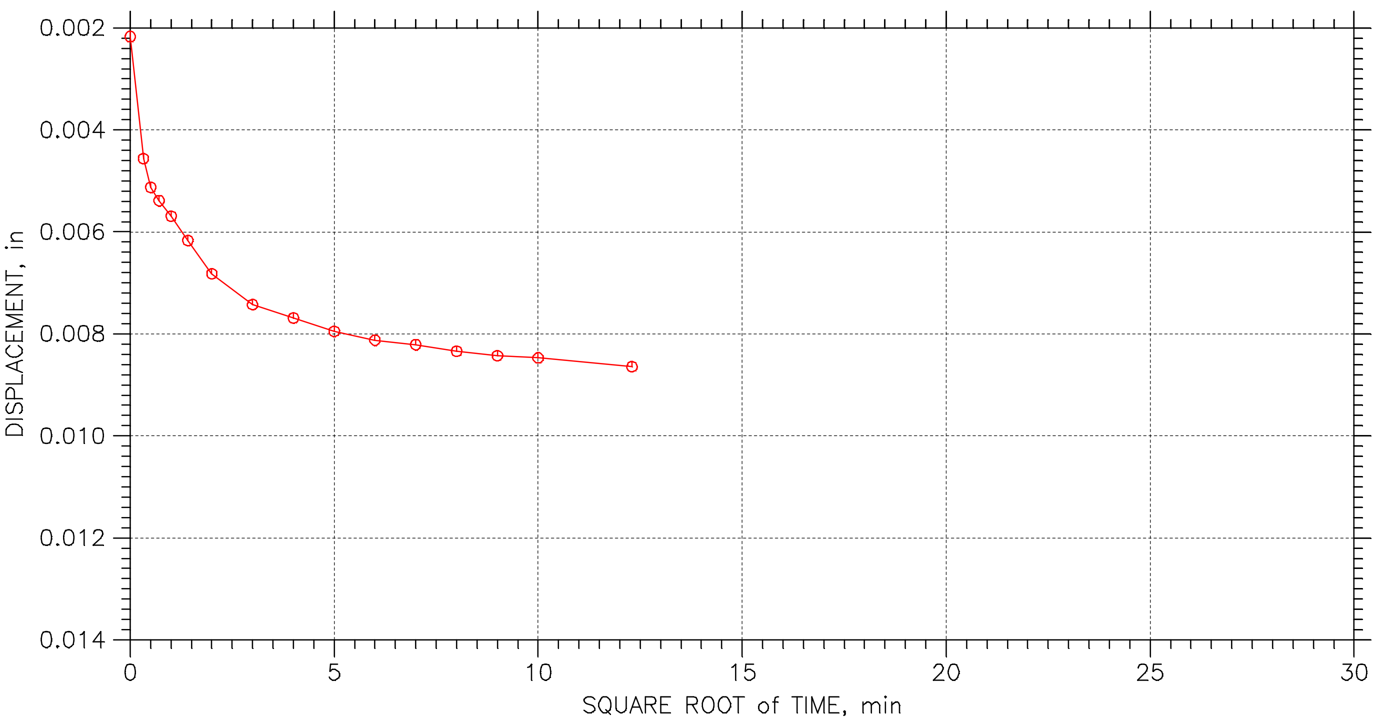
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 2 of 23

Stress: 0.25 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

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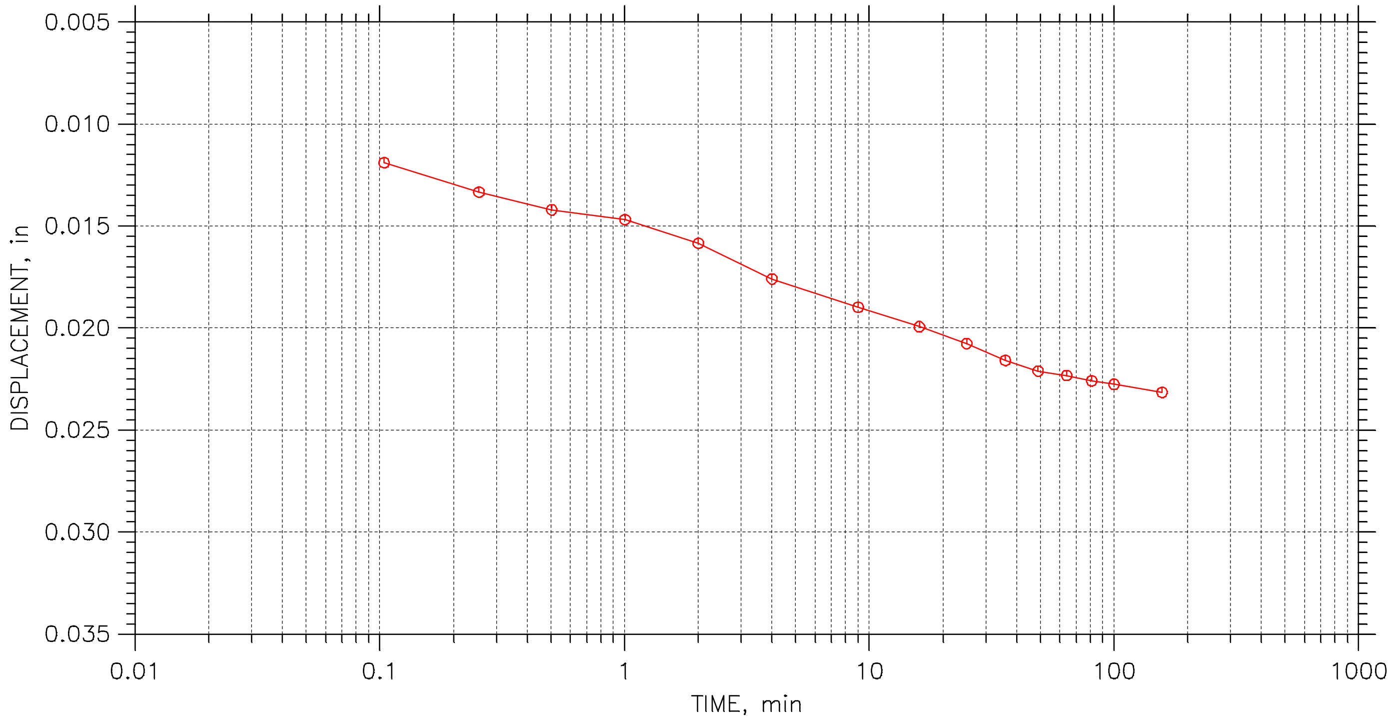
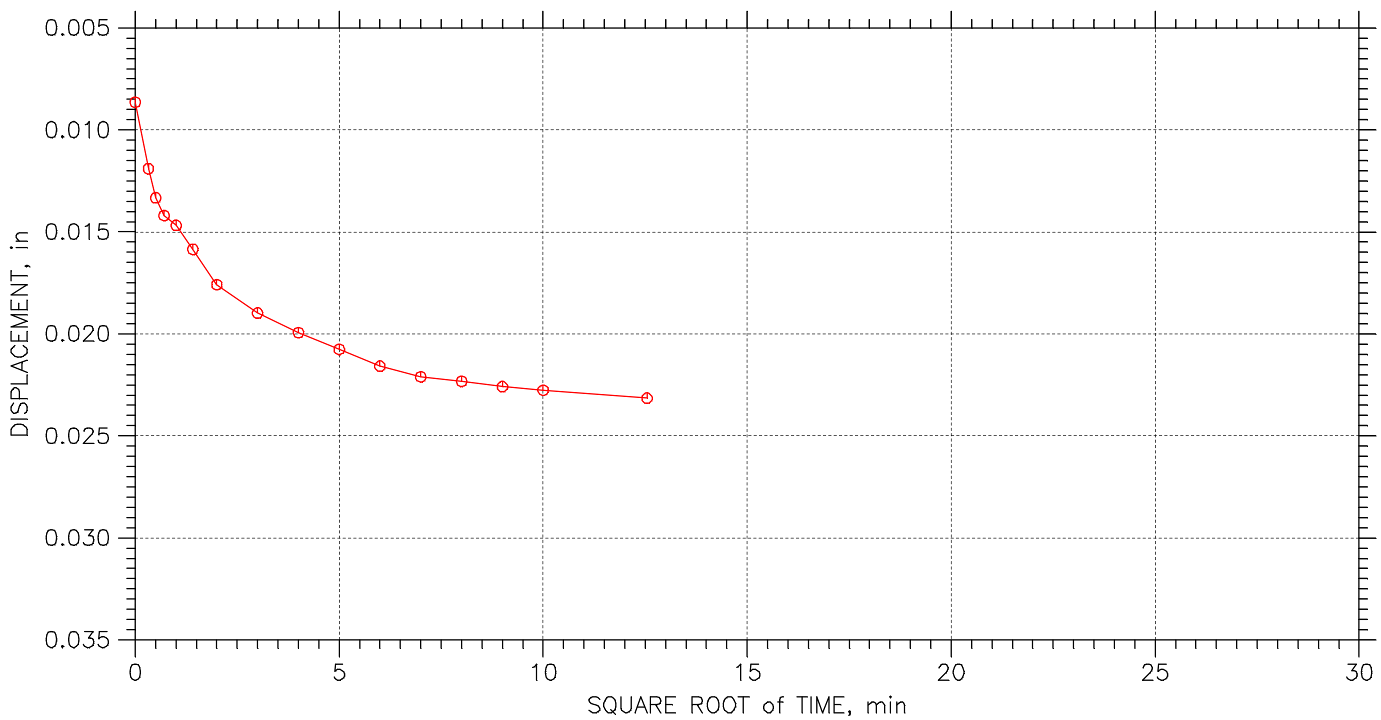
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 3 of 23

Stress: 0.5 tsf





Terracon Consulting Engineers & Scientists			
	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

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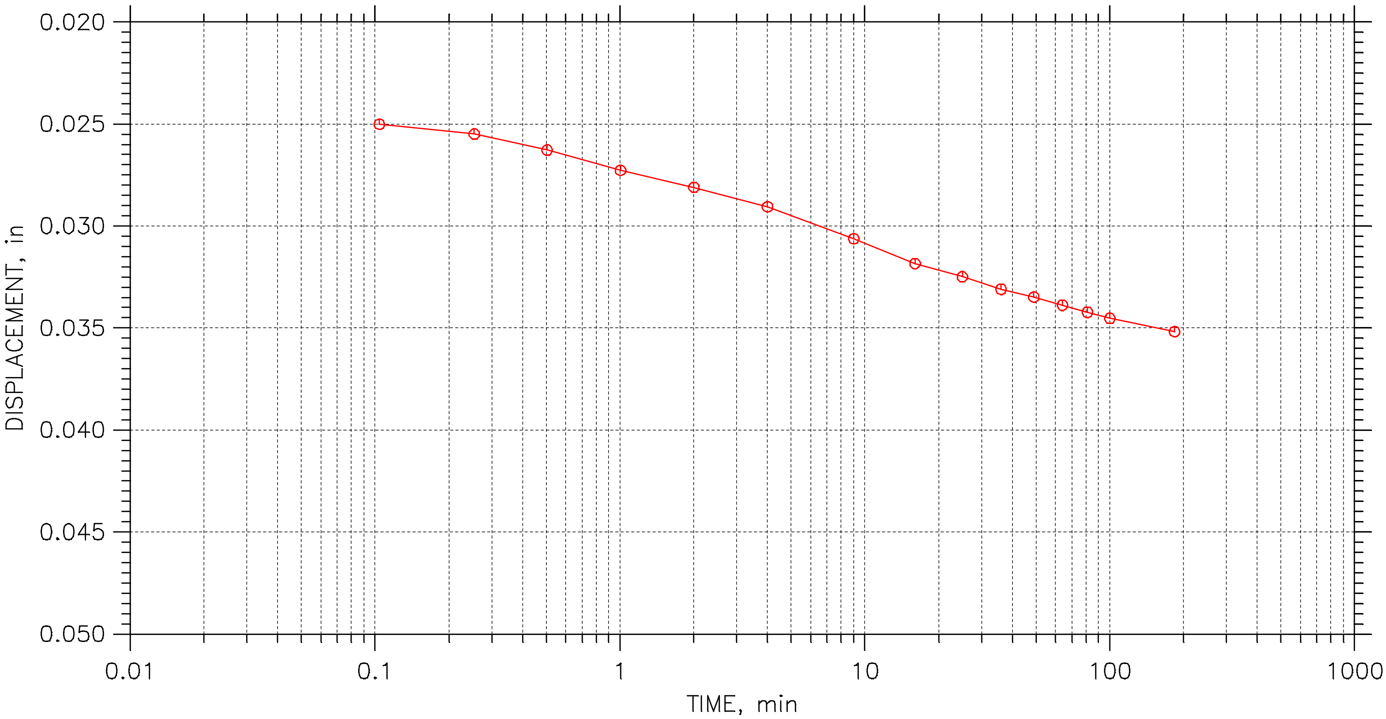
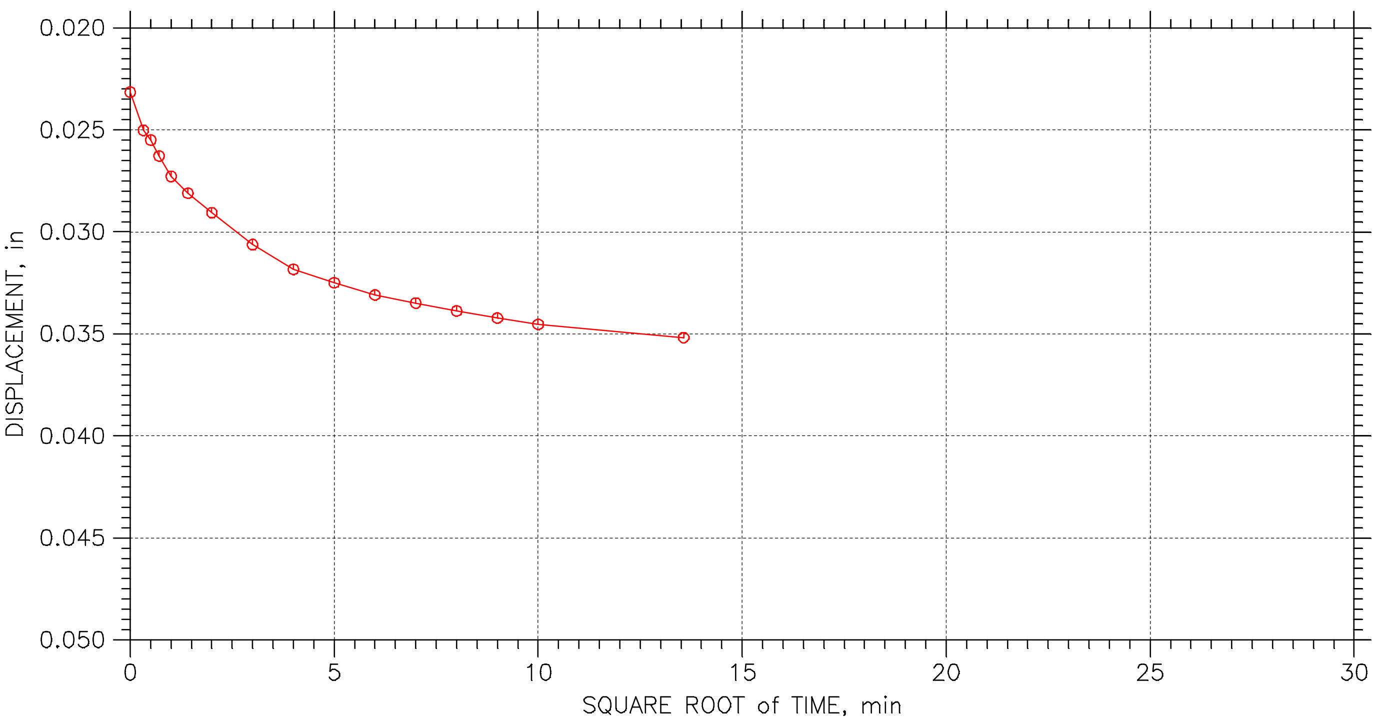
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 4 of 23

Stress: 0.75 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

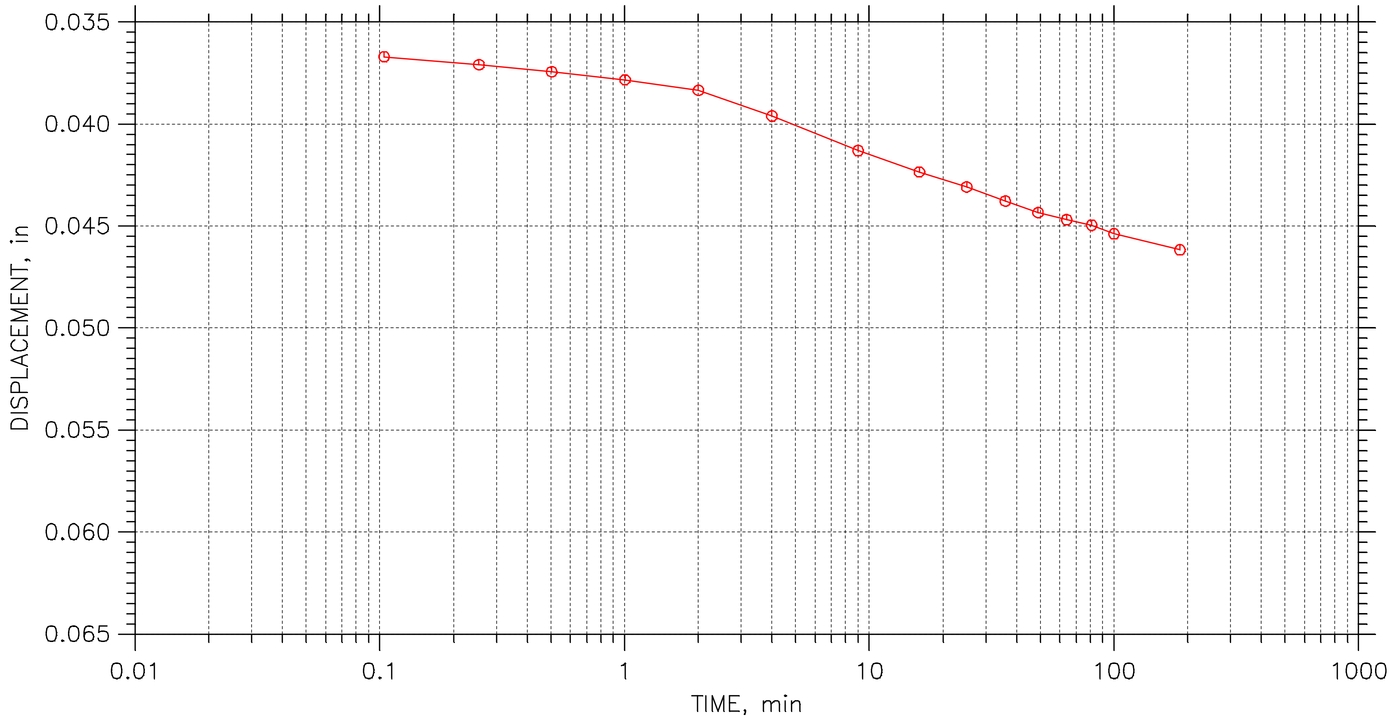
Mon, 16-NOV-2015 17:10:53

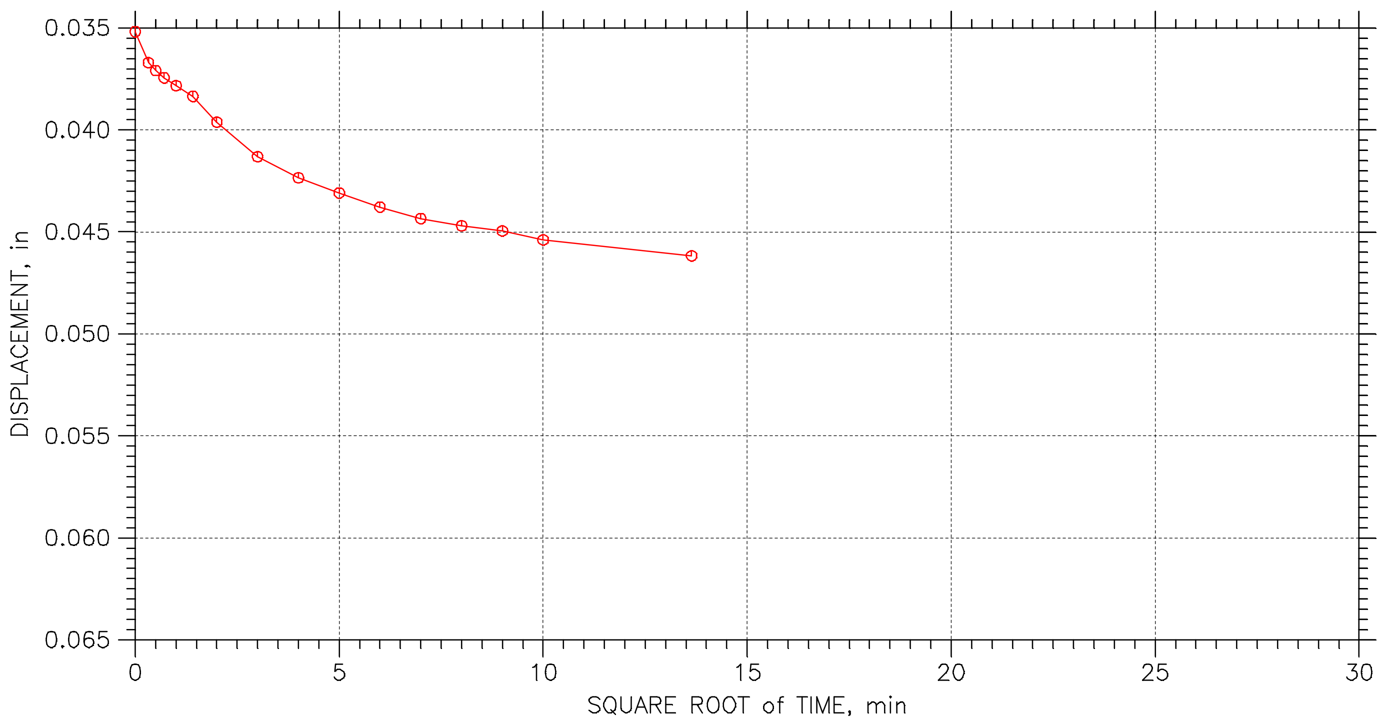
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 5 of 23

Stress: 1. tsf





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	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

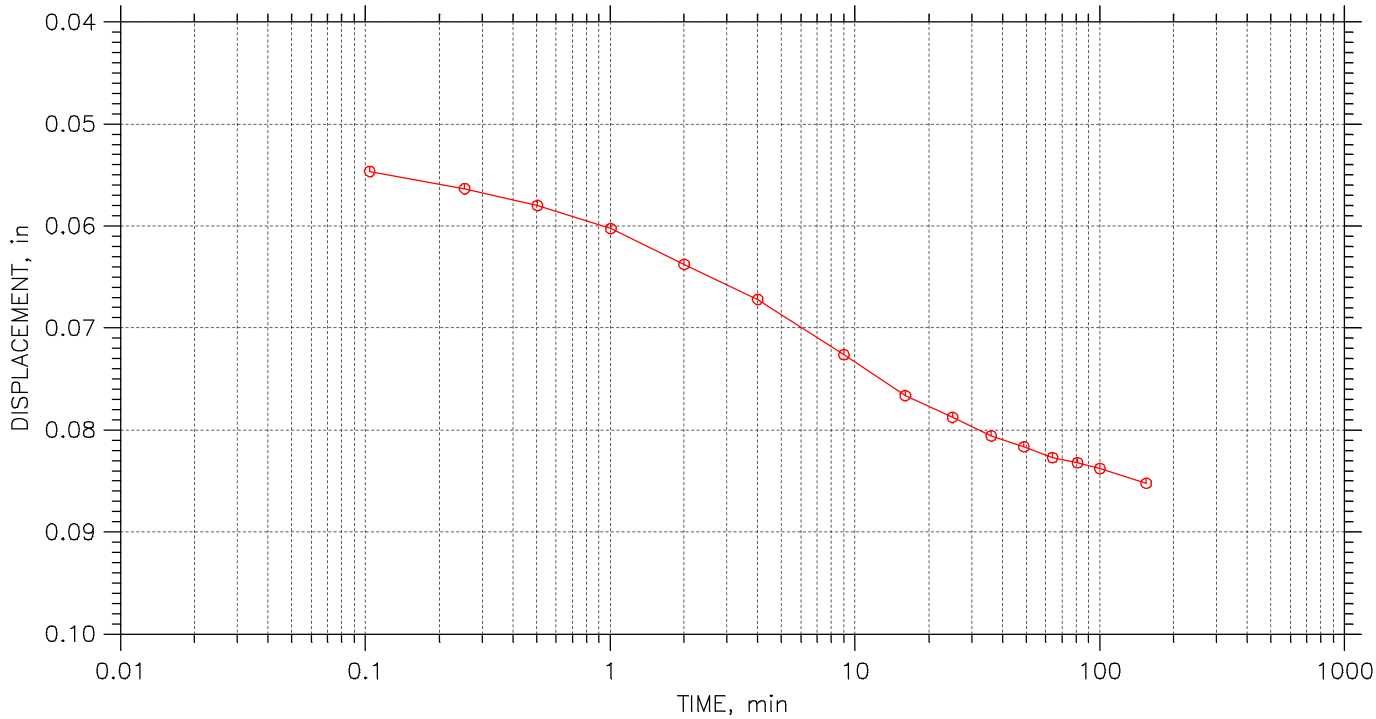
Mon, 16-NOV-2015 17:10:54

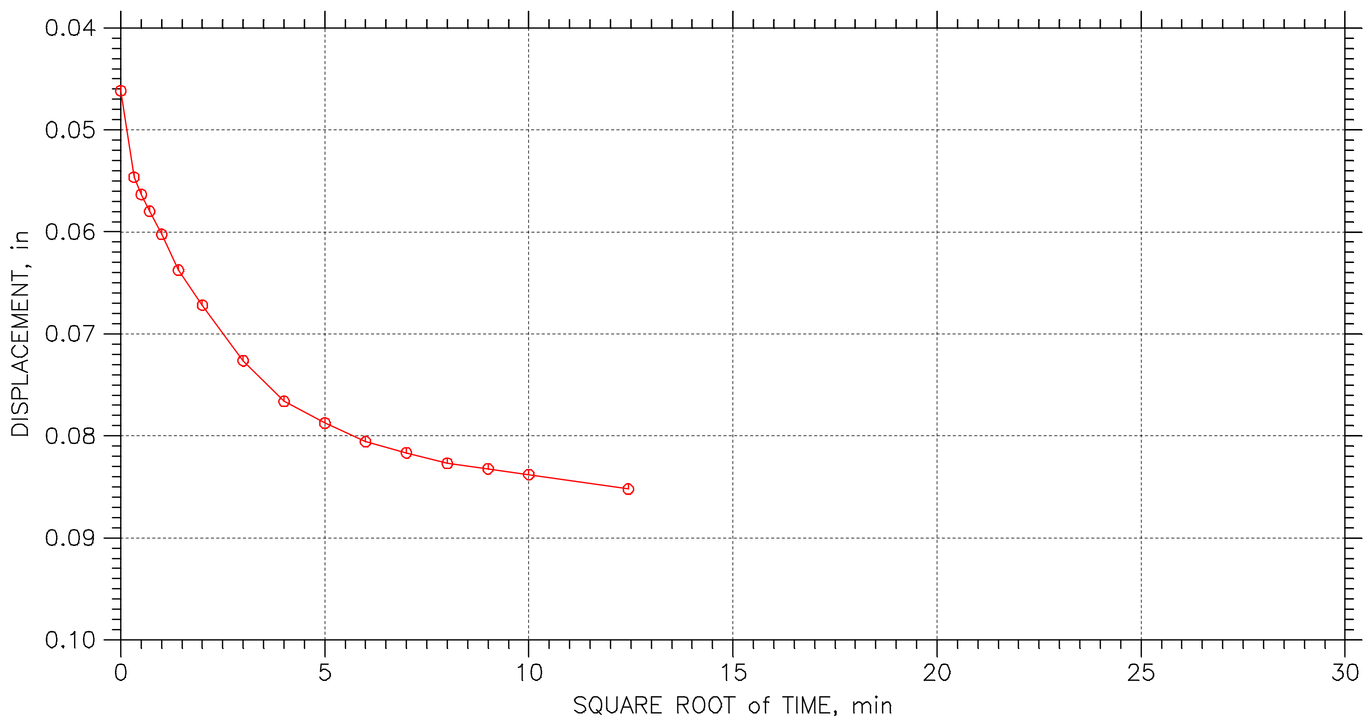
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 6 of 23

Stress: 2. tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

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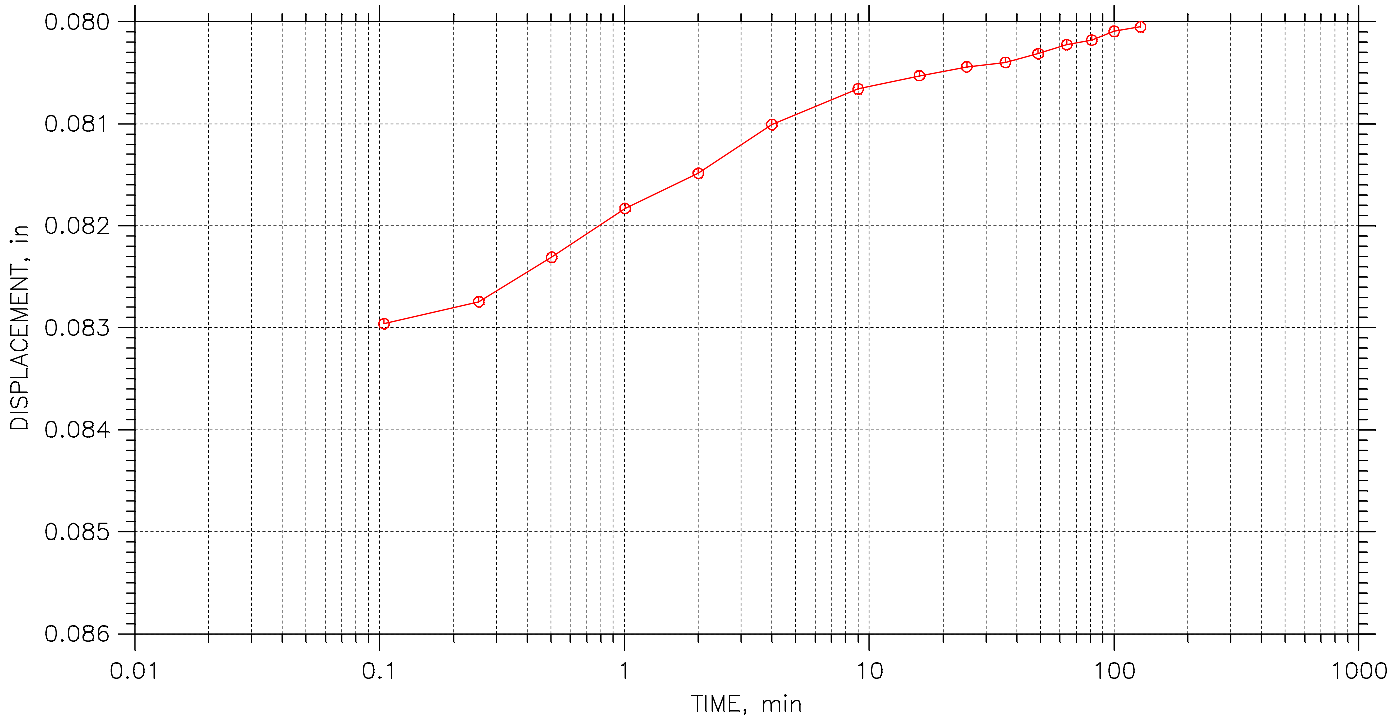
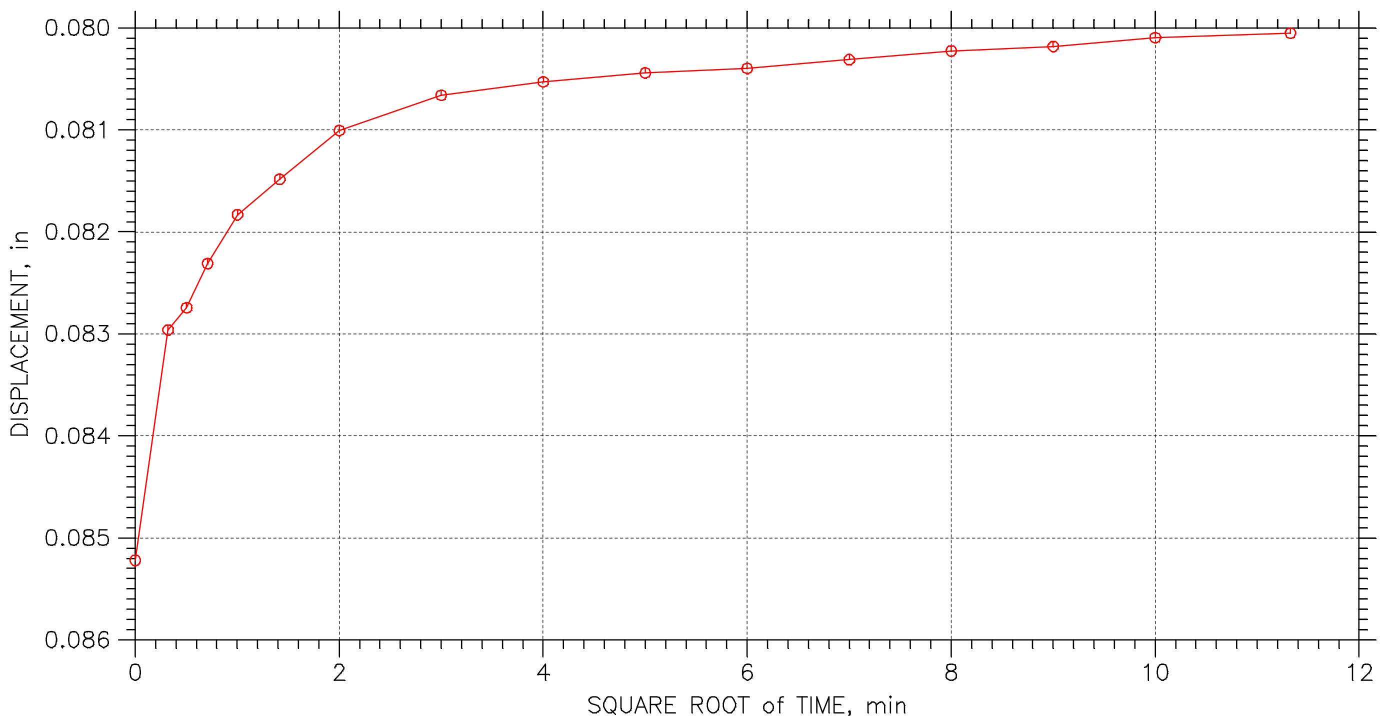
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 7 of 23

Stress: 1. tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

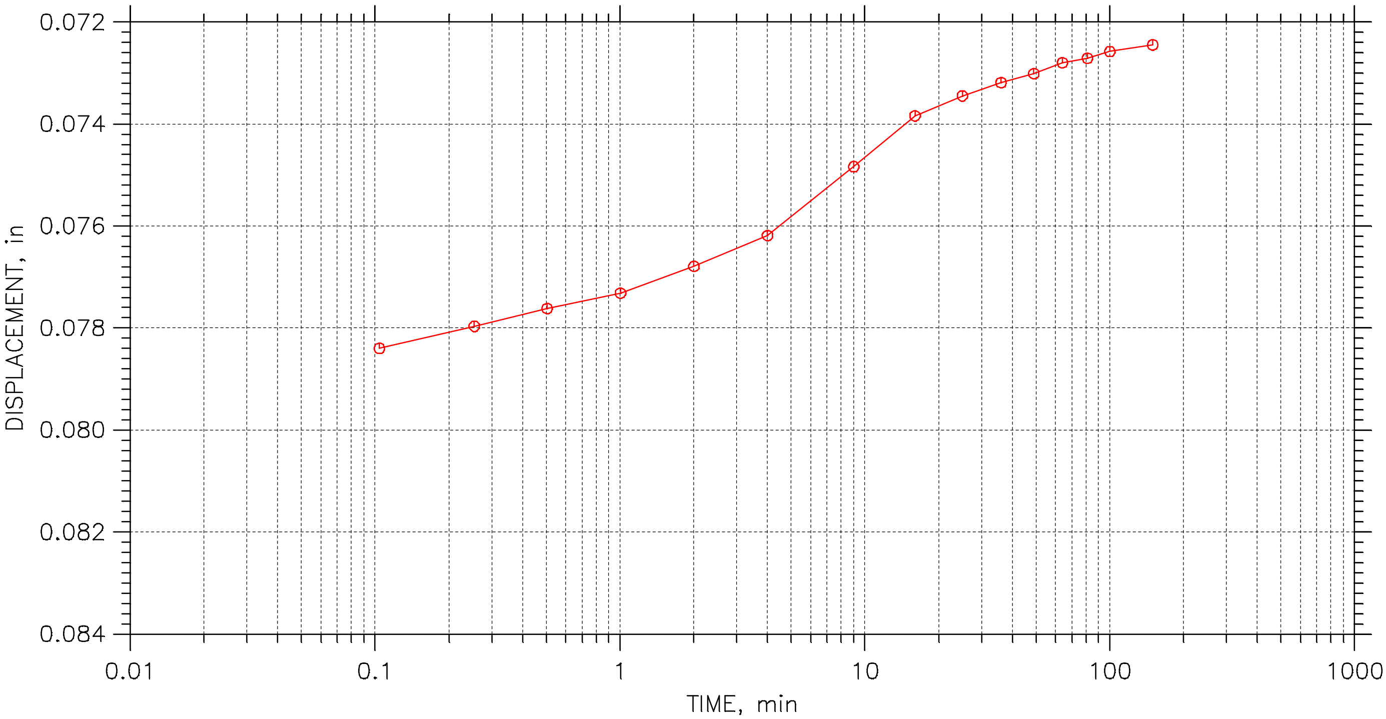
Mon, 16-NOV-2015 17:10:57

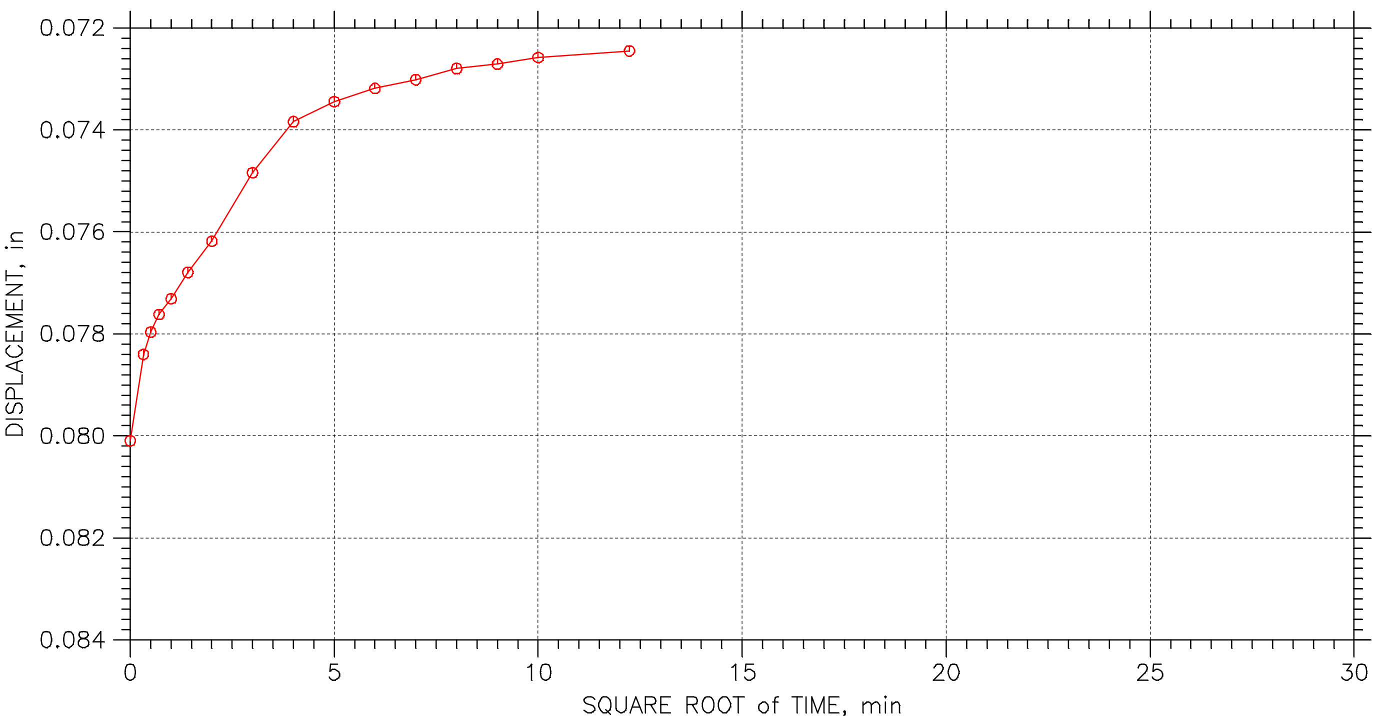
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 8 of 23

Stress: 0.5 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

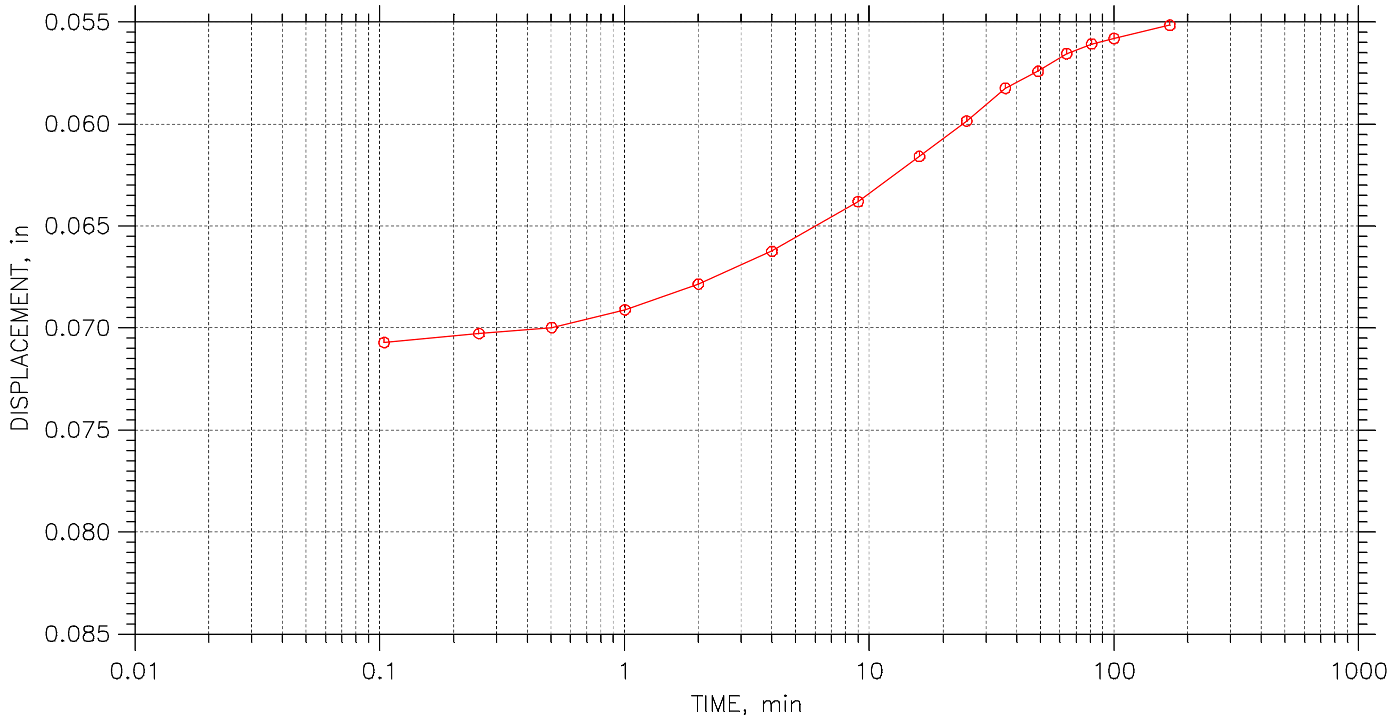
Mon, 16-NOV-2015 17:10:59

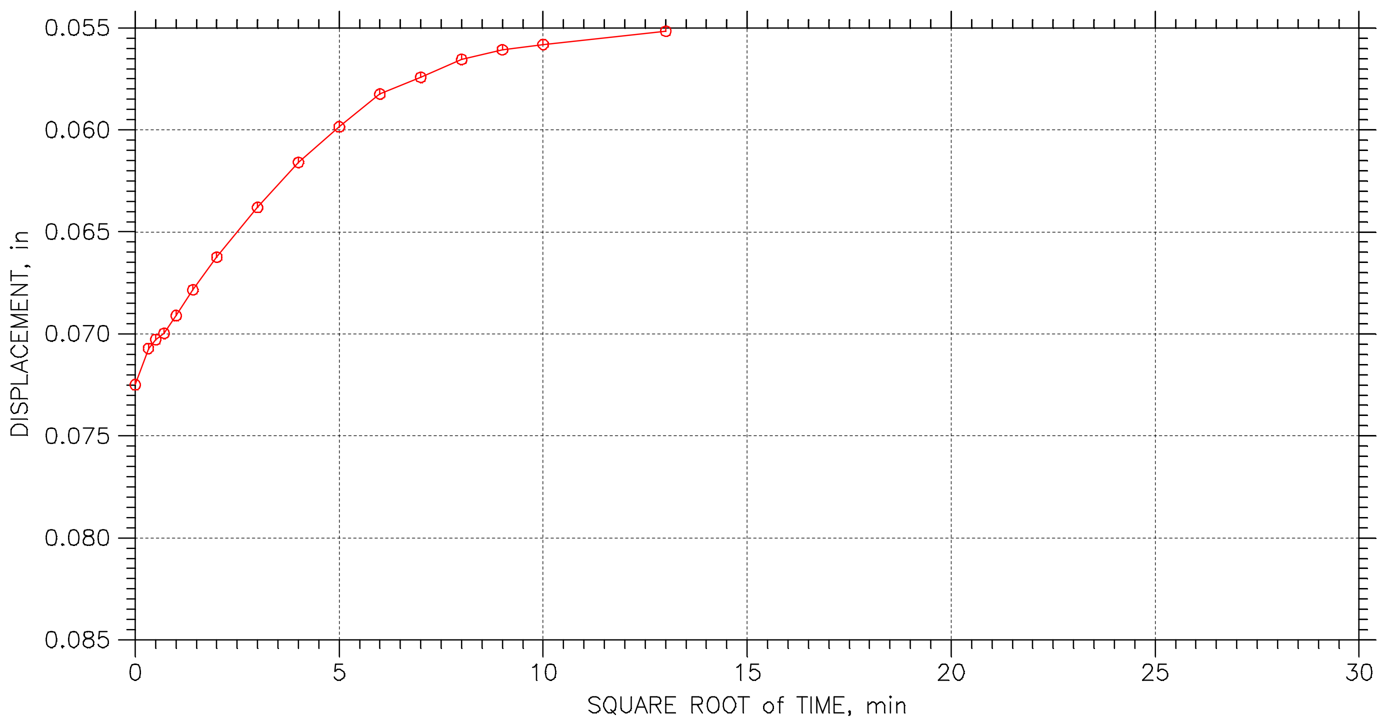
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 9 of 23

Stress: 0.125 tsf





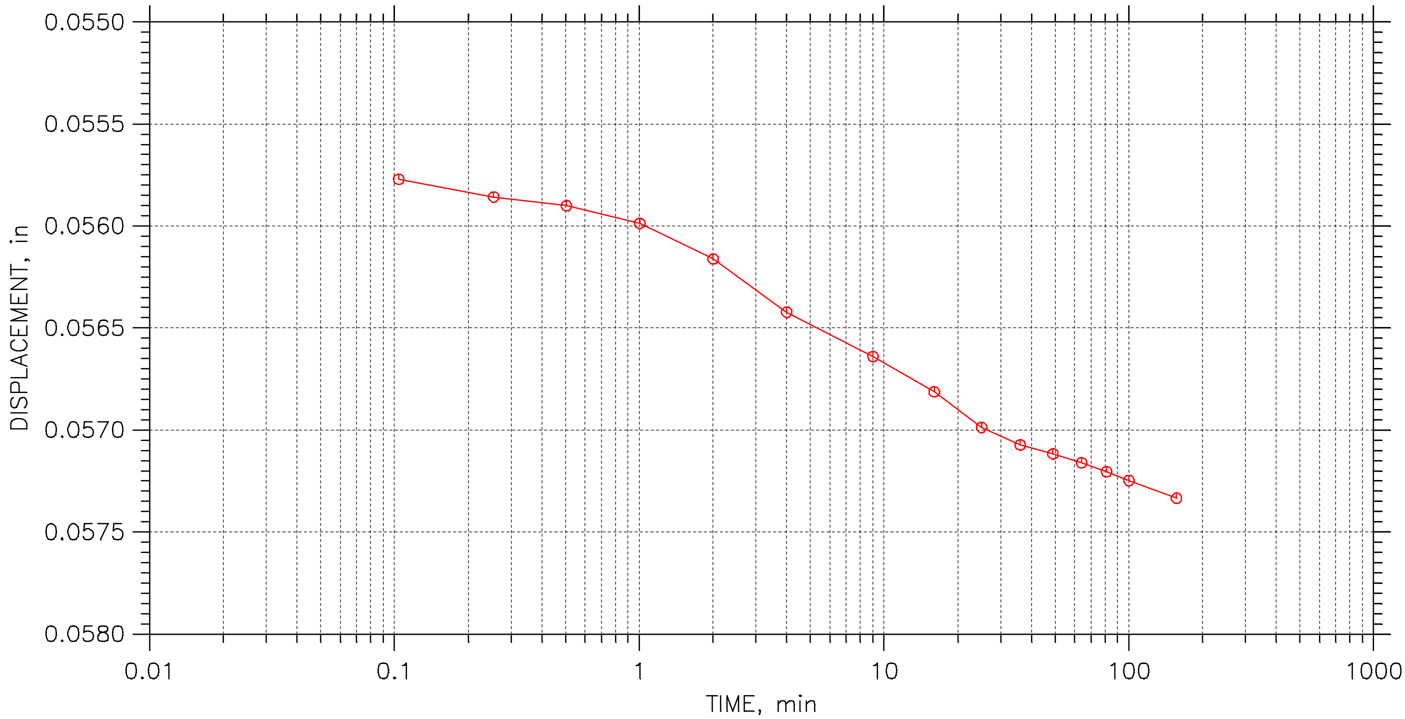
Terracon Consulting Engineers & Scientists			
	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

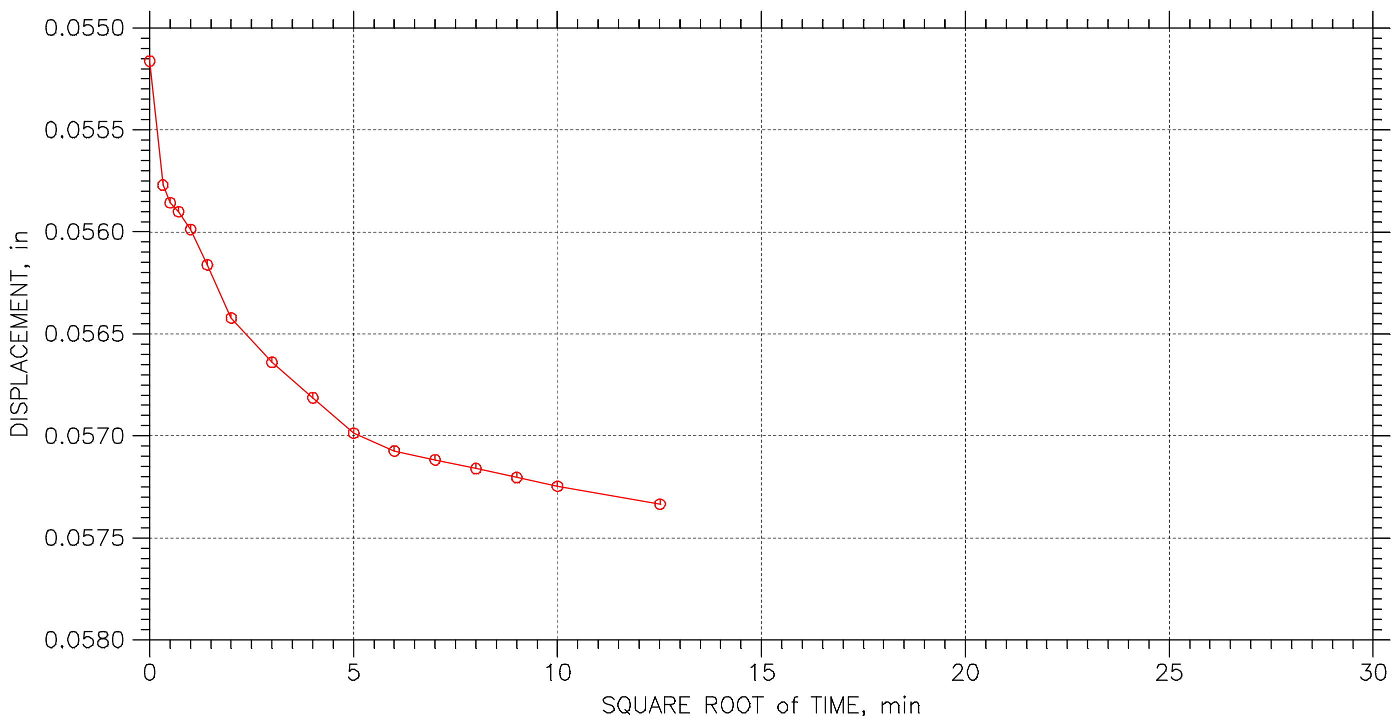
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 10 of 23

Stress: 0.25 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

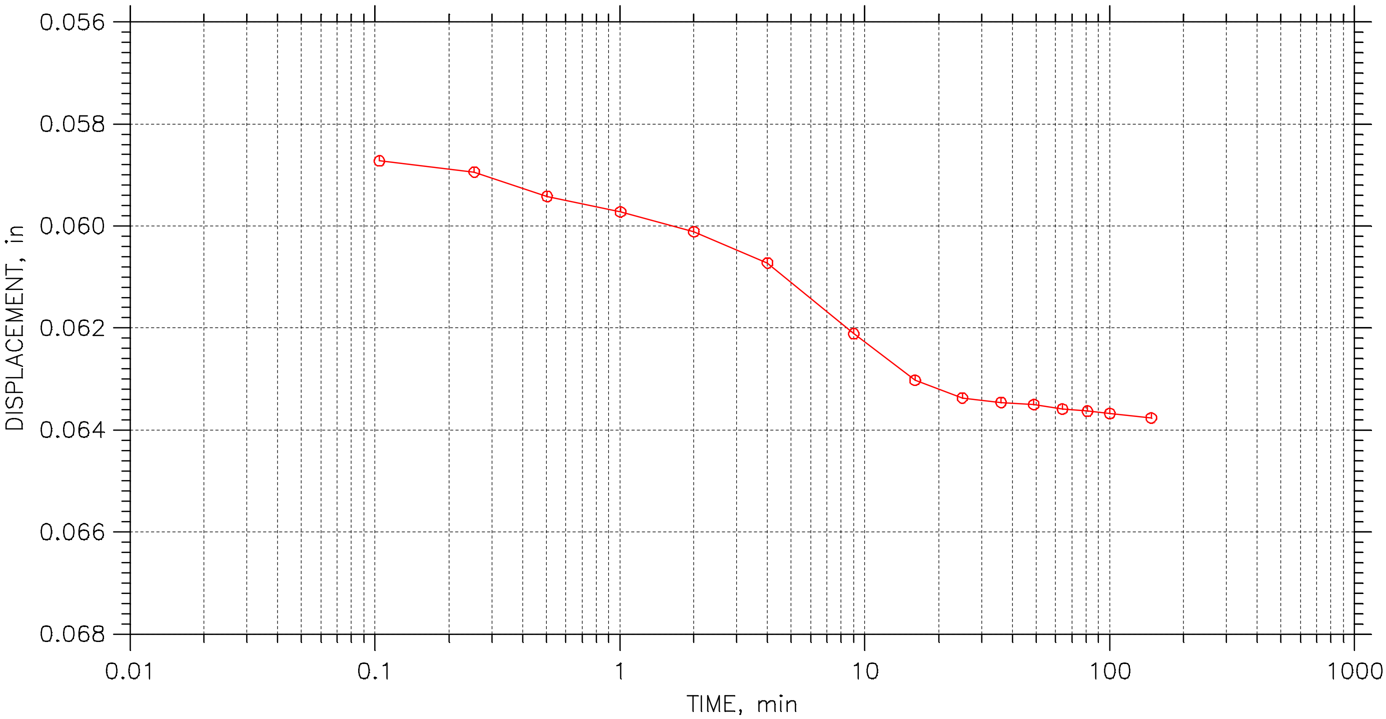
Mon, 16-NOV-2015 17:11:01

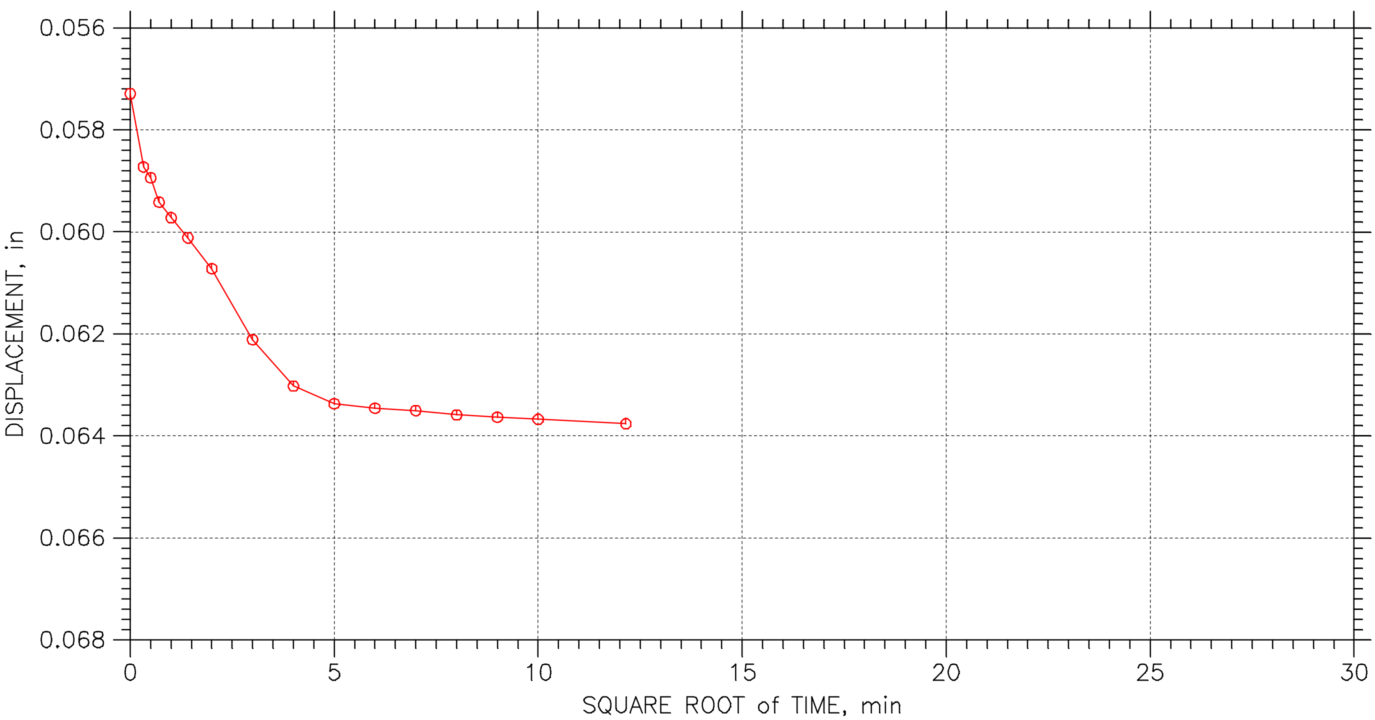
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 11 of 23

Stress: 0.5 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

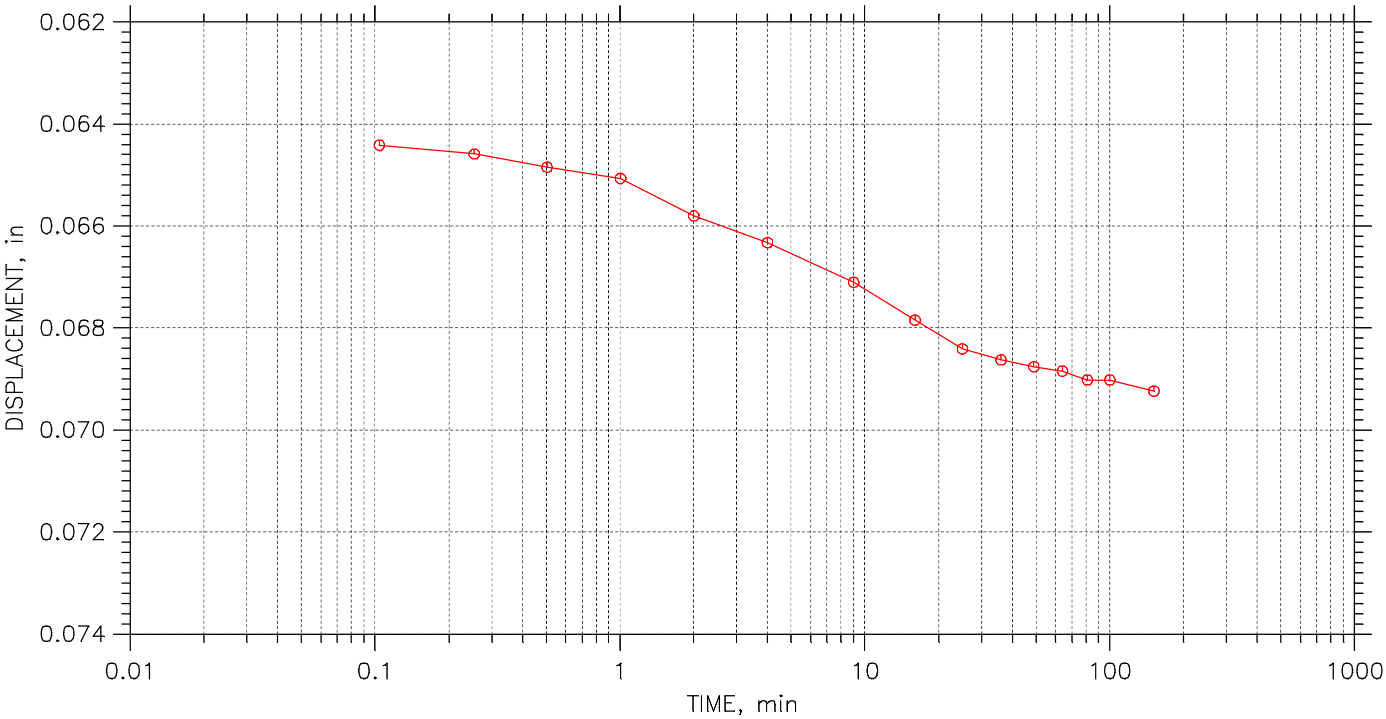
Mon, 16-NOV-2015 17:11:03

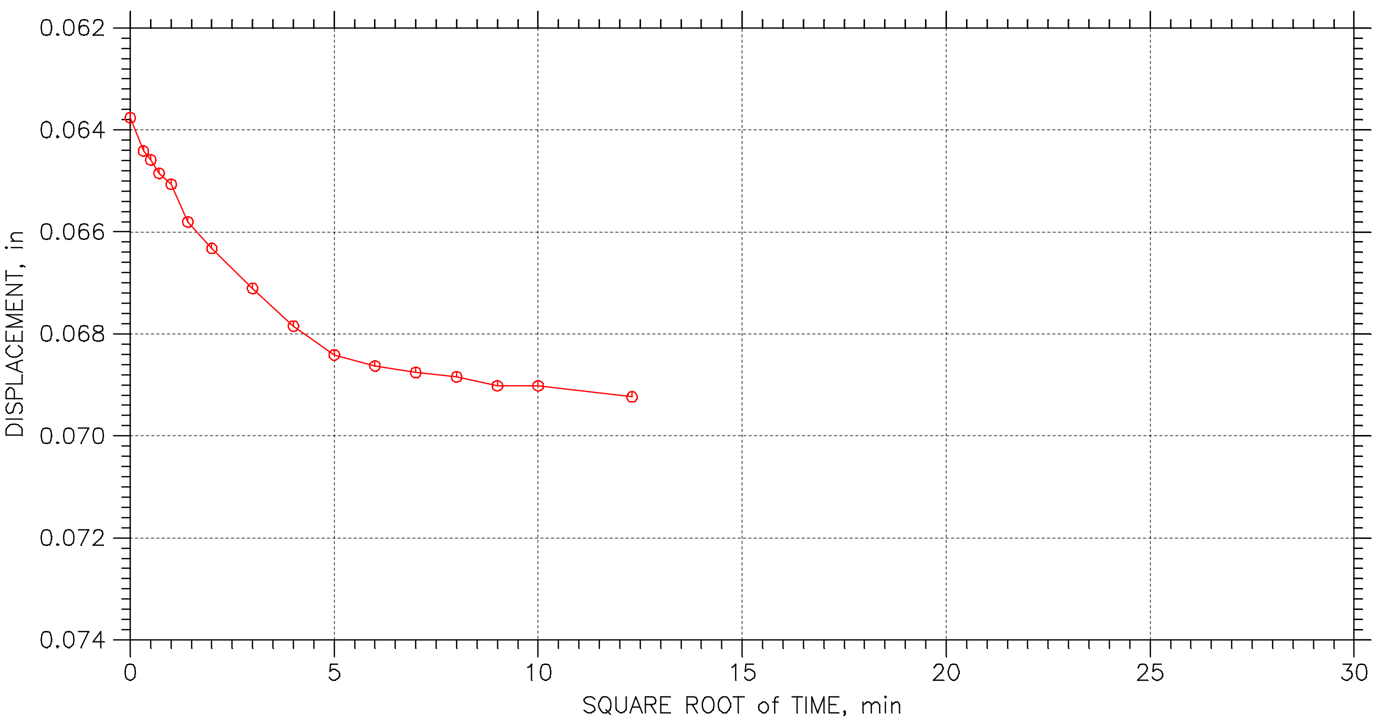
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 12 of 23

Stress: 0.75 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

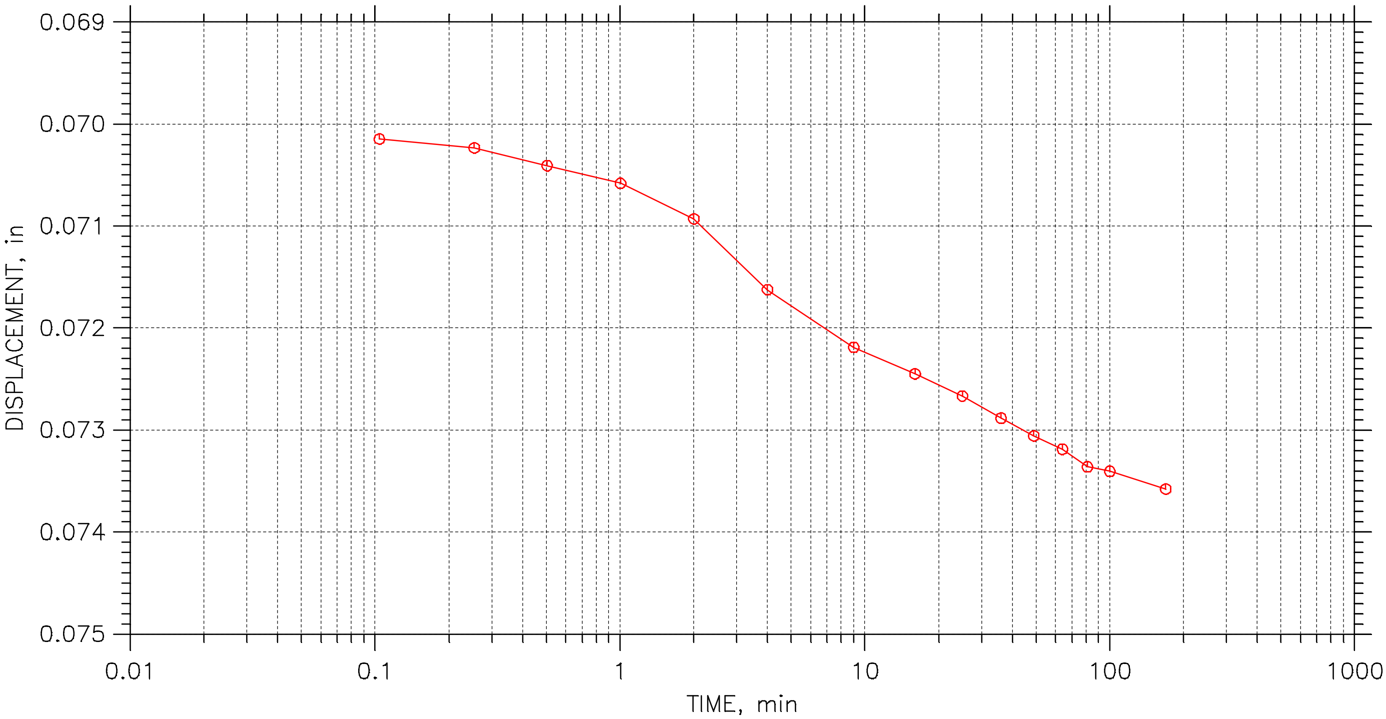
Mon, 16-NOV-2015 17:11:04

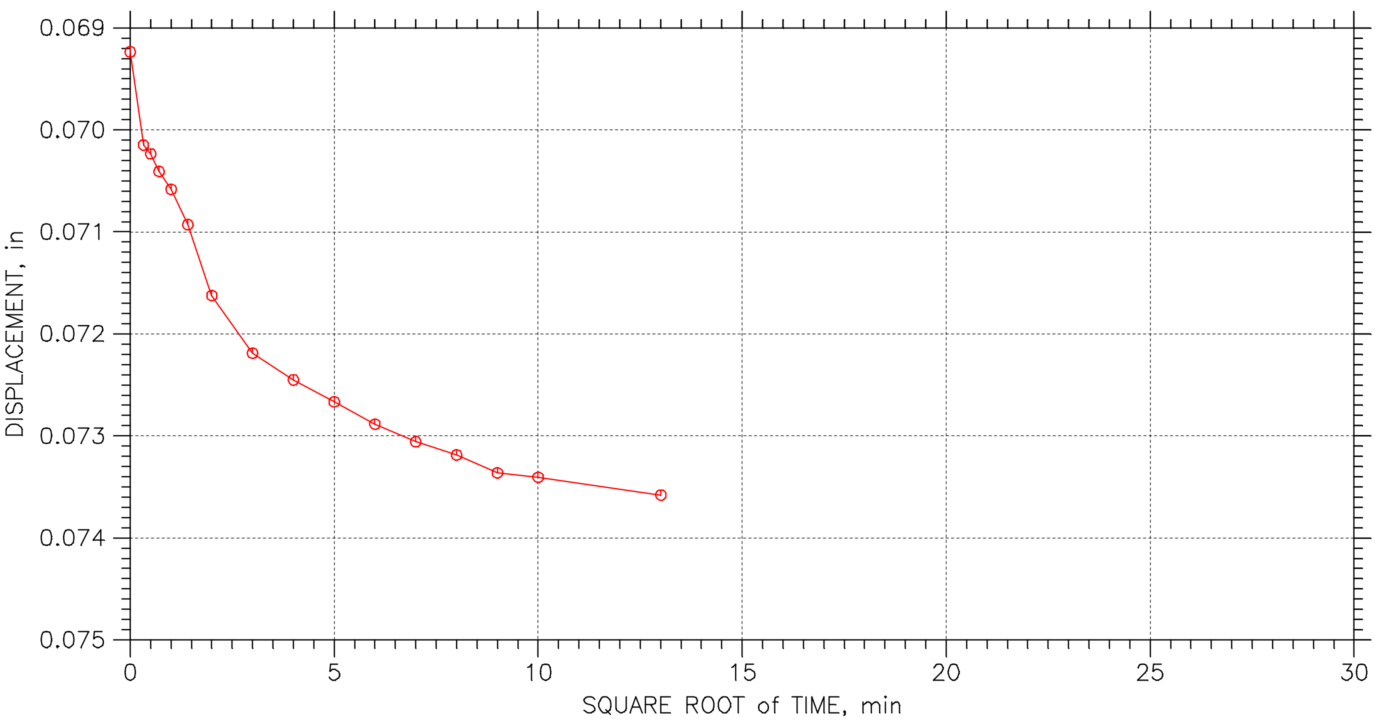
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 13 of 23

Stress: 1. tsf





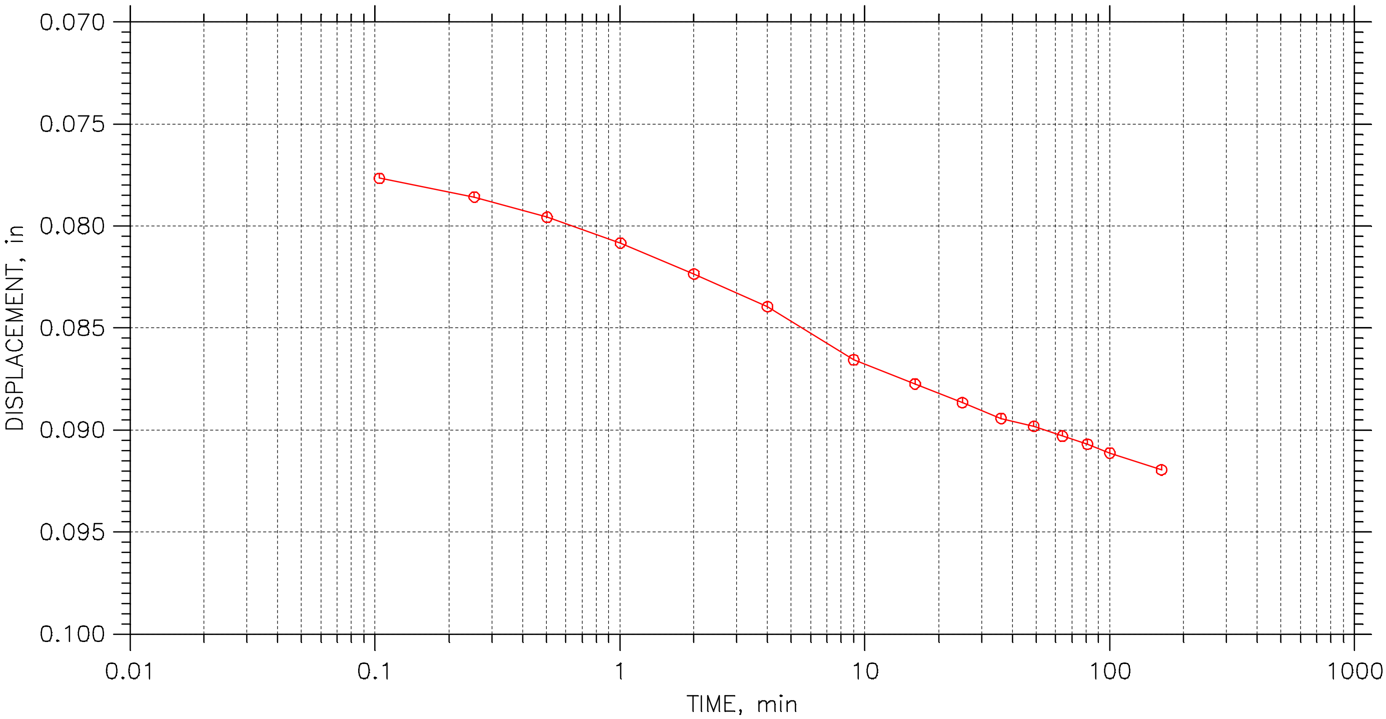
Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

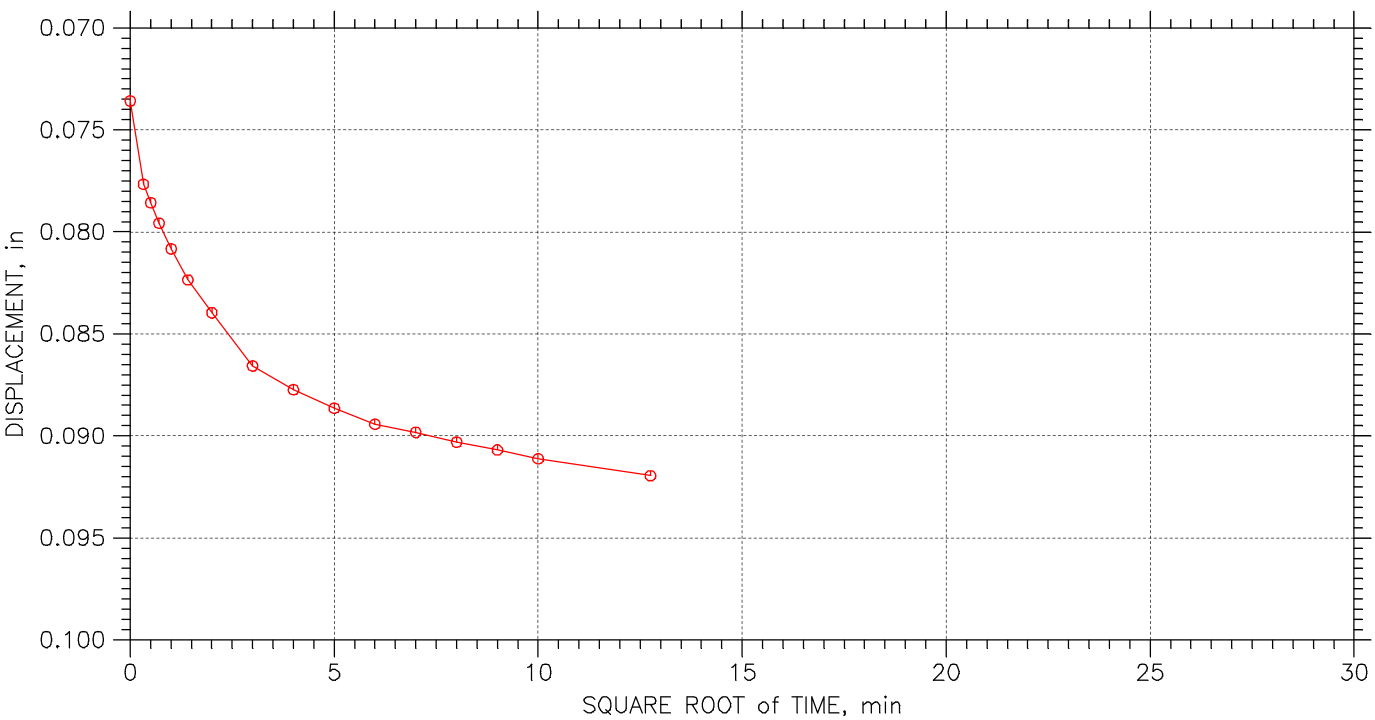
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 14 of 23

Stress: 2. tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

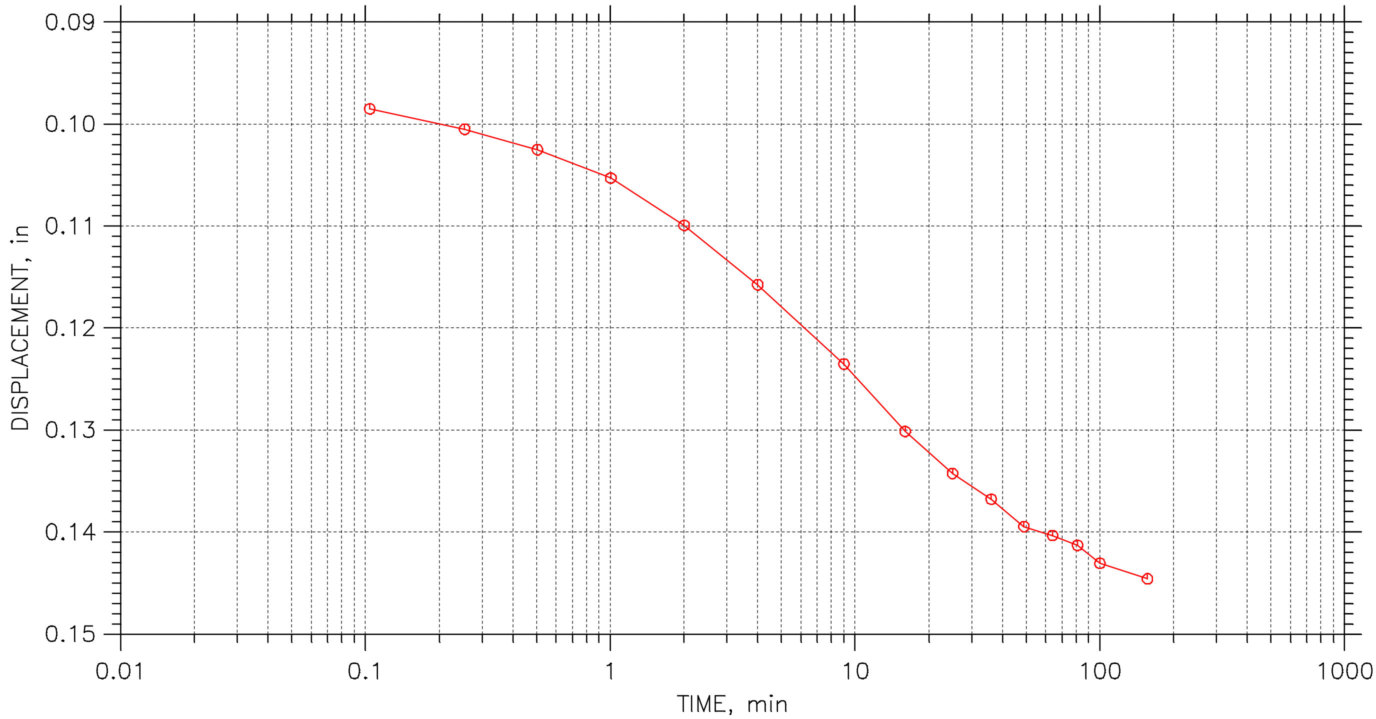
Mon, 16-NOV-2015 17:11:07

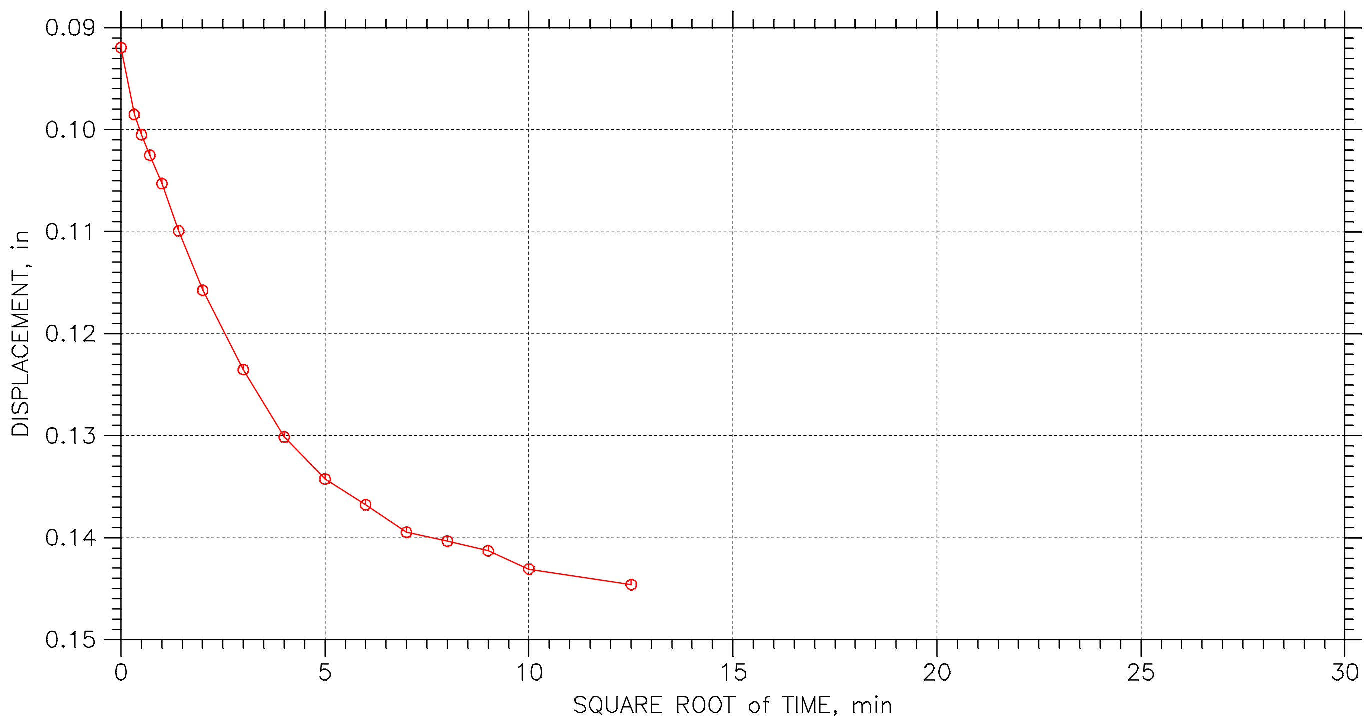
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 15 of 23

Stress: 4. tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

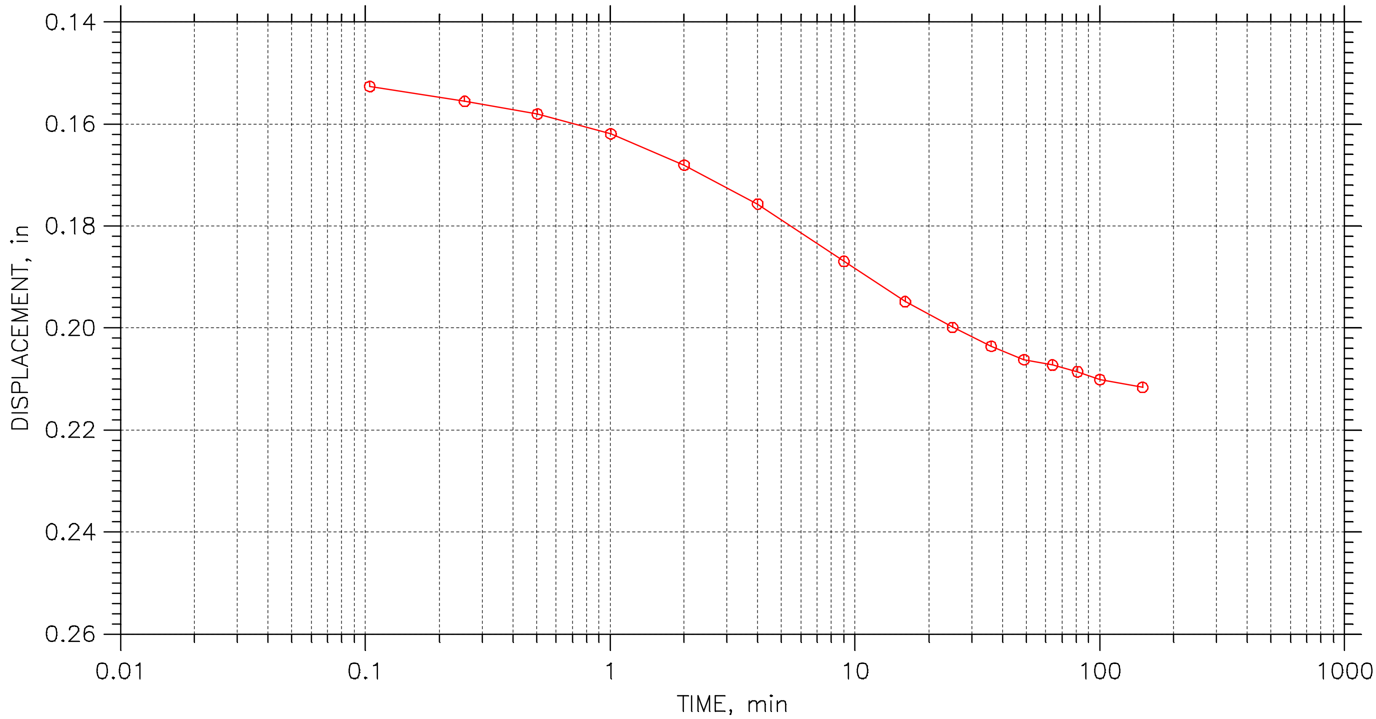
Mon, 16-NOV-2015 17:11:08

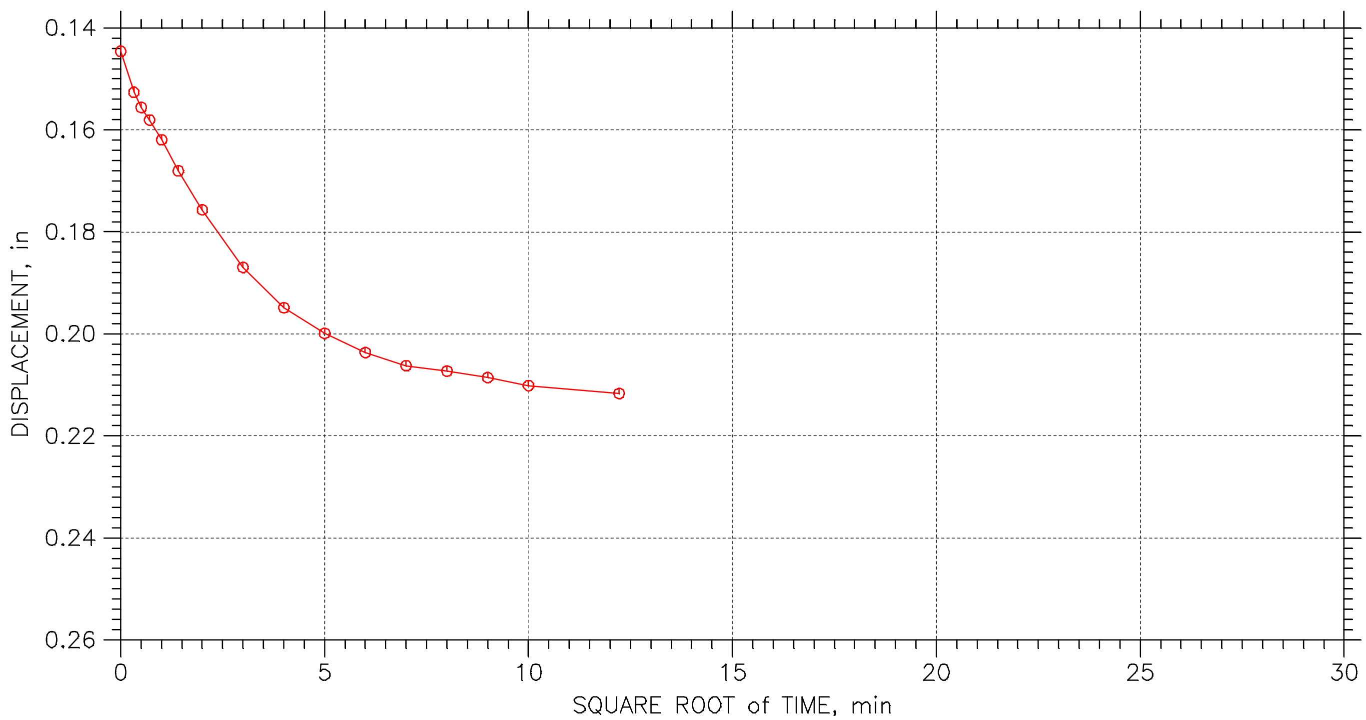
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 16 of 23

Stress: 8. tsf





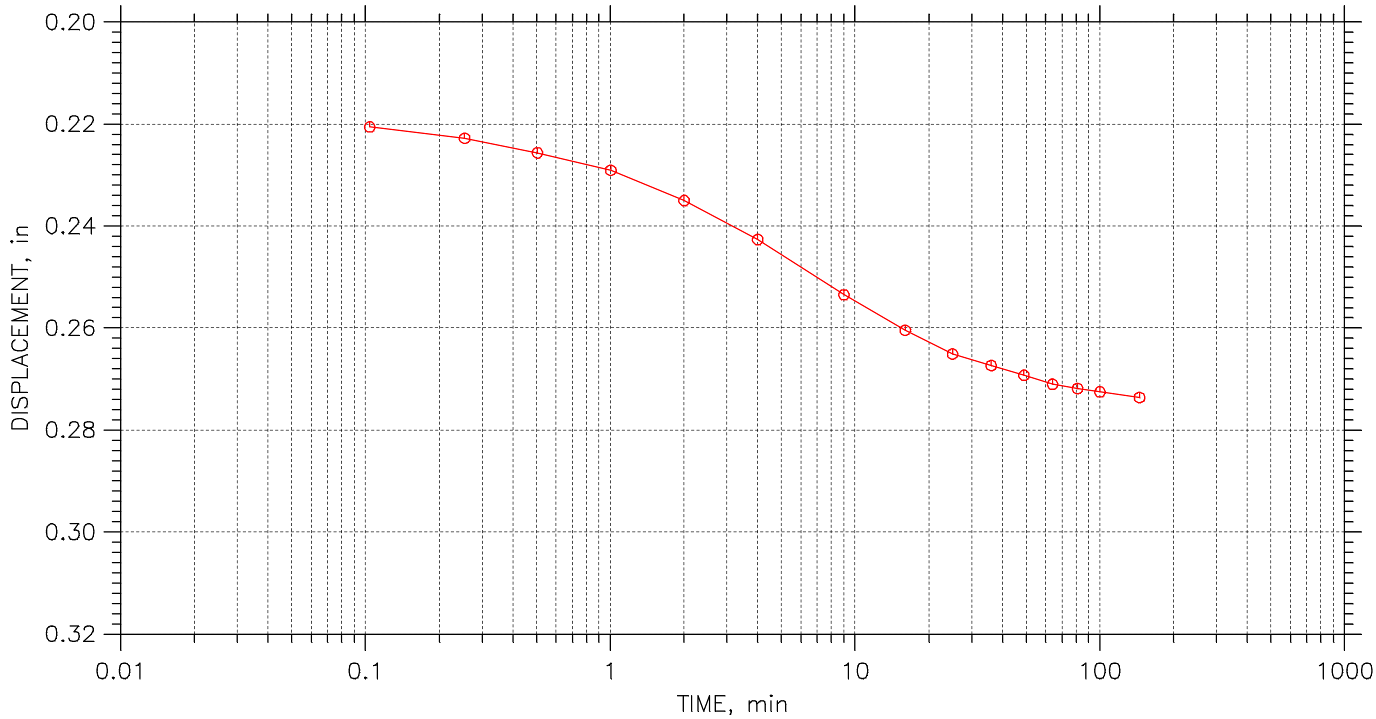
Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

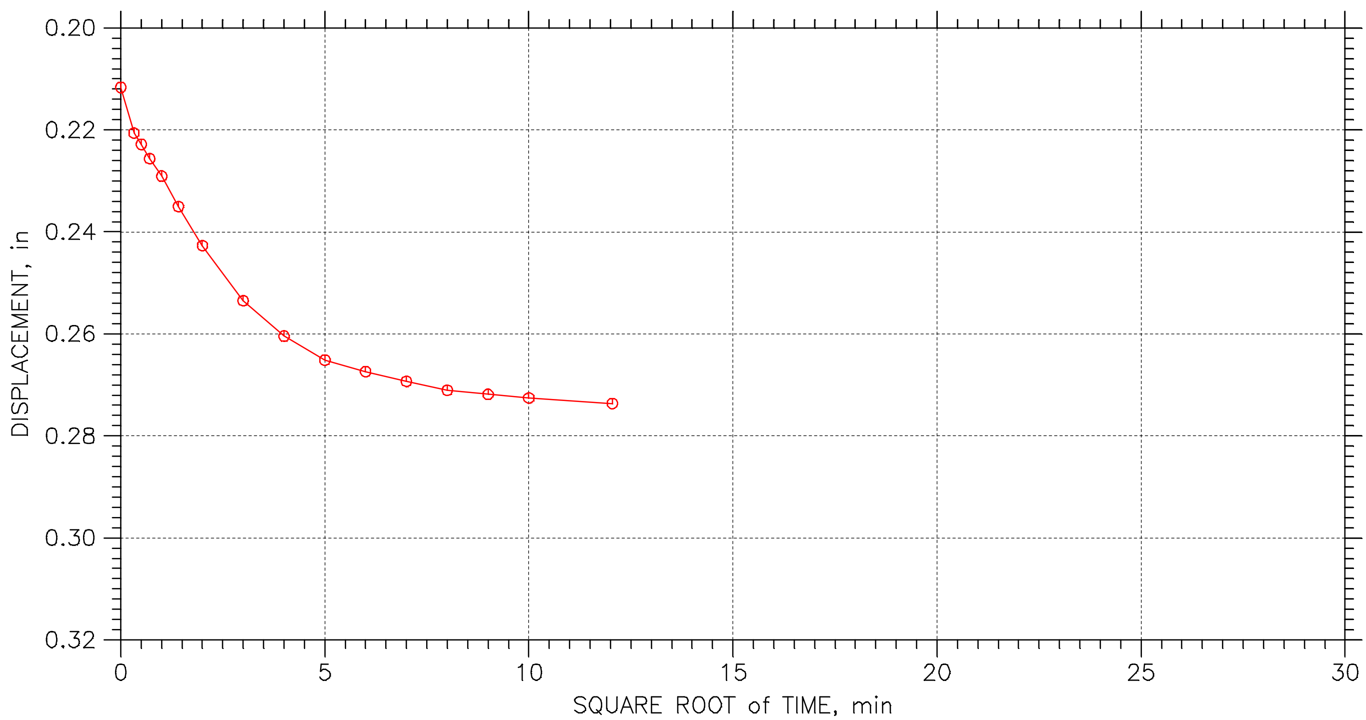
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 17 of 23

Stress: 16. tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

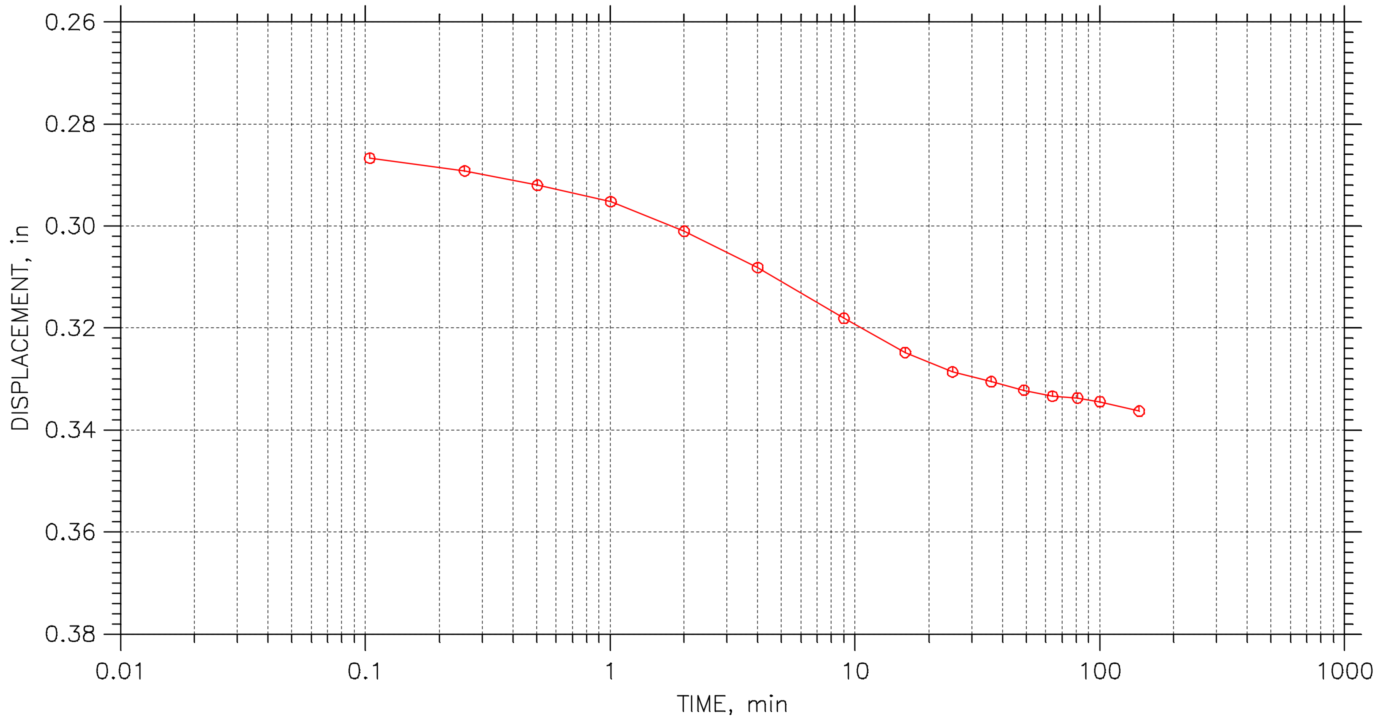
Mon, 16-NOV-2015 17:11:11

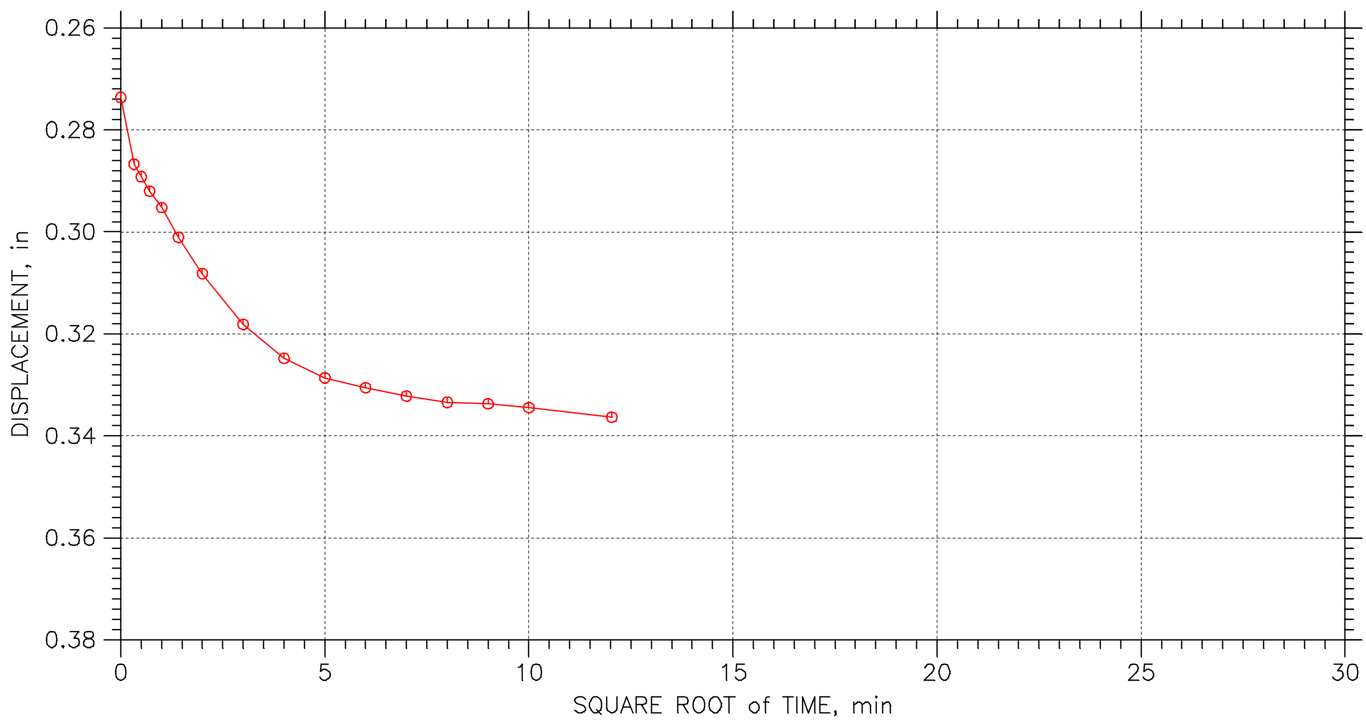
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 18 of 23

Stress: 32. tsf





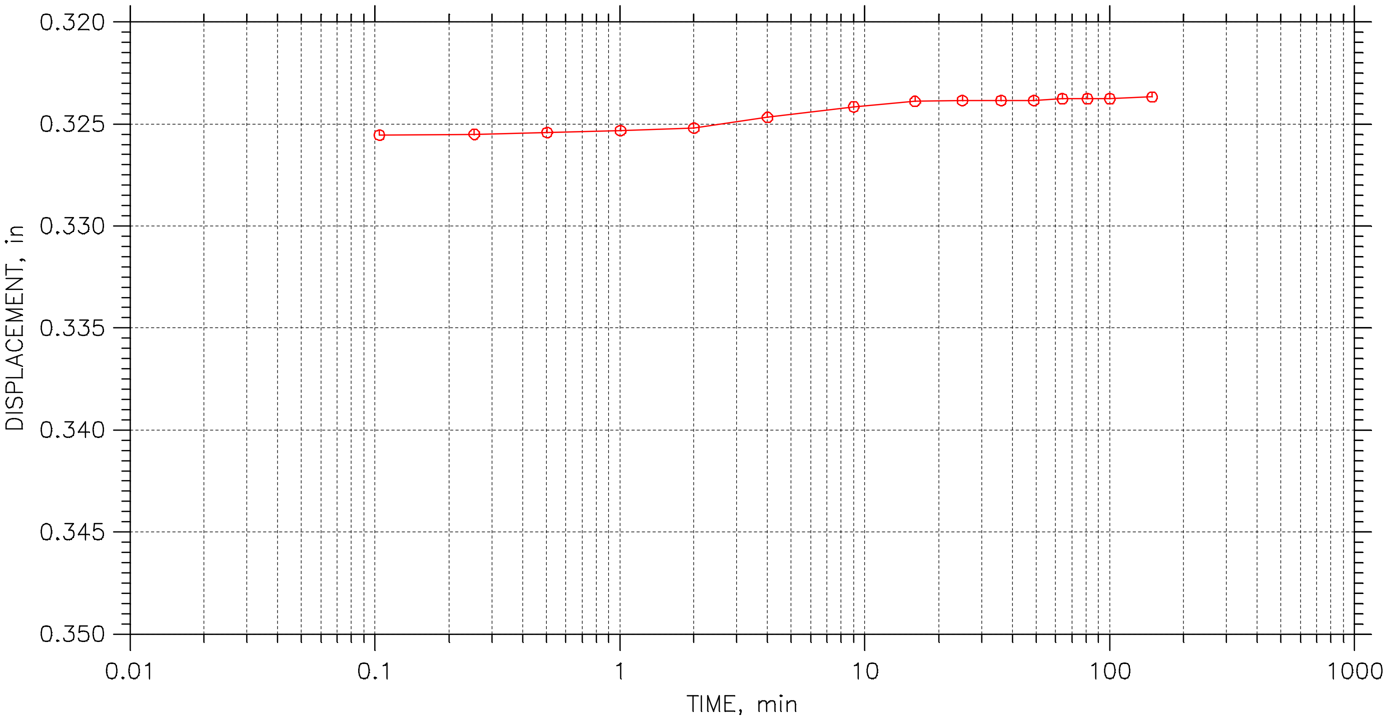
Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

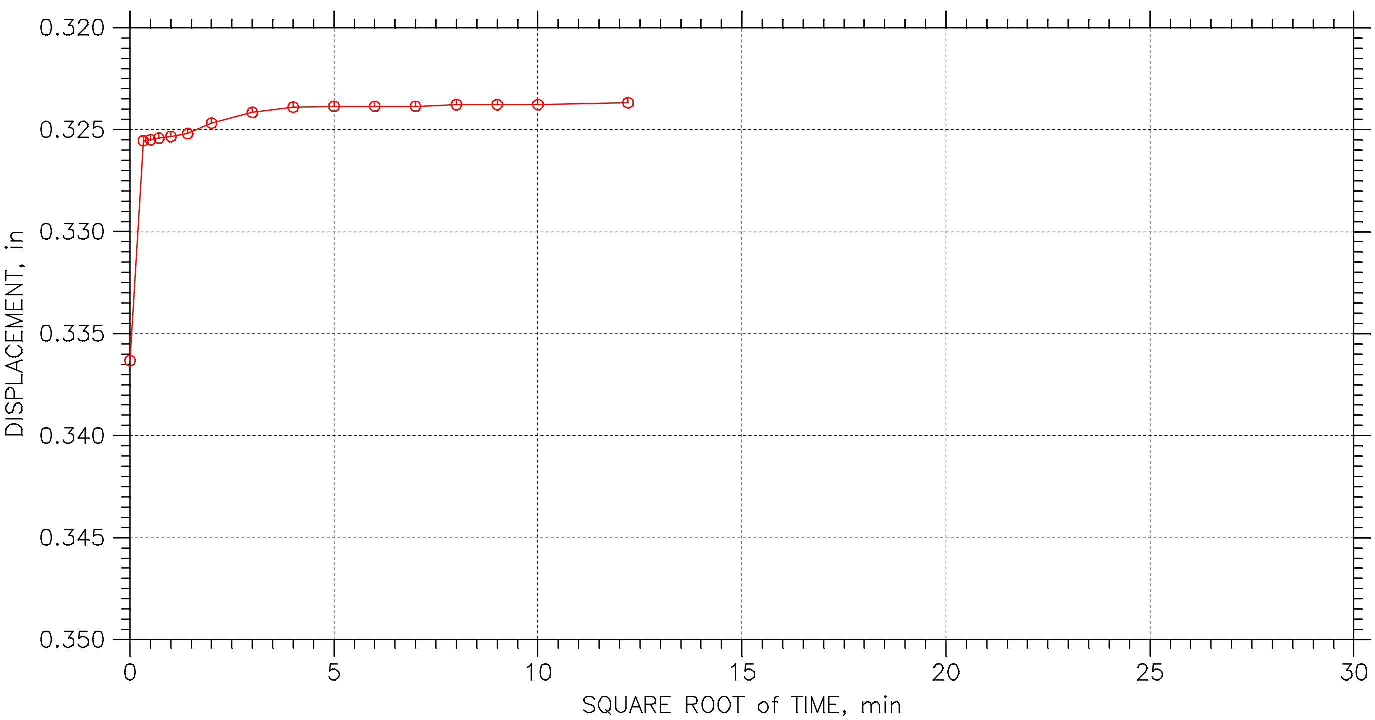
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 19 of 23

Stress: 16. tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

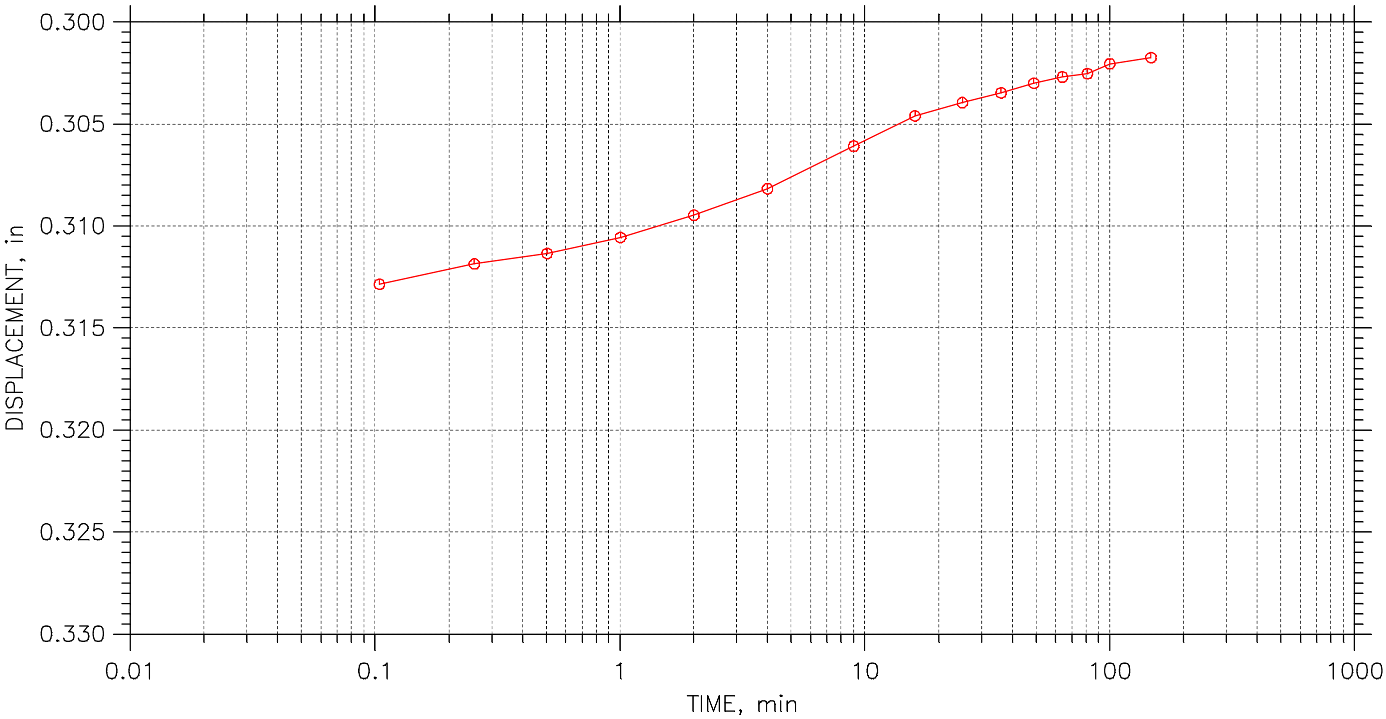
Mon, 16-NOV-2015 17:11:14

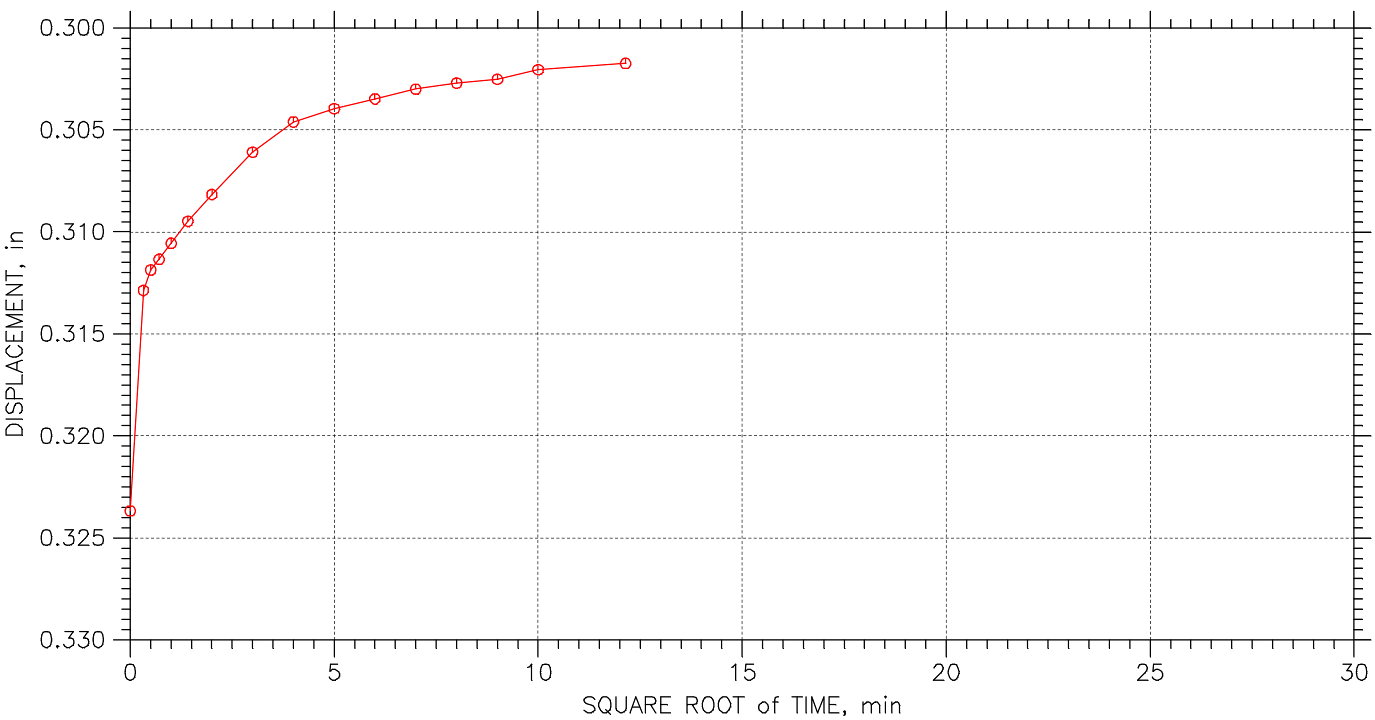
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 20 of 23

Stress: 4. tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

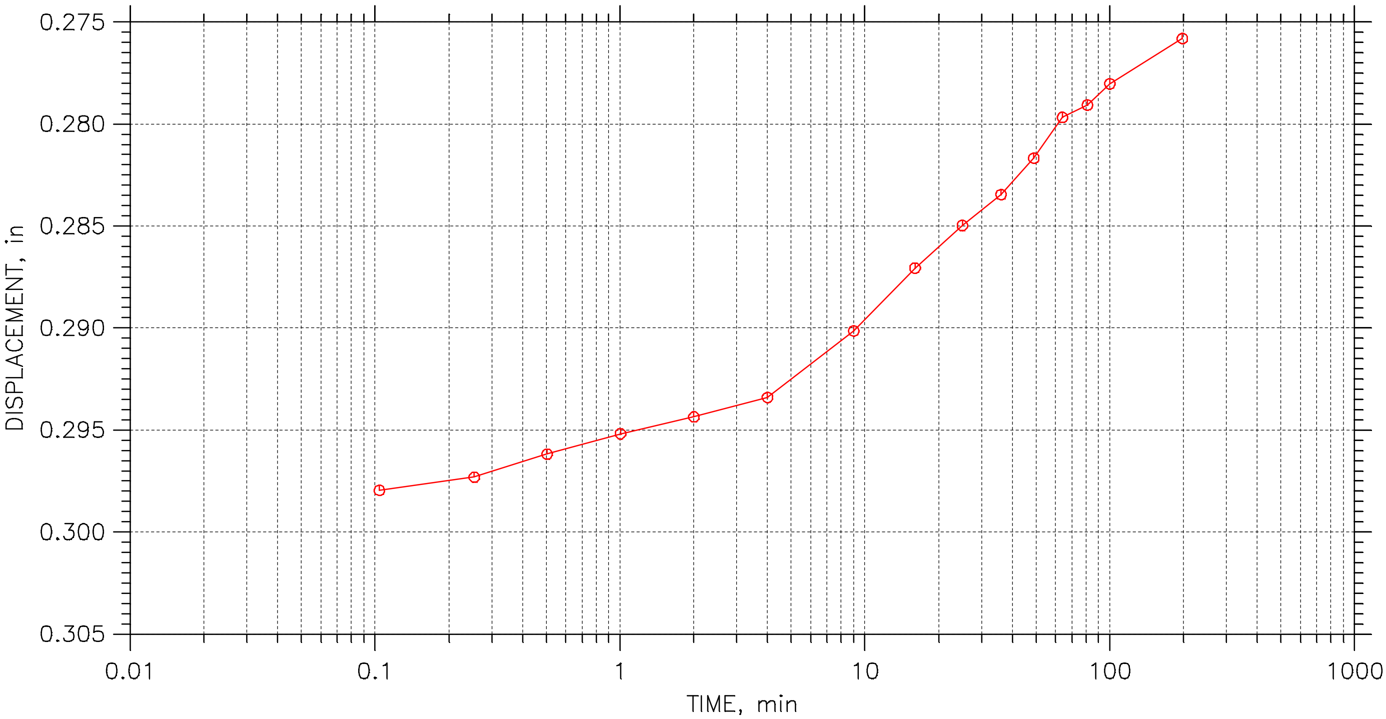
Mon, 16-NOV-2015 17:11:15

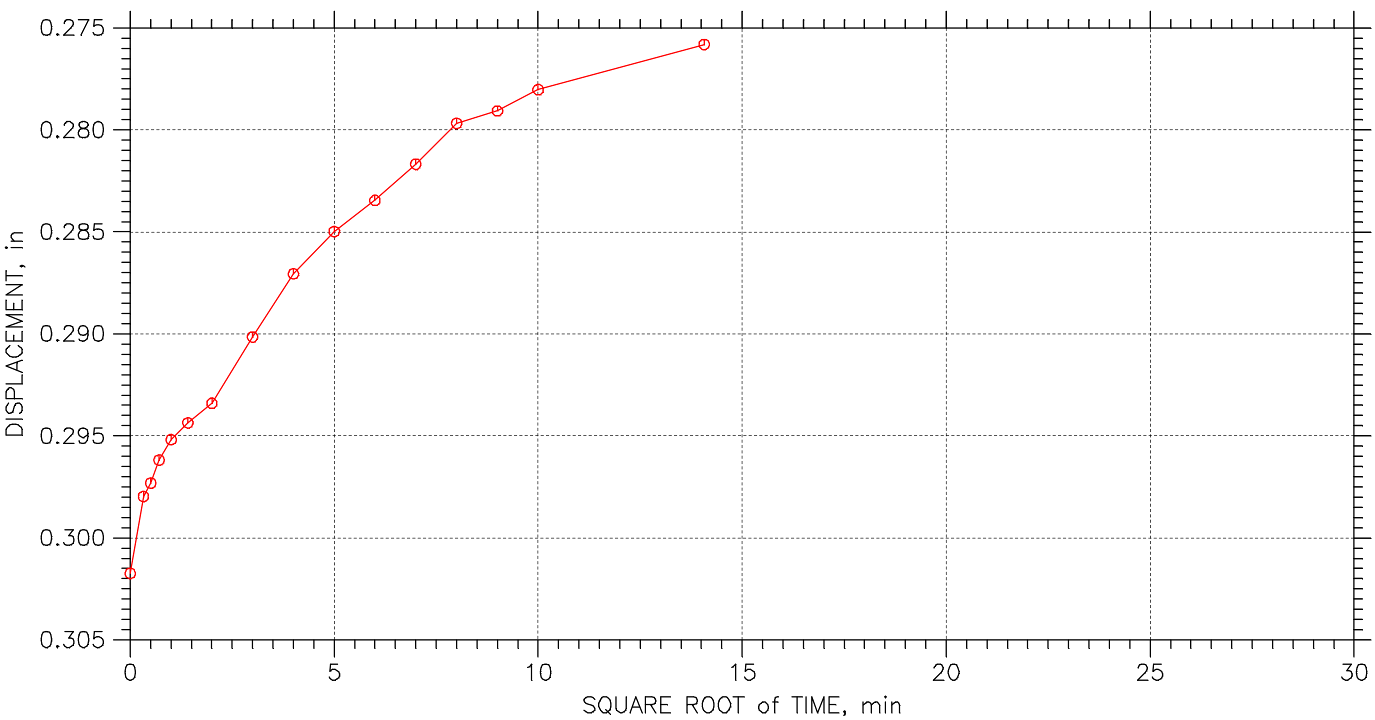
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 21 of 23

Stress: 1. tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

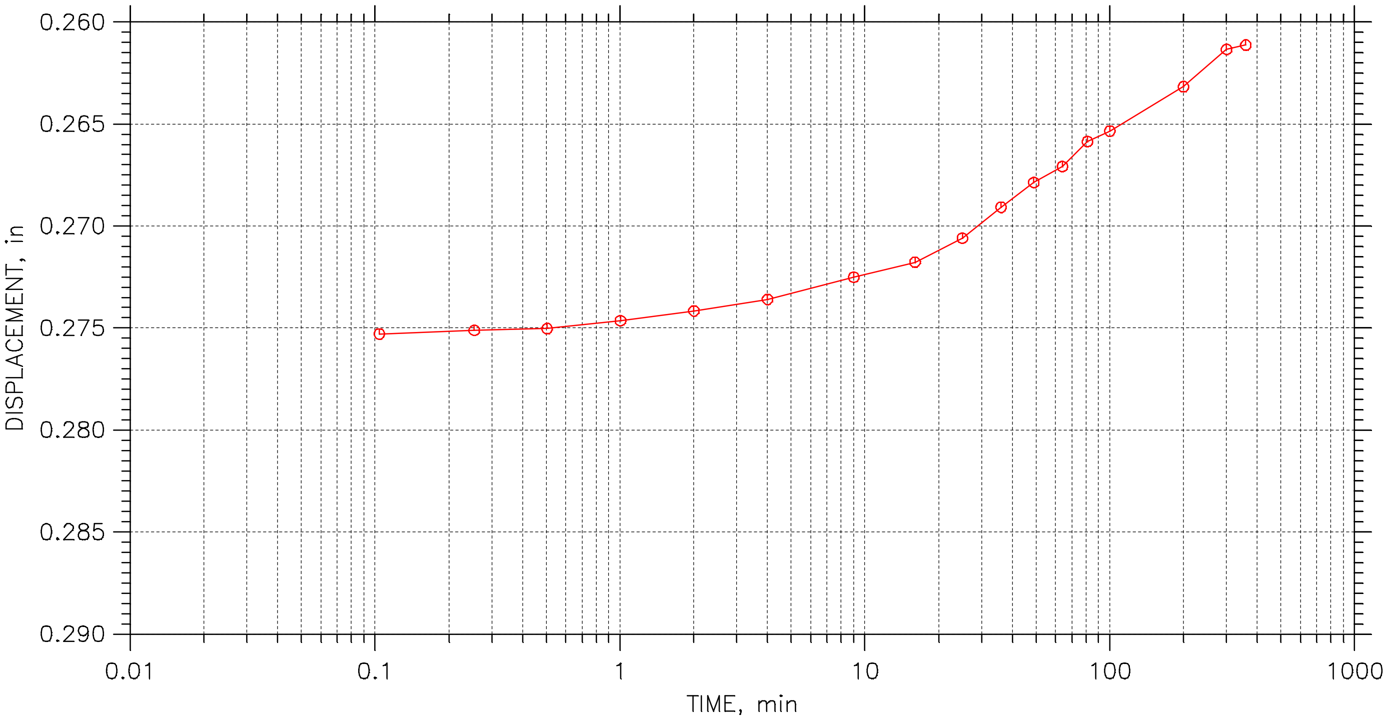
Mon, 16-NOV-2015 17:11:16

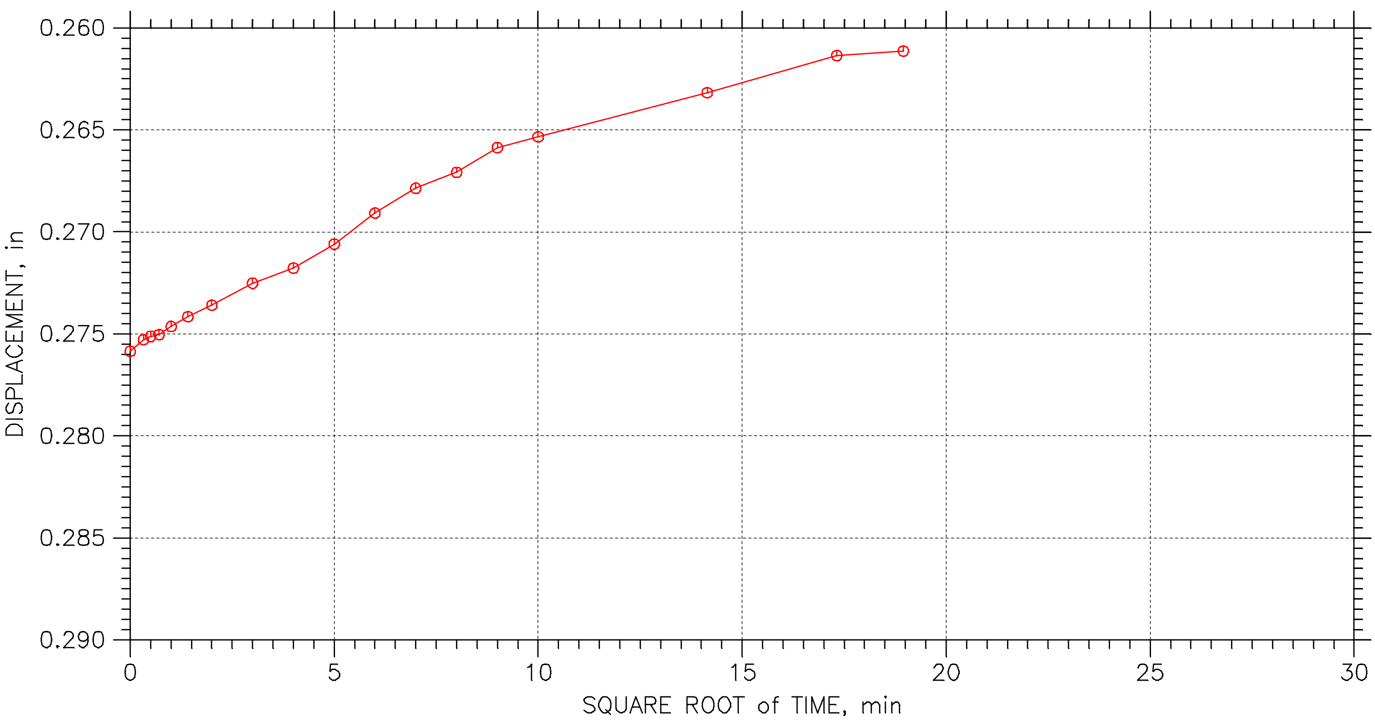
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 22 of 23

Stress: 0.5 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

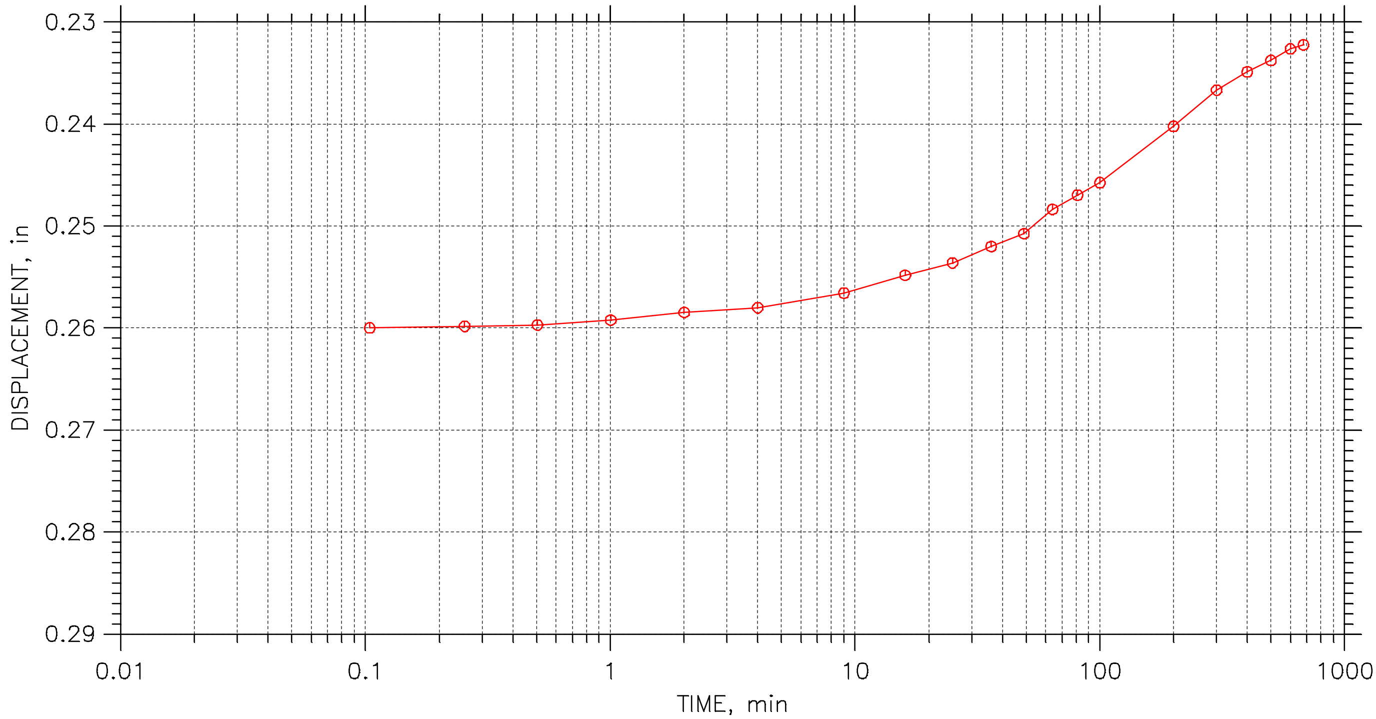
Mon, 16-NOV-2015 17:11:18

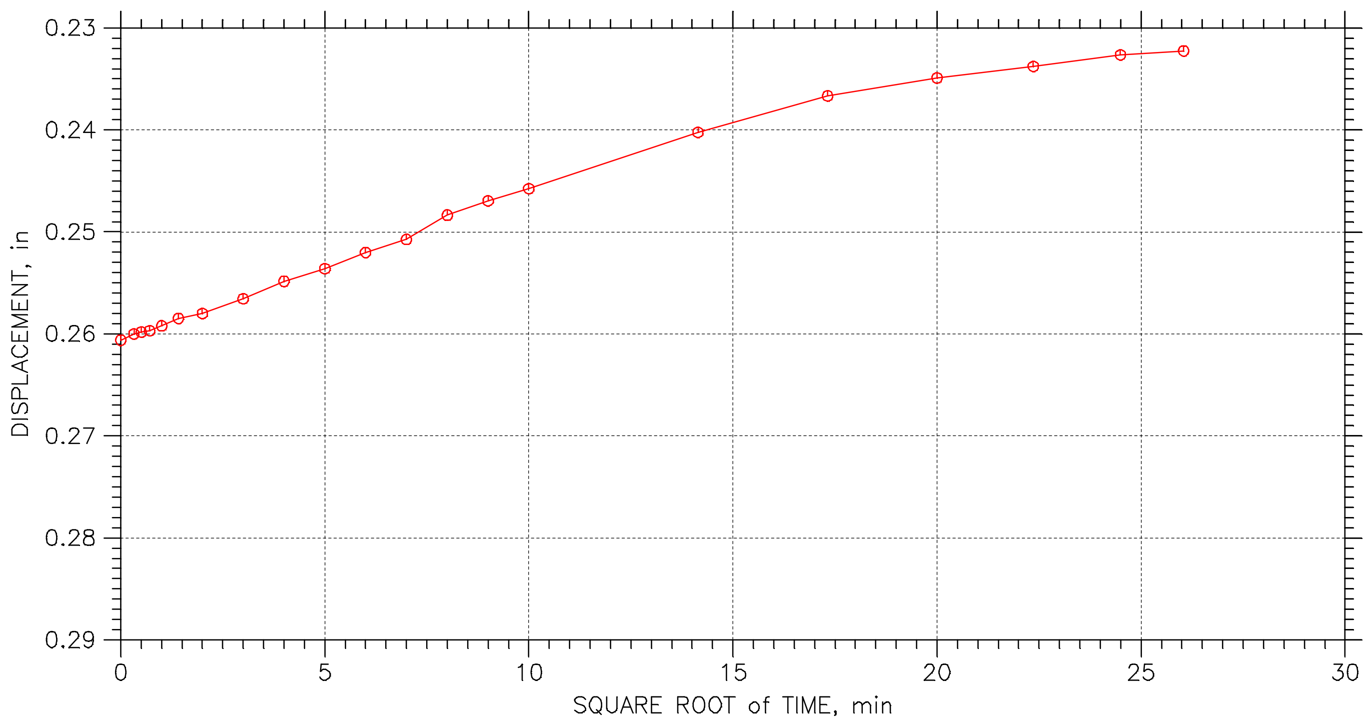
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 23 of 23

Stress: 0.125 tsf



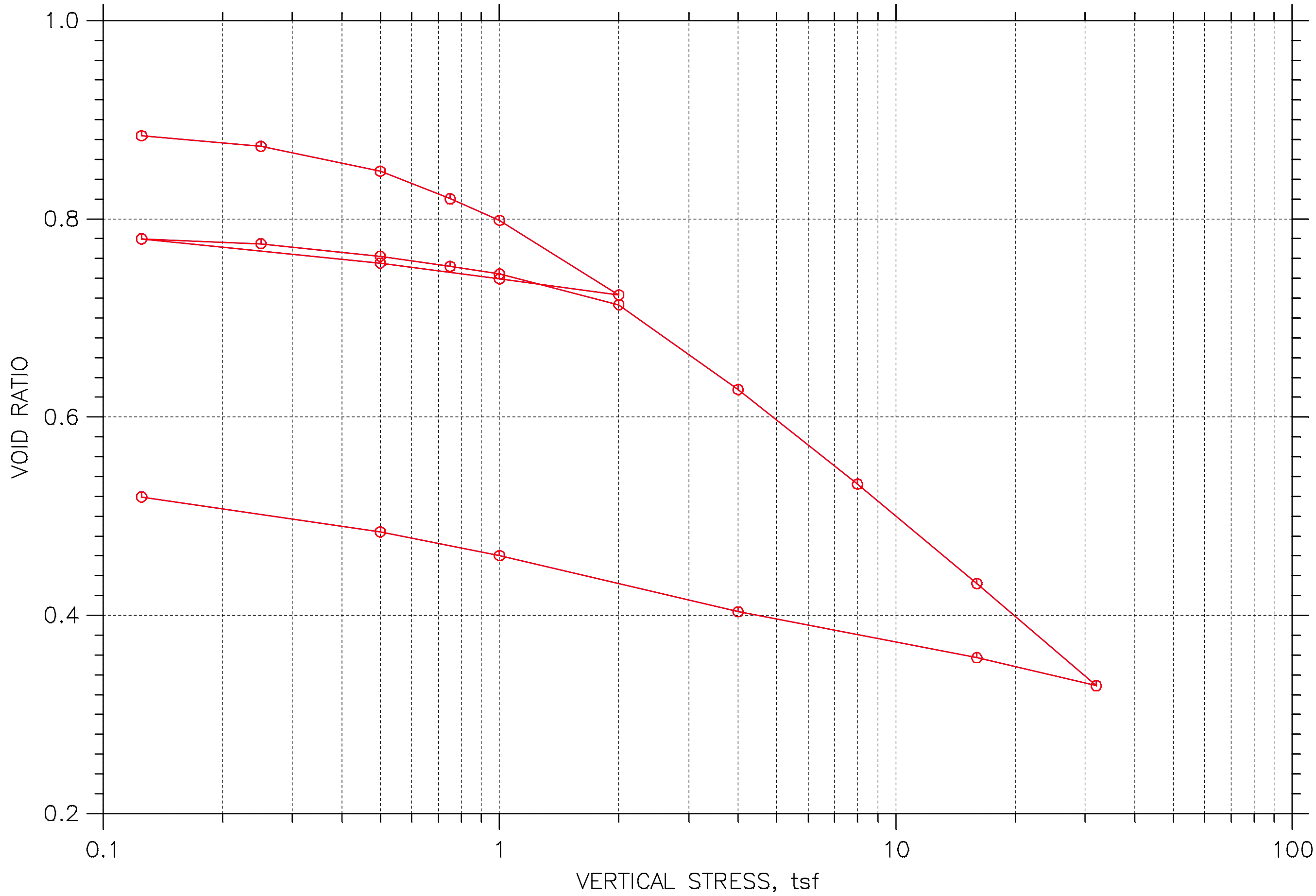


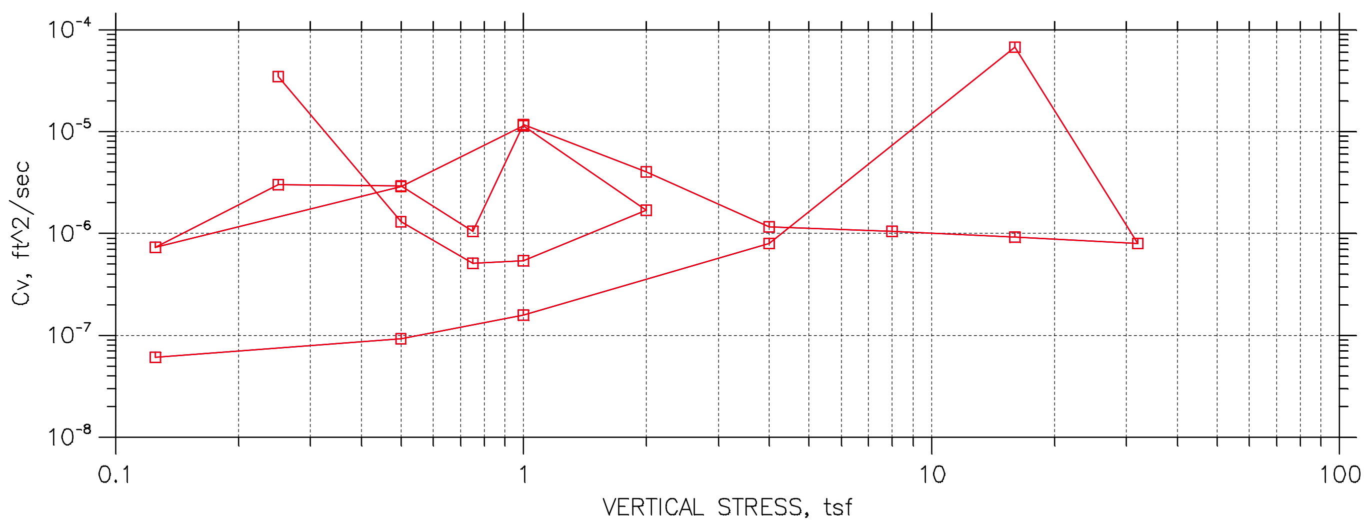
Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B003	Tested By: HP	Checked By: BCM
	Sample No.: S-12	Test Date: 10/26/15	Depth: 45.0'-47.0'
	Test No.: EDW003S12	Sample Type: 3.0'' ST	Elevation: ----
	Description: DARK GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 1.1 tsf Cc = 0.445 Ccr = 0.054 TEST PERFORMED AS PER ASTM D2435		

Mon, 16-NOV-2015 17:11:19

CONSOLIDATION TEST DATA

SUMMARY REPORT





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

Mon, 16-NOV-2015 17:16:44

CONSOLIDATION TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW-B008 S5
Sample No.: S-5
Test No.: EDWB008S5

Location: BARTONVILLE, IL
Tested By: HP
Test Date: 10/26/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: BCM
Depth: 11.0'-13.0'
Elevation: -----

Soil Description: BROWN AND GRAY FAT CLAY WITH SAND CH
Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435

Estimated Specific Gravity: 2.72
Initial Void Ratio: 0.91
Final Void Ratio: 0.52

Liquid Limit: 52
Plastic Limit: 19
Plasticity Index: 33

Initial Height: 0.75 in
Specimen Diameter: 2.49 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	X19	RING	RING	A-8
Wt. Container + Wet Soil, gm	194.52	185.3	175.79	131.94
Wt. Container + Dry Soil, gm	156.81	159.5	159.5	115.76
Wt. Container, gm	44.78	74.3	74.3	31.14
Wt. Dry Soil, gm	112.03	85.199	85.199	84.62
Water Content, %	33.66	30.28	19.12	19.12
Void Ratio	---	0.91	0.52	---
Degree of Saturation, %	---	90.87	100.68	---
Dry Unit Weight, pcf	---	89.066	111.96	---

CONSOLIDATION TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW-B008 S5
Sample No.: S-5
Test No.: EDWB008S5

Location: BARTONVILLE, IL
Tested By: HP
Test Date: 10/26/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: BCM
Depth: 11.0'-13.0'
Elevation: -----

Soil Description: BROWN AND GRAY FAT CLAY WITH SAND CH
Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435

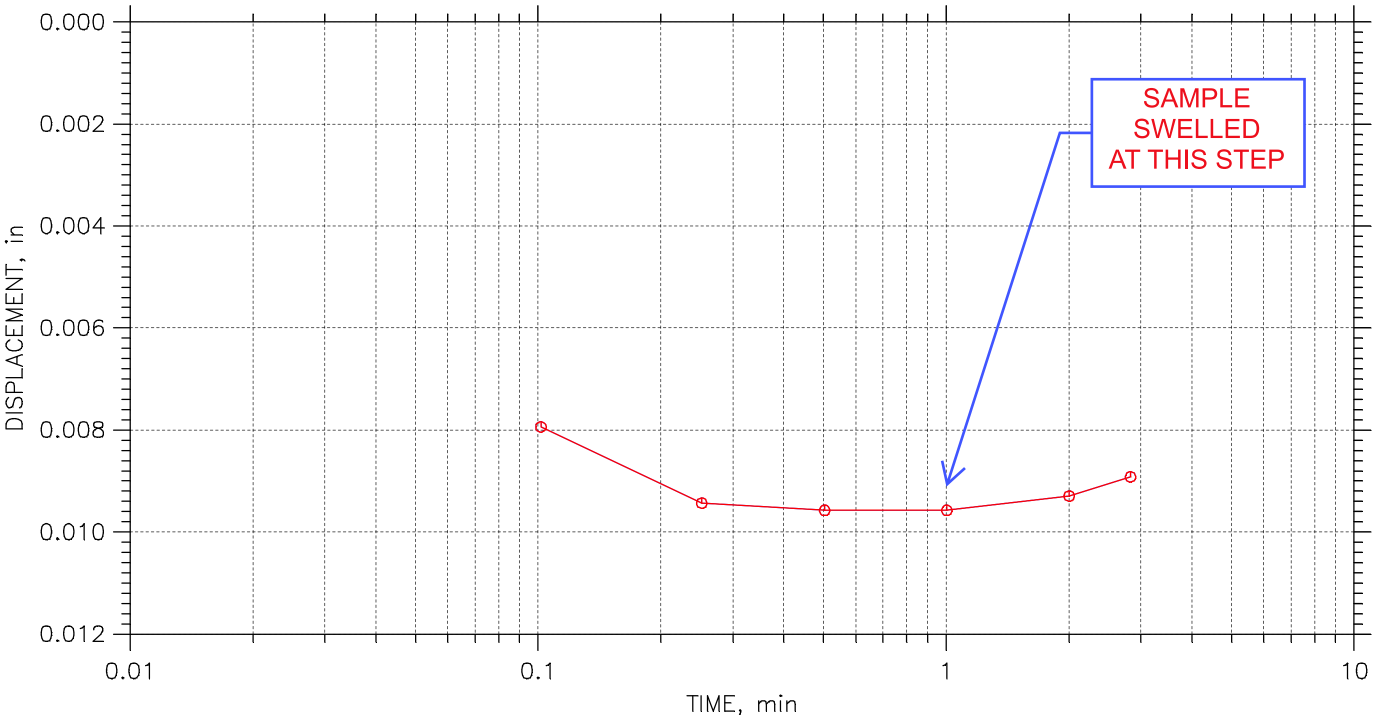
	Applied	Final	Void	Strain	T50 Fitting		Coefficient of Consolidation		
	Stress	Displacement	Ratio	at End	Sq.Rt.	Log	Sq.Rt.	Log	Ave.
	tsf	in		%	min	min	ft^2/sec	ft^2/sec	ft^2/sec
1	0.125	0.008922	0.884	1.19	0.0	0.0	0.00e+000	0.00e+000	0.00e+000
2	0.25	0.01289	0.874	1.72	0.1	0.0	3.48e-005	0.00e+000	3.48e-005
3	0.5	0.02294	0.848	3.07	1.5	0.5	2.05e-006	5.95e-006	3.05e-006
4	0.75	0.03373	0.821	4.51	5.8	0.0	5.07e-007	0.00e+000	5.07e-007
5	1	0.04241	0.798	5.67	3.8	3.2	7.58e-007	8.96e-007	8.21e-007
6	2	0.07189	0.723	9.61	2.1	1.1	1.30e-006	2.41e-006	1.69e-006
7	1	0.06554	0.739	8.76	0.2	0.0	1.15e-005	0.00e+000	1.15e-005
8	0.5	0.05914	0.756	7.91	0.9	0.0	2.88e-006	0.00e+000	2.88e-006
9	0.125	0.0497	0.780	6.64	3.7	0.0	7.35e-007	0.00e+000	7.35e-007
10	0.25	0.05157	0.775	6.89	0.9	0.0	3.01e-006	0.00e+000	3.01e-006
11	0.5	0.05657	0.762	7.56	0.9	0.0	2.94e-006	0.00e+000	2.94e-006
12	0.75	0.06059	0.752	8.10	3.9	1.3	6.94e-007	2.10e-006	1.04e-006
13	1	0.06357	0.744	8.50	0.2	0.0	1.18e-005	0.00e+000	1.18e-005
14	2	0.07577	0.713	10.13	0.9	0.4	2.80e-006	7.14e-006	4.02e-006
15	4	0.1094	0.628	14.62	2.1	0.0	1.17e-006	0.00e+000	1.17e-006
16	8	0.1468	0.532	19.63	2.1	0.0	1.04e-006	0.00e+000	1.04e-006
17	16	0.1861	0.432	24.88	2.1	0.0	9.17e-007	0.00e+000	9.17e-007
18	32	0.2266	0.329	30.29	2.1	0.0	7.97e-007	0.00e+000	7.97e-007
19	16	0.2155	0.357	28.81	0.0	0.0	6.68e-005	0.00e+000	6.68e-005
20	4	0.1974	0.403	26.38	2.1	0.0	7.97e-007	0.00e+000	7.97e-007
21	1	0.1751	0.460	23.40	11.4	0.0	1.58e-007	0.00e+000	1.58e-007
22	0.5	0.1661	0.483	22.21	8.8	0.0	2.16e-007	0.00e+000	2.16e-007
23	0.125	0.153	0.517	20.45	32.0	0.0	6.18e-008	0.00e+000	6.18e-008

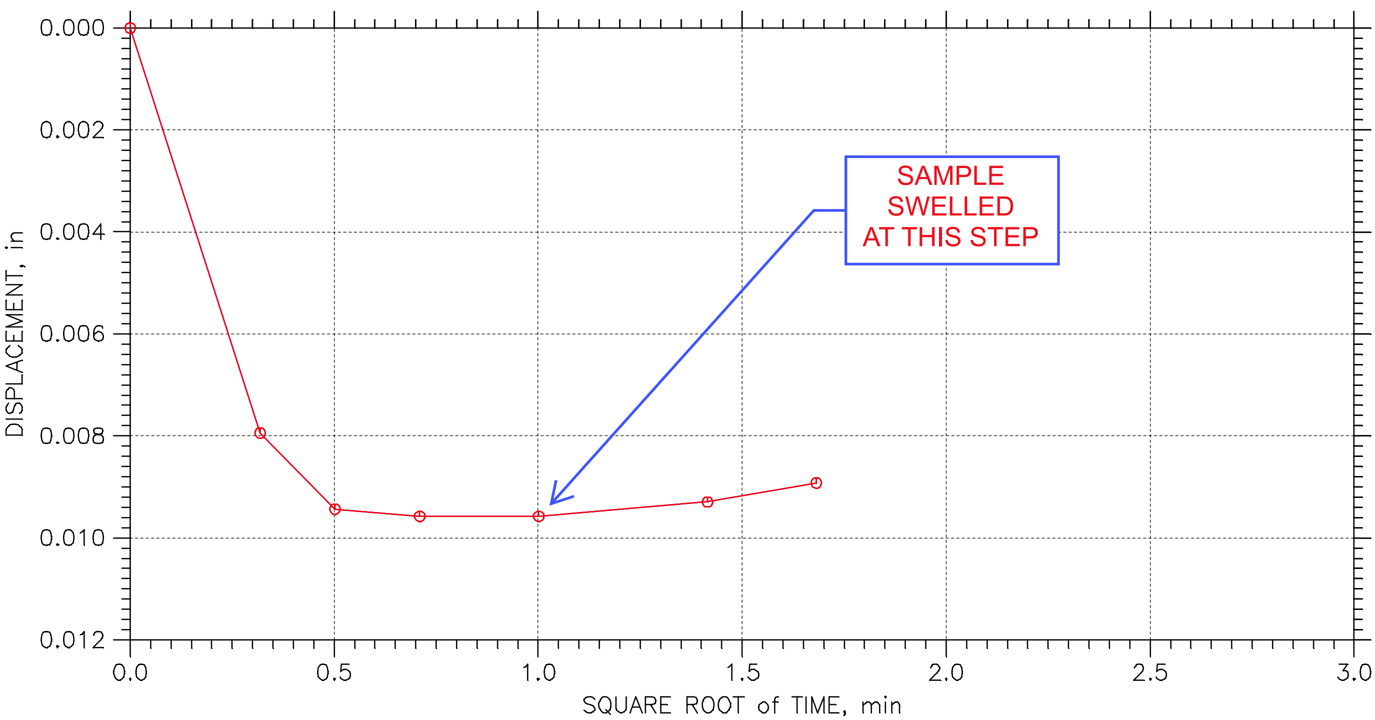
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 1 of 23

Stress: 0.125 tsf





Terracon Consulting Engineers & Scientists			
	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

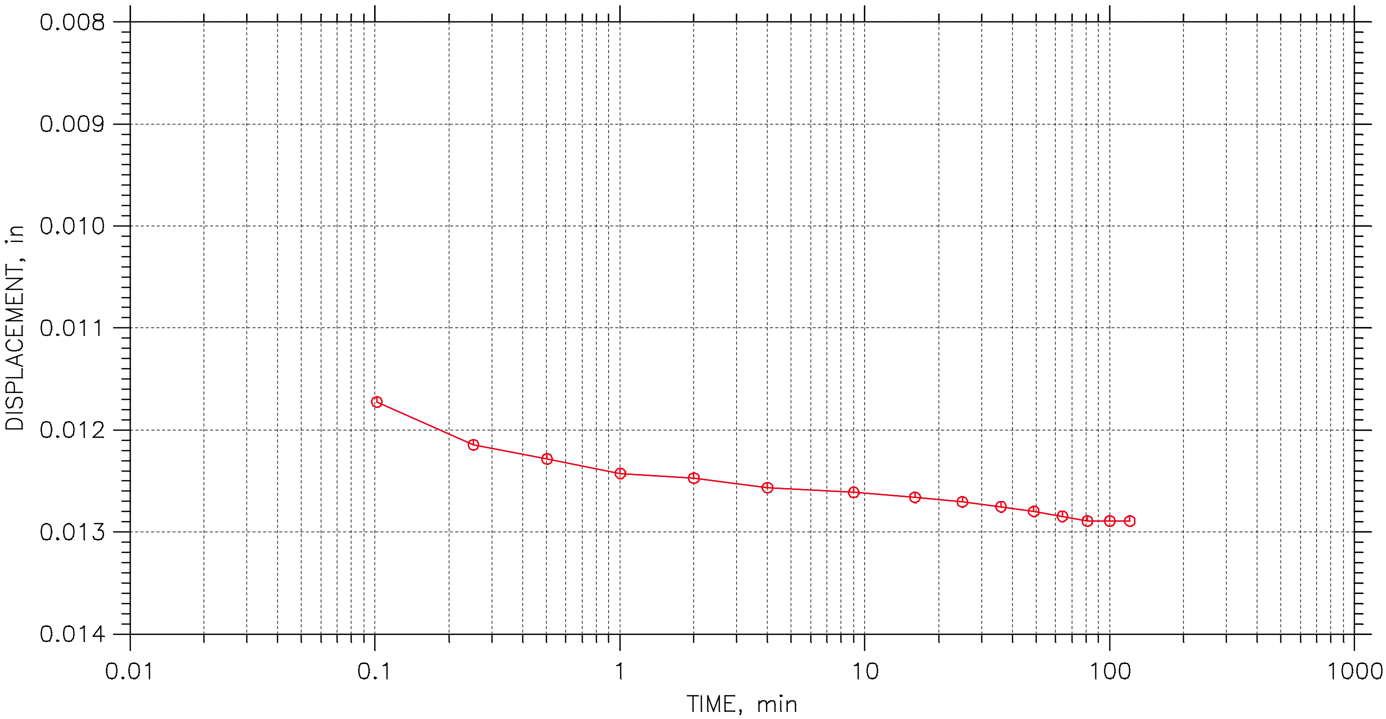
Mon, 16-NOV-2015 18:54:39

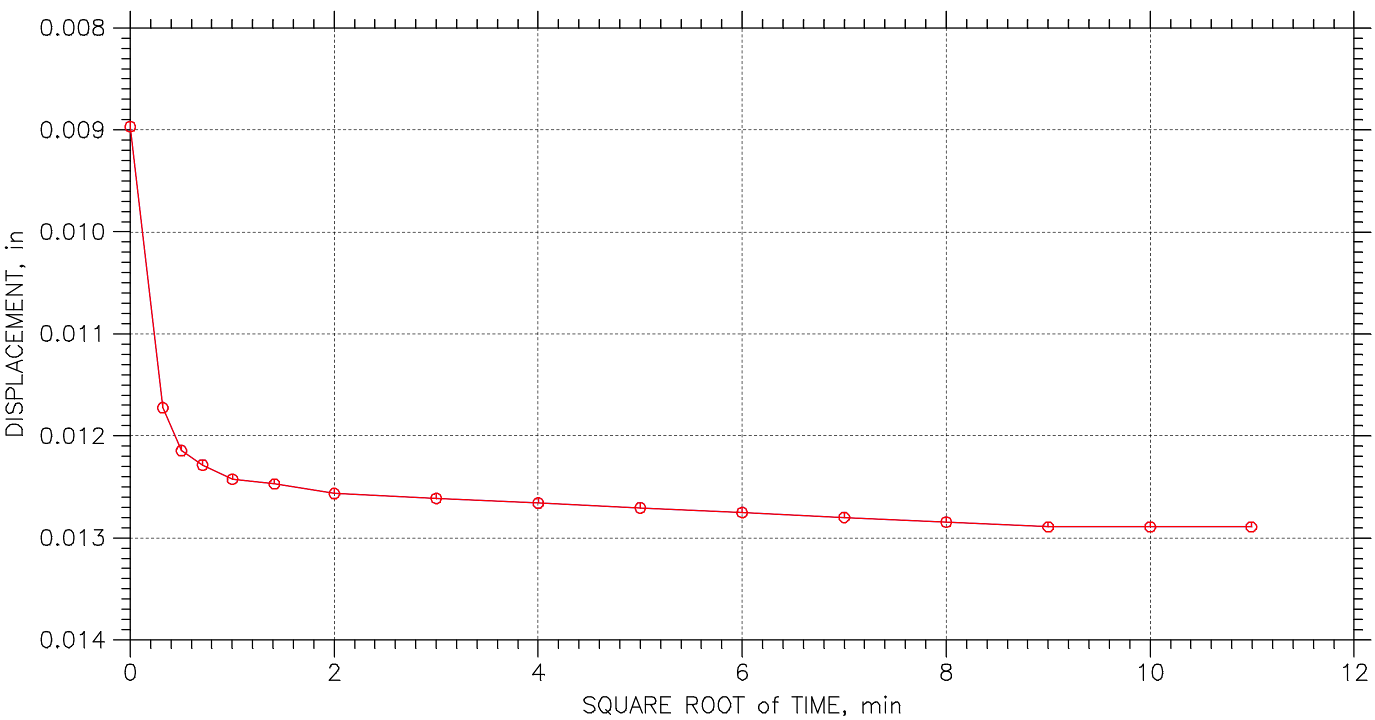
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 2 of 23

Stress: 0.25 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0" ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

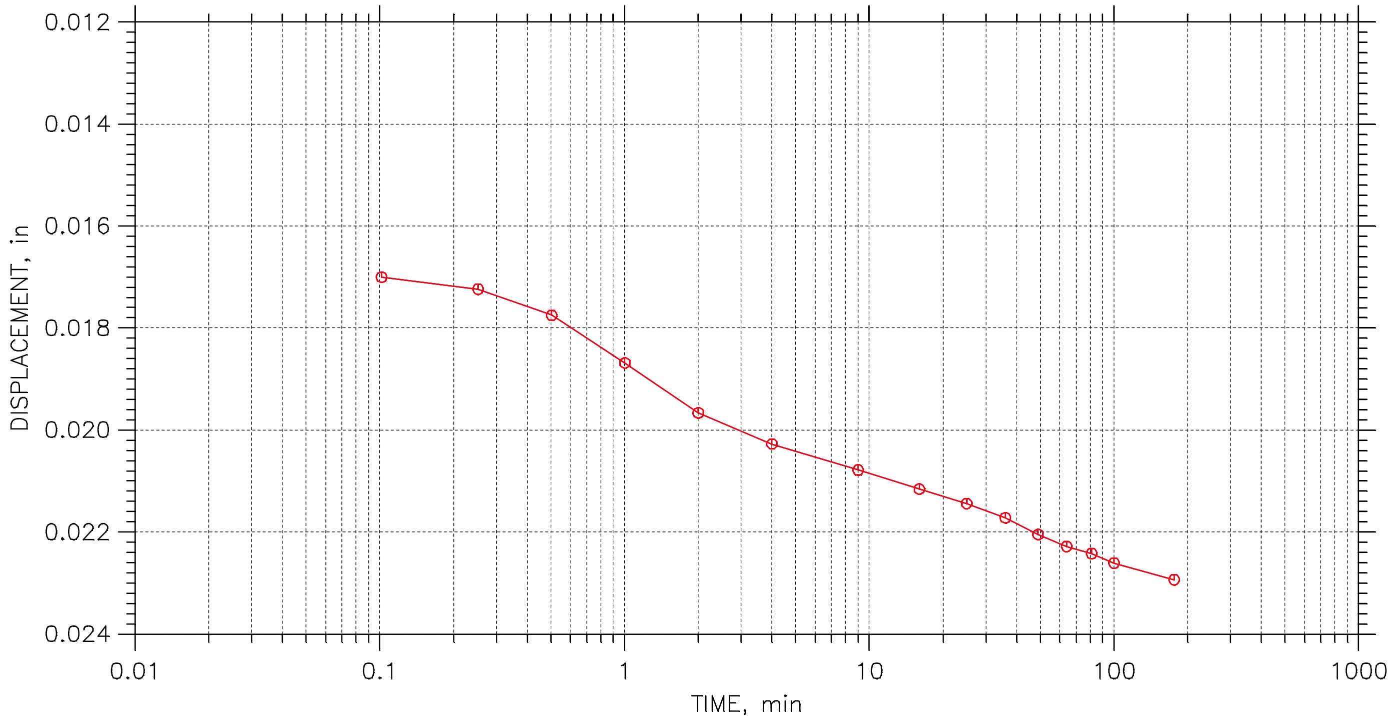
Mon, 16-NOV-2015 18:54:41

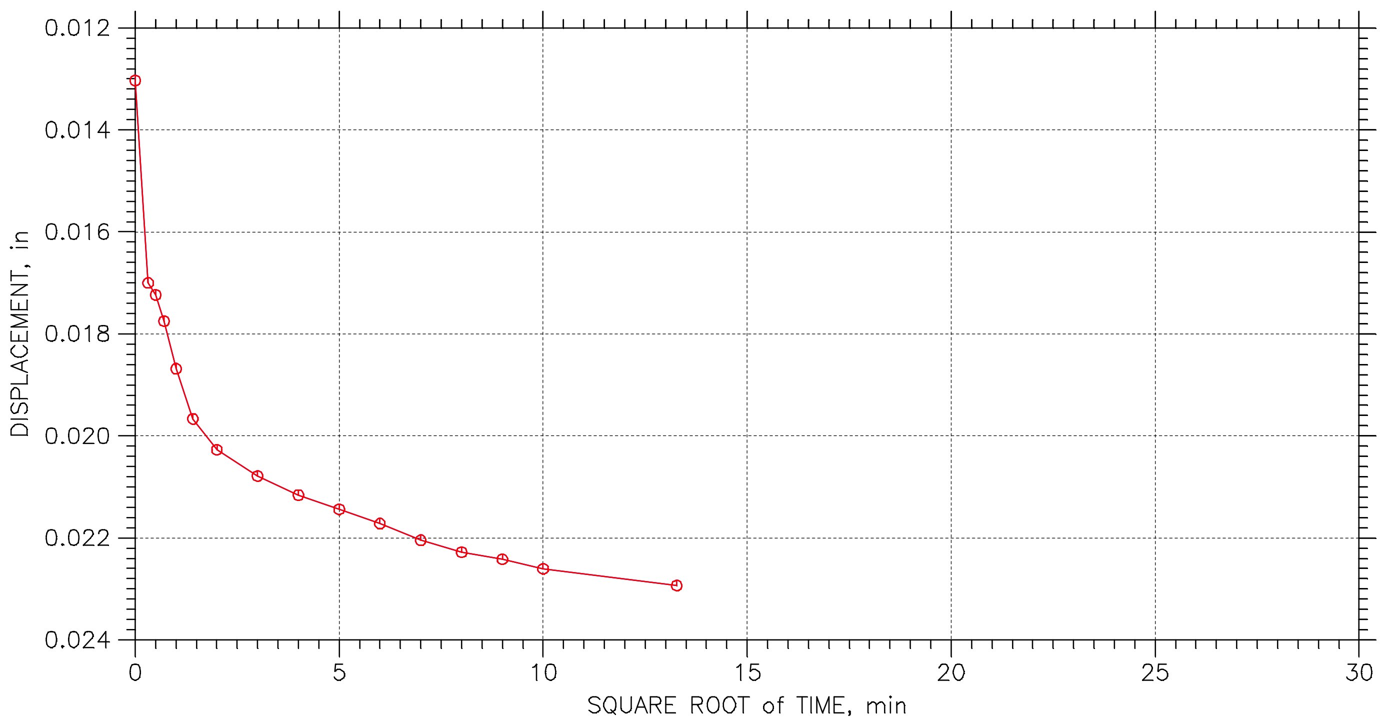
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 3 of 23

Stress: 0.5 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0" ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

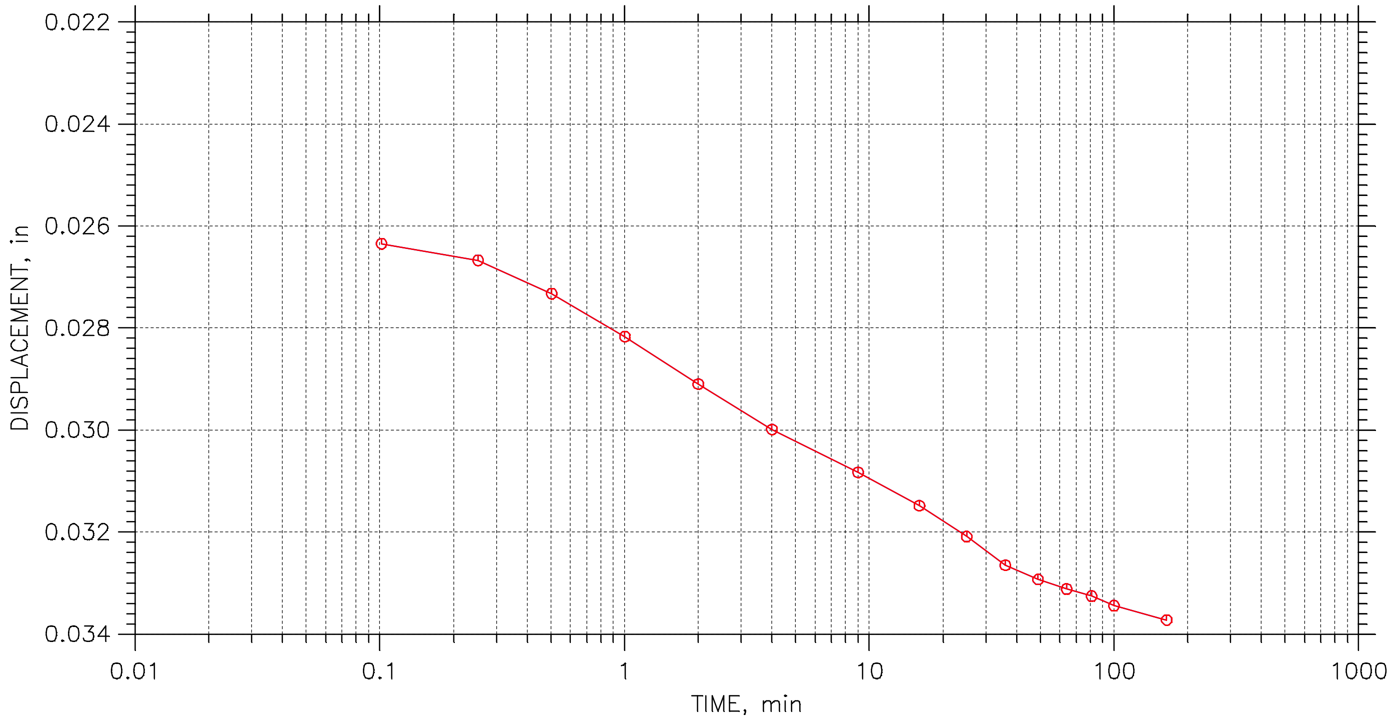
Mon, 16-NOV-2015 18:54:42

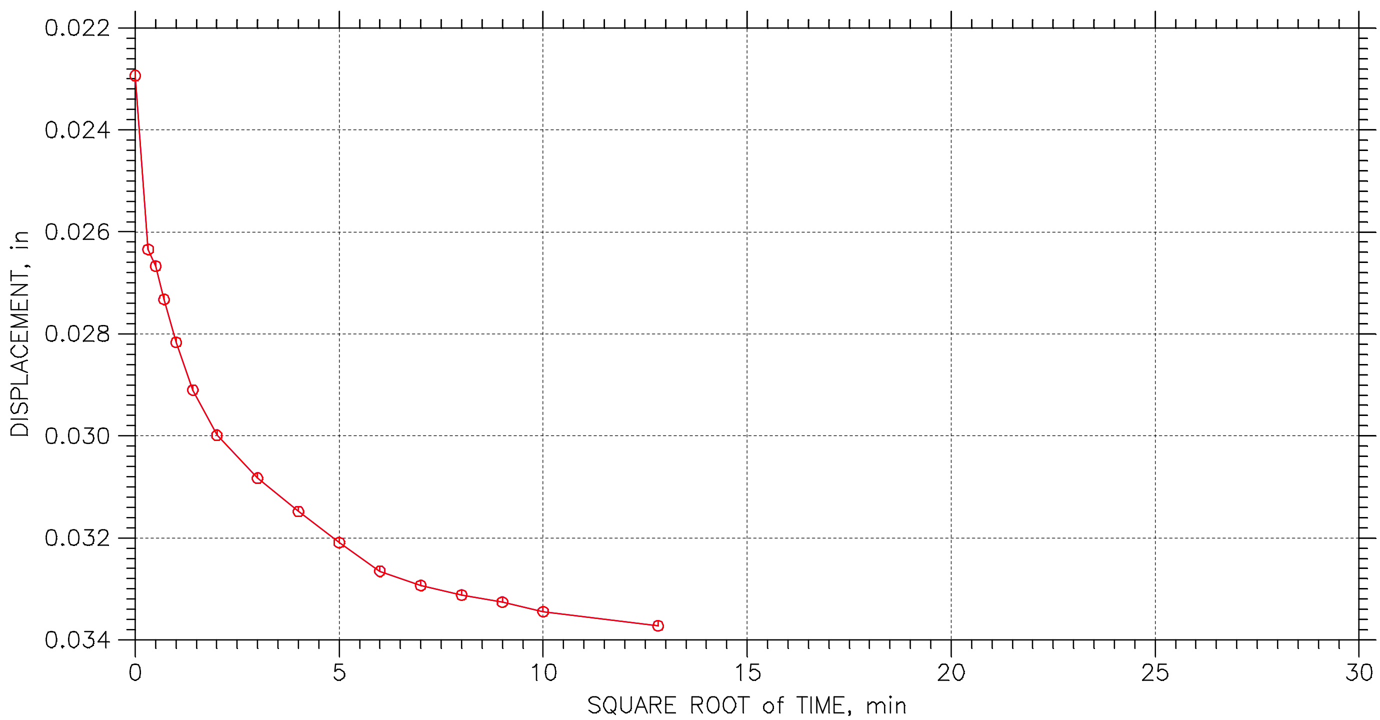
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 4 of 23

Stress: 0.75 tsf





Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
Test No.: EDWB008S5	Sample Type: 3.0" ST	Elevation: -----
Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

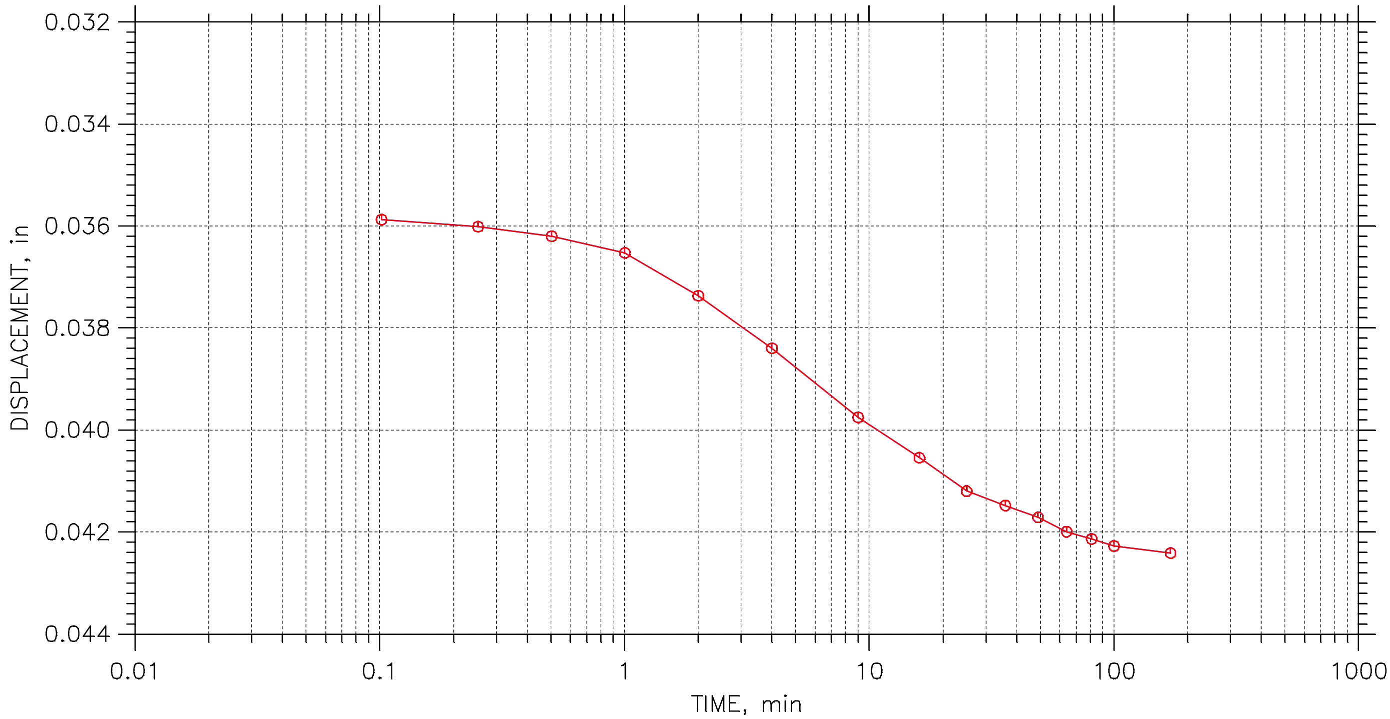
Mon, 16-NOV-2015 18:54:44

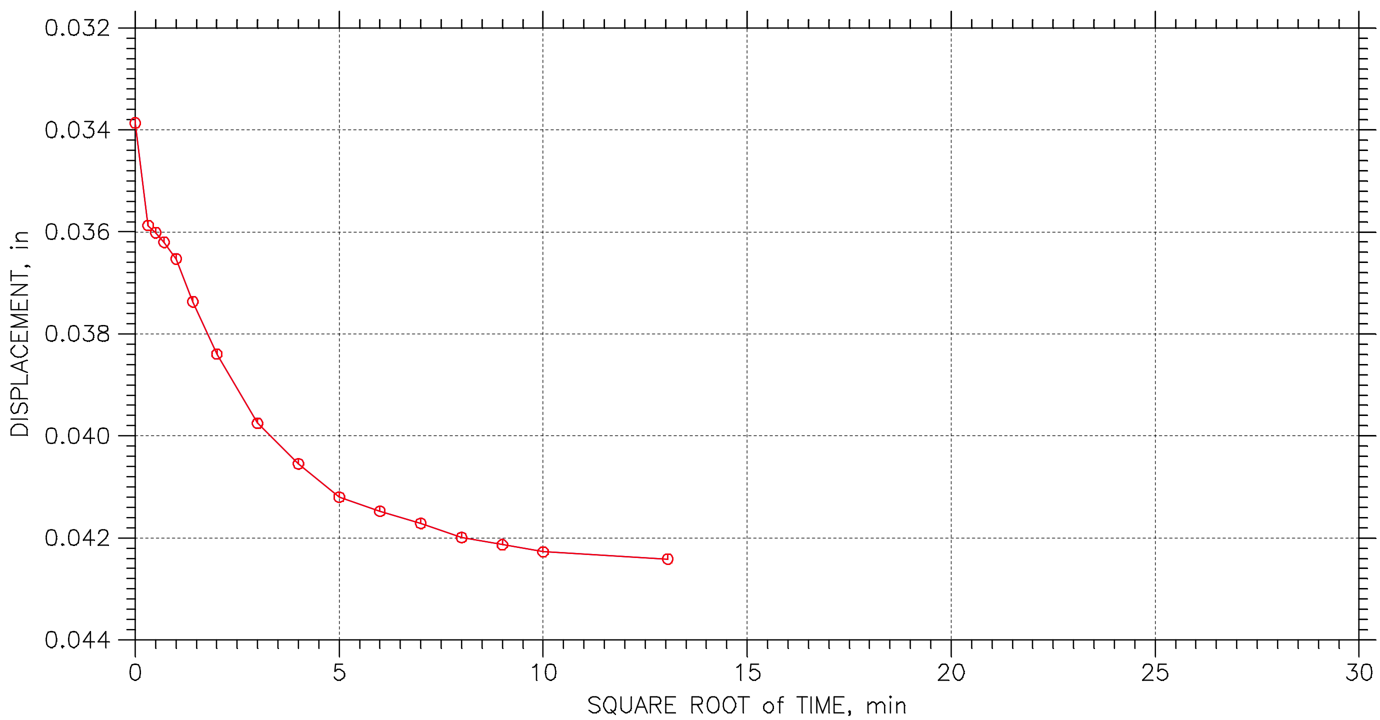
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 5 of 23

Stress: 1. tsf





Terracon Consulting Engineers & Scientists			
	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

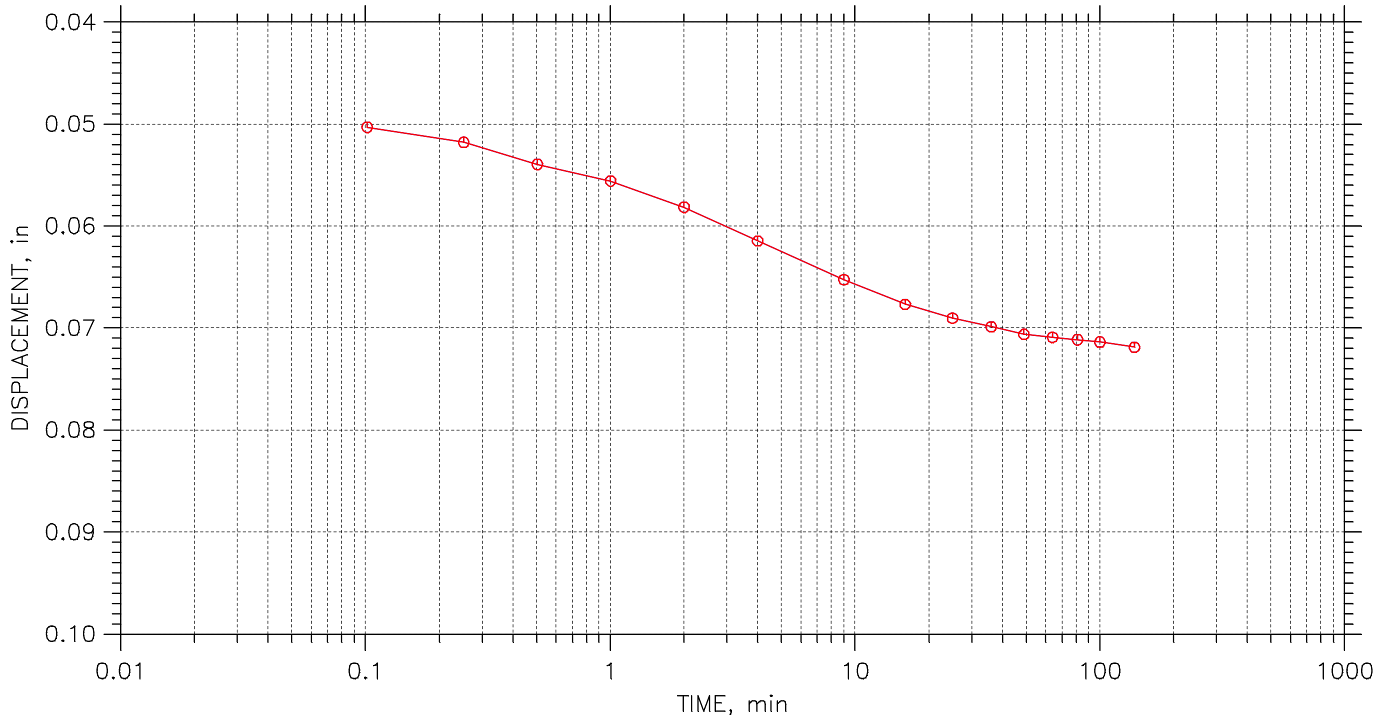
Mon, 16-NOV-2015 18:54:46

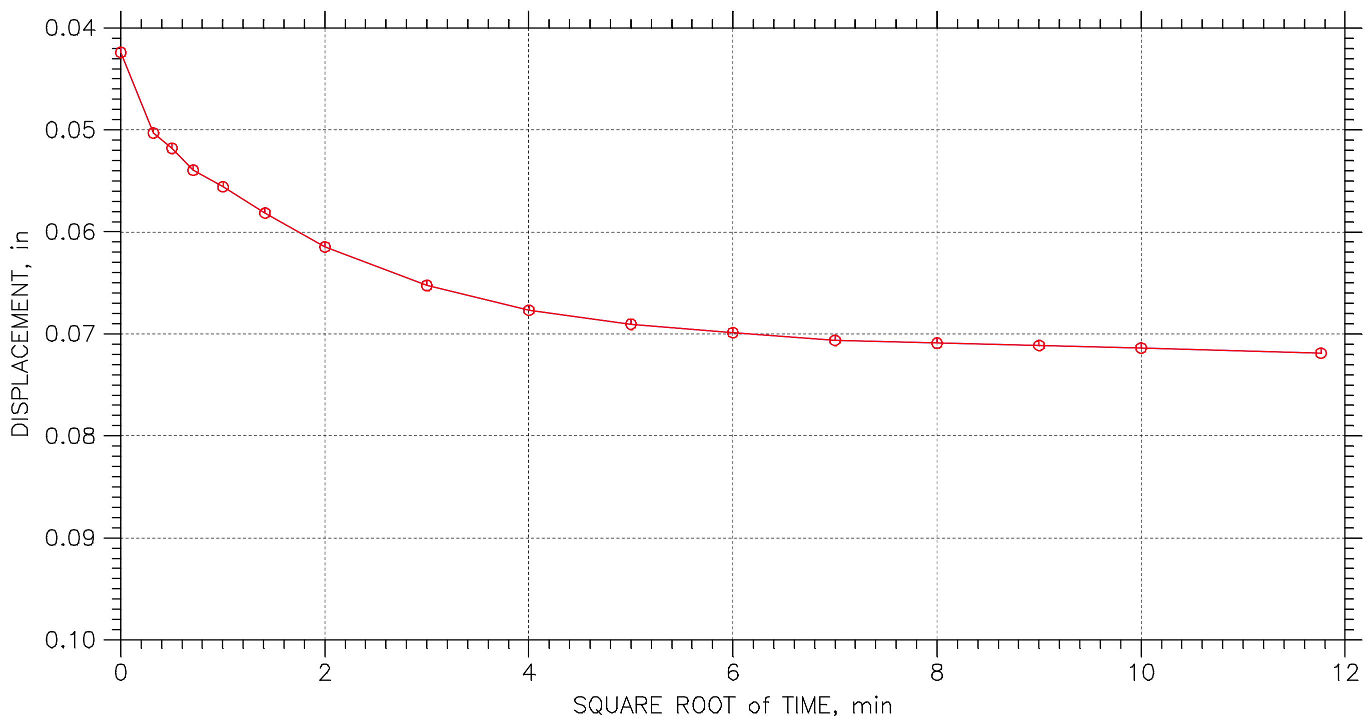
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 6 of 23

Stress: 2. tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

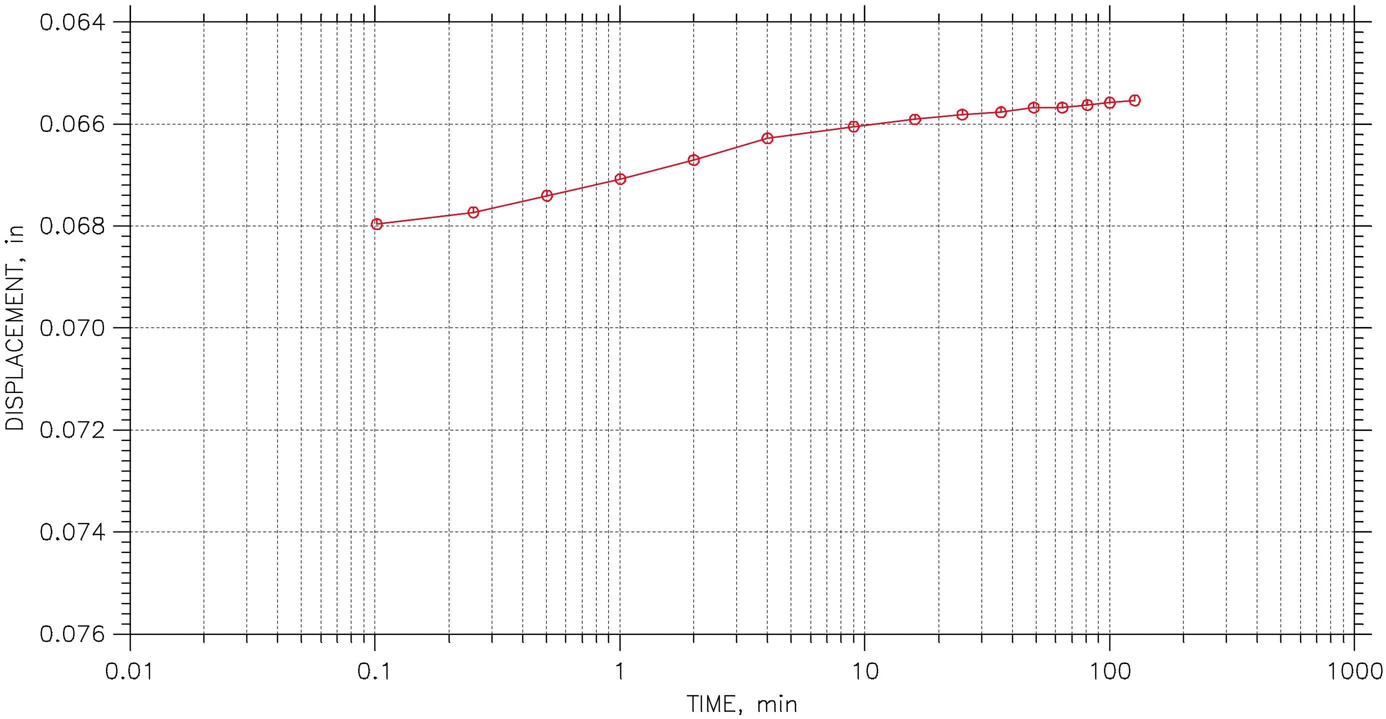
Mon, 16-NOV-2015 18:54:47

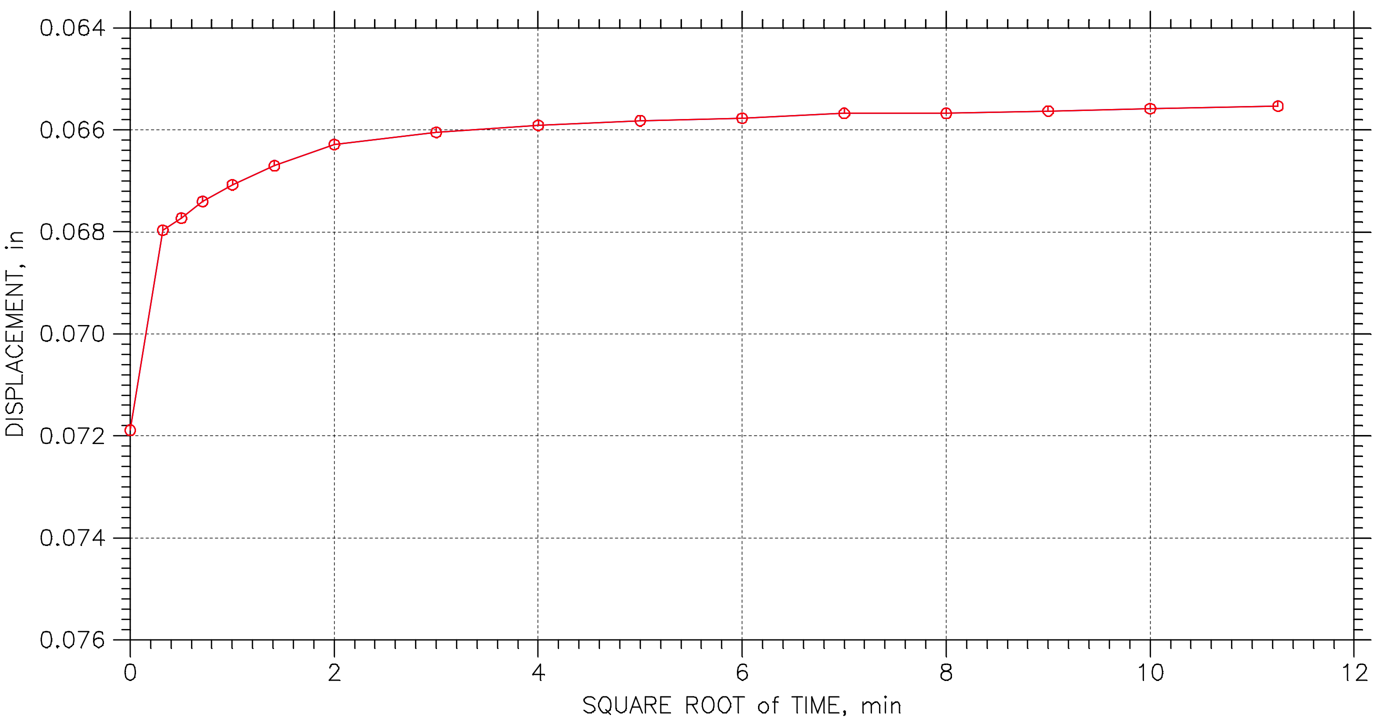
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 7 of 23

Stress: 1. tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

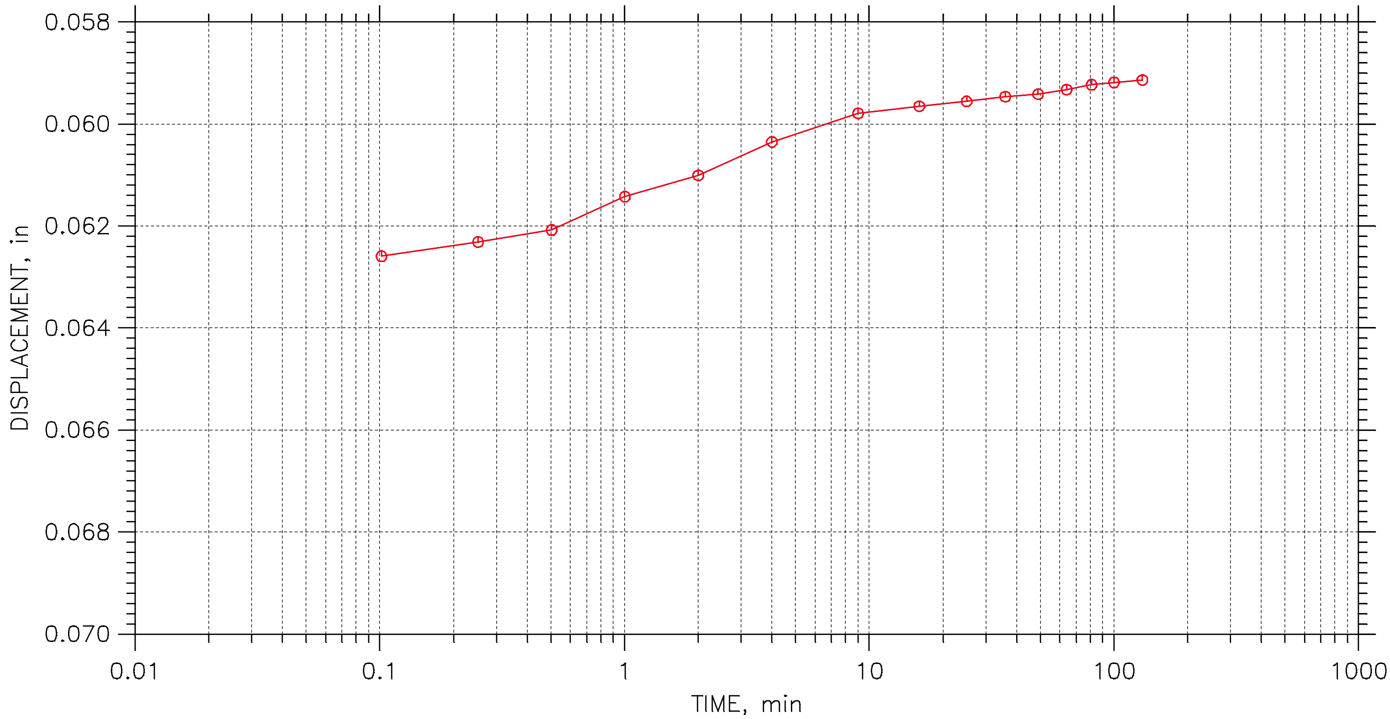
Mon, 16-NOV-2015 18:54:49

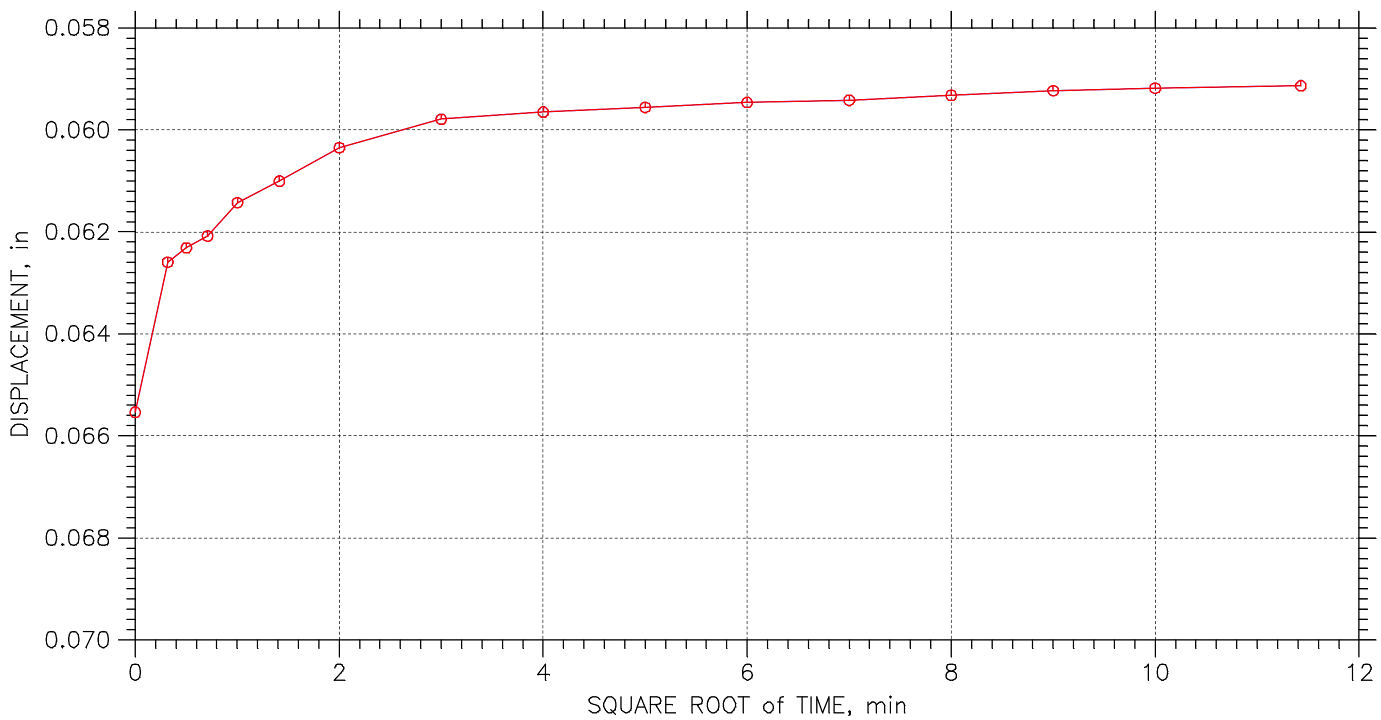
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 8 of 23

Stress: 0.5 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

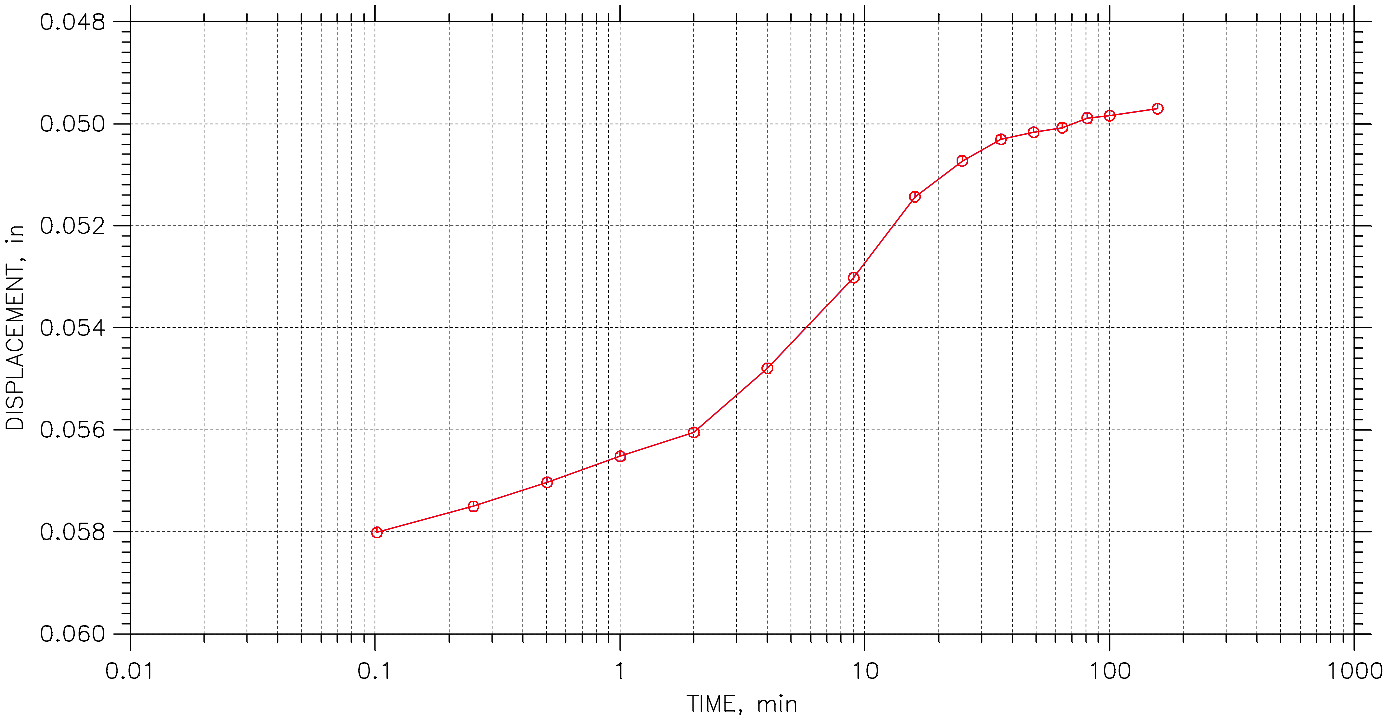
Mon, 16-NOV-2015 18:54:50

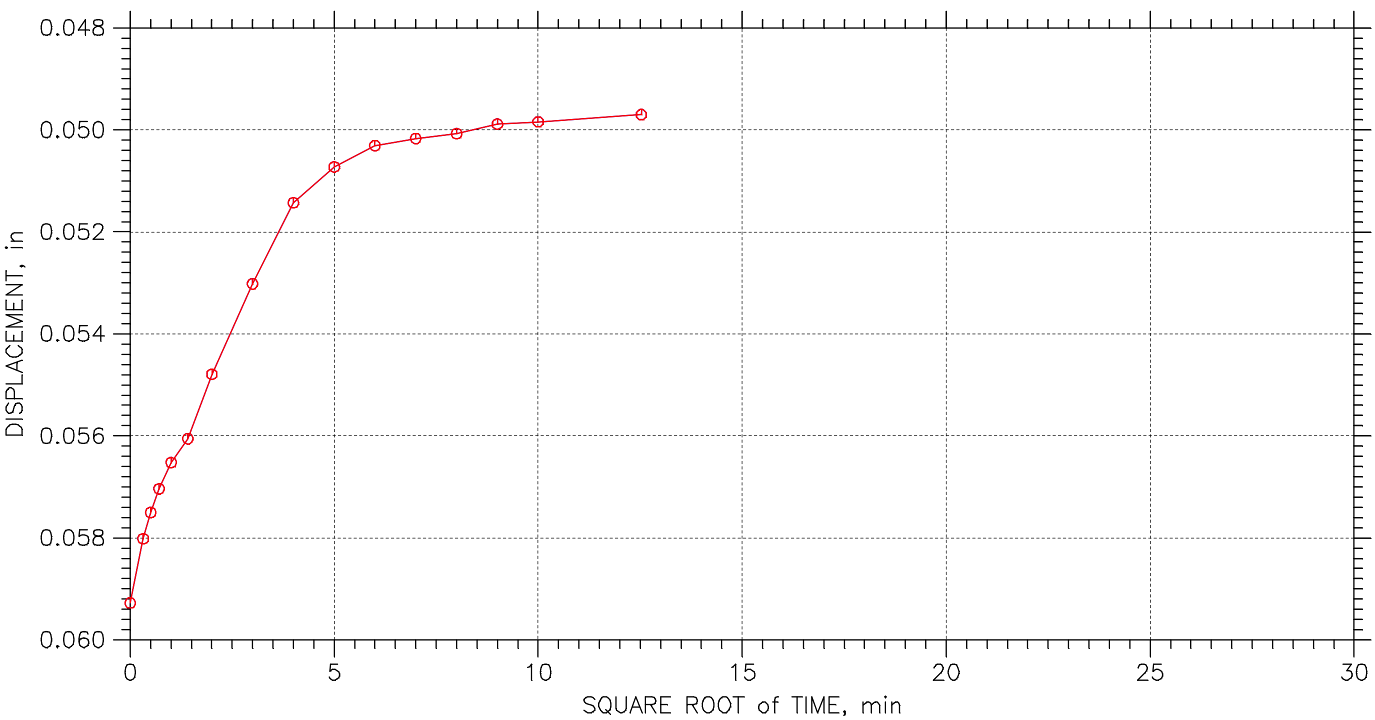
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 9 of 23

Stress: 0.125 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

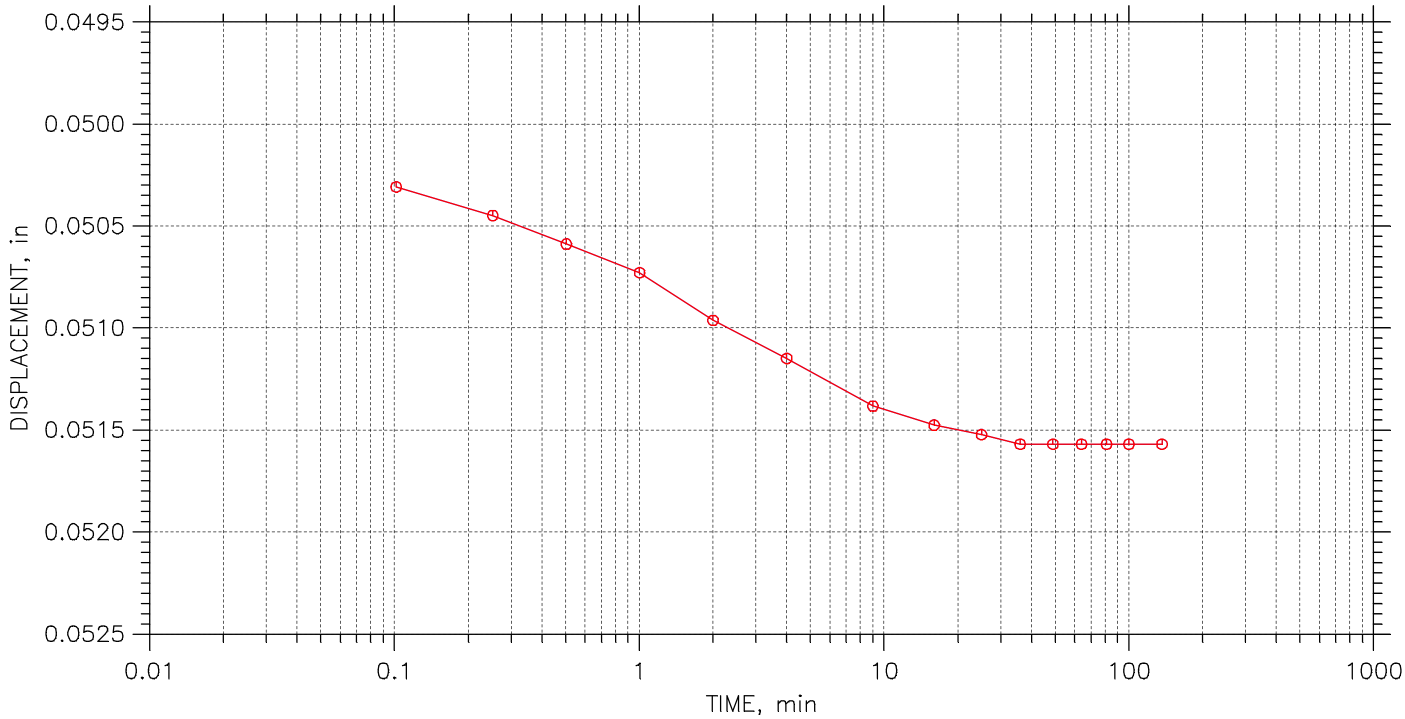
Mon, 16-NOV-2015 18:54:52

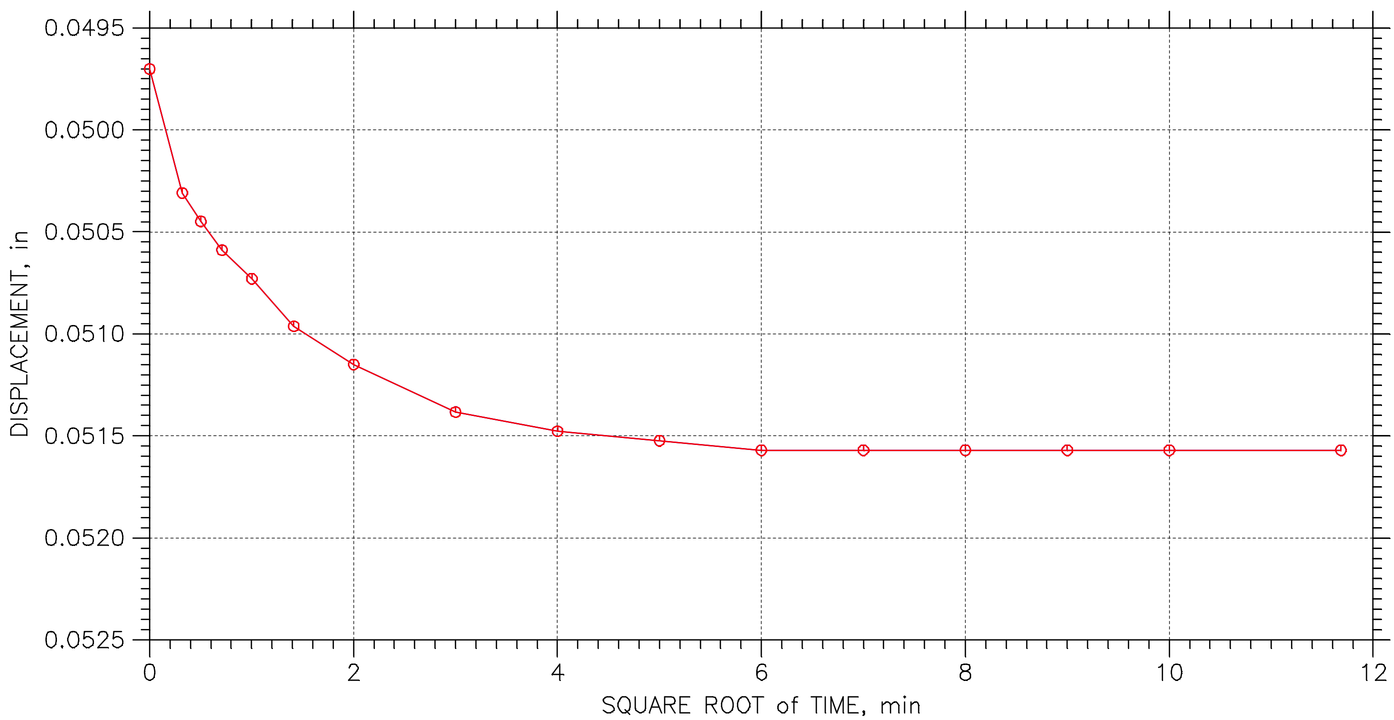
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 10 of 23

Stress: 0.25 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

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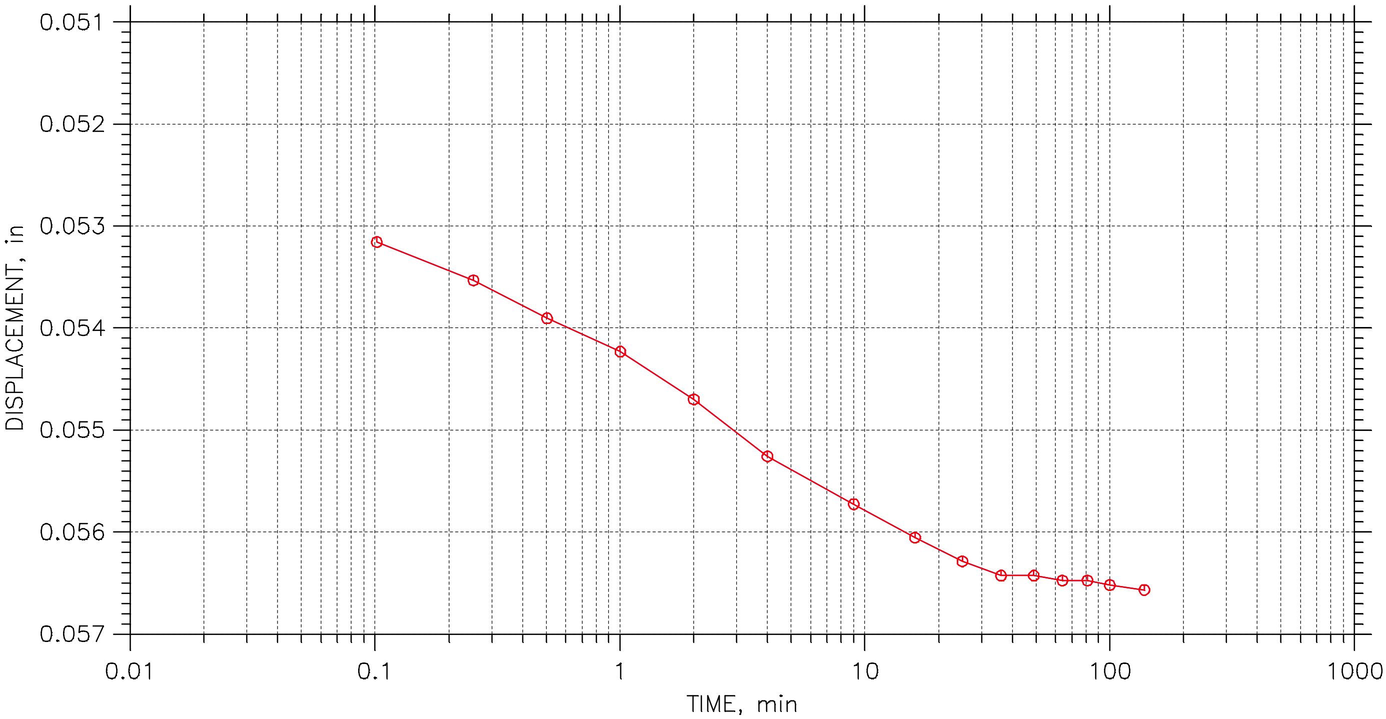
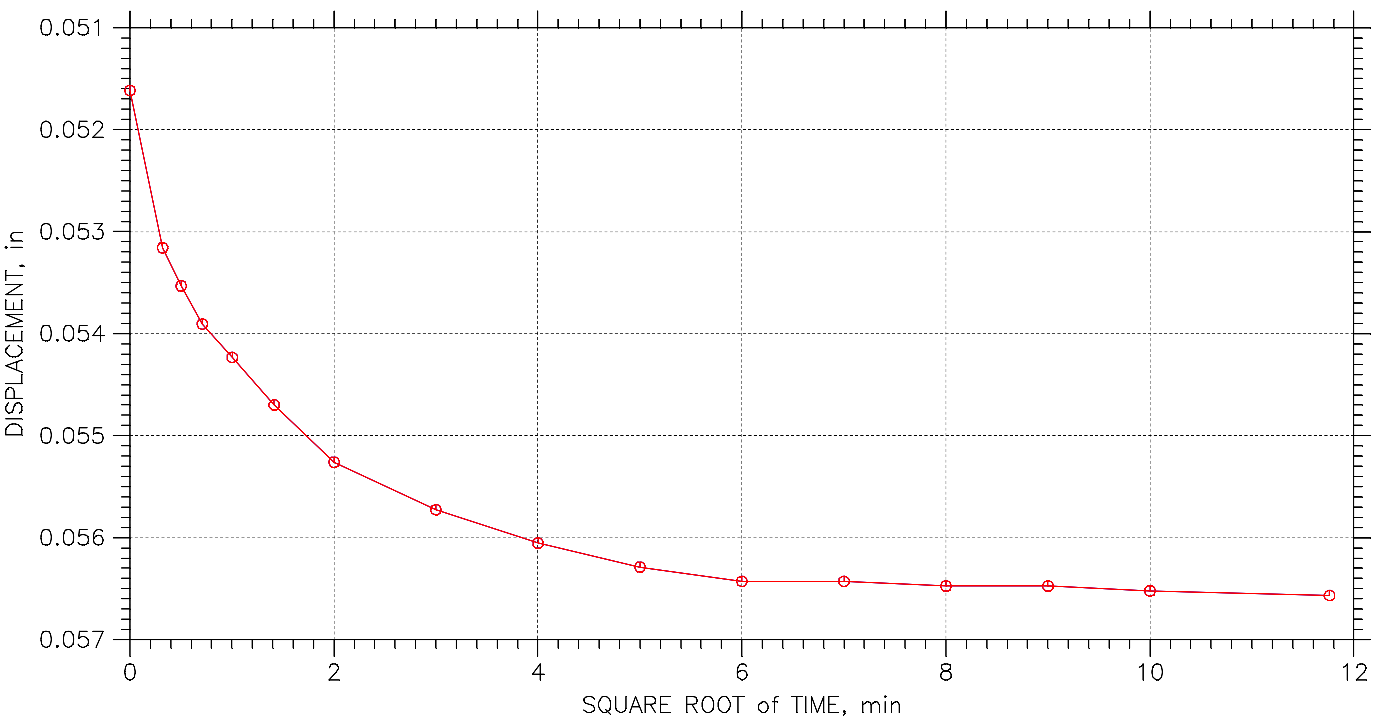
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 11 of 23

Stress: 0.5 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

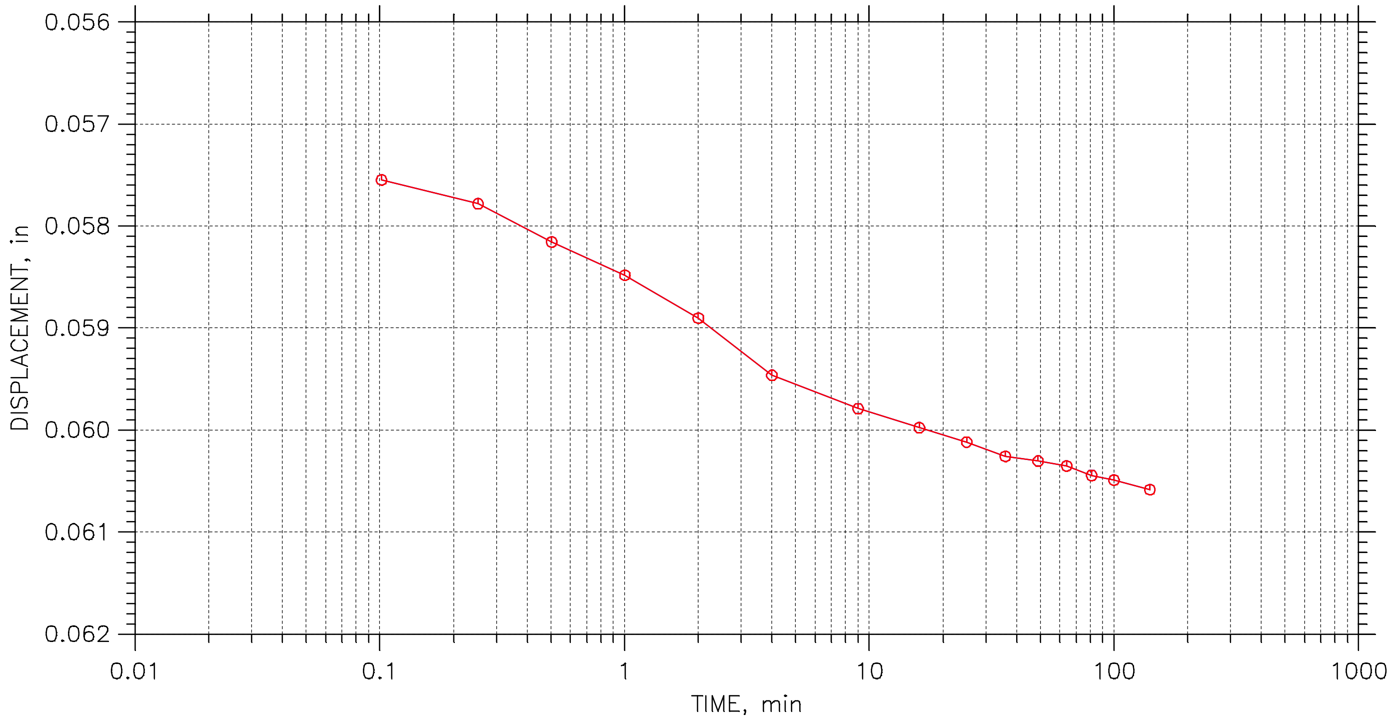
Mon, 16-NOV-2015 18:54:55

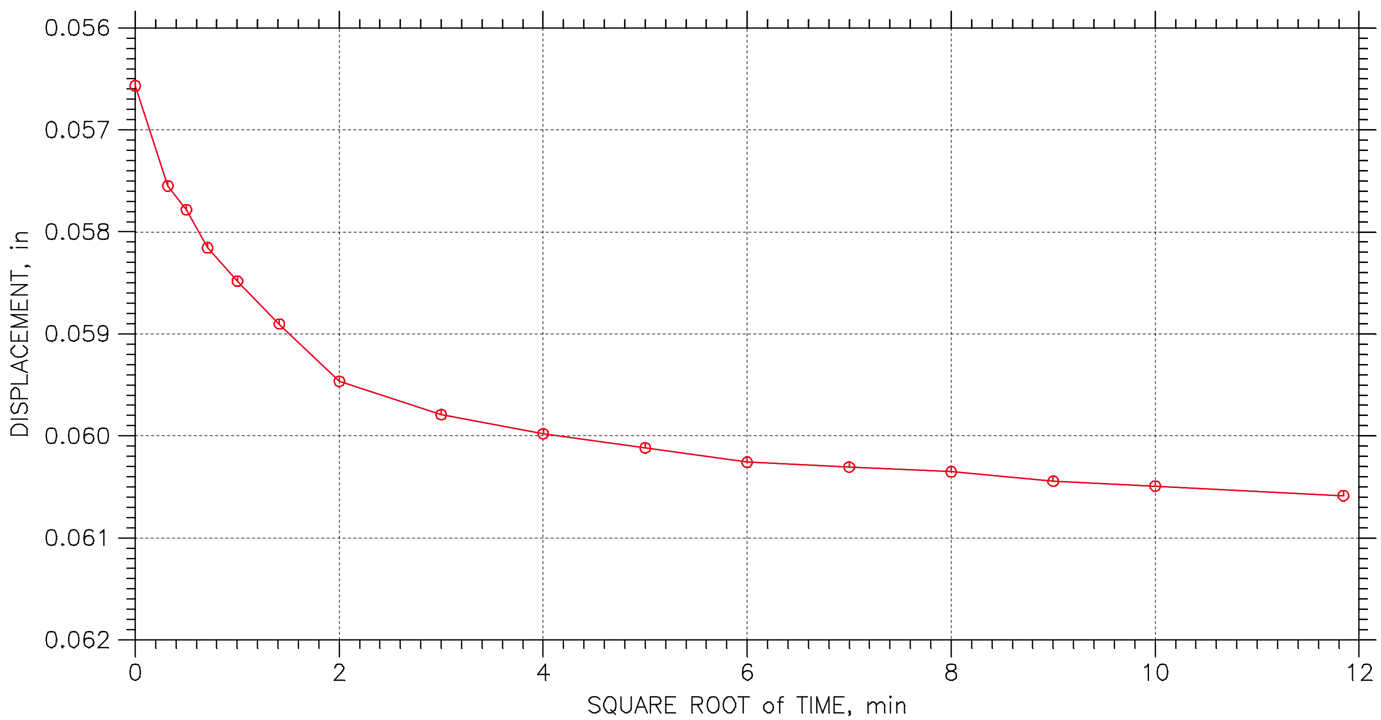
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 12 of 23

Stress: 0.75 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

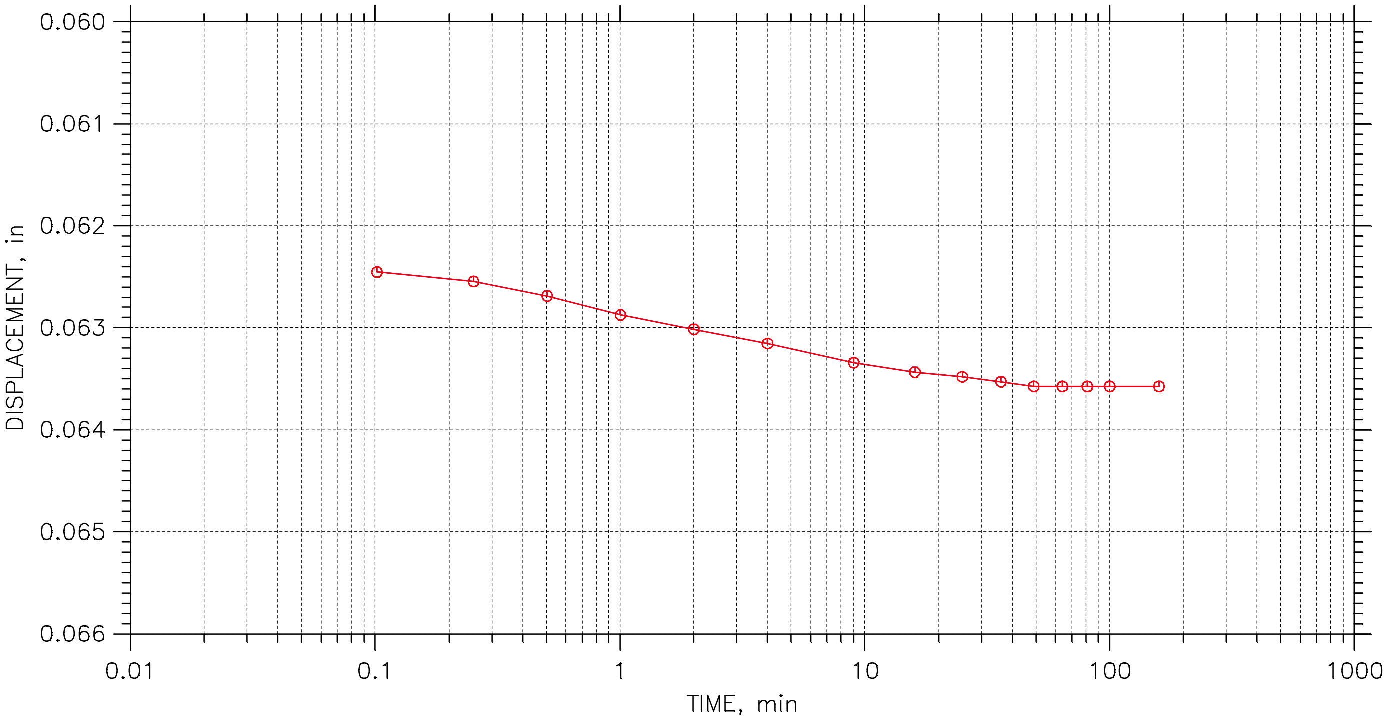
Mon, 16-NOV-2015 18:54:57

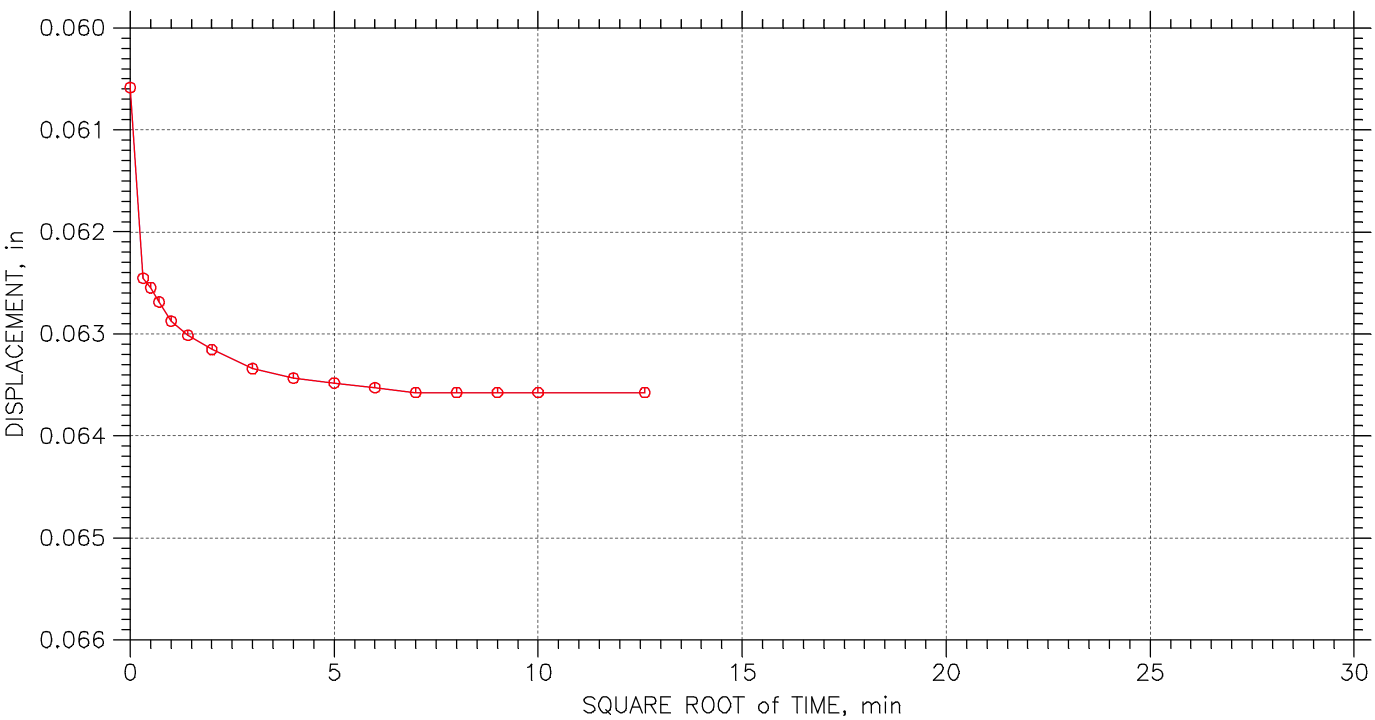
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 13 of 23

Stress: 1. tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0" ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

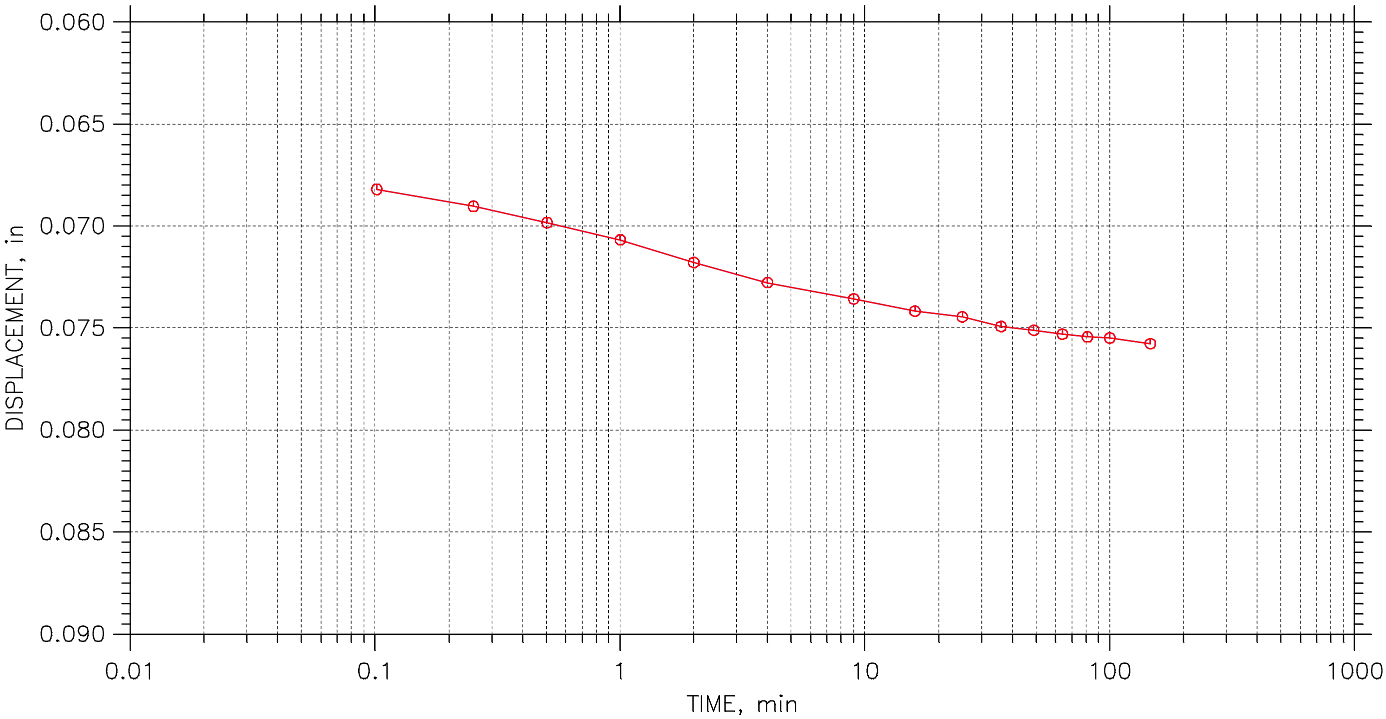
Mon, 16-NOV-2015 18:54:58

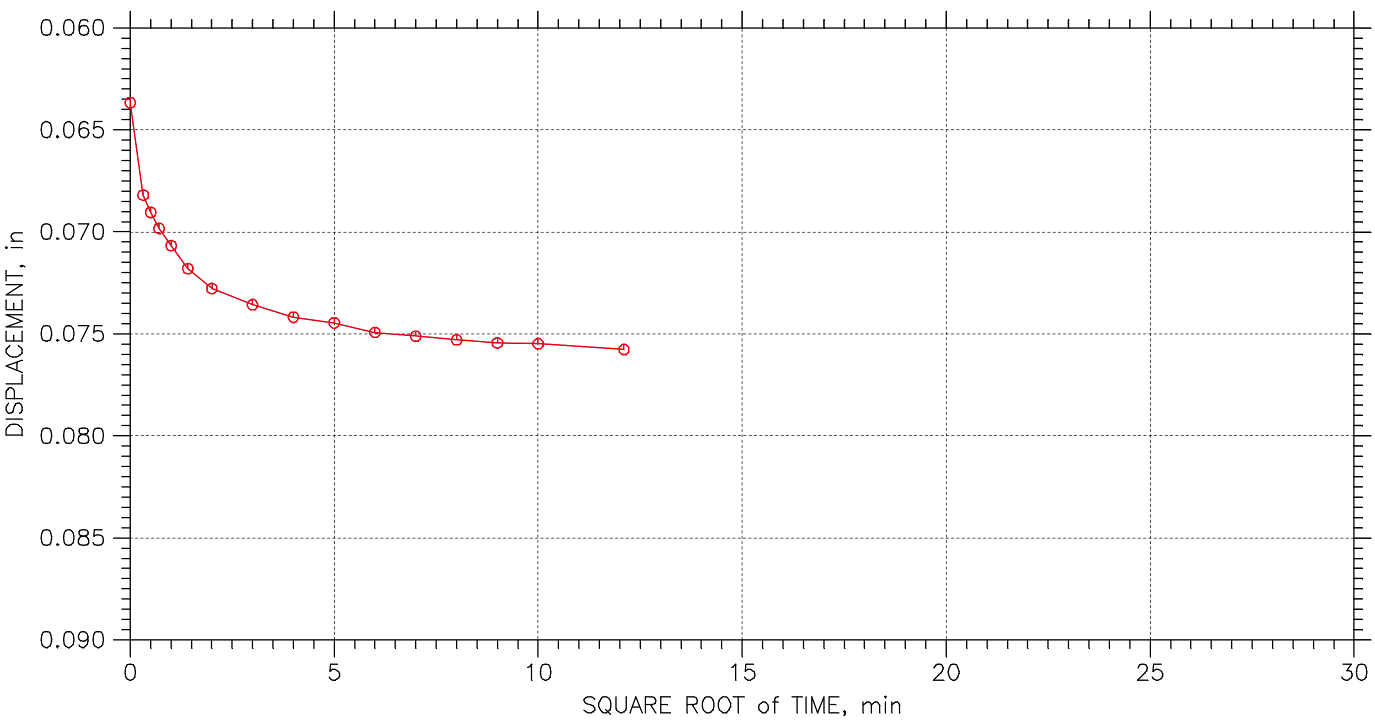
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 14 of 23

Stress: 2. tsf





Terracon Consulting Engineers & Scientists			
	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

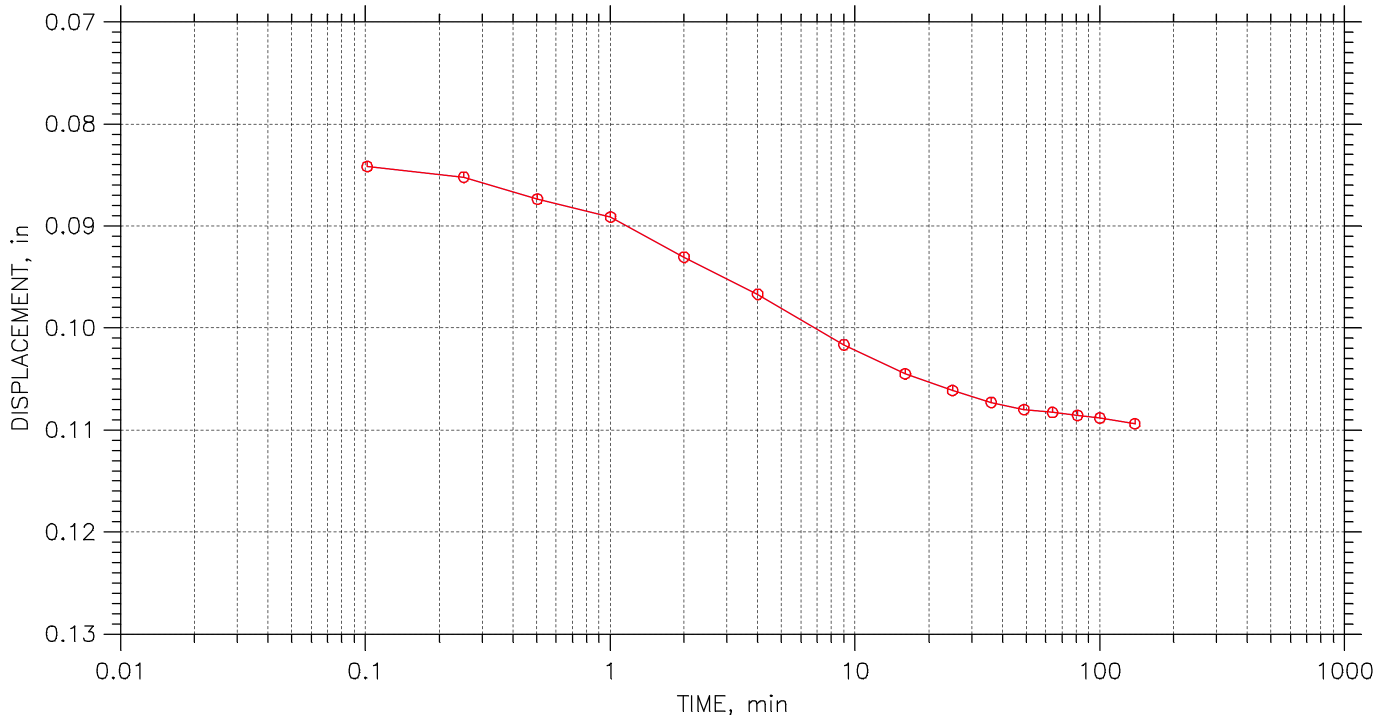
Mon, 16-NOV-2015 18:55:00

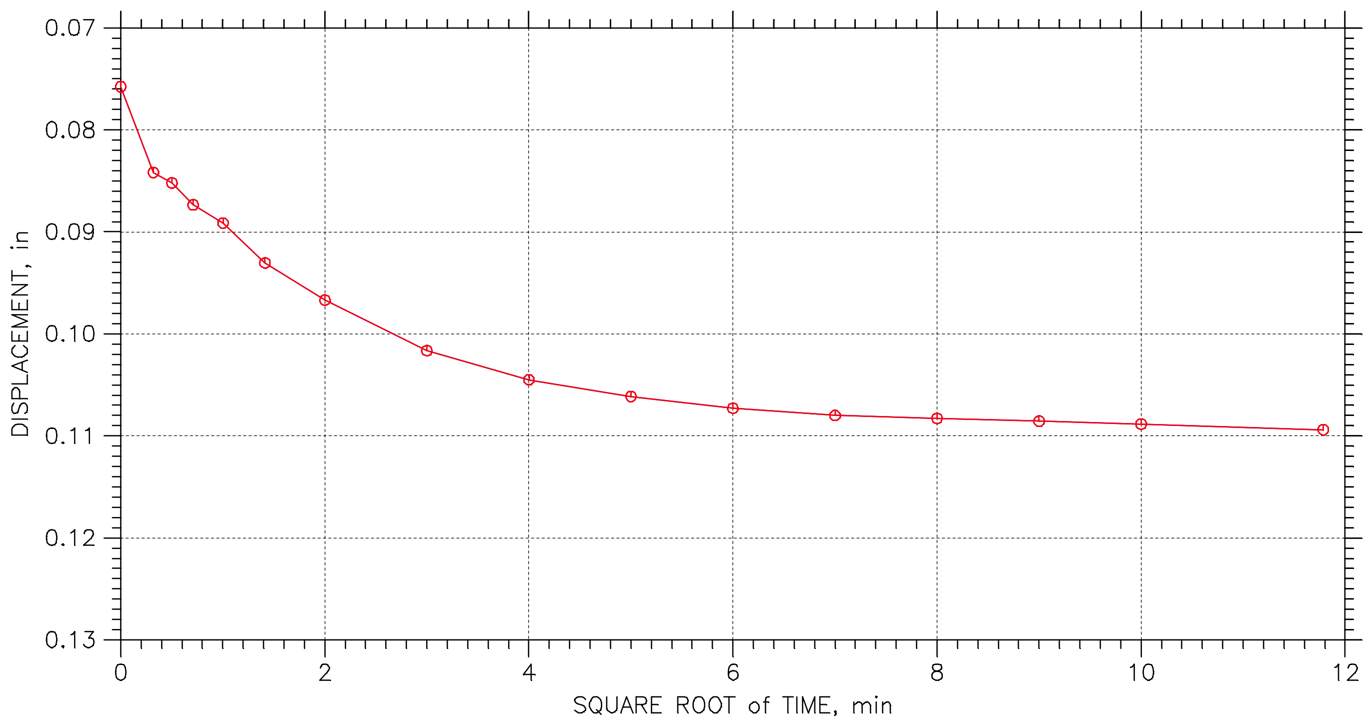
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 15 of 23

Stress: 4. tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

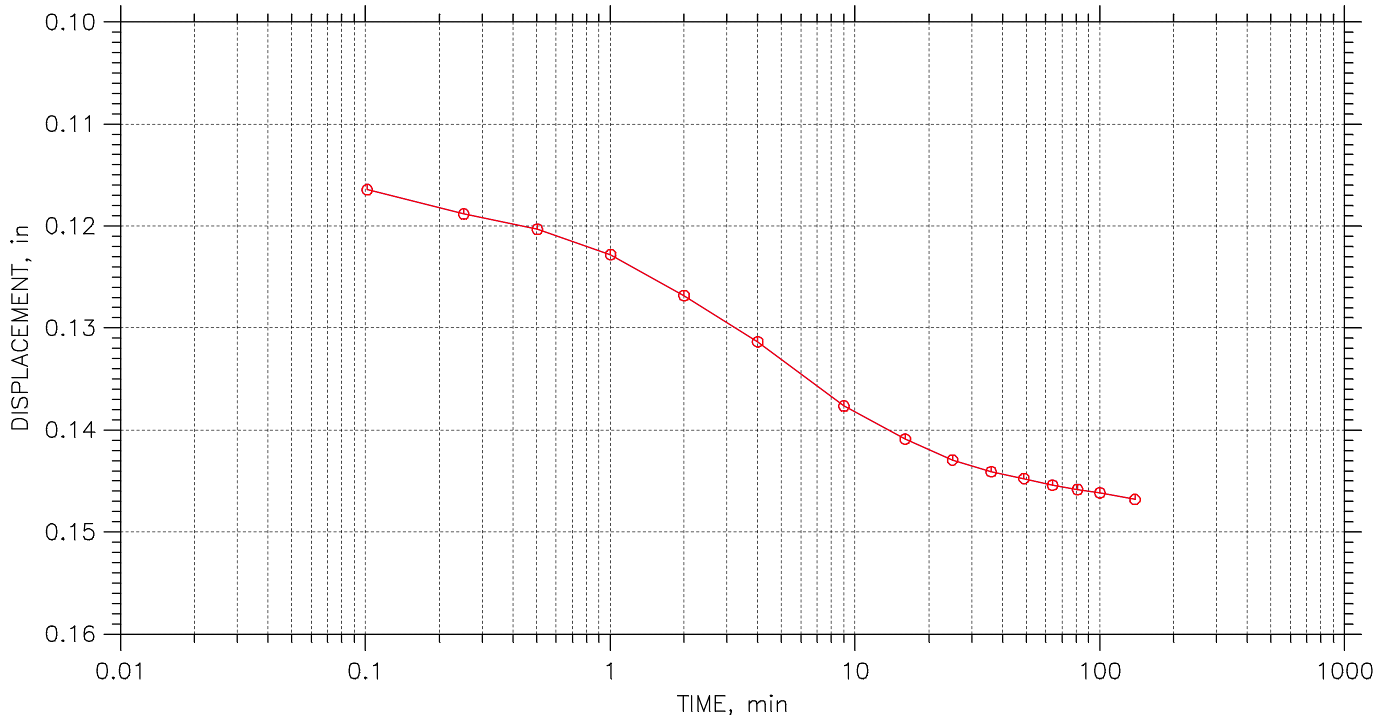
Mon, 16-NOV-2015 18:55:01

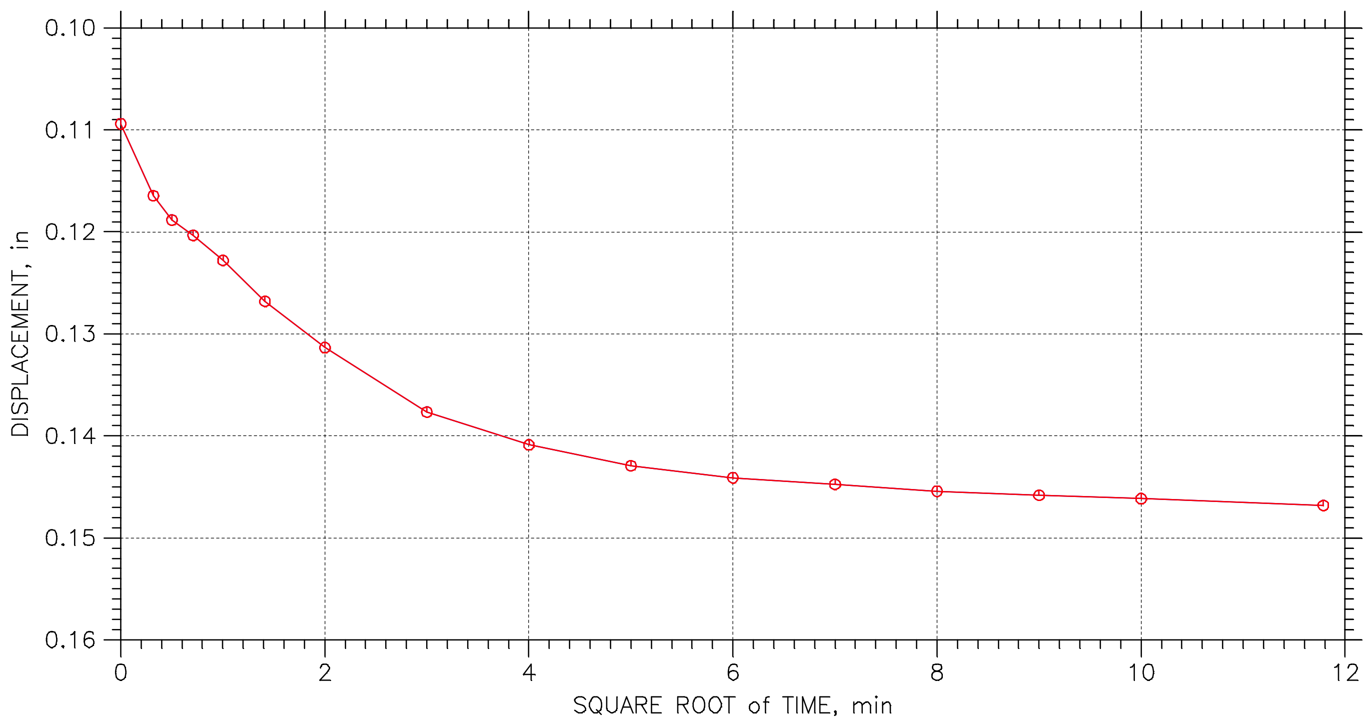
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 16 of 23

Stress: 8. tsf





Terracon Consulting Engineers & Scientists			
	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

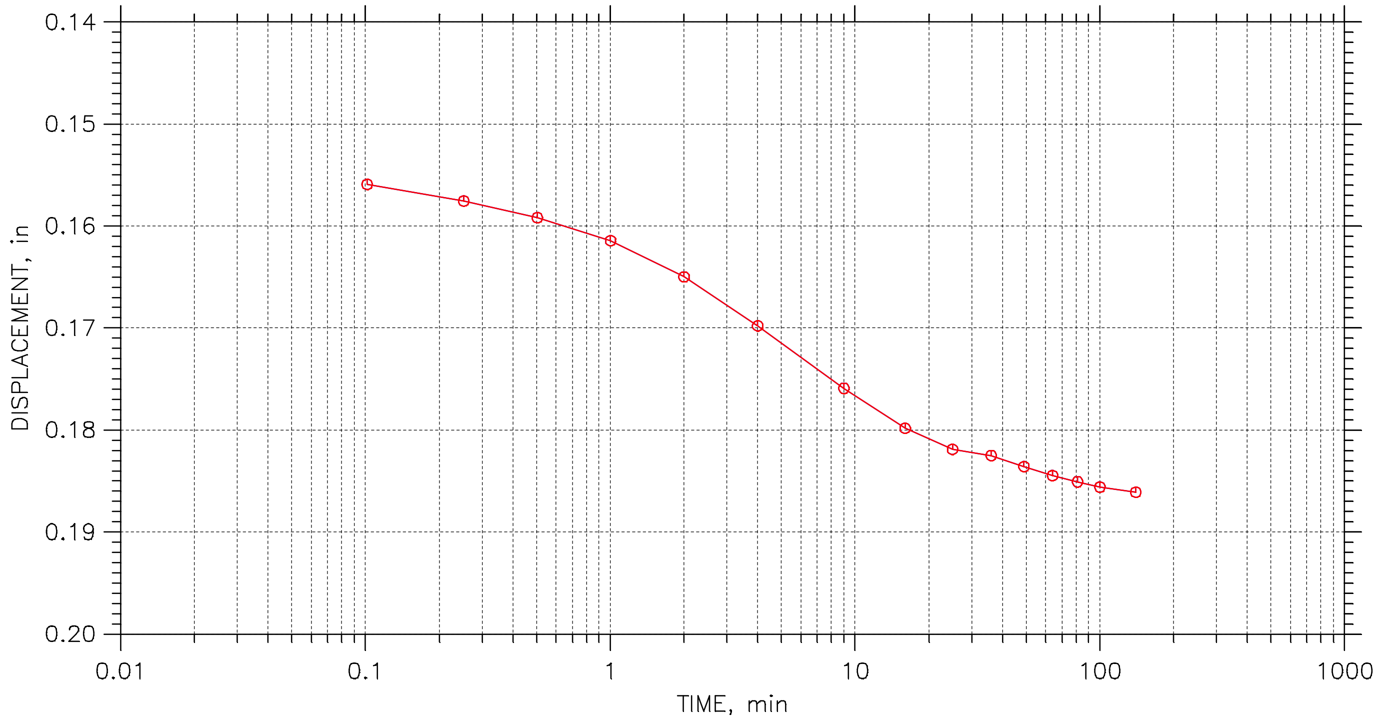
Mon, 16-NOV-2015 18:55:03

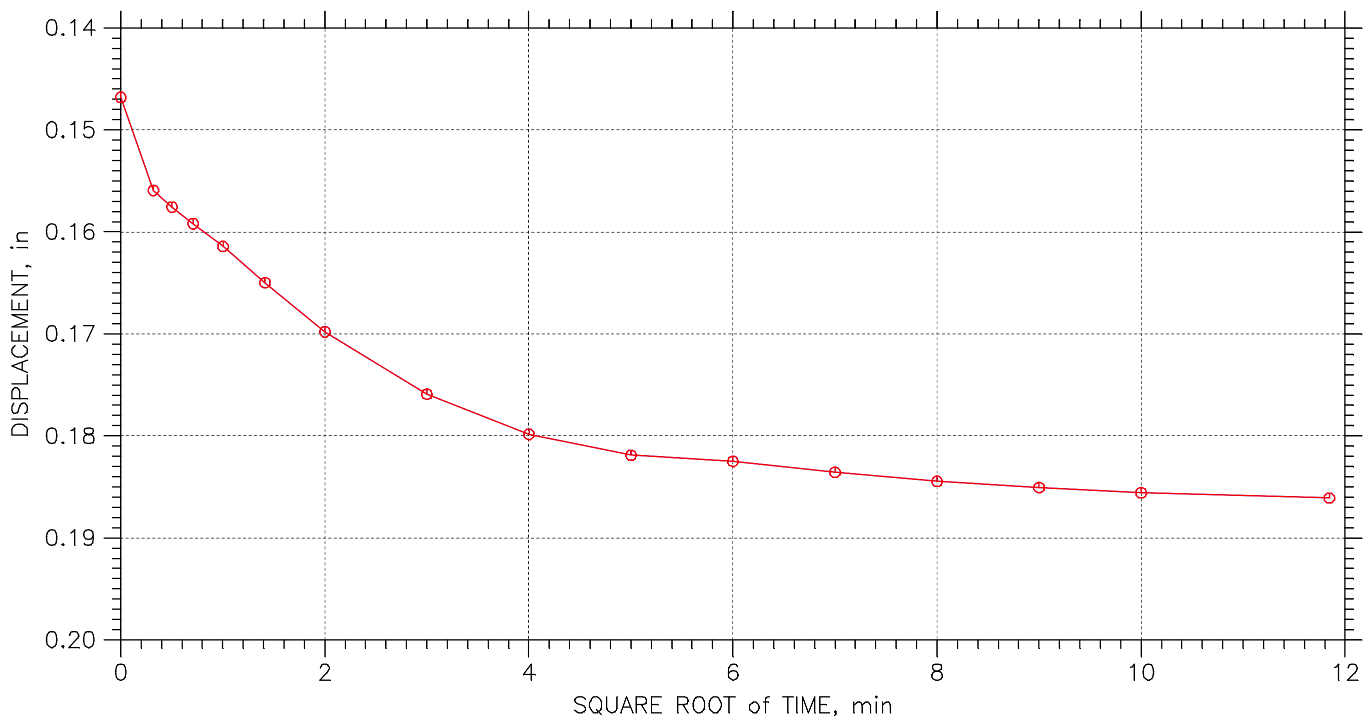
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 17 of 23

Stress: 16. tsf





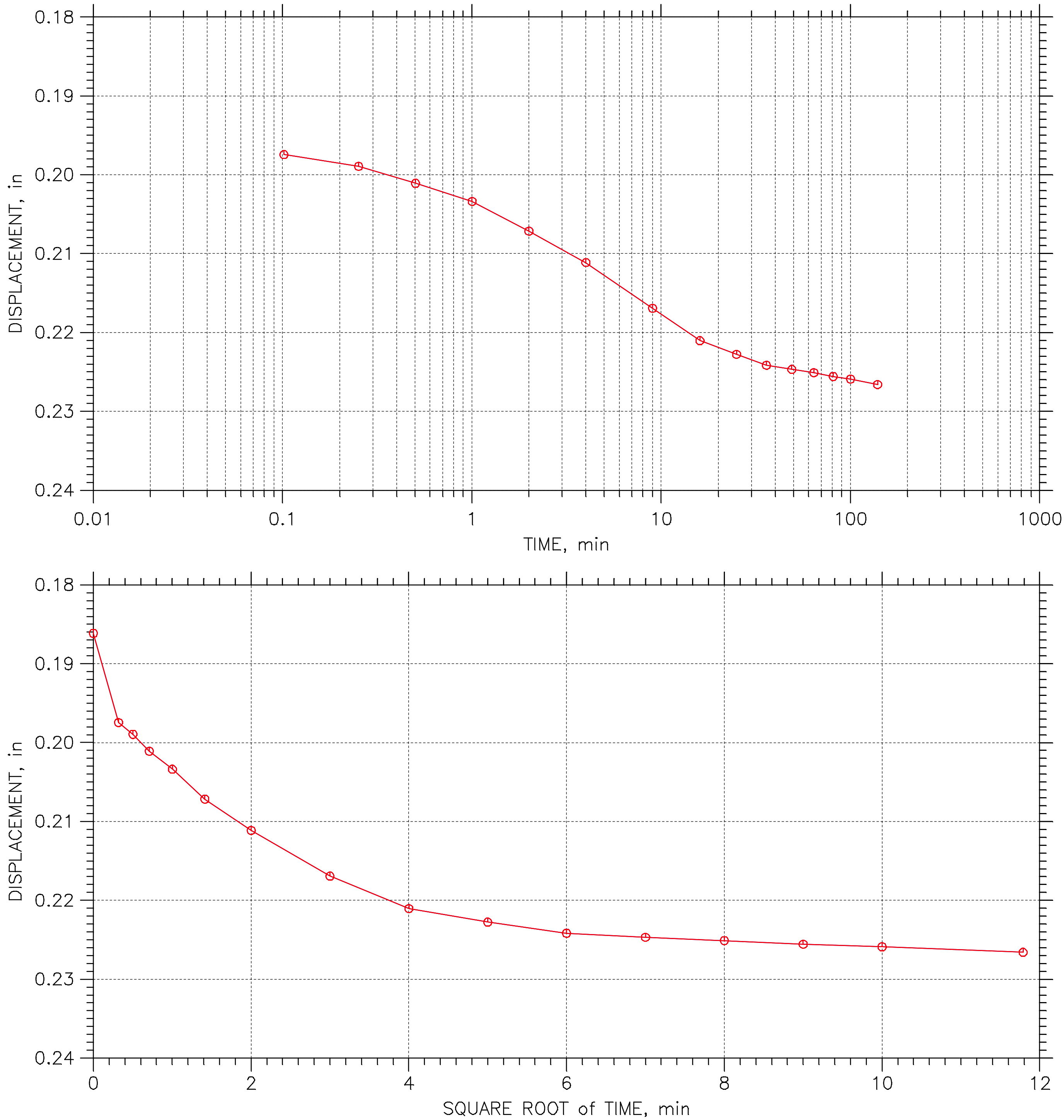
Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 18 of 23

Stress: 32. tsf



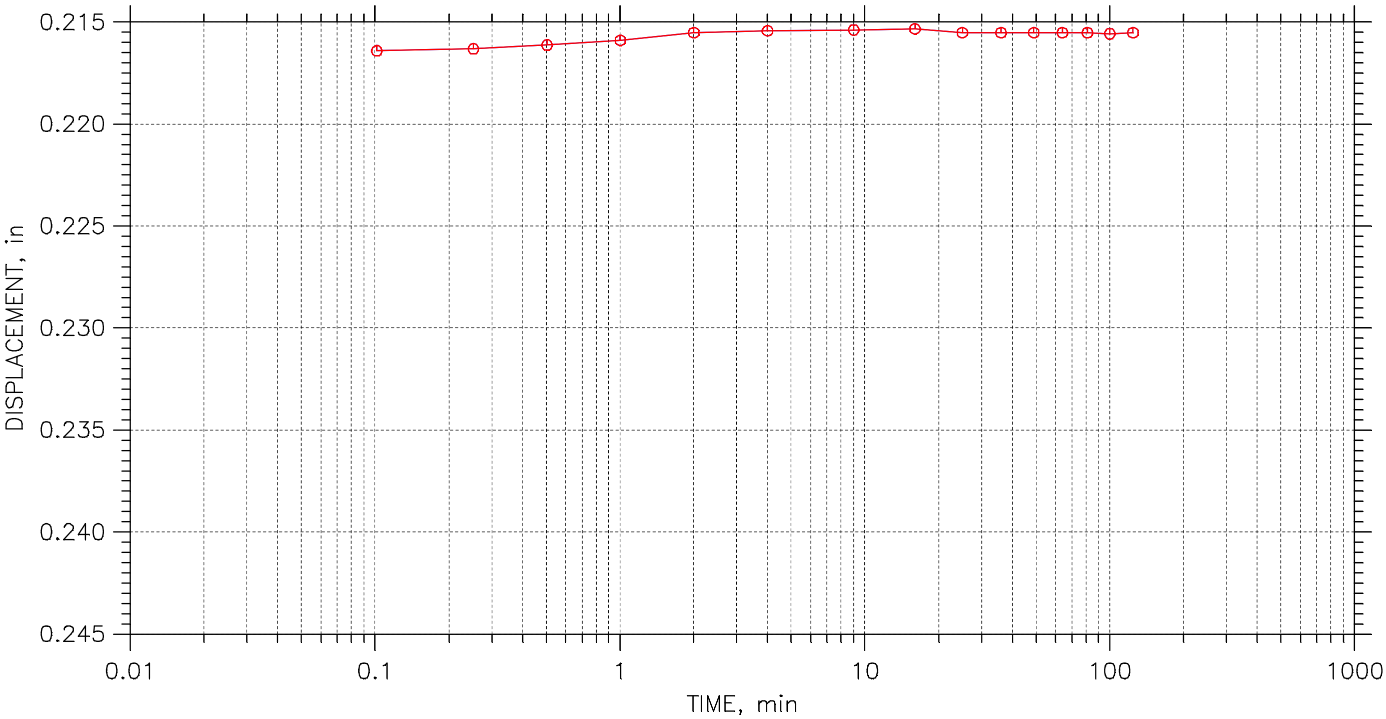
Terracon Consulting Engineers & Scientists			
	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

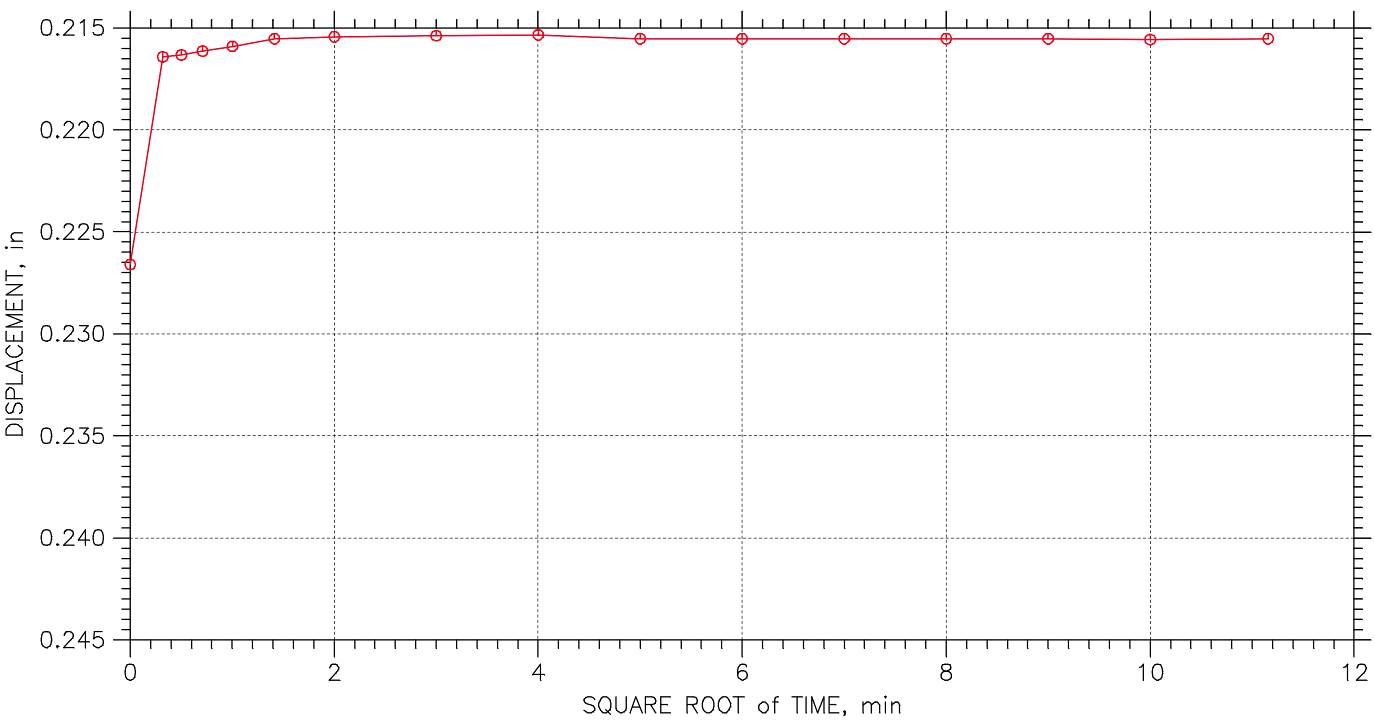
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 19 of 23

Stress: 16. tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

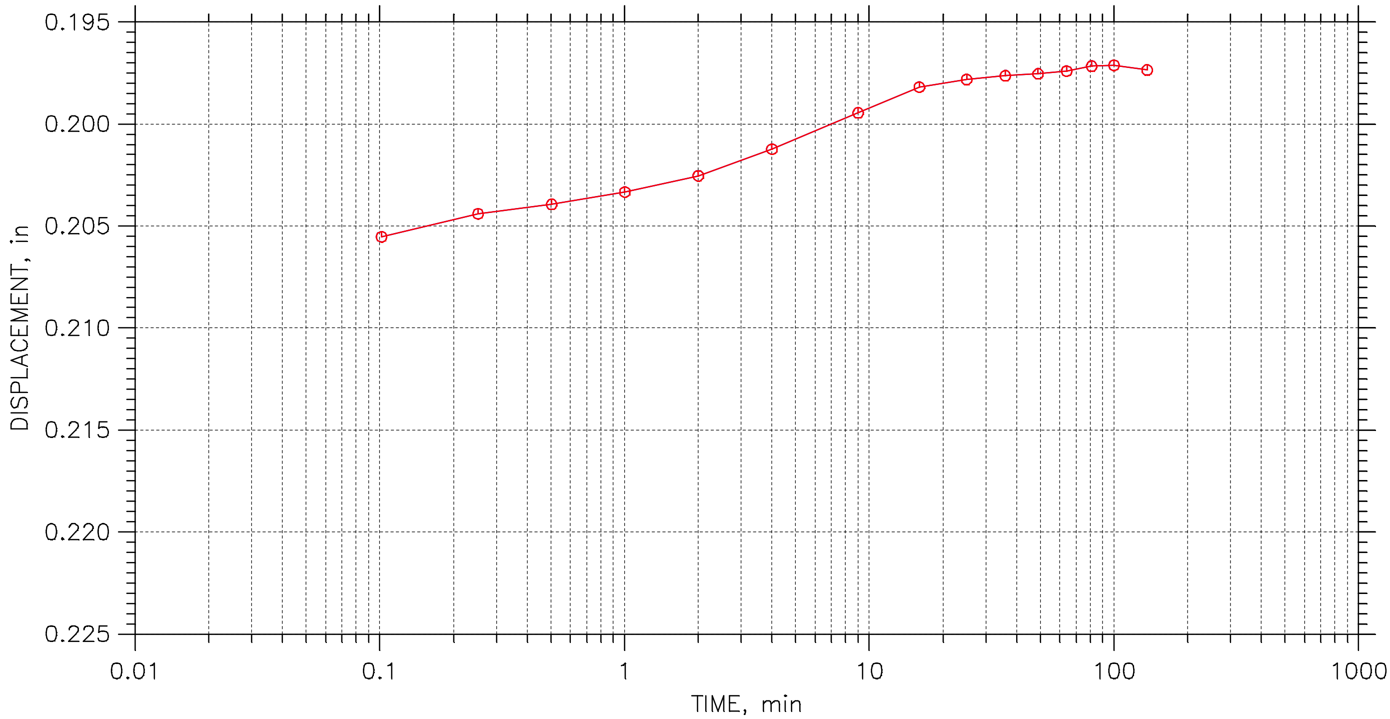
Mon, 16-NOV-2015 18:55:07

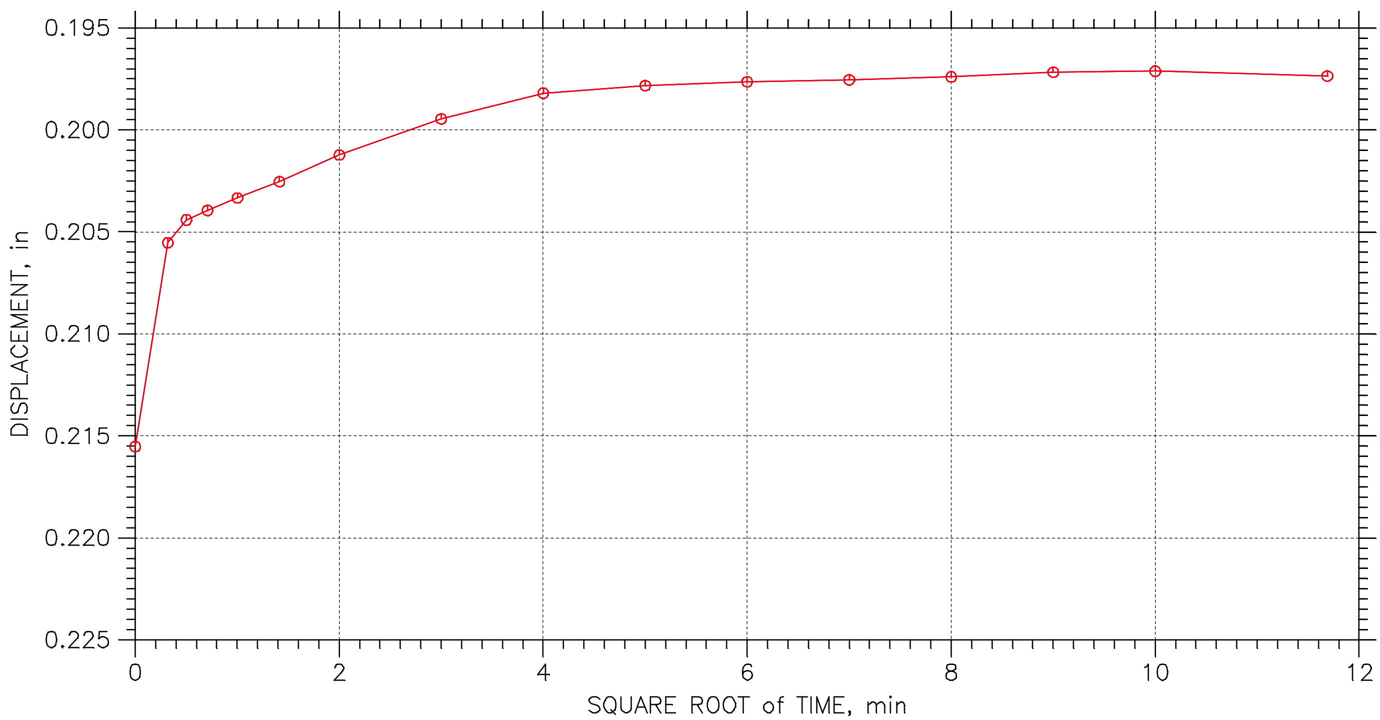
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 20 of 23

Stress: 4. tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

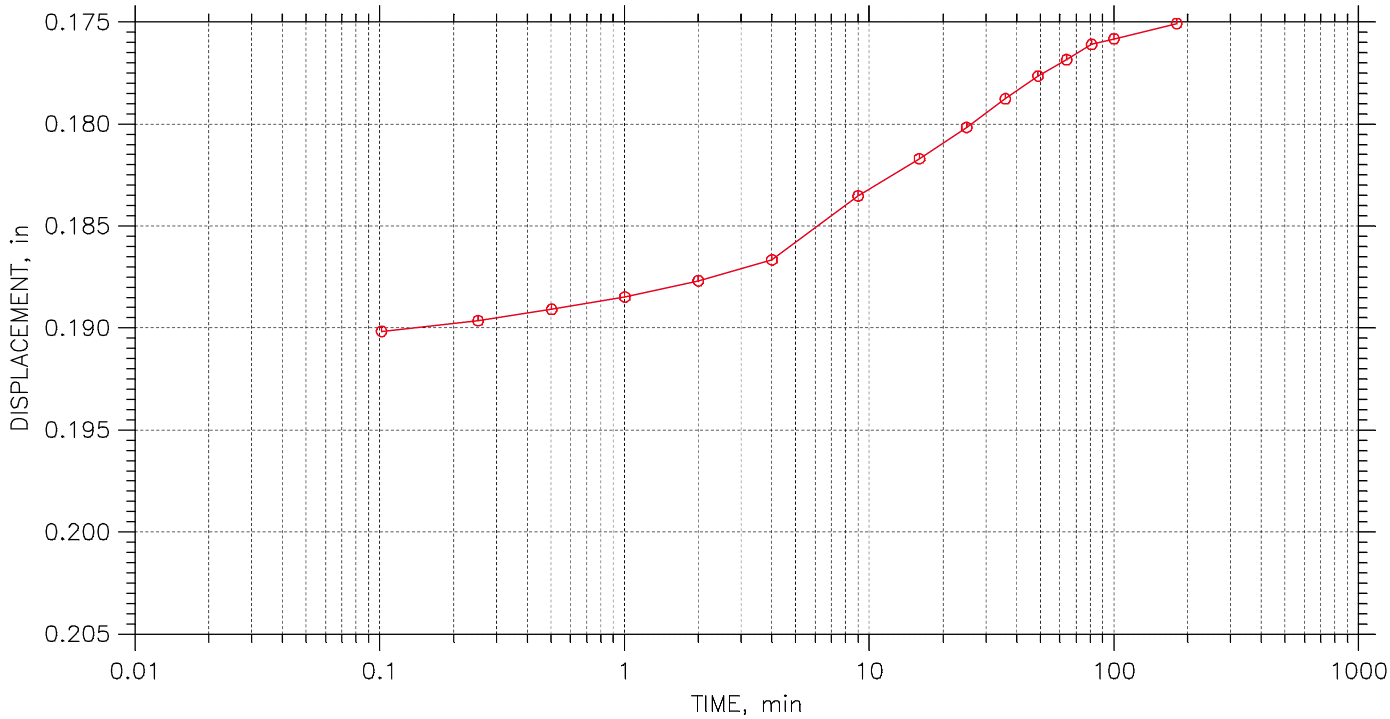
Mon, 16-NOV-2015 18:55:09

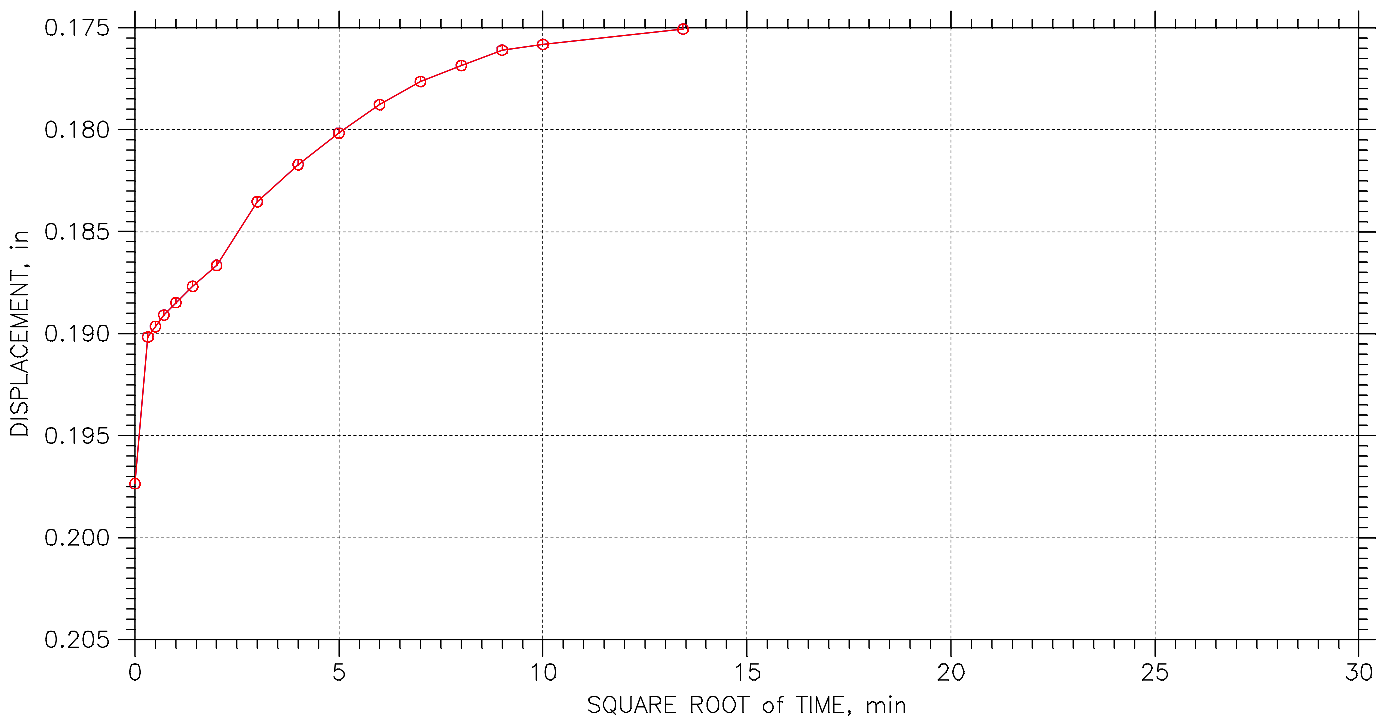
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 21 of 23

Stress: 1. tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

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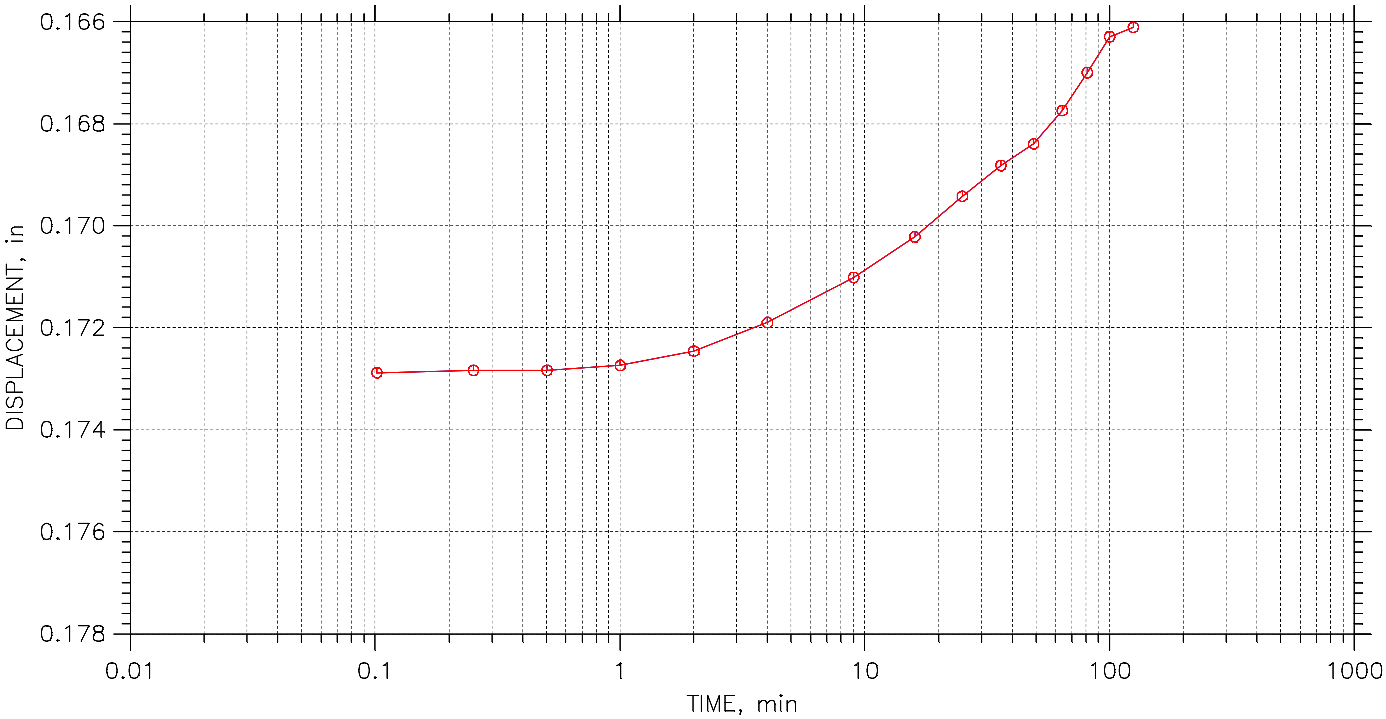
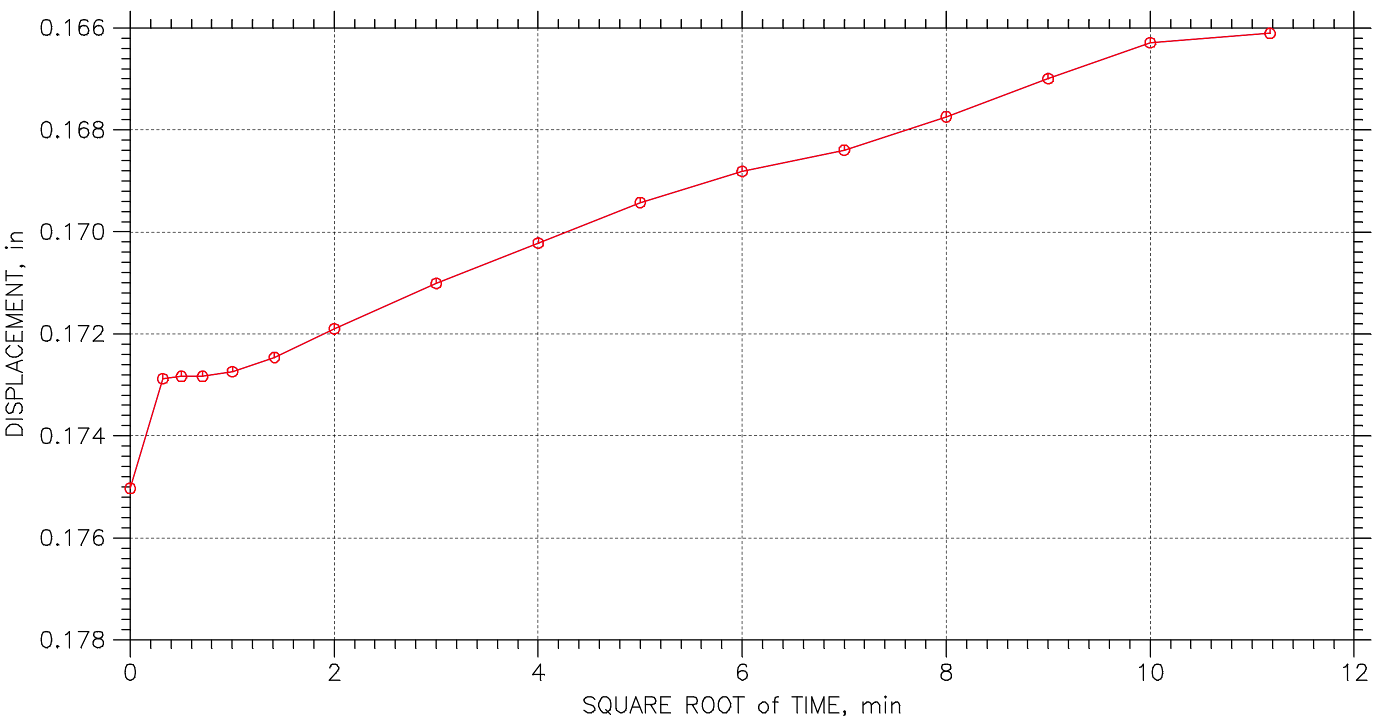
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 22 of 23

Stress: 0.5 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

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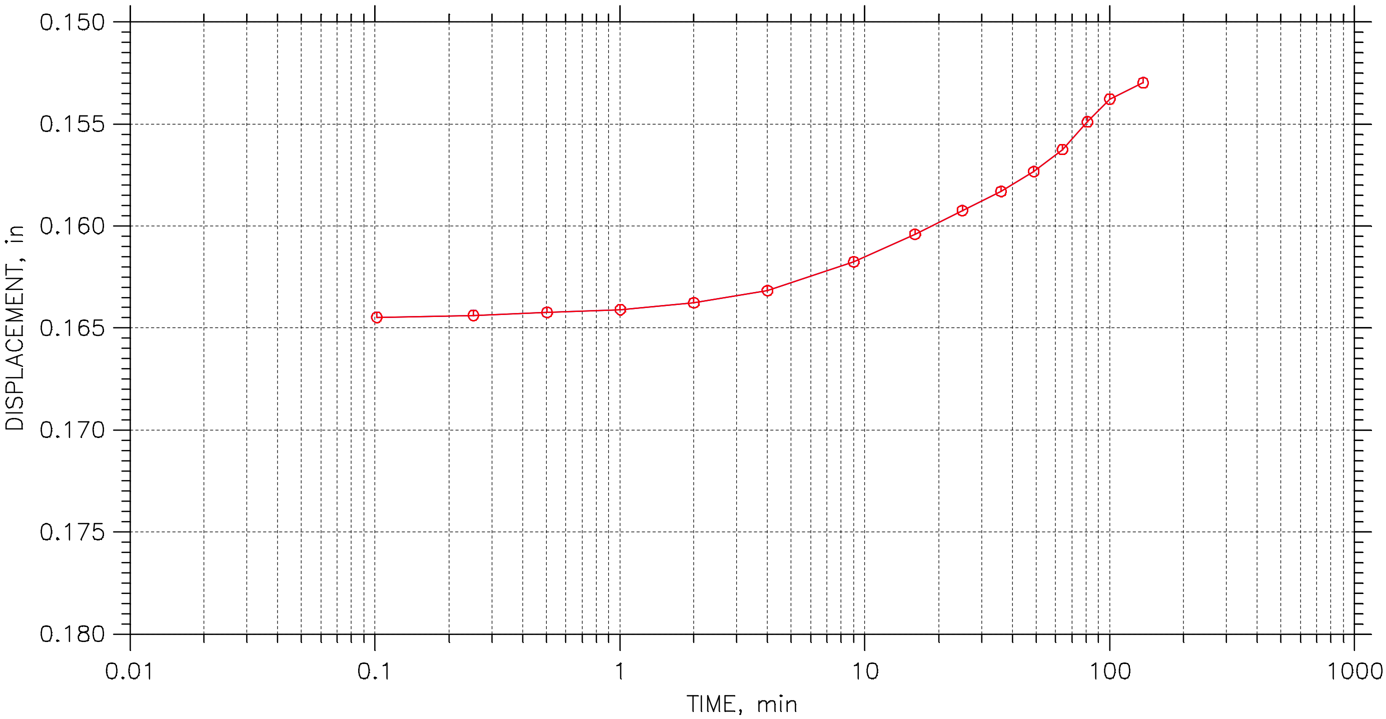
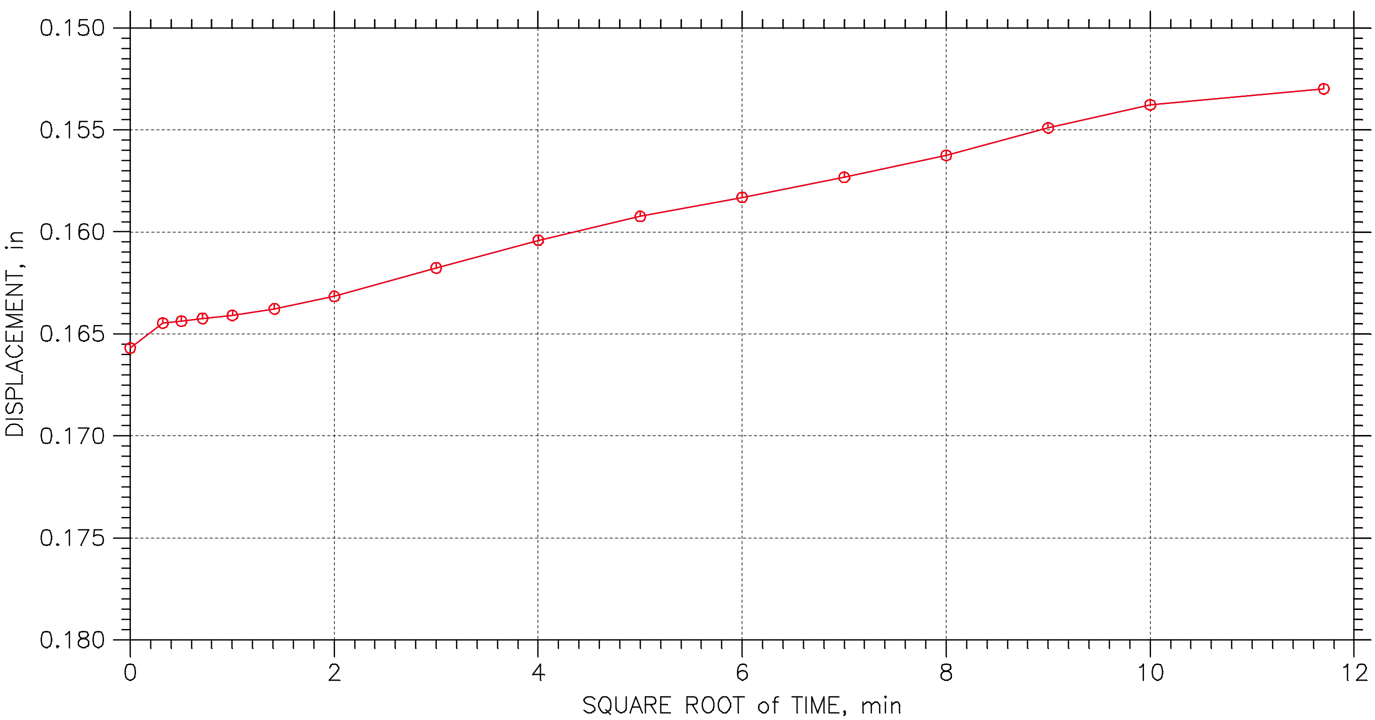
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 23 of 23

Stress: 0.125 tsf





Terracon Consulting Engineers & Scientists	Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
	Boring No.: EDW-B008 S5	Tested By: HP	Checked By: BCM
	Sample No.: S-5	Test Date: 10/26/15	Depth: 11.0'-13.0'
	Test No.: EDWB008S5	Sample Type: 3.0'' ST	Elevation: -----
	Description: BROWN AND GRAY FAT CLAY WITH SAND CH		
	Remarks: Pc = 0.93 tsf Cc = 0.292 Ccr = 0.037 TEST PERFORMED AS PER ASTM D2435		

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CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST
ASTM D4767

Terracon
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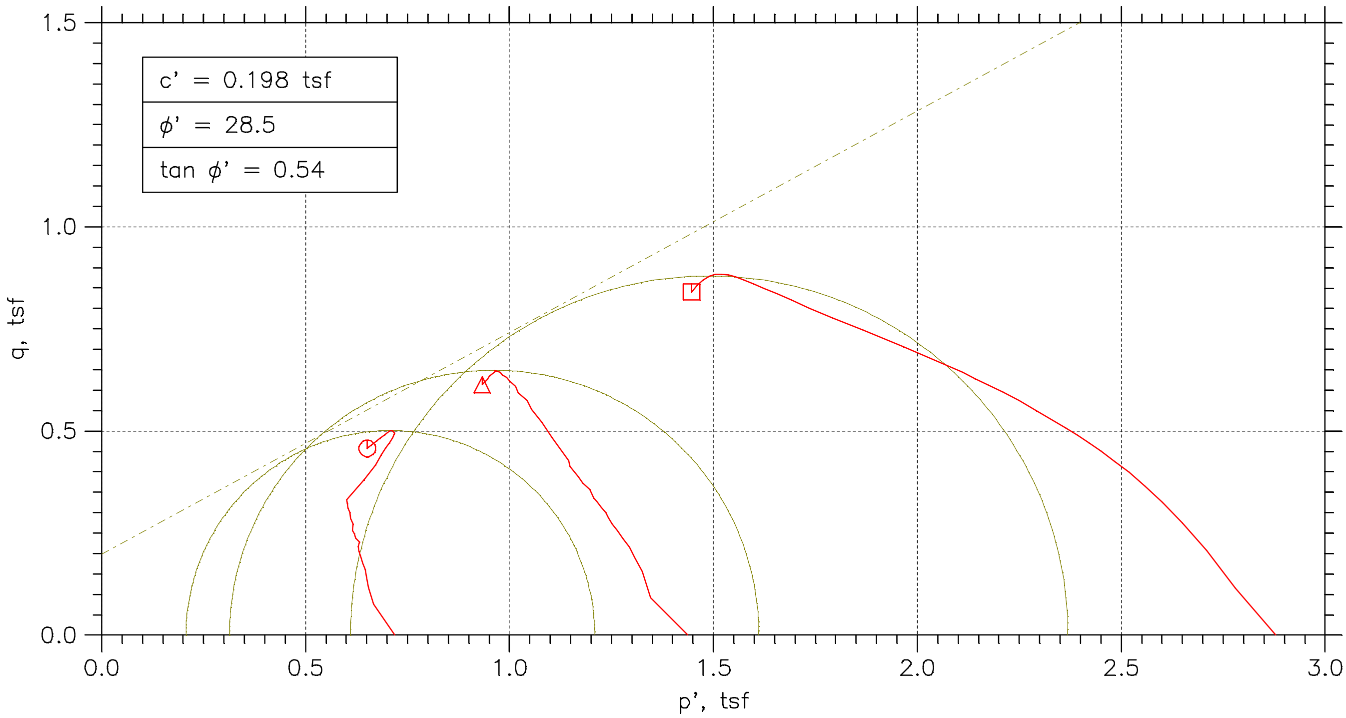
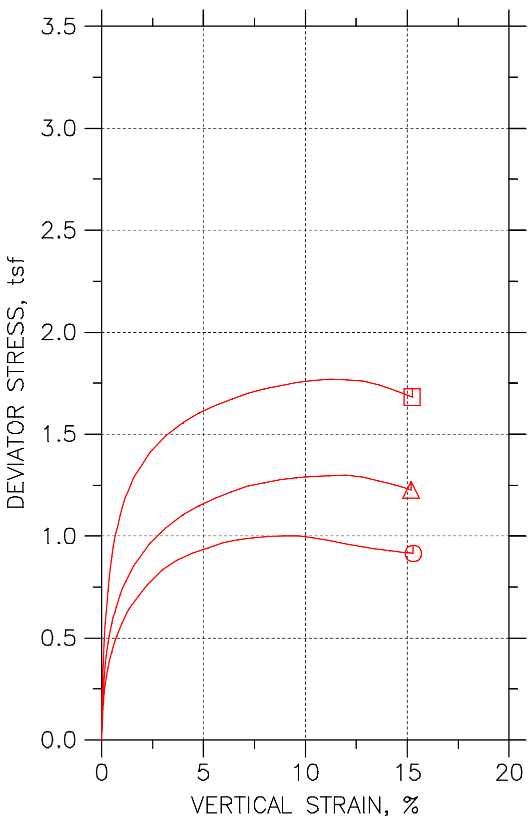
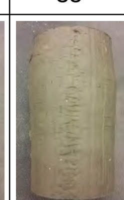




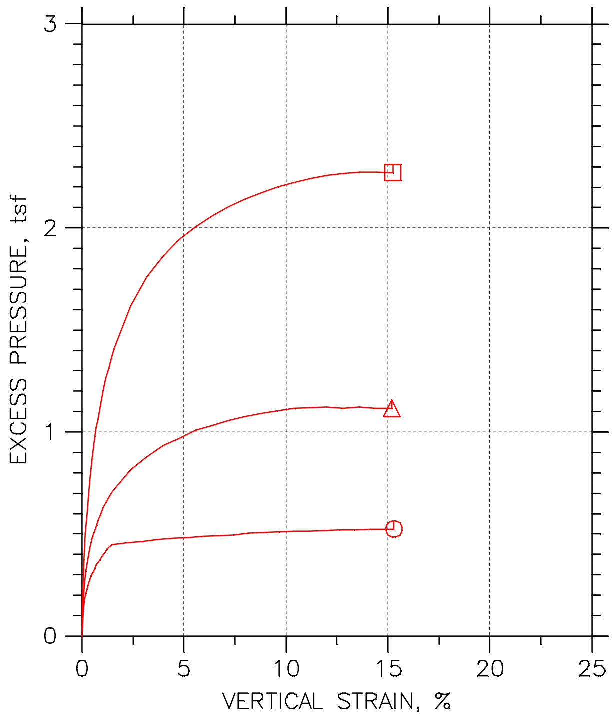
Symbol		○	△	□	
Test No.		10.0 PSI	20.0 PSI	40.0 PSI	
Initial	Diameter, in	2.8213	2.8323	2.8173	
	Height, in	6.3035	6.2161	6.1913	
	Water Content, %	75.11	79.41	77.79	
	Dry Density, pcf	54.95	52.86	53.58	
	Saturation, %	99.96	99.73	99.68	
	Void Ratio	1.9536	2.0704	2.0291	
Before Shear	Water Content, %	68.95	65.19	53.75	
	Dry Density, pcf	58.12	60.23	67.7	
	Saturation, %	100.00	100.00	100.00	
	Void Ratio	1.7926	1.6948	1.3974	
	Back Press., tsf	5.0417	5.0434	5.0421	
Minor Prin. Stress, tsf		0.71831	1.4366	2.8779	
Max. Dev. Stress, tsf		1.0023	1.2984	1.7688	
Time to Failure, min		780	900	840	
Strain Rate, %/min		0.02	0.02	0.02	
B-Value		0.96	0.99	0.95	
Estimated Specific Gravity		2.60	2.60	2.60	
Liquid Limit		72	72	72	
Plastic Limit		37	37	37	
Plasticity Index		35	35	35	
Failure Sketch					

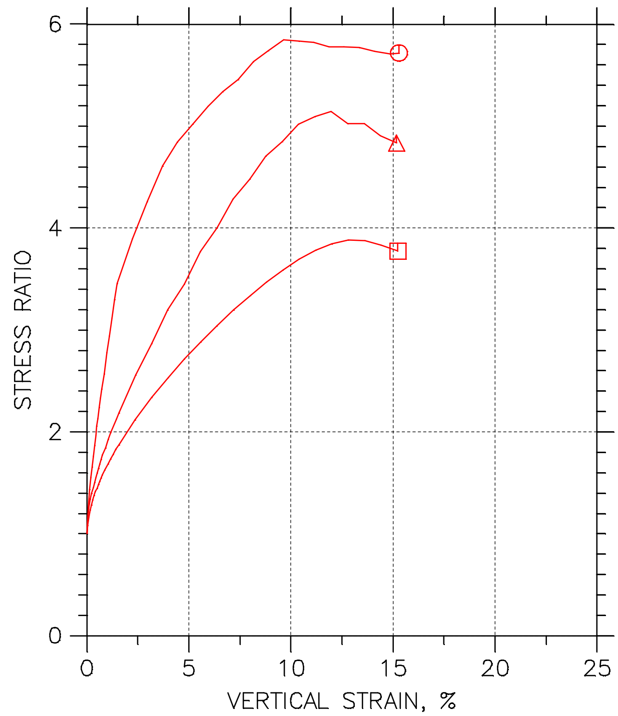
Project: DYNERGY EDWARDS	
Location: BARTONVILLE, IL	
Project No.: MR155218	
Boring No.: EDW006 S9	
Sample Type: 3.0'' ST	
Description: DARK GRAY ORGANIC SILT OH SHELL NOTED	
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.	

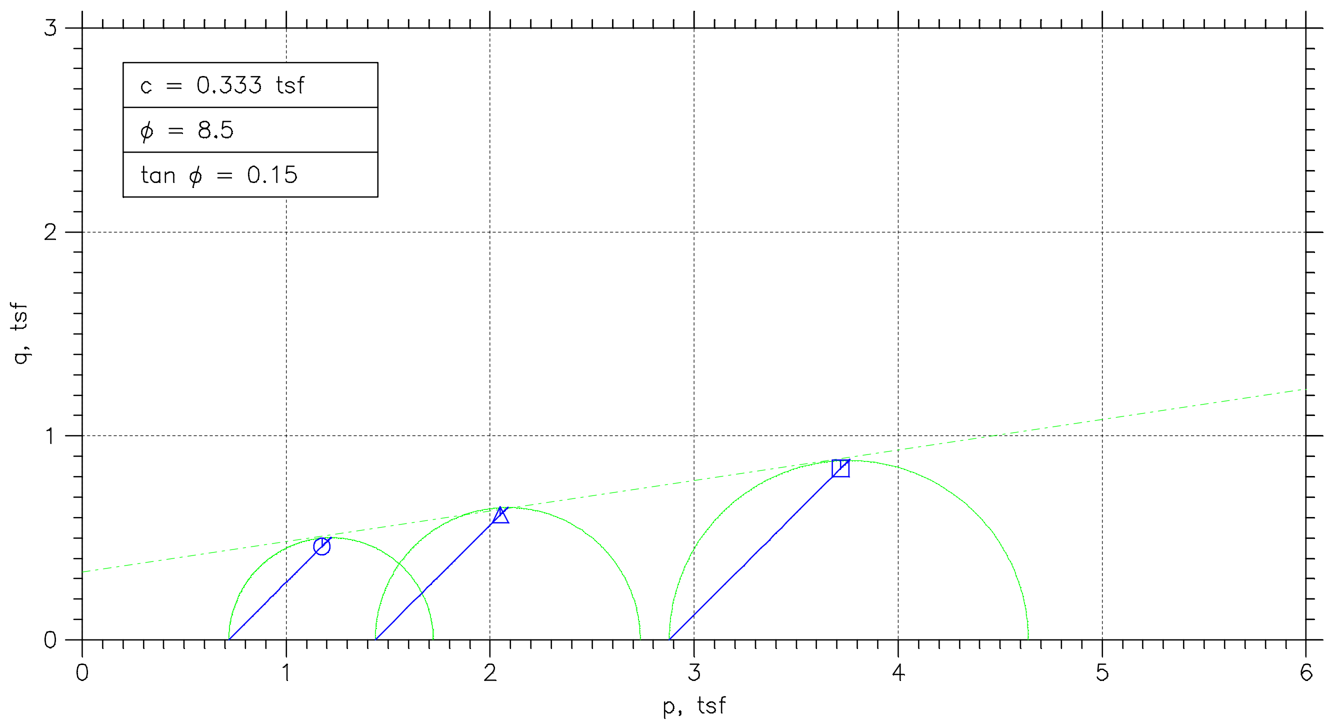
Mon, 16-NOV-2015 19:59:37

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST
ASTM D4767

Terracon Consulting Engineers & Scientists







Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
Boring No.: EDW006 S9	Tested By: BCM	Checked By: WPQ
Sample No.: S-9	Test Date: 10/29/15	Depth: 26.0'-28.0'
Test No.: EDW006 S9	Sample Type: 3.0" ST	Elevation: ----
Description: DARK GRAY ORGANIC SILT OH SHELL NOTED		
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.		

Mon, 16-NOV-2015 20:00:32

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW006 S9
Sample No.: S-9
Test No.: 10.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 26.0'-28.0'
Elevation: ----

Soil Description: DARK GRAY ORGANIC SILT OH SHELL NOTED
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.30 in
Specimen Area: 6.25 in^2
Specimen Volume: 39.41 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 72

Plastic Limit: 37

Estimated Specific Gravity: 2.60

	Time min	Vertical Strain %	Corrected Area in^2	Deviator Load lb	Deviator Stress tsf	Pore Pressure tsf	Horizontal Stress tsf	Vertical Stress tsf
1	0	0	6.2514	0	0	5.0417	5.76	5.76
2	5.0001	0.062925	6.2553	13.244	0.15244	5.17	5.76	5.9124
3	10	0.12448	6.2592	20.256	0.233	5.2217	5.76	5.993
4	15	0.18877	6.2632	24.54	0.28211	5.2513	5.76	6.0421
5	20	0.2517	6.2672	27.823	0.31965	5.2728	5.76	6.0796
6	25	0.31326	6.271	30.773	0.35331	5.2966	5.76	6.1133
7	30	0.37618	6.275	33.555	0.38502	5.3169	5.76	6.145
8	35	0.43911	6.279	35.892	0.41157	5.3355	5.76	6.1716
9	40	0.4993	6.2828	37.896	0.43428	5.3483	5.76	6.1943
10	45	0.56085	6.2866	39.843	0.45632	5.3564	5.76	6.2163
11	50	0.62241	6.2905	41.568	0.47578	5.375	5.76	6.2358
12	55	0.68534	6.2945	43.405	0.49649	5.3878	5.76	6.2565
13	60	0.74689	6.2984	44.74	0.51144	5.4	5.76	6.2714
14	70	0.87137	6.3063	47.578	0.5432	5.4145	5.76	6.3032
15	80.001	0.99586	6.3143	50.305	0.57361	5.4371	5.76	6.3336
16	90.001	1.119	6.3221	52.698	0.60015	5.4511	5.76	6.3602
17	100	1.2393	6.3298	54.645	0.62158	5.4662	5.76	6.3816
18	110	1.3625	6.3377	56.704	0.64419	5.4795	5.76	6.4042
19	120	1.4856	6.3457	58.429	0.66296	5.49	5.76	6.423
20	180	2.2256	6.3937	67.5	0.76012	5.4975	5.76	6.5201
21	240	2.9766	6.4432	74.567	0.83326	5.5045	5.76	6.5933
22	300	3.7112	6.4923	79.52	0.88187	5.5155	5.76	6.6419
23	360	4.4485	6.5424	83.304	0.91676	5.5214	5.76	6.6768
24	420	5.2009	6.5943	86.308	0.94235	5.5254	5.76	6.7024
25	480	5.9368	6.6459	89.202	0.96639	5.5295	5.76	6.7264
26	540	6.6769	6.6986	91.372	0.98211	5.5335	5.76	6.7421
27	600	7.4293	6.7531	92.93	0.99081	5.5376	5.76	6.7508
28	660	8.1638	6.8071	94.322	0.99766	5.5446	5.76	6.7577
29	720	8.9039	6.8624	95.435	1.0013	5.5486	5.76	6.7613
30	780	9.6562	6.9196	96.325	1.0023	5.5533	5.76	6.7623
31	840	10.394	6.9765	96.047	0.99124	5.555	5.76	6.7512
32	900	11.131	7.0344	95.768	0.98023	5.5568	5.76	6.7402
33	960	11.883	7.0944	94.878	0.9629	5.5585	5.76	6.7229
34	1020	12.607	7.1532	94.489	0.95107	5.5608	5.76	6.7111
35	1080	13.351	7.2146	94.043	0.93853	5.5632	5.76	6.6985
36	1140	14.11	7.2784	93.876	0.92866	5.5637	5.76	6.6887
37	1200	14.841	7.3408	93.71	0.91912	5.5649	5.76	6.6791
38	1236.6	15.291	7.3798	93.765	0.91481	5.5661	5.76	6.6748

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW006 S9
Sample No.: S-9
Test No.: 10.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 26.0'-28.0'
Elevation: ----

Terracon
Consulting Engineers & Scientists

Soil Description: DARK GRAY ORGANIC SILT OH SHELL NOTED
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.30 in
Specimen Area: 6.25 in^2
Specimen Volume: 39.41 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 72

Plastic Limit: 37

Estimated Specific Gravity: 2.60

	Vertical Strain %	Total Vertical Stress tsf	Total Horizontal Stress tsf	Excess Pore Pressure tsf	A Parameter	Effective Vertical Stress tsf	Effective Horizontal Stress tsf	Stress Ratio	Effective p tsf	q tsf
1	0.00	5.76	5.76	0	0.000	0.71831	0.71831	1.000	0.71831	0
2	0.06	5.9124	5.76	0.12834	0.842	0.74242	0.58998	1.258	0.6662	0.07622
3	0.12	5.993	5.76	0.18002	0.773	0.77129	0.53829	1.433	0.65479	0.1165
4	0.19	6.0421	5.76	0.20963	0.743	0.79079	0.50868	1.555	0.64973	0.14105
5	0.25	6.0796	5.76	0.23112	0.723	0.80684	0.48719	1.656	0.64702	0.15982
6	0.31	6.1133	5.76	0.25493	0.722	0.8167	0.46338	1.762	0.64004	0.17666
7	0.38	6.145	5.76	0.27525	0.715	0.82807	0.44306	1.869	0.63556	0.19251
8	0.44	6.1716	5.76	0.29384	0.714	0.83605	0.42447	1.970	0.63026	0.20579
9	0.50	6.1943	5.76	0.30661	0.706	0.84598	0.4117	2.055	0.62884	0.21714
10	0.56	6.2163	5.76	0.31474	0.690	0.85989	0.40357	2.131	0.63173	0.22816
11	0.62	6.2358	5.76	0.33333	0.701	0.86077	0.38499	2.236	0.62288	0.23789
12	0.69	6.2565	5.76	0.3461	0.697	0.8687	0.37221	2.334	0.62045	0.24824
13	0.75	6.2714	5.76	0.3583	0.701	0.87146	0.36002	2.421	0.61574	0.25572
14	0.87	6.3032	5.76	0.37281	0.686	0.8887	0.3455	2.572	0.6171	0.2716
15	1.00	6.3336	5.76	0.39546	0.689	0.89647	0.32285	2.777	0.60966	0.28681
16	1.12	6.3602	5.76	0.4094	0.682	0.90907	0.30891	2.943	0.60899	0.30008
17	1.24	6.3816	5.76	0.4245	0.683	0.91539	0.29382	3.116	0.6046	0.31079
18	1.36	6.4042	5.76	0.43785	0.680	0.92465	0.28046	3.297	0.60255	0.3221
19	1.49	6.423	5.76	0.4483	0.676	0.93297	0.27001	3.455	0.60149	0.33148
20	2.23	6.5201	5.76	0.45585	0.600	1.0226	0.26246	3.896	0.64252	0.38006
21	2.98	6.5933	5.76	0.46282	0.555	1.0887	0.25549	4.261	0.67212	0.41663
22	3.71	6.6419	5.76	0.47386	0.537	1.1263	0.24446	4.608	0.68539	0.44094
23	4.45	6.6768	5.76	0.47966	0.523	1.1554	0.23865	4.841	0.69703	0.45838
24	5.20	6.7024	5.76	0.48373	0.513	1.1769	0.23458	5.017	0.70576	0.47118
25	5.94	6.7264	5.76	0.48779	0.505	1.1969	0.23052	5.192	0.71371	0.48319
26	6.68	6.7421	5.76	0.49186	0.501	1.2086	0.22645	5.337	0.71751	0.49106
27	7.43	6.7508	5.76	0.49592	0.501	1.2132	0.22239	5.455	0.71779	0.4954
28	8.16	6.7577	5.76	0.50289	0.504	1.2131	0.21542	5.631	0.71425	0.49883
29	8.90	6.7613	5.76	0.50696	0.506	1.2127	0.21136	5.738	0.712	0.50065
30	9.66	6.7623	5.76	0.5116	0.510	1.209	0.20671	5.849	0.70785	0.50114
31	10.39	6.7512	5.76	0.51334	0.518	1.1962	0.20497	5.836	0.70059	0.49562
32	11.13	6.7402	5.76	0.51509	0.525	1.1835	0.20323	5.823	0.69334	0.49012
33	11.88	6.7229	5.76	0.51683	0.537	1.1644	0.20148	5.779	0.68293	0.48145
34	12.61	6.7111	5.76	0.51915	0.546	1.1502	0.19916	5.775	0.6747	0.47554
35	13.35	6.6985	5.76	0.52147	0.556	1.1354	0.19684	5.768	0.6661	0.46927
36	14.11	6.6887	5.76	0.52205	0.562	1.1249	0.19626	5.732	0.66058	0.46433
37	14.84	6.6791	5.76	0.52322	0.569	1.1142	0.1951	5.711	0.65466	0.45956
38	15.29	6.6748	5.76	0.52438	0.573	1.1087	0.19393	5.717	0.65134	0.4574

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW006 S9
Sample No.: S-9
Test No.: 20.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 26.0'-28.0'
Elevation: ----

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Consulting Engineers & Scientists

Soil Description: DARK GRAY ORGANIC SILT OH SHELL NOTED
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.22 in
Specimen Area: 6.30 in^2
Specimen Volume: 39.16 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 72

Plastic Limit: 37

Estimated Specific Gravity: 2.60

	Time min	Vertical Strain %	Corrected Area in^2	Deviator Load lb	Deviator Stress tsf	Pore Pressure tsf	Horizontal Stress tsf	Vertical Stress tsf
1	0	0	6.3003	0	0	5.0434	6.48	6.48
2	5.0002	0.053874	6.3037	16.056	0.18339	5.2253	6.48	6.6634
3	10	0.11698	6.3077	27.272	0.3113	5.3105	6.48	6.7913
4	15	0.18163	6.3118	33.307	0.37994	5.363	6.48	6.8599
5	20	0.24782	6.316	37.862	0.43162	5.4014	6.48	6.9116
6	25	0.31247	6.3201	41.506	0.47285	5.4382	6.48	6.9528
7	30	0.3802	6.3244	44.922	0.51142	5.4714	6.48	6.9914
8	35	0.44639	6.3286	47.826	0.54411	5.5006	6.48	7.0241
9	40	0.51412	6.3329	50.502	0.57417	5.5245	6.48	7.0542
10	45	0.57876	6.337	52.95	0.60161	5.5449	6.48	7.0816
11	50	0.64649	6.3413	55.228	0.62706	5.5682	6.48	7.1071
12	55	0.71268	6.3456	57.391	0.65119	5.5898	6.48	7.1312
13	60	0.77887	6.3498	59.327	0.67271	5.6102	6.48	7.1527
14	70	0.91279	6.3584	62.857	0.71177	5.6382	6.48	7.1918
15	80.001	1.0467	6.367	65.988	0.74622	5.6732	6.48	7.2262
16	90.001	1.1791	6.3755	68.778	0.77673	5.7	6.48	7.2567
17	110	1.4485	6.3929	73.504	0.82783	5.7449	6.48	7.3078
18	120	1.5824	6.4016	75.895	0.8536	5.7619	6.48	7.3336
19	180	2.3828	6.4541	86.713	0.96734	5.8598	6.48	7.4473
20	240	3.1817	6.5074	94.171	1.0419	5.9216	6.48	7.5219
21	300	3.9805	6.5615	100.66	1.1046	5.9782	6.48	7.5846
22	360	4.7763	6.6164	105.5	1.1481	6.0115	6.48	7.6281
23	420	5.5721	6.6721	109.89	1.1858	6.0517	6.48	7.6658
24	480	6.371	6.729	113.87	1.2184	6.0739	6.48	7.6984
25	540	7.1745	6.7873	117.29	1.2442	6.1013	6.48	7.7242
26	600	7.978	6.8465	119.96	1.2616	6.1176	6.48	7.7416
27	660	8.7738	6.9063	122.35	1.2756	6.1357	6.48	7.7556
28	720	9.5758	6.9675	124.58	1.2873	6.1456	6.48	7.7673
29	780	10.378	7.0299	126.17	1.2922	6.1584	6.48	7.7722
30	840	11.177	7.0931	127.76	1.2969	6.1631	6.48	7.7769
31	900	11.976	7.1575	129.07	1.2984	6.1666	6.48	7.7784
32	960	12.787	7.224	129.36	1.2893	6.1596	6.48	7.7693
33	1020	13.584	7.2907	128.62	1.2702	6.1643	6.48	7.7502
34	1080	14.381	7.3586	127.93	1.2518	6.1596	6.48	7.7318
35	1140	15.18	7.4279	126.51	1.2263	6.1602	6.48	7.7063

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW006 S9
Sample No.: S-9
Test No.: 20.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 26.0'-28.0'
Elevation: ----

Soil Description: DARK GRAY ORGANIC SILT OH SHELL NOTED
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.22 in
Specimen Area: 6.30 in^2
Specimen Volume: 39.16 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 72

Plastic Limit: 37

Estimated Specific Gravity: 2.60

	Vertical Strain %	Total Vertical Stress tsf	Total Horizontal Stress tsf	Excess Pore Pressure tsf	A Parameter	Effective Vertical Stress tsf	Effective Horizontal Stress tsf	Stress Ratio	Effective p tsf	q tsf
1	0.00	6.48	6.48	0	0.000	1.4366	1.4366	1.000	1.4366	0
2	0.05	6.6634	6.48	0.18195	0.992	1.4381	1.2547	1.146	1.3464	0.091693
3	0.12	6.7913	6.48	0.2671	0.858	1.4808	1.1695	1.266	1.3252	0.15565
4	0.18	6.8599	6.48	0.31958	0.841	1.497	1.117	1.340	1.307	0.18997
5	0.25	6.9116	6.48	0.35807	0.830	1.5102	1.0786	1.400	1.2944	0.21581
6	0.31	6.9528	6.48	0.39482	0.835	1.5147	1.0418	1.454	1.2782	0.23642
7	0.38	6.9914	6.48	0.42806	0.837	1.52	1.0086	1.507	1.2643	0.25571
8	0.45	7.0241	6.48	0.45722	0.840	1.5235	0.97941	1.556	1.2515	0.27206
9	0.51	7.0542	6.48	0.48113	0.838	1.5297	0.9555	1.601	1.2426	0.28708
10	0.58	7.0816	6.48	0.50154	0.834	1.5367	0.93509	1.643	1.2359	0.30081
11	0.65	7.1071	6.48	0.52487	0.837	1.5388	0.91176	1.688	1.2253	0.31353
12	0.71	7.1312	6.48	0.54644	0.839	1.5414	0.89018	1.732	1.2158	0.32559
13	0.78	7.1527	6.48	0.56685	0.843	1.5425	0.86977	1.773	1.2061	0.33635
14	0.91	7.1918	6.48	0.59485	0.836	1.5535	0.84178	1.846	1.1977	0.35589
15	1.05	7.2262	6.48	0.62984	0.844	1.553	0.80679	1.925	1.1799	0.37311
16	1.18	7.2567	6.48	0.65666	0.845	1.5567	0.77996	1.996	1.1683	0.38836
17	1.45	7.3078	6.48	0.70157	0.847	1.5629	0.73506	2.126	1.149	0.41392
18	1.58	7.3336	6.48	0.71848	0.842	1.5717	0.71814	2.189	1.1449	0.4268
19	2.38	7.4473	6.48	0.81646	0.844	1.5875	0.62017	2.560	1.1038	0.48367
20	3.18	7.5219	6.48	0.87827	0.843	1.6003	0.55835	2.866	1.0793	0.52097
21	3.98	7.5846	6.48	0.93484	0.846	1.6064	0.50178	3.201	1.0541	0.55229
22	4.78	7.6281	6.48	0.96809	0.843	1.6166	0.46854	3.450	1.0426	0.57404
23	5.57	7.6658	6.48	1.0083	0.850	1.6141	0.4283	3.769	1.0212	0.5929
24	6.37	7.6984	6.48	1.0305	0.846	1.6246	0.40614	4.000	1.0153	0.6092
25	7.17	7.7242	6.48	1.0579	0.850	1.6229	0.37873	4.285	1.0008	0.6221
26	7.98	7.7416	6.48	1.0742	0.852	1.624	0.3624	4.481	0.99318	0.63078
27	8.77	7.7556	6.48	1.0923	0.856	1.6199	0.34432	4.705	0.98212	0.63779
28	9.58	7.7673	6.48	1.1022	0.856	1.6217	0.33441	4.850	0.97807	0.64366
29	10.38	7.7722	6.48	1.115	0.863	1.6138	0.32158	5.018	0.96769	0.64611
30	11.18	7.7769	6.48	1.1197	0.863	1.6138	0.31691	5.092	0.96536	0.64845
31	11.98	7.7784	6.48	1.1232	0.865	1.6118	0.31341	5.143	0.96261	0.6492
32	12.79	7.7693	6.48	1.1162	0.866	1.6097	0.32041	5.024	0.96505	0.64464
33	13.58	7.7502	6.48	1.1209	0.882	1.5859	0.31575	5.023	0.95083	0.63509
34	14.38	7.7318	6.48	1.1162	0.892	1.5722	0.32041	4.907	0.9463	0.62588
35	15.18	7.7063	6.48	1.1168	0.911	1.5461	0.31983	4.834	0.93298	0.61315

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-006 S9
Sample No.: S-9
Test No.: 40.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 26.0'-28.0'
Elevation: ----

Soil Description: DARK GRAY ORGANIC SILT OH SHELL NOTED
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D 4767.

Specimen Height: 6.19 in
Specimen Area: 6.23 in^2
Specimen Volume: 38.60 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 72

Plastic Limit: 37

Estimated Specific Gravity: 2.60

	Time min	Vertical Strain %	Corrected Area in^2	Deviator Load lb	Deviator Stress tsf	Pore Pressure tsf	Horizontal Stress tsf	Vertical Stress tsf
1	0	0	6.2339	0	0	5.0421	7.92	7.92
2	5.0041	0.048386	6.237	20.074	0.23173	5.2556	7.92	8.1517
3	10.004	0.10997	6.2408	35.922	0.41443	5.4179	7.92	8.3344
4	15	0.17448	6.2448	47.727	0.55027	5.5452	7.92	8.4703
5	20	0.239	6.2489	56.501	0.65101	5.6441	7.92	8.571
6	25	0.30498	6.253	63.345	0.72938	5.7261	7.92	8.6494
7	30	0.37096	6.2572	69.271	0.79709	5.7994	7.92	8.7171
8	35	0.43547	6.2612	74.094	0.85204	5.8628	7.92	8.772
9	40	0.50292	6.2655	78.366	0.90055	5.9192	7.92	8.8206
10	45	0.57036	6.2697	82.179	0.94372	5.971	7.92	8.8637
11	50	0.63781	6.274	85.44	0.98051	6.0187	7.92	8.9005
12	55	0.70379	6.2781	88.426	1.0141	6.0629	7.92	8.9341
13	60	0.77124	6.2824	91.274	1.0461	6.1059	7.92	8.9661
14	70	0.90613	6.291	96.097	1.0998	6.1781	7.92	9.0198
15	80	1.0381	6.2993	100.51	1.1488	6.2449	7.92	9.0688
16	90	1.173	6.3079	104.27	1.1902	6.3054	7.92	9.1102
17	100	1.3079	6.3166	107.4	1.2242	6.3572	7.92	9.1442
18	110	1.4398	6.325	110.34	1.256	6.4072	7.92	9.176
19	120	1.5747	6.3337	113.19	1.2867	6.4514	7.92	9.2067
20	180	2.3709	6.3853	125.22	1.412	6.6602	7.92	9.332
21	240	3.1832	6.4389	133.67	1.4947	6.801	7.92	9.4147
22	300	3.9838	6.4926	140.24	1.5552	6.9063	7.92	9.4752
23	360	4.7858	6.5473	145.66	1.6018	6.9854	7.92	9.5218
24	420	5.5951	6.6034	150.49	1.6408	7.0493	7.92	9.5608
25	480	6.3957	6.6599	154.71	1.6726	7.1017	7.92	9.5926
26	540	7.1948	6.7172	158.57	1.6997	7.1459	7.92	9.6197
27	600	8.0027	6.7762	162.01	1.7215	7.1825	7.92	9.6415
28	660	8.8047	6.8358	165.09	1.7389	7.2151	7.92	9.6589
29	720	9.6009	6.896	167.99	1.7539	7.2424	7.92	9.6739
30	780	10.406	6.958	170.42	1.7635	7.2651	7.92	9.6835
31	840	11.211	7.0211	172.49	1.7688	7.2843	7.92	9.6888
32	900	12.013	7.0851	173.91	1.7673	7.2989	7.92	9.6873
33	960	12.824	7.151	174.74	1.7594	7.3099	7.92	9.6794
34	1020	13.618	7.2167	174.37	1.7397	7.3151	7.92	9.6597
35	1080	14.419	7.2843	173.27	1.7126	7.3157	7.92	9.6326
36	1140	15.24	7.3548	171.71	1.6809	7.314	7.92	9.6009

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-006 S9
Sample No.: S-9
Test No.: 40.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 26.0'-28.0'
Elevation: ----

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Soil Description: DARK GRAY ORGANIC SILT OH SHELL NOTED
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D 4767.

Specimen Height: 6.19 in
Specimen Area: 6.23 in^2
Specimen Volume: 38.60 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 72

Plastic Limit: 37

Estimated Specific Gravity: 2.60

	Vertical Strain %	Total Vertical Stress tsf	Total Horizontal Stress tsf	Excess Pore Pressure tsf	A Parameter	Effective Vertical Stress tsf	Effective Horizontal Stress tsf	Stress Ratio	Effective p tsf	q tsf
1	0.00	7.92	7.92	0	0.000	2.8779	2.8779	1.000	2.8779	0
2	0.05	8.1517	7.92	0.21346	0.921	2.8961	2.6644	1.087	2.7803	0.11587
3	0.11	8.3344	7.92	0.37573	0.907	2.9166	2.5021	1.166	2.7093	0.20721
4	0.17	8.4703	7.92	0.50311	0.914	2.925	2.3748	1.232	2.6499	0.27514
5	0.24	8.571	7.92	0.60199	0.925	2.9269	2.2759	1.286	2.6014	0.3255
6	0.30	8.6494	7.92	0.68399	0.938	2.9233	2.1939	1.332	2.5586	0.36469
7	0.37	8.7171	7.92	0.75728	0.950	2.9177	2.1206	1.376	2.5191	0.39854
8	0.44	8.772	7.92	0.82068	0.963	2.9092	2.0572	1.414	2.4832	0.42602
9	0.50	8.8206	7.92	0.8771	0.974	2.9013	2.0008	1.450	2.451	0.45028
10	0.57	8.8637	7.92	0.92886	0.984	2.8927	1.949	1.484	2.4209	0.47186
11	0.64	8.9005	7.92	0.97655	0.996	2.8818	1.9013	1.516	2.3916	0.49026
12	0.70	8.9341	7.92	1.0208	1.007	2.8712	1.8571	1.546	2.3642	0.50705
13	0.77	8.9661	7.92	1.0638	1.017	2.8601	1.8141	1.577	2.3371	0.52303
14	0.91	9.0198	7.92	1.1359	1.033	2.8418	1.7419	1.631	2.2919	0.54992
15	1.04	9.0688	7.92	1.2028	1.047	2.8238	1.6751	1.686	2.2494	0.57439
16	1.17	9.1102	7.92	1.2633	1.061	2.8048	1.6146	1.737	2.2097	0.5951
17	1.31	9.1442	7.92	1.3151	1.074	2.787	1.5628	1.783	2.1749	0.61209
18	1.44	9.176	7.92	1.3651	1.087	2.7688	1.5128	1.830	2.1408	0.62801
19	1.57	9.2067	7.92	1.4093	1.095	2.7552	1.4686	1.876	2.1119	0.64333
20	2.37	9.332	7.92	1.6181	1.146	2.6717	1.2598	2.121	1.9658	0.70598
21	3.18	9.4147	7.92	1.7588	1.177	2.6137	1.119	2.336	1.8664	0.74736
22	3.98	9.4752	7.92	1.8641	1.199	2.569	1.0137	2.534	1.7914	0.77761
23	4.79	9.5218	7.92	1.9432	1.213	2.5365	0.93464	2.714	1.7356	0.80092
24	5.60	9.5608	7.92	2.0072	1.223	2.5115	0.87066	2.885	1.6911	0.8204
25	6.40	9.5926	7.92	2.0595	1.231	2.4909	0.81832	3.044	1.6546	0.83629
26	7.19	9.6197	7.92	2.1037	1.238	2.4738	0.77411	3.196	1.6239	0.84983
27	8.00	9.6415	7.92	2.1404	1.243	2.4589	0.73747	3.334	1.5982	0.86073
28	8.80	9.6589	7.92	2.173	1.250	2.4438	0.7049	3.467	1.5743	0.86944
29	9.60	9.6739	7.92	2.2003	1.255	2.4315	0.67756	3.589	1.5545	0.87696
30	10.41	9.6835	7.92	2.223	1.261	2.4184	0.65488	3.693	1.5366	0.88174
31	11.21	9.6888	7.92	2.2422	1.268	2.4045	0.63569	3.783	1.5201	0.88442
32	12.01	9.6873	7.92	2.2567	1.277	2.3885	0.62115	3.845	1.5048	0.88367
33	12.82	9.6794	7.92	2.2678	1.289	2.3695	0.61009	3.884	1.4898	0.87969
34	13.62	9.6597	7.92	2.273	1.307	2.3445	0.60486	3.876	1.4747	0.86983
35	14.42	9.6326	7.92	2.2736	1.328	2.3169	0.60428	3.834	1.4606	0.85632
36	15.24	9.6009	7.92	2.2718	1.352	2.287	0.60602	3.774	1.4465	0.84046

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST
ASTM D4767

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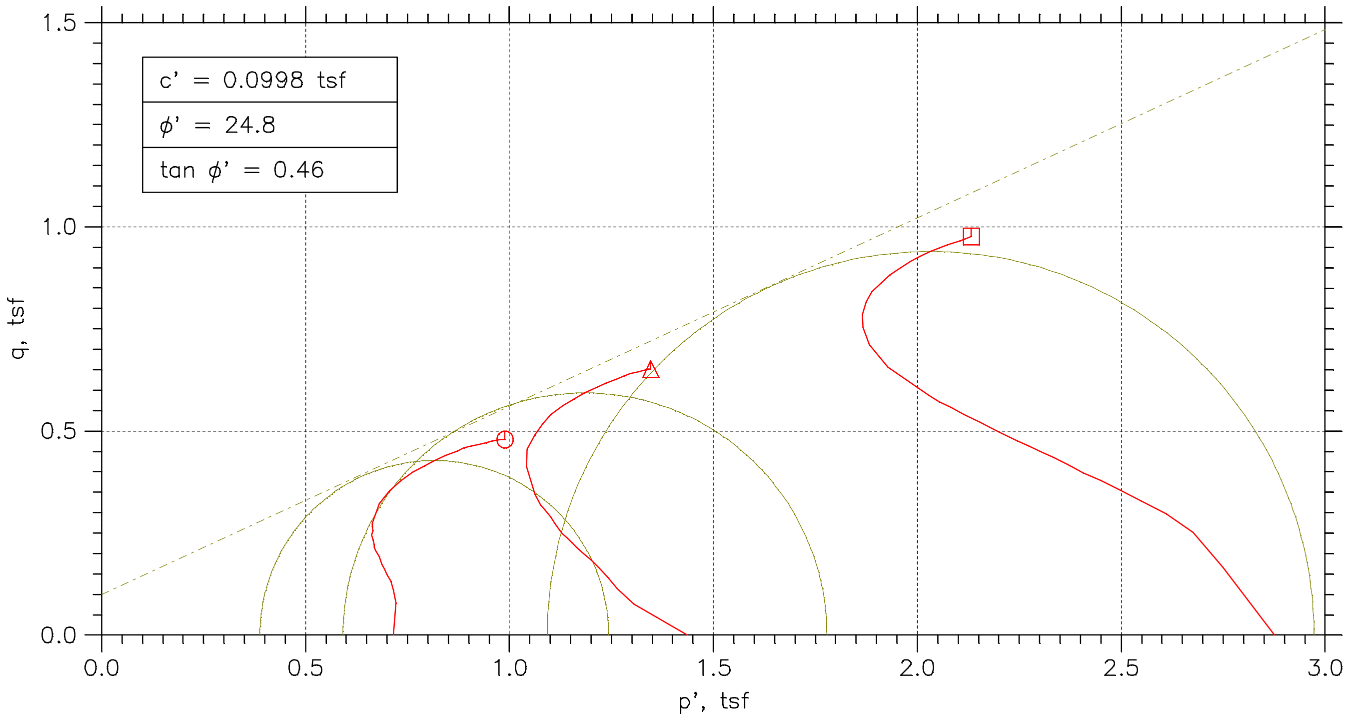

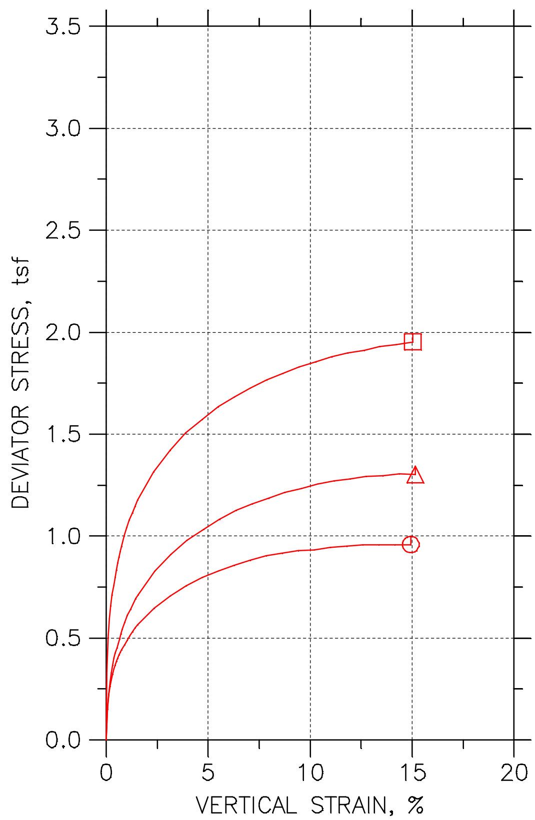

	Symbol	○	△	□	
	Test No.	10.0 PSI	20.0 PSI	40.0 PSI	
Initial	Diameter, in	2.8094	2.8291	2.8406	
Initial	Height, in	5.9575	6.2256	6.276	
Initial	Water Content, %	27.95	28.58	25.69	
Initial	Dry Density, pcf	95.83	93.77	96.62	
Initial	Saturation, %	98.51	95.87	92.26	
Initial	Void Ratio	0.77188	0.81092	0.75748	
Before Shear	Water Content, %	27.39	26.71	23.87	
Before Shear	Dry Density, pcf	97.31	98.35	103.	
Before Shear	Saturation, %	100.00	100.00	100.00	
Before Shear	Void Ratio	0.74495	0.72649	0.64936	
Before Shear	Back Press., tsf	5.0452	5.044	5.045	
	Minor Prin. Stress, tsf	0.71483	1.436	2.875	
	Max. Dev. Stress, tsf	0.95795	1.304	1.9522	
	Time to Failure, min	1140	1080	1140	
	Strain Rate, %/min	0.02	0.02	0.02	
	B-Value	0.95	0.97	0.95	
	Estimated Specific Gravity	2.72	2.72	2.72	
	Liquid Limit	48	48	48	
	Plastic Limit	18	18	18	
	Plasticity Index	30	30	30	
	Failure Sketch				

Project: DYNERGY EDWARDS
Location: BARTONVILLE, IL
Project No.: MR155218
Boring No.: EDW010 S-7
Sample Type: 3.0'' ST
Description: BROWN AND GRAY MOTTLED LEAN CLAY CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

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CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST
ASTM D4767

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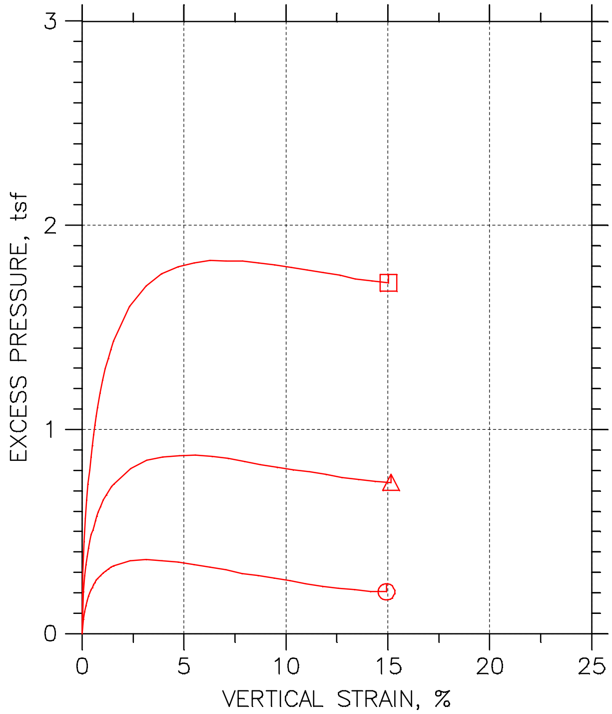

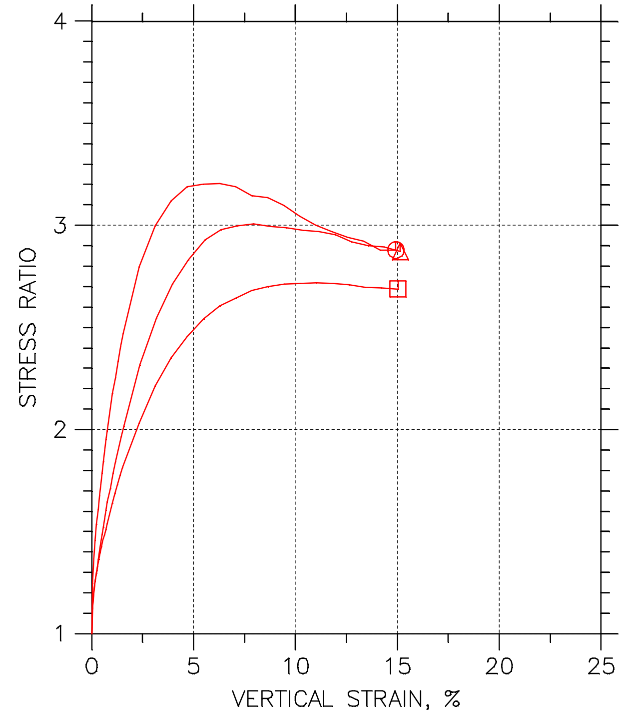

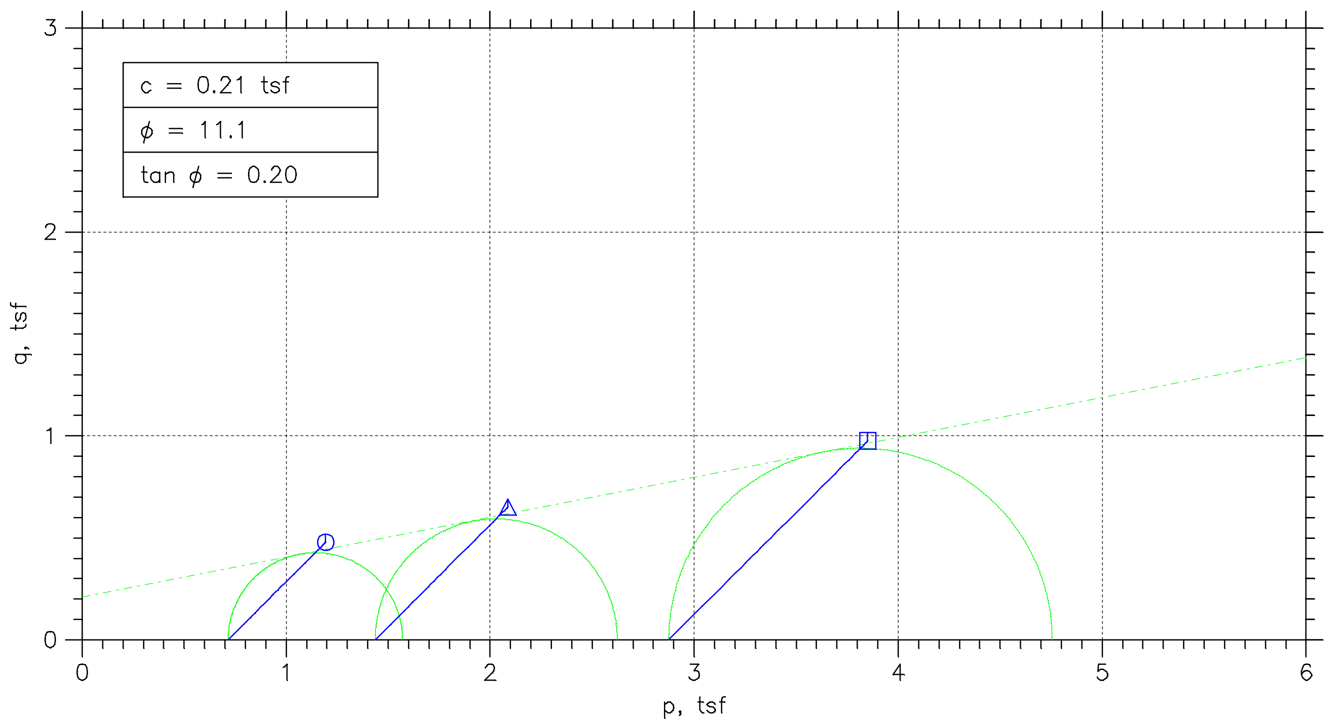

Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
Boring No.: EDW-010 S-7	Tested By: BCM	Checked By: WPQ
Sample No.: S-7	Test Date: 10/29/15	Depth: 15.0'-17.0'
Test No.: EDW-010 S-7	Sample Type: 3.0" ST	Elevation: ----
Description: BROWN AND GRAY MOTTLED LEAN CLAY CL		
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.		

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TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-010 S-7
Sample No.: S-7
Test No.: 10.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 15.0'-17.0'
Elevation: ----

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Soil Description: BROWN AND GRAY MOTTLED LEAN CLAY CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 5.96 in
Specimen Area: 6.20 in^2
Specimen Volume: 36.93 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 48

Plastic Limit: 18

Estimated Specific Gravity: 2.72

	Time min	Vertical Strain %	Corrected Area in^2	Deviator Load lb	Deviator Stress tsf	Pore Pressure tsf	Horizontal Stress tsf	Vertical Stress tsf
1	0	0	6.1991	0	0	5.0452	5.76	5.76
2	5.0041	0.056448	6.2027	13.621	0.15811	5.1172	5.76	5.9181
3	10.004	0.12013	6.2066	19.07	0.22122	5.1549	5.76	5.9812
4	15.004	0.18382	6.2106	22.767	0.26394	5.1834	5.76	6.0239
5	20	0.24895	6.2146	25.54	0.29589	5.2078	5.76	6.0559
6	25	0.31408	6.2187	27.923	0.3233	5.2287	5.76	6.0833
7	30	0.37922	6.2227	29.967	0.34673	5.2467	5.76	6.1067
8	35	0.4429	6.2267	31.669	0.36619	5.2595	5.76	6.1262
9	40	0.50948	6.2309	33.275	0.3845	5.2716	5.76	6.1445
10	45	0.57462	6.235	34.734	0.4011	5.285	5.76	6.1611
11	50	0.63975	6.2391	36.047	0.41599	5.296	5.76	6.176
12	55	0.70488	6.2432	37.312	0.43031	5.3065	5.76	6.1903
13	60	0.77001	6.2473	38.48	0.44348	5.314	5.76	6.2035
14	70	0.90028	6.2555	40.669	0.4681	5.3286	5.76	6.2281
15	80	1.032	6.2638	42.663	0.4904	5.3431	5.76	6.2504
16	90	1.1608	6.272	44.609	0.5121	5.3512	5.76	6.2721
17	100	1.2925	6.2803	46.263	0.53038	5.3622	5.76	6.2904
18	110	1.4213	6.2885	47.869	0.54807	5.3704	5.76	6.3081
19	120	1.5516	6.2969	49.377	0.56459	5.3762	5.76	6.3246
20	180	2.3404	6.3477	56.868	0.64504	5.4011	5.76	6.405
21	240	3.1249	6.3991	62.706	0.70554	5.407	5.76	6.4655
22	300	3.908	6.4513	67.717	0.75576	5.4035	5.76	6.5158
23	360	4.7026	6.5051	72.046	0.79743	5.3959	5.76	6.5574
24	420	5.4871	6.5591	75.549	0.82931	5.3831	5.76	6.5893
25	480	6.2774	6.6144	78.565	0.85521	5.3721	5.76	6.6152
26	540	7.0676	6.6706	81.63	0.88108	5.3576	5.76	6.6411
27	600	7.8492	6.7272	84.305	0.90231	5.3396	5.76	6.6623
28	660	8.6337	6.7849	86.446	0.91734	5.3303	5.76	6.6773
29	720	9.424	6.8441	88.197	0.92783	5.3175	5.76	6.6878
30	780	10.213	6.9043	89.462	0.93294	5.3036	5.76	6.6929
31	840	10.997	6.9651	91.213	0.94289	5.2891	5.76	6.7029
32	900	11.786	7.0274	92.818	0.95098	5.2769	5.76	6.711
33	960	12.572	7.0906	94.083	0.95535	5.2682	5.76	6.7154
34	1020	13.361	7.1551	95.105	0.95701	5.2618	5.76	6.717
35	1080	14.148	7.2208	95.981	0.95705	5.2502	5.76	6.717
36	1140	14.93	7.2871	96.953	0.95795	5.2502	5.76	6.7179

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-010 S-7
Sample No.: S-7
Test No.: 10.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 15.0'-17.0'
Elevation: ----

Terracon
Consulting Engineers & Scientists

Soil Description: BROWN AND GRAY MOTTLED LEAN CLAY CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 5.96 in
Specimen Area: 6.20 in^2
Specimen Volume: 36.93 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 48

Plastic Limit: 18

Estimated Specific Gravity: 2.72

	Vertical Strain %	Total Vertical Stress tsf	Total Horizontal Stress tsf	Excess Pore Pressure tsf	A Parameter	Effective Vertical Stress tsf	Effective Horizontal Stress tsf	Stress Ratio	Effective p tsf	q tsf
1	0.00	5.76	5.76	0	0.000	0.71483	0.71483	1.000	0.71483	0
2	0.06	5.9181	5.76	0.072008	0.455	0.80093	0.64282	1.246	0.72188	0.079057
3	0.12	5.9812	5.76	0.10975	0.496	0.82629	0.60507	1.366	0.71568	0.11061
4	0.18	6.0239	5.76	0.13821	0.524	0.84056	0.57662	1.458	0.70859	0.13197
5	0.25	6.0559	5.76	0.1626	0.550	0.84812	0.55223	1.536	0.70018	0.14795
6	0.31	6.0833	5.76	0.1835	0.568	0.85462	0.53132	1.608	0.69297	0.16165
7	0.38	6.1067	5.76	0.2015	0.581	0.86005	0.51332	1.675	0.68669	0.17336
8	0.44	6.1262	5.76	0.21428	0.585	0.86674	0.50055	1.732	0.68364	0.1831
9	0.51	6.1445	5.76	0.22648	0.589	0.87285	0.48835	1.787	0.6806	0.19225
10	0.57	6.1611	5.76	0.23983	0.598	0.87609	0.475	1.844	0.67555	0.20055
11	0.64	6.176	5.76	0.25086	0.603	0.87996	0.46396	1.897	0.67196	0.208
12	0.70	6.1903	5.76	0.26132	0.607	0.88382	0.45351	1.949	0.66866	0.21515
13	0.77	6.2035	5.76	0.26887	0.606	0.88944	0.44596	1.994	0.6677	0.22174
14	0.90	6.2281	5.76	0.28338	0.605	0.89954	0.43144	2.085	0.66549	0.23405
15	1.03	6.2504	5.76	0.2979	0.607	0.90733	0.41693	2.176	0.66213	0.2452
16	1.16	6.2721	5.76	0.30603	0.598	0.9209	0.4088	2.253	0.66485	0.25605
17	1.29	6.2904	5.76	0.31707	0.598	0.92814	0.39776	2.333	0.66295	0.26519
18	1.42	6.3081	5.76	0.3252	0.593	0.9377	0.38963	2.407	0.66367	0.27403
19	1.55	6.3246	5.76	0.331	0.586	0.94841	0.38382	2.471	0.66612	0.28229
20	2.34	6.405	5.76	0.35597	0.552	1.0039	0.35885	2.797	0.68137	0.32252
21	3.12	6.4655	5.76	0.36178	0.513	1.0586	0.35305	2.998	0.70582	0.35277
22	3.91	6.5158	5.76	0.3583	0.474	1.1123	0.35653	3.120	0.73441	0.37788
23	4.70	6.5574	5.76	0.35075	0.440	1.1615	0.36408	3.190	0.7628	0.39872
24	5.49	6.5893	5.76	0.33797	0.408	1.2062	0.37686	3.201	0.79151	0.41466
25	6.28	6.6152	5.76	0.32694	0.382	1.2431	0.38789	3.205	0.8155	0.42761
26	7.07	6.6411	5.76	0.31242	0.355	1.2835	0.40241	3.190	0.84295	0.44054
27	7.85	6.6623	5.76	0.29442	0.326	1.3227	0.42041	3.146	0.87156	0.45115
28	8.63	6.6773	5.76	0.28513	0.311	1.347	0.4297	3.135	0.88837	0.45867
29	9.42	6.6878	5.76	0.27235	0.294	1.3703	0.44248	3.097	0.90639	0.46391
30	10.21	6.6929	5.76	0.25841	0.277	1.3894	0.45641	3.044	0.92288	0.46647
31	11.00	6.7029	5.76	0.2439	0.259	1.4138	0.47093	3.002	0.94238	0.47144
32	11.79	6.711	5.76	0.2317	0.244	1.4341	0.48313	2.968	0.95862	0.47549
33	12.57	6.7154	5.76	0.22299	0.233	1.4472	0.49184	2.942	0.96951	0.47768
34	13.36	6.717	5.76	0.2166	0.226	1.4552	0.49822	2.921	0.97673	0.47851
35	14.15	6.717	5.76	0.20499	0.214	1.4669	0.50984	2.877	0.98836	0.47852
36	14.93	6.7179	5.76	0.20499	0.214	1.4678	0.50984	2.879	0.98881	0.47897

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW010 S-7
Sample No.: S-7
Test No.: 20.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 15.0'-17.0'
Elevation: ----

Soil Description: BROWN AND GRAY MOTTLED LEAN CLAY CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.23 in
Specimen Area: 6.29 in^2
Specimen Volume: 39.14 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 48

Plastic Limit: 18

Estimated Specific Gravity: 2.72

	Time min	Vertical Strain %	Corrected Area in^2	Deviator Load lb	Deviator Stress tsf	Pore Pressure tsf	Horizontal Stress tsf	Vertical Stress tsf
1	0	0	6.2863	0	0	5.044	6.48	6.48
2	5.0041	0.05533	6.2898	13.126	0.15025	5.2498	6.48	6.6303
3	10.004	0.11988	6.2939	19.719	0.22558	5.328	6.48	6.7056
4	15.004	0.18597	6.298	24.693	0.2823	5.381	6.48	6.7623
5	20.004	0.25206	6.3022	28.769	0.32867	5.4242	6.48	6.8087
6	25.004	0.31968	6.3065	32.245	0.36814	5.4644	6.48	6.8481
7	30.004	0.38731	6.3108	35.122	0.40071	5.4988	6.48	6.8807
8	35.004	0.45339	6.315	37.46	0.4271	5.5286	6.48	6.9071
9	40.004	0.52256	6.3193	39.617	0.45138	5.5525	6.48	6.9314
10	45.004	0.58557	6.3234	41.595	0.47362	5.5747	6.48	6.9536
11	50.004	0.65166	6.3276	43.633	0.49649	5.5991	6.48	6.9765
12	55.004	0.71775	6.3318	45.791	0.5207	5.6207	6.48	7.0007
13	60.004	0.7823	6.3359	47.769	0.54284	5.6394	6.48	7.0228
14	70.004	0.91601	6.3444	50.885	0.57747	5.6668	6.48	7.0575
15	80	1.0497	6.353	54.002	0.61202	5.6983	6.48	7.092
16	90	1.1834	6.3616	56.459	0.639	5.7228	6.48	7.119
17	110	1.4493	6.3788	61.314	0.69208	5.7642	6.48	7.1721
18	120	1.583	6.3874	63.292	0.71343	5.7776	6.48	7.1934
19	180	2.3746	6.4392	73.961	0.82699	5.8522	6.48	7.307
20	240	3.1676	6.492	82.052	0.91001	5.8919	6.48	7.39
21	300	3.9653	6.5459	89.124	0.9803	5.9077	6.48	7.4603
22	360	4.766	6.6009	94.698	1.0329	5.9158	6.48	7.5129
23	420	5.5652	6.6568	100.03	1.082	5.9193	6.48	7.562
24	480	6.366	6.7137	104.89	1.1248	5.9117	6.48	7.6048
25	540	7.1682	6.7717	108.78	1.1566	5.9012	6.48	7.6366
26	600	7.9582	6.8299	112.56	1.1866	5.8884	6.48	7.6666
27	660	8.7559	6.8896	116.22	1.2145	5.8709	6.48	7.6945
28	720	9.5582	6.9507	119.03	1.233	5.8598	6.48	7.713
29	780	10.356	7.0125	122.09	1.2535	5.8453	6.48	7.7335
30	840	11.16	7.076	124.79	1.2697	5.8353	6.48	7.7497
31	900	11.954	7.1398	127	1.2807	5.8248	6.48	7.7607
32	960	12.753	7.2052	129.22	1.2913	5.8073	6.48	7.7713
33	1020	13.56	7.2725	130.84	1.2954	5.7986	6.48	7.7754
34	1080	14.358	7.3402	132.94	1.304	5.791	6.48	7.784
35	1140	15.15	7.4087	134.02	1.3024	5.7846	6.48	7.7824

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW010 S-7
Sample No.: S-7
Test No.: 20.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 15.0'-17.0'
Elevation: ----

Soil Description: BROWN AND GRAY MOTTLED LEAN CLAY CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.23 in
Specimen Area: 6.29 in^2
Specimen Volume: 39.14 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 48

Plastic Limit: 18

Estimated Specific Gravity: 2.72

	Vertical Strain %	Total Vertical Stress tsf	Total Horizontal Stress tsf	Excess Pore Pressure tsf	A Parameter	Effective Vertical Stress tsf	Effective Horizontal Stress tsf	Stress Ratio	Effective p tsf	q tsf
1	0.00	6.48	6.48	0	0.000	1.436	1.436	1.000	1.436	0
2	0.06	6.6303	6.48	0.20586	1.370	1.3804	1.2302	1.122	1.3053	0.075127
3	0.12	6.7056	6.48	0.28401	1.259	1.3776	1.152	1.196	1.2648	0.11279
4	0.19	6.7623	6.48	0.33708	1.194	1.3813	1.099	1.257	1.2401	0.14115
5	0.25	6.8087	6.48	0.38024	1.157	1.3845	1.0558	1.311	1.2201	0.16434
6	0.32	6.8481	6.48	0.42048	1.142	1.3837	1.0156	1.362	1.1996	0.18407
7	0.39	6.8807	6.48	0.45488	1.135	1.3819	0.98116	1.408	1.1815	0.20036
8	0.45	6.9071	6.48	0.48463	1.135	1.3785	0.95142	1.449	1.165	0.21355
9	0.52	6.9314	6.48	0.50854	1.127	1.3789	0.92751	1.487	1.1532	0.22569
10	0.59	6.9536	6.48	0.5307	1.121	1.379	0.90535	1.523	1.1422	0.23681
11	0.65	6.9765	6.48	0.55519	1.118	1.3773	0.88085	1.564	1.1291	0.24825
12	0.72	7.0007	6.48	0.57677	1.108	1.38	0.85927	1.606	1.1196	0.26035
13	0.78	7.0228	6.48	0.59543	1.097	1.3834	0.84061	1.646	1.112	0.27142
14	0.92	7.0575	6.48	0.62284	1.079	1.3907	0.8132	1.710	1.1019	0.28874
15	1.05	7.092	6.48	0.65433	1.069	1.3937	0.78171	1.783	1.0877	0.30601
16	1.18	7.119	6.48	0.67883	1.062	1.3962	0.75722	1.844	1.0767	0.3195
17	1.45	7.1721	6.48	0.72023	1.041	1.4079	0.71581	1.967	1.0619	0.34604
18	1.58	7.1934	6.48	0.73365	1.028	1.4158	0.7024	2.016	1.0591	0.35672
19	2.37	7.307	6.48	0.80829	0.977	1.4547	0.62775	2.317	1.0412	0.41349
20	3.17	7.39	6.48	0.84795	0.932	1.4981	0.58809	2.547	1.0431	0.455
21	3.97	7.4603	6.48	0.8637	0.881	1.5526	0.57235	2.713	1.0625	0.49015
22	4.77	7.5129	6.48	0.87186	0.844	1.5971	0.56418	2.831	1.0806	0.51646
23	5.57	7.562	6.48	0.87536	0.809	1.6426	0.56068	2.930	1.1017	0.54098
24	6.37	7.6048	6.48	0.86778	0.771	1.6931	0.56827	2.979	1.1307	0.56242
25	7.17	7.6366	6.48	0.85728	0.741	1.7354	0.57876	2.998	1.1571	0.57831
26	7.96	7.6666	6.48	0.84445	0.712	1.7782	0.59159	3.006	1.1849	0.5933
27	8.76	7.6945	6.48	0.82695	0.681	1.8236	0.60909	2.994	1.2163	0.60726
28	9.56	7.713	6.48	0.81587	0.662	1.8532	0.62017	2.988	1.2367	0.61651
29	10.36	7.7335	6.48	0.80129	0.639	1.8883	0.63475	2.975	1.2615	0.62676
30	11.16	7.7497	6.48	0.79138	0.623	1.9144	0.64466	2.970	1.2795	0.63487
31	11.95	7.7607	6.48	0.78088	0.610	1.9359	0.65516	2.955	1.2955	0.64037
32	12.75	7.7713	6.48	0.76339	0.591	1.9639	0.67266	2.920	1.3183	0.64564
33	13.56	7.7754	6.48	0.75464	0.583	1.9768	0.6814	2.901	1.3291	0.64768
34	14.36	7.784	6.48	0.74706	0.573	1.993	0.68899	2.893	1.341	0.65199
35	15.15	7.7824	6.48	0.74064	0.569	1.9978	0.6954	2.873	1.3466	0.6512

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-010 S7
Sample No.: S-7
Test No.: 40.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 15.0'-17.0'
Elevation: ----

Soil Description: BROWN AND GRAY MOTTLED LEAN CLAY CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.28 in
Specimen Area: 6.34 in^2
Specimen Volume: 39.77 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 48

Plastic Limit: 18

Estimated Specific Gravity: 2.72

	Time min	Vertical Strain %	Corrected Area in^2	Deviator Load lb	Deviator Stress tsf	Pore Pressure tsf	Horizontal Stress tsf	Vertical Stress tsf
1	0	0	6.3372	0	0	5.045	7.92	7.92
2	5.0034	0.036161	6.3395	29.009	0.32946	5.3353	7.92	8.2495
3	10.003	0.10125	6.3436	44.36	0.50349	5.4952	7.92	8.4235
4	15.003	0.16634	6.3477	52.512	0.59563	5.6081	7.92	8.5156
5	20.003	0.23288	6.352	58.07	0.65823	5.6994	7.92	8.5782
6	25.003	0.29942	6.3562	62.835	0.71176	5.7779	7.92	8.6318
7	30.003	0.36451	6.3604	66.964	0.75804	5.8489	7.92	8.678
8	35.003	0.43104	6.3646	70.351	0.79586	5.9111	7.92	8.7159
9	40.003	0.49758	6.3689	73.792	0.83422	5.9681	7.92	8.7542
10	45.003	0.56122	6.3729	76.915	0.86897	6.0199	7.92	8.789
11	50.003	0.62632	6.3771	79.509	0.89769	6.0658	7.92	8.8177
12	55.003	0.69141	6.3813	82.103	0.92637	6.11	7.92	8.8464
13	60.003	0.7565	6.3855	84.432	0.95202	6.1513	7.92	8.872
14	70.003	0.88523	6.3938	88.826	1.0003	6.2246	7.92	8.9203
15	80.003	1.0154	6.4022	92.637	1.0418	6.2874	7.92	8.9618
16	90.003	1.1441	6.4105	96.078	1.0791	6.3444	7.92	8.9991
17	100	1.2743	6.419	99.307	1.1139	6.3944	7.92	9.0339
18	110	1.4031	6.4273	102.17	1.1445	6.4386	7.92	9.0645
19	120	1.5318	6.4357	105.08	1.1756	6.4788	7.92	9.0956
20	180	2.3245	6.488	118.31	1.313	6.648	7.92	9.233
21	240	3.1243	6.5415	129.11	1.4211	6.7475	7.92	9.3411
22	300	3.8982	6.5942	137.9	1.5057	6.8062	7.92	9.4257
23	360	4.6923	6.6492	145.04	1.5706	6.8405	7.92	9.4906
24	420	5.4951	6.7056	152.14	1.6335	6.8615	7.92	9.5535
25	480	6.2791	6.7617	157.91	1.6814	6.8719	7.92	9.6014
26	540	7.0746	6.8196	163.31	1.7241	6.8714	7.92	9.6441
27	600	7.8702	6.8785	168.65	1.7654	6.8702	7.92	9.6854
28	660	8.6498	6.9372	173.1	1.7966	6.8621	7.92	9.7166
29	720	9.454	6.9988	177.86	1.8298	6.8516	7.92	9.7498
30	780	10.257	7.0614	181.83	1.854	6.8399	7.92	9.774
31	840	11.038	7.1234	185.96	1.8796	6.8272	7.92	9.7996
32	900	11.839	7.1882	189.4	1.8971	6.8149	7.92	9.8171
33	960	12.632	7.2534	192.47	1.9106	6.8021	7.92	9.8306
34	1020	13.412	7.3187	196.23	1.9305	6.7824	7.92	9.8505
35	1080	14.223	7.388	199.09	1.9403	6.7742	7.92	9.8603
36	1140	15.029	7.458	202.21	1.9522	6.7638	7.92	9.8722

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Location: BARTONVILLE, IL
Project No.: MR155218
Boring No.: EDW-010 S7
Tested By: BCM
Checked By: WPQ
Sample No.: S-7
Test Date: 10/29/15
Depth: 15.0'-17.0'
Test No.: 40.0 PSI
Sample Type: 3.0" ST
Elevation: ----

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Soil Description: BROWN AND GRAY MOTTLED LEAN CLAY CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.28 in
Piston Area: 0.00 in^2
Filter Strip Correction: 0.00 tsf
Specimen Area: 6.34 in^2
Piston Friction: 0.00 lb
Membrane Correction: 0.00 lb/in
Specimen Volume: 39.77 in^3
Piston Weight: 0.00 lb
Correction Type: Uniform

Liquid Limit: 48
Plastic Limit: 18
Estimated Specific Gravity: 2.72

	Vertical Strain %	Total Vertical Stress tsf	Total Horizontal Stress tsf	Excess Pore Pressure tsf	A Parameter	Effective Vertical Stress tsf	Effective Horizontal Stress tsf	Stress Ratio	Effective p tsf	q tsf
1	0.00	7.92	7.92	0	0.000	2.875	2.875	1.000	2.875	0
2	0.04	8.2495	7.92	0.29023	0.881	2.9142	2.5847	1.127	2.7495	0.16473
3	0.10	8.4235	7.92	0.45018	0.894	2.9283	2.4248	1.208	2.6765	0.25174
4	0.17	8.5156	7.92	0.56302	0.945	2.9076	2.3119	1.258	2.6098	0.29781
5	0.23	8.5782	7.92	0.65433	0.994	2.8789	2.2206	1.296	2.5497	0.32912
6	0.30	8.6318	7.92	0.73285	1.030	2.8539	2.1421	1.332	2.498	0.35588
7	0.36	8.678	7.92	0.80381	1.060	2.8292	2.0711	1.366	2.4502	0.37902
8	0.43	8.7159	7.92	0.86604	1.088	2.8048	2.0089	1.396	2.4068	0.39793
9	0.50	8.7542	7.92	0.92304	1.106	2.7861	1.9519	1.427	2.369	0.41711
10	0.56	8.789	7.92	0.97481	1.122	2.7691	1.9001	1.457	2.3346	0.43449
11	0.63	8.8177	7.92	1.0208	1.137	2.7519	1.8542	1.484	2.303	0.44885
12	0.69	8.8464	7.92	1.065	1.150	2.7364	1.81	1.512	2.2732	0.46318
13	0.76	8.872	7.92	1.1063	1.162	2.7207	1.7687	1.538	2.2447	0.47601
14	0.89	8.9203	7.92	1.1795	1.179	2.6957	1.6954	1.590	2.1955	0.50013
15	1.02	8.9618	7.92	1.2424	1.192	2.6744	1.6326	1.638	2.1535	0.52091
16	1.14	8.9991	7.92	1.2994	1.204	2.6547	1.5756	1.685	2.1152	0.53955
17	1.27	9.0339	7.92	1.3494	1.211	2.6395	1.5256	1.730	2.0825	0.55695
18	1.40	9.0645	7.92	1.3936	1.218	2.6258	1.4814	1.773	2.0536	0.57224
19	1.53	9.0956	7.92	1.4337	1.220	2.6168	1.4412	1.816	2.029	0.58778
20	2.32	9.233	7.92	1.603	1.221	2.5849	1.272	2.032	1.9285	0.65648
21	3.12	9.3411	7.92	1.7024	1.198	2.5936	1.1725	2.212	1.8831	0.71053
22	3.90	9.4257	7.92	1.7612	1.170	2.6194	1.1138	2.352	1.8666	0.75283
23	4.69	9.4906	7.92	1.7955	1.143	2.6501	1.0795	2.455	1.8648	0.7853
24	5.50	9.5535	7.92	1.8164	1.112	2.6921	1.0585	2.543	1.8753	0.81676
25	6.28	9.6014	7.92	1.8269	1.087	2.7295	1.0481	2.604	1.8888	0.84071
26	7.07	9.6441	7.92	1.8263	1.059	2.7728	1.0486	2.644	1.9107	0.86207
27	7.87	9.6854	7.92	1.8251	1.034	2.8152	1.0498	2.682	1.9325	0.88268
28	8.65	9.7166	7.92	1.817	1.011	2.8545	1.0579	2.698	1.9562	0.89828
29	9.45	9.7498	7.92	1.8065	0.987	2.8982	1.0684	2.713	1.9833	0.91488
30	10.26	9.774	7.92	1.7949	0.968	2.9341	1.0801	2.717	2.0071	0.92701
31	11.04	9.7996	7.92	1.7821	0.948	2.9725	1.0928	2.720	2.0327	0.93981
32	11.84	9.8171	7.92	1.7699	0.933	3.0022	1.1051	2.717	2.0536	0.94857
33	12.63	9.8306	7.92	1.7571	0.920	3.0284	1.1179	2.709	2.0731	0.95528
34	13.41	9.8505	7.92	1.7373	0.900	3.0681	1.1376	2.697	2.1029	0.96525
35	14.22	9.8603	7.92	1.7292	0.891	3.086	1.1458	2.693	2.1159	0.97013
36	15.03	9.8722	7.92	1.7187	0.880	3.1084	1.1562	2.688	2.1323	0.97609

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST
ASTM D4767

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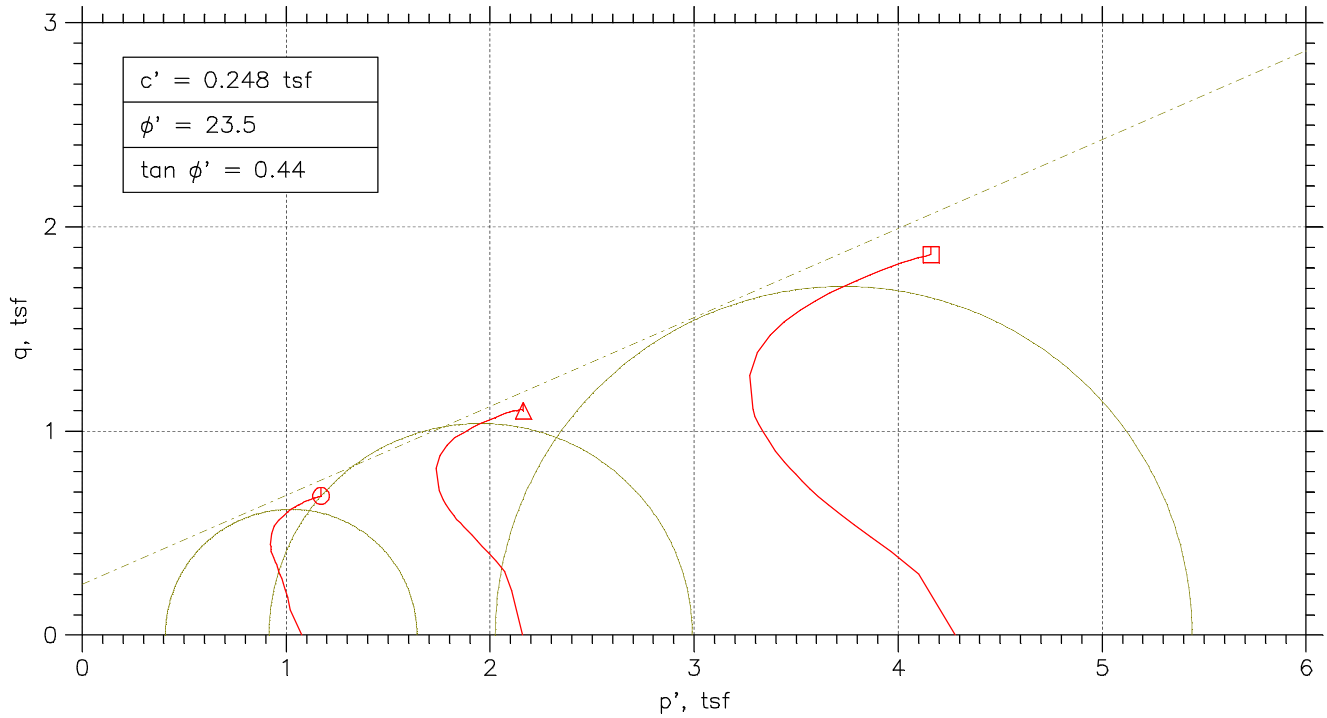

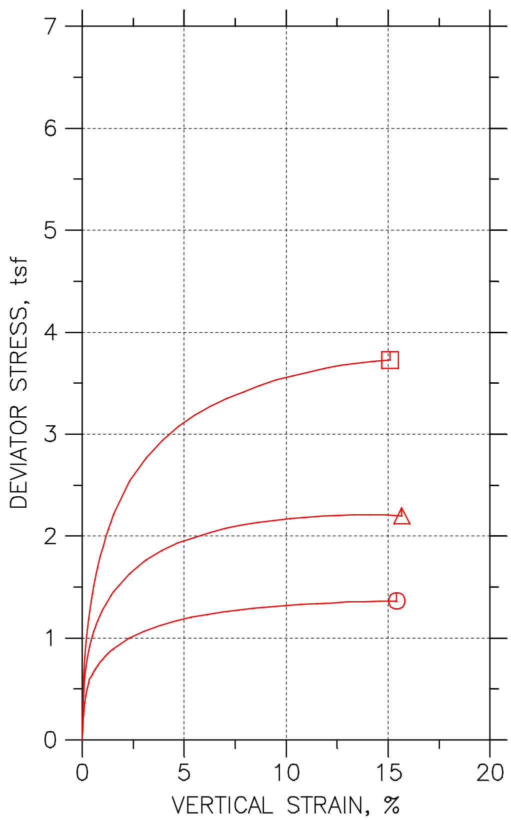

Symbol		○	△	□	
Test No.		15.0 PSI	30.0 PSI	60.0 PSI	
Initial	Diameter, in	2.8382	2.8134	2.8295	
	Height, in	6.3996	6.3425	6.2551	
	Water Content, %	31.54	29.27	28.87	
	Dry Density, pcf	87.92	91.94	94.81	
	Saturation, %	92.13	94.02	99.28	
	Void Ratio	0.93126	0.84681	0.791	
Before Shear	Water Content, %	31.86	27.59	24.62	
	Dry Density, pcf	90.97	97.01	101.7	
	Saturation, %	100.00	100.00	100.00	
	Void Ratio	0.86663	0.75044	0.66973	
	Back Press., tsf	5.0434	5.0422	5.0794	
Minor Prin. Stress, tsf		1.0766	2.1578	4.2806	
Max. Dev. Stress, tsf		1.3642	2.2082	3.7265	
Time to Failure, min		1205.9	1080	1140	
Strain Rate, %/min		0.02	0.02	0.02	
B-Value		0.97	0.98	0.96	
Estimated Specific Gravity		2.72	2.72	2.72	
Liquid Limit		48	48	48	
Plastic Limit		19	19	19	
Plasticity Index		29	29	29	

Failure Sketch

Project: DYNERGY EDWARDS	
Location: BARTONVILLE, IL	
Project No.: MR155218	
Boring No.: EDW-012 S-7	
Sample Type: 3.0'' ST	
Description: BROWN AND RUST BROWN MOTTLED LEAN CLAY CL	
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.	

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CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST
ASTM D4767

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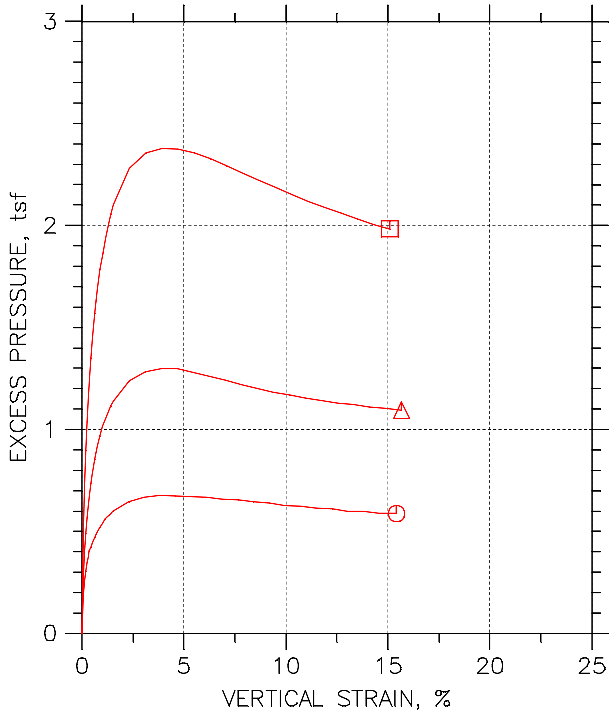

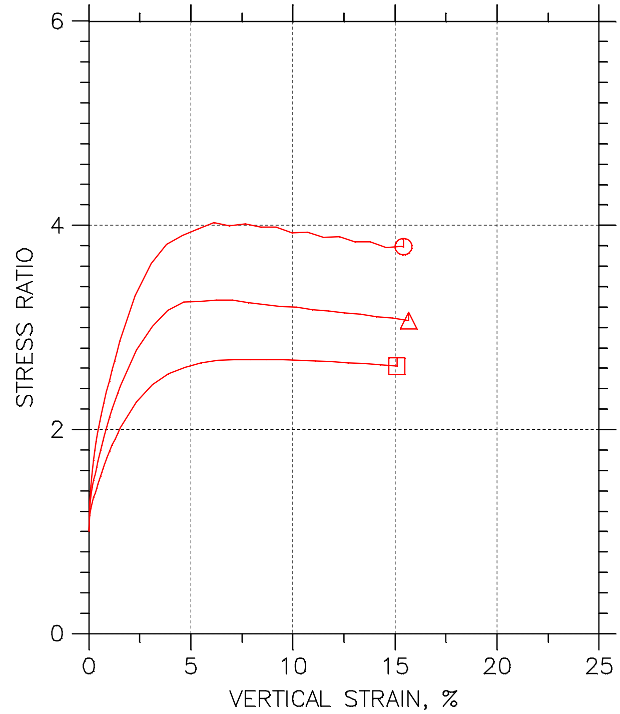

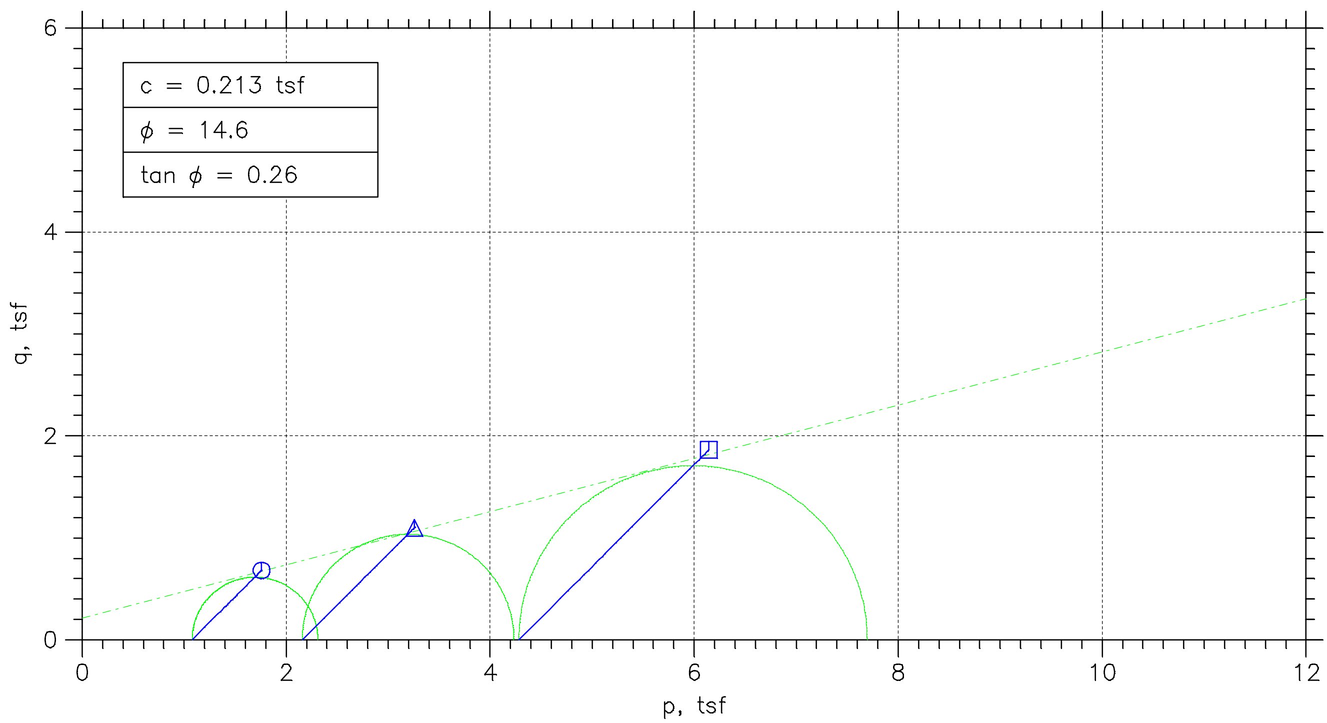

Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
Boring No.: EDW-012 S-7	Tested By: BCM	Checked By: WPQ
Sample No.: S-7	Test Date: 11/5/15	Depth: 15.0'-17.0'
Test No.: EDW-012 S-7	Sample Type: 3.0" ST	Elevation: ----
Description: BROWN AND RUST BROWN MOTTLED LEAN CLAY CL		
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.		

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TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-012 S-7
Sample No.: S-7
Test No.: 15.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/5/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 15.0'-17.0'
Elevation: ----

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Soil Description: BROWN AND RUST BROWN MOTTLED LEAN CLAY CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.40 in
Specimen Area: 6.33 in^2
Specimen Volume: 40.49 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 48

Plastic Limit: 19

Estimated Specific Gravity: 2.72

	Time min	Vertical Strain %	Corrected Area in^2	Deviator Load lb	Deviator Stress tsf	Pore Pressure tsf	Horizontal Stress tsf	Vertical Stress tsf
1	0	0	6.3266	0	0	5.0434	6.12	6.12
2	5.0003	0.05234	6.3299	21.743	0.24732	5.2234	6.12	6.3673
3	10	0.11458	6.3339	32.694	0.37164	5.2995	6.12	6.4916
4	15	0.17541	6.3377	39.538	0.44917	5.3506	6.12	6.5692
5	20	0.23765	6.3417	44.908	0.50986	5.3907	6.12	6.6299
6	25	0.30131	6.3458	49.067	0.55672	5.4203	6.12	6.6767
7	30	0.36214	6.3496	52.331	0.5934	5.4476	6.12	6.7134
8	35	0.42579	6.3537	54.963	0.62285	5.4673	6.12	6.7428
9	40	0.48945	6.3577	57.122	0.64689	5.4848	6.12	6.7669
10	45	0.55452	6.3619	59.175	0.66971	5.4993	6.12	6.7897
11	50.001	0.61818	6.366	61.228	0.6925	5.5132	6.12	6.8125
12	55.001	0.68183	6.3701	62.966	0.71169	5.5283	6.12	6.8317
13	60.001	0.74549	6.3741	64.545	0.72908	5.5399	6.12	6.8491
14	70.001	0.87563	6.3825	67.599	0.76257	5.5632	6.12	6.8826
15	80.001	1.0029	6.3907	70.284	0.79184	5.5829	6.12	6.9118
16	90.001	1.1303	6.399	72.863	0.81985	5.6032	6.12	6.9398
17	100	1.259	6.4073	75.18	0.84481	5.6154	6.12	6.9648
18	110	1.3863	6.4156	77.444	0.86913	5.6276	6.12	6.9891
19	120	1.5136	6.4239	79.392	0.88984	5.6427	6.12	7.0098
20	180	2.2832	6.4745	89.553	0.99588	5.6886	6.12	7.1159
21	240	3.0499	6.5257	96.923	1.0694	5.7124	6.12	7.1894
22	300	3.8194	6.5779	102.87	1.126	5.7194	6.12	7.246
23	360	4.5847	6.6306	107.72	1.1697	5.7165	6.12	7.2897
24	420	5.35	6.6842	111.77	1.2039	5.7141	6.12	7.3239
25	480	6.1238	6.7393	115.4	1.2329	5.7124	6.12	7.3529
26	540	6.8848	6.7944	118.4	1.2547	5.7014	6.12	7.3747
27	600	7.6572	6.8512	121.14	1.2731	5.6973	6.12	7.3931
28	660	8.4239	6.9086	123.83	1.2905	5.6874	6.12	7.4105
29	720	9.1878	6.9667	126.25	1.3047	5.6822	6.12	7.4247
30	780	9.9587	7.0264	128.56	1.3174	5.67	6.12	7.4374
31	840	10.721	7.0864	130.72	1.3282	5.6671	6.12	7.4482
32	900	11.496	7.1484	132.83	1.3379	5.6561	6.12	7.4579
33	960	12.266	7.2111	134.78	1.3457	5.6538	6.12	7.4657
34	1020	13.031	7.2746	136.78	1.3537	5.6433	6.12	7.4737
35	1080	13.799	7.3394	138.3	1.3568	5.6416	6.12	7.4768
36	1140	14.57	7.4057	139.88	1.36	5.6317	6.12	7.48
37	1200	15.338	7.4728	141.57	1.364	5.6317	6.12	7.484
38	1205.9	15.418	7.4798	141.73	1.3642	5.6311	6.12	7.4842

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-012 S-7
Sample No.: S-7
Test No.: 15.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/5/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 15.0'-17.0'
Elevation: ----

Terracon
Consulting Engineers & Scientists

Soil Description: BROWN AND RUST BROWN MOTTLED LEAN CLAY CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.40 in
Specimen Area: 6.33 in^2
Specimen Volume: 40.49 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 48

Plastic Limit: 19

Estimated Specific Gravity: 2.72

	Vertical Strain %	Total Vertical Stress tsf	Total Horizontal Stress tsf	Excess Pore Pressure tsf	A Parameter	Effective Vertical Stress tsf	Effective Horizontal Stress tsf	Stress Ratio	Effective p tsf	q tsf
1	0.00	6.12	6.12	0	0.000	1.0766	1.0766	1.000	1.0766	0
2	0.05	6.3673	6.12	0.18002	0.728	1.1439	0.89655	1.276	1.0202	0.12366
3	0.11	6.4916	6.12	0.25609	0.689	1.1921	0.82048	1.453	1.0063	0.18582
4	0.18	6.5692	6.12	0.30719	0.684	1.2185	0.76938	1.584	0.99396	0.22459
5	0.24	6.6299	6.12	0.34726	0.681	1.2392	0.72931	1.699	0.98424	0.25493
6	0.30	6.6767	6.12	0.37688	0.677	1.2564	0.69969	1.796	0.97805	0.27836
7	0.36	6.7134	6.12	0.40417	0.681	1.2658	0.6724	1.883	0.9691	0.2967
8	0.43	6.7428	6.12	0.42392	0.681	1.2755	0.65265	1.954	0.96408	0.31142
9	0.49	6.7669	6.12	0.44134	0.682	1.2821	0.63523	2.018	0.95868	0.32345
10	0.55	6.7897	6.12	0.45585	0.681	1.2904	0.62072	2.079	0.95557	0.33485
11	0.62	6.8125	6.12	0.46979	0.678	1.2993	0.60678	2.141	0.95303	0.34625
12	0.68	6.8317	6.12	0.48489	0.681	1.3034	0.59168	2.203	0.94753	0.35585
13	0.75	6.8491	6.12	0.4965	0.681	1.3091	0.58007	2.257	0.94461	0.36454
14	0.88	6.8826	6.12	0.51973	0.682	1.3194	0.55684	2.369	0.93812	0.38128
15	1.00	6.9118	6.12	0.53948	0.681	1.3289	0.53709	2.474	0.93301	0.39592
16	1.13	6.9398	6.12	0.5598	0.683	1.3366	0.51677	2.586	0.92669	0.40992
17	1.26	6.9648	6.12	0.572	0.677	1.3494	0.50457	2.674	0.92698	0.42241
18	1.39	6.9891	6.12	0.58419	0.672	1.3615	0.49238	2.765	0.92694	0.43456
19	1.51	7.0098	6.12	0.59929	0.673	1.3671	0.47728	2.864	0.9222	0.44492
20	2.28	7.1159	6.12	0.64516	0.648	1.4273	0.43141	3.308	0.92935	0.49794
21	3.05	7.1894	6.12	0.66897	0.626	1.477	0.4076	3.624	0.94229	0.53469
22	3.82	7.246	6.12	0.67594	0.600	1.5266	0.40063	3.811	0.96364	0.56301
23	4.58	7.2897	6.12	0.67304	0.575	1.5732	0.40353	3.899	0.98836	0.58483
24	5.35	7.3239	6.12	0.67072	0.557	1.6098	0.40585	3.966	1.0078	0.60197
25	6.12	7.3529	6.12	0.66897	0.543	1.6405	0.4076	4.025	1.024	0.61645
26	6.88	7.3747	6.12	0.65794	0.524	1.6733	0.41863	3.997	1.046	0.62736
27	7.66	7.3931	6.12	0.65387	0.514	1.6958	0.42269	4.012	1.0592	0.63654
28	8.42	7.4105	6.12	0.644	0.499	1.7231	0.43257	3.983	1.0778	0.64524
29	9.19	7.4247	6.12	0.63878	0.490	1.7425	0.43779	3.980	1.0902	0.65237
30	9.96	7.4374	6.12	0.62658	0.476	1.7674	0.44999	3.928	1.1087	0.6587
31	10.72	7.4482	6.12	0.62368	0.470	1.7811	0.45289	3.933	1.117	0.66409
32	11.50	7.4579	6.12	0.61264	0.458	1.8018	0.46392	3.884	1.1329	0.66893
33	12.27	7.4657	6.12	0.61032	0.454	1.8119	0.46625	3.886	1.1391	0.67284
34	13.03	7.4737	6.12	0.59987	0.443	1.8304	0.4767	3.840	1.1536	0.67687
35	13.80	7.4768	6.12	0.59813	0.441	1.8352	0.47844	3.836	1.1568	0.67838
36	14.57	7.48	6.12	0.58826	0.433	1.8483	0.48831	3.785	1.1683	0.67999
37	15.34	7.484	6.12	0.58826	0.431	1.8523	0.48831	3.793	1.1703	0.68199
38	15.42	7.4842	6.12	0.58767	0.431	1.8531	0.48889	3.790	1.171	0.68212

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-012 S-7
Sample No.: S-7
Test No.: 30.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/5/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 15.0'-16.5'
Elevation: ----

Soil Description: BROWN AND RUST BROWN MOTTLED LEAN CLAY CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.34 in
Specimen Area: 6.22 in^2
Specimen Volume: 39.43 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 48

Plastic Limit: 19

Estimated Specific Gravity: 2.72

	Time min	Vertical Strain %	Corrected Area in^2	Deviator Load lb	Deviator Stress tsf	Pore Pressure tsf	Horizontal Stress tsf	Vertical Stress tsf
1	0	0	6.2165	0	0	5.0422	7.2	7.2
2	5	0.057327	6.2201	37.373	0.4326	5.3099	7.2	7.6326
3	10	0.11918	6.224	53.994	0.62462	5.4417	7.2	7.8246
4	15	0.18405	6.228	62.676	0.72458	5.5332	7.2	7.9246
5	20	0.24892	6.232	69.557	0.80361	5.6096	7.2	8.0036
6	25	0.31228	6.236	75.327	0.86972	5.6726	7.2	8.0697
7	30	0.37564	6.24	80.356	0.92719	5.728	7.2	8.1272
8	35	0.44202	6.2441	85.068	0.9809	5.7788	7.2	8.1809
9	40	0.50689	6.2482	88.985	1.0254	5.8225	7.2	8.2254
10	45	0.57025	6.2522	92.478	1.065	5.8616	7.2	8.265
11	50	0.6321	6.2561	95.602	1.1003	5.8972	7.2	8.3003
12	55	0.69697	6.2602	98.513	1.133	5.9298	7.2	8.333
13	60	0.76033	6.2642	101.53	1.167	5.9607	7.2	8.367
14	70	0.88856	6.2723	106.72	1.225	6.0115	7.2	8.425
15	80	1.0198	6.2806	111.69	1.2804	6.0569	7.2	8.4804
16	90	1.1496	6.2888	115.93	1.3273	6.0949	7.2	8.5273
17	110	1.412	6.3056	123.92	1.415	6.1573	7.2	8.615
18	120	1.5403	6.3138	127.47	1.4536	6.1806	7.2	8.6536
19	180	2.3247	6.3645	144.14	1.6307	6.2815	7.2	8.8307
20	240	3.1062	6.4158	156.9	1.7608	6.3252	7.2	8.9608
21	300	3.8877	6.468	167.01	1.8591	6.3415	7.2	9.0591
22	360	4.6691	6.521	175.01	1.9323	6.3398	7.2	9.1323
23	420	5.4611	6.5756	181.3	1.9852	6.32	7.2	9.1852
24	480	6.2516	6.6311	187.18	2.0324	6.3025	7.2	9.2324
25	540	7.0361	6.687	192.69	2.0747	6.2844	7.2	9.2747
26	600	7.8221	6.7441	197.24	2.1057	6.2616	7.2	9.3057
27	660	8.6005	6.8015	201.31	2.1311	6.2418	7.2	9.3311
28	720	9.391	6.8608	205.13	2.1527	6.2237	7.2	9.3527
29	780	10.177	6.9209	208.78	2.172	6.2109	7.2	9.372
30	840	10.96	6.9817	211.85	2.1847	6.1957	7.2	9.3847
31	900	11.752	7.0444	214.97	2.1972	6.1841	7.2	9.3972
32	960	12.536	7.1076	217.25	2.2007	6.1713	7.2	9.4007
33	1020	13.315	7.1714	219.79	2.2067	6.1631	7.2	9.4067
34	1080	14.104	7.2373	221.96	2.2082	6.1514	7.2	9.4082
35	1140	14.884	7.3036	223.76	2.2059	6.145	7.2	9.4059
36	1200	15.665	7.3713	225.14	2.199	6.1363	7.2	9.399

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-012 S-7
Sample No.: S-7
Test No.: 30.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/5/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 15.0'-16.5'
Elevation: ----

Soil Description: BROWN AND RUST BROWN MOTTLED LEAN CLAY CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.34 in
Specimen Area: 6.22 in^2
Specimen Volume: 39.43 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 48

Plastic Limit: 19

Estimated Specific Gravity: 2.72

	Vertical Strain %	Total Vertical Stress tsf	Total Horizontal Stress tsf	Excess Pore Pressure tsf	A Parameter	Effective Vertical Stress tsf	Effective Horizontal Stress tsf	Stress Ratio	Effective p tsf	q tsf
1	0.00	7.2	7.2	0	0.000	2.1578	2.1578	1.000	2.1578	0
2	0.06	7.6326	7.2	0.26768	0.619	2.3227	1.8901	1.229	2.1064	0.2163
3	0.12	7.8246	7.2	0.39948	0.640	2.3829	1.7583	1.355	2.0706	0.31231
4	0.18	7.9246	7.2	0.49104	0.678	2.3913	1.6668	1.435	2.029	0.36229
5	0.25	8.0036	7.2	0.56744	0.706	2.394	1.5904	1.505	1.9922	0.4018
6	0.31	8.0697	7.2	0.63042	0.725	2.3971	1.5274	1.569	1.9622	0.43486
7	0.38	8.1272	7.2	0.68582	0.740	2.3992	1.472	1.630	1.9356	0.4636
8	0.44	8.1809	7.2	0.73656	0.751	2.4021	1.4212	1.690	1.9117	0.49045
9	0.51	8.2254	7.2	0.7803	0.761	2.4029	1.3775	1.744	1.8902	0.5127
10	0.57	8.265	7.2	0.81937	0.769	2.4034	1.3384	1.796	1.8709	0.53249
11	0.63	8.3003	7.2	0.85495	0.777	2.4031	1.3028	1.845	1.853	0.55013
12	0.70	8.333	7.2	0.88761	0.783	2.4032	1.2702	1.892	1.8367	0.56651
13	0.76	8.367	7.2	0.91851	0.787	2.4063	1.2393	1.942	1.8228	0.58349
14	0.89	8.425	7.2	0.96925	0.791	2.4136	1.1885	2.031	1.8011	0.61251
15	1.02	8.4804	7.2	1.0147	0.792	2.4235	1.1431	2.120	1.7833	0.64022
16	1.15	8.5273	7.2	1.0526	0.793	2.4324	1.1051	2.201	1.7688	0.66363
17	1.41	8.615	7.2	1.115	0.788	2.4577	1.0427	2.357	1.7502	0.7075
18	1.54	8.6536	7.2	1.1384	0.783	2.473	1.0194	2.426	1.7462	0.7268
19	2.32	8.8307	7.2	1.2393	0.760	2.5492	0.91853	2.775	1.7339	0.81533
20	3.11	8.9608	7.2	1.283	0.729	2.6356	0.87479	3.013	1.7552	0.88039
21	3.89	9.0591	7.2	1.2993	0.699	2.7176	0.85846	3.166	1.788	0.92957
22	4.67	9.1323	7.2	1.2976	0.672	2.7925	0.86021	3.246	1.8263	0.96614
23	5.46	9.1852	7.2	1.2778	0.644	2.8652	0.88004	3.256	1.8726	0.9926
24	6.25	9.2324	7.2	1.2603	0.620	2.9299	0.89753	3.264	1.9137	1.0162
25	7.04	9.2747	7.2	1.2422	0.599	2.9903	0.91561	3.266	1.9529	1.0373
26	7.82	9.3057	7.2	1.2194	0.579	3.0441	0.93836	3.244	1.9912	1.0529
27	8.60	9.3311	7.2	1.1996	0.563	3.0893	0.95818	3.224	2.0237	1.0655
28	9.39	9.3527	7.2	1.1815	0.549	3.1289	0.97626	3.205	2.0526	1.0763
29	10.18	9.372	7.2	1.1687	0.538	3.1611	0.98909	3.196	2.0751	1.086
30	10.96	9.3847	7.2	1.1535	0.528	3.189	1.0043	3.175	2.0966	1.0924
31	11.75	9.3972	7.2	1.1419	0.520	3.2131	1.0159	3.163	2.1145	1.0986
32	12.54	9.4007	7.2	1.129	0.513	3.2295	1.0287	3.139	2.1291	1.1004
33	13.31	9.4067	7.2	1.1209	0.508	3.2436	1.0369	3.128	2.1402	1.1033
34	14.10	9.4082	7.2	1.1092	0.502	3.2567	1.0486	3.106	2.1527	1.1041
35	14.88	9.4059	7.2	1.1028	0.500	3.2608	1.055	3.091	2.1579	1.1029
36	15.67	9.399	7.2	1.0941	0.498	3.2628	1.0637	3.067	2.1633	1.0995

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-012 S-7
Sample No.: S-7
Test No.: 60.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/5/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 15.0'-16.5'
Elevation: ----

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Soil Description: BROWN AND RUST BROWN MOTTLED LEAN CLAY CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D 4767.

Specimen Height: 6.26 in
Specimen Area: 6.29 in^2
Specimen Volume: 39.33 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 48

Plastic Limit: 19

Estimated Specific Gravity: 2.72

	Time min	Vertical Strain %	Corrected Area in^2	Deviator Load lb	Deviator Stress tsf	Pore Pressure tsf	Horizontal Stress tsf	Vertical Stress tsf
1	0	0	6.2881	0	0	5.0794	9.36	9.36
2	5	0.055149	6.2915	52.036	0.59549	5.5563	9.36	9.9555
3	10	0.11755	6.2955	71.569	0.81852	5.8035	9.36	10.179
4	15	0.18141	6.2995	84.326	0.96381	5.9774	9.36	10.324
5	20	0.24672	6.3036	94.702	1.0817	6.1181	9.36	10.442
6	25	0.31203	6.3078	103.75	1.1843	6.2356	9.36	10.544
7	30	0.37733	6.3119	111.85	1.2759	6.3392	9.36	10.636
8	35	0.44119	6.3159	119.26	1.3596	6.4305	9.36	10.72
9	40	0.5065	6.3201	125.99	1.4353	6.5113	9.36	10.795
10	45	0.5718	6.3242	132.6	1.5097	6.5858	9.36	10.87
11	50	0.63566	6.3283	138.48	1.5755	6.6503	9.36	10.936
12	55	0.70097	6.3325	143.88	1.6359	6.7091	9.36	10.996
13	60	0.76628	6.3366	149.33	1.6968	6.7667	9.36	11.057
14	70	0.89544	6.3449	158.97	1.8039	6.8626	9.36	11.164
15	80	1.0261	6.3533	167.86	1.9023	6.9446	9.36	11.262
16	90	1.1567	6.3617	176.06	1.9927	7.0185	9.36	11.353
17	100	1.2873	6.3701	183	2.0684	7.0773	9.36	11.428
18	110	1.4165	6.3784	189.56	2.1398	7.1325	9.36	11.5
19	120	1.5471	6.3869	196.55	2.2157	7.1802	9.36	11.576
20	180	2.3351	6.4384	227.25	2.5413	7.3582	9.36	11.901
21	240	3.1261	6.491	249.54	2.768	7.4332	9.36	12.128
22	300	3.9156	6.5443	267.01	2.9376	7.4565	9.36	12.298
23	360	4.7123	6.599	281.56	3.0721	7.453	9.36	12.432
24	420	5.5149	6.6551	294.48	3.1859	7.4338	9.36	12.546
25	480	6.3087	6.7115	305.17	3.2739	7.4059	9.36	12.634
26	540	7.1069	6.7692	315.07	3.3513	7.3716	9.36	12.711
27	600	7.9066	6.8279	323.91	3.4156	7.3349	9.36	12.776
28	660	8.699	6.8872	332.28	3.4737	7.2994	9.36	12.834
29	720	9.5044	6.9485	340.75	3.5308	7.2645	9.36	12.891
30	780	10.304	7.0104	347.84	3.5725	7.2302	9.36	12.932
31	840	11.102	7.0734	354.51	3.6086	7.1977	9.36	12.969
32	900	11.898	7.1372	361.34	3.6452	7.1668	9.36	13.005
33	960	12.697	7.2026	367.64	3.675	7.1383	9.36	13.035
34	1020	13.49	7.2686	373.2	3.6967	7.1104	9.36	13.057
35	1080	14.297	7.337	378.28	3.7121	7.0837	9.36	13.072
36	1140	15.095	7.406	383.31	3.7265	7.0621	9.36	13.086

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-012 S-7
Sample No.: S-7
Test No.: 60.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/5/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 15.0'-16.5'
Elevation: ----

Soil Description: BROWN AND RUST BROWN MOTTLED LEAN CLAY CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D 4767.

Specimen Height: 6.26 in
Specimen Area: 6.29 in^2
Specimen Volume: 39.33 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 48

Plastic Limit: 19

Estimated Specific Gravity: 2.72

	Vertical Strain %	Total Vertical Stress tsf	Total Horizontal Stress tsf	Excess Pore Pressure tsf	A Parameter	Effective Vertical Stress tsf	Effective Horizontal Stress tsf	Stress Ratio	Effective p tsf	q tsf
1	0.00	9.36	9.36	0	0.000	4.2806	4.2806	1.000	4.2806	0
2	0.06	9.9555	9.36	0.47694	0.801	4.3992	3.8037	1.157	4.1015	0.29775
3	0.12	10.179	9.36	0.72413	0.885	4.375	3.5565	1.230	3.9658	0.40926
4	0.18	10.324	9.36	0.89803	0.932	4.3464	3.3826	1.285	3.8645	0.4819
5	0.25	10.442	9.36	1.0388	0.960	4.3235	3.2419	1.334	3.7827	0.54084
6	0.31	10.544	9.36	1.1563	0.976	4.3087	3.1244	1.379	3.7165	0.59215
7	0.38	10.636	9.36	1.2598	0.987	4.2967	3.0208	1.422	3.6588	0.63796
8	0.44	10.72	9.36	1.3511	0.994	4.2891	2.9295	1.464	3.6093	0.67979
9	0.51	10.795	9.36	1.432	0.998	4.2839	2.8487	1.504	3.5663	0.71764
10	0.57	10.87	9.36	1.5064	0.998	4.2839	2.7742	1.544	3.5291	0.75483
11	0.64	10.936	9.36	1.571	0.997	4.2852	2.7097	1.581	3.4974	0.78777
12	0.70	10.996	9.36	1.6297	0.996	4.2868	2.6509	1.617	3.4689	0.81795
13	0.77	11.057	9.36	1.6873	0.994	4.2901	2.5933	1.654	3.4417	0.84839
14	0.90	11.164	9.36	1.7833	0.989	4.3013	2.4974	1.722	3.3993	0.90195
15	1.03	11.262	9.36	1.8653	0.981	4.3177	2.4154	1.788	3.3665	0.95115
16	1.16	11.353	9.36	1.9391	0.973	4.3341	2.3415	1.851	3.3378	0.99633
17	1.29	11.428	9.36	1.9979	0.966	4.3511	2.2827	1.906	3.3169	1.0342
18	1.42	11.5	9.36	2.0531	0.960	4.3673	2.2275	1.961	3.2974	1.0699
19	1.55	11.576	9.36	2.1008	0.948	4.3955	2.1798	2.016	3.2877	1.1079
20	2.34	11.901	9.36	2.2788	0.897	4.5432	2.0018	2.270	3.2725	1.2707
21	3.13	12.128	9.36	2.3539	0.850	4.6947	1.9268	2.437	3.3108	1.384
22	3.92	12.298	9.36	2.3771	0.809	4.8411	1.9035	2.543	3.3723	1.4688
23	4.71	12.432	9.36	2.3736	0.773	4.9791	1.907	2.611	3.443	1.536
24	5.51	12.546	9.36	2.3544	0.739	5.1121	1.9262	2.654	3.5192	1.593
25	6.31	12.634	9.36	2.3265	0.711	5.228	1.9541	2.675	3.5911	1.6369
26	7.11	12.711	9.36	2.2922	0.684	5.3397	1.9884	2.685	3.6641	1.6756
27	7.91	12.776	9.36	2.2556	0.660	5.4407	2.0251	2.687	3.7329	1.7078
28	8.70	12.834	9.36	2.2201	0.639	5.5342	2.0606	2.686	3.7974	1.7368
29	9.50	12.891	9.36	2.1852	0.619	5.6263	2.0955	2.685	3.8609	1.7654
30	10.30	12.932	9.36	2.1509	0.602	5.7022	2.1298	2.677	3.916	1.7862
31	11.10	12.969	9.36	2.1183	0.587	5.7709	2.1623	2.669	3.9666	1.8043
32	11.90	13.005	9.36	2.0875	0.573	5.8383	2.1932	2.662	4.0158	1.8226
33	12.70	13.035	9.36	2.059	0.560	5.8967	2.2217	2.654	4.0592	1.8375
34	13.49	13.057	9.36	2.031	0.549	5.9463	2.2496	2.643	4.098	1.8484
35	14.30	13.072	9.36	2.0043	0.540	5.9885	2.2763	2.631	4.1324	1.8561
36	15.09	13.086	9.36	1.9828	0.532	6.0243	2.2979	2.622	4.1611	1.8632

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST
ASTM D4767

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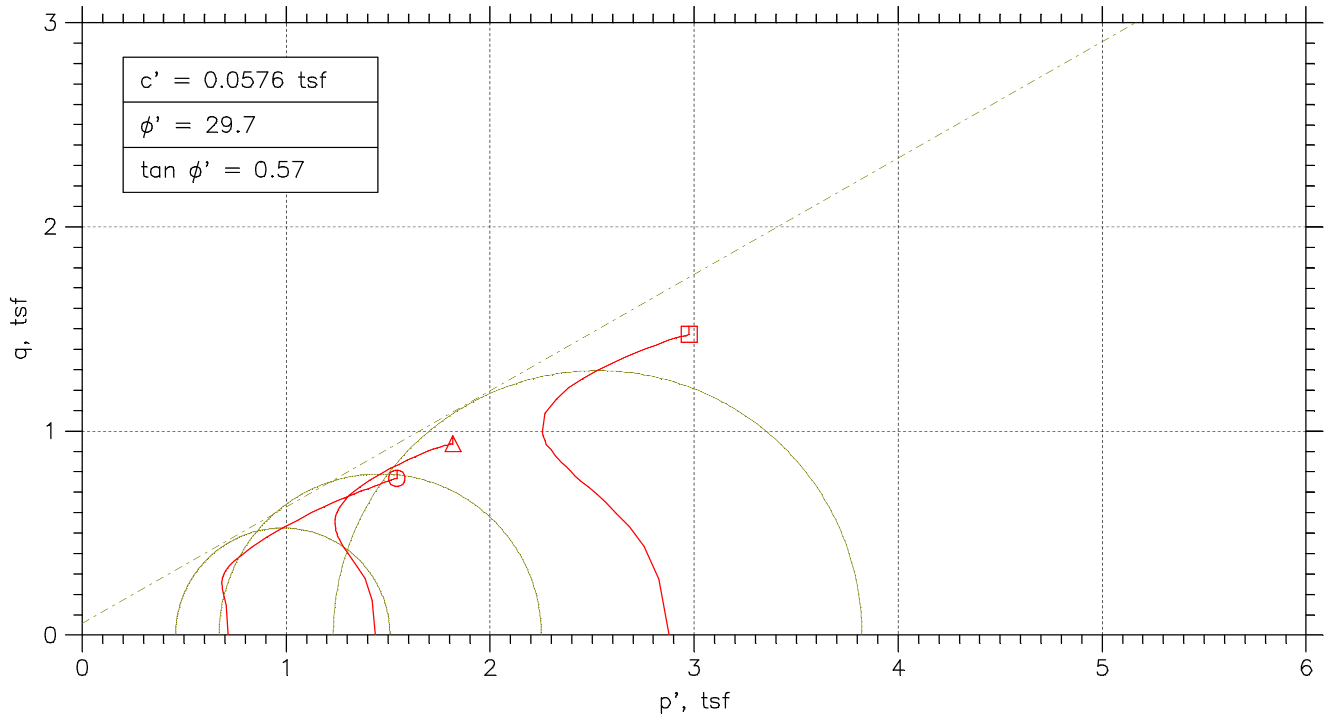
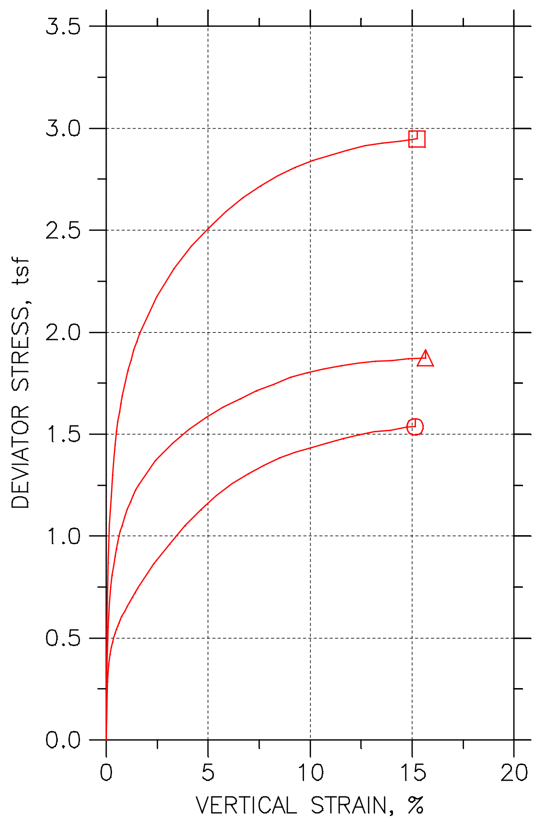
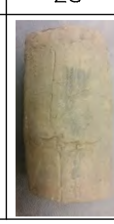




	Symbol	○	△	□	
	Test No.	10.0 PSI	20.0 PSI	40.0 PSI	
Initial	Diameter, in	2.8386	2.8571	2.8543	
	Height, in	6.0421	6.0181	5.878	
	Water Content, %	19.07	19.02	18.95	
	Dry Density, pcf	111.5	111.3	111.5	
	Saturation, %	99.28	98.47	98.47	
	Void Ratio	0.52245	0.52554	0.52343	
Before Shear	Water Content, %	18.80	18.40	16.50	
	Dry Density, pcf	112.4	113.2	117.2	
	Saturation, %	100.00	100.00	100.00	
	Void Ratio	0.51129	0.50044	0.4489	
	Back Press., tsf	5.0445	5.044	5.0432	
	Minor Prin. Stress, tsf	0.71549	1.436	2.8768	
	Max. Dev. Stress, tsf	1.536	1.8745	2.9478	
	Time to Failure, min	1174.7	1140	1080	
	Strain Rate, %/min	0.02	0.02	0.02	
	B-Value	0.95	0.97	0.97	
	Estimated Specific Gravity	2.72	2.72	2.72	
	Liquid Limit	49	49	49	
	Plastic Limit	21	21	21	
	Plasticity Index	28	28	28	
	Failure Sketch				

Project: DYNERGY EDWARDS
Location: BARTONVILLE, IL
Project No.: MR155218
Boring No.: EDW-013 S3
Sample Type: 3.0'' ST
Description: BROWNISH GRAY LEAN CLAY WITH SAND AND GRAVEL CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST
ASTM D4767

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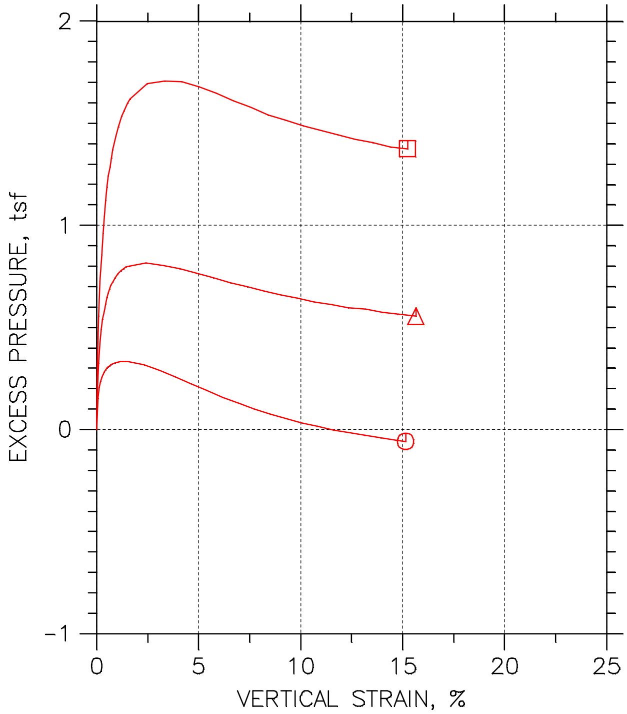

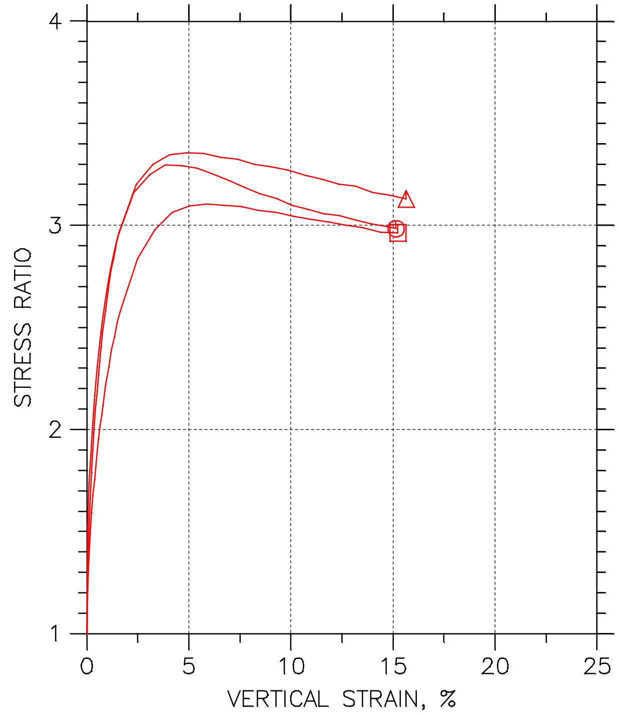

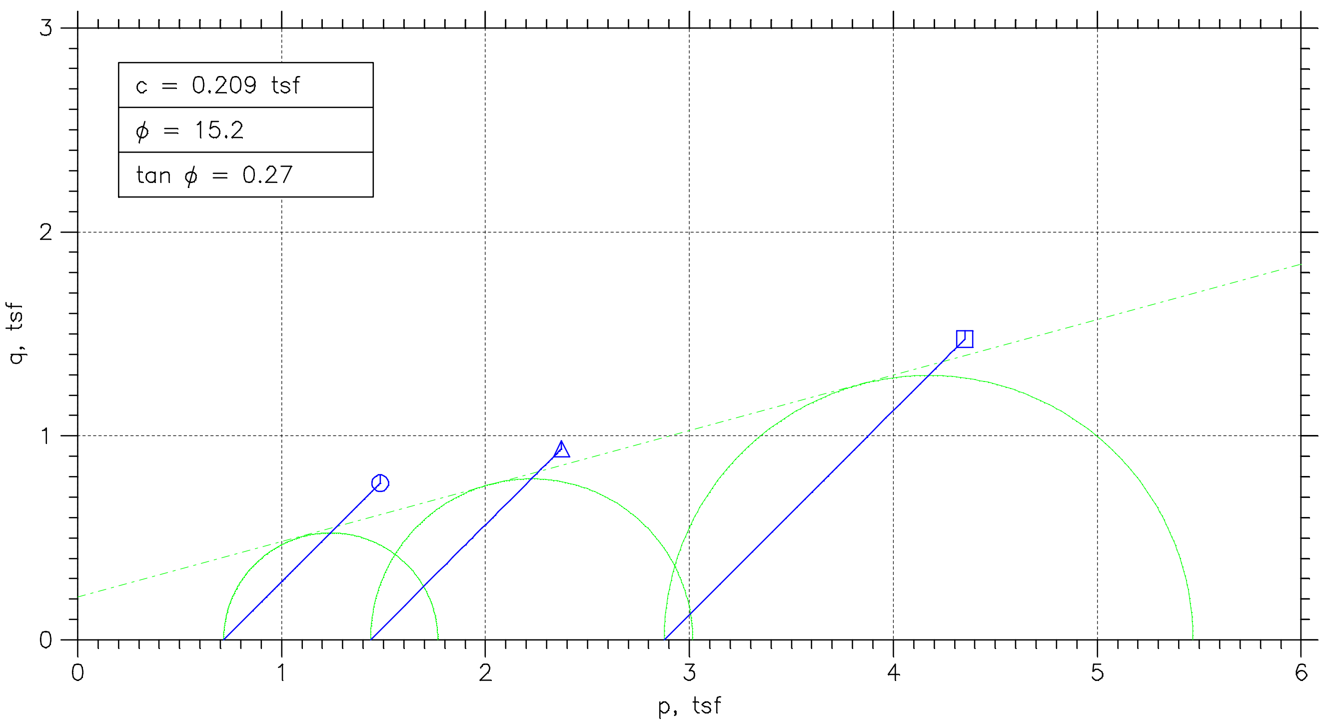

Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
Boring No.: EDW-013 S3	Tested By: BCM	Checked By: WPQ
Sample No.: S-3	Test Date: 11/4/15	Depth: 6.0'-8.0'
Test No.: EDW-013 S3	Sample Type: 3.0" ST	Elevation: -----
Description: BROWNISH GRAY LEAN CLAY WITH SAND AND GRAVEL CL		
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767		

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TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-013 S3
Sample No.: S-3
Test No.: 10.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/4/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 6.0'-8.0'
Elevation: -----

Soil Description: BROWNISH GRAY LEAN CLAY WITH SAND AND GRAVEL CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767

Specimen Height: 6.04 in
Specimen Area: 6.33 in^2
Specimen Volume: 38.24 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 49

Plastic Limit: 21

Estimated Specific Gravity: 2.72

	Time min	Vertical Strain %	Corrected Area in^2	Deviator Load lb	Deviator Stress tsf	Pore Pressure tsf	Horizontal Stress tsf	Vertical Stress tsf
1	0	0	6.3284	0	0	5.0445	5.76	5.76
2	5.0002	0.058512	6.3321	25.429	0.28914	5.1976	5.76	6.0491
3	10	0.12273	6.3362	32.957	0.3745	5.2511	5.76	6.1345
4	15	0.18695	6.3402	36.958	0.4197	5.2802	5.76	6.1797
5	20	0.25117	6.3443	39.959	0.45348	5.3	5.76	6.2135
6	25	0.31682	6.3485	42.381	0.48065	5.3139	5.76	6.2407
7	30	0.38104	6.3526	44.539	0.50481	5.3273	5.76	6.2648
8	35	0.44526	6.3567	46.277	0.52416	5.3372	5.76	6.2842
9	40	0.50948	6.3608	47.909	0.5423	5.3454	5.76	6.3023
10	45	0.5737	6.3649	49.488	0.55981	5.3512	5.76	6.3198
11	50	0.63935	6.3691	50.91	0.57551	5.3564	5.76	6.3355
12	55	0.70357	6.3732	52.278	0.5906	5.3617	5.76	6.3506
13	60	0.76922	6.3774	53.542	0.60448	5.3657	5.76	6.3645
14	70.001	0.89623	6.3856	55.911	0.63042	5.371	5.76	6.3904
15	80.001	1.0232	6.3938	58.175	0.6551	5.375	5.76	6.4151
16	90.001	1.1503	6.402	60.386	0.67913	5.3774	5.76	6.4391
17	100	1.2787	6.4104	62.387	0.70072	5.3779	5.76	6.4607
18	110	1.4043	6.4185	64.387	0.72227	5.3785	5.76	6.4823
19	120	1.5342	6.427	66.493	0.74491	5.3768	5.76	6.5049
20	180	2.3134	6.4783	77.602	0.86247	5.3611	5.76	6.6225
21	240	3.0926	6.5303	87.078	0.96008	5.3331	5.76	6.7201
22	300	3.8561	6.5822	96.028	1.0504	5.3023	5.76	6.8104
23	360	4.6339	6.6359	103.98	1.1282	5.268	5.76	6.8882
24	420	5.4102	6.6903	111.3	1.1977	5.2348	5.76	6.9577
25	480	6.1766	6.745	117.72	1.2566	5.2016	5.76	7.0166
26	540	6.9544	6.8014	123.3	1.3053	5.172	5.76	7.0653
27	600	7.7321	6.8587	128.09	1.3446	5.1446	5.76	7.1046
28	660	8.4985	6.9162	132.78	1.3822	5.1184	5.76	7.1422
29	720	9.2777	6.9756	136.88	1.4129	5.0975	5.76	7.1729
30	780	10.057	7.036	140.2	1.4347	5.0759	5.76	7.1947
31	840	10.819	7.0961	143.62	1.4572	5.0591	5.76	7.2172
32	900	11.602	7.159	146.99	1.4783	5.0416	5.76	7.2383
33	960	12.382	7.2227	150.1	1.4963	5.0288	5.76	7.2563
34	1020	13.151	7.2866	152.89	1.5107	5.0148	5.76	7.2707
35	1080	13.932	7.3527	155.15	1.5193	5.0032	5.76	7.2793
36	1140	14.706	7.4195	157.94	1.5327	4.9921	5.76	7.2927
37	1174.7	15.146	7.458	159.1	1.536	4.9857	5.76	7.296

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-013 S3
Sample No.: S-3
Test No.: 10.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/4/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 6.0'-8.0'
Elevation: -----

Soil Description: BROWNISH GRAY LEAN CLAY WITH SAND AND GRAVEL CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767

Specimen Height: 6.04 in
Specimen Area: 6.33 in^2
Specimen Volume: 38.24 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 49

Plastic Limit: 21

Estimated Specific Gravity: 2.72

	Vertical Strain %	Total Vertical Stress tsf	Total Horizontal Stress tsf	Excess Pore Pressure tsf	A Parameter	Effective Vertical Stress tsf	Effective Horizontal Stress tsf	Stress Ratio	Effective p tsf	q tsf
1	0.00	5.76	5.76	0	0.000	0.71549	0.71549	1.000	0.71549	0
2	0.06	6.0491	5.76	0.15304	0.529	0.85158	0.56245	1.514	0.70701	0.14457
3	0.12	6.1345	5.76	0.20658	0.552	0.88341	0.50891	1.736	0.69616	0.18725
4	0.19	6.1797	5.76	0.23567	0.562	0.89951	0.47981	1.875	0.68966	0.20985
5	0.25	6.2135	5.76	0.25546	0.563	0.91352	0.46003	1.986	0.68677	0.22674
6	0.32	6.2407	5.76	0.26942	0.561	0.92672	0.44606	2.078	0.68639	0.24033
7	0.38	6.2648	5.76	0.2828	0.560	0.93749	0.43268	2.167	0.68508	0.2524
8	0.45	6.2842	5.76	0.2927	0.558	0.94695	0.42279	2.240	0.68487	0.26208
9	0.51	6.3023	5.76	0.30084	0.555	0.95694	0.41464	2.308	0.68579	0.27115
10	0.57	6.3198	5.76	0.30666	0.548	0.96863	0.40882	2.369	0.68873	0.27991
11	0.64	6.3355	5.76	0.3119	0.542	0.9791	0.40359	2.426	0.69134	0.28776
12	0.70	6.3506	5.76	0.31714	0.537	0.98895	0.39835	2.483	0.69365	0.2953
13	0.77	6.3645	5.76	0.32121	0.531	0.99875	0.39428	2.533	0.69651	0.30224
14	0.90	6.3904	5.76	0.32645	0.518	1.0195	0.38904	2.620	0.70425	0.31521
15	1.02	6.4151	5.76	0.33052	0.505	1.0401	0.38496	2.702	0.71252	0.32755
16	1.15	6.4391	5.76	0.33285	0.490	1.0618	0.38264	2.775	0.7222	0.33956
17	1.28	6.4607	5.76	0.33343	0.476	1.0828	0.38206	2.834	0.73241	0.35036
18	1.40	6.4823	5.76	0.33401	0.462	1.1037	0.38147	2.893	0.74261	0.36113
19	1.53	6.5049	5.76	0.33227	0.446	1.1281	0.38322	2.944	0.75567	0.37245
20	2.31	6.6225	5.76	0.31656	0.367	1.2614	0.39893	3.162	0.83017	0.43124
21	3.09	6.7201	5.76	0.28862	0.301	1.3869	0.42686	3.249	0.9069	0.48004
22	3.86	6.8104	5.76	0.25778	0.245	1.5081	0.4577	3.295	0.98291	0.52521
23	4.63	6.8882	5.76	0.22345	0.198	1.6202	0.49203	3.293	1.0561	0.56408
24	5.41	6.9577	5.76	0.19028	0.159	1.7229	0.5252	3.281	1.1241	0.59887
25	6.18	7.0166	5.76	0.15711	0.125	1.815	0.55837	3.250	1.1867	0.6283
26	6.95	7.0653	5.76	0.12744	0.098	1.8933	0.58805	3.220	1.2407	0.65263
27	7.73	7.1046	5.76	0.10009	0.074	1.96	0.6154	3.185	1.2877	0.67232
28	8.50	7.1422	5.76	0.073902	0.053	2.0238	0.64158	3.154	1.3327	0.69112
29	9.28	7.1729	5.76	0.052953	0.037	2.0754	0.66253	3.133	1.369	0.70643
30	10.06	7.1947	5.76	0.031423	0.022	2.1187	0.68406	3.097	1.4014	0.71734
31	10.82	7.2172	5.76	0.014548	0.010	2.1582	0.70094	3.079	1.4296	0.72862
32	11.60	7.2383	5.76	-0.0029095	-0.002	2.1967	0.7184	3.058	1.4576	0.73916
33	12.38	7.2563	5.76	-0.015711	-0.011	2.2275	0.7312	3.046	1.4793	0.74813
34	13.15	7.2707	5.76	-0.029677	-0.020	2.2559	0.74516	3.027	1.5005	0.75534
35	13.93	7.2793	5.76	-0.041315	-0.027	2.2761	0.7568	3.008	1.5164	0.75964
36	14.71	7.2927	5.76	-0.052371	-0.034	2.3005	0.76786	2.996	1.5342	0.76634
37	15.15	7.296	5.76	-0.058772	-0.038	2.3102	0.77426	2.984	1.5422	0.76798

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-013 S3
Sample No.: ----
Test No.: 20.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/4/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 6.0'-8.0'
Elevation: ----

Soil Description: BROWNISH GRAY LEAN CLAY WITH SAND AND GRAVEL CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.02 in
Specimen Area: 6.41 in^2
Specimen Volume: 38.58 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 49

Plastic Limit: 21

Estimated Specific Gravity: 2.72

	Time min	Vertical Strain %	Corrected Area in^2	Deviator Load lb	Deviator Stress tsf	Pore Pressure tsf	Horizontal Stress tsf	Vertical Stress tsf
1	0	0	6.4112	0	0	5.044	6.48	6.48
2	5.0001	0.036568	6.4135	30.226	0.33933	5.2282	6.48	6.8193
3	10	0.095395	6.4173	49.495	0.55532	5.3711	6.48	7.0353
4	15	0.16217	6.4216	59.764	0.67009	5.4644	6.48	7.1501
5	20	0.22895	6.4259	66.858	0.74912	5.5321	6.48	7.2291
6	25	0.29572	6.4302	72.098	0.8073	5.5828	6.48	7.2873
7	30	0.36409	6.4346	76.704	0.85828	5.6254	6.48	7.3383
8	35	0.43405	6.4391	80.568	0.90088	5.6604	6.48	7.3809
9	40	0.50082	6.4434	83.903	0.93755	5.689	6.48	7.4175
10	45	0.57078	6.448	86.92	0.97058	5.7129	6.48	7.4506
11	50	0.63756	6.4523	89.62	1.0001	5.7309	6.48	7.4801
12	55	0.70433	6.4566	92.002	1.0259	5.7496	6.48	7.5059
13	60	0.77429	6.4612	94.384	1.0518	5.7642	6.48	7.5318
14	70	0.91261	6.4702	98.513	1.0962	5.7881	6.48	7.5762
15	80.001	1.0478	6.479	101.9	1.1324	5.8068	6.48	7.6124
16	90.001	1.1861	6.4881	105.29	1.1684	5.8219	6.48	7.6484
17	100	1.3212	6.497	108.15	1.1985	5.8301	6.48	7.6785
18	110	1.4595	6.5061	110.79	1.2261	5.8394	6.48	7.7061
19	120	1.5947	6.5151	113.28	1.2519	5.8435	6.48	7.7319
20	180	2.423	6.5704	125.03	1.3702	5.8581	6.48	7.8502
21	240	3.2498	6.6265	133.87	1.4546	5.847	6.48	7.9346
22	300	4.0702	6.6832	141.44	1.5238	5.8307	6.48	8.0038
23	360	4.8969	6.7413	147.9	1.5797	5.8091	6.48	8.0597
24	420	5.7253	6.8005	154.2	1.6326	5.7863	6.48	8.1126
25	480	6.5521	6.8607	159.44	1.6733	5.763	6.48	8.1533
26	540	7.3804	6.922	164.79	1.7141	5.742	6.48	8.1941
27	600	8.2072	6.9844	169.34	1.7457	5.7204	6.48	8.2257
28	660	9.0339	7.0479	174.05	1.7781	5.7024	6.48	8.2581
29	720	9.8591	7.1124	177.97	1.8016	5.686	6.48	8.2816
30	780	10.684	7.1781	181.41	1.8196	5.6697	6.48	8.2996
31	840	11.508	7.2449	184.64	1.835	5.6563	6.48	8.315
32	900	12.335	7.3132	187.76	1.8486	5.6406	6.48	8.3286
33	960	13.166	7.3832	190.52	1.8579	5.633	6.48	8.3379
34	1020	13.991	7.4541	192.74	1.8617	5.619	6.48	8.3417
35	1080	14.821	7.5267	195.44	1.8695	5.6096	6.48	8.3495
36	1140	15.646	7.6003	197.87	1.8745	5.5997	6.48	8.3545

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-013 S3
Sample No.: ----
Test No.: 20.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/4/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 6.0'-8.0'
Elevation: ----

Terracon Consulting Engineers & Scientists

Soil Description: BROWNISH GRAY LEAN CLAY WITH SAND AND GRAVEL CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.02 in
Specimen Area: 6.41 in^2
Specimen Volume: 38.58 in^3

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Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 49

Plastic Limit: 21

Estimated Specific Gravity: 2.72

	Vertical Strain %	Total Vertical Stress tsf	Total Horizontal Stress tsf	Excess Pore Pressure tsf	A Parameter	Effective Vertical Stress tsf	Effective Horizontal Stress tsf	Stress Ratio	Effective p tsf	q tsf
1	0.00	6.48	6.48	0	0.000	1.436	1.436	1.000	1.436	0
2	0.04	6.8193	6.48	0.18429	0.543	1.5911	1.2518	1.271	1.4214	0.16966
3	0.10	7.0353	6.48	0.32717	0.589	1.6642	1.1089	1.501	1.3865	0.27766
4	0.16	7.1501	6.48	0.42048	0.627	1.6857	1.0156	1.660	1.3506	0.33504
5	0.23	7.2291	6.48	0.48812	0.652	1.697	0.94792	1.790	1.3225	0.37456
6	0.30	7.2873	6.48	0.53886	0.667	1.7045	0.89718	1.900	1.3008	0.40365
7	0.36	7.3383	6.48	0.58143	0.677	1.7129	0.85461	2.004	1.2837	0.42914
8	0.43	7.3809	6.48	0.61643	0.684	1.7205	0.81962	2.099	1.2701	0.45044
9	0.50	7.4175	6.48	0.645	0.688	1.7286	0.79104	2.185	1.2598	0.46877
10	0.57	7.4506	6.48	0.66891	0.689	1.7377	0.76713	2.265	1.2524	0.48529
11	0.64	7.4801	6.48	0.68699	0.687	1.7491	0.74905	2.335	1.2491	0.50003
12	0.70	7.5059	6.48	0.70565	0.688	1.7563	0.73039	2.405	1.2434	0.51297
13	0.77	7.5318	6.48	0.72023	0.685	1.7676	0.71581	2.469	1.2417	0.52588
14	0.91	7.5762	6.48	0.74414	0.679	1.7881	0.6919	2.584	1.24	0.54812
15	1.05	7.6124	6.48	0.7628	0.674	1.8056	0.67324	2.682	1.2394	0.5662
16	1.19	7.6484	6.48	0.77797	0.666	1.8265	0.65808	2.775	1.2423	0.58421
17	1.32	7.6785	6.48	0.78613	0.656	1.8484	0.64991	2.844	1.2492	0.59925
18	1.46	7.7061	6.48	0.79546	0.649	1.8667	0.64058	2.914	1.2536	0.61305
19	1.59	7.7319	6.48	0.79954	0.639	1.8884	0.6365	2.967	1.2625	0.62596
20	2.42	7.8502	6.48	0.81412	0.594	1.9921	0.62192	3.203	1.307	0.68508
21	3.25	7.9346	6.48	0.80304	0.552	2.0876	0.633	3.298	1.3603	0.7273
22	4.07	8.0038	6.48	0.78671	0.516	2.1731	0.64933	3.347	1.4112	0.76191
23	4.90	8.0597	6.48	0.76514	0.484	2.2506	0.67091	3.355	1.4607	0.78983
24	5.73	8.1126	6.48	0.74239	0.455	2.3262	0.69365	3.354	1.5099	0.8163
25	6.55	8.1533	6.48	0.71907	0.430	2.3903	0.71698	3.334	1.5536	0.83664
26	7.38	8.1941	6.48	0.69807	0.407	2.452	0.73797	3.323	1.595	0.85703
27	8.21	8.2257	6.48	0.67649	0.388	2.5052	0.75955	3.298	1.6324	0.87284
28	9.03	8.2581	6.48	0.65841	0.370	2.5557	0.77763	3.287	1.6667	0.88905
29	9.86	8.2816	6.48	0.64209	0.356	2.5956	0.79396	3.269	1.6948	0.90081
30	10.68	8.2996	6.48	0.62576	0.344	2.6299	0.81029	3.246	1.7201	0.90982
31	11.51	8.315	6.48	0.61234	0.334	2.6587	0.8237	3.228	1.7412	0.91748
32	12.33	8.3286	6.48	0.5966	0.323	2.688	0.83945	3.202	1.7637	0.92428
33	13.17	8.3379	6.48	0.58902	0.317	2.7049	0.84703	3.193	1.776	0.92893
34	13.99	8.3417	6.48	0.57502	0.309	2.7227	0.86102	3.162	1.7919	0.93084
35	14.82	8.3495	6.48	0.56569	0.303	2.7399	0.87036	3.148	1.8051	0.93477
36	15.65	8.3545	6.48	0.55577	0.296	2.7548	0.88027	3.129	1.8175	0.93725

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-013 S3
Sample No.: S-3
Test No.: 40.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/4/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 6.0'-8.0'
Elevation: ----

Terracon Consulting Engineers & Scientists

Soil Description: BROWNISH GRAY LEAN CLAY WITH SAND AND GRAVEL CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 5.88 in
Specimen Area: 6.40 in^2
Specimen Volume: 37.61 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 49

Plastic Limit: 21

Estimated Specific Gravity: 2.72

	Time min	Vertical Strain %	Corrected Area in^2	Deviator Load lb	Deviator Stress tsf	Pore Pressure tsf	Horizontal Stress tsf	Vertical Stress tsf
1	0	0	6.3988	0	0	5.0432	7.92	7.92
2	5.0041	0.048179	6.4019	48.62	0.54682	5.3658	7.92	8.4668
3	10.004	0.10879	6.4058	77.205	0.86778	5.6	7.92	8.7878
4	15.004	0.17407	6.41	94.356	1.0599	5.7689	7.92	8.9799
5	20.004	0.23934	6.4142	106.47	1.1952	5.9005	7.92	9.1152
6	25.004	0.30772	6.4186	115.76	1.2985	6.0036	7.92	9.2185
7	30	0.37611	6.423	123.2	1.3811	6.0892	7.92	9.3011
8	35	0.44449	6.4274	129.5	1.4506	6.1649	7.92	9.3706
9	40	0.51287	6.4318	135	1.5113	6.2313	7.92	9.4313
10	45	0.58125	6.4362	139.57	1.5613	6.2855	7.92	9.4813
11	50	0.65119	6.4407	143.87	1.6083	6.3309	7.92	9.5283
12	55	0.72113	6.4453	147.8	1.6511	6.3746	7.92	9.5711
13	60	0.78951	6.4497	151.16	1.6874	6.413	7.92	9.6074
14	70	0.93094	6.4589	157.56	1.7563	6.4788	7.92	9.6763
15	80	1.0724	6.4682	162.96	1.814	6.5278	7.92	9.734
16	90	1.2138	6.4774	167.78	1.865	6.5767	7.92	9.785
17	100	1.3568	6.4868	172.3	1.9124	6.607	7.92	9.8324
18	110	1.4982	6.4961	176.23	1.9532	6.639	7.92	9.8732
19	120	1.6381	6.5054	179.9	1.9911	6.6605	7.92	9.9111
20	180	2.4804	6.5616	198.15	2.1743	6.7374	7.92	10.094
21	240	3.3274	6.619	212.42	2.3106	6.7514	7.92	10.231
22	300	4.176	6.6777	224.69	2.4227	6.7467	7.92	10.343
23	360	5.0277	6.7375	234.87	2.5099	6.7217	7.92	10.43
24	420	5.8747	6.7982	244.73	2.5919	6.6891	7.92	10.512
25	480	6.7264	6.8602	253.49	2.6604	6.6512	7.92	10.58
26	540	7.5718	6.923	261.25	2.717	6.6209	7.92	10.637
27	600	8.4204	6.9871	268.49	2.7667	6.5848	7.92	10.687
28	660	9.2674	7.0524	275.04	2.808	6.5598	7.92	10.728
29	720	10.122	7.1194	280.92	2.841	6.5301	7.92	10.761
30	780	10.979	7.1879	286.37	2.8685	6.5068	7.92	10.789
31	840	11.838	7.258	291.67	2.8934	6.4858	7.92	10.813
32	900	12.685	7.3284	296.55	2.9135	6.4643	7.92	10.834
33	960	13.532	7.4002	300.74	2.9261	6.4474	7.92	10.846
34	1020	14.391	7.4745	304.73	2.9354	6.4276	7.92	10.855
35	1080	15.24	7.5493	309.08	2.9478	6.4183	7.92	10.868

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-013 S3
Sample No.: S-3
Test No.: 40.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/4/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 6.0'-8.0'
Elevation: ----

Soil Description: BROWNISH GRAY LEAN CLAY WITH SAND AND GRAVEL CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 5.88 in
Specimen Area: 6.40 in^2
Specimen Volume: 37.61 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 49

Plastic Limit: 21

Estimated Specific Gravity: 2.72

	Vertical Strain %	Total Vertical Stress tsf	Total Horizontal Stress tsf	Excess Pore Pressure tsf	A Parameter	Effective Vertical Stress tsf	Effective Horizontal Stress tsf	Stress Ratio	Effective p tsf	q tsf
1	0.00	7.92	7.92	0	0.000	2.8768	2.8768	1.000	2.8768	0
2	0.05	8.4668	7.92	0.32266	0.590	3.101	2.5542	1.214	2.8276	0.27341
3	0.11	8.7878	7.92	0.55679	0.642	3.1878	2.32	1.374	2.7539	0.43389
4	0.17	8.9799	7.92	0.72569	0.685	3.211	2.1511	1.493	2.6811	0.52993
5	0.24	9.1152	7.92	0.85732	0.717	3.2147	2.0195	1.592	2.6171	0.59758
6	0.31	9.2185	7.92	0.96041	0.740	3.2149	1.9164	1.678	2.5657	0.64924
7	0.38	9.3011	7.92	1.046	0.757	3.2119	1.8308	1.754	2.5213	0.69054
8	0.44	9.3706	7.92	1.1217	0.773	3.2057	1.7551	1.827	2.4804	0.72532
9	0.51	9.4313	7.92	1.1881	0.786	3.2	1.6887	1.895	2.4443	0.75564
10	0.58	9.4813	7.92	1.2423	0.796	3.1958	1.6345	1.955	2.4152	0.78065
11	0.65	9.5283	7.92	1.2877	0.801	3.1974	1.5891	2.012	2.3932	0.80414
12	0.72	9.5711	7.92	1.3314	0.806	3.1965	1.5454	2.068	2.371	0.82554
13	0.79	9.6074	7.92	1.3698	0.812	3.1944	1.507	2.120	2.3507	0.84371
14	0.93	9.6763	7.92	1.4357	0.817	3.1975	1.4412	2.219	2.3193	0.87817
15	1.07	9.734	7.92	1.4846	0.818	3.2062	1.3922	2.303	2.2992	0.90699
16	1.21	9.785	7.92	1.5335	0.822	3.2083	1.3433	2.388	2.2758	0.93251
17	1.36	9.8324	7.92	1.5638	0.818	3.2254	1.313	2.456	2.2692	0.95619
18	1.50	9.8732	7.92	1.5958	0.817	3.2342	1.281	2.525	2.2576	0.97662
19	1.64	9.9111	7.92	1.6174	0.812	3.2506	1.2595	2.581	2.255	0.99555
20	2.48	10.094	7.92	1.6943	0.779	3.3569	1.1826	2.839	2.2697	1.0872
21	3.33	10.231	7.92	1.7082	0.739	3.4792	1.1686	2.977	2.3239	1.1553
22	4.18	10.343	7.92	1.7036	0.703	3.5959	1.1733	3.065	2.3846	1.2113
23	5.03	10.43	7.92	1.6785	0.669	3.7082	1.1983	3.095	2.4532	1.2549
24	5.87	10.512	7.92	1.6459	0.635	3.8228	1.2309	3.106	2.5269	1.296
25	6.73	10.58	7.92	1.6081	0.604	3.9292	1.2688	3.097	2.599	1.3302
26	7.57	10.637	7.92	1.5778	0.581	4.0161	1.2991	3.092	2.6576	1.3585
27	8.42	10.687	7.92	1.5417	0.557	4.1018	1.3352	3.072	2.7185	1.3833
28	9.27	10.728	7.92	1.5166	0.540	4.1682	1.3602	3.064	2.7642	1.404
29	10.12	10.761	7.92	1.4869	0.523	4.2309	1.3899	3.044	2.8104	1.4205
30	10.98	10.789	7.92	1.4636	0.510	4.2817	1.4132	3.030	2.8475	1.4343
31	11.84	10.813	7.92	1.4427	0.499	4.3276	1.4342	3.017	2.8809	1.4467
32	12.69	10.834	7.92	1.4211	0.488	4.3692	1.4557	3.001	2.9125	1.4568
33	13.53	10.846	7.92	1.4042	0.480	4.3987	1.4726	2.987	2.9357	1.463
34	14.39	10.855	7.92	1.3844	0.472	4.4278	1.4924	2.967	2.9601	1.4677
35	15.24	10.868	7.92	1.3751	0.466	4.4495	1.5017	2.963	2.9756	1.4739

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST
ASTM D4767

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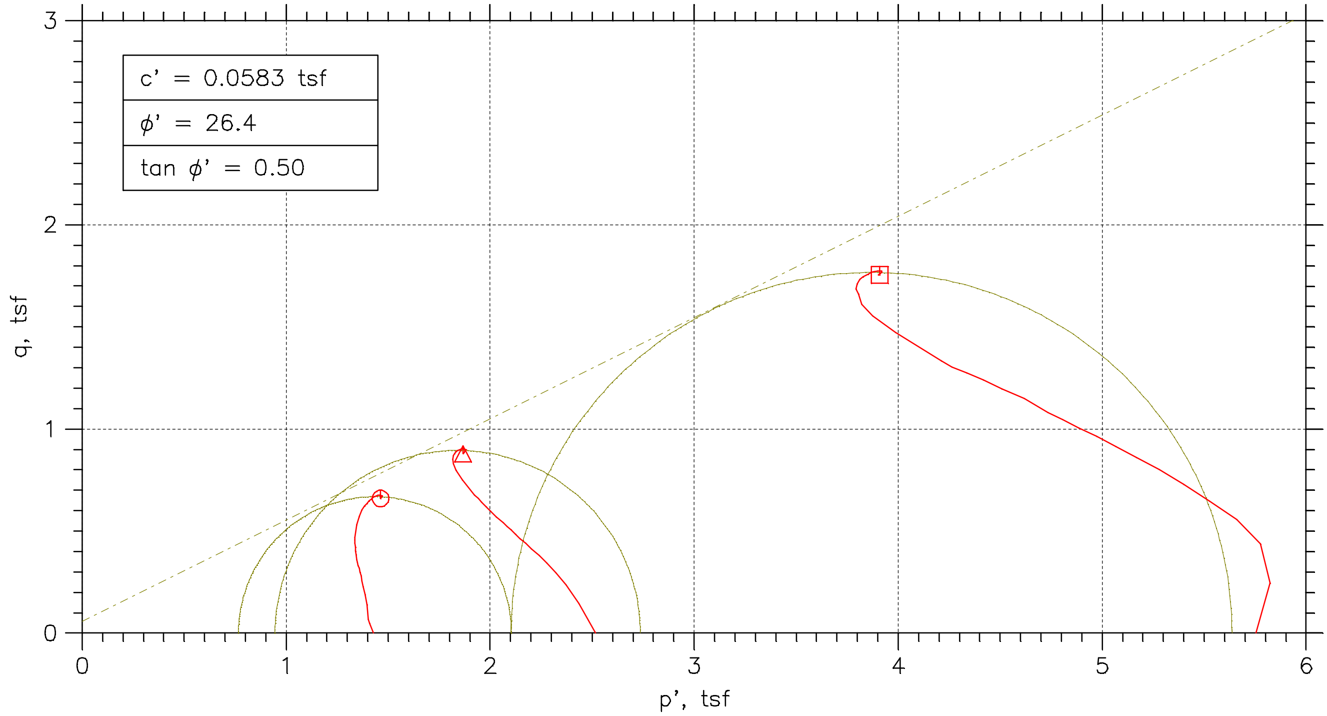

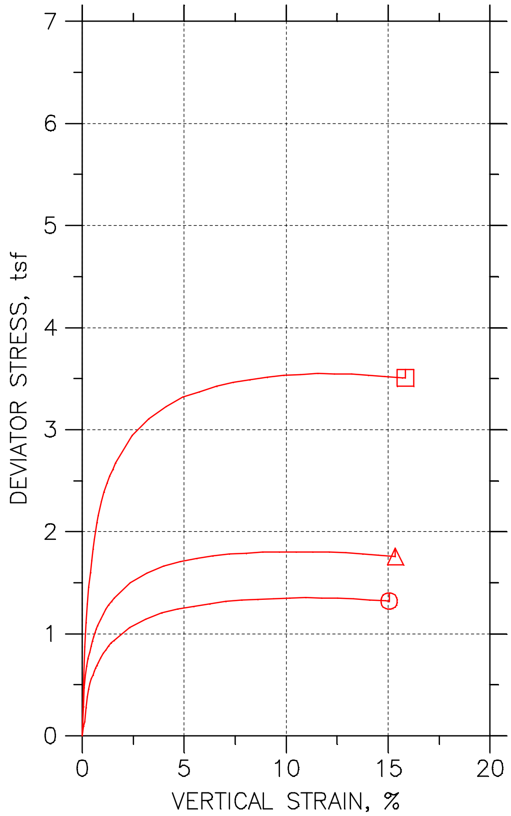

Symbol		○	△	□	
Test No.		20.0 PSI	40.0 PSI	80.0 PSI	
Initial	Diameter, in	2.8323	2.8394	2.8232	
	Height, in	5.9835	6.1287	6.0461	
	Water Content, %	35.45	32.69	30.23	
	Dry Density, pcf	84.39	88.44	92.32	
	Saturation, %	95.27	96.65	97.97	
	Void Ratio	1.0122	0.91997	0.83931	
Before Shear	Water Content, %	27.91	28.32	23.10	
	Dry Density, pcf	96.52	95.92	104.3	
	Saturation, %	100.00	100.00	100.00	
	Void Ratio	0.75927	0.7702	0.62821	
	Back Press., tsf	5.0509	5.0422	1.4473	
Minor Prin. Stress, tsf		1.4291	2.5178	5.7527	
Max. Dev. Stress, tsf		1.3524	1.8029	3.5485	
Time to Failure, min		840	780	840	
Strain Rate, %/min		0.02	0.02	0.02	
B-Value		0.98	0.99	0.96	
Estimated Specific Gravity		2.72	2.72	2.72	
Liquid Limit		42	42	42	
Plastic Limit		23	23	23	
Plasticity Index		19	19	19	
Failure Sketch					

Project: DYNERGY EDWARDS

Location: BARTONVILLE, IL

Project No.: MR155218

Boring No.: EDW-013 S10

Sample Type: 3.0'' ST

Description: GRAY AND BROWN LEAN CLAY WITH SAND CL

Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767

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CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST
ASTM D4767

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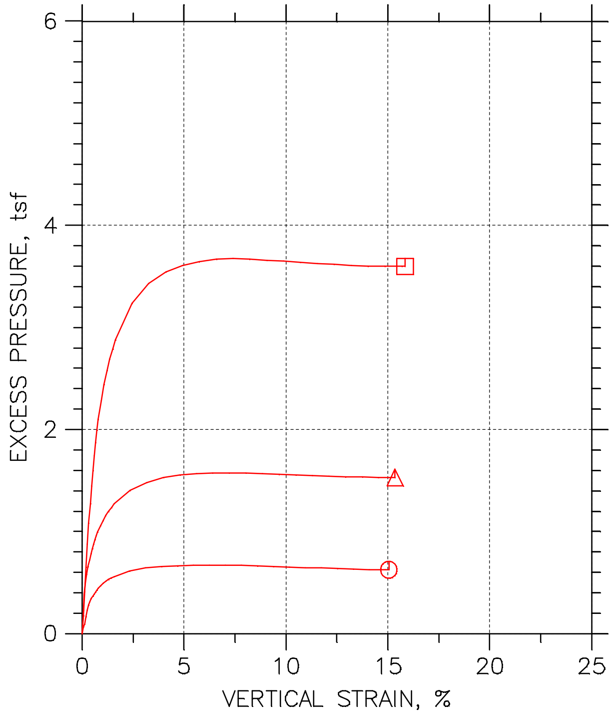

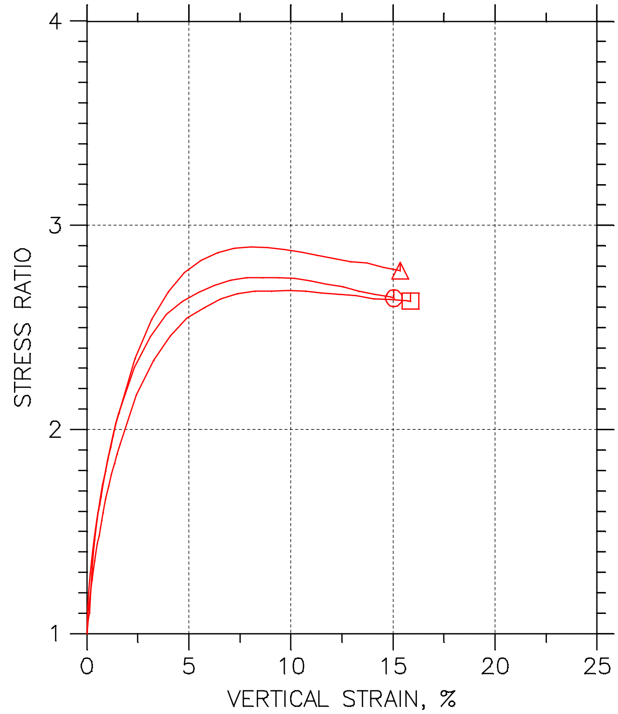

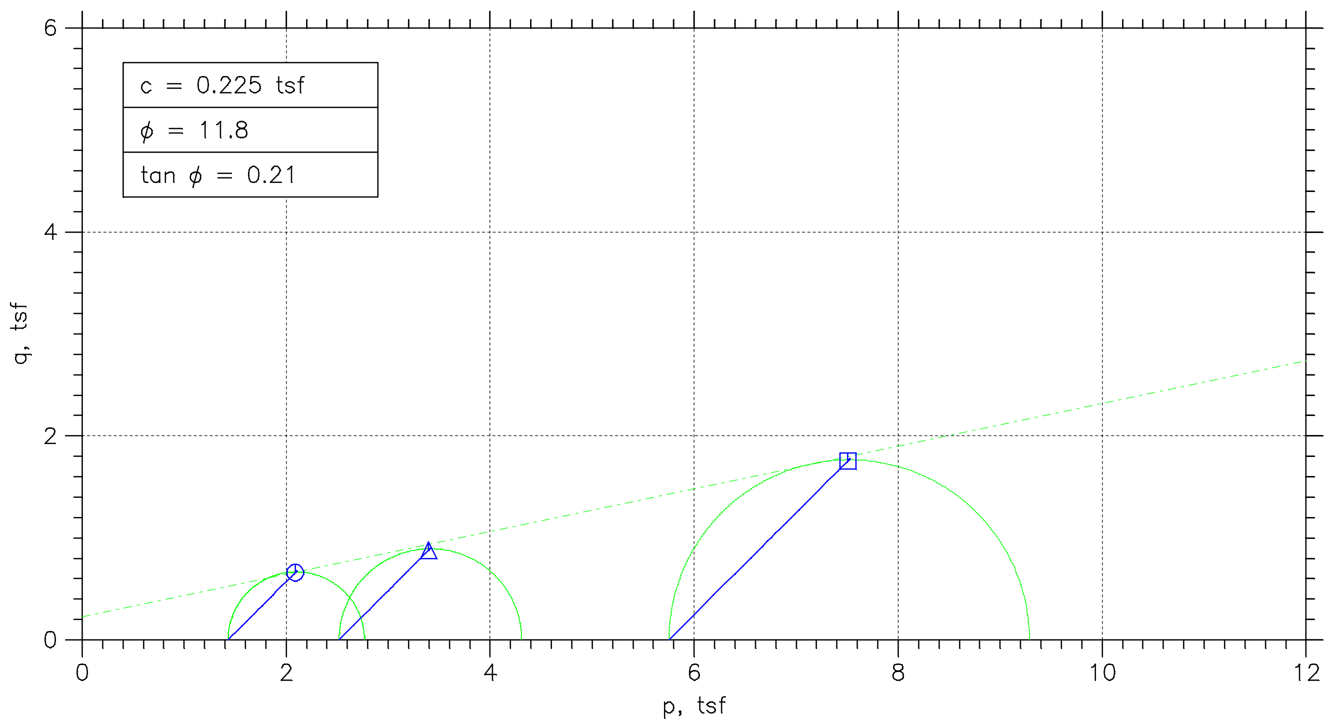

Project: DYNERGY EDWARDS	Location: BARTONVILLE, IL	Project No.: MR155218
Boring No.: EDW-013 S10	Tested By: BCM	Checked By: WPQ
Sample No.: S-10	Test Date: 10/29/15	Depth: 32.0'-34.0'
Test No.: EDW-013 S10	Sample Type: 3.0" ST	Elevation: -----
Description: GRAY AND BROWN LEAN CLAY WITH SAND CL		
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767		

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TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-013 S10
Sample No.: S-10
Test No.: 20.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 32.0'-34.0'
Elevation: -----

Soil Description: GRAY AND BROWN LEAN CLAY WITH SAND CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767

Specimen Height: 5.98 in
Specimen Area: 6.30 in^2
Specimen Volume: 37.70 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 42

Plastic Limit: 23

Estimated Specific Gravity: 2.72

	Time min	Vertical Strain %	Corrected Area in^2	Deviator Load lb	Deviator Stress tsf	Pore Pressure tsf	Horizontal Stress tsf	Vertical Stress tsf
1	0	0	6.3003	0	0	5.0509	6.48	6.48
2	5.0003	0.070614	6.3048	8.4452	0.096443	5.1202	6.48	6.5764
3	10	0.13546	6.3089	11.964	0.13654	5.1458	6.48	6.6165
4	15	0.19743	6.3128	24.163	0.27558	5.2208	6.48	6.7556
5	20	0.26228	6.3169	33.487	0.38169	5.2837	6.48	6.8617
6	25	0.32713	6.321	40.115	0.45693	5.3296	6.48	6.9369
7	30	0.39054	6.325	45.041	0.51272	5.364	6.48	6.9927
8	35	0.45539	6.3292	49.088	0.55842	5.3925	6.48	7.0384
9	40	0.52024	6.3333	52.665	0.59872	5.4169	6.48	7.0787
10	45	0.58653	6.3375	55.773	0.63364	5.4396	6.48	7.1136
11	50	0.6485	6.3415	58.412	0.66321	5.4594	6.48	7.1432
12	55	0.71335	6.3456	61.052	0.69272	5.4775	6.48	7.1727
13	60.001	0.7782	6.3497	63.339	0.7182	5.4932	6.48	7.1982
14	70.001	0.9079	6.3581	67.62	0.76574	5.5199	6.48	7.2457
15	80.001	1.039	6.3665	71.315	0.80652	5.5438	6.48	7.2865
16	90.001	1.1687	6.3748	74.716	0.84388	5.5636	6.48	7.3239
17	100	1.297	6.3831	77.825	0.87784	5.5816	6.48	7.3578
18	110	1.4281	6.3916	80.698	0.90905	5.5979	6.48	7.389
19	120	1.5593	6.4001	83.161	0.93555	5.6095	6.48	7.4155
20	180	2.3332	6.4508	95.243	1.063	5.6642	6.48	7.543
21	240	3.1229	6.5034	103.34	1.144	5.6945	6.48	7.624
22	300	3.904	6.5563	109.67	1.2044	5.7102	6.48	7.6844
23	360	4.6807	6.6097	114.07	1.2426	5.7172	6.48	7.7226
24	420	5.469	6.6648	117.59	1.2703	5.7201	6.48	7.7503
25	480	6.2544	6.7207	120.81	1.2943	5.7218	6.48	7.7743
26	540	7.0312	6.7768	123.8	1.3153	5.7207	6.48	7.7953
27	600	7.8223	6.835	126.21	1.3295	5.7178	6.48	7.8095
28	660	8.6063	6.8936	128.03	1.3372	5.7137	6.48	7.8172
29	720	9.3787	6.9524	129.79	1.3441	5.709	6.48	7.8241
30	780	10.17	7.0136	131.6	1.351	5.7044	6.48	7.831
31	840	10.952	7.0752	132.89	1.3524	5.6974	6.48	7.8324
32	900	11.731	7.1376	133.72	1.3488	5.6928	6.48	7.8288
33	960	12.525	7.2024	134.83	1.3478	5.6875	6.48	7.8278
34	1020	13.309	7.2675	135.53	1.3427	5.68	6.48	7.8227
35	1080	14.091	7.3337	135.65	1.3318	5.6794	6.48	7.8118
36	1140	14.882	7.4019	135.94	1.3224	5.6776	6.48	7.8024
37	1152.3	15.045	7.4161	135.89	1.3193	5.677	6.48	7.7993

TRIAXIAL TEST

Project: DYNERGY EDWARDS | Location: BARTONVILLE, IL | Project No.: MR155218
Boring No.: EDW-013 S10 | Tested By: BCM | Checked By: WPQ
Sample No.: S-10 | Test Date: 10/29/15 | Depth: 32.0'-34.0'
Test No.: 20.0 PSI | Sample Type: 3.0" ST | Elevation: -----

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Soil Description: GRAY AND BROWN LEAN CLAY WITH SAND CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767

Specimen Height: 5.98 in | Piston Area: 0.00 in^2 | Filter Strip Correction: 0.00 tsf
Specimen Area: 6.30 in^2 | Piston Friction: 0.00 lb | Membrane Correction: 0.00 lb/in
Specimen Volume: 37.70 in^3 | Piston Weight: 0.00 lb | Correction Type: Uniform

Liquid Limit: 42 | Plastic Limit: 23 | Estimated Specific Gravity: 2.72

	Vertical Strain %	Total Vertical Stress tsf	Total Horizontal Stress tsf	Excess Pore Pressure tsf	A Parameter	Effective Vertical Stress tsf	Effective Horizontal Stress tsf	Stress Ratio	Effective p tsf	q tsf
1	0.00	6.48	6.48	0	0.000	1.4291	1.4291	1.000	1.4291	0
2	0.07	6.5764	6.48	0.069246	0.718	1.4563	1.3598	1.071	1.4081	0.048221
3	0.14	6.6165	6.48	0.09485	0.695	1.4708	1.3342	1.102	1.4025	0.068269
4	0.20	6.7556	6.48	0.16992	0.617	1.5348	1.2592	1.219	1.397	0.13779
5	0.26	6.8617	6.48	0.23276	0.610	1.578	1.1963	1.319	1.3872	0.19084
6	0.33	6.9369	6.48	0.27873	0.610	1.6073	1.1504	1.397	1.3788	0.22846
7	0.39	6.9927	6.48	0.31306	0.611	1.6287	1.116	1.459	1.3724	0.25636
8	0.46	7.0384	6.48	0.34158	0.612	1.6459	1.0875	1.513	1.3667	0.27921
9	0.52	7.0787	6.48	0.36602	0.611	1.6618	1.0631	1.563	1.3624	0.29936
10	0.59	7.1136	6.48	0.38871	0.613	1.674	1.0404	1.609	1.3572	0.31682
11	0.65	7.1432	6.48	0.4085	0.616	1.6838	1.0206	1.650	1.3522	0.3316
12	0.71	7.1727	6.48	0.42653	0.616	1.6953	1.0025	1.691	1.3489	0.34636
13	0.78	7.1982	6.48	0.44225	0.616	1.705	0.98684	1.728	1.3459	0.3591
14	0.91	7.2457	6.48	0.46901	0.612	1.7258	0.96007	1.798	1.3429	0.38287
15	1.04	7.2865	6.48	0.49287	0.611	1.7427	0.93621	1.861	1.3395	0.40326
16	1.17	7.3239	6.48	0.51266	0.608	1.7603	0.91643	1.921	1.3384	0.42194
17	1.30	7.3578	6.48	0.5307	0.605	1.7762	0.89839	1.977	1.3373	0.43892
18	1.43	7.389	6.48	0.54699	0.602	1.7911	0.8821	2.031	1.3366	0.45452
19	1.56	7.4155	6.48	0.55863	0.597	1.806	0.87046	2.075	1.3382	0.46777
20	2.33	7.543	6.48	0.61333	0.577	1.8788	0.81576	2.303	1.3473	0.53152
21	3.12	7.624	6.48	0.64358	0.563	1.9295	0.7855	2.456	1.3575	0.57202
22	3.90	7.6844	6.48	0.6593	0.547	1.9742	0.76979	2.565	1.372	0.60219
23	4.68	7.7226	6.48	0.66628	0.536	2.0054	0.76281	2.629	1.3841	0.62128
24	5.47	7.7503	6.48	0.66919	0.527	2.0302	0.7599	2.672	1.395	0.63515
25	6.25	7.7743	6.48	0.67093	0.518	2.0524	0.75815	2.707	1.4053	0.64715
26	7.03	7.7953	6.48	0.66977	0.509	2.0747	0.75931	2.732	1.417	0.65767
27	7.82	7.8095	6.48	0.66686	0.502	2.0917	0.76222	2.744	1.427	0.66474
28	8.61	7.8172	6.48	0.66279	0.496	2.1035	0.7663	2.745	1.4349	0.66858
29	9.38	7.8241	6.48	0.65813	0.490	2.115	0.77095	2.743	1.443	0.67204
30	10.17	7.831	6.48	0.65348	0.484	2.1266	0.77561	2.742	1.4511	0.67551
31	10.95	7.8324	6.48	0.64649	0.478	2.135	0.78259	2.728	1.4588	0.67619
32	11.73	7.8288	6.48	0.64184	0.476	2.1361	0.78725	2.713	1.4617	0.67442
33	12.52	7.8278	6.48	0.6366	0.472	2.1403	0.79248	2.701	1.4664	0.67392
34	13.31	7.8227	6.48	0.62904	0.468	2.1428	0.80005	2.678	1.4714	0.67137
35	14.09	7.8118	6.48	0.62845	0.472	2.1324	0.80063	2.663	1.4665	0.66588
36	14.88	7.8024	6.48	0.62671	0.474	2.1247	0.80238	2.648	1.4636	0.66118
37	15.05	7.7993	6.48	0.62613	0.475	2.1222	0.80296	2.643	1.4626	0.65963

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-013 S10
Sample No.: S-10
Test No.: 40.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 32.0'-34.0'
Elevation: ----

Soil Description: GRAY AND BROWN LEAN CLAY WITH SAND CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.13 in
Specimen Area: 6.33 in^2
Specimen Volume: 38.81 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 42

Plastic Limit: 23

Estimated Specific Gravity: 2.72

	Time min	Vertical Strain %	Corrected Area in^2	Deviator Load lb	Deviator Stress tsf	Pore Pressure tsf	Horizontal Stress tsf	Vertical Stress tsf
1	0	0	6.3319	0	0	5.0422	7.56	7.56
2	5.0001	0.049959	6.3351	25.547	0.29035	5.2708	7.56	7.8503
3	10.004	0.10929	6.3388	41.648	0.47306	5.4236	7.56	8.0331
4	15.004	0.17017	6.3427	52.381	0.59462	5.5356	7.56	8.1546
5	20.004	0.23262	6.3467	60.539	0.68679	5.6242	7.56	8.2468
6	25.004	0.29975	6.3509	67.151	0.76129	5.7006	7.56	8.3213
7	30.004	0.36533	6.3551	72.647	0.82305	5.7683	7.56	8.3831
8	35.004	0.4309	6.3593	77.585	0.87841	5.8248	7.56	8.4384
9	40.004	0.49803	6.3636	81.878	0.9264	5.8756	7.56	8.4864
10	45.004	0.56204	6.3677	85.914	0.97144	5.9211	7.56	8.5314
11	50.004	0.62761	6.3719	89.435	1.0106	5.9619	7.56	8.5706
12	55.004	0.6963	6.3763	92.698	1.0467	6.001	7.56	8.6067
13	60.004	0.76187	6.3805	95.875	1.0819	6.0371	7.56	8.6419
14	70.004	0.89614	6.3892	101.2	1.1404	6.1001	7.56	8.7004
15	80.004	1.0304	6.3978	105.97	1.1925	6.1538	7.56	8.7525
16	90.004	1.1631	6.4064	110.34	1.2401	6.201	7.56	8.8001
17	100	1.3005	6.4153	114.08	1.2803	6.2412	7.56	8.8403
18	110	1.4332	6.424	117.56	1.3176	6.2774	7.56	8.8776
19	120	1.569	6.4328	120.69	1.3509	6.3118	7.56	8.9109
20	180	2.3684	6.4855	135.2	1.501	6.4477	7.56	9.061
21	240	3.1786	6.5398	144.78	1.594	6.5241	7.56	9.154
22	300	3.9889	6.595	152.03	1.6598	6.569	7.56	9.2198
23	360	4.7976	6.651	157.53	1.7053	6.5952	7.56	9.2653
24	420	5.6095	6.7082	162	1.7387	6.6086	7.56	9.2987
25	480	6.4166	6.766	165.6	1.7622	6.6151	7.56	9.3222
26	540	7.2316	6.8255	168.65	1.779	6.6174	7.56	9.339
27	600	8.0434	6.8857	171.18	1.79	6.6145	7.56	9.35
28	660	8.8506	6.9467	173.55	1.7987	6.6092	7.56	9.3587
29	720	9.6608	7.009	175.35	1.8013	6.6022	7.56	9.3613
30	780	10.477	7.073	177.11	1.8029	6.5958	7.56	9.3629
31	840	11.286	7.1374	178.61	1.8018	6.5882	7.56	9.3618
32	900	12.099	7.2035	180.03	1.7994	6.5812	7.56	9.3594
33	960	12.914	7.2709	181.32	1.7955	6.5748	7.56	9.3555
34	1020	13.732	7.3398	181.88	1.7841	6.5766	7.56	9.3441
35	1080	14.54	7.4092	182.18	1.7703	6.5725	7.56	9.3303
36	1140	15.353	7.4804	182.61	1.7576	6.5719	7.56	9.3176

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-013 S10
Sample No.: S-10
Test No.: 40.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 32.0'-34.0'
Elevation: ----

Terracon Consulting Engineers & Scientists

Soil Description: GRAY AND BROWN LEAN CLAY WITH SAND CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.13 in
Specimen Area: 6.33 in^2
Specimen Volume: 38.81 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 42

Plastic Limit: 23

Estimated Specific Gravity: 2.72

	Vertical Strain %	Total Vertical Stress tsf	Total Horizontal Stress tsf	Excess Pore Pressure tsf	A Parameter	Effective Vertical Stress tsf	Effective Horizontal Stress tsf	Stress Ratio	Effective p tsf	q tsf
1	0.00	7.56	7.56	0	0.000	2.5178	2.5178	1.000	2.5178	0
2	0.05	7.8503	7.56	0.22861	0.787	2.5795	2.2892	1.127	2.4344	0.14517
3	0.11	8.0331	7.56	0.3814	0.806	2.6094	2.1364	1.221	2.3729	0.23653
4	0.17	8.1546	7.56	0.49337	0.830	2.619	2.0244	1.294	2.3217	0.29731
5	0.23	8.2468	7.56	0.58202	0.847	2.6226	1.9358	1.355	2.2792	0.34339
6	0.30	8.3213	7.56	0.65841	0.865	2.6207	1.8594	1.409	2.24	0.38064
7	0.37	8.3831	7.56	0.72606	0.882	2.6148	1.7917	1.459	2.2033	0.41153
8	0.43	8.4384	7.56	0.78263	0.891	2.6136	1.7352	1.506	2.1744	0.43921
9	0.50	8.4864	7.56	0.83337	0.900	2.6108	1.6844	1.550	2.1476	0.4632
10	0.56	8.5314	7.56	0.87886	0.905	2.6104	1.6389	1.593	2.1247	0.48572
11	0.63	8.5706	7.56	0.91968	0.910	2.6087	1.5981	1.632	2.1034	0.50529
12	0.70	8.6067	7.56	0.95875	0.916	2.6058	1.559	1.671	2.0824	0.52336
13	0.76	8.6419	7.56	0.99491	0.920	2.6048	1.5229	1.710	2.0638	0.54095
14	0.90	8.7004	7.56	1.0579	0.928	2.6003	1.4599	1.781	2.0301	0.57021
15	1.03	8.7525	7.56	1.1115	0.932	2.5988	1.4062	1.848	2.0025	0.59626
16	1.16	8.8001	7.56	1.1588	0.934	2.5991	1.359	1.913	1.9791	0.62007
17	1.30	8.8403	7.56	1.199	0.936	2.5991	1.3188	1.971	1.9589	0.64017
18	1.43	8.8776	7.56	1.2352	0.937	2.6002	1.2826	2.027	1.9414	0.65879
19	1.57	8.9109	7.56	1.2696	0.940	2.5991	1.2482	2.082	1.9236	0.67543
20	2.37	9.061	7.56	1.4055	0.936	2.6133	1.1123	2.349	1.8628	0.7505
21	3.18	9.154	7.56	1.4819	0.930	2.6299	1.0359	2.539	1.8329	0.79698
22	3.99	9.2198	7.56	1.5268	0.920	2.6508	0.99102	2.675	1.8209	0.82991
23	4.80	9.2653	7.56	1.553	0.911	2.6701	0.96477	2.768	1.8174	0.85267
24	5.61	9.2987	7.56	1.5664	0.901	2.6901	0.95136	2.828	1.8207	0.86936
25	6.42	9.3222	7.56	1.5728	0.893	2.7072	0.94495	2.865	1.8261	0.88112
26	7.23	9.339	7.56	1.5752	0.885	2.7217	0.94261	2.887	1.8321	0.88952
27	8.04	9.35	7.56	1.5723	0.878	2.7355	0.94553	2.893	1.8405	0.89498
28	8.85	9.3587	7.56	1.567	0.871	2.7495	0.95078	2.892	1.8501	0.89937
29	9.66	9.3613	7.56	1.56	0.866	2.759	0.95778	2.881	1.8584	0.90063
30	10.48	9.3629	7.56	1.5536	0.862	2.7671	0.96419	2.870	1.8656	0.90145
31	11.29	9.3618	7.56	1.546	0.858	2.7736	0.97177	2.854	1.8727	0.90089
32	12.10	9.3594	7.56	1.539	0.855	2.7782	0.97877	2.838	1.8785	0.89971
33	12.91	9.3555	7.56	1.5326	0.854	2.7807	0.98519	2.822	1.8829	0.89775
34	13.73	9.3441	7.56	1.5344	0.860	2.7675	0.98344	2.814	1.8755	0.89205
35	14.54	9.3303	7.56	1.5303	0.864	2.7578	0.98752	2.793	1.8727	0.88516
36	15.35	9.3176	7.56	1.5297	0.870	2.7457	0.9881	2.779	1.8669	0.87881

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-013 S10
Sample No.: S-10
Test No.: 80.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 32.0'-34.0'
Elevation: ----

Soil Description: GRAY AND BROWN LEAN CLAY WITH SAND CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.05 in
Specimen Area: 6.26 in^2
Specimen Volume: 37.85 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 42

Plastic Limit: 23

Estimated Specific Gravity: 2.72

	Time min	Vertical Strain %	Corrected Area in^2	Deviator Load lb	Deviator Stress tsf	Pore Pressure tsf	Horizontal Stress tsf	Vertical Stress tsf
1	0	0	6.2601	0	0	1.4473	7.2	7.2
2	5.0002	0.057416	6.2637	42.956	0.49377	1.6232	7.2	7.6938
3	10	0.12843	6.2682	75.999	0.87297	1.8591	7.2	8.073
4	15	0.19491	6.2723	96.821	1.1114	2.0973	7.2	8.3114
5	20	0.26139	6.2765	112.87	1.2948	2.3215	7.2	8.4948
6	25	0.32939	6.2808	127.24	1.4586	2.53	7.2	8.6586
7	30	0.39436	6.2849	139.93	1.6031	2.7199	7.2	8.8031
8	35	0.46084	6.2891	150.32	1.7209	2.8923	7.2	8.9209
9	40	0.52581	6.2932	159.97	1.8302	3.0478	7.2	9.0302
10	45	0.59531	6.2976	168.57	1.9273	3.1905	7.2	9.1273
11	50	0.6633	6.3019	175.7	2.0074	3.3198	7.2	9.2074
12	55	0.7313	6.3062	183.2	2.0917	3.438	7.2	9.2917
13	60	0.79929	6.3105	189.45	2.1615	3.5452	7.2	9.3615
14	70	0.9383	6.3194	201.61	2.2971	3.7298	7.2	9.4971
15	80	1.0758	6.3282	210.37	2.3936	3.8876	7.2	9.5936
16	90.001	1.2163	6.3372	218.14	2.4784	4.0228	7.2	9.6784
17	100	1.3538	6.346	224.69	2.5493	4.1375	7.2	9.7493
18	110	1.4928	6.355	230.15	2.6075	4.2388	7.2	9.8075
19	120	1.6303	6.3639	236.18	2.6721	4.3262	7.2	9.8721
20	180	2.4432	6.4169	262.25	2.9425	4.685	7.2	10.142
21	240	3.2787	6.4723	279.34	3.1075	4.8801	7.2	10.308
22	300	4.1067	6.5282	292.25	3.2232	4.9907	7.2	10.423
23	360	4.9136	6.5836	303.47	3.3188	5.0548	7.2	10.519
24	420	5.7506	6.6421	310.87	3.3698	5.0903	7.2	10.57
25	480	6.5802	6.701	318.68	3.4241	5.1136	7.2	10.624
26	540	7.4006	6.7604	325.24	3.4638	5.1206	7.2	10.664
27	600	8.2346	6.8219	330.8	3.4913	5.1171	7.2	10.691
28	660	9.0626	6.884	336.15	3.5158	5.1061	7.2	10.716
29	720	9.877	6.9462	340.92	3.5338	5.0973	7.2	10.734
30	780	10.714	7.0113	344.8	3.5408	5.088	7.2	10.741
31	840	11.542	7.0769	348.79	3.5485	5.0746	7.2	10.749
32	900	12.361	7.1431	351.99	3.5479	5.0647	7.2	10.748
33	960	13.204	7.2124	355.4	3.5478	5.0566	7.2	10.748
34	1020	14.025	7.2813	357.18	3.5319	5.0478	7.2	10.732
35	1080	14.848	7.3517	359.59	3.5217	5.0496	7.2	10.722
36	1140	15.696	7.4256	361.69	3.507	5.049	7.2	10.707
37	1151.2	15.853	7.4395	362.53	3.5086	5.0455	7.2	10.709

TRIAXIAL TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-013 S10
Sample No.: S-10
Test No.: 80.0 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/29/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 32.0'-34.0'
Elevation: ----

Soil Description: GRAY AND BROWN LEAN CLAY WITH SAND CL
Remarks: FAILURE CRITERIA = MAXIMUM EFFECTIVE STRESS RATIO TEST PERFORMED AS PER ASTM D4767.

Specimen Height: 6.05 in
Specimen Area: 6.26 in^2
Specimen Volume: 37.85 in^3

Piston Area: 0.00 in^2
Piston Friction: 0.00 lb
Piston Weight: 0.00 lb

Filter Strip Correction: 0.00 tsf
Membrane Correction: 0.00 lb/in
Correction Type: Uniform

Liquid Limit: 42

Plastic Limit: 23

Estimated Specific Gravity: 2.72

	Vertical Strain %	Total Vertical Stress tsf	Total Horizontal Stress tsf	Excess Pore Pressure tsf	A Parameter	Effective Vertical Stress tsf	Effective Horizontal Stress tsf	Stress Ratio	Effective p tsf	q tsf
1	0.00	7.2	7.2	0	0.000	5.7527	5.7527	1.000	5.7527	0
2	0.06	7.6938	7.2	0.17589	0.356	6.0706	5.5768	1.089	5.8237	0.24688
3	0.13	8.073	7.2	0.41177	0.472	6.2139	5.3409	1.163	5.7774	0.43648
4	0.19	8.3114	7.2	0.64998	0.585	6.2141	5.1027	1.218	5.6584	0.5557
5	0.26	8.4948	7.2	0.87421	0.675	6.1733	4.8785	1.265	5.5259	0.64739
6	0.33	8.6586	7.2	1.0827	0.742	6.1286	4.67	1.312	5.3993	0.72932
7	0.39	8.8031	7.2	1.2726	0.794	6.0832	4.4801	1.358	5.2816	0.80155
8	0.46	8.9209	7.2	1.445	0.840	6.0286	4.3077	1.399	5.1682	0.86046
9	0.53	9.0302	7.2	1.6005	0.874	5.9824	4.1522	1.441	5.0673	0.9151
10	0.60	9.1273	7.2	1.7432	0.904	5.9368	4.0095	1.481	4.9731	0.96363
11	0.66	9.2074	7.2	1.8725	0.933	5.8877	3.8802	1.517	4.8839	1.0037
12	0.73	9.2917	7.2	1.9907	0.952	5.8537	3.762	1.556	4.8078	1.0459
13	0.80	9.3615	7.2	2.0979	0.971	5.8163	3.6548	1.591	4.7356	1.0807
14	0.94	9.4971	7.2	2.2825	0.994	5.7673	3.4702	1.662	4.6187	1.1485
15	1.08	9.5936	7.2	2.4403	1.020	5.7059	3.3124	1.723	4.5091	1.1968
16	1.22	9.6784	7.2	2.5755	1.039	5.6556	3.1772	1.780	4.4164	1.2392
17	1.35	9.7493	7.2	2.6902	1.055	5.6118	3.0625	1.832	4.3371	1.2746
18	1.49	9.8075	7.2	2.7915	1.071	5.5686	2.9612	1.881	4.2649	1.3037
19	1.63	9.8721	7.2	2.8789	1.077	5.5459	2.8738	1.930	4.2098	1.336
20	2.44	10.142	7.2	3.2377	1.100	5.4575	2.515	2.170	3.9863	1.4712
21	3.28	10.308	7.2	3.4328	1.105	5.4274	2.3199	2.339	3.8737	1.5538
22	4.11	10.423	7.2	3.5434	1.099	5.4325	2.2093	2.459	3.8209	1.6116
23	4.91	10.519	7.2	3.6075	1.087	5.464	2.1452	2.547	3.8046	1.6594
24	5.75	10.57	7.2	3.643	1.081	5.4794	2.1097	2.597	3.7945	1.6849
25	6.58	10.624	7.2	3.6663	1.071	5.5105	2.0864	2.641	3.7984	1.712
26	7.40	10.664	7.2	3.6733	1.060	5.5432	2.0794	2.666	3.8113	1.7319
27	8.23	10.691	7.2	3.6698	1.051	5.5742	2.0829	2.676	3.8285	1.7457
28	9.06	10.716	7.2	3.6588	1.041	5.6097	2.0939	2.679	3.8518	1.7579
29	9.88	10.734	7.2	3.65	1.033	5.6364	2.1027	2.681	3.8695	1.7669
30	10.71	10.741	7.2	3.6407	1.028	5.6528	2.112	2.677	3.8824	1.7704
31	11.54	10.749	7.2	3.6273	1.022	5.6739	2.1254	2.670	3.8996	1.7743
32	12.36	10.748	7.2	3.6174	1.020	5.6832	2.1353	2.662	3.9092	1.774
33	13.20	10.748	7.2	3.6093	1.017	5.6913	2.1434	2.655	3.9173	1.7739
34	14.02	10.732	7.2	3.6005	1.019	5.6841	2.1522	2.641	3.9181	1.766
35	14.85	10.722	7.2	3.6023	1.023	5.6721	2.1504	2.638	3.9113	1.7609
36	15.70	10.707	7.2	3.6017	1.027	5.658	2.151	2.630	3.9045	1.7535
37	15.85	10.709	7.2	3.5982	1.026	5.6631	2.1545	2.628	3.9088	1.7543

DIRECT SHEAR TEST REPORT

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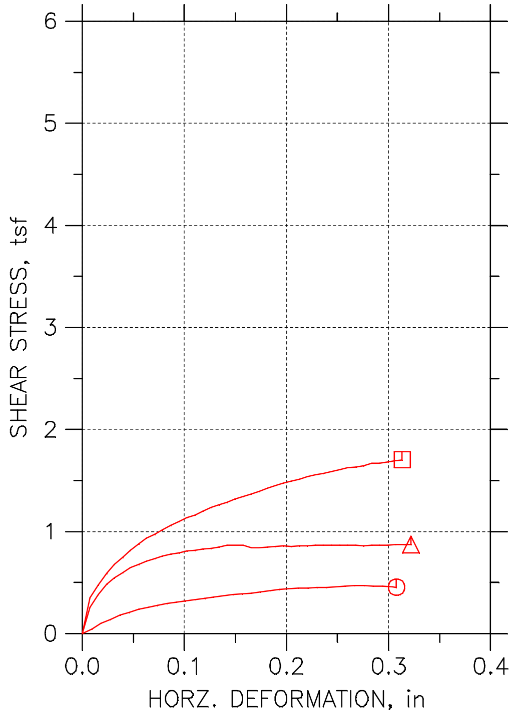
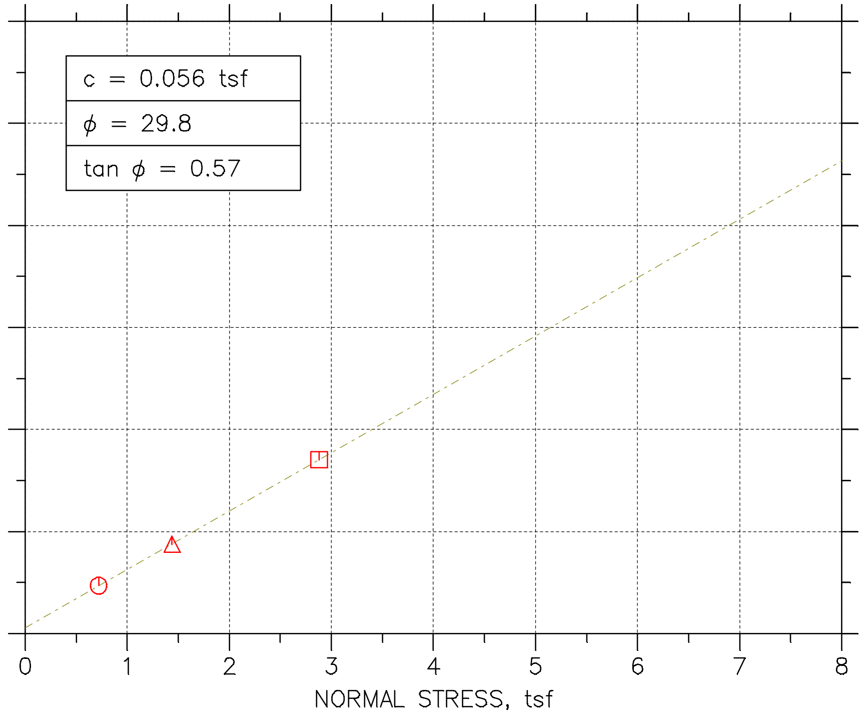
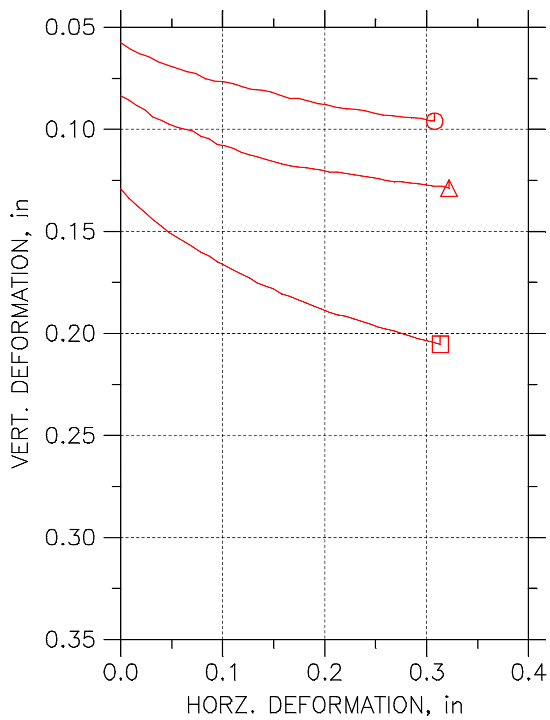






	Symbol	○	△	□	
	Test No.	10 PSI	20 PSI	40 PSI	
	Sample No.	S-5	S-5	S-5	
	Shape	Circular	Circular	Circular	
Initial	Dimension, in	2.502	2.5016	2.5035	
	Area, in^2	4.9165	4.9149	4.9227	
	Height, in	1.0098	1.0087	1.0067	
	Water Content, %	75.08	66.70	67.21	
	Dry Density, pcf	51.869	56.572	54.543	
	Saturation, %	97.66	99.74	94.70	
	Void Ratio	1.7682	1.5381	1.6325	
	Consol. Height, in	0.955	0.93155	0.88124	
	Consol. Void Ratio	1.6179	1.344	1.3044	
Final	Water Content, %	64.90	53.10	47.20	
	Dry Density, pcf	57.319	64.848	68.523	
	Saturation, %	99.18	100.59	99.10	
	Void Ratio	1.505	1.2142	1.0954	
	Normal Stress, tsf	0.71991	1.4387	2.88	
	Max. Shear Stress, tsf	0.47008	0.87498	1.7039	
	Ult. Shear Stress, tsf	0.45479	0.87367	1.7039	
	Time to Failure, min	3678.3	1181.7	1190.6	
	Disp. Rate, in/min	6.49e-005	0.000267	0.000267	
	Estimated Specific Gravity	2.30	2.30	2.30	
	Liquid Limit	NP	NP	NP	
	Plastic Limit	NP	NP	NP	
	Plasticity Index	NP	NP	NP	

Project: DYNERGY EDWARDS
Location: BARTONVILLE, IL
Project No.: MR155218
Boring No.: EDW-B002 S5
Sample Type: 3.0'' ST
Description: GRAY TO DARK GRAY VARVED FLY ASH
Remarks: TEST PERFORMED AS PER ASTM D3080.

Tue, 17-NOV-2015 14:27:49

DIRECT SHEAR TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW-B002 S5
Sample No.: S-5
Test No.: 10 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/23/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 10.0'-12.0'
Elevation: ----

Soil Description: GRAY TO DARK GRAY VARVED FLY ASH
Remarks: TEST PERFORMED AS PER ASTM D3080.

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in
1	0.00	0.7191	0.05749	0	0
2	156.95	0.7199	0.06058	0.04248	0.009199
3	277.29	0.7199	0.06298	0.1019	0.0184
4	393.34	0.7199	0.06449	0.1405	0.0276
5	521.67	0.7199	0.06689	0.1795	0.03679
6	638.11	0.7191	0.06852	0.2096	0.04599
7	753.57	0.7199	0.07016	0.2362	0.05519
8	865.04	0.7199	0.07168	0.2577	0.06439
9	981.73	0.7199	0.07275	0.2764	0.07359
10	1096.66	0.7199	0.07502	0.2939	0.08279
11	1214.45	0.7199	0.07628	0.3104	0.09199
12	1328.38	0.7199	0.07678	0.3228	0.1012
13	1454.83	0.7199	0.07767	0.3353	0.1104
14	1573.59	0.7199	0.0793	0.3472	0.1196
15	1688.63	0.7199	0.08044	0.3596	0.1288
16	1817.30	0.7199	0.08094	0.3721	0.138
17	1955.96	0.7199	0.08183	0.3817	0.1472
18	2070.95	0.7199	0.08321	0.3902	0.1564
19	2203.51	0.7199	0.08473	0.3965	0.1656
20	2323.62	0.7199	0.08485	0.4072	0.1748
21	2452.80	0.7199	0.08599	0.4191	0.184
22	2580.16	0.7199	0.08731	0.431	0.1932
23	2700.75	0.7199	0.08813	0.4401	0.2024
24	2823.89	0.7199	0.08933	0.4463	0.2116
25	2950.56	0.7199	0.09002	0.4486	0.2208
26	3070.17	0.7199	0.09027	0.4491	0.23
27	3194.72	0.7199	0.09078	0.4514	0.2392
28	3328.14	0.7199	0.09217	0.4588	0.2483
29	3443.95	0.7191	0.09292	0.4655	0.2575
30	3554.17	0.7191	0.09343	0.4695	0.2667
31	3678.32	0.7199	0.09393	0.4701	0.2759
32	3812.79	0.7199	0.09443	0.4678	0.2851
33	3932.15	0.7199	0.09475	0.4633	0.2943
34	4054.51	0.7199	0.09576	0.4571	0.3035
35	4102.88	0.7199	0.09601	0.4548	0.3078

DIRECT SHEAR TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW-B002 S5
Sample No.: S-5
Test No.: 20 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/23/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 10.0'-12.0'
Elevation: ----

Soil Description: GRAY TO DARK GRAY VARVED FLY ASH
Remarks: TEST PERFORMED AS PER ASTM D3080.

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in
1	0.00	1.438	0.08377	0	0
2	33.66	1.439	0.08551	0.2598	0.007876
3	62.53	1.439	0.08828	0.3842	0.01575
4	94.03	1.439	0.09063	0.4817	0.02363
5	123.61	1.439	0.09391	0.5451	0.0315
6	153.40	1.439	0.09565	0.5982	0.03938
7	184.06	1.439	0.09749	0.644	0.04725
8	213.02	1.439	0.09903	0.6793	0.05513
9	241.92	1.439	0.09985	0.7094	0.06301
10	271.68	1.439	0.101	0.7362	0.07088
11	302.17	1.439	0.1033	0.7611	0.07876
12	330.34	1.439	0.1047	0.7781	0.08663
13	360.65	1.439	0.1073	0.7886	0.09451
14	392.06	1.439	0.1082	0.8089	0.1024
15	421.40	1.439	0.1095	0.818	0.1103
16	448.87	1.439	0.1113	0.8259	0.1181
17	477.79	1.439	0.1125	0.8351	0.126
18	506.84	1.439	0.1134	0.8495	0.1339
19	537.40	1.439	0.1148	0.8632	0.1418
20	593.97	1.439	0.1167	0.8652	0.1575
21	623.57	1.439	0.1179	0.8429	0.1654
22	655.08	1.439	0.1184	0.8423	0.1733
23	684.47	1.439	0.1188	0.8481	0.1811
24	712.80	1.439	0.1195	0.8521	0.189
25	740.02	1.439	0.1199	0.8573	0.1969
26	771.65	1.439	0.1208	0.8567	0.2048
27	801.16	1.439	0.121	0.858	0.2126
28	830.38	1.439	0.1215	0.8625	0.2205
29	861.82	1.439	0.1222	0.8645	0.2284
30	891.86	1.439	0.1228	0.8665	0.2362
31	920.33	1.439	0.1234	0.8678	0.2441
32	947.61	1.439	0.124	0.8645	0.252
33	978.79	1.439	0.1249	0.8645	0.2599
34	1008.02	1.439	0.1256	0.8645	0.2677
35	1036.49	1.439	0.1257	0.8625	0.2756
36	1067.92	1.439	0.1262	0.8652	0.2835
37	1095.86	1.439	0.1267	0.8652	0.2914
38	1124.42	1.439	0.1273	0.8691	0.2992
39	1152.92	1.439	0.1277	0.8704	0.3071
40	1181.69	1.439	0.128	0.875	0.315
41	1207.99	1.439	0.1287	0.8737	0.322

DIRECT SHEAR TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW-B002 S5
Sample No.: S-5
Test No.: 40 PSI

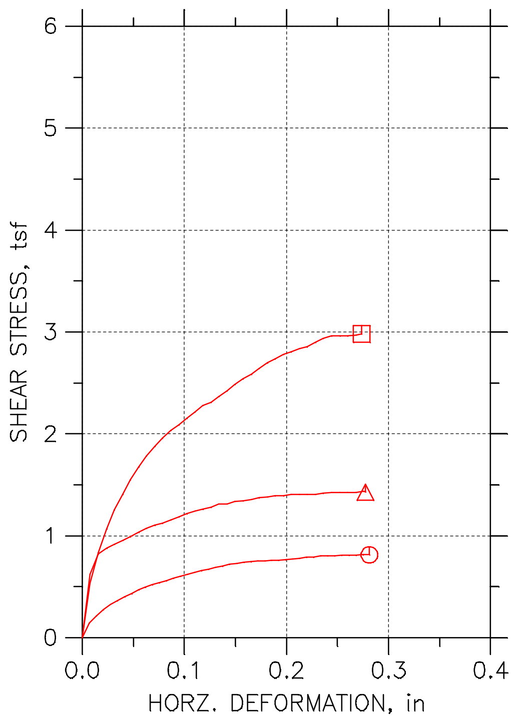
Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/23/15
Sample Type: 3.0" ST

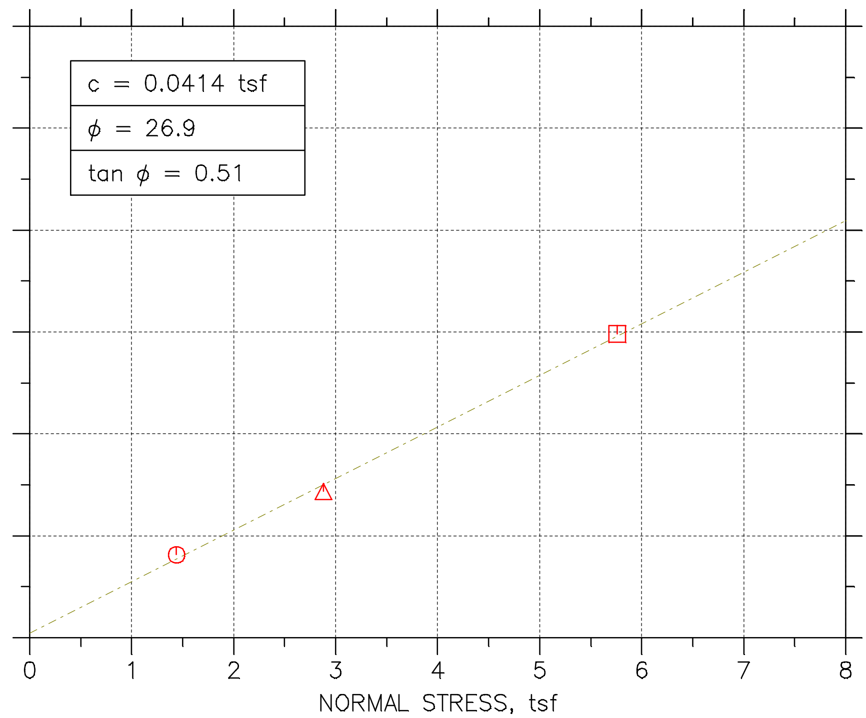
Project No.: MR155218
Checked By: WPQ
Depth: 10.0'-12.0'
Elevation: ----

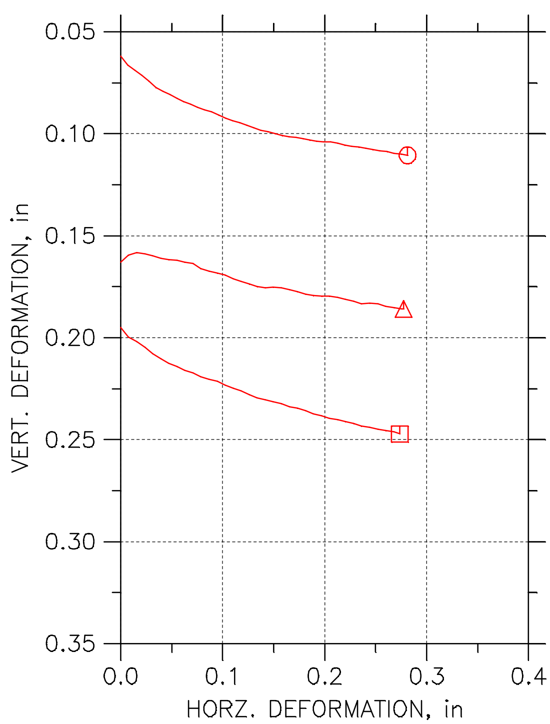
Soil Description: GRAY TO DARK GRAY VARVED FLY ASH
Remarks: TEST PERFORMED AS PER ASTM D3080.

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in
1	0.00	2.879	0.1292	0	0
2	34.66	2.879	0.1336	0.3516	0.007876
3	65.95	2.879	0.1374	0.4772	0.01575
4	98.49	2.879	0.1406	0.5912	0.02363
5	128.04	2.879	0.1442	0.6779	0.0315
6	157.00	2.879	0.1474	0.7496	0.03938
7	188.14	2.88	0.1504	0.8151	0.04725
8	217.44	2.88	0.1529	0.8772	0.05513
9	247.88	2.879	0.1551	0.9339	0.06301
10	276.45	2.879	0.1577	0.9701	0.07088
11	306.20	2.879	0.1601	1.017	0.07876
12	336.36	2.879	0.162	1.06	0.08663
13	366.50	2.879	0.1648	1.096	0.09451
14	397.75	2.879	0.1667	1.135	0.1024
15	427.67	2.88	0.169	1.161	0.1103
16	455.53	2.88	0.171	1.197	0.1181
17	485.04	2.879	0.1726	1.234	0.126
18	515.15	2.879	0.1753	1.262	0.1339
19	546.34	2.879	0.1769	1.285	0.1418
20	576.29	2.879	0.1782	1.317	0.1496
21	605.44	2.879	0.1806	1.346	0.1575
22	631.71	2.879	0.1819	1.367	0.1654
23	663.92	2.879	0.1834	1.395	0.1733
24	693.09	2.879	0.1851	1.423	0.1811
25	722.31	2.879	0.1865	1.447	0.189
26	753.49	2.88	0.1881	1.472	0.1969
27	783.68	2.879	0.1898	1.494	0.2048
28	812.56	2.879	0.1911	1.515	0.2126
29	840.21	2.879	0.1916	1.537	0.2205
30	873.07	2.879	0.1927	1.556	0.2284
31	901.78	2.88	0.194	1.57	0.2362
32	929.62	2.88	0.1952	1.589	0.2441
33	960.88	2.88	0.1967	1.608	0.252
34	990.19	2.88	0.1979	1.625	0.2599
35	1019.61	2.88	0.1986	1.632	0.2677
36	1048.80	2.879	0.1999	1.647	0.2756
37	1076.60	2.88	0.2013	1.668	0.2835
38	1109.68	2.88	0.2026	1.67	0.2914
39	1138.55	2.88	0.2036	1.681	0.2992
40	1167.91	2.879	0.2044	1.694	0.3071
41	1190.59	2.88	0.2054	1.704	0.3133

DIRECT SHEAR TEST REPORT







Symbol		○	△	□	
Test No.		20 PSI	40 PSI	80 PSI	
Sample No.		S-9	S-9	S-9	
Shape		Circular	Circular	Circular	
Initial	Dimension, in	2.5035	2.4988	2.4921	
	Area, in^2	4.9227	4.9041	4.8779	
	Height, in	1.0067	0.98937	0.99213	
	Water Content, %	71.70	70.21	69.53	
	Dry Density, pcf	53.119	54.563	54.248	
	Saturation, %	96.83	98.97	97.11	
	Void Ratio	1.7031	1.6315	1.6468	
Consol. Height, in		0.95172	0.83719	0.8042	
Consol. Void Ratio		1.5555	1.2268	1.1454	
Final	Water Content, %	60.80	49.80	42.70	
	Dry Density, pcf	59.677	67.193	72.249	
	Saturation, %	99.46	100.75	99.47	
	Void Ratio	1.406	1.1369	0.98736	
Normal Stress, tsf		1.4396	2.8798	5.7593	
Max. Shear Stress, tsf		0.81396	1.4353	2.9807	
Ult. Shear Stress, tsf		0.81396	1.4289	2.9807	
Time to Failure, min		1202.3	4163.3	1353.2	
Disp. Rate, in/min		0.000267	6.69e-005	0.000207	
Estimated Specific Gravity		2.30	2.30	2.30	
Liquid Limit		NP	NP	NP	
Plastic Limit		NP	NP	NP	
Plasticity Index		NP	NP	NP	

Project: DYNERGY EDWARDS
Location: BARTONVILLE, IL
Project No.: MR155218
Boring No.: EDW-B003 S9
Sample Type: 3.0'' ST
Description: VERY DARK GRAY VARVED FLY ASH
Remarks: TEST PERFORMED AS PER ASTM D3080

DIRECT SHEAR TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW-B003 S9
Sample No.: S-9
Test No.: 20 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/23/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 30.0'-32.0'
Elevation: ----

Soil Description: VERY DARK GRAY VARVED FLY ASH
Remarks: TEST PERFORMED AS PER ASTM D3080

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in
1	0.00	1.438	0.06197	0	0
2	29.97	1.439	0.06626	0.1471	0.006868
3	57.78	1.439	0.06903	0.2144	0.01374
4	88.56	1.439	0.07142	0.2734	0.0206
5	120.00	1.439	0.0742	0.3261	0.02747
6	147.42	1.439	0.07741	0.3658	0.03434
7	177.07	1.44	0.07918	0.4002	0.04121
8	208.08	1.439	0.08094	0.4362	0.04807
9	237.87	1.439	0.08258	0.468	0.05494
10	268.15	1.44	0.08422	0.4952	0.06181
11	297.24	1.44	0.08555	0.5181	0.06868
12	327.37	1.439	0.08693	0.5374	0.07555
13	354.52	1.44	0.08832	0.5599	0.08241
14	388.81	1.439	0.08933	0.5859	0.08928
15	414.34	1.439	0.0909	0.6053	0.09615
16	443.05	1.44	0.09235	0.6214	0.103
17	475.44	1.44	0.09362	0.6428	0.1099
18	503.04	1.439	0.09456	0.6569	0.1168
19	531.73	1.44	0.09576	0.672	0.1236
20	563.76	1.44	0.09708	0.6908	0.1305
21	590.20	1.44	0.09841	0.7049	0.1374
22	620.48	1.439	0.09897	0.719	0.1442
23	648.48	1.44	0.09992	0.7268	0.1511
24	679.58	1.44	0.1007	0.7399	0.158
25	707.75	1.44	0.1014	0.7493	0.1648
26	736.66	1.44	0.1019	0.7503	0.1717
27	766.24	1.44	0.1026	0.754	0.1786
28	796.15	1.44	0.1031	0.7592	0.1854
29	823.23	1.439	0.1038	0.7618	0.1923
30	851.40	1.44	0.104	0.767	0.1991
31	883.03	1.44	0.1041	0.7727	0.206
32	911.21	1.44	0.1047	0.7764	0.2129
33	944.16	1.44	0.1056	0.7879	0.2197
34	971.55	1.44	0.1061	0.7936	0.2266
35	1000.34	1.44	0.1065	0.802	0.2335
36	1031.20	1.44	0.1073	0.803	0.2403
37	1059.90	1.439	0.1079	0.8067	0.2472
38	1088.96	1.44	0.1084	0.8113	0.2541
39	1119.26	1.44	0.1087	0.8108	0.2609
40	1145.99	1.44	0.1097	0.8098	0.2678
41	1177.16	1.44	0.1101	0.814	0.2747
42	1202.27	1.44	0.1106	0.814	0.2812

DIRECT SHEAR TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW-B003 S9
Sample No.: S-9
Test No.: 40 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/23/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 30.0'-32.0'
Elevation: ----

Soil Description: VERY DARK GRAY VARVED FLY ASH
Remarks: TEST PERFORMED AS PER ASTM D3080

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in
1	0.00	4.541	0.1631	0	0
2	165.26	2.88	0.1594	0.623	0.007876
3	285.62	2.88	0.1584	0.8242	0.01575
4	408.00	2.88	0.1589	0.8772	0.02363
5	528.28	2.88	0.1597	0.9172	0.0315
6	644.59	2.88	0.161	0.9573	0.03938
7	763.78	2.88	0.1618	0.994	0.04725
8	884.32	2.88	0.1622	1.033	0.05513
9	993.76	2.88	0.163	1.072	0.06301
10	1117.20	2.88	0.1637	1.102	0.07088
11	1235.24	2.88	0.166	1.124	0.07876
12	1344.93	2.88	0.1672	1.154	0.08663
13	1464.24	2.88	0.1684	1.183	0.09451
14	1587.75	2.88	0.1694	1.219	0.1024
15	1704.16	2.879	0.171	1.241	0.1103
16	1806.00	2.879	0.1724	1.26	0.1181
17	1919.53	2.88	0.1737	1.281	0.126
18	2040.50	2.88	0.1748	1.31	0.1339
19	2161.06	2.88	0.1757	1.312	0.1418
20	2270.85	2.88	0.1753	1.338	0.1496
21	2391.12	2.88	0.1755	1.346	0.1575
22	2509.07	2.88	0.1764	1.356	0.1654
23	2633.81	2.88	0.1773	1.373	0.1733
24	2755.77	2.88	0.1787	1.382	0.1811
25	2871.20	2.88	0.1792	1.392	0.189
26	2977.15	2.88	0.1795	1.392	0.1969
27	3107.25	2.88	0.1796	1.405	0.2048
28	3223.67	2.88	0.1804	1.408	0.2126
29	3336.47	2.88	0.1812	1.406	0.2205
30	3458.59	2.88	0.1821	1.403	0.2284
31	3580.72	2.88	0.1833	1.418	0.2362
32	3695.22	2.879	0.1829	1.425	0.2441
33	3803.01	2.88	0.1834	1.426	0.252
34	3924.20	2.88	0.1847	1.426	0.2599
35	4048.11	2.88	0.1853	1.428	0.2677
36	4163.33	2.88	0.1858	1.435	0.2756
37	4182.96	2.88	0.186	1.429	0.2775

DIRECT SHEAR TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW-B003 S9
Sample No.: S-9
Test No.: 80 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 10/23/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 30.0'-32.0'
Elevation: ----

Soil Description: VERY DARK GRAY VARVED FLY ASH
Remarks: TEST PERFORMED AS PER ASTM D3080

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in
1	0.00	5.757	0.195	0	0
2	58.95	5.759	0.1996	0.5335	0.007876
3	100.20	5.759	0.2019	0.8357	0.01575
4	140.38	5.759	0.2048	1.069	0.02363
5	178.98	5.759	0.2079	1.257	0.0315
6	214.75	5.759	0.2102	1.405	0.03938
7	256.36	5.759	0.2126	1.554	0.04725
8	295.19	5.759	0.2142	1.68	0.05513
9	332.54	5.759	0.216	1.784	0.06301
10	373.08	5.759	0.2174	1.879	0.07088
11	411.52	5.759	0.219	1.962	0.07876
12	450.22	5.759	0.2203	2.034	0.08663
13	487.04	5.759	0.2214	2.089	0.09451
14	524.30	5.759	0.2232	2.152	0.1024
15	562.81	5.759	0.2247	2.215	0.1103
16	600.83	5.759	0.2262	2.277	0.1181
17	638.96	5.759	0.2278	2.314	0.126
18	681.52	5.759	0.2295	2.365	0.1339
19	716.24	5.759	0.2303	2.426	0.1418
20	755.33	5.76	0.2315	2.489	0.1496
21	791.66	5.759	0.2324	2.542	0.1575
22	830.85	5.759	0.2338	2.587	0.1654
23	870.20	5.759	0.2346	2.643	0.1733
24	908.45	5.759	0.2356	2.697	0.1811
25	944.85	5.759	0.2372	2.738	0.189
26	983.52	5.759	0.2383	2.779	0.1969
27	1022.76	5.759	0.2395	2.809	0.2048
28	1059.45	5.759	0.2401	2.838	0.2126
29	1096.13	5.759	0.2411	2.858	0.2205
30	1136.62	5.759	0.2421	2.903	0.2284
31	1174.43	5.759	0.2433	2.936	0.2362
32	1210.69	5.759	0.244	2.961	0.2441
33	1248.49	5.759	0.2448	2.964	0.252
34	1288.45	5.759	0.2456	2.966	0.2599
35	1323.77	5.759	0.2462	2.967	0.2677
36	1353.20	5.759	0.2472	2.982	0.2737

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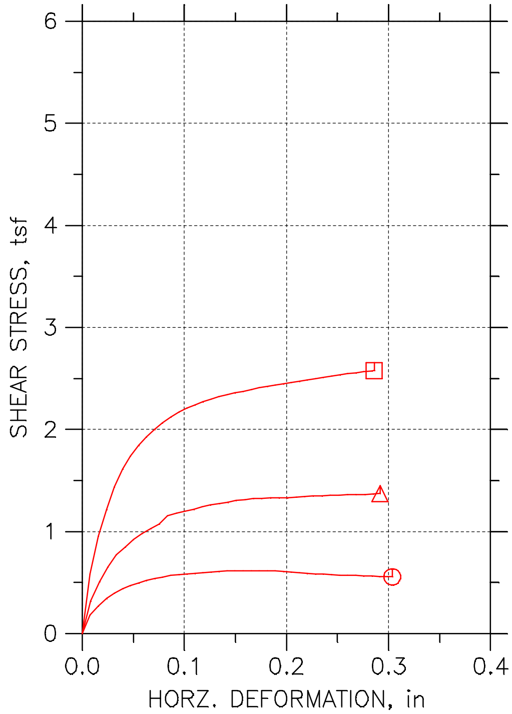
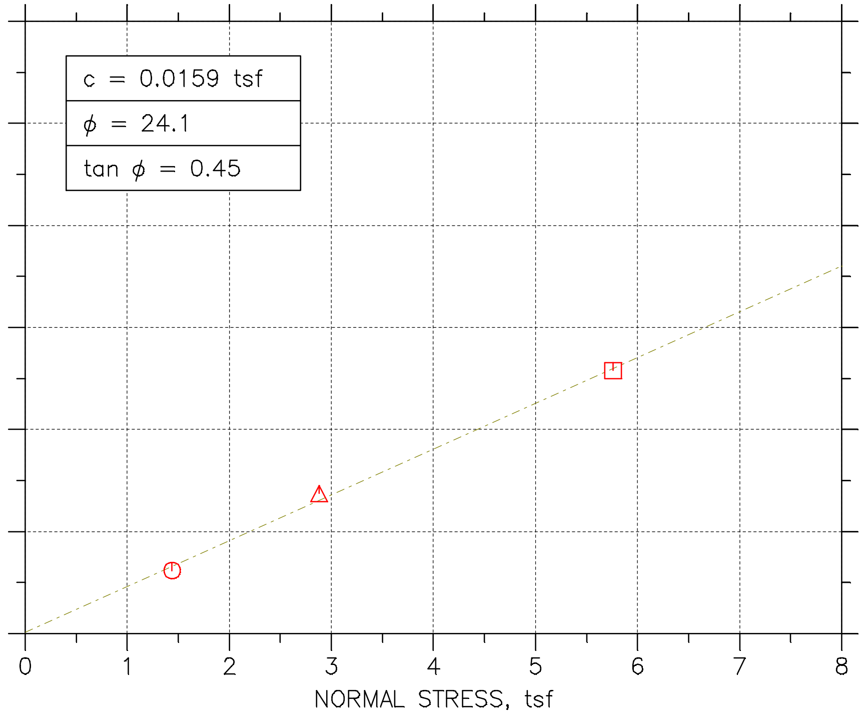
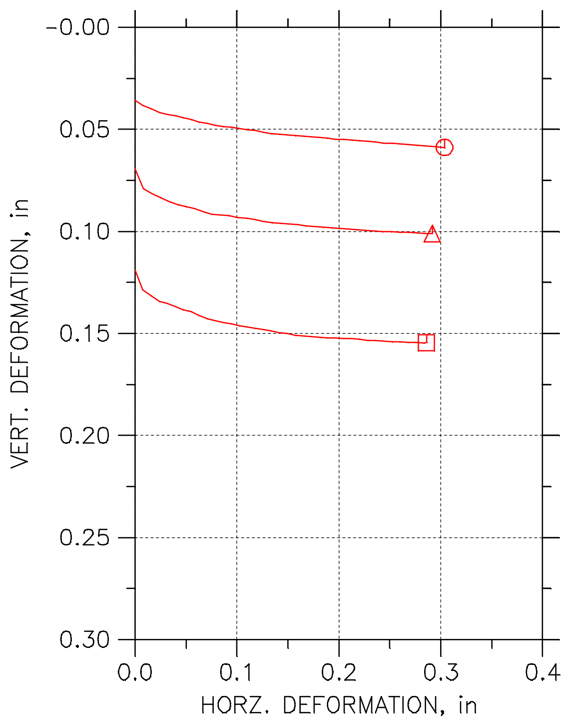
DIRECT SHEAR TEST REPORT







	Symbol	○	△	□	
	Test No.	20 PSI	40 PSI	80 PSI	
	Sample No.	S-10	S-10	S-10	
	Shape	Circular	Circular	Circular	
Initial	Dimension, in	2.4921	2.4996	2.4976	
Initial	Area, in^2	4.8779	4.9072	4.8995	
Initial	Height, in	0.99606	0.98583	0.98858	
Initial	Water Content, %	29.91	28.99	29.10	
Initial	Dry Density, pcf	90.515	92.188	91.834	
Initial	Saturation, %	92.88	93.65	93.21	
Initial	Void Ratio	0.87597	0.84192	0.84903	
	Consol. Height, in	0.96227	0.91945	0.88312	
	Consol. Void Ratio	0.81233	0.71789	0.65176	
Final	Water Content, %	28.10	23.40	19.70	
Final	Dry Density, pcf	96.208	102.73	108.85	
Final	Saturation, %	99.92	97.47	95.68	
Final	Void Ratio	0.76496	0.653	0.56003	
	Normal Stress, tsf	1.4392	2.8795	5.7594	
	Max. Shear Stress, tsf	0.61821	1.3715	2.5767	
	Ult. Shear Stress, tsf	0.55697	1.3715	2.5767	
	Time to Failure, min	793.54	1341	1400	
	Disp. Rate, in/min	0.000207	0.000207	0.000207	
	Estimated Specific Gravity	2.72	2.72	2.72	
	Liquid Limit	40	40	40	
	Plastic Limit	15	15	15	
	Plasticity Index	25	25	25	

Project: DYNERGY EDWARDS
Location: BARTONVILLE, IL
Project No.: MR155218
Boring No.: EDW010 S10
Sample Type: 3.0'' ST
Description: BLUISH GRAY LEAN CLAY CL
Remarks: TEST PERFORMED AS PER ASTM D3080

DIRECT SHEAR TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW010 S10
Sample No.: S-10
Test No.: 20 PSI

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/4/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 30.0'-32.0'
Elevation: ----

Soil Description: BLUISH GRAY LEAN CLAY CL
Remarks: TEST PERFORMED AS PER ASTM D3080

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in
1	0.00	1.438	0.03587	0	0
2	39.39	1.439	0.03845	0.185	0.007876
3	76.42	1.439	0.0399	0.2733	0.01575
4	116.70	1.439	0.04167	0.343	0.02363
5	155.57	1.439	0.04274	0.3971	0.0315
6	194.59	1.439	0.04325	0.439	0.03938
7	231.17	1.439	0.04419	0.4699	0.04725
8	266.54	1.439	0.04514	0.4951	0.05513
9	305.27	1.439	0.0464	0.5183	0.06301
10	340.94	1.439	0.04709	0.537	0.07088
11	379.25	1.439	0.04797	0.555	0.07876
12	423.04	1.439	0.04873	0.5699	0.08663
13	457.67	1.439	0.04905	0.5782	0.09451
14	495.80	1.439	0.04968	0.586	0.1024
15	531.98	1.439	0.05012	0.5924	0.1103
16	571.20	1.439	0.05068	0.5989	0.1181
17	608.83	1.439	0.0515	0.604	0.126
18	647.29	1.439	0.05207	0.6079	0.1339
19	683.43	1.438	0.05239	0.6124	0.1418
20	721.04	1.438	0.0527	0.615	0.1496
21	758.83	1.439	0.05295	0.6169	0.1575
22	793.54	1.439	0.05327	0.6182	0.1654
23	830.97	1.439	0.05365	0.6176	0.1733
24	869.12	1.439	0.05396	0.615	0.1811
25	906.41	1.439	0.0544	0.6124	0.189
26	945.26	1.439	0.05491	0.6073	0.1969
27	982.69	1.439	0.0551	0.6021	0.2048
28	1020.06	1.439	0.05529	0.5957	0.2126
29	1059.90	1.439	0.0556	0.5905	0.2205
30	1095.28	1.439	0.05585	0.586	0.2284
31	1131.23	1.439	0.05617	0.5821	0.2362
32	1169.64	1.439	0.05674	0.5776	0.2441
33	1209.10	1.439	0.05699	0.5731	0.252
34	1244.59	1.439	0.0573	0.5718	0.2599
35	1283.36	1.439	0.05762	0.5705	0.2677
36	1319.90	1.439	0.05775	0.5679	0.2756
37	1357.90	1.439	0.05806	0.5641	0.2835
38	1393.69	1.438	0.05838	0.5615	0.2914
39	1434.20	1.44	0.05875	0.5589	0.2992
40	1455.26	1.439	0.05894	0.557	0.3036

DIRECT SHEAR TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW010 S10
Sample No.: S-10
Test No.: 40 PSI

Location: BARTONVILLE, IL
Tested By: HP
Test Date: 11/4/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: BCM
Depth: 30.0'-32.0'
Elevation: ----

Soil Description: BLUISH GRAY LEAN CLAY CL
Remarks: TEST PERFORMED AS PER ASTM D3080.

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in
1	0.00	2.879	0.06953	0	0
2	66.92	2.879	0.07899	0.3222	0.00838
3	104.04	2.88	0.0817	0.5099	0.01676
4	142.82	2.879	0.08347	0.6542	0.02514
5	185.18	2.88	0.08542	0.7741	0.03352
6	219.73	2.88	0.08681	0.8505	0.0419
7	257.69	2.88	0.08794	0.9202	0.05028
8	298.10	2.88	0.08882	0.982	0.05866
9	333.83	2.88	0.09046	1.029	0.06704
10	369.75	2.88	0.0916	1.072	0.07542
11	413.04	2.88	0.09204	1.152	0.0838
12	445.97	2.88	0.09229	1.18	0.09218
13	485.62	2.88	0.09317	1.197	0.1006
14	521.13	2.88	0.09368	1.22	0.1089
15	559.14	2.88	0.09418	1.241	0.1173
16	595.57	2.879	0.095	1.261	0.1257
17	634.46	2.88	0.09563	1.272	0.1341
18	671.61	2.88	0.0962	1.289	0.1425
19	707.68	2.88	0.09645	1.303	0.1508
20	746.34	2.88	0.0967	1.312	0.1592
21	785.27	2.879	0.09727	1.321	0.1676
22	821.12	2.88	0.09778	1.327	0.176
23	858.67	2.88	0.09796	1.33	0.1844
24	895.38	2.88	0.09834	1.334	0.1927
25	934.75	2.88	0.09866	1.333	0.2011
26	971.24	2.88	0.09891	1.337	0.2095
27	1007.72	2.88	0.09916	1.342	0.2179
28	1045.96	2.88	0.09941	1.346	0.2262
29	1084.53	2.88	0.09992	1.351	0.2346
30	1120.37	2.88	0.1001	1.354	0.243
31	1156.63	2.88	0.1002	1.357	0.2513
32	1197.77	2.88	0.1003	1.36	0.2597
33	1233.68	2.88	0.1004	1.362	0.2681
34	1272.09	2.88	0.1006	1.364	0.2765
35	1311.64	2.88	0.1009	1.369	0.2849
36	1340.99	2.88	0.1011	1.371	0.2916

DIRECT SHEAR TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW010 S10
Sample No.: S-10
Test No.: 80 PSI

Location: BARTONVILLE, IL
Tested By: HP
Test Date: 11/5/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: BCM
Depth: 30.0'-32.0'
Elevation: ----

Soil Description: BLUISH GRAY LEAN CLAY CL
Remarks: TEST PERFORMED AS PER ASTM D3080.

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in
1	0.00	5.757	0.1189	0	0
2	53.81	5.759	0.1286	0.586	0.007876
3	93.90	5.759	0.1315	0.9544	0.01575
4	132.06	5.759	0.1342	1.218	0.02363
5	171.21	5.759	0.1354	1.435	0.0315
6	211.15	5.759	0.1367	1.61	0.03938
7	250.46	5.759	0.1385	1.74	0.04725
8	288.21	5.759	0.1395	1.844	0.05513
9	324.71	5.759	0.1411	1.926	0.06301
10	364.16	5.759	0.1428	2.004	0.07088
11	401.96	5.759	0.1437	2.067	0.07876
12	438.83	5.759	0.1446	2.119	0.08663
13	478.24	5.759	0.1452	2.171	0.09451
14	515.94	5.759	0.1461	2.207	0.1024
15	554.42	5.759	0.1469	2.242	0.1103
16	590.30	5.759	0.1476	2.272	0.1181
17	626.52	5.759	0.1482	2.294	0.126
18	663.24	5.759	0.1488	2.321	0.1339
19	700.05	5.759	0.1496	2.34	0.1418
20	741.31	5.759	0.15	2.362	0.1496
21	780.69	5.759	0.1509	2.374	0.1575
22	817.38	5.759	0.1512	2.393	0.1654
23	854.69	5.759	0.1515	2.407	0.1733
24	892.50	5.759	0.1519	2.423	0.1811
25	930.62	5.759	0.1523	2.434	0.189
26	969.48	5.759	0.1523	2.444	0.1969
27	1008.12	5.759	0.1525	2.457	0.2048
28	1045.34	5.759	0.1527	2.471	0.2126
29	1083.92	5.759	0.1529	2.484	0.2205
30	1123.76	5.759	0.1533	2.499	0.2284
31	1160.12	5.759	0.1535	2.512	0.2362
32	1197.88	5.759	0.1537	2.526	0.2441
33	1240.24	5.759	0.1541	2.536	0.252
34	1277.15	5.759	0.1541	2.545	0.2599
35	1312.34	5.759	0.1543	2.556	0.2677
36	1351.46	5.759	0.1543	2.566	0.2756
37	1391.74	5.759	0.1546	2.576	0.2835
38	1399.98	5.759	0.1545	2.577	0.2859

DIRECT SHEAR TEST REPORT

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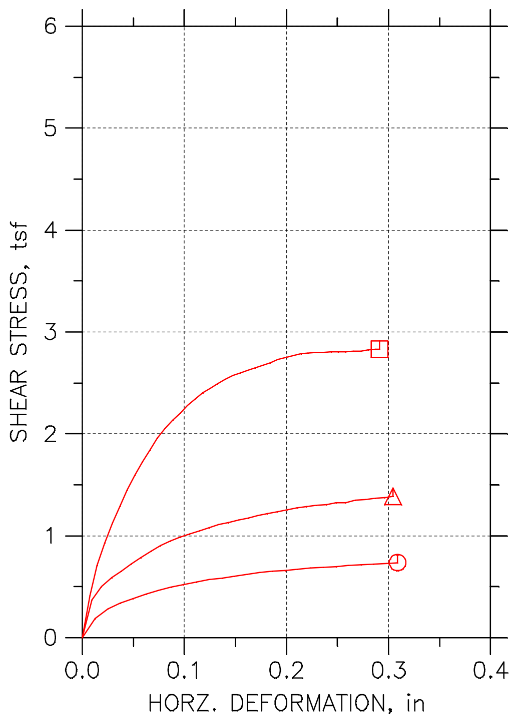

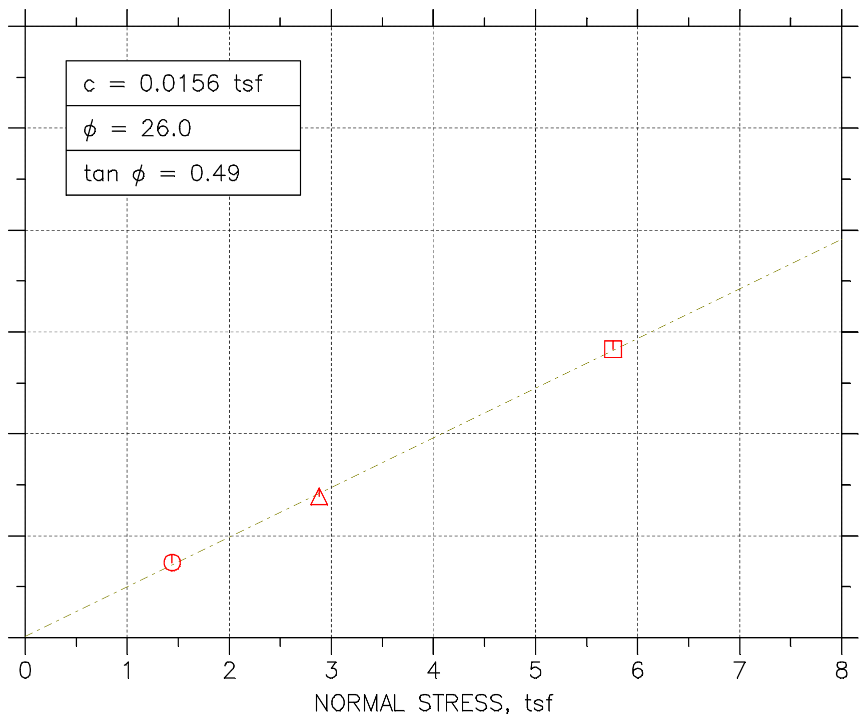

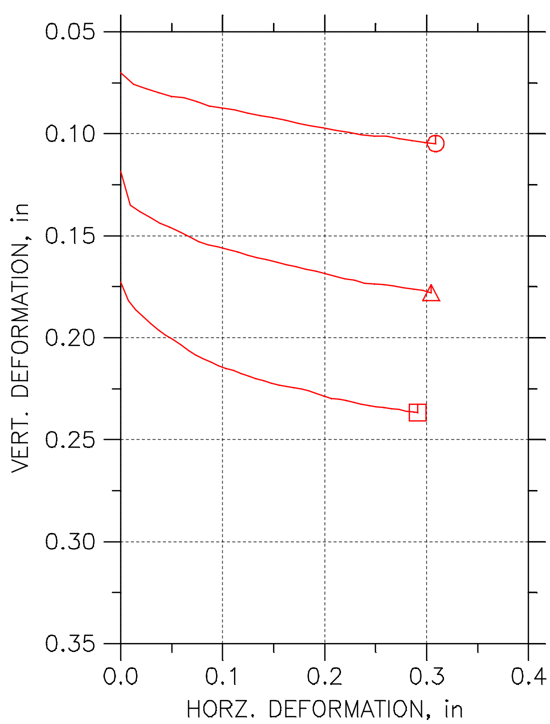

Symbol		○	△	□	
Test No.		20 PSI	40 PSI	80 PSI	
Sample No.		S-14	S-14	S-14	
Shape		Circular	Circular	Circular	
Initial	Dimension, in	2.5087	2.5067	2.502	
	Area, in^2	4.9428	4.9351	4.9165	
	Height, in	0.99961	1.0098	0.99646	
	Water Content, %	50.80	50.19	50.11	
	Dry Density, pcf	69.233	69.813	69.282	
	Saturation, %	95.13	95.32	93.94	
	Void Ratio	1.4527	1.4323	1.4509	
Consol. Height, in		0.93203	0.8987	0.83564	
Consol. Void Ratio		1.2868	1.1646	1.0554	
Final	Water Content, %	44.10	36.30	31.60	
	Dry Density, pcf	77.344	84.748	90.862	
	Saturation, %	100.34	98.38	98.93	
	Void Ratio	1.1954	1.0036	0.86882	
Normal Stress, tsf		1.4393	2.8799	5.7593	
Max. Shear Stress, tsf		0.73733	1.3874	2.8312	
Ult. Shear Stress, tsf		0.73733	1.3874	2.8312	
Time to Failure, min		961	3164.9	1365.2	
Disp. Rate, in/min		0.000207	8.85e-005	0.000232	
Estimated Specific Gravity		2.72	2.72	2.72	
Liquid Limit		54	54	54	
Plastic Limit		20	20	20	
Plasticity Index		34	34	34	

Project: DYNERGY EDWARDS

Location: BARTONVILLE, IL

Project No.: MR155218

Boring No.: EDW012 S14

Sample Type: 3.0'' ST

Description: DARK GRAY FAT CLAY CH SHELL NOTED

Remarks: TEST PERFORMED AS PER ASTM D3080.

Tue, 17-NOV-2015 17:00:29

DIRECT SHEAR TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW012 S14
Sample No.: S-14
Test No.: 20 PSI

Location: BARTONVILLE, IL
Tested By: HP
Test Date: 11/5/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: BCM
Depth: 47.0'-49.0'
Elevation: ----

Soil Description: DARK GRAY FAT CLAY CH SHELL NOTED
Remarks: TEST PERFORMED AS PER ASTM D3080.

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in
1	0.00	1.438	0.07004	0	0
2	47.30	1.438	0.0759	0.1909	0.01241
3	86.02	1.439	0.07811	0.2818	0.02482
4	124.31	1.439	0.07994	0.3416	0.03724
5	160.06	1.438	0.08176	0.3855	0.04965
6	200.31	1.439	0.08246	0.4281	0.06206
7	238.78	1.438	0.08441	0.4644	0.07447
8	275.86	1.439	0.08649	0.4949	0.08688
9	314.97	1.439	0.08737	0.5229	0.09929
10	355.17	1.439	0.08832	0.5477	0.1117
11	393.92	1.439	0.08977	0.5706	0.1241
12	429.38	1.439	0.09128	0.5859	0.1365
13	468.43	1.439	0.09223	0.6056	0.1489
14	506.02	1.439	0.09336	0.6215	0.1614
15	542.62	1.439	0.09481	0.6381	0.1738
16	586.75	1.439	0.09614	0.6521	0.1862
17	618.29	1.439	0.09721	0.6616	0.1986
18	656.28	1.438	0.09828	0.6718	0.211
19	696.76	1.439	0.09935	0.682	0.2234
20	732.98	1.439	0.1005	0.6915	0.2358
21	769.67	1.439	0.1012	0.6998	0.2482
22	812.59	1.439	0.1013	0.7093	0.2606
23	848.00	1.439	0.1026	0.7151	0.2731
24	887.83	1.438	0.1033	0.724	0.2855
25	924.52	1.438	0.1043	0.731	0.2979
26	961.00	1.439	0.1048	0.7373	0.3088

DIRECT SHEAR TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW012 S14
Sample No.: S-14
Test No.: 40 PSI

Location: BARTONVILLE, IL
Tested By: HP
Test Date: 11/7/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: BCM
Depth: 47.0'-49.0'
Elevation: ----

Soil Description: DARK GRAY FAT CLAY CH SHELL NOTED
Remarks: TEST PERFORMED AS PER ASTM D3080.

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in
1	0.00	2.879	0.1185	0	0
2	372.53	2.88	0.1351	0.3735	0.009556
3	468.99	2.88	0.1381	0.5003	0.01911
4	564.01	2.88	0.141	0.5902	0.02867
5	651.75	2.88	0.144	0.656	0.03822
6	744.20	2.88	0.1459	0.7228	0.04778
7	835.68	2.879	0.1481	0.7865	0.05733
8	925.97	2.88	0.1505	0.8454	0.06689
9	1018.05	2.88	0.1529	0.9026	0.07645
10	1104.25	2.88	0.1545	0.9476	0.086
11	1195.15	2.88	0.1556	0.9882	0.09556
12	1289.11	2.88	0.1568	1.019	0.1051
13	1376.20	2.88	0.158	1.049	0.1147
14	1467.76	2.88	0.1596	1.082	0.1242
15	1560.82	2.88	0.1608	1.11	0.1338
16	1648.67	2.88	0.1618	1.132	0.1433
17	1734.35	2.88	0.1631	1.153	0.1529
18	1827.14	2.88	0.1642	1.177	0.1624
19	1925.93	2.88	0.1651	1.202	0.172
20	2006.92	2.88	0.1663	1.219	0.1816
21	2105.98	2.88	0.1673	1.236	0.1911
22	2191.37	2.88	0.1688	1.253	0.2007
23	2278.65	2.88	0.1698	1.274	0.2102
24	2368.36	2.88	0.1711	1.289	0.2198
25	2452.94	2.88	0.1719	1.301	0.2293
26	2544.63	2.88	0.1735	1.308	0.2389
27	2629.18	2.88	0.1737	1.323	0.2485
28	2720.25	2.88	0.1741	1.327	0.2579
29	2813.74	2.88	0.1747	1.347	0.2675
30	2902.90	2.88	0.1755	1.353	0.2771
31	2995.72	2.88	0.1763	1.367	0.2866
32	3085.70	2.879	0.177	1.376	0.2962
33	3164.86	2.88	0.178	1.387	0.3043

DIRECT SHEAR TEST DATA

Project: DYNERGY EDWARDS
Location: BARTONVILLE, IL
Project No.: MR155218
Boring No.: EDW012 S14
Tested By: HP
Checked By: BCM
Sample No.: S-14
Test Date: 11/9/15
Depth: 47.0'-49.0'
Test No.: 80 PSI
Sample Type: 3.0" ST
Elevation: ----

Soil Description: DARK GRAY FAT CLAY CH SHELL NOTED
Remarks: TEST PERFORMED AS PER ASTM D3080.

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in
1	0.00	5.758	0.1729	0	0
2	39.55	5.758	0.1819	0.4139	0.007372
3	77.10	5.759	0.1863	0.7122	0.01474
4	112.99	5.759	0.1897	0.9304	0.02212
5	148.81	5.759	0.193	1.122	0.02949
6	184.76	5.759	0.1961	1.293	0.03686
7	219.25	5.759	0.1988	1.448	0.04423
8	256.03	5.759	0.2008	1.596	0.0516
9	290.21	5.759	0.2034	1.726	0.05897
10	325.35	5.759	0.2062	1.846	0.06635
11	362.78	5.759	0.2083	1.96	0.07372
12	397.12	5.759	0.2103	2.054	0.08109
13	429.34	5.759	0.2121	2.132	0.08846
14	462.52	5.759	0.2137	2.205	0.09583
15	499.06	5.759	0.215	2.279	0.1032
16	532.30	5.759	0.2162	2.34	0.1106
17	569.81	5.76	0.2177	2.403	0.1179
18	598.74	5.759	0.2187	2.447	0.1253
19	633.77	5.759	0.2199	2.494	0.1327
20	670.11	5.759	0.2209	2.537	0.1401
21	703.89	5.759	0.2224	2.574	0.1474
22	737.17	5.759	0.2233	2.6	0.1548
23	771.57	5.759	0.2238	2.622	0.1622
24	805.68	5.759	0.2246	2.647	0.1696
25	841.96	5.759	0.2251	2.675	0.1769
26	874.04	5.759	0.226	2.7	0.1843
27	910.30	5.759	0.2273	2.727	0.1917
28	942.84	5.759	0.2287	2.746	0.199
29	977.11	5.759	0.2297	2.769	0.2064
30	1011.86	5.759	0.2302	2.785	0.2137
31	1046.27	5.759	0.2307	2.794	0.2211
32	1078.57	5.759	0.2316	2.801	0.2285
33	1111.99	5.759	0.2326	2.8	0.2359
34	1147.40	5.759	0.2332	2.803	0.2432
35	1179.32	5.759	0.2338	2.804	0.2506
36	1216.60	5.759	0.2341	2.806	0.258
37	1246.79	5.759	0.2347	2.809	0.2653
38	1278.72	5.759	0.2353	2.814	0.2727
39	1316.44	5.759	0.236	2.823	0.2801
40	1349.92	5.759	0.2364	2.829	0.2875
41	1365.24	5.759	0.2367	2.831	0.2913

DIRECT SHEAR TEST REPORT

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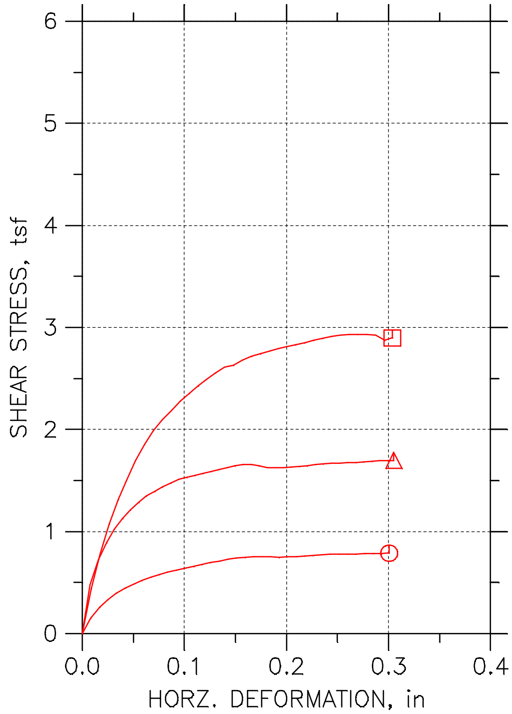

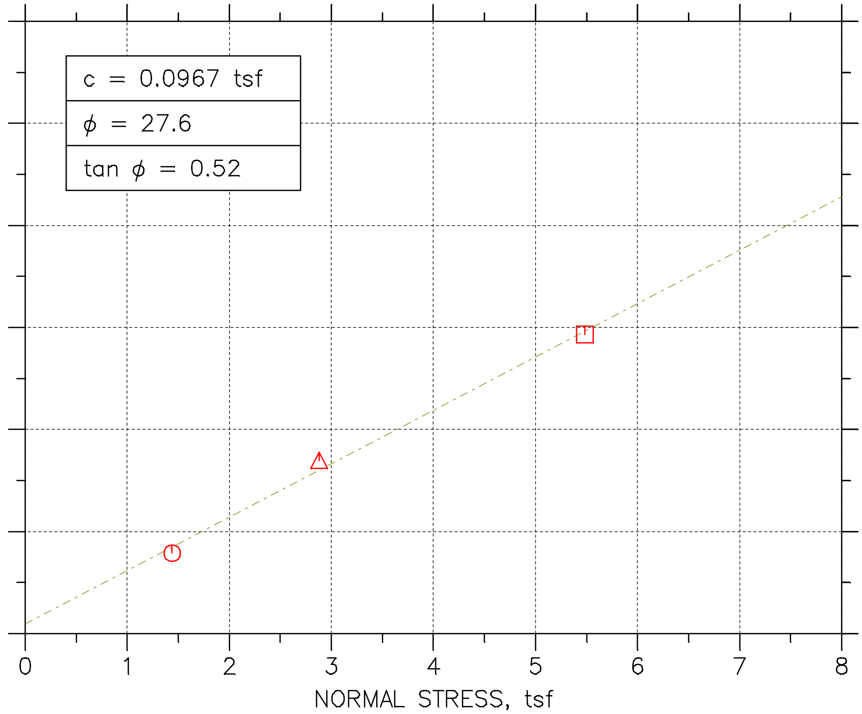

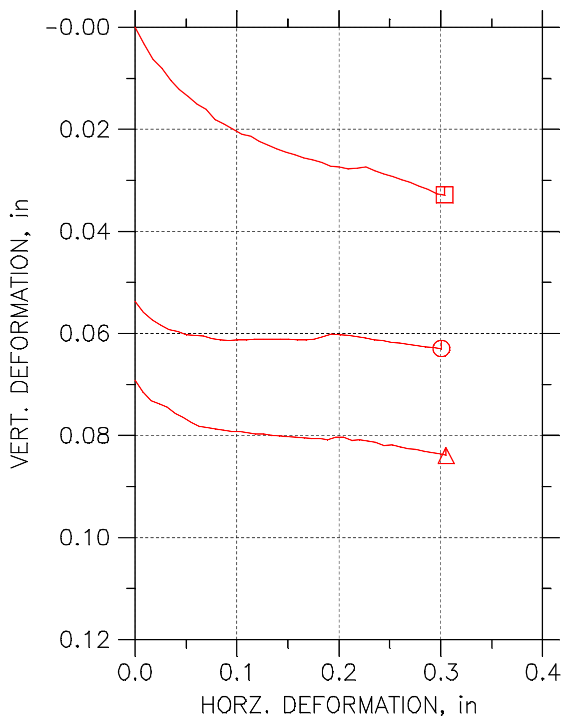

		○	△	□	
Symbol		○	△	□	
Test No.		20 PSI	40 PSI	80 PSI	
Sample No.		S-10	S-10	S-10	
Shape		Circular	Circular	Circular	
Initial	Dimension, in	2.498	2.5	2.5087	
	Area, in^2	4.901	4.9087	4.9431	
	Height, in	0.98898	0.99252	0.99606	
	Water Content, %	20.30	20.20	20.70	
	Dry Density, pcf	101.54	100.62	99.218	
	Saturation, %	85.50	83.10	82.20	
	Void Ratio	0.62921	0.64421	0.66738	
Consol. Height, in		0.94144	0.9279	0.99606	
Consol. Void Ratio		0.5509	0.53717	0.66738	
Final	Water Content, %	19.10	18.60	22.80	
	Dry Density, pcf	108.45	109.91	102.6	
	Saturation, %	96.32	97.56	98.66	
	Void Ratio	0.52546	0.50521	0.61241	
Normal Stress, tsf		1.4396	2.8794	5.4854	
Max. Shear Stress, tsf		0.78821	1.6963	2.9302	
Ult. Shear Stress, tsf		0.78821	1.6963	2.8965	
Time to Failure, min		1242.6	1357.2	1031.5	
Disp. Rate, in/min		0.000232	0.000232	0.000232	
Estimated Specific Gravity		2.65	2.65	2.65	
Liquid Limit		24	24	24	
Plastic Limit		13	13	13	
Plasticity Index		11	11	11	

Project: DYNERGY EDWARDS
Location: BARTONVILLE, IL
Project No.: MR155218
Boring No.: EDW015 S10
Sample Type: 3.0'' ST
Description: BROWN AND GRAY MOTTLED SANDY LEAN CLAY WITH GRAVEL CL
Remarks: TEST PERFORMED AS PER ASTM D3080.

Tue, 17-NOV-2015 17:37:38

DIRECT SHEAR TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW015 S10
Sample No.: S-10
Test No.: 20 PSI

Location: BARTONVILLE, IL
Tested By: HP
Test Date: 11/10/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: BCM
Depth: 31.0'-33.0'
Elevation: ----

Soil Description: BROWN AND GRAY MOTTLED SANDY LEAN CLAY WITH GRAVEL CL
Remarks: TEST PERFORMED AS PER ASTM D3080.

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in
1	0.00	1.439	0.05371	0	0
2	53.95	1.44	0.05592	0.1498	0.00838
3	89.12	1.439	0.05743	0.2586	0.01676
4	121.56	1.439	0.05838	0.3313	0.02514
5	157.67	1.44	0.05919	0.3949	0.03352
6	194.41	1.44	0.05957	0.4472	0.0419
7	229.85	1.44	0.0602	0.4865	0.05028
8	262.66	1.44	0.06033	0.5204	0.05866
9	296.74	1.44	0.06052	0.5501	0.06704
10	331.66	1.44	0.06102	0.577	0.07542
11	364.35	1.44	0.06128	0.6007	0.0838
12	395.09	1.44	0.06134	0.6201	0.09218
13	431.13	1.44	0.06121	0.6417	0.1006
14	466.24	1.44	0.06121	0.6611	0.1089
15	499.12	1.44	0.06109	0.6772	0.1173
16	531.39	1.44	0.06109	0.6939	0.1257
17	565.38	1.44	0.06115	0.7106	0.1341
18	600.22	1.44	0.06115	0.7257	0.1425
19	633.76	1.44	0.06115	0.7381	0.1508
20	668.19	1.44	0.06121	0.7478	0.1592
21	702.22	1.44	0.06121	0.7543	0.1676
22	736.72	1.44	0.06115	0.7553	0.176
23	772.13	1.439	0.06058	0.7521	0.1844
24	804.93	1.44	0.06008	0.7494	0.1927
25	838.10	1.44	0.06027	0.751	0.2011
26	873.29	1.44	0.06033	0.7548	0.2095
27	907.96	1.44	0.06058	0.7613	0.2179
28	940.97	1.44	0.06083	0.7661	0.2262
29	974.96	1.44	0.06121	0.771	0.2346
30	1009.21	1.44	0.0614	0.7758	0.243
31	1042.51	1.44	0.06178	0.7769	0.2513
32	1073.94	1.439	0.06191	0.778	0.2597
33	1112.13	1.44	0.06216	0.7801	0.2681
34	1143.69	1.44	0.06241	0.7823	0.2765
35	1177.31	1.44	0.0626	0.785	0.2849
36	1213.76	1.44	0.06273	0.7861	0.2932
37	1242.60	1.44	0.06298	0.7882	0.3006

DIRECT SHEAR TEST DATA

Project: DYNERGY EDWARDS
Location: BARTONVILLE, IL
Project No.: MR155218
Boring No.: EDW015 S10
Tested By: HP
Checked By: BCM
Sample No.: S-10
Test Date: 11/10/15
Depth: 31.0'-33.0'
Test No.: 40 PSI
Sample Type: 3.0" ST
Elevation: ----

Soil Description: BROWN AND GRAY MOTTLED SANDY LEAN CLAY WITH GRAVEL CL
Remarks: TEST PERFORMED AS PER ASTM D3080.

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in
1	0.00	2.887	0.06916	0	0
2	81.09	2.879	0.07142	0.4785	0.007876
3	117.60	2.879	0.07313	0.7219	0.01575
4	151.97	2.879	0.07376	0.8898	0.02363
5	186.66	2.879	0.07439	1.023	0.0315
6	221.15	2.879	0.07571	1.129	0.03938
7	253.83	2.879	0.07647	1.211	0.04725
8	289.37	2.879	0.07741	1.288	0.05513
9	323.30	2.879	0.07823	1.347	0.06301
10	356.53	2.879	0.07849	1.394	0.07088
11	391.02	2.879	0.07867	1.439	0.07876
12	424.56	2.879	0.07893	1.477	0.08663
13	459.98	2.879	0.07918	1.51	0.09451
14	492.86	2.879	0.07924	1.534	0.1024
15	523.80	2.879	0.07943	1.552	0.1103
16	556.72	2.879	0.07968	1.571	0.1181
17	588.93	2.879	0.07975	1.588	0.126
18	622.51	2.879	0.08	1.607	0.1339
19	657.43	2.879	0.08006	1.626	0.1418
20	692.69	2.879	0.08025	1.644	0.1496
21	724.45	2.879	0.08031	1.655	0.1575
22	759.66	2.879	0.08044	1.658	0.1654
23	791.34	2.88	0.08057	1.646	0.1733
24	825.40	2.879	0.08063	1.628	0.1811
25	858.43	2.879	0.08082	1.623	0.189
26	892.73	2.879	0.08031	1.623	0.1969
27	926.40	2.879	0.08038	1.63	0.2048
28	958.76	2.879	0.08101	1.635	0.2126
29	993.58	2.879	0.08088	1.643	0.2205
30	1027.07	2.879	0.08113	1.655	0.2284
31	1059.32	2.88	0.08132	1.662	0.2362
32	1094.50	2.879	0.08195	1.667	0.2441
33	1128.29	2.879	0.08189	1.671	0.252
34	1161.15	2.879	0.08227	1.676	0.2599
35	1194.98	2.879	0.08258	1.676	0.2677
36	1230.64	2.879	0.08271	1.684	0.2756
37	1263.56	2.879	0.08315	1.688	0.2835
38	1294.95	2.879	0.0834	1.693	0.2914
39	1331.25	2.879	0.08365	1.694	0.2992
40	1357.24	2.879	0.08391	1.696	0.3052

DIRECT SHEAR TEST DATA

Project: DYNERGY EDWARDS
Boring No.: EDW015 S10
Sample No.: S-10
Test No.: 80 PSI

Location: BARTONVILLE, IL
Tested By: HP
Test Date: 11/12/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: BCM
Depth: 31.0'-33.0'
Elevation: ----

Soil Description: BROWN AND GRAY MOTTLED SANDY LEAN CLAY WITH GRAVEL CL
Remarks: TEST PERFORMED AS PER ASTM D3080.

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in
1	0.00	5.485	0	0	0
2	36.40	5.485	0.003256	0.437	0.008716
3	71.32	5.485	0.006327	0.7826	0.01743
4	106.78	5.485	0.008001	1.076	0.02615
5	141.55	5.485	0.01042	1.313	0.03486
6	173.06	5.485	0.01219	1.499	0.04358
7	209.72	5.485	0.01358	1.693	0.05229
8	245.51	5.485	0.01507	1.854	0.06101
9	279.22	5.485	0.0161	1.987	0.06973
10	314.35	5.485	0.01805	2.098	0.07844
11	349.53	5.485	0.01898	2.187	0.08716
12	383.30	5.485	0.02	2.276	0.09587
13	415.59	5.485	0.02093	2.352	0.1046
14	449.70	5.485	0.0214	2.428	0.1133
15	485.17	5.485	0.02242	2.494	0.122
16	517.51	5.485	0.02317	2.551	0.1307
17	556.85	5.485	0.02382	2.612	0.1395
18	584.89	5.485	0.02447	2.627	0.1482
19	618.32	5.485	0.02503	2.678	0.1569
20	654.74	5.485	0.02568	2.719	0.1656
21	687.22	5.485	0.02596	2.742	0.1743
22	720.44	5.485	0.02652	2.766	0.183
23	755.56	5.485	0.02726	2.793	0.1917
24	788.89	5.485	0.02735	2.81	0.2005
25	823.96	5.485	0.02782	2.83	0.2092
26	856.37	5.485	0.02763	2.851	0.2179
27	893.08	5.485	0.02735	2.874	0.2266
28	925.58	5.485	0.02819	2.893	0.2353
29	960.00	5.485	0.02875	2.911	0.244
30	995.06	5.485	0.02931	2.924	0.2527
31	1031.53	5.485	0.02987	2.93	0.2614
32	1062.43	5.485	0.03042	2.929	0.2701
33	1097.75	5.486	0.03117	2.929	0.2789
34	1131.93	5.485	0.03182	2.926	0.2876
35	1165.06	5.485	0.03266	2.877	0.2963
36	1194.80	5.485	0.03284	2.897	0.3037

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HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

Laboratory Services Group 750 Corporate Woods Parkway Vernon Hills, Illinois 60061 Phone:(847) 793-0306 Fax:(847) 793-0309

TERRACON PROJECT NO.:	**MR155218**	**11/17/2015**
PROJECT NAME:	**DYNERGY - EDWARDS SITE**	
CLIENT:	**AECOM**	
LOCATION :	**BARTONVILLE, IL**	

SUMMARY OF TEST RESULTS

BORING NO.	EDW-B002
SAMPLE NO.	S-5
DEPTH:	10.0'-12.0'
CLASSIFICATION	GRAY TO DARK GRAY VARVED FLY ASH

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	55.9	59.7
WATER CONTENT (%)	66.4	60.8
DIAMETER (cm)	7.218	7.030
LENGTH (cm)	8.678	8.558
HYDRAULIC GRADIENT (MAXIMUM)	10.87	
PERCENT SATURATION	100.0	
HYDRAULIC CONDUCTIVITY k (cm/sec)	9.19E-05	

SAMPLE PHOTO

(Percent saturation calculation is based on final measurements and an estimated specific gravity.)

Deaired water was used as the liquid permeant.

Laboratory Services Group 750 Corporate Woods Parkway Vernon Hills, Illinois 60061 Phone:(847) 793-0306 Fax:(847) 793-0309

TERRACON PROJECT NO.: **MR155218** **11/17/2015**
PROJECT NAME: **DYNERGY - EDWARDS SITE**
CLIENT: **AECOM**
LOCATION : **BARTONVILLE, IL**

SUMMARY OF TEST RESULTS

BORING NO. EDW-B003

SAMPLE NO. S-9

DEPTH: 30.0'-32.0'

CLASSIFICATION VERY DARK GRAY VARVED FLY ASH

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	53.2	59.3
WATER CONTENT (%)	71.2	61.7
DIAMETER (cm)	7.206	6.968
LENGTH (cm)	8.429	8.091

SAMPLE PHOTO

HYDRAULIC GRADIENT (MAXIMUM) 11.19

PERCENT SATURATION 100.2

(Percent saturation calculation is based on final measurements and an estimated specific gravity.)

HYDRAULIC CONDUCTIVITY k (cm/sec) $\boxed{6.79E-05}$

Deaired water was used as the liquid permeant.

HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

Laboratory Services Group 750 Corporate Woods Parkway Vernon Hills, Illinois 60061 Phone:(847) 793-0306 Fax:(847) 793-0309

TERRACON PROJECT NO.:	**MR155218**	**11/17/2015**
PROJECT NAME:	**DYNERGY - EDWARDS SITE**	
CLIENT:	**AECOM**	
LOCATION :	**BARTONVILLE, IL**	

SUMMARY OF TEST RESULTS

BORING NO.	EDW-B004
SAMPLE NO.	S-11
DEPTH:	36.0'-38.0'
CLASSIFICATION	BROWN AND GRAYISH BROWN LEAN CLAY WITH SAND CL

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	111.1	113.9
WATER CONTENT (%)	19.3	18.0
DIAMETER (cm)	7.117	7.074
LENGTH (cm)	8.145	8.042

SAMPLE PHOTO

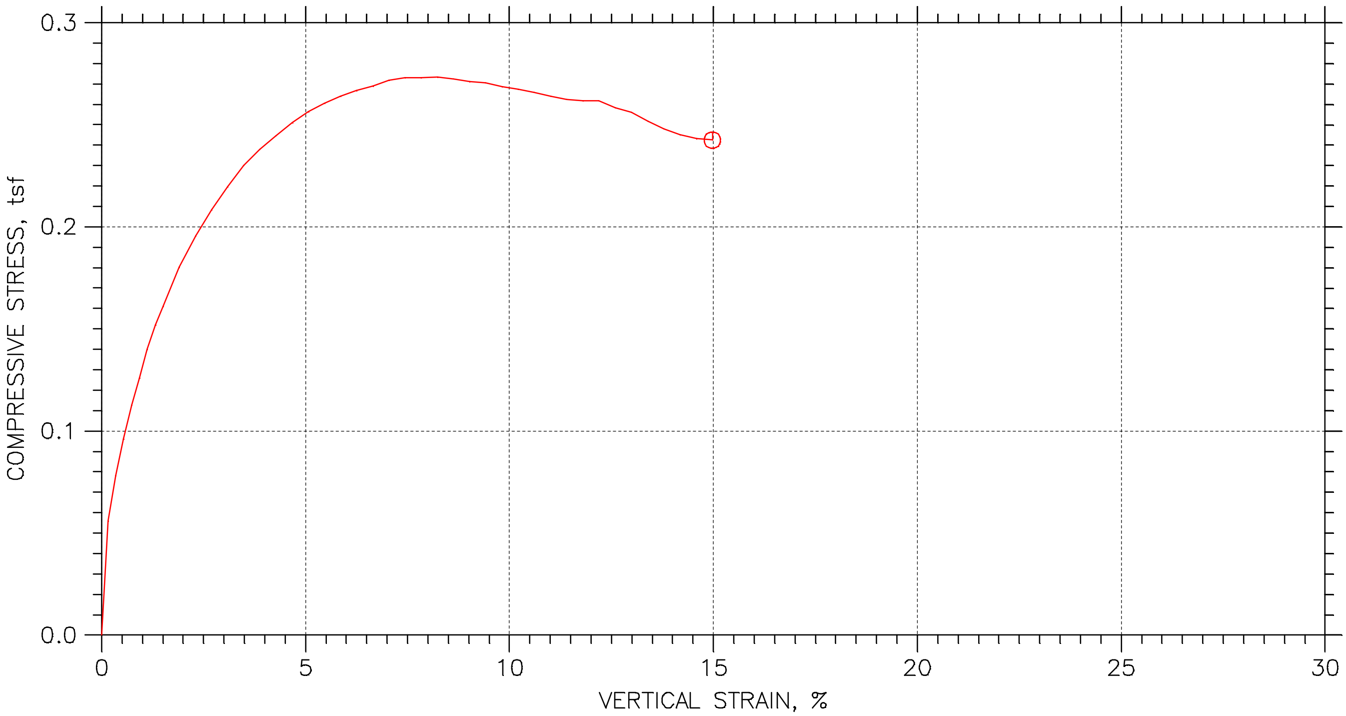
HYDRAULIC GRADIENT (MAXIMUM)	20.21
PERCENT SATURATION	100.5
HYDRAULIC CONDUCTIVITY k (cm/sec)	7.20E-07

(Percent saturation calculation is based on final measurements and an estimated specific gravity.)

Deaired water was used as the liquid permeant.

UNCONFINED COMPRESSION TEST REPORT

Terracon Consulting Engineers & Scientists



Symbol		⏀			
Test No.		EDW-002 S10			
Initial	Diameter, in	2.8118			
	Height, in	5.9587			
	Water Content, %	29.48			
	Dry Density, pcf	93.81			
	Saturation, %	98.98			
	Void Ratio	0.81002			
Unconfined Compressive Strength, tsf		0.27347			
Undrained Shear Strength, tsf		0.13673			
Time to Failure, min		10.5			
Strain Rate, %/min		1			
Estimated Specific Gravity		2.72			
Liquid Limit		36			
Plastic Limit		18			
Plasticity Index		18			
Failure Sketch					

Project: DYNERGY EDWARDS
Location: BARTONVILLE, IL
Project No.: MR155199
Boring No.: EDW-002 S10
Sample Type: 3.0'' ST
Description: GRAY LEAN CLAY WITH SAND CL
Remarks: TEST PERFORMED AS PER ASTM D 2166.

Mon, 16-NOV-2015 21:50:26

UNCONFINED COMPRESSION TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-002 S10
Sample No.: S-10
Test No.: EDW-002 S10

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/17/15
Sample Type: 3.0" ST

Project No.: MR155199
Checked By: WPQ
Depth: 35.0'-37.0'
Elevation: -----

Terracon Consulting Engineers & Scientists

Soil Description: GRAY LEAN CLAY WITH SAND CL
Remarks: TEST PERFORMED AS PER ASTM D 2166.

Specimen Height: 5.96 in
Specimen Area: 6.21 in^2
Specimen Volume: 37.00 in^3

Liquid Limit: 36
Plastic Limit: 18
Estimated Specific Gravity: 2.72

Cap Mass: 0 gm

	Time min	Axial Displacement in	Axial Strain %	Load lb	Corrected Area in^2	Vertical Stress tsf	Shear Stress tsf
1	0	0	0	0	6.2096	0	0
2	0.25007	0.0091325	0.15326	4.8253	6.2191	0.055864	0.027932
3	0.50007	0.020663	0.34678	6.7659	6.2312	0.078179	0.039089
4	0.75007	0.032286	0.54184	8.3394	6.2434	0.096171	0.048086
5	1.0001	0.043725	0.73381	9.808	6.2555	0.11289	0.056444
6	1.2501	0.055348	0.92887	10.962	6.2678	0.12592	0.062961
7	1.5001	0.066879	1.1224	12.221	6.2801	0.14011	0.070054
8	1.7501	0.078318	1.3144	13.27	6.2923	0.15184	0.075919
9	2.0001	0.089941	1.5094	14.109	6.3047	0.16112	0.080561
10	2.5001	0.11346	1.9042	15.84	6.3301	0.18016	0.090082
11	3.0001	0.13708	2.3005	17.256	6.3558	0.19548	0.097739
12	3.5001	0.1606	2.6953	18.462	6.3816	0.2083	0.10415
13	4.0001	0.18413	3.09	19.564	6.4076	0.21983	0.10991
14	4.5001	0.20756	3.4833	20.56	6.4337	0.23009	0.11504
15	5.0001	0.23108	3.878	21.347	6.4601	0.23792	0.11896
16	5.5001	0.2546	4.2728	22.029	6.4867	0.24451	0.12225
17	6.0001	0.27822	4.6691	22.71	6.5137	0.25103	0.12552
18	6.5001	0.30183	5.0654	23.287	6.5409	0.25634	0.12817
19	7.0001	0.32536	5.4602	23.759	6.5682	0.26045	0.13022
20	7.5001	0.34897	5.8565	24.179	6.5959	0.26394	0.13197
21	8.0001	0.37249	6.2513	24.546	6.6236	0.26682	0.13341
22	8.5001	0.39602	6.6461	24.861	6.6517	0.2691	0.13455
23	9.0001	0.41972	7.0439	25.228	6.6801	0.27191	0.13596
24	9.5001	0.44343	7.4418	25.438	6.7088	0.273	0.1365
25	10	0.46686	7.835	25.543	6.7375	0.27296	0.13648
26	10.5	0.49039	8.2298	25.7	6.7664	0.27347	0.13673
27	11	0.51372	8.6215	25.7	6.7954	0.2723	0.13615
28	11.5	0.53734	9.0178	25.7	6.825	0.27112	0.13556
29	12	0.56114	9.4172	25.753	6.8551	0.27048	0.13524
30	12.5	0.58503	9.8182	25.7	6.8856	0.26873	0.13437
31	13	0.60874	10.216	25.7	6.9161	0.26755	0.13377
32	13.5	0.63235	10.612	25.648	6.9468	0.26582	0.13291
33	14	0.65588	11.007	25.595	6.9776	0.26411	0.13205
34	14.5	0.67912	11.397	25.543	7.0083	0.26241	0.13121
35	15	0.70274	11.794	25.595	7.0398	0.26178	0.13089
36	15.5	0.72654	12.193	25.7	7.0718	0.26166	0.13083
37	16	0.75043	12.594	25.49	7.1043	0.25834	0.12917
38	16.5	0.77414	12.992	25.385	7.1368	0.2561	0.12805
39	17	0.79784	13.39	25.071	7.1696	0.25177	0.12589
40	17.5	0.82155	13.788	24.808	7.2026	0.24799	0.124
41	18	0.84517	14.184	24.651	7.2359	0.24529	0.12264
42	18.5	0.86887	14.582	24.546	7.2696	0.24311	0.12156
43	19	0.8924	14.976	24.599	7.3034	0.2425	0.12125

UNCONFINED COMPRESSION TEST REPORT

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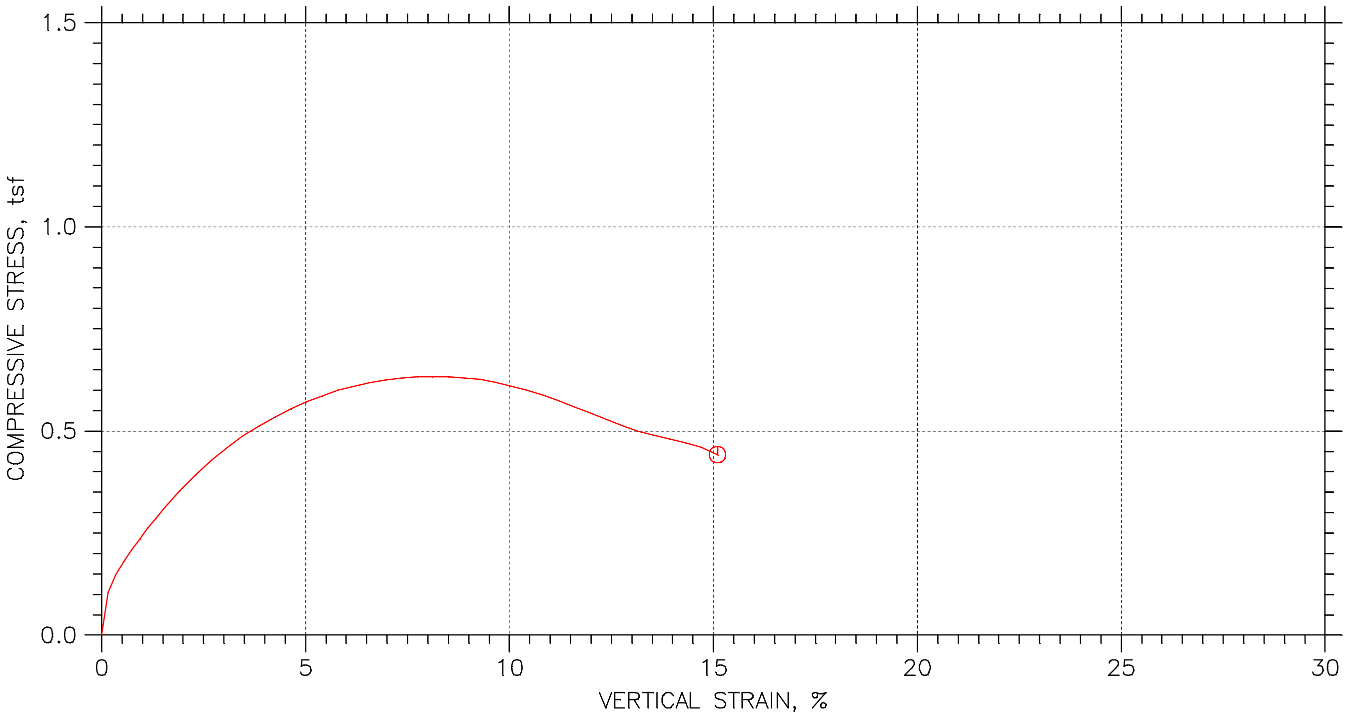
Consulting Engineers & Scientists



Symbol		○			
Test No.		EDWB003S12			
Initial	Diameter, in	2.8343			
	Height, in	6.0811			
	Water Content, %	41.57			
	Dry Density, pcf	79.31			
	Saturation, %	99.09			
	Void Ratio	1.141			
Unconfined Compressive Strength, tsf		0.63249			
Undrained Shear Strength, tsf		0.31624			
Time to Failure, min		10.504			
Strain Rate, %/min		1			
Estimated Specific Gravity		2.72			
Liquid Limit		51			
Plastic Limit		17			
Plasticity Index		34			
Failure Sketch					

Project: DYNERGY EDWARDS
Location: BARTONVILLE, IL
Project No.: MR155218
Boring No.: EDW-003 S12
Sample Type: 3.0'' ST
Description: DARK GRAY FAT CLAY WITH SAND CH
Remarks: TEST PERFORMED AS PER ASTM D2166.

Mon, 16-NOV-2015 21:57:54

UNCONFINED COMPRESSION TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-003 S12
Sample No.: S-12
Test No.: EDWB003S12

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/13/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 45.0'-47.0'
Elevation: -----

Soil Description: DARK GRAY FAT CLAY WITH SAND CH
Remarks: TEST PERFORMED AS PER ASTM D2166.

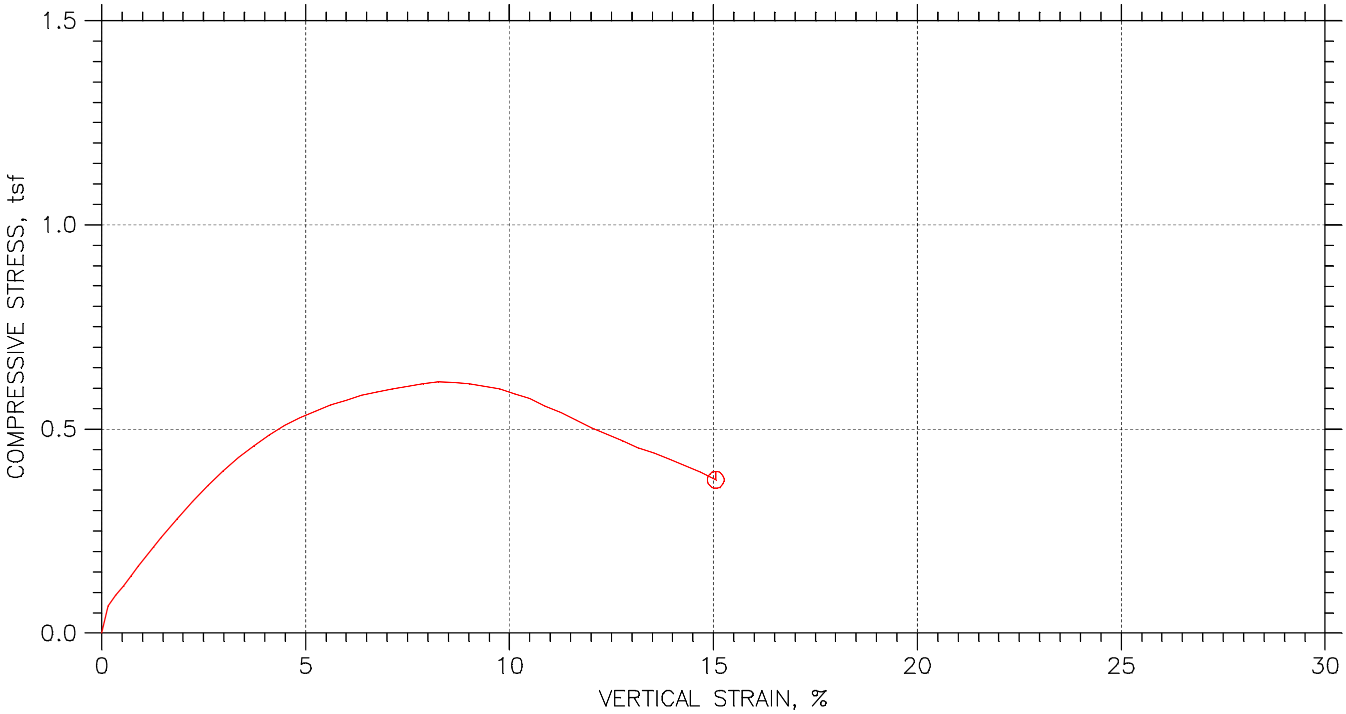
Specimen Height: 6.08 in
Specimen Area: 6.31 in^2
Specimen Volume: 38.37 in^3

Liquid Limit: 51
Plastic Limit: 17
Estimated Specific Gravity: 2.72

Cap Mass: 0 gm

	Time min	Axial Displacement in	Axial Strain %	Load lb	Corrected Area in^2	Vertical Stress tsf	Shear Stress tsf
1	0	0	0	0	6.3091	0	0
2	0.25402	0.0096859	0.15928	9.0737	6.3192	0.10339	0.051693
3	0.50402	0.021401	0.35193	13.007	6.3314	0.14792	0.07396
4	0.75402	0.033117	0.54458	15.945	6.3436	0.18097	0.090485
5	1.004	0.044924	0.73875	18.515	6.356	0.20973	0.10486
6	1.254	0.056824	0.93444	20.927	6.3686	0.23659	0.1183
7	1.504	0.068816	1.1316	23.235	6.3813	0.26216	0.13108
8	1.754	0.080808	1.3288	25.385	6.3941	0.28585	0.14293
9	2.004	0.092893	1.5276	27.536	6.407	0.30944	0.15472
10	2.504	0.11678	1.9205	31.522	6.4326	0.35282	0.17641
11	3.004	0.14058	2.3118	35.246	6.4584	0.39293	0.19646
12	3.504	0.1642	2.7002	38.55	6.4842	0.42806	0.21403
13	4.004	0.18754	3.084	41.592	6.5099	0.46002	0.23001
14	4.504	0.21115	3.4723	44.319	6.536	0.48822	0.24411
15	5.004	0.23505	3.8652	46.732	6.5628	0.5127	0.25635
16	5.504	0.25885	4.2565	48.935	6.5896	0.53468	0.26734
17	6.004	0.28246	4.6449	50.981	6.6164	0.55477	0.27739
18	6.504	0.30571	5.0272	52.764	6.643	0.57188	0.28594
19	7.004	0.32905	5.4109	54.285	6.67	0.58598	0.29299
20	7.504	0.35248	5.7962	55.753	6.6973	0.59938	0.29969
21	8.0041	0.37637	6.1891	56.96	6.7253	0.6098	0.3049
22	8.5041	0.40026	6.582	58.061	6.7536	0.61899	0.30949
23	9.0041	0.42388	6.9704	58.848	6.7818	0.62477	0.31238
24	9.5041	0.44721	7.3542	59.53	6.8099	0.6294	0.3147
25	10.004	0.47018	7.7319	60.054	6.8378	0.63235	0.31618
26	10.504	0.49343	8.1141	60.316	6.8662	0.63249	0.31624
27	11.004	0.51723	8.5055	60.526	6.8956	0.63198	0.31599
28	11.504	0.54121	8.8999	60.631	6.9255	0.63035	0.31517
29	12.004	0.56511	9.2928	60.474	6.9554	0.626	0.313
30	12.504	0.58835	9.6751	60.002	6.9849	0.6185	0.30925
31	13.004	0.61151	10.056	59.372	7.0145	0.60943	0.30471
32	13.504	0.63484	10.44	58.691	7.0445	0.59986	0.29993
33	14.004	0.65874	10.833	57.746	7.0756	0.58762	0.29381
34	14.504	0.68281	11.228	56.593	7.1071	0.57332	0.28666
35	15.004	0.70689	11.624	55.334	7.1389	0.55807	0.27904
36	15.504	0.73023	12.008	54.127	7.1701	0.54353	0.27177
37	16.004	0.7532	12.386	52.816	7.201	0.52809	0.26404
38	16.504	0.77598	12.761	51.505	7.2319	0.51278	0.25639
39	17.004	0.79904	13.14	50.456	7.2635	0.50015	0.25007
40	17.504	0.82266	13.528	49.669	7.2961	0.49015	0.24507
41	18.004	0.84637	13.918	48.987	7.3292	0.48124	0.24062
42	18.504	0.86998	14.306	48.201	7.3624	0.47138	0.23569
43	19.004	0.89341	14.692	47.257	7.3956	0.46007	0.23003
44	19.504	0.91666	15.074	45.736	7.4289	0.44326	0.22163
45	19.538	0.91823	15.1	45.631	7.4312	0.44211	0.22106

UNCONFINED COMPRESSION TEST REPORT



Symbol		①			
Test No.		EDWB004S11			
Initial	Diameter, in	2.8217			
	Height, in	6.2535			
	Water Content, %	19.25			
	Dry Density, pcf	111.4			
	Saturation, %	99.83			
	Void Ratio	0.52451			
Unconfined Compressive Strength, tsf		0.61504			
Undrained Shear Strength, tsf		0.30752			
Time to Failure, min		11.004			
Strain Rate, %/min		1			
Estimated Specific Gravity		2.72			
Liquid Limit		35			
Plastic Limit		17			
Plasticity Index		18			
Failure Sketch					

Project: DYNERGY EDWARDS
Location: BARTONVILLE, IL
Project No.: MR155218
Boring No.: EDW-004 S11
Sample Type: 3.0'' ST
Description: BROWN AND GRAYISH BROWN LEAN CLAY WITH SAND CL
Remarks: TEST PERFORMED AS PER ASTM D 2166.

Mon, 16-NOV-2015 22:03:56

UNCONFINED COMPRESSION TEST

Project: DYNERGY EDWARDS
Location: BARTONVILLE, IL
Project No.: MR155218
Boring No.: EDW-004 S11
Tested By: BCM
Checked By: WPQ
Sample No.: S-11
Test Date: 11/13/15
Depth: 36.0'-38.0'
Test No.: EDWB004S11
Sample Type: 3.0" ST
Elevation: -----

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Soil Description: BROWN AND GRAYISH BROWN LEAN CLAY WITH SAND CL
Remarks: TEST PERFORMED AS PER ASTM D 2166.

Specimen Height: 6.25 in
Liquid Limit: 35
Cap Mass: 0 gm
Specimen Area: 6.25 in^2
Plastic Limit: 17
Specimen Volume: 39.10 in^3
Estimated Specific Gravity: 2.72

	Time min	Axial Displacement in	Axial Strain %	Load lb	Corrected Area in^2	Vertical Stress tsf	Shear Stress tsf
1	0	0	0	0	6.2531	0	0
2	0.25398	0.0096859	0.15489	5.717	6.2628	0.065724	0.032862
3	0.50398	0.021494	0.3437	8.0772	6.2747	0.092683	0.046341
4	0.75398	0.033117	0.52957	10.07	6.2864	0.11534	0.057668
5	1.004	0.04474	0.71543	12.221	6.2982	0.1397	0.069852
6	1.254	0.056363	0.9013	14.319	6.31	0.16338	0.081691
7	1.504	0.068078	1.0886	16.469	6.322	0.18756	0.093782
8	1.754	0.079701	1.2745	18.567	6.3339	0.21106	0.10553
9	2.004	0.091601	1.4648	20.665	6.3461	0.23446	0.11723
10	2.504	0.1154	1.8454	24.808	6.3707	0.28038	0.14019
11	3.004	0.13929	2.2274	28.637	6.3956	0.32239	0.1612
12	3.504	0.16291	2.6051	32.256	6.4204	0.36173	0.18087
13	4.004	0.18652	2.9827	35.56	6.4454	0.39724	0.19862
14	4.504	0.20977	3.3544	38.707	6.4702	0.43074	0.21537
15	5.004	0.2332	3.7291	41.382	6.4953	0.45872	0.22936
16	5.504	0.257	4.1097	43.952	6.5211	0.48528	0.24264
17	6.004	0.2808	4.4903	46.313	6.5471	0.50931	0.25465
18	6.504	0.30442	4.8679	48.201	6.5731	0.52798	0.26399
19	7.004	0.32794	5.244	49.827	6.5992	0.54363	0.27182
20	7.504	0.35128	5.6172	51.4	6.6253	0.55859	0.27929
21	8.004	0.37462	5.9904	52.606	6.6516	0.56944	0.28472
22	8.504	0.39832	6.3696	53.97	6.6785	0.58184	0.29092
23	9.004	0.42221	6.7516	55.019	6.7059	0.59073	0.29537
24	9.504	0.44601	7.1322	55.911	6.7334	0.59785	0.29893
25	10.004	0.46945	7.5069	56.802	6.7606	0.60494	0.30247
26	10.504	0.4926	7.8771	57.537	6.7878	0.61031	0.30515
27	11.004	0.51594	8.2503	58.219	6.8154	0.61504	0.30752
28	11.504	0.53928	8.6235	58.323	6.8433	0.61364	0.30682
29	12.004	0.56298	9.0026	58.323	6.8718	0.61109	0.30555
30	12.504	0.58678	9.3832	58.009	6.9006	0.60525	0.30263
31	13.004	0.6104	9.7608	57.537	6.9295	0.59783	0.29891
32	13.504	0.63355	10.131	56.593	6.9581	0.5856	0.2928
33	14.004	0.65671	10.501	55.701	6.9868	0.574	0.287
34	14.504	0.68014	10.876	54.18	7.0162	0.55599	0.278
35	15.004	0.70394	11.257	52.869	7.0463	0.54022	0.27011
36	15.504	0.72783	11.639	51.295	7.0768	0.52188	0.26094
37	16.004	0.75163	12.019	49.669	7.1074	0.50317	0.25158
38	16.504	0.77515	12.395	48.306	7.1379	0.48726	0.24363
39	17.004	0.79867	12.772	46.889	7.1687	0.47094	0.23547
40	17.504	0.82229	13.149	45.368	7.1998	0.45369	0.22685
41	18.004	0.84655	13.537	44.319	7.2322	0.44122	0.22061
42	18.504	0.87081	13.925	43.008	7.2648	0.42625	0.21312
43	19.004	0.89489	14.31	41.592	7.2974	0.41037	0.20519
44	19.504	0.91832	14.685	40.071	7.3294	0.39363	0.19682
45	20.004	0.94157	15.057	38.393	7.3615	0.3755	0.18775

UNCONFINED COMPRESSION TEST REPORT

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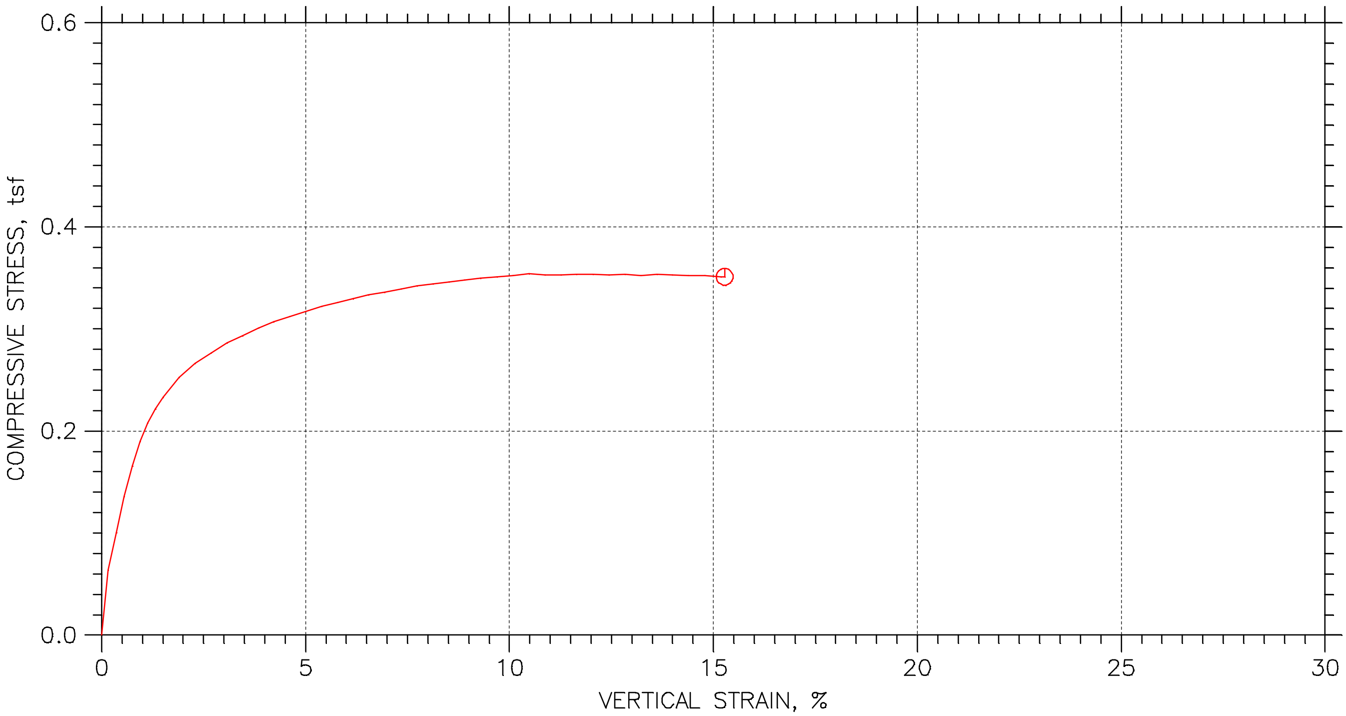

Symbol					
Test No.		EDWB008S5			
Initial	Diameter, in	2.8047			
	Height, in	6.0665			
	Water Content, %	33.59			
	Dry Density, pcf	88.9			
	Saturation, %	100.40			
	Void Ratio	0.91009			
Unconfined Compressive Strength, tsf		0.35399			
Undrained Shear Strength, tsf		0.177			
Time to Failure, min		13.504			
Strain Rate, %/min		1			
Estimated Specific Gravity		2.72			
Liquid Limit		52			
Plastic Limit		19			
Plasticity Index		33			
Failure Sketch					

Project: DYNERGY EDWARDS
Location: BARTONVILLE, IL
Project No.: MR155218
Boring No.: EDW-008 S5
Sample Type: 3.0'' ST
Description: BROWN AND GRAY FAT CLAY WITH SAND CH
Remarks: TEST PERFORMED AS PER ASTM D2166.

UNCONFINED COMPRESSION TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-008 S5
Sample No.: S-5
Test No.: EDWB008S5

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/13/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 11.0'-13.0'
Elevation: -----

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Soil Description: BROWN AND GRAY FAT CLAY WITH SAND CH
Remarks: TEST PERFORMED AS PER ASTM D2166.

Specimen Height: 6.07 in
Specimen Area: 6.18 in^2
Specimen Volume: 37.48 in^3

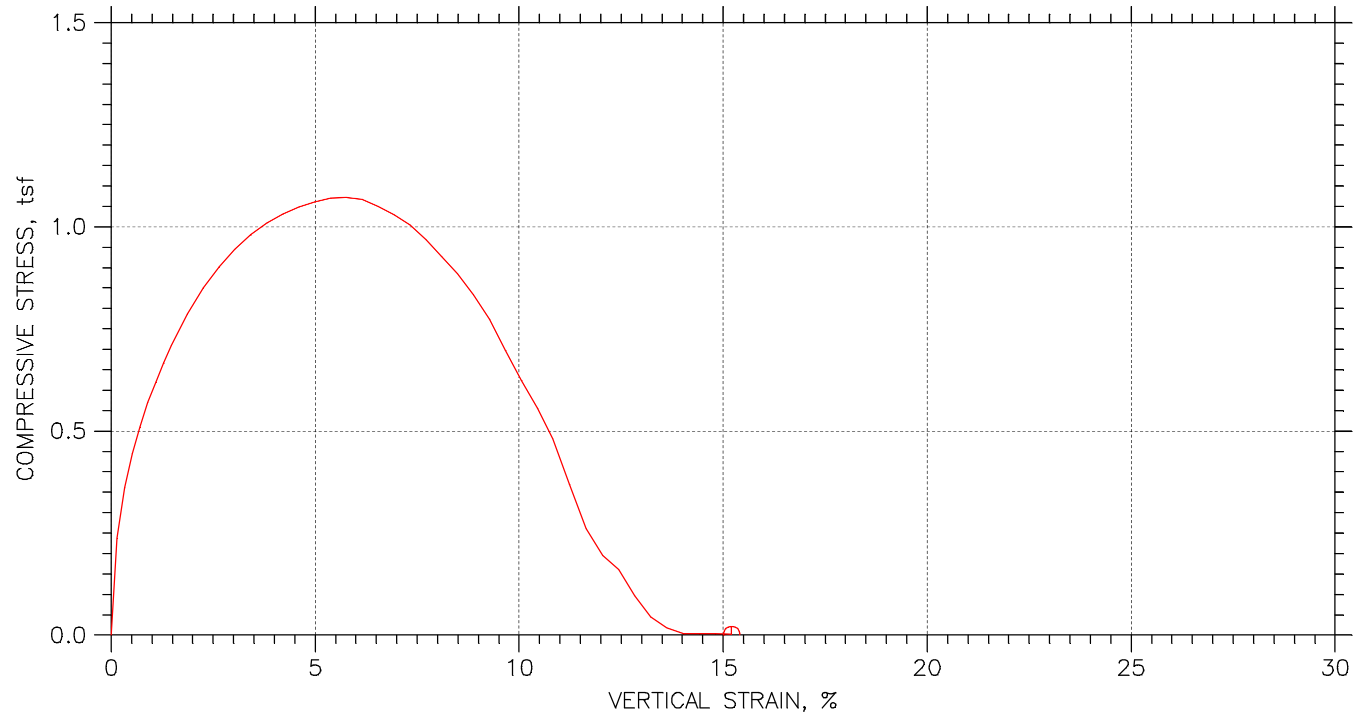
Liquid Limit: 52
Plastic Limit: 19
Estimated Specific Gravity: 2.72

Cap Mass: 0 gm

	Time min	Axial Displacement in	Axial Strain %	Load lb	Corrected Area in^2	Vertical Stress tsf	Shear Stress tsf
1	0	0	0	0	6.1783	0	0
2	0.254	0.0097782	0.16118	5.4547	6.1883	0.063465	0.031732
3	0.504	0.021678	0.35734	8.6541	6.2005	0.10049	0.050246
4	0.754	0.033578	0.55349	11.696	6.2127	0.13555	0.067774
5	1.004	0.045293	0.74661	14.319	6.2248	0.16562	0.082809
6	1.254	0.057009	0.93972	16.417	6.2369	0.18952	0.094758
7	1.504	0.068632	1.1313	18.042	6.249	0.20788	0.10394
8	1.754	0.080255	1.3229	19.301	6.2611	0.22195	0.11098
9	2.004	0.091878	1.5145	20.298	6.2733	0.23296	0.11648
10	2.504	0.11512	1.8977	22.081	6.2978	0.25244	0.12622
11	3.004	0.13865	2.2854	23.392	6.3228	0.26638	0.13319
12	3.504	0.16245	2.6778	24.389	6.3483	0.27661	0.1383
13	4.004	0.18615	3.0685	25.333	6.3739	0.28616	0.14308
14	4.504	0.20949	3.4533	26.067	6.3993	0.29329	0.14664
15	5.004	0.23274	3.8364	26.854	6.4248	0.30094	0.15047
16	5.504	0.25608	4.2212	27.483	6.4506	0.30676	0.15338
17	6.004	0.27969	4.6104	28.06	6.4769	0.31193	0.15596
18	6.504	0.30368	5.0058	28.637	6.5039	0.31702	0.15851
19	7.004	0.32748	5.3981	29.214	6.5309	0.32207	0.16104
20	7.504	0.35091	5.7843	29.686	6.5576	0.32594	0.16297
21	8.004	0.37406	6.166	30.158	6.5843	0.32978	0.16489
22	8.504	0.39731	6.5492	30.63	6.6113	0.33358	0.16679
23	9.004	0.42092	6.9384	30.997	6.639	0.33617	0.16808
24	9.504	0.445	7.3353	31.417	6.6674	0.33927	0.16963
25	10.004	0.46917	7.7337	31.837	6.6962	0.34232	0.17116
26	10.504	0.49315	8.1291	32.151	6.725	0.34422	0.17211
27	11.004	0.51658	8.5153	32.466	6.7534	0.34613	0.17307
28	11.504	0.53992	8.9	32.781	6.7819	0.34802	0.17401
29	12.004	0.56363	9.2908	33.095	6.8111	0.34985	0.17492
30	12.504	0.5878	9.6892	33.358	6.8412	0.35107	0.17554
31	13.004	0.61206	10.089	33.62	6.8716	0.35227	0.17613
32	13.504	0.63614	10.486	33.935	6.9021	0.35399	0.177
33	14.004	0.65966	10.874	33.987	6.9321	0.35301	0.1765
34	14.504	0.68309	11.26	34.092	6.9623	0.35256	0.17628
35	15.004	0.70661	11.648	34.354	6.9928	0.35372	0.17686
36	15.504	0.7305	12.042	34.459	7.0241	0.35322	0.17661
37	16.004	0.75467	12.44	34.564	7.0561	0.35269	0.17634
38	16.504	0.77875	12.837	34.774	7.0882	0.35322	0.17661
39	17.004	0.80255	13.229	34.826	7.1203	0.35216	0.17608
40	17.504	0.8258	13.612	35.088	7.1518	0.35325	0.17662
41	18.004	0.84923	13.999	35.193	7.184	0.35272	0.17636
42	18.504	0.87293	14.389	35.298	7.2168	0.35216	0.17608
43	19.004	0.89719	14.789	35.456	7.2506	0.35208	0.17604
44	19.504	0.92127	15.186	35.508	7.2846	0.35096	0.17548
45	19.621	0.92671	15.276	35.56	7.2923	0.35111	0.17555

UNCONFINED COMPRESSION TEST REPORT

Terracon
Consulting Engineers & Scientists



Symbol		⏀			
Test No.		EDWB015S12			
Initial	Diameter, in	2.8217			
	Height, in	6.061			
	Water Content, %	41.01			
	Dry Density, pcf	79.76			
	Saturation, %	98.82			
	Void Ratio	1.1289			
Unconfined Compressive Strength, tsf		1.0722			
Undrained Shear Strength, tsf		0.53609			
Time to Failure, min		7.5002			
Strain Rate, %/min		1			
Estimated Specific Gravity		2.72			
Liquid Limit		66			
Plastic Limit		23			
Plasticity Index		43			
Failure Sketch					

Project: DYNERGY EDWARDS
Location: BARTONVILLE, IL
Project No.: MR155218
Boring No.: EDW-015 S12
Sample Type: 3.0'' ST
Description: DARK GRAY FAT CLAY CH
Remarks: TEST PERFORMED AS PER ASTM D 2166.

Mon, 16-NOV-2015 22:13:27

UNCONFINED COMPRESSION TEST

Project: DYNERGY EDWARDS
Boring No.: EDW-015 S12
Sample No.: S-12
Test No.: EDWB015S12

Location: BARTONVILLE, IL
Tested By: BCM
Test Date: 11/13/15
Sample Type: 3.0" ST

Project No.: MR155218
Checked By: WPQ
Depth: 37.0'-39.0'
Elevation: -----

Terracon Consulting Engineers & Scientists

Soil Description: DARK GRAY FAT CLAY CH
Remarks: TEST PERFORMED AS PER ASTM D 2166.

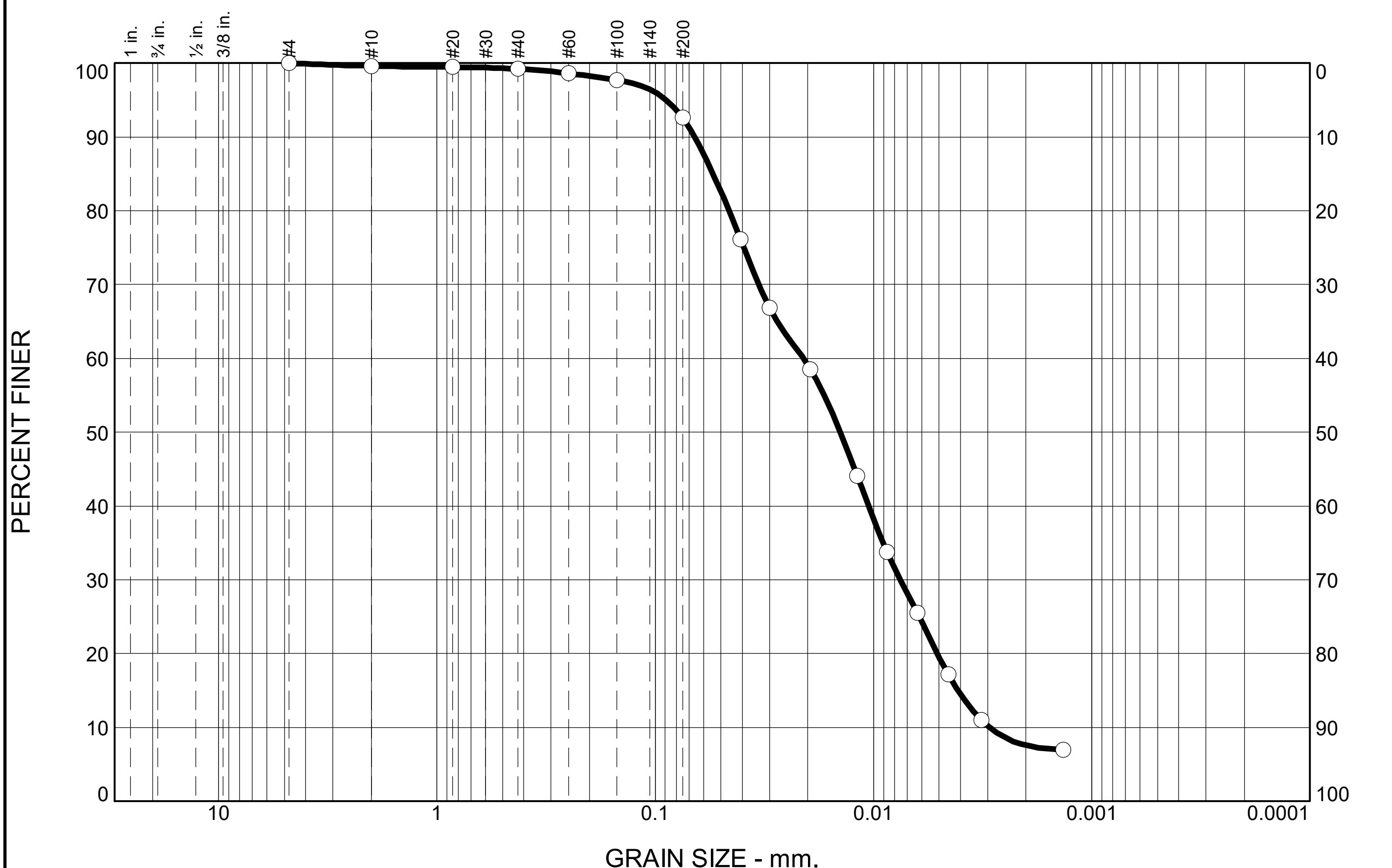
Specimen Height: 6.06 in
Specimen Area: 6.25 in^2
Specimen Volume: 37.90 in^3

Liquid Limit: 66
Plastic Limit: 23
Estimated Specific Gravity: 2.72

Cap Mass: 0 gm

	Time min	Axial Displacement in	Axial Strain %	Load lb	Corrected Area in^2	Vertical Stress tsf	Shear Stress tsf
1	0	0	0	0	6.2531	0	0
2	0.25015	0.0088557	0.14611	20.683	6.2623	0.2378	0.1189
3	0.50015	0.02011	0.33179	31.44	6.2739	0.3608	0.1804
4	0.75015	0.031548	0.52051	38.87	6.2858	0.44523	0.22261
5	1.0002	0.042987	0.70924	44.692	6.2978	0.51094	0.25547
6	1.2502	0.05461	0.90101	49.96	6.31	0.57006	0.28503
7	1.5002	0.066141	1.0913	54.506	6.3221	0.62075	0.31038
8	1.7502	0.077949	1.2861	58.665	6.3346	0.6668	0.3334
9	2.0002	0.089664	1.4794	62.547	6.347	0.70952	0.35476
10	2.5002	0.11346	1.872	69.644	6.3724	0.78689	0.39344
11	3.0002	0.13726	2.2647	75.633	6.398	0.85113	0.42556
12	3.5002	0.16069	2.6513	80.512	6.4234	0.90246	0.45123
13	4.0002	0.18385	3.0333	84.615	6.4487	0.94473	0.47236
14	4.5002	0.20728	3.4199	88.164	6.4745	0.98043	0.49021
15	5.0002	0.23089	3.8095	91.158	6.5008	1.0096	0.50482
16	5.5002	0.25497	4.2067	93.543	6.5277	1.0318	0.51588
17	6.0002	0.27905	4.604	95.428	6.5549	1.0482	0.5241
18	6.5002	0.30266	4.9936	96.98	6.5818	1.0609	0.53045
19	7.0002	0.32582	5.3756	98.2	6.6084	1.0699	0.53496
20	7.5002	0.34915	5.7607	98.81	6.6354	1.0722	0.53609
21	8.0002	0.37277	6.1503	98.755	6.6629	1.0672	0.53358
22	8.5002	0.39685	6.5475	97.535	6.6912	1.0495	0.52475
23	9.0002	0.42074	6.9417	96.149	6.7196	1.0302	0.51511
24	9.5002	0.44445	7.3329	94.097	6.7479	1.004	0.502
25	10	0.46769	7.7164	91.214	6.776	0.96922	0.48461
26	10.5	0.49085	8.0984	87.72	6.8042	0.92824	0.46412
27	11	0.51428	8.485	84.061	6.8329	0.88577	0.44289
28	11.5	0.53798	8.8761	79.514	6.8622	0.83428	0.41714
29	12	0.56215	9.2749	74.135	6.8924	0.77444	0.38722
30	12.5	0.58614	9.6706	67.093	6.9226	0.69782	0.34891
31	13	0.60966	10.059	60.162	6.9525	0.62304	0.31152
32	13.5	0.63291	10.442	53.897	6.9822	0.55578	0.27789
33	14	0.65652	10.832	46.854	7.0127	0.48106	0.24053
34	14.5	0.6806	11.229	36.153	7.0441	0.36953	0.18476
35	15	0.70532	11.637	25.617	7.0766	0.26064	0.13032
36	15.5	0.72986	12.042	19.296	7.1092	0.19543	0.097714
37	16	0.75366	12.435	15.969	7.1411	0.16101	0.080505
38	16.5	0.77773	12.832	9.5372	7.1736	0.095723	0.047862
39	17	0.80181	13.229	4.3805	7.2065	0.043765	0.021883
40	17.5	0.82543	13.619	1.7744	7.239	0.017648	0.0088241
41	18	0.8496	14.017	0.44359	7.2725	0.0043917	0.0021958
42	18.5	0.87404	14.421	0.38814	7.3068	0.0038247	0.0019123
43	19	0.89802	14.816	0.33269	7.3408	0.0032632	0.0016316
44	19.5	0.92164	15.206	0.16635	7.3745	0.0016241	0.00081206

PARTICLE SIZE ANALYSIS OF SOILS ASTM D422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	0.4	6.6	73.1	19.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.6		
#20	99.5		
#40	99.2		
#60	98.6		
#100	97.7		
#200	92.6		

* (no specification provided)

DARK GRAY FLY ASH

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.0659 D_{85}= 0.0543 D_{60}= 0.0210
D_{50}= 0.0142 D_{30}= 0.0075 D_{15}= 0.0041
D_{10}= 0.0029 C_u= 7.16 C_c= 0.92

Classification

USCS= AASHTO=

Remarks

F.M.=0.05

Source of Sample: EDW-B002 **Depth:** 7.5'-10.0'
Sample Number: S-4

Date: 11-5-15

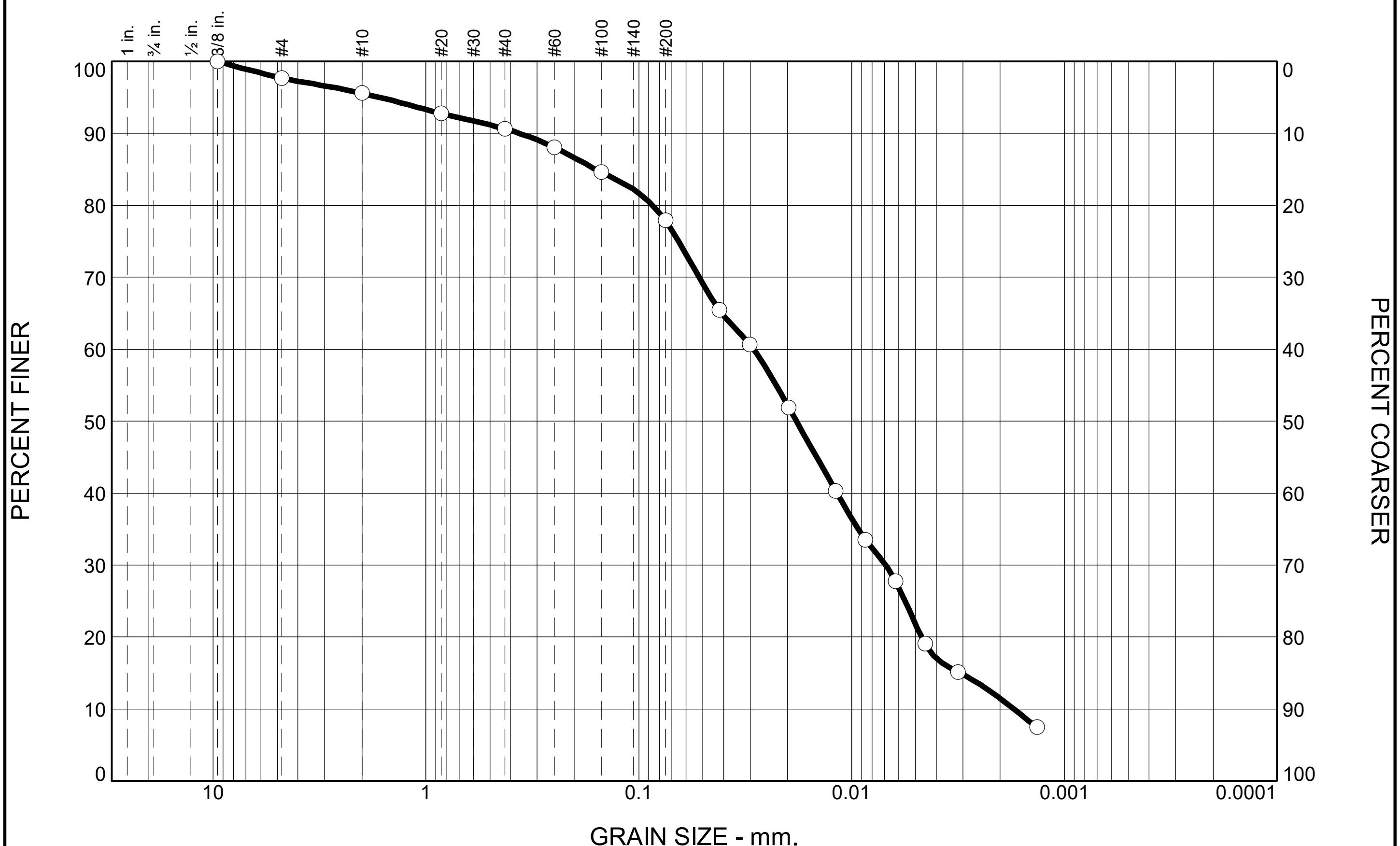
Terracon

Client: DYNERGY
Project: DYNERGY - EDWARDS SITE

Project No: MR155218 **Figure**

Tested By: SJH **Checked By:** WPQ

PARTICLE SIZE ANALYSIS OF SOILS ASTM D422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.3	2.1	5.0	12.7	56.3	21.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	97.7		
#10	95.6		
#20	92.8		
#40	90.6		
#60	88.1		
#100	84.6		
#200	77.9		

* (no specification provided)

FILL: DARK GRAY FLY ASH

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.3632 D_{85}= 0.1593 D_{60}= 0.0290
D_{50}= 0.0181 D_{30}= 0.0069 D_{15}= 0.0031
D_{10}= 0.0017 C_u= 16.81 C_c= 0.96

Classification

USCS= AASHTO=

Remarks

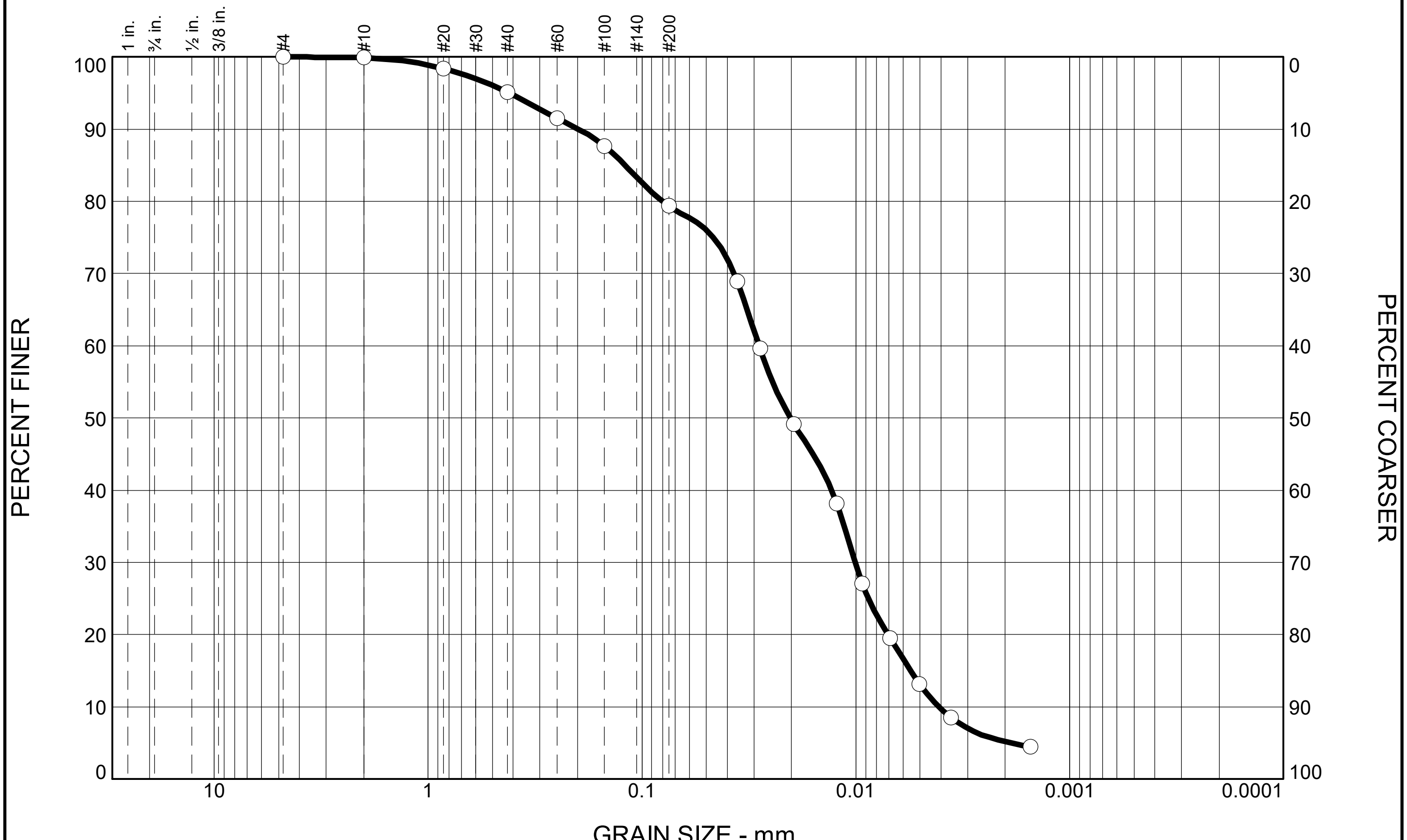
F.M.=0.47

Source of Sample: EDW-B003 **Depth:** 10.0'-11.5'
Sample Number: S-5 **Date:** 11-5-15

Client: DYNERGY
Project: DYNERGY - EDWARDS SITE
Project No: MR155218 **Figure**

Tested By: SJH **Checked By:** WPQ

PARTICLE SIZE ANALYSIS OF SOILS ASTM D422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	4.8	15.7	66.4	13.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.9		
#20	98.4		
#40	95.1		
#60	91.5		
#100	87.6		
#200	79.4		

* (no specification provided)

FILL: VERY DARK GRAY VARVED FLY ASH

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.1981 D_{85}= 0.1202 D_{60}= 0.0284
D_{50}= 0.0203 D_{30}= 0.0101 D_{15}= 0.0056
D_{10}= 0.0041 C_u= 6.92 C_c= 0.87

Classification

USCS= AASHTO=

Remarks

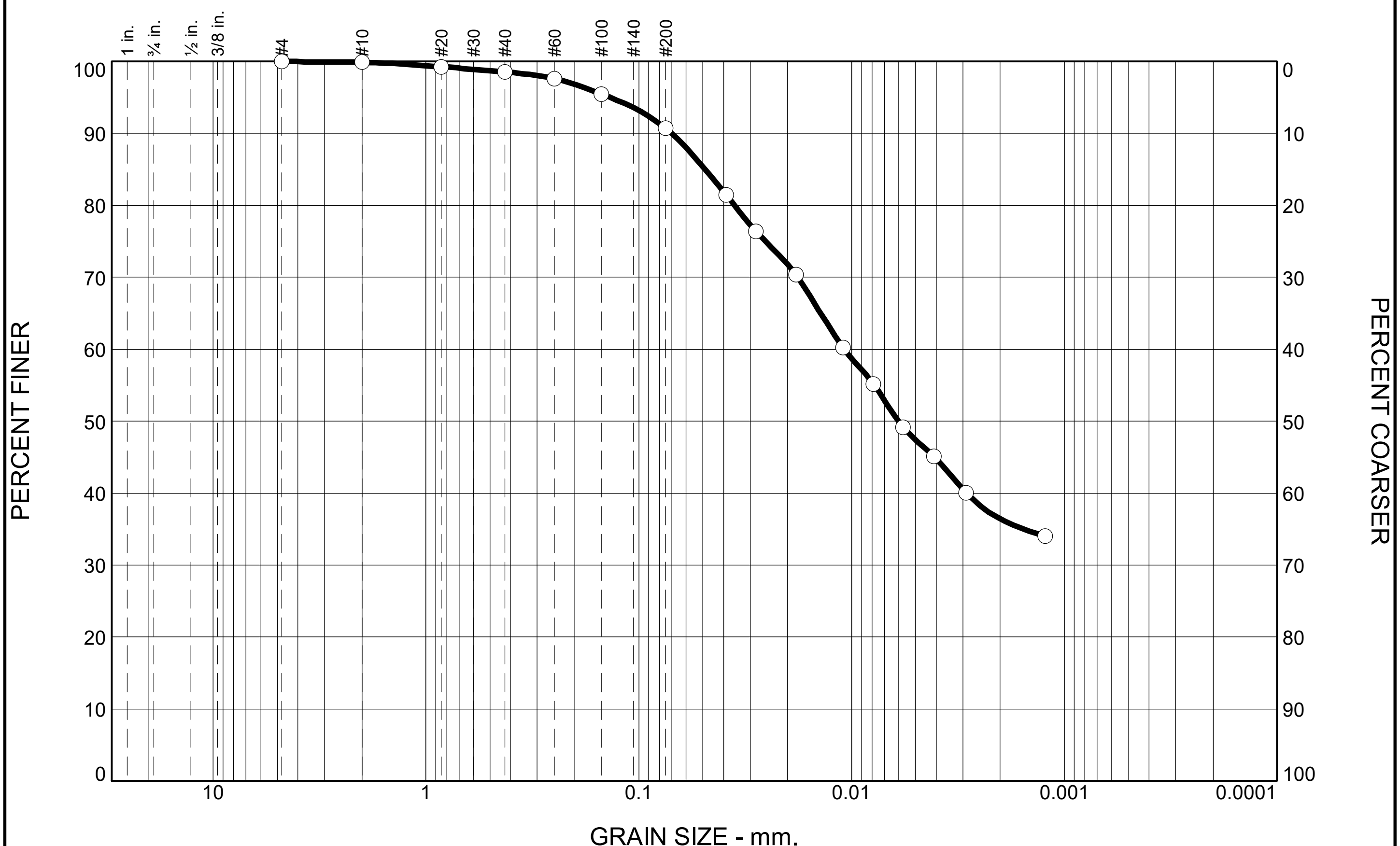
F.M.=0.23

Source of Sample: EDW-B003 **Depth:** 30.0'-32.0'
Sample Number: S-9 **Date:** 11-5-15

Client: DYNERGY
Project: DYNERGY - EDWARDS SITE
Project No: MR155218 **Figure**

Tested By: SJH **Checked By:** WPQ

PARTICLE SIZE ANALYSIS OF SOILS ASTM D422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.4	7.8	43.3	47.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.9		
#20	99.3		
#40	98.5		
#60	97.6		
#100	95.5		
#200	90.7		

* (no specification provided)

GRAY AND DARK GRAY LEAN CLAY WITH ORGANICS

Atterberg Limits

PL= 16 LL= 37 PI= 21

Coefficients

D_{90}= 0.0702 D_{85}= 0.0486 D_{60}= 0.0108
D_{50}= 0.0060 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(19)

Remarks

F.M.=0.08

Source of Sample: EDW-B004 **Depth:** 7.5'-9.0'
Sample Number: S-4

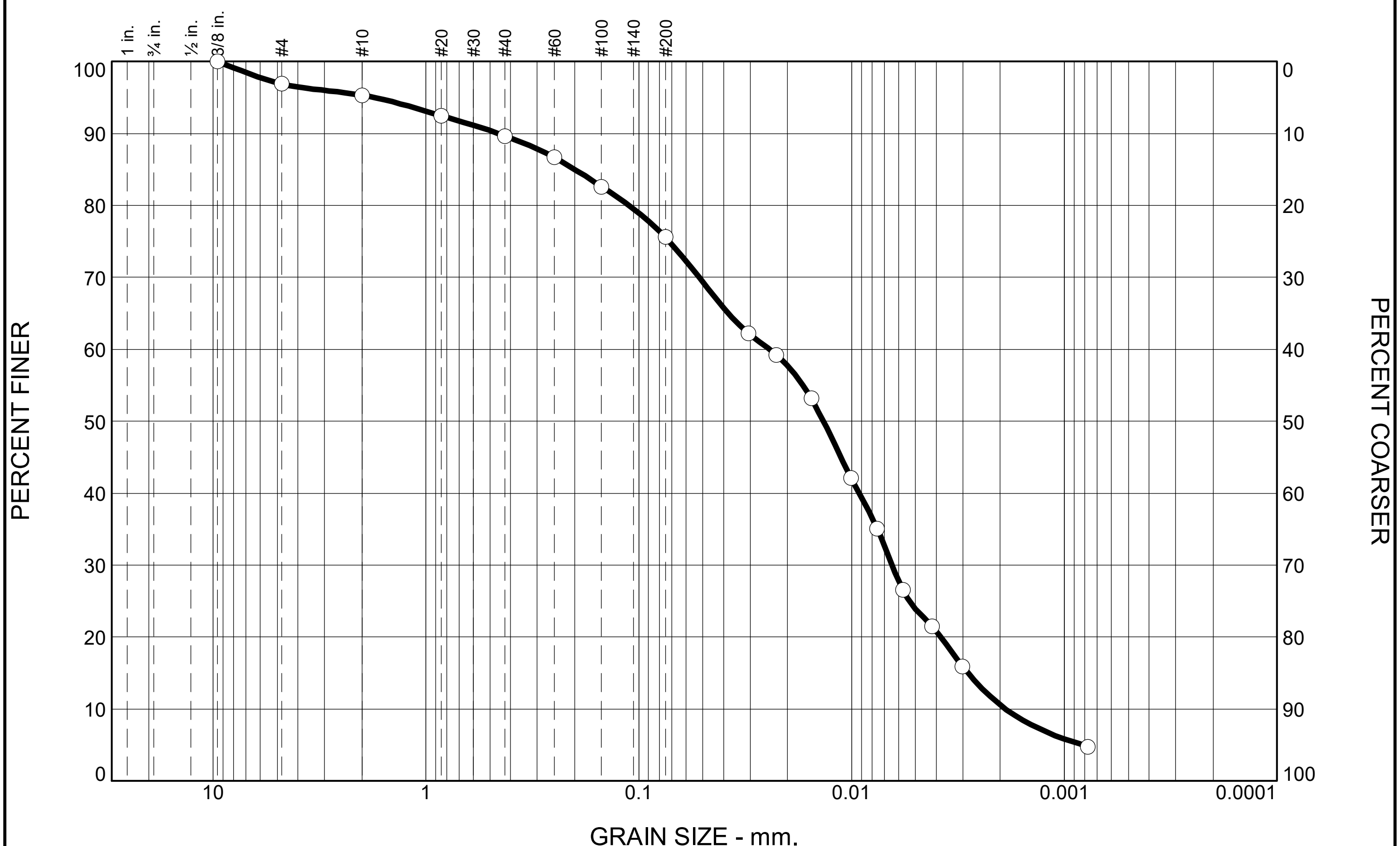
Date: 11-5-15

Terracon

Client: DYNERGY
Project: DYNERGY - EDWARDS SITE
Project No: MR155218 **Figure**

Tested By: SJH **Checked By:** WPQ

PARTICLE SIZE ANALYSIS OF SOILS ASTM D422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.1	1.6	5.6	14.1	51.7	23.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	96.9		
#10	95.3		
#20	92.5		
#40	89.7		
#60	86.7		
#100	82.6		
#200	75.6		

* (no specification provided)

FILL: GRAY FLY ASH

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.4580 D_{85}= 0.1999 D_{60}= 0.0244
D_{50}= 0.0136 D_{30}= 0.0065 D_{15}= 0.0028
D_{10}= 0.0019 C_u= 12.93 C_c= 0.91

Classification

USCS= AASHTO=

Remarks

F.M.=0.52

Source of Sample: EDW-B005 **Depth:** 20.0'-21.5'
Sample Number: S-7 **Date:** 11-13-15

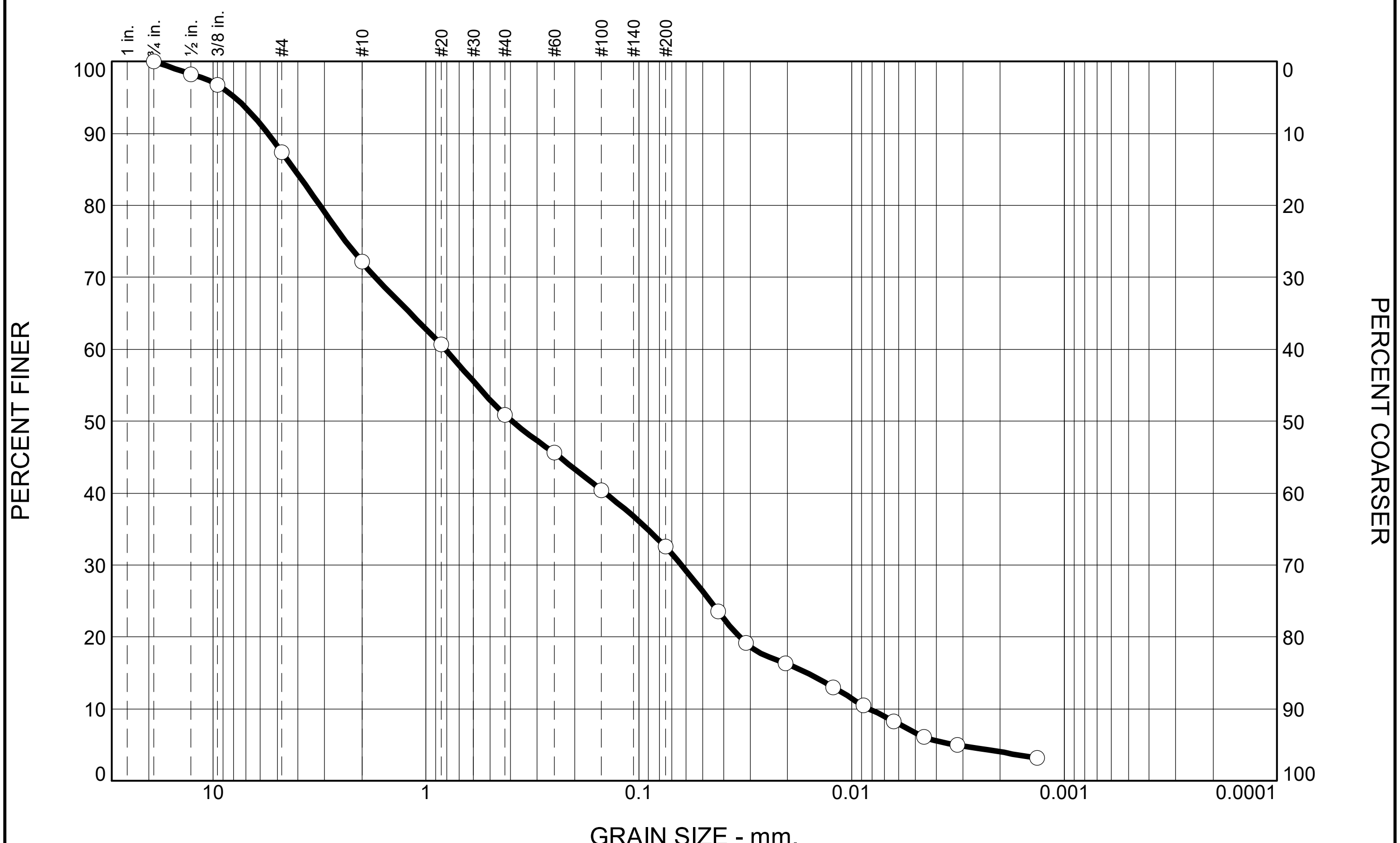
Terracon

Client: DYNERGY
Project: DYNERGY - EDWARDS SITE

Project No: MR155218 **Figure**

Tested By: SJH **Checked By:** WPQ

PARTICLE SIZE ANALYSIS OF SOILS ASTM D422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	12.6	15.3	21.2	18.3	26.0	6.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	98.2		
.375	96.7		
#4	87.4		
#10	72.1		
#20	60.6		
#40	50.9		
#60	45.6		
#100	40.4		
#200	32.6		

* (no specification provided)

FILL: DARK BROWN AND DARK GRAY SAND WITH GRAVEL - FLY ASH NOTED

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 5.5350 D_{85}= 4.1471 D_{60}= 0.8124
D_{50}= 0.3943 D_{30}= 0.0630 D_{15}= 0.0162
D_{10}= 0.0082 C_u= 98.50 C_c= 0.59

Classification

USCS= SP AASHTO=

Remarks

F.M.=2.33

Source of Sample: EDW-B010 **Depth:** 5.0'-6.5'
Sample Number: S-3

Date: 11-5-15

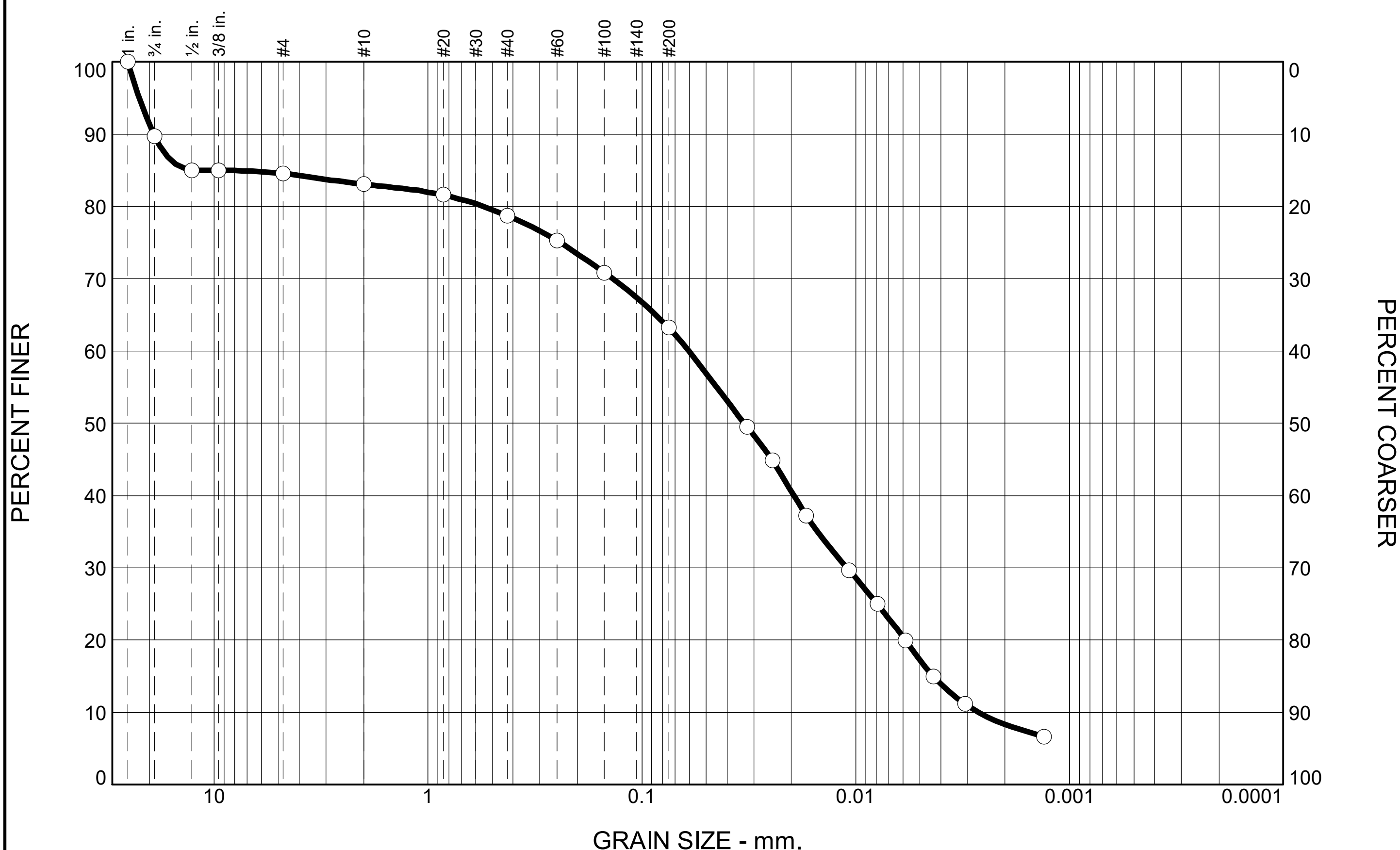
Terracon

Client: DYNERGY
Project: DYNERGY - EDWARDS SITE

Project No: MR155218 **Figure**

Tested By: SJH **Checked By:** WPQ

PARTICLE SIZE ANALYSIS OF SOILS ASTM D422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	10.3	5.2	1.4	4.4	15.5	46.0	17.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	89.7		
.5	85.0		
.375	85.0		
#4	84.5		
#10	83.1		
#20	81.6		
#40	78.7		
#60	75.3		
#100	70.8		
#200	63.2		

* (no specification provided)

FILL: VERY DARK GRAY FLY ASH

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 19.2789 D_{85}= 8.9744 D_{60}= 0.0604
D_{50}= 0.0333 D_{30}= 0.0110 D_{15}= 0.0043
D_{10}= 0.0027 C_u= 22.70 C_c= 0.75

Classification

USCS= AASHTO=

Remarks

F.M.=1.47

Source of Sample: EDW-B011 **Depth:** 9.0'-11.0'
Sample Number: S-5

Date: 11-12-15

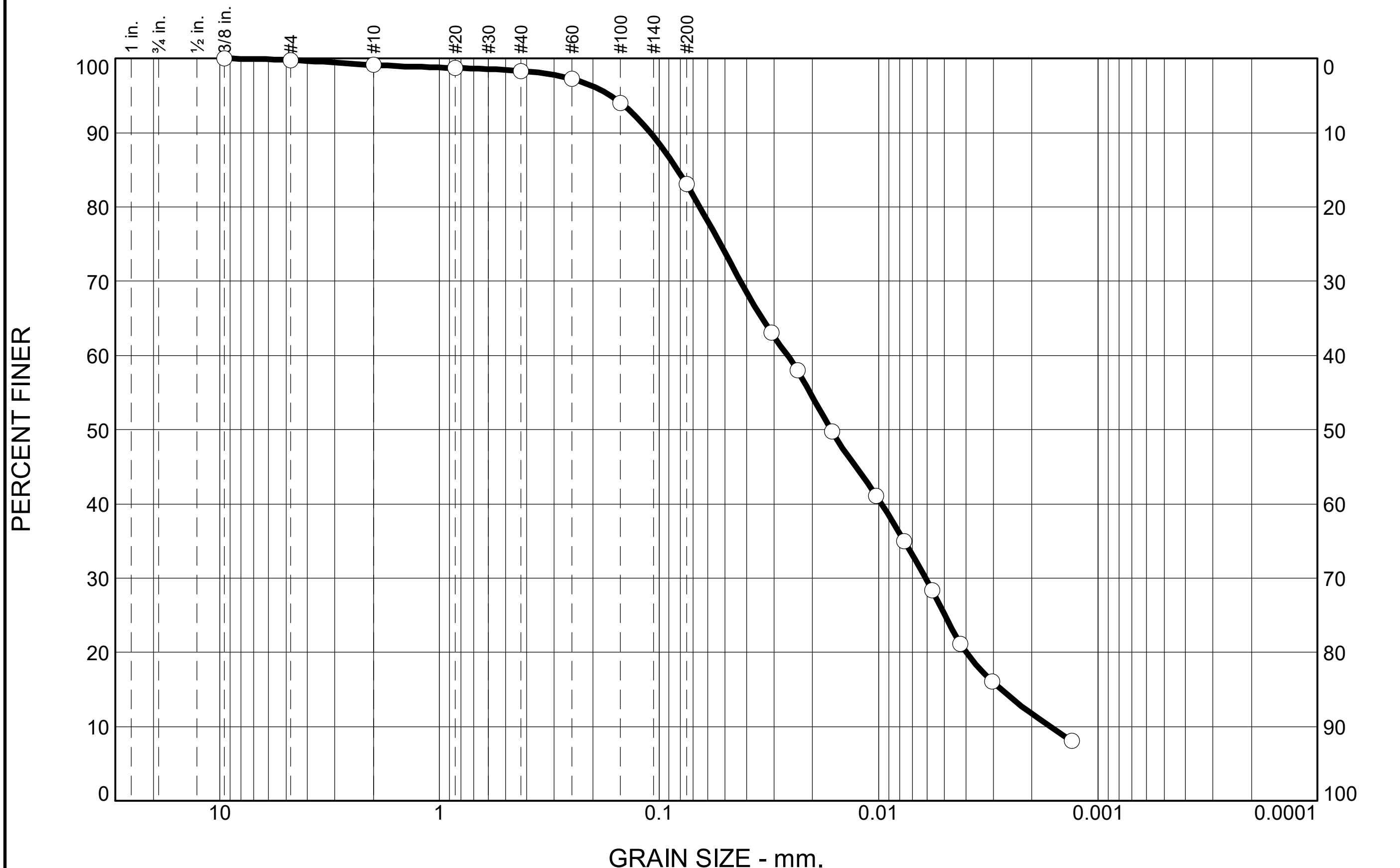
Terracon

Client: DYNERGY
Project: DYNERGY - EDWARDS SITE

Project No: MR155218 **Figure**

Tested By: SJH **Checked By:** WPQ

PARTICLE SIZE ANALYSIS OF SOILS ASTM D422



%+3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.7	0.8	15.2	58.0	25.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.1		
#20	98.7		
#40	98.3		
#60	97.3		
#100	94.0		
#200	83.1		

* (no specification provided)

FILL: GRAY FLY ASH

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.1094 D_{85}= 0.0823 D_{60}= 0.0260
D_{50}= 0.0165 D_{30}= 0.0061 D_{15}= 0.0028
D_{10}= 0.0017 C_u= 15.75 C_c= 0.87

Classification

USCS= AASHTO=

Remarks

F.M.=0.12

Source of Sample: EDW-B011 **Depth:** 19.5'-21.5'
Sample Number: S-7

Date: 11-11-15

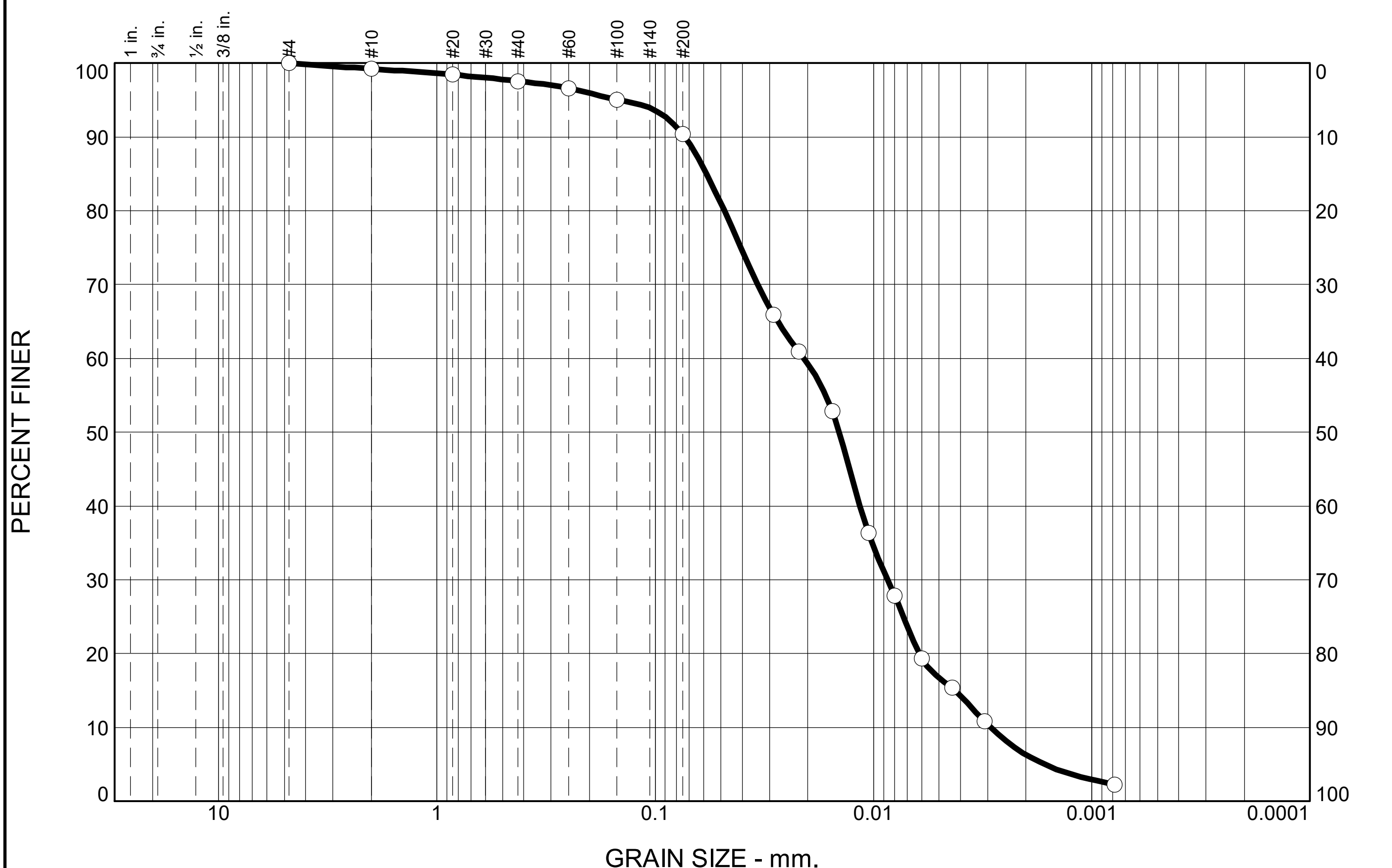
Terracon

Client: DYNERGY
Project: DYNERGY - EDWARDS SITE

Project No: MR155218 **Figure**

Tested By: SJH **Checked By:** WPQ

PARTICLE SIZE ANALYSIS OF SOILS ASTM D422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.8	1.6	7.2	73.7	16.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.2		
#20	98.4		
#40	97.6		
#60	96.6		
#100	95.1		
#200	90.4		

* (no specification provided)

FILL: DARK GRAY FLY ASH

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.0732 D_{85}= 0.0581 D_{60}= 0.0208
D_{50}= 0.0144 D_{30}= 0.0086 D_{15}= 0.0042
D_{10}= 0.0029 C_u= 7.17 C_c= 1.22

Classification

USCS= AASHTO=

Remarks

F.M.=0.12

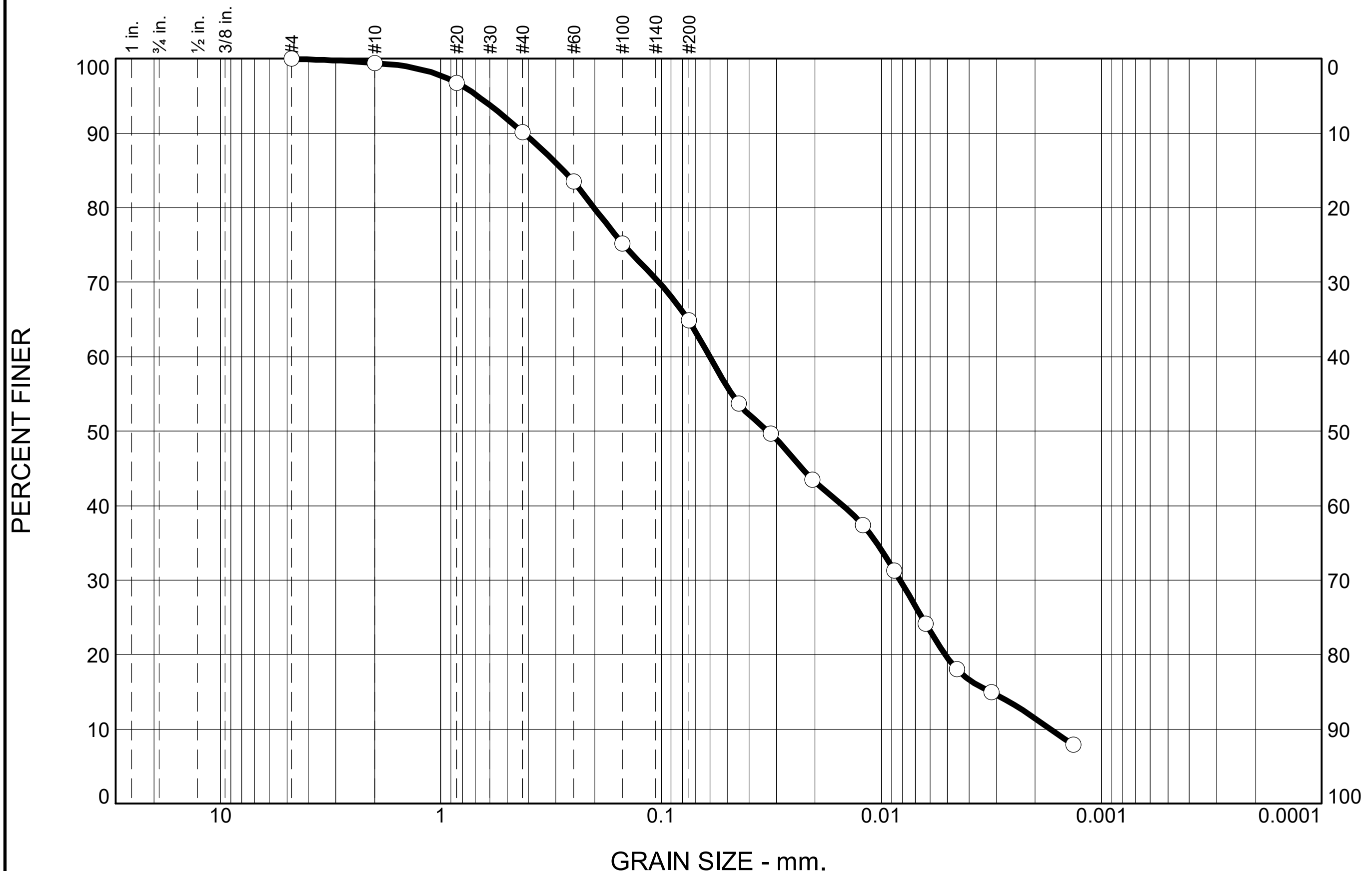
Source of Sample: EDW-B012 **Depth:** 5.0'-6.5'
Sample Number: S-3 **Date:** 11-13-15

Terracon

Client: DYNERGY
Project: DYNERGY - EDWARDS SITE
Project No: MR155218 **Figure**

Tested By: SJH **Checked By:** WPQ

PARTICLE SIZE ANALYSIS OF SOILS ASTM D422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.6	9.3	25.2	45.4	19.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.4		
#20	96.8		
#40	90.1		
#60	83.5		
#100	75.2		
#200	64.9		

* (no specification provided)

FILL: GRAY SILTY SAND WITH GRAVEL - FLY ASH NOTED

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.4213 D_{85}= 0.2775 D_{60}= 0.0602
D_{50}= 0.0328 D_{30}= 0.0082 D_{15}= 0.0032
D_{10}= 0.0017 C_u= 35.34 C_c= 0.66

Classification

USCS= SM AASHTO=

Remarks

F.M.=0.47

Source of Sample: EDW-B014 **Depth:** 7.0'-8.5'
Sample Number: S-4

Date: 11-5-15

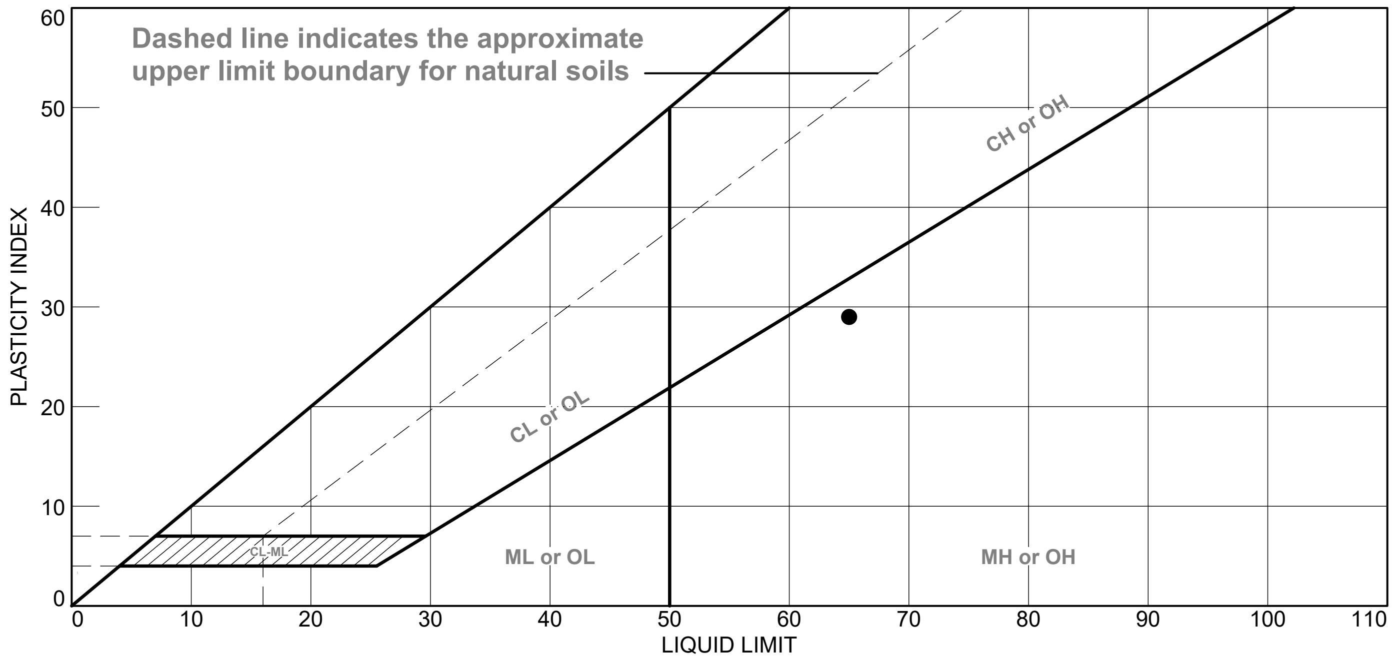
Terracon

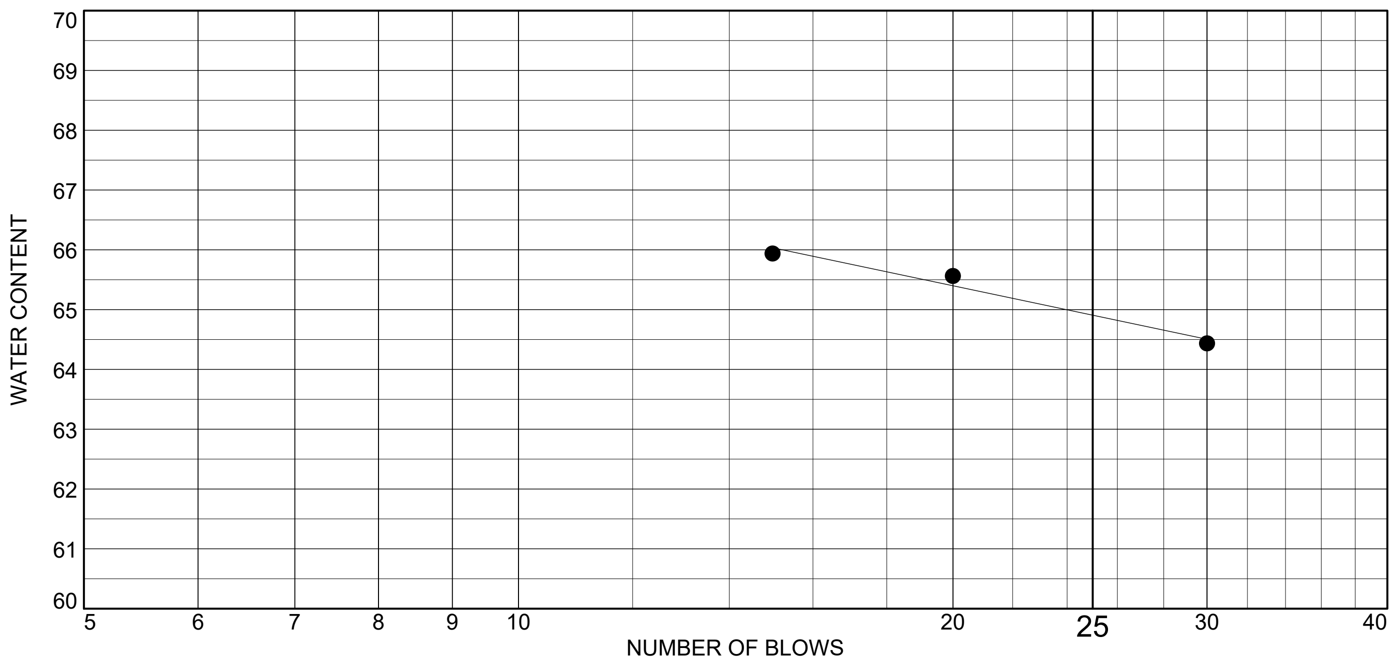
Client: DYNERGY
Project: DYNERGY - EDWARDS SITE

Project No: MR155218 **Figure**

Tested By: SJH **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	GREENISH GRAY SANDY SILT	65	36	29			MH

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

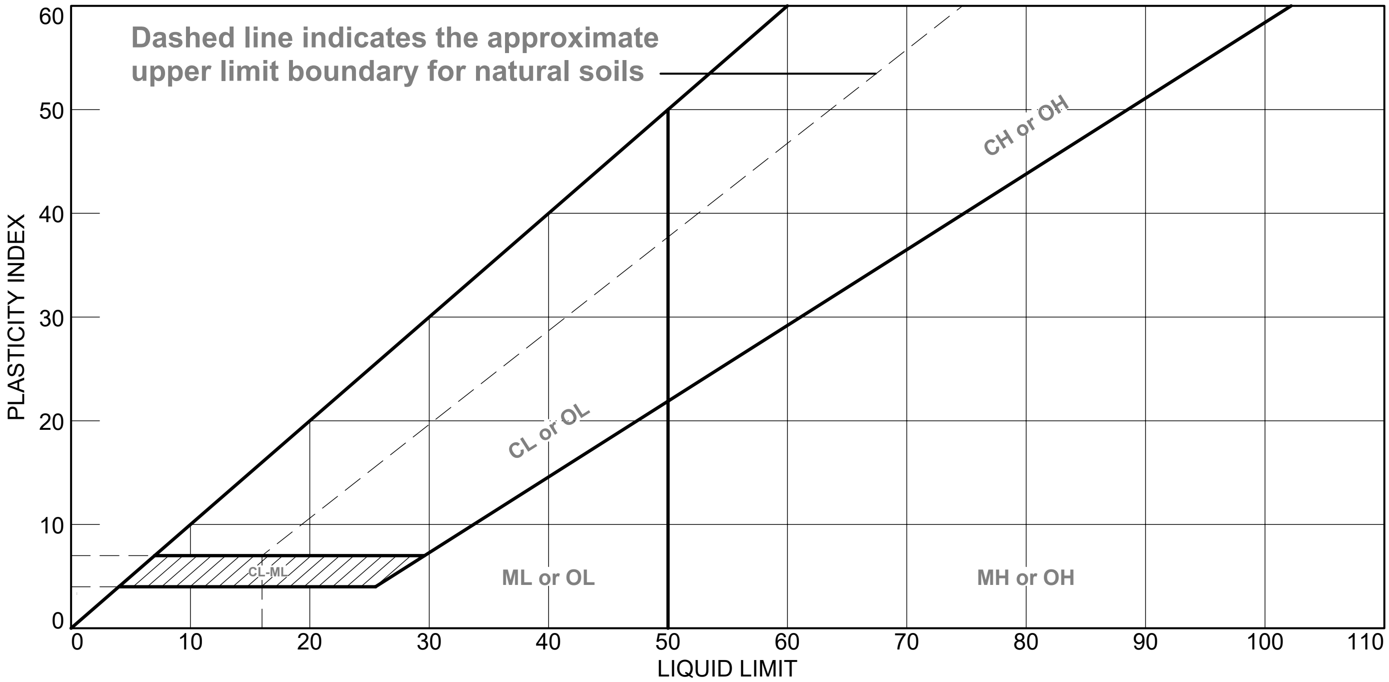
Source of Sample: EDW-B002 **Depth:** 5.0'-7.0'
Sample Number: S-3

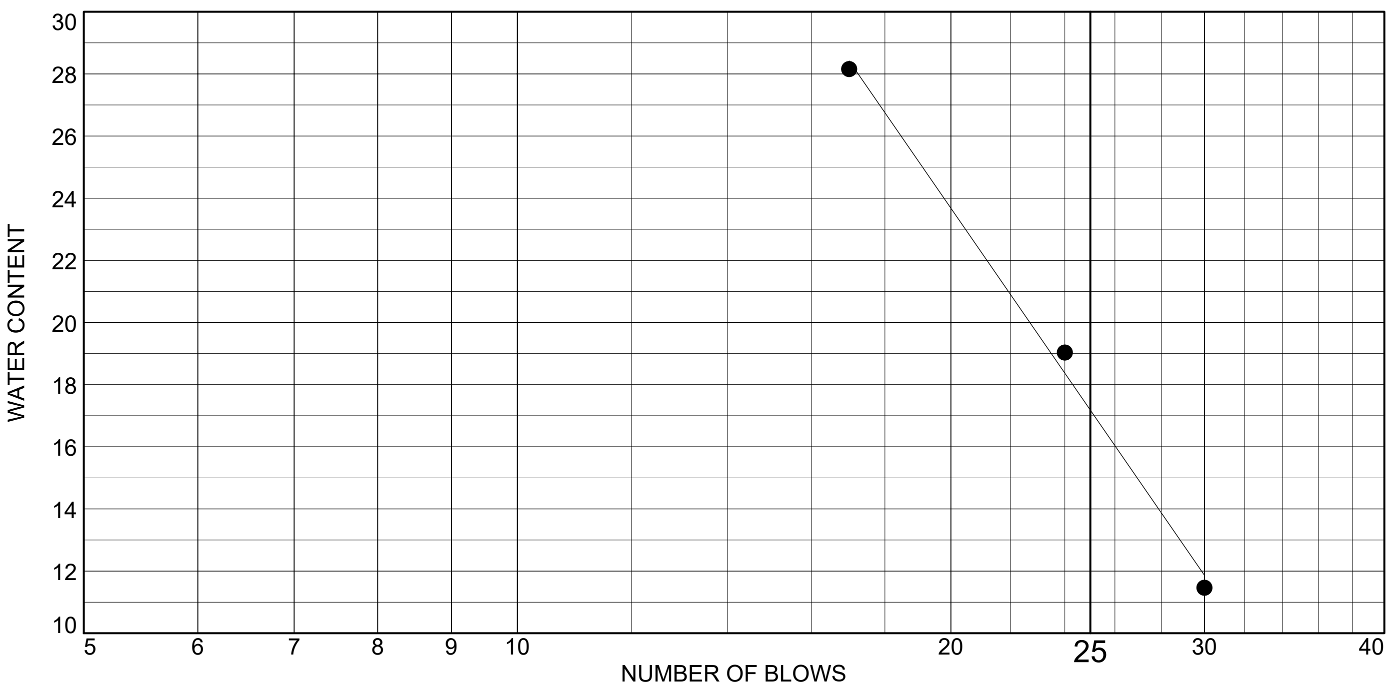
Remarks:
● SHELL NOTED

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	GRAY TO DARK GRAY FLY ASH	17	27	NP			

Project No. MR155218 **Client:** DYNERGY

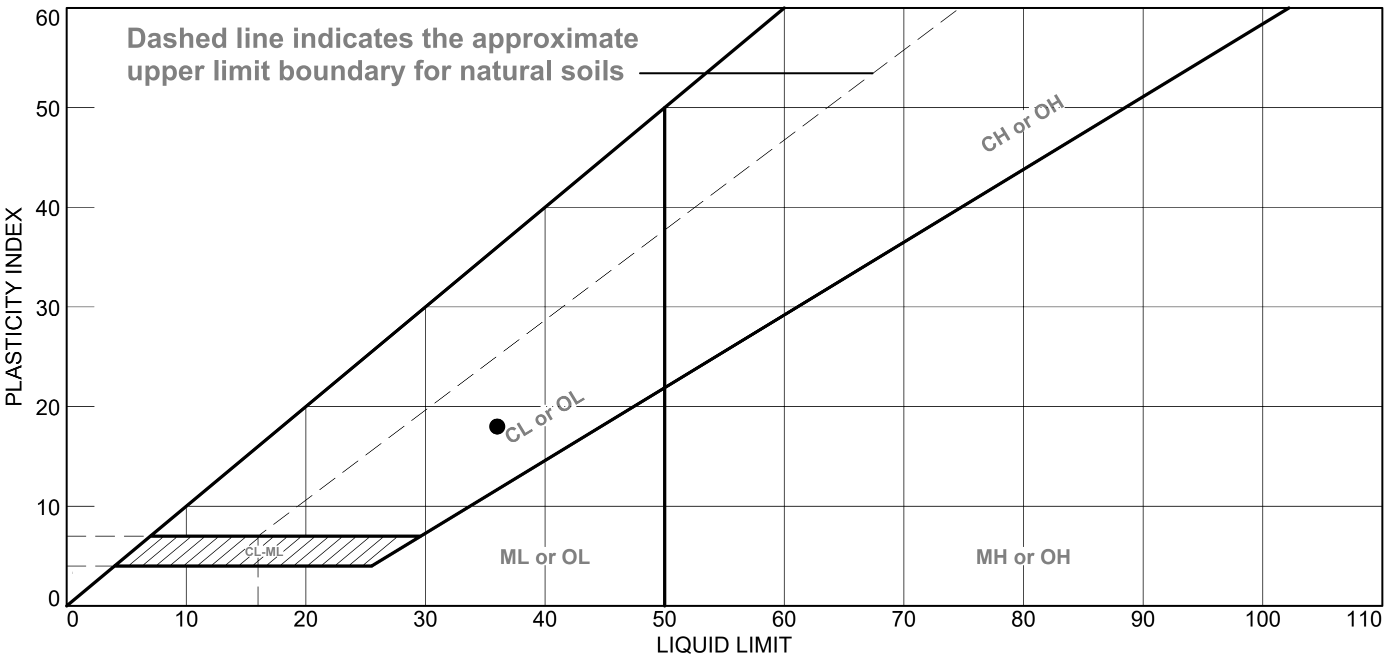
Project: DYNERGY - EDWARDS SITE

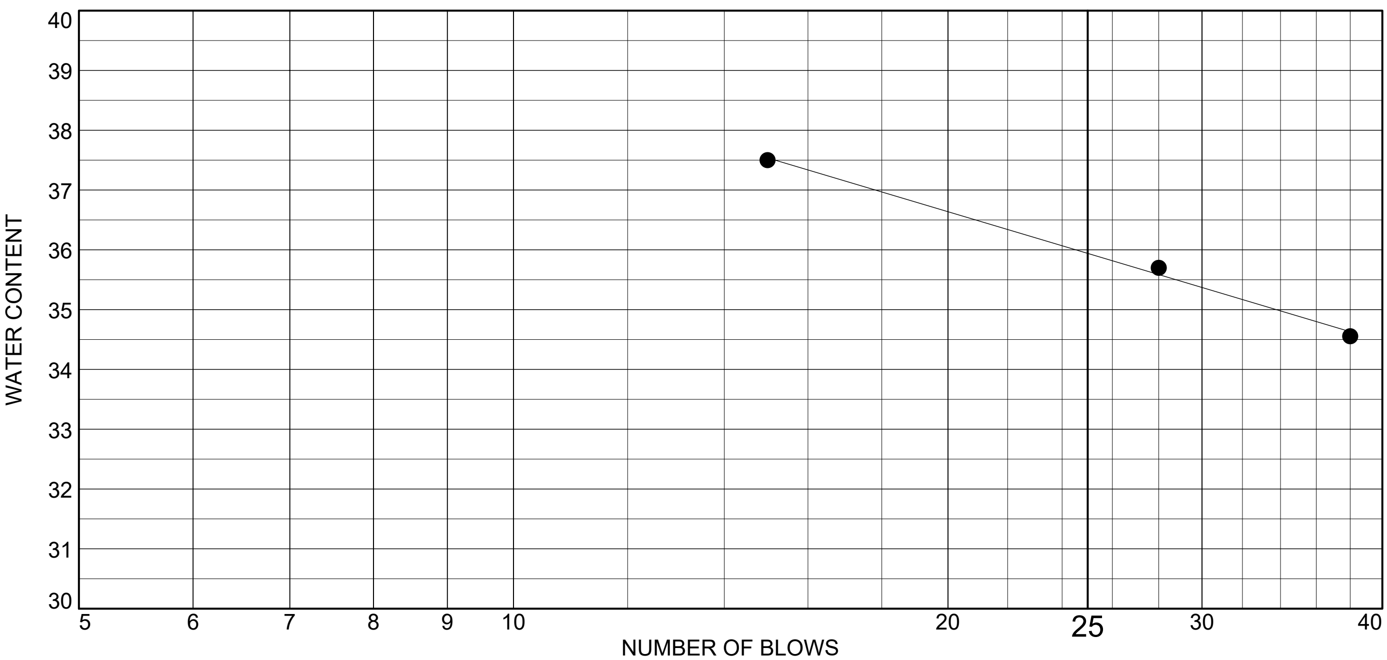
Source of Sample: EDW-B002 **Depth:** 10.0'-12.0'
Sample Number: S-5

Remarks:

Figure

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	GRAY LEAN CLAY WITH SAND	36	18	18			CL

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B002 **Depth:** 35.0'-37.0'
Sample Number: S-10

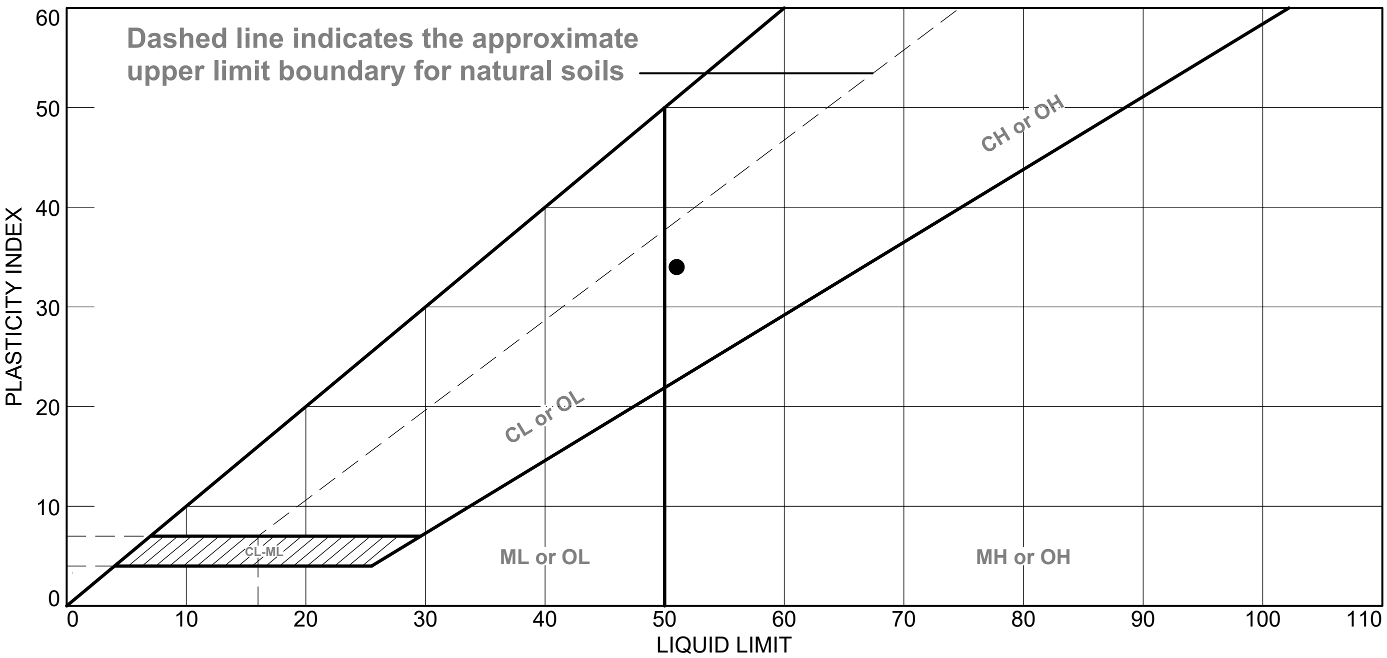
Terracon

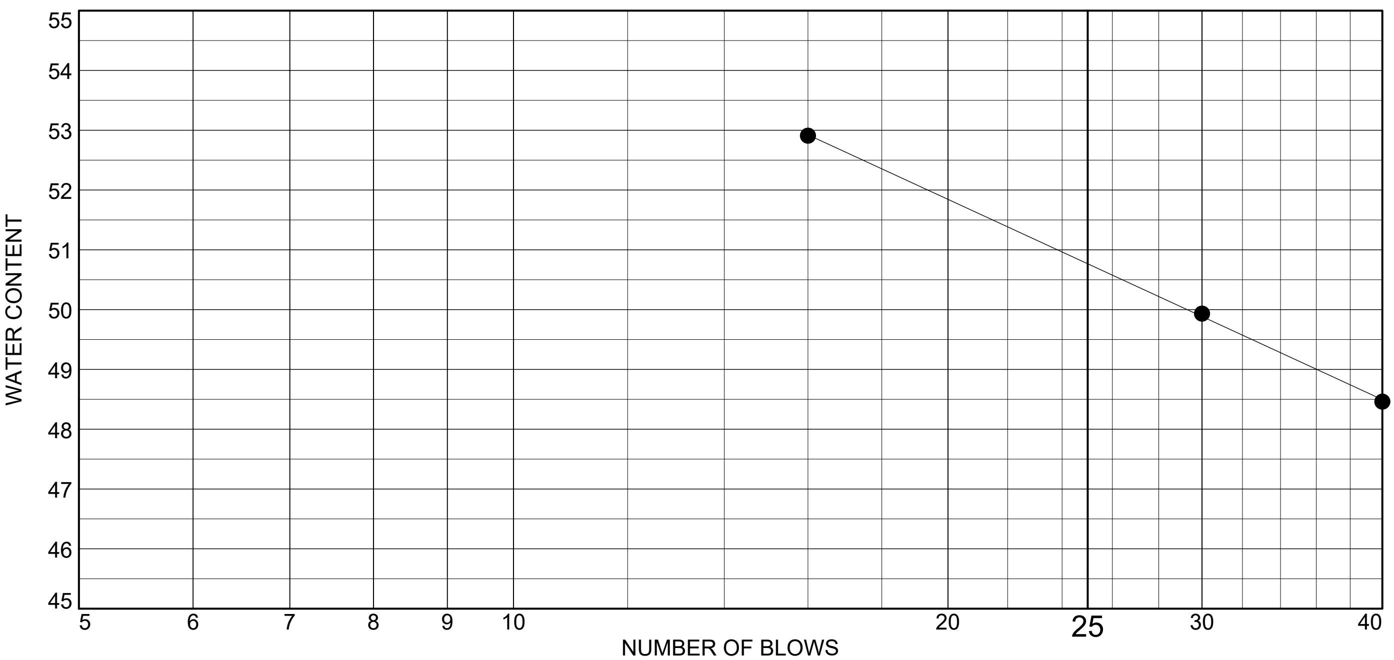
Remarks:

Figure

Tested By: SJH **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	DARK GRAY FAT CLAY WITH SAND	51	17	34			CH

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B003 **Depth:** 45.0'-47.0'
Sample Number: S-12

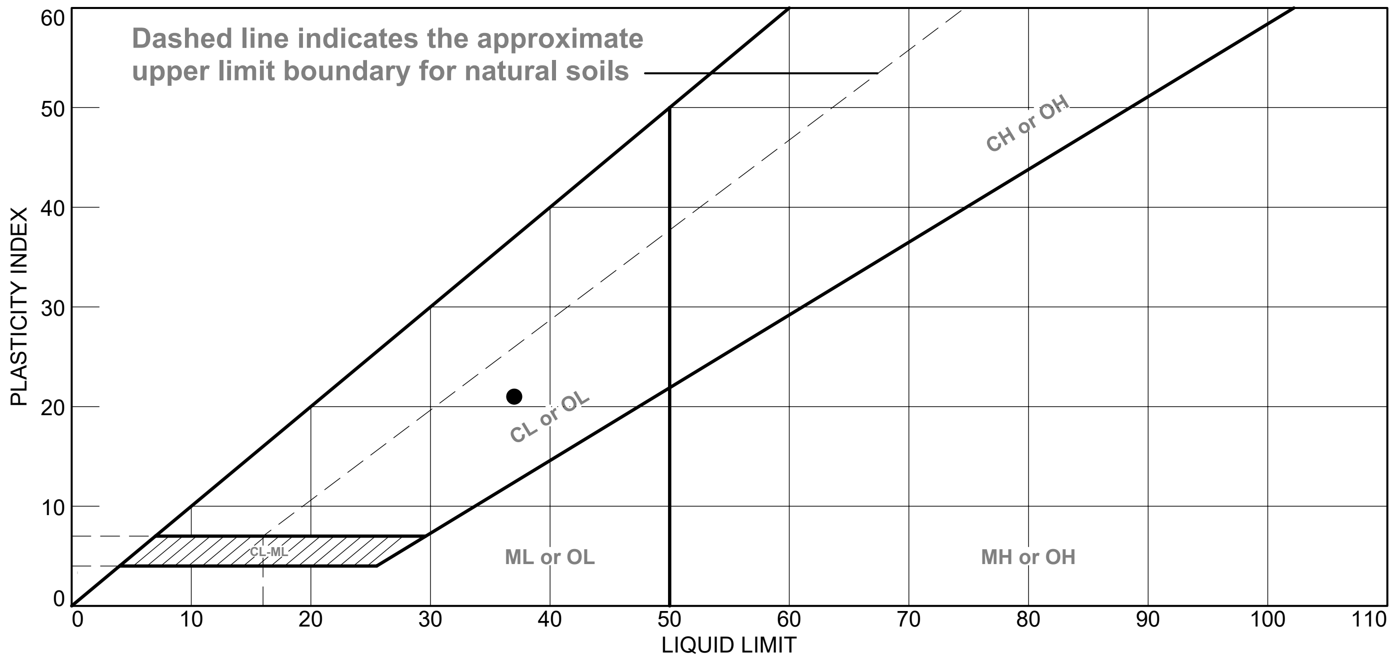
Terracon

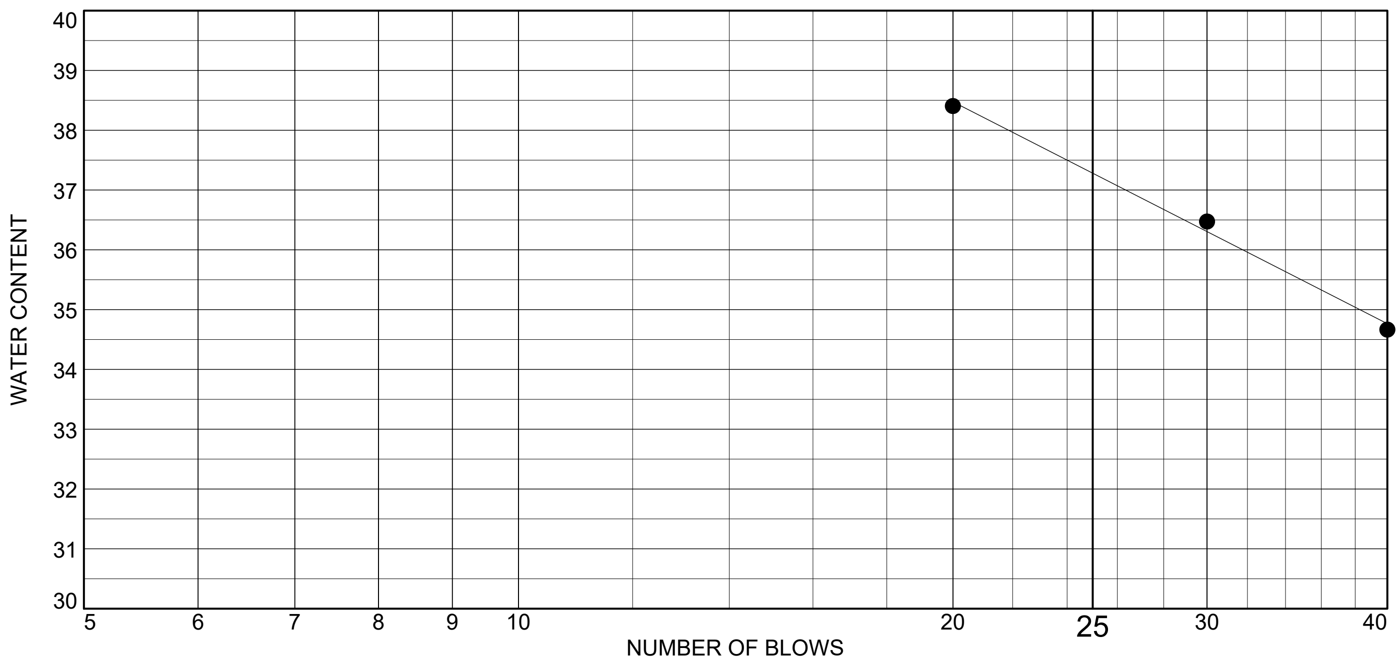
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	GRAY AND DARK GRAY LEAN CLAY WITH ORGANICS	37	16	21	98.5	90.7	CL

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B004 **Depth:** 7.5'-9.0'
Sample Number: S-4

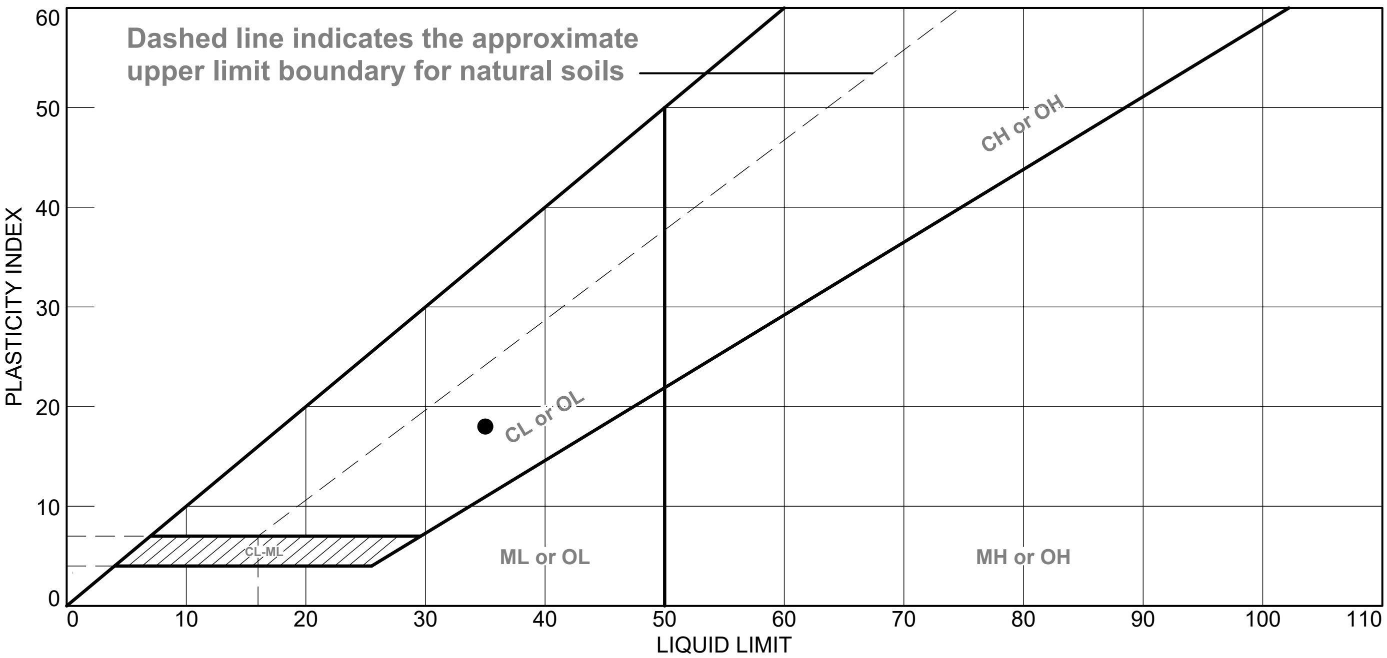
Terracon

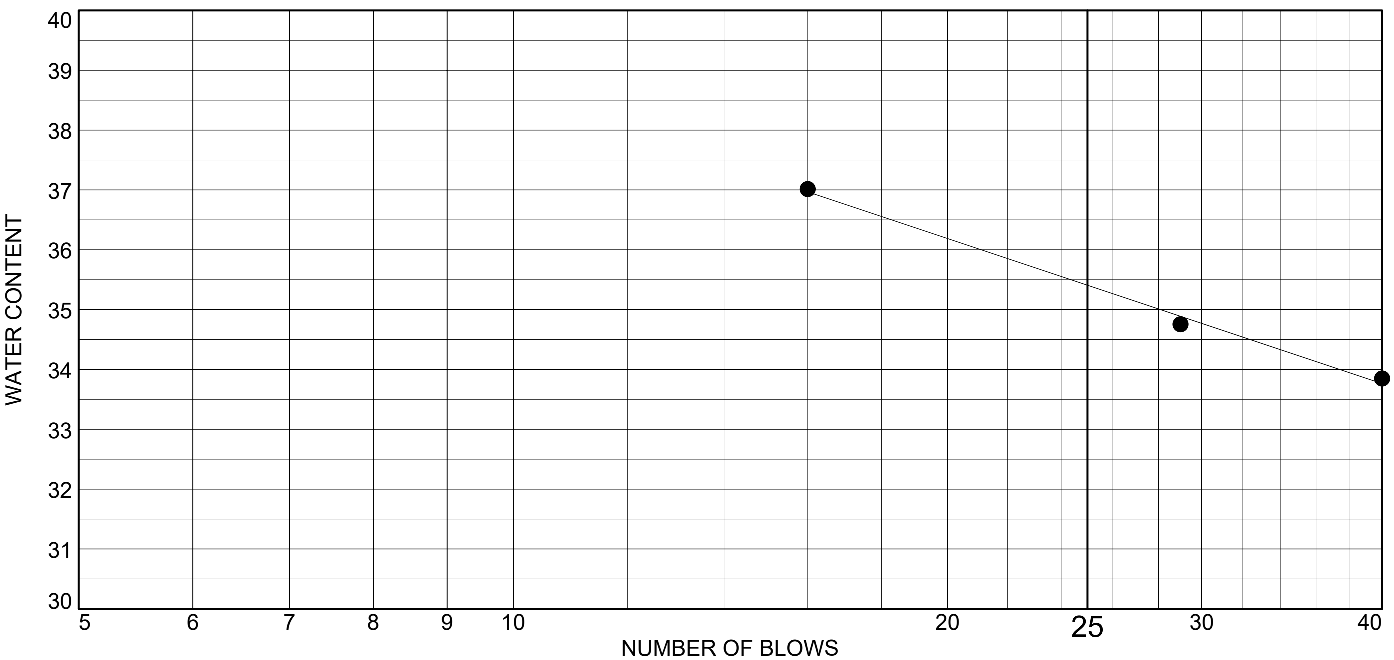
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	BROWN AND GRAYISH BROWN LEAN CLAY WITH SAND	35	17	18			CL

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B004 **Depth:** 36.0'-38.0'
Sample Number: S-11

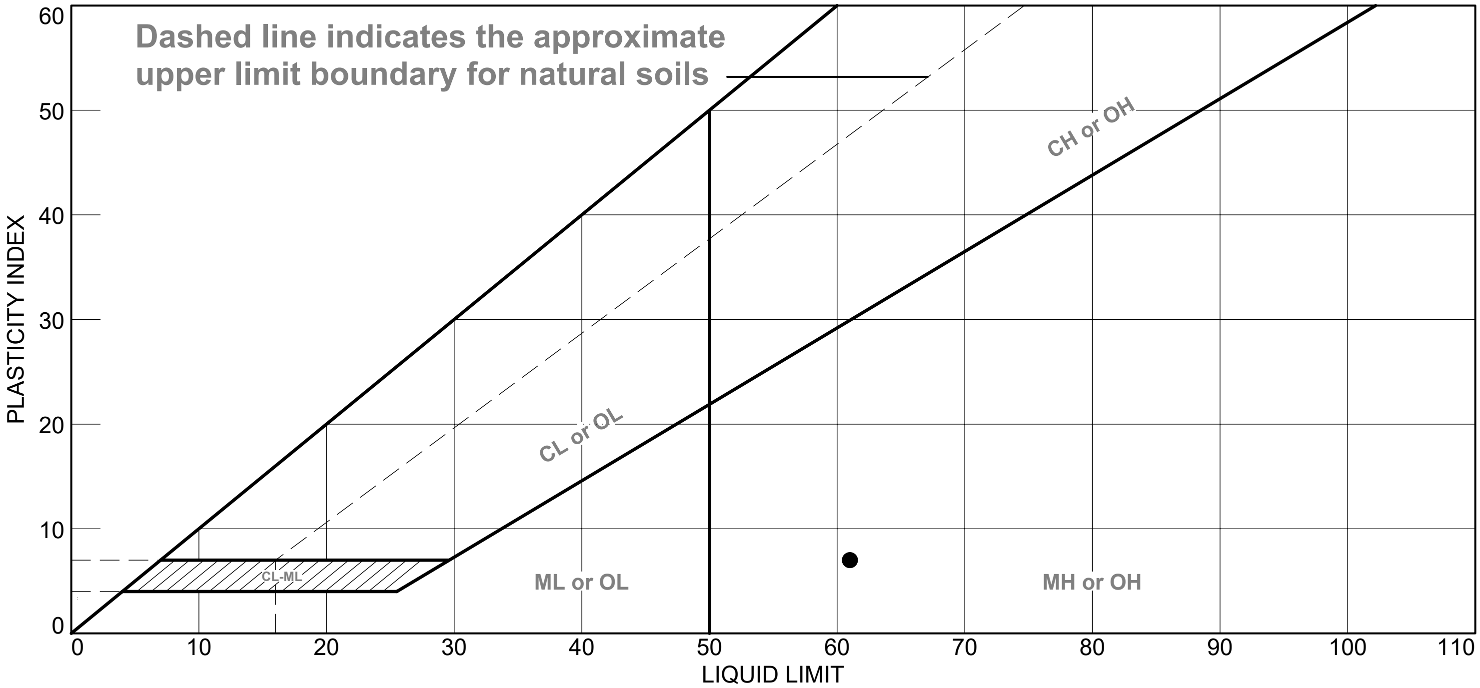
Terracon

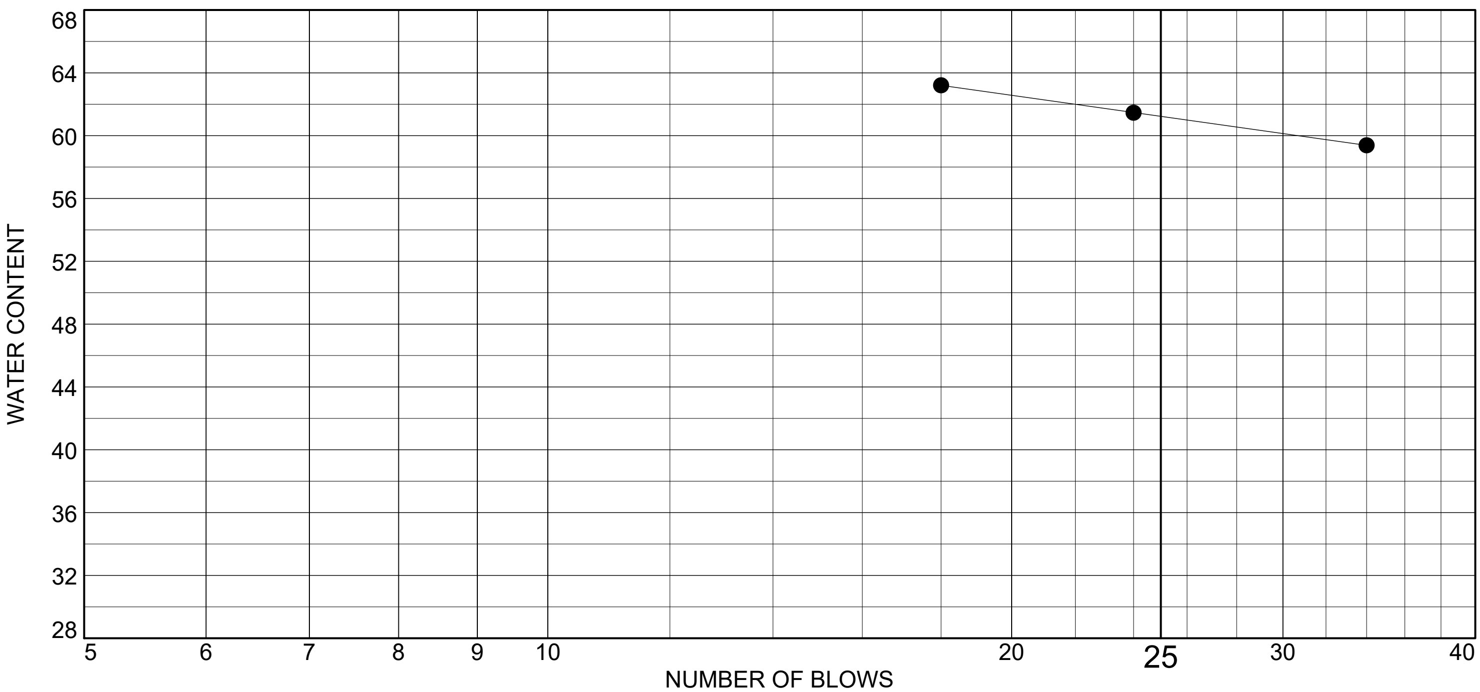
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	FILL: BROWN SANDY SILT WITH CLAY CHUNKS	61	54	7			MH

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B005 **Depth:** 5.0'-6.5'
Sample Number: S-3

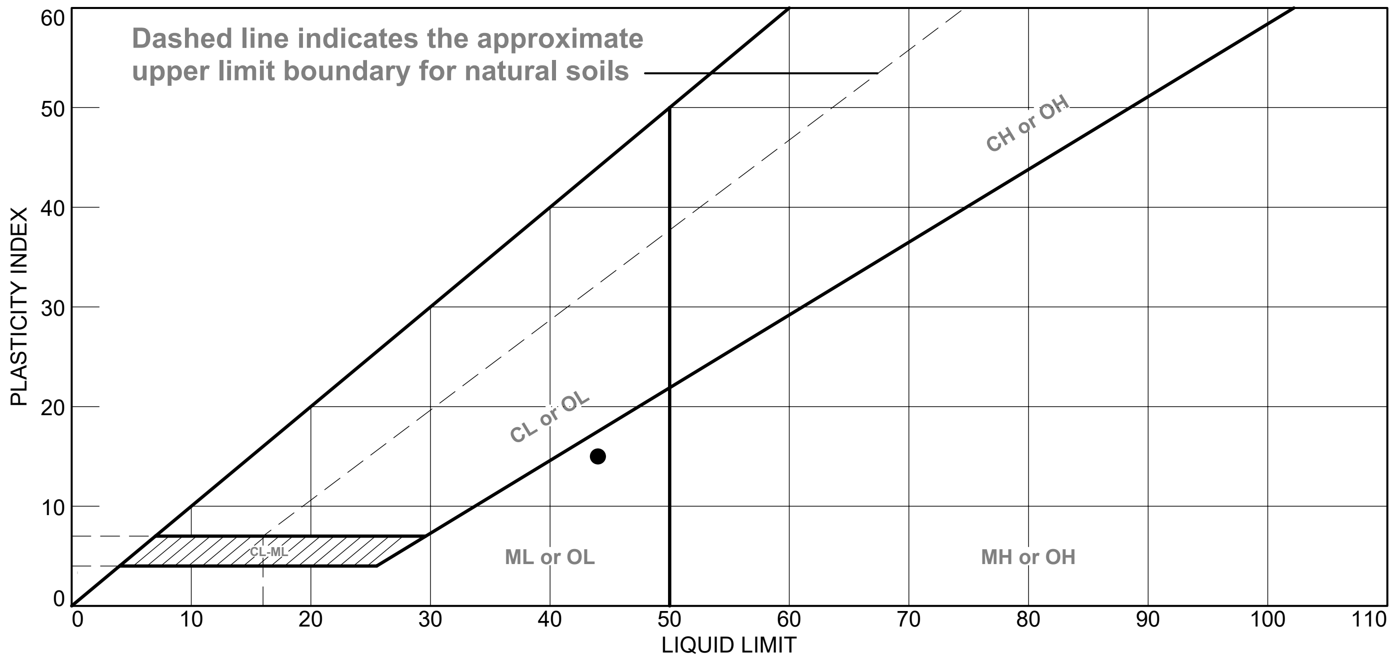
Terracon

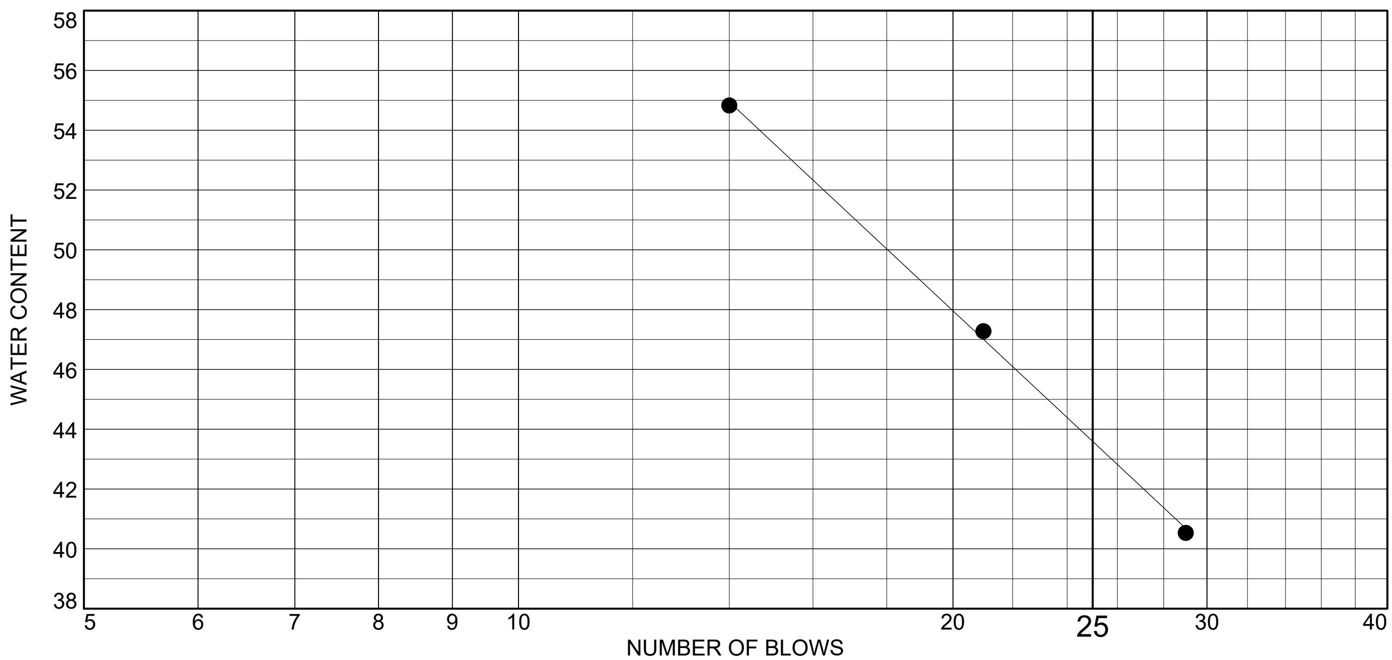
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	FILL: GRAY AND BLACK ORGANIC SILT	44	29	15			OL

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B005 **Depth:** 26.0'-27.0'
Sample Number: S-8A

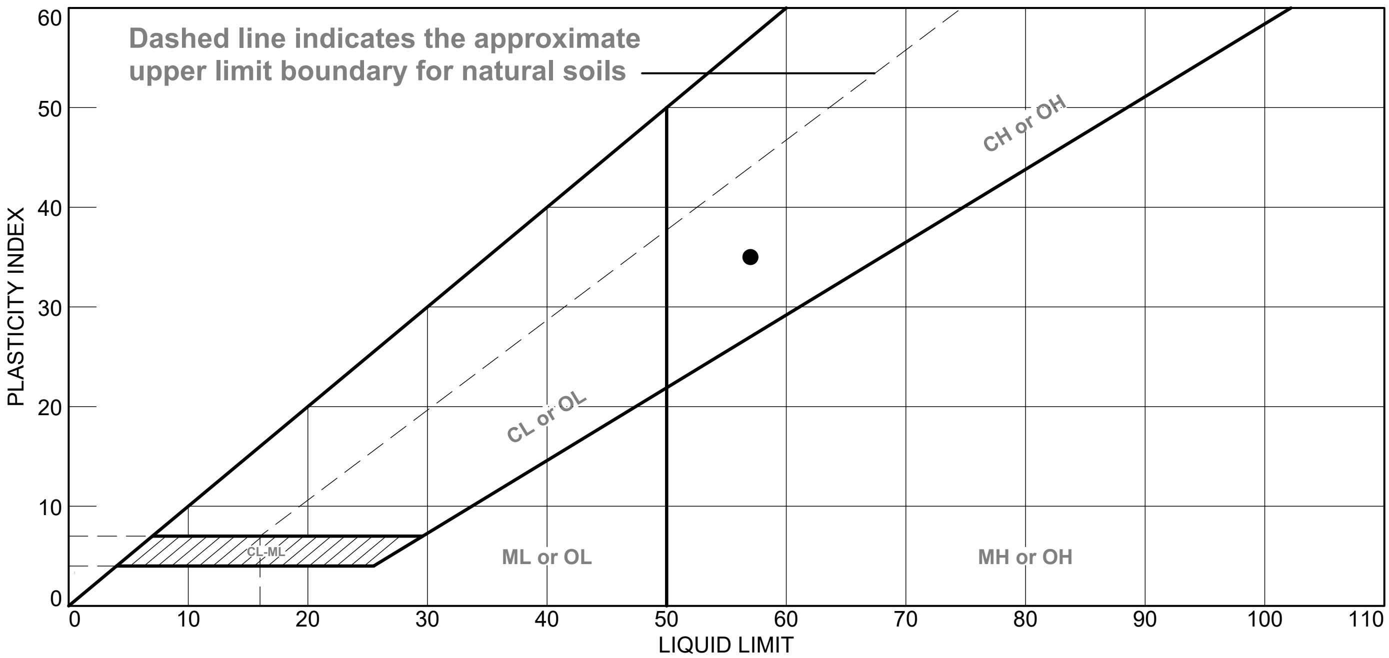
Terracon

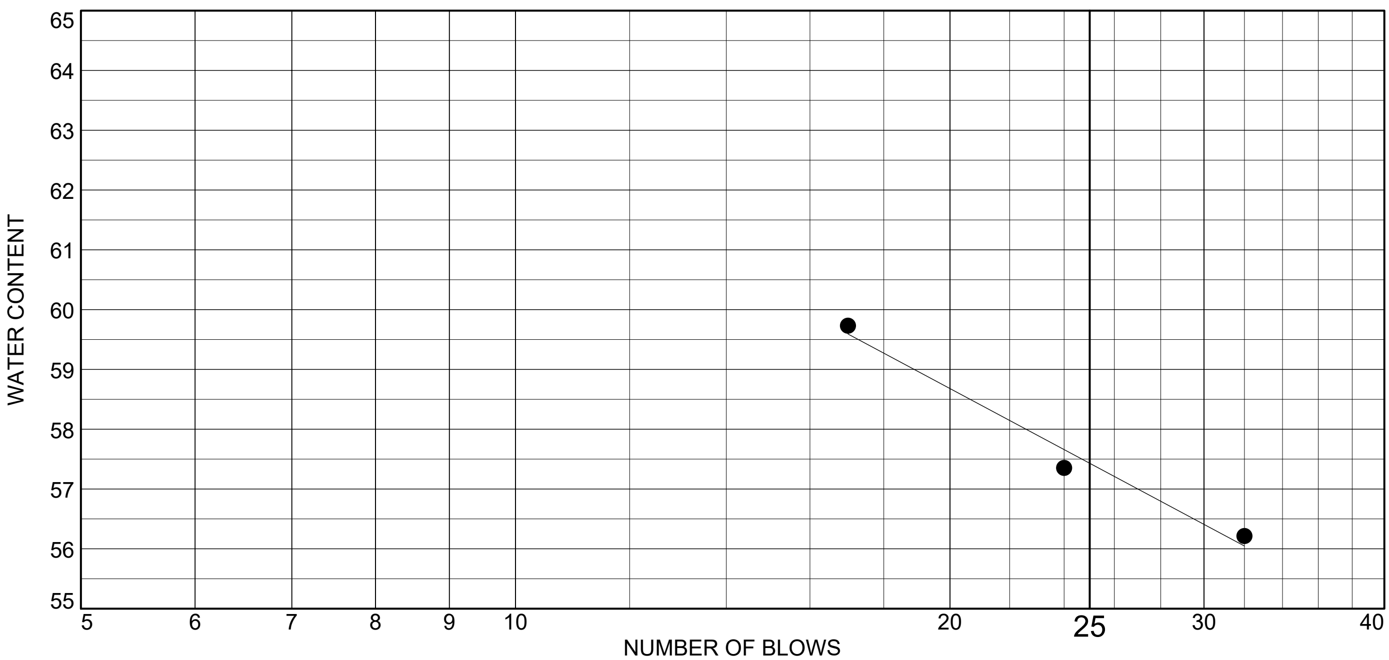
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	GRAY FAT CLAY SHELL - ORGANICS NOTED	57	22	35			CH

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B005 **Depth:** 41.0'-43.0'
Sample Number: S-11

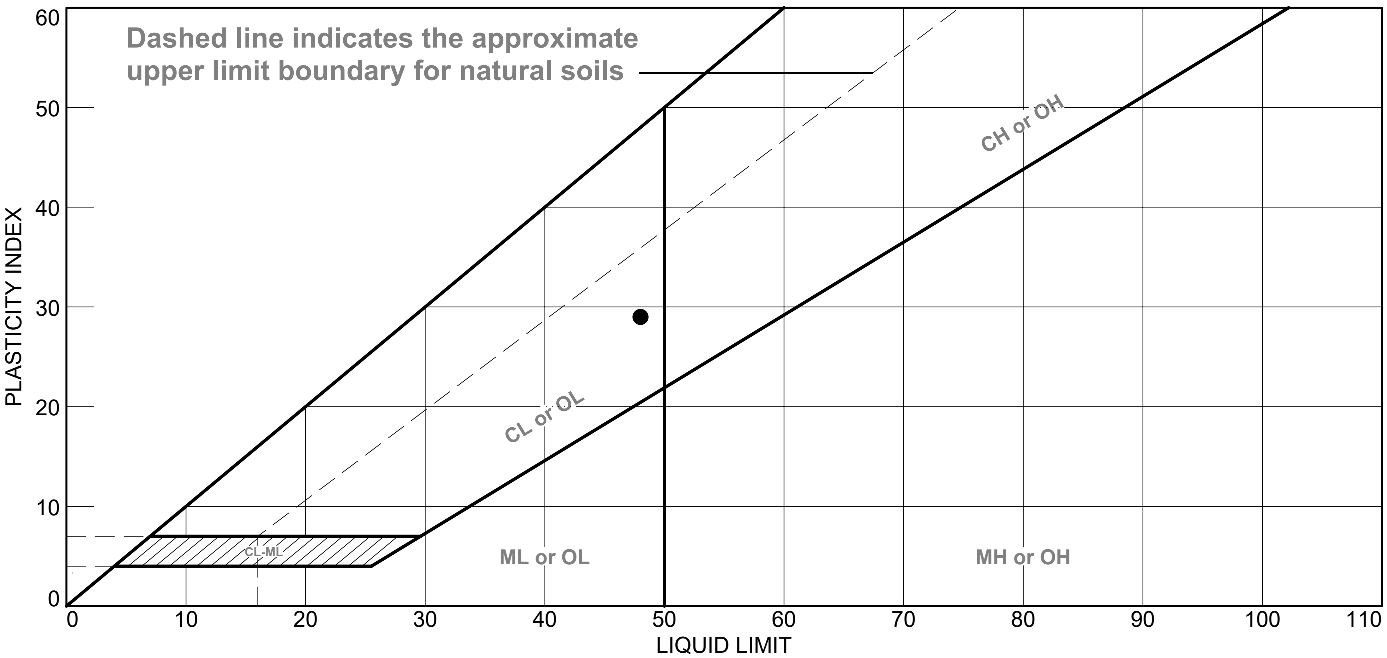
Terracon

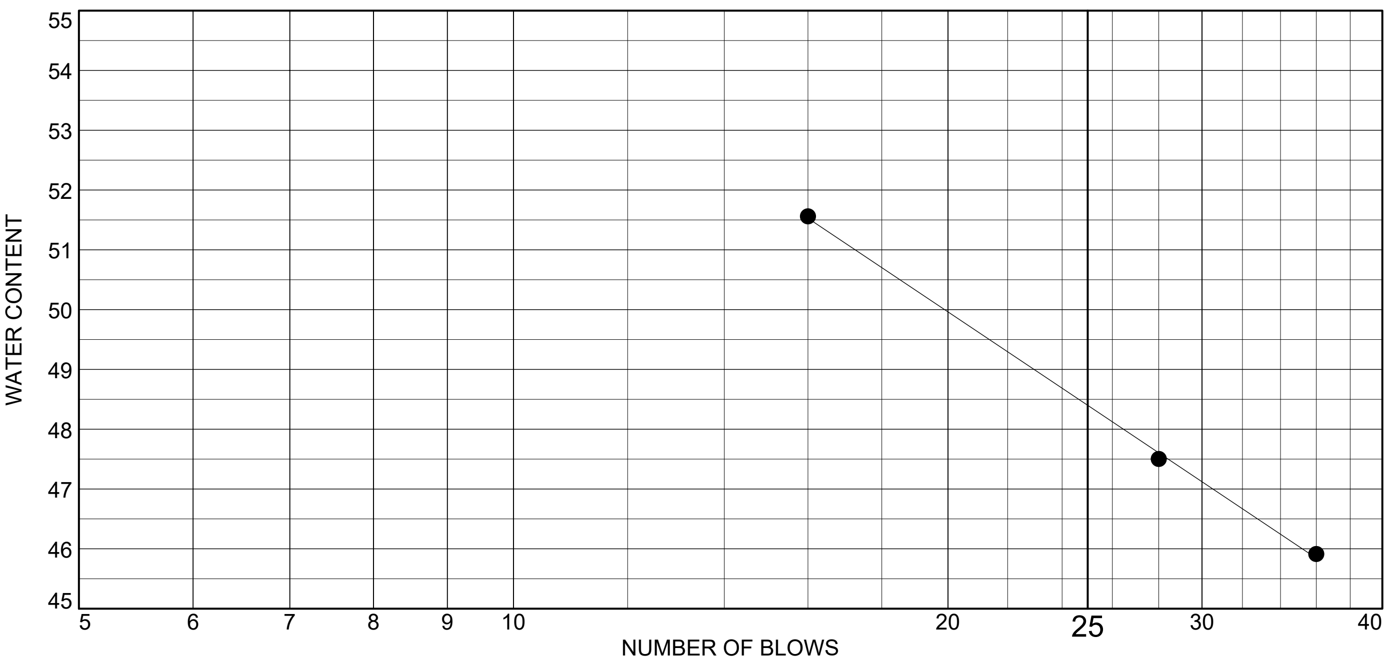
Remarks:

Figure

Tested By: SJH **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	GRAY AND DARK GRAY LEAN CLAY TRACE SAND	48	19	29			CL

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B006 **Depth:** 5.0'-6.5'
Sample Number: S-3

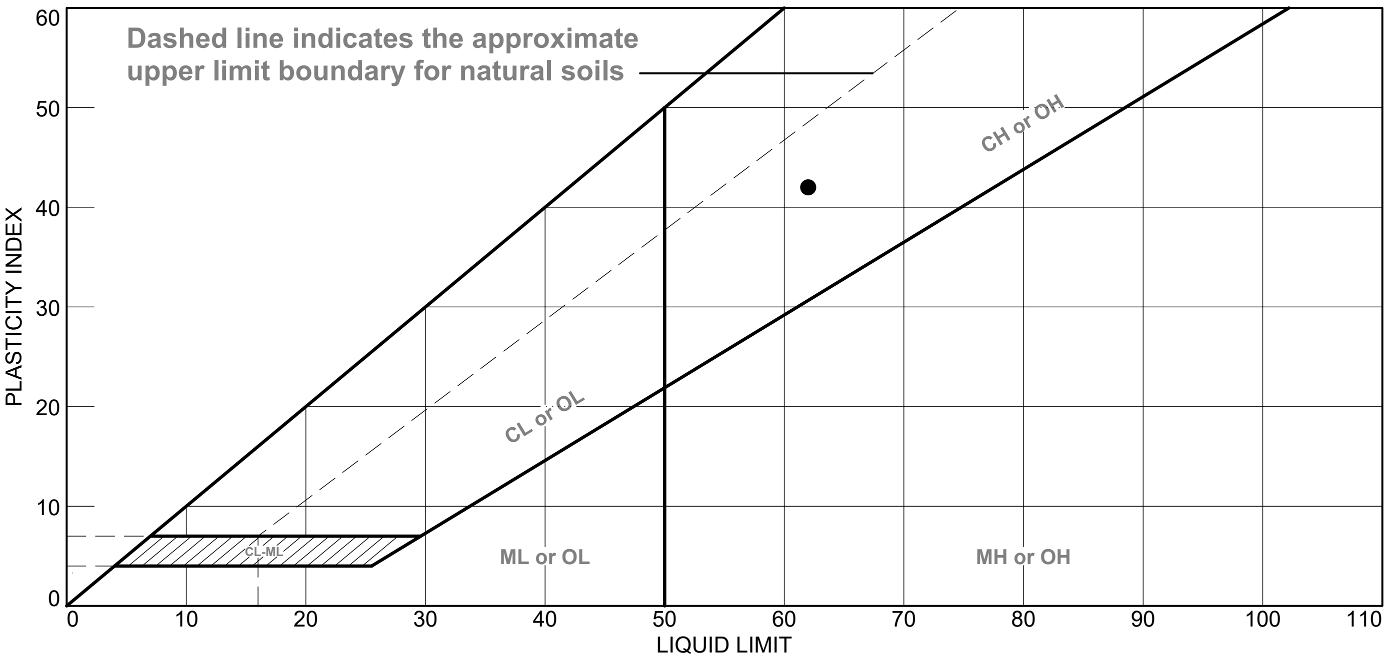
Terracon

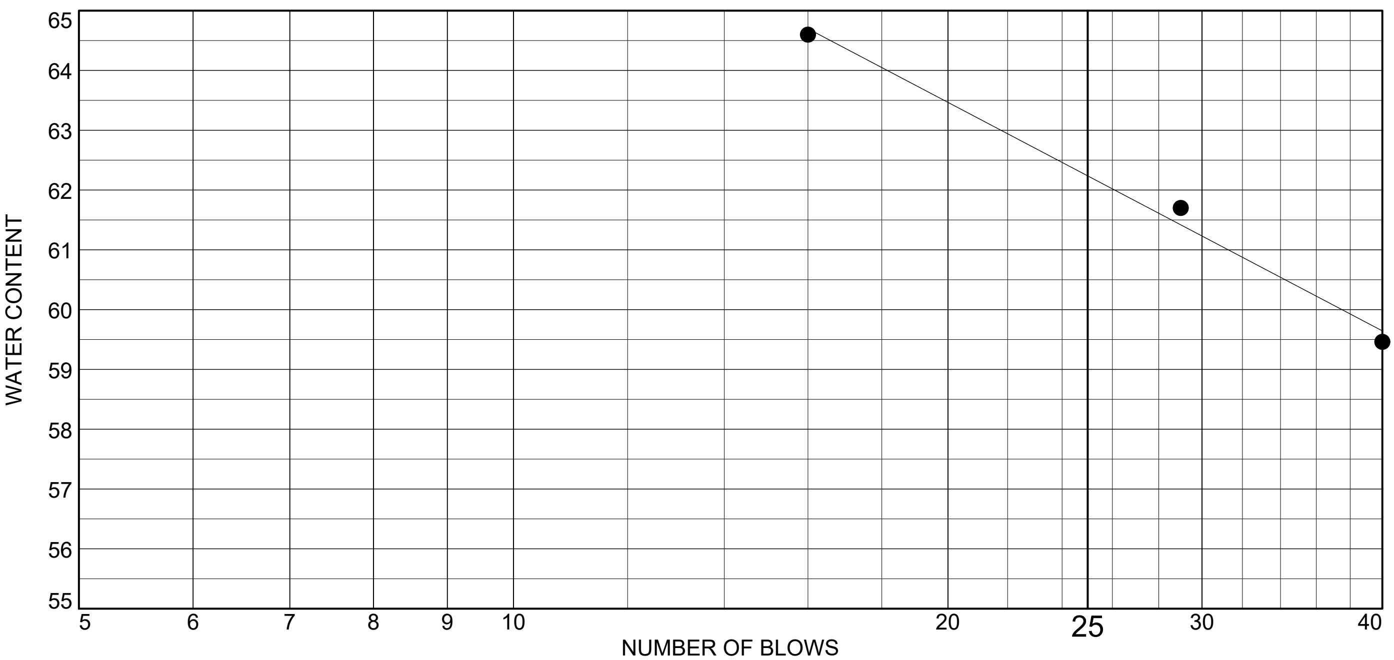
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	GRAY FAT CLAY WITH SAND	62	20	42			CH

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

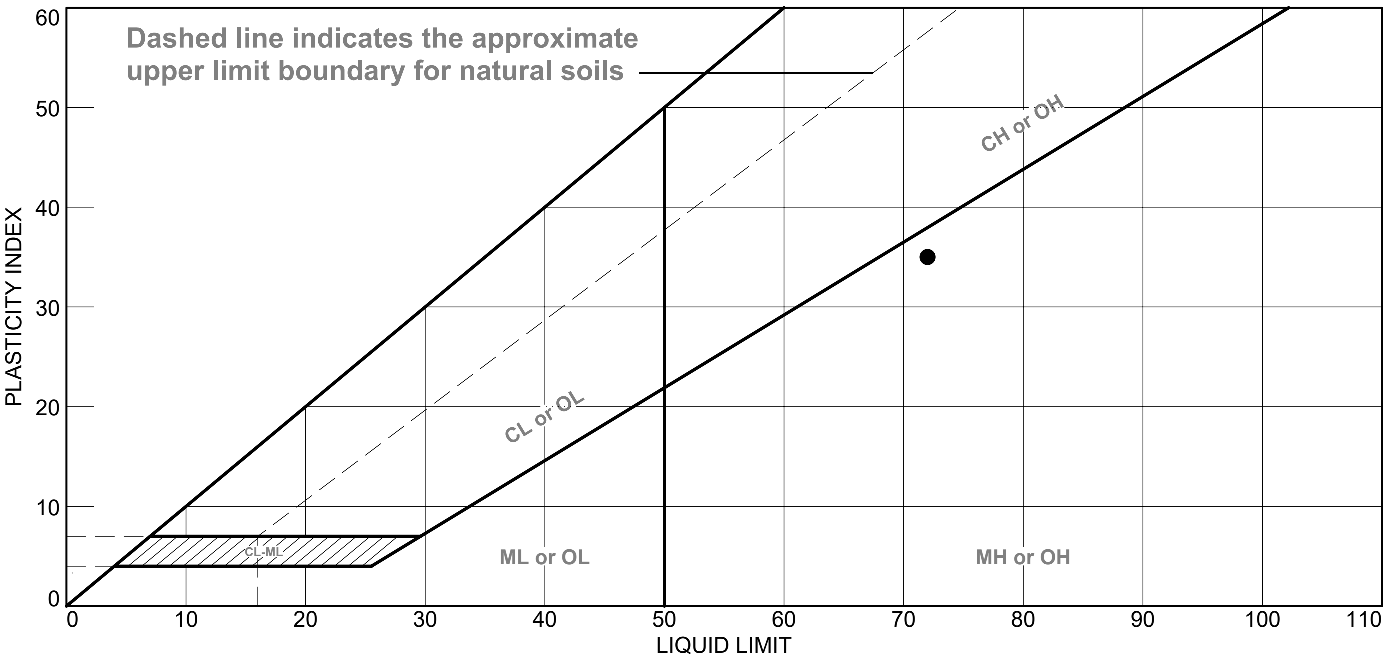
Source of Sample: EDW-B006 **Depth:** 13.0'-15.0'
Sample Number: S-6

Remarks:

Figure

Tested By: SJH **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	DARK GRAY ORGANIC SILT	72	37	35			OH

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B006 **Depth:** 26.0'-28.0'
Sample Number: S-9

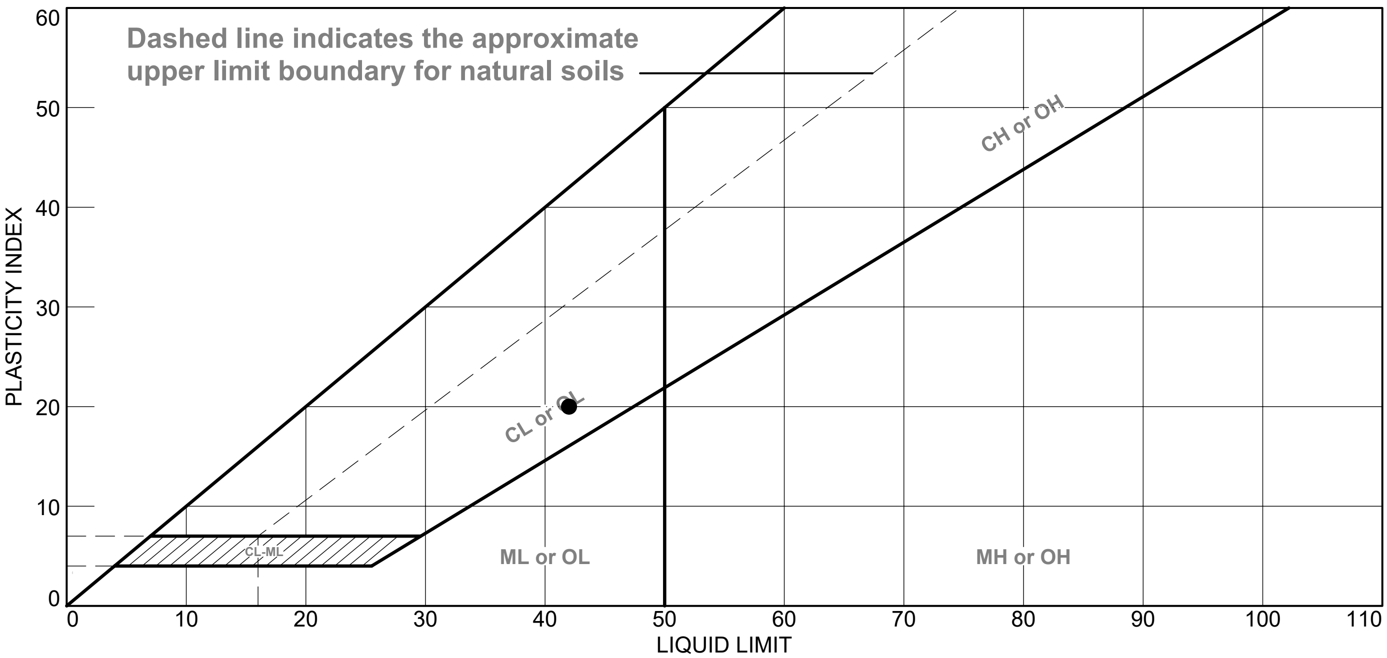
Terracon

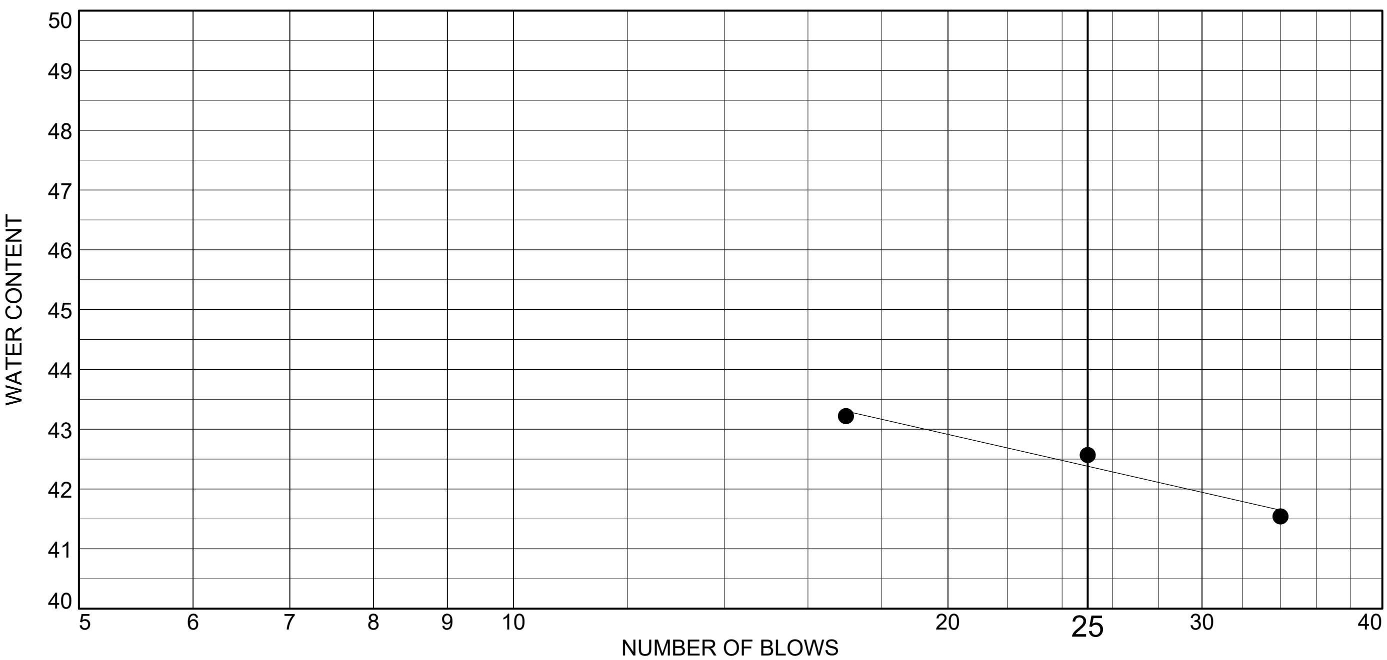
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	DARK BROWN LEAN CLAY WITH SAND	42	22	20			CL

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B008 **Depth:** 2.5'-4.0'
Sample Number: S-2

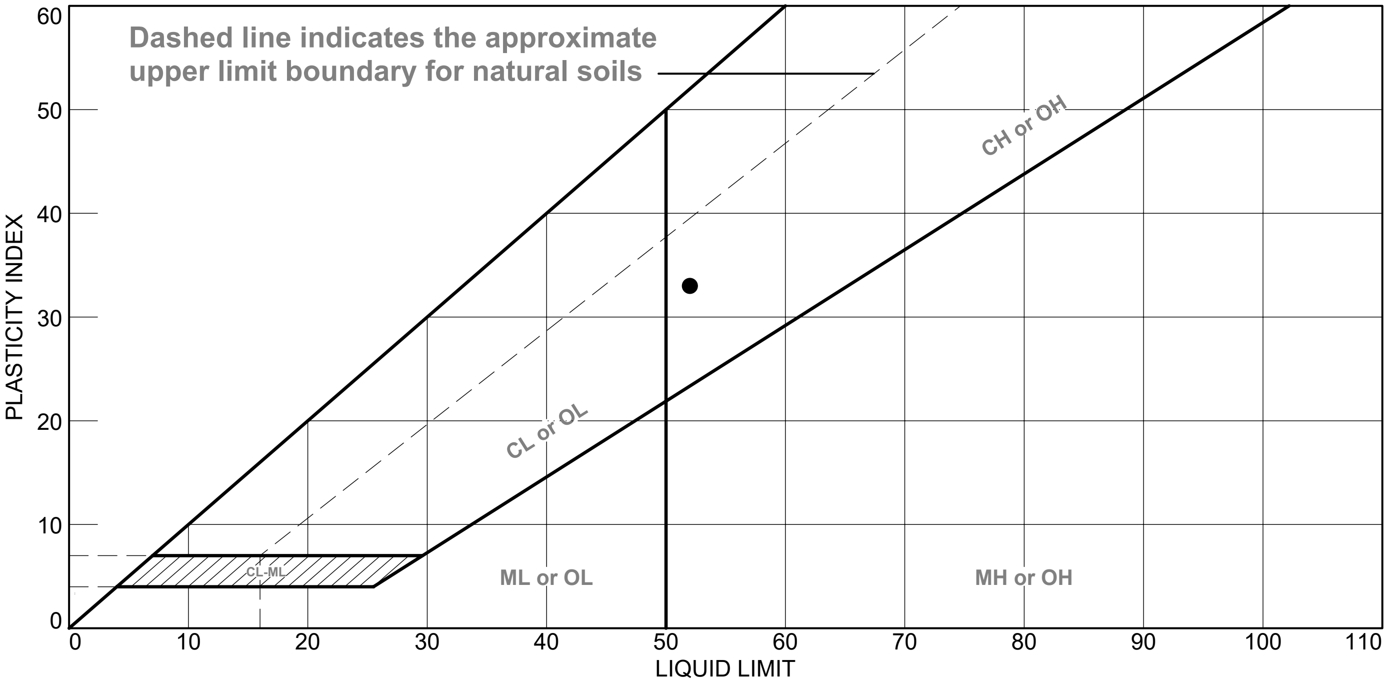
Terracon

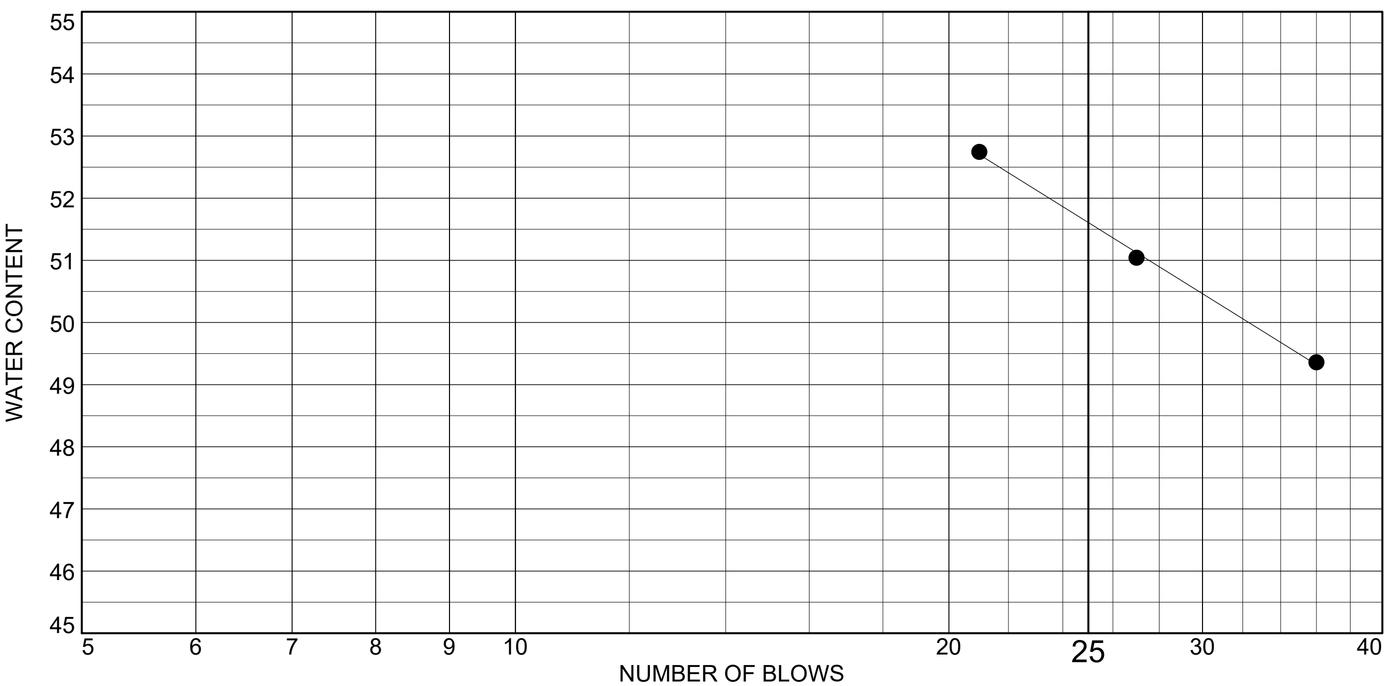
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	BROWN AND GRAY FAT CLAY WITH SAND	52	19	33			CH

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

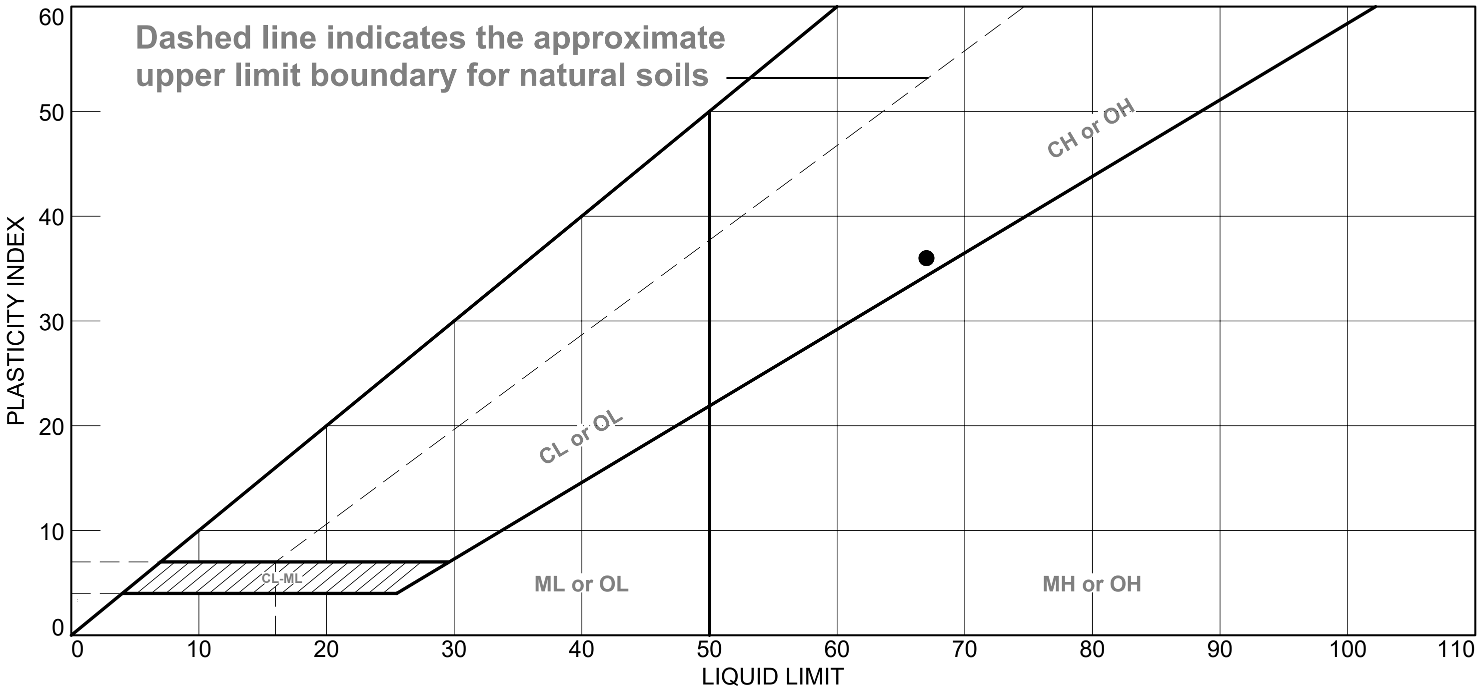
Source of Sample: EDW-B008 **Depth:** 11.0'-13.0'
Sample Number: S-5

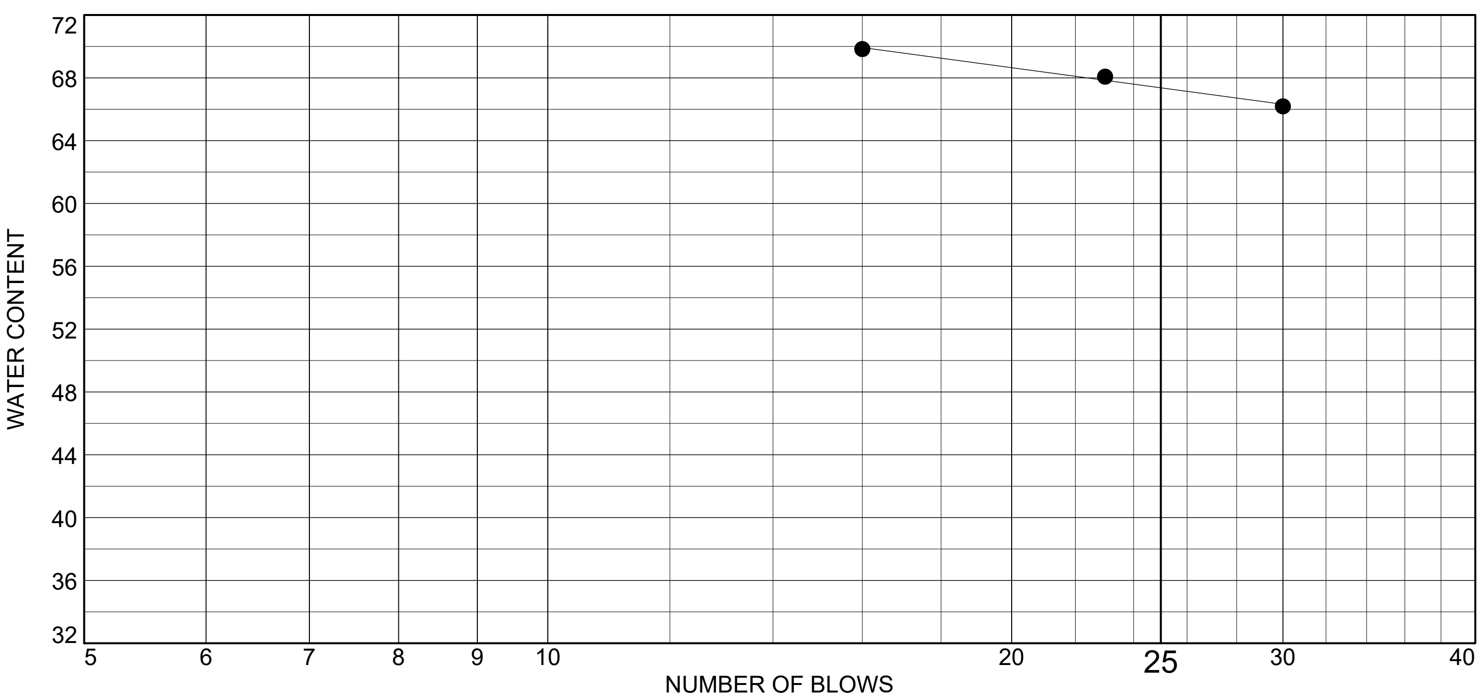
Terracon

Remarks:

Figure

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	DARK GRAY FAT CLAY SHELL - ORGANICS NOTED	67	31	36			CH

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B008 **Depth:** 24.0'-26.5'
Sample Number: S-8

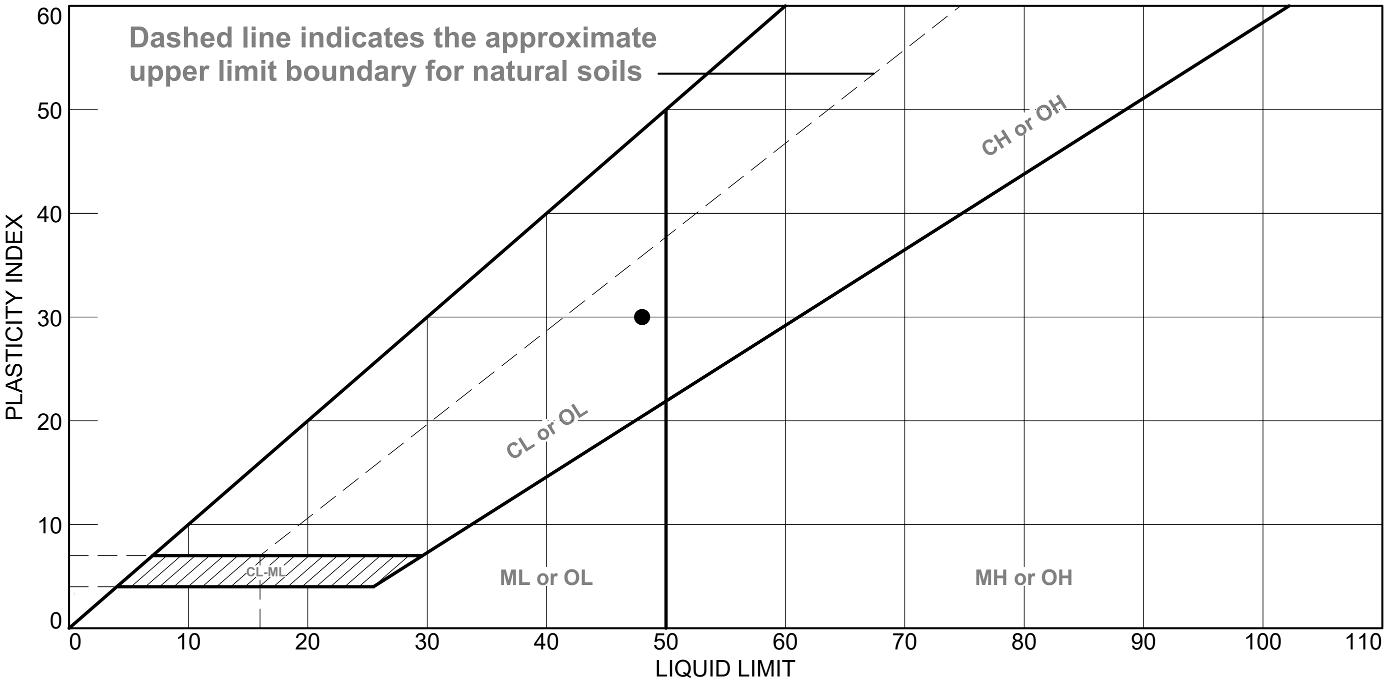
Terracon

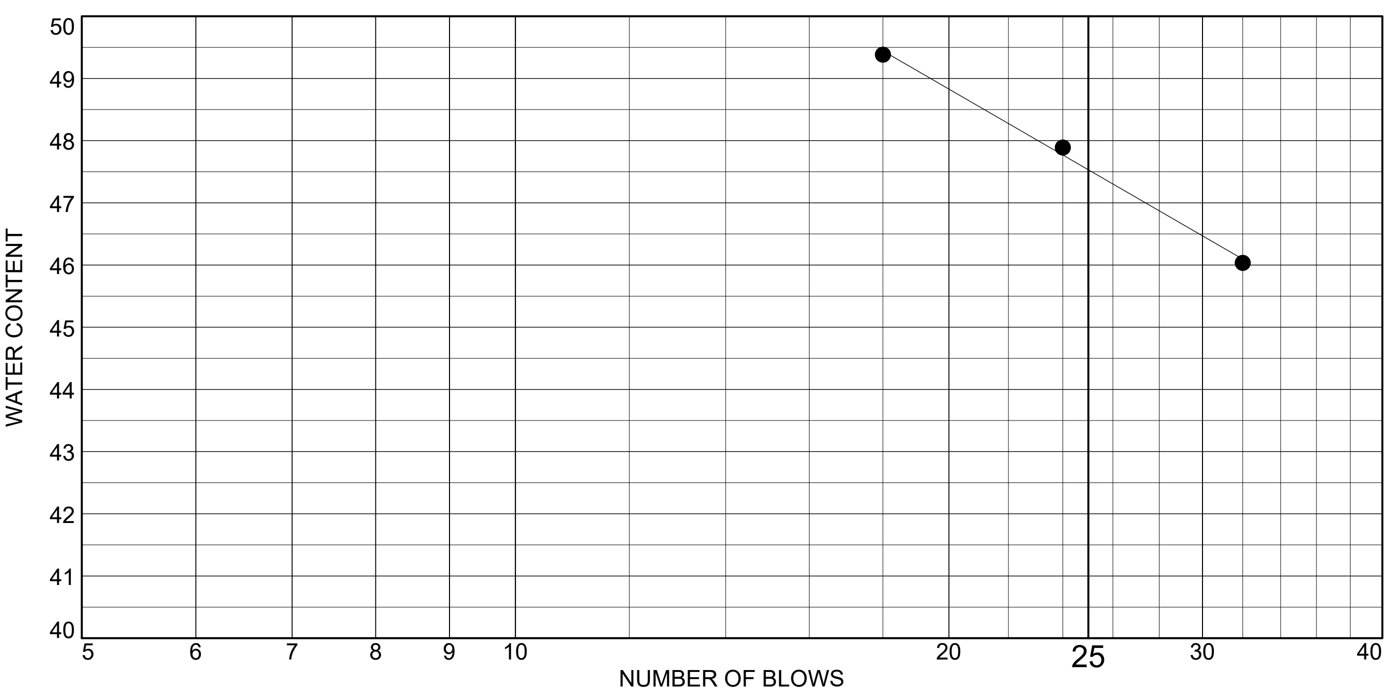
Remarks:

Figure

Tested By: SJH **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	BROWN AND GRAY MOTTLED LEAN CLAY	48	18	30			CL

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

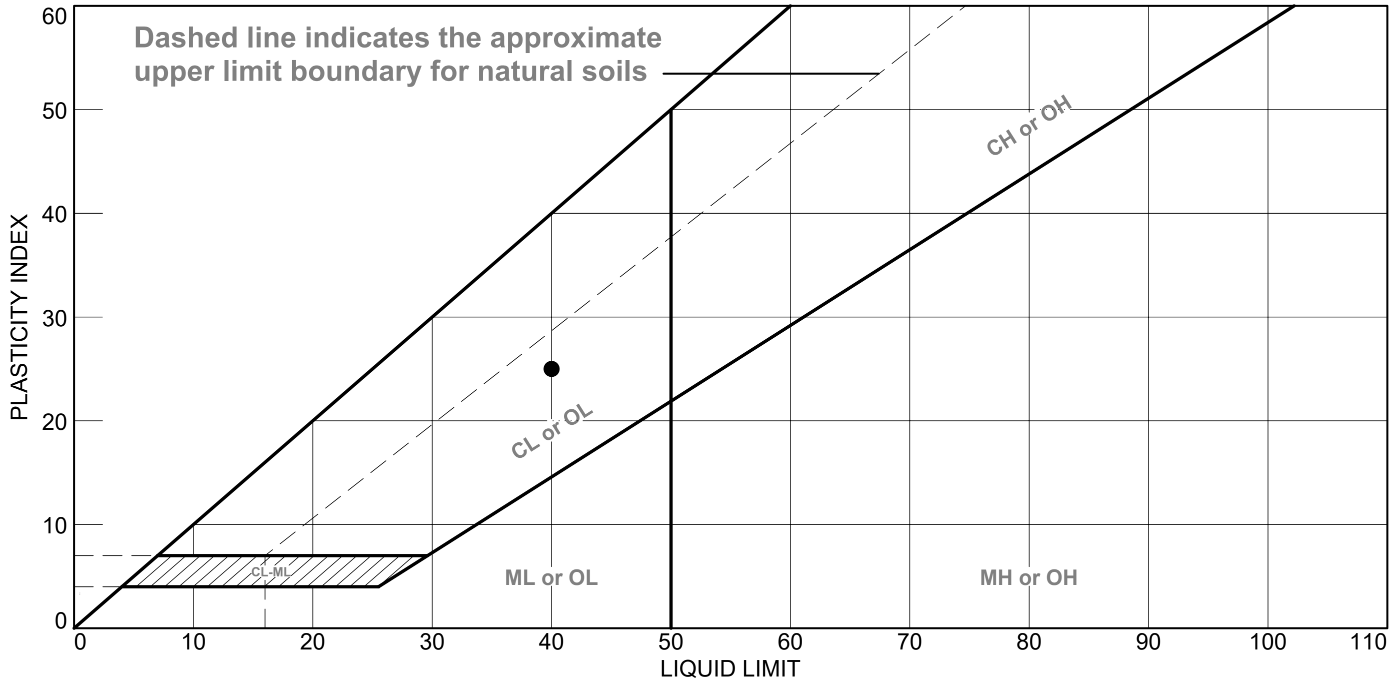
Source of Sample: EDW-B010 **Depth:** 15.0'-17.0'
Sample Number: S-7

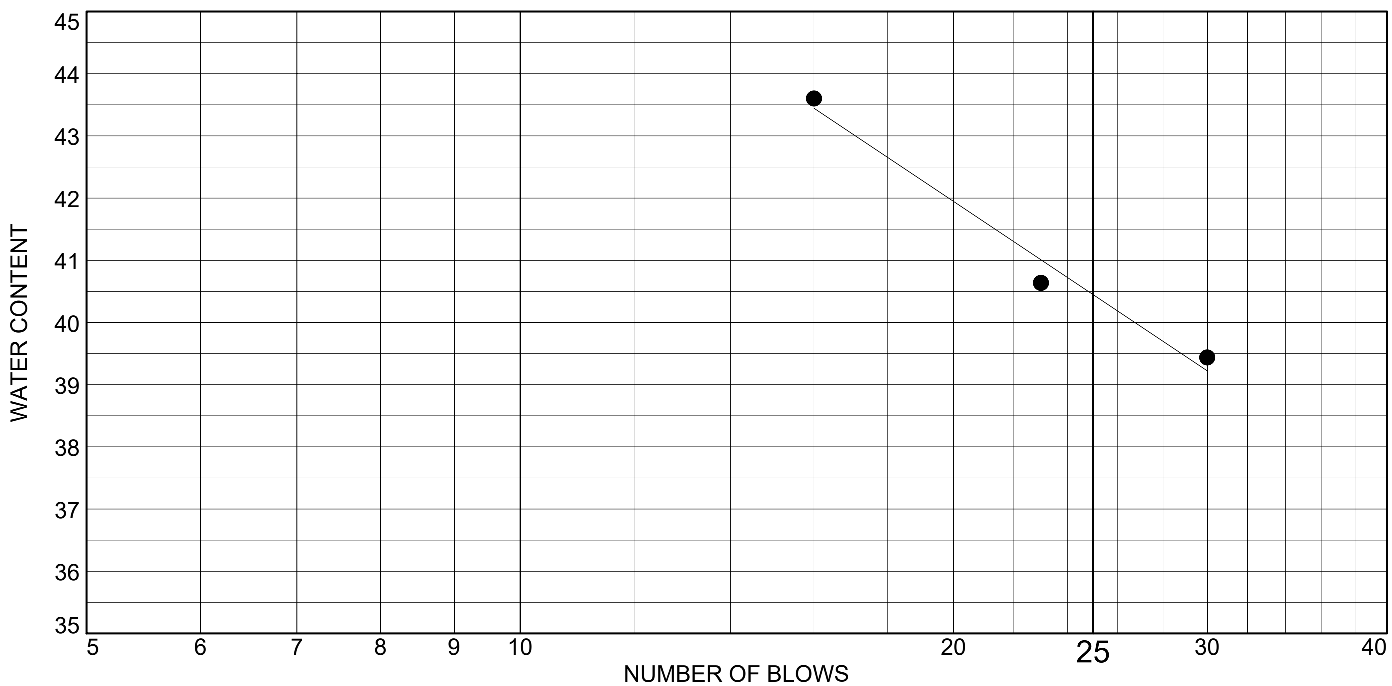
Terracon

Remarks:

Figure

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	BLUISH GRAY LEAN CLAY	40	15	25			CL

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

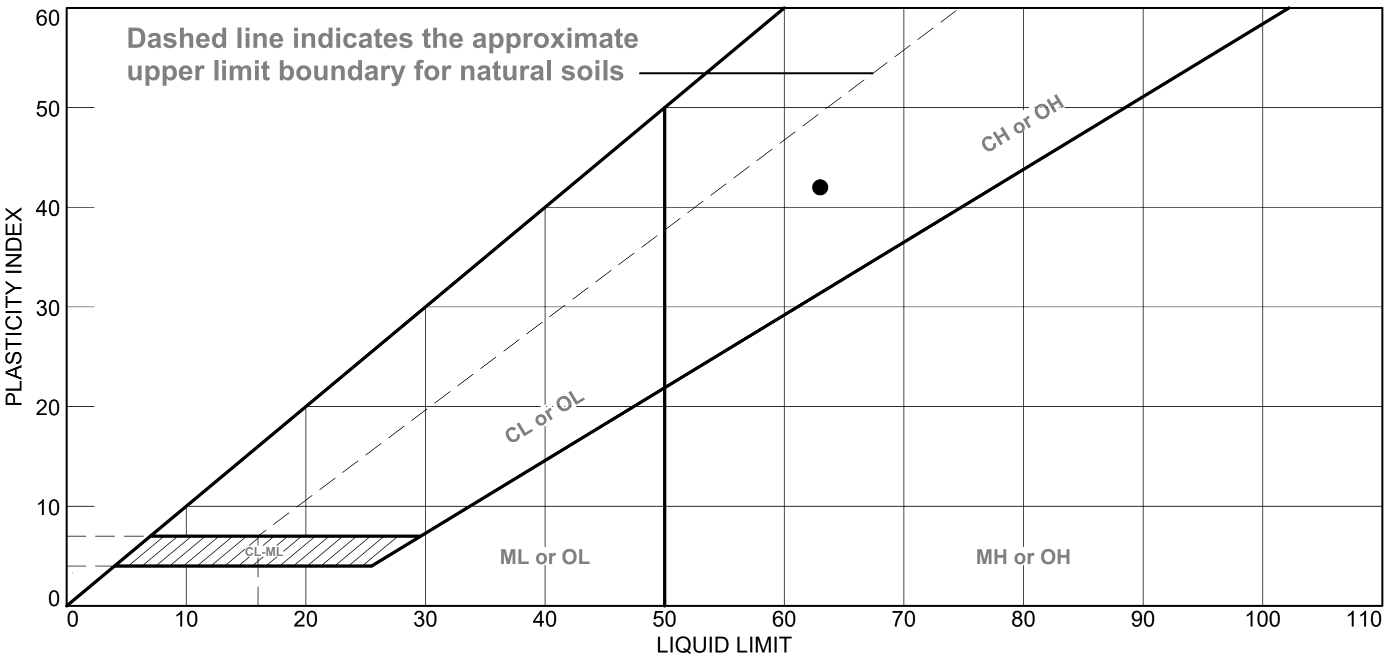
Source of Sample: EDW-B010 **Depth:** 30.0'-32.0'
Sample Number: S-10

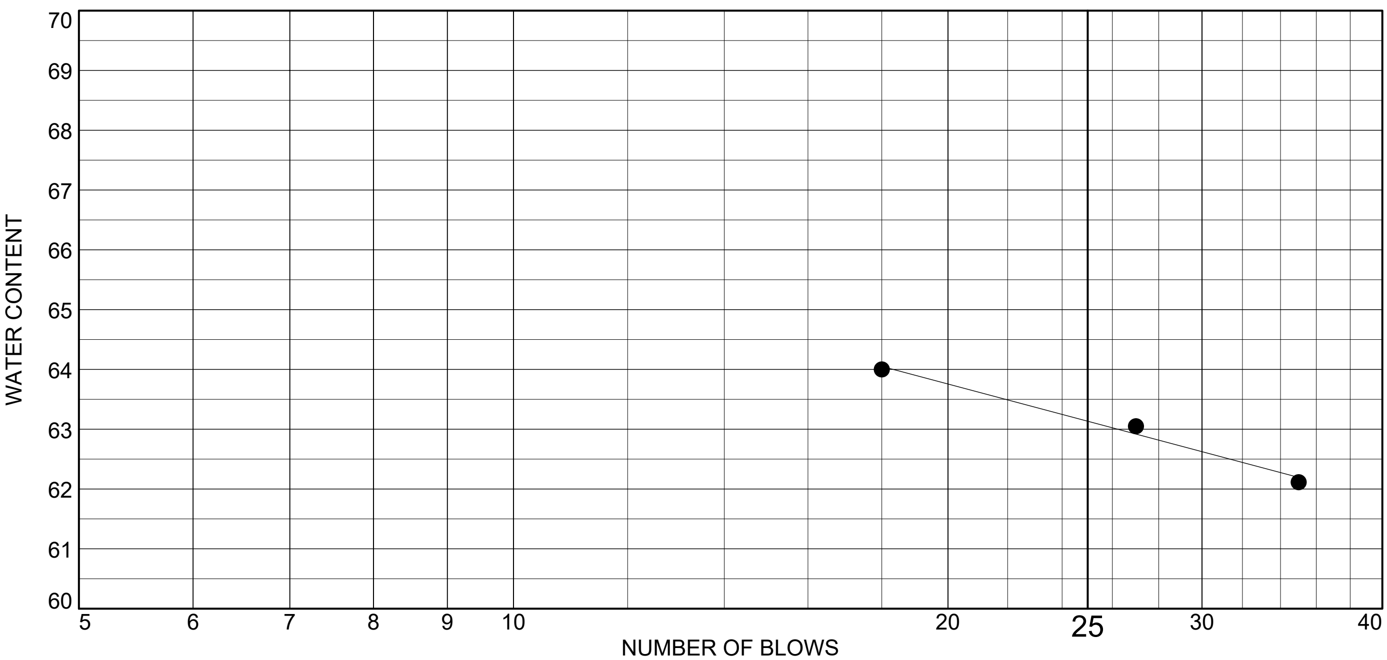
Terracon

Remarks:

Figure

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	GRAYISH BROWN FAT CLAY WITH SAND	63	21	42			CH

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

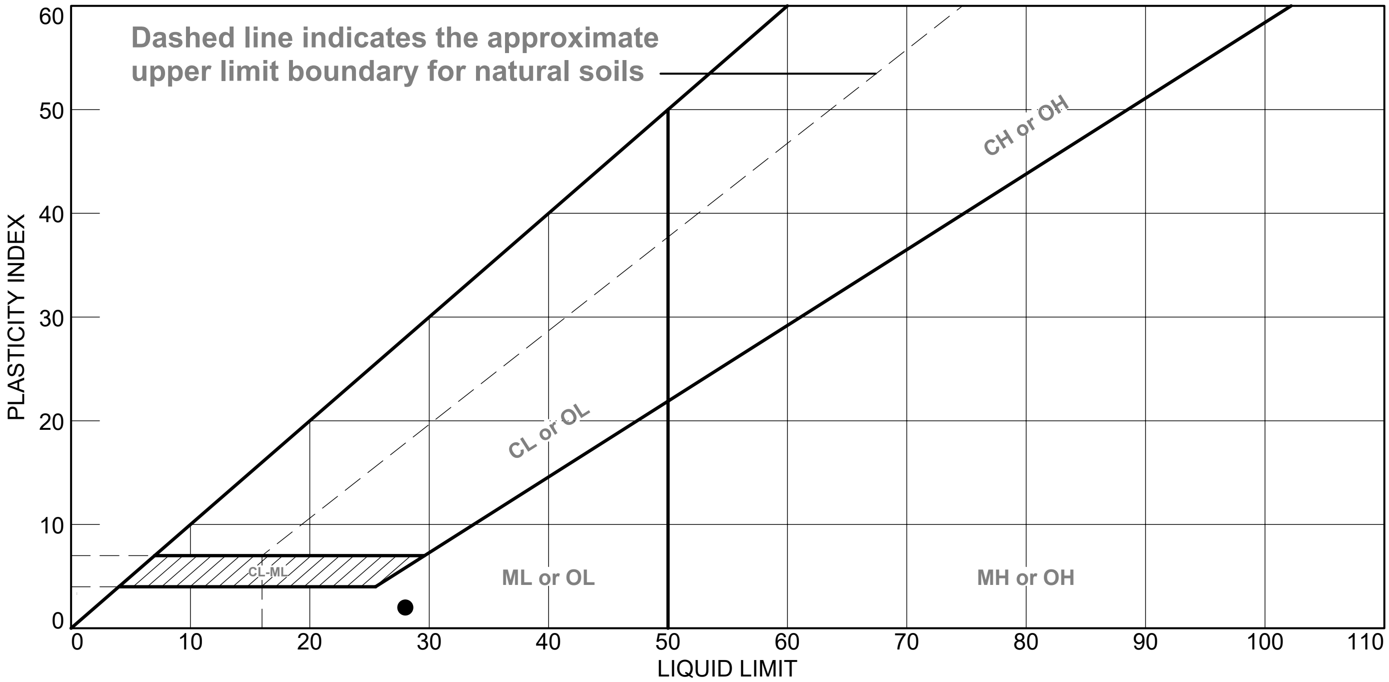
Source of Sample: EDW-B011 **Depth:** 45.0'-46.5'
Sample Number: S-14

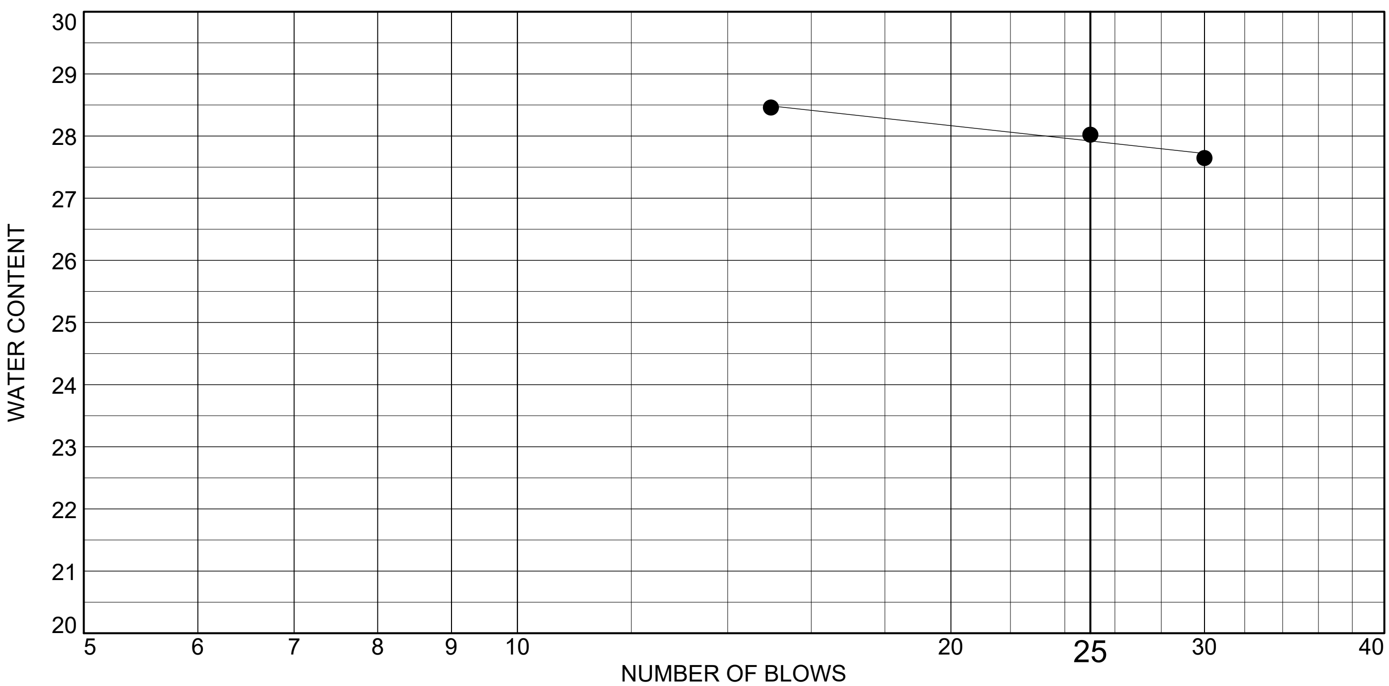
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	FILL: DARK GRAY FLY ASH	28	26	2			

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

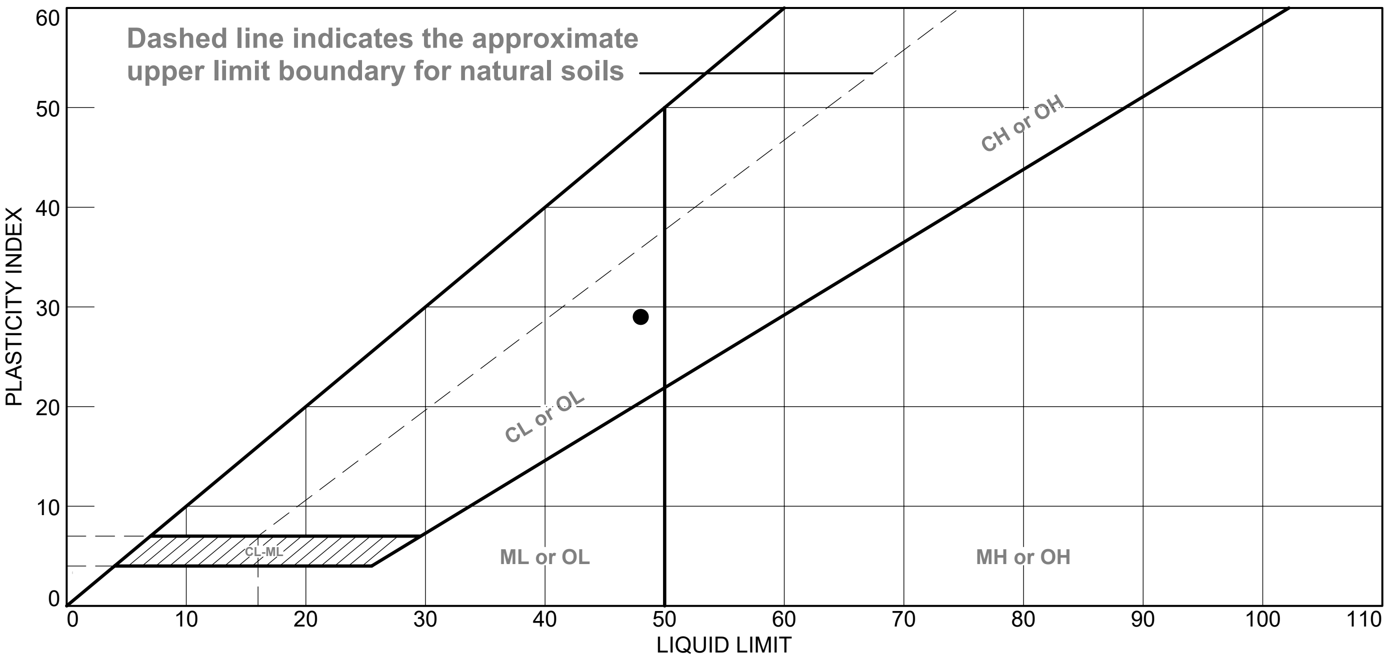
Source of Sample: EDW-B012 **Depth:** 2.5'-4.0'
Sample Number: S-2

Terracon

Remarks:

Figure

LIQUID AND PLASTIC LIMITS ASTM D4318



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	BROWN AND RUST BROWN MOTTLED LEAN CLAY	48	19	29			CL

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B012 **Depth:** 15.0'-16.5'
Sample Number: S-7

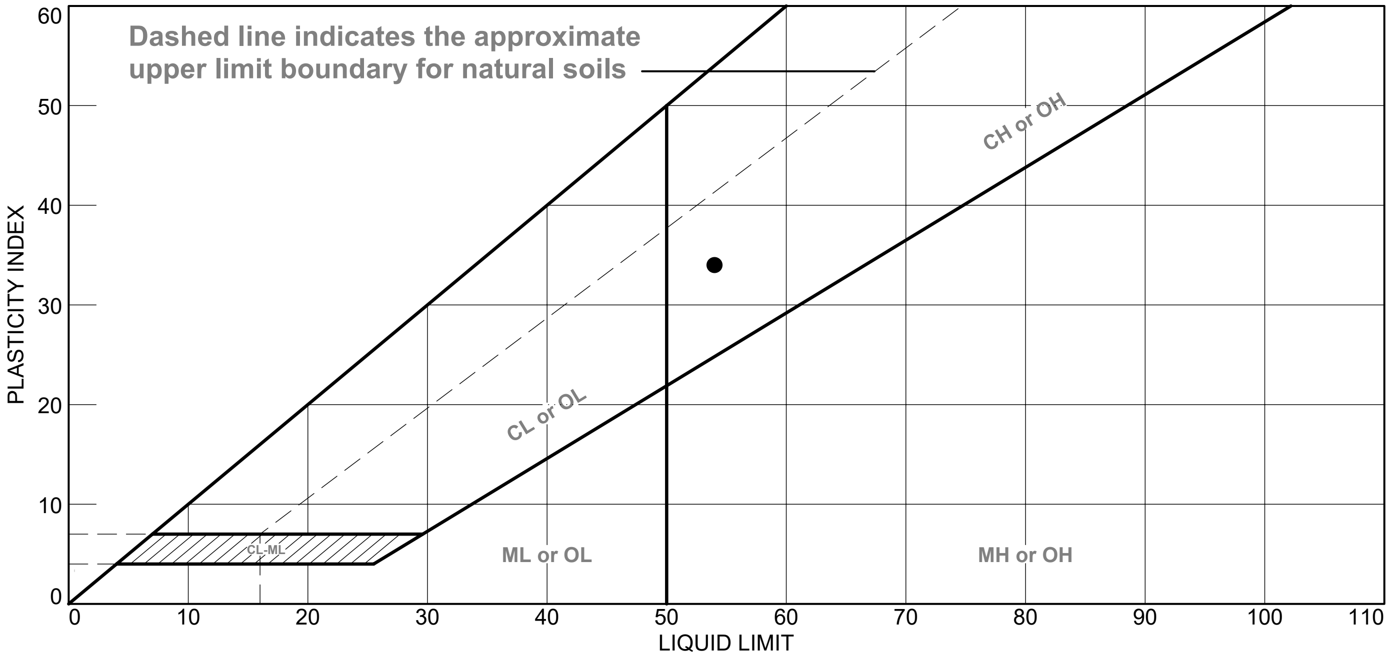
Terracon

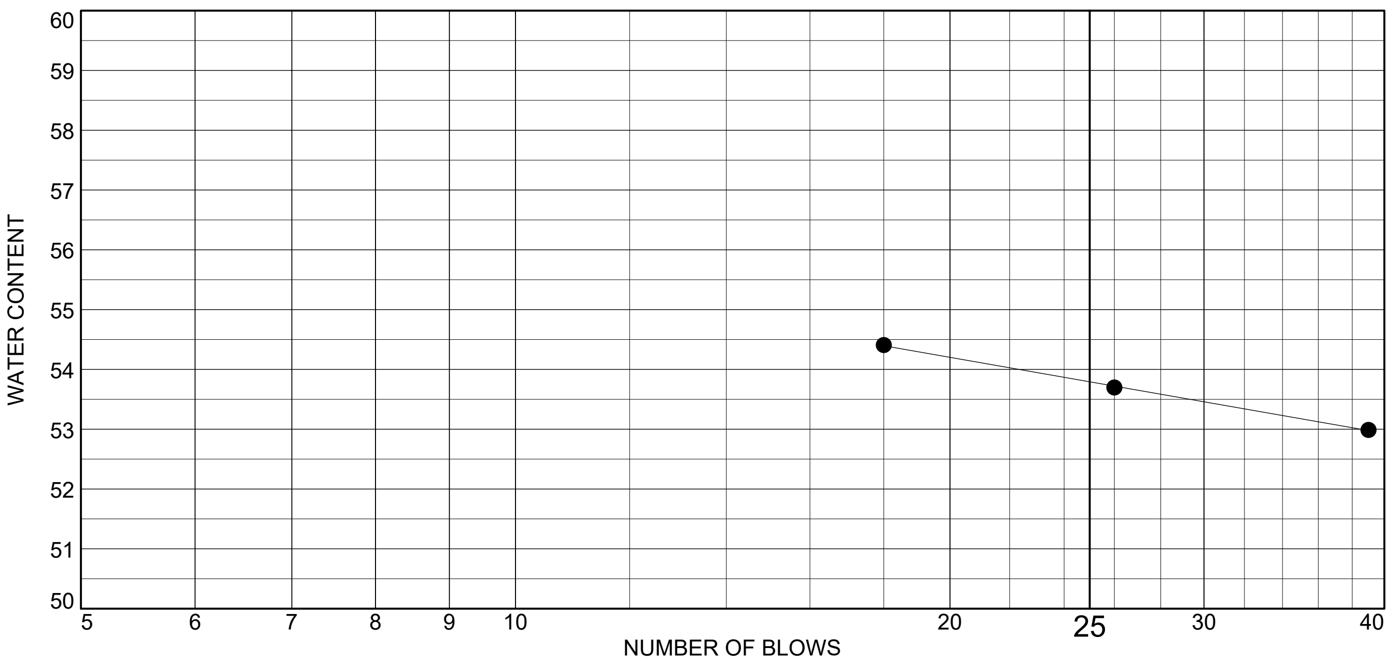
Remarks:

Figure

Tested By: SJH **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	DARK GRAY FAT CLAY	54	20	34			CH

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B012 **Depth:** 47.0'-49.0'
Sample Number: S-14

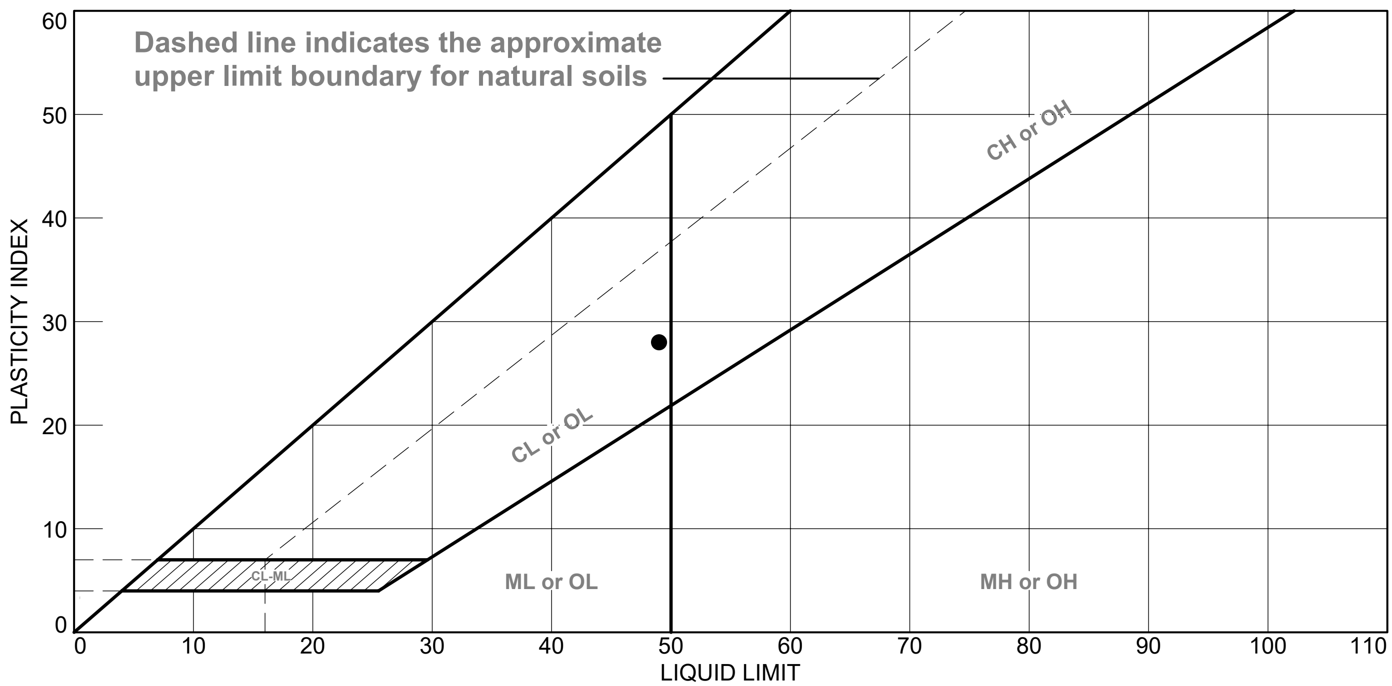
Terracon

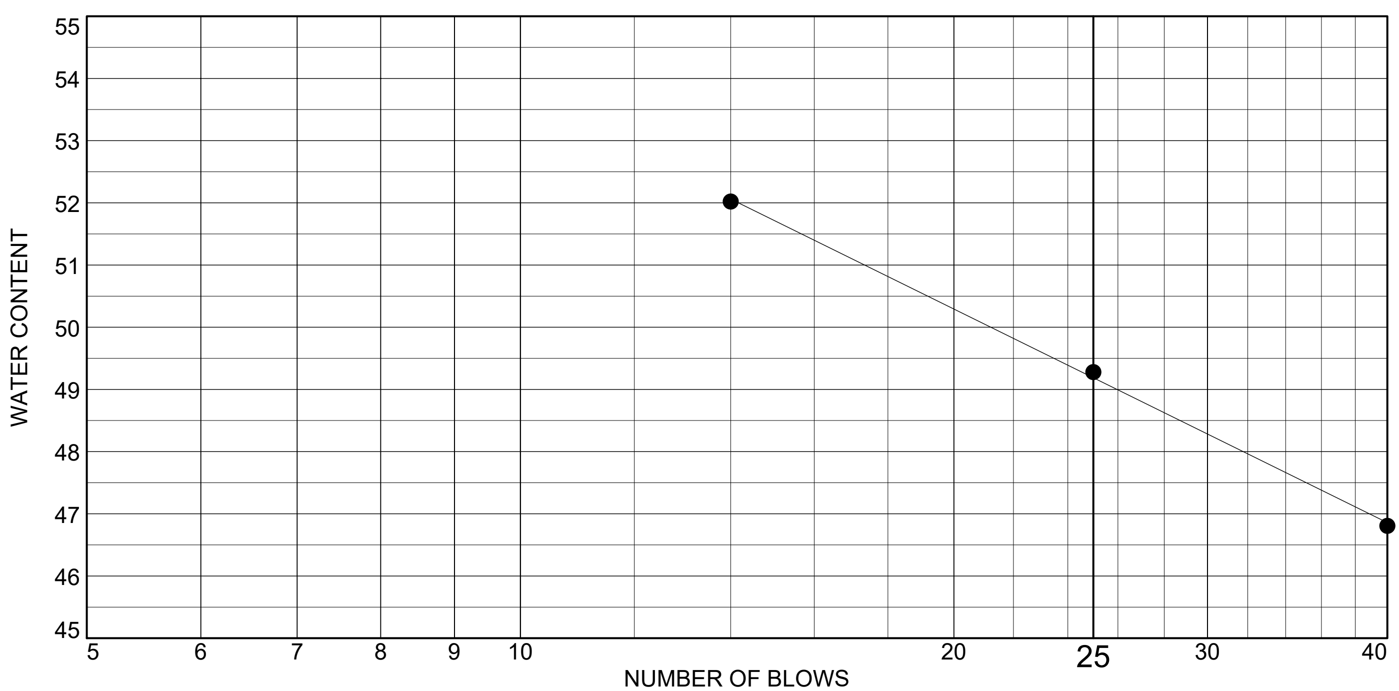
Remarks:

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	BROWNISH GRAY LEAN CLAY WITH SAND AND GRAVEL	49	21	28			CL

Project No. MR155218 **Client:** DYNERGY

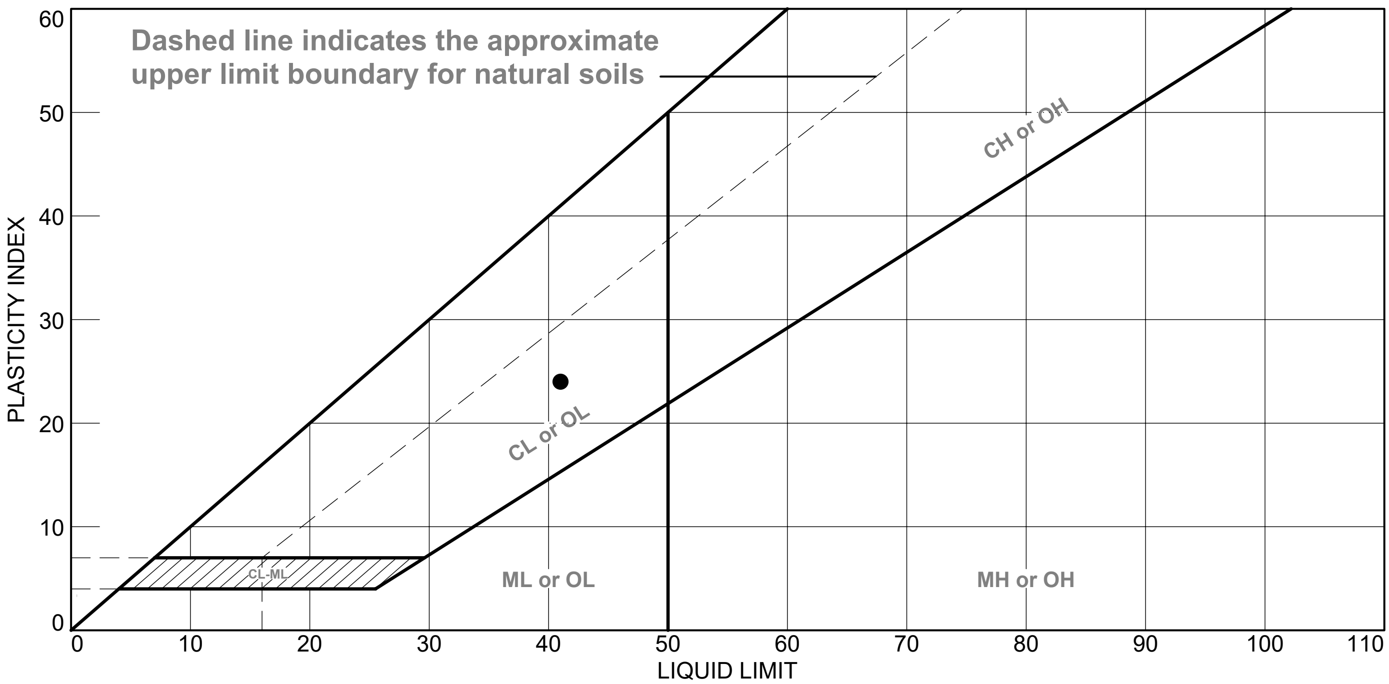
Project: DYNERGY - EDWARDS SITE

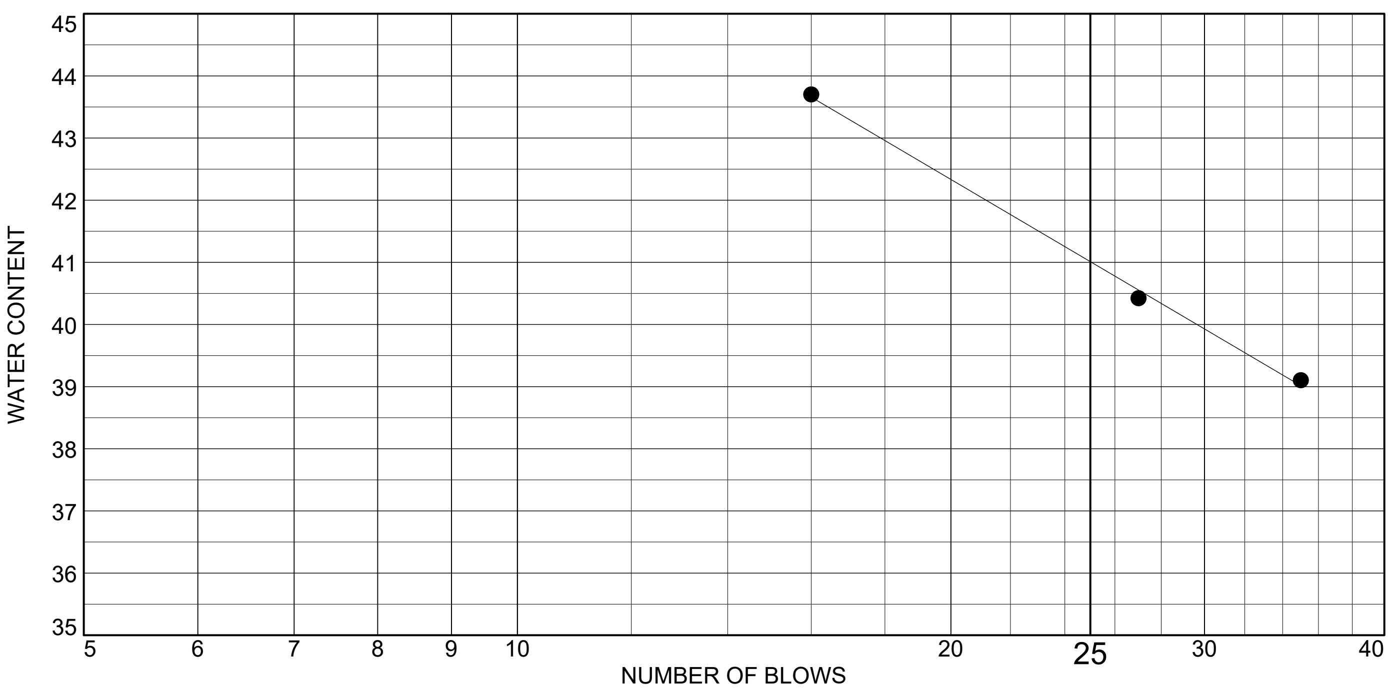
Source of Sample: EDW-B013 **Depth:** 6.0'-8.0'
Sample Number: S-3

Remarks:

Figure

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	DARK GRAY AND BROWNISH GRAY LEAN CLAY	41	17	24			CL

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

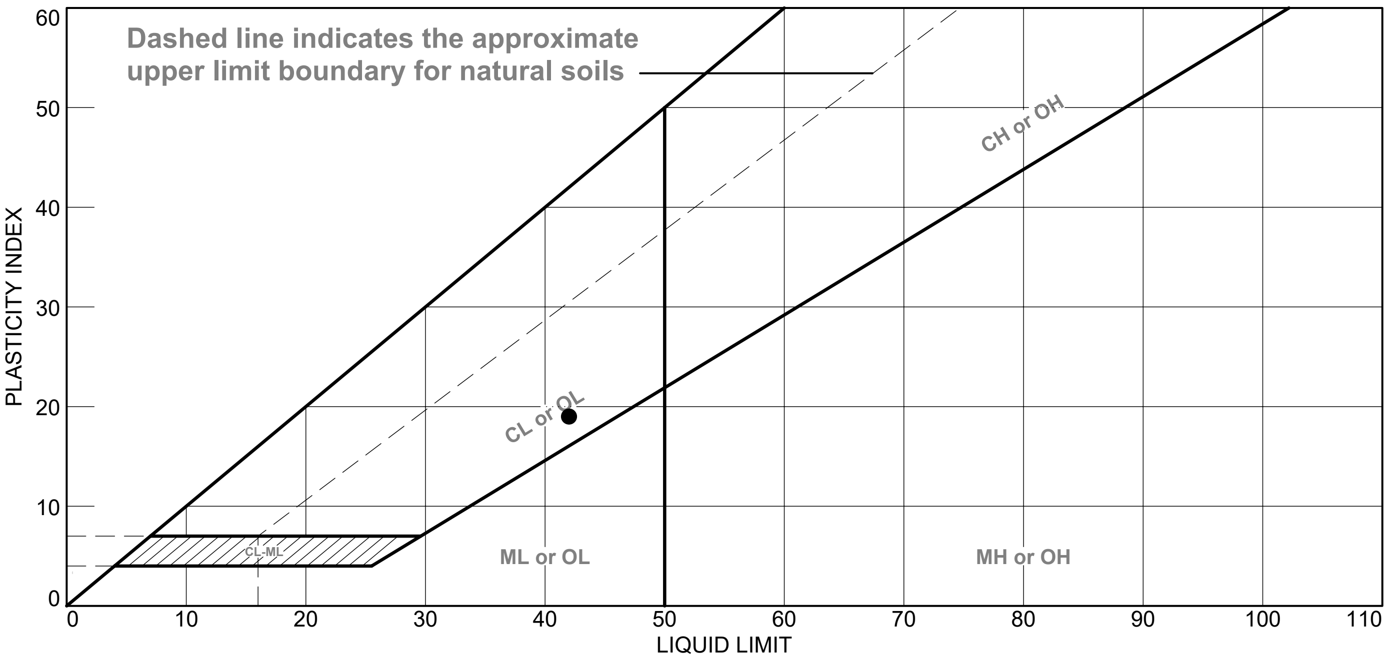
Source of Sample: EDW-B013 **Depth:** 15.0'-16.5'
Sample Number: S-6

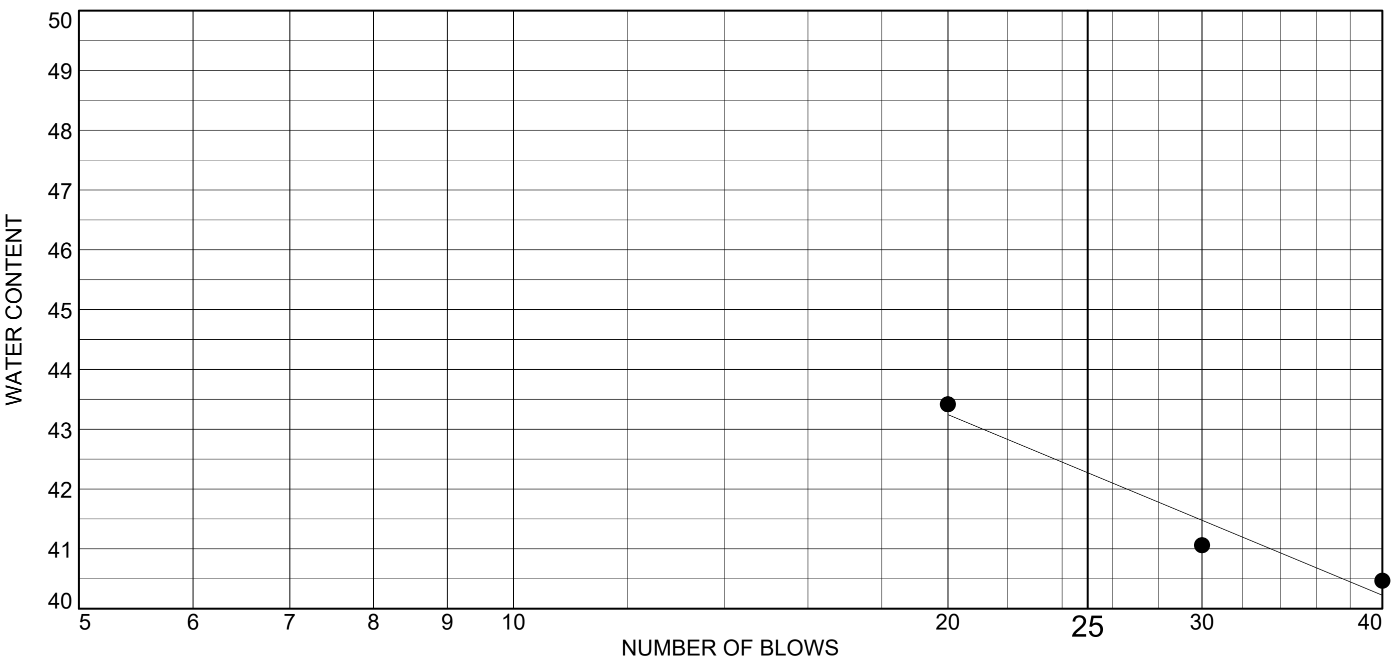
Terracon

Remarks:

Figure

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	GRAY AND BROWN LEAN CLAY WITH SAND	42	23	19			CL

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B013 **Depth:** 32.0'-34.0'
Sample Number: S-10

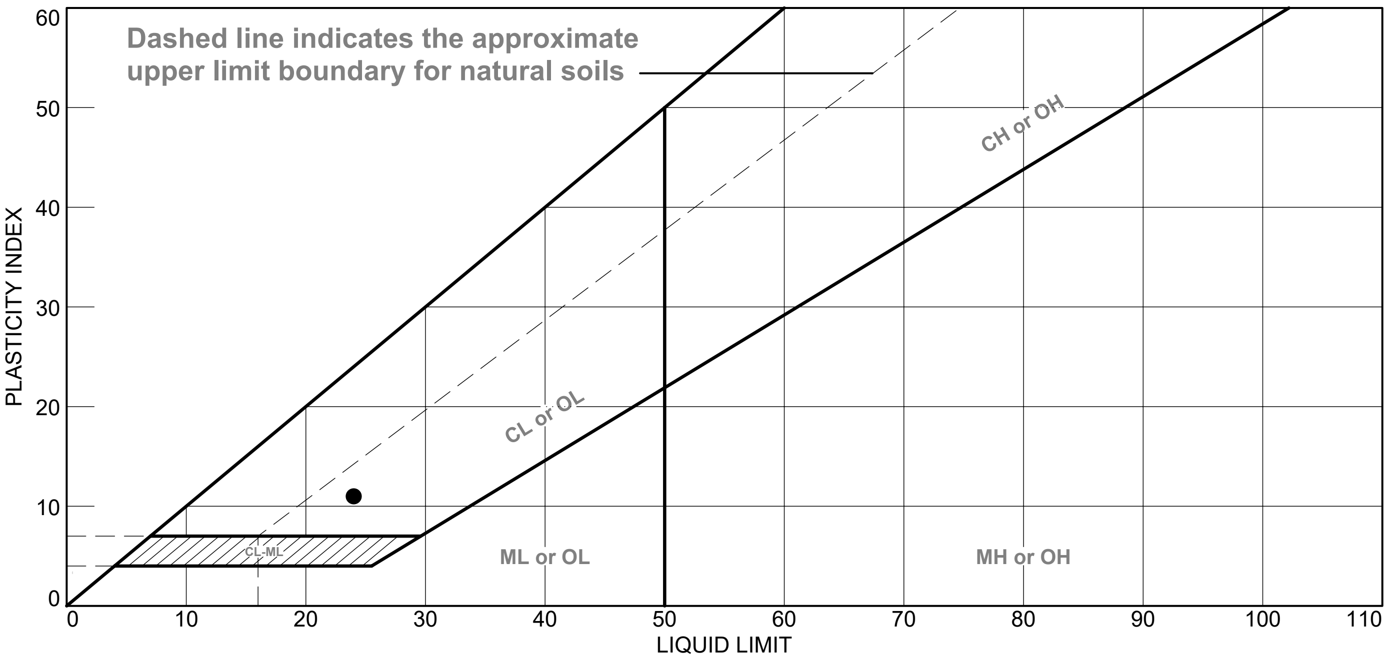
Remarks:

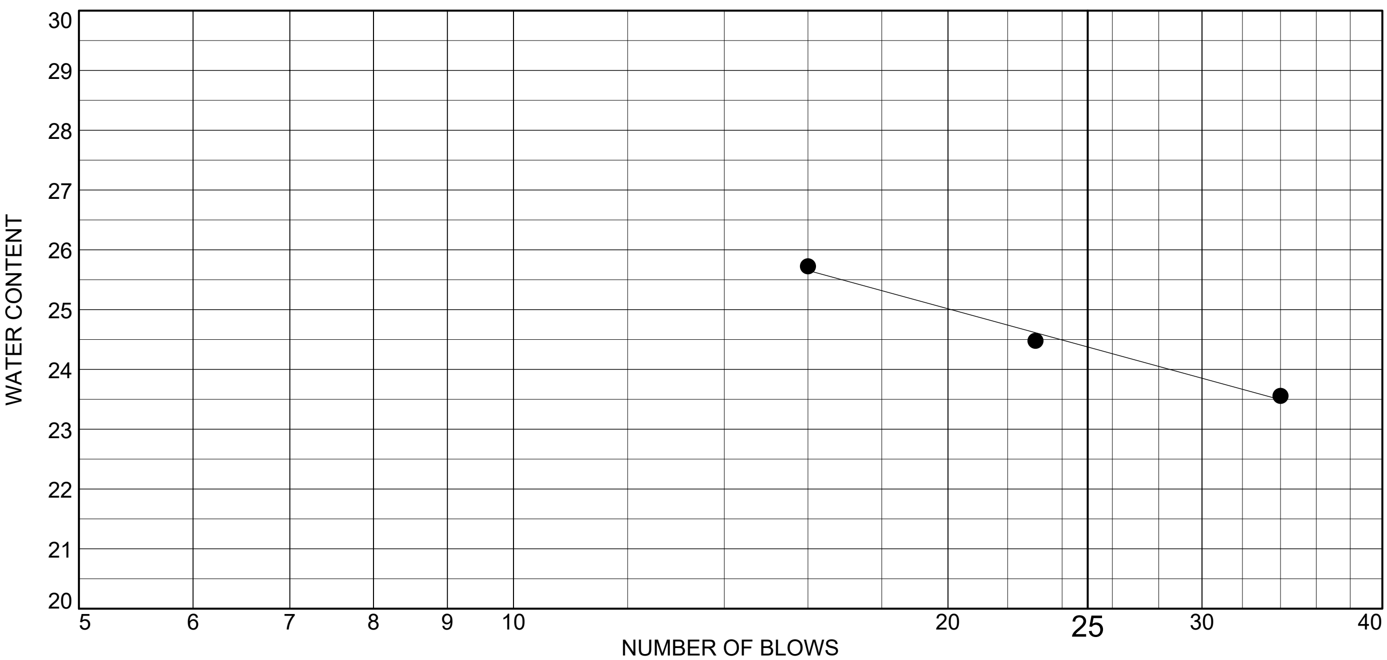
Terracon

Figure

Tested By: DT **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	BROWN AND GRAY MOTTLED SANDY LEAN CLAY WITH GRAVEL	24	13	11			CL

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B015 **Depth:** 31.0'-33.0'
Sample Number: S-10

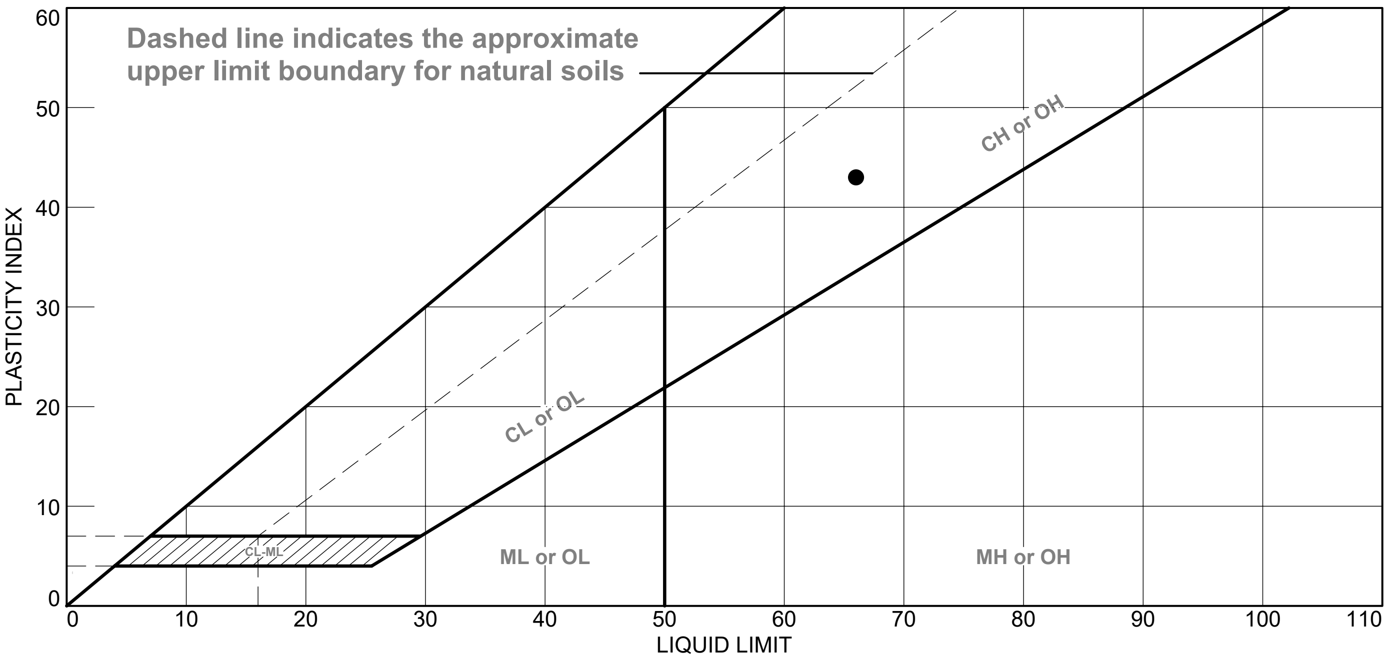
Remarks:

Terracon

Figure

Tested By: SJH **Checked By:** WPQ

LIQUID AND PLASTIC LIMITS ASTM D4318



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	DARK GRAY FAT CLAY	66	23	43			CH

Project No. MR155218 **Client:** DYNERGY

Project: DYNERGY - EDWARDS SITE

Source of Sample: EDW-B015 **Depth:** 37.0'-39.0'
Sample Number: S-12

Terracon

Remarks:

Figure

Tested By: SJH **Checked By:** WPQ

Terracon
Consulting Engineers & Scientists

SPECIFIC GRAVITY OF SOIL SOLIDS
ASTM D-854

Project Number: MR155218
Project Name: Dynergy Edwards
Test Date: 11/10/2015

Results Summary

Boring / Sample	Sample Description	USCS	Sample Number	Depth (ft)	Passing #4	Specific Gravity (Gs)
EDW-B002	DARK GRAY FLY ASH		S-8	25.0'-27.0'	100.00%	2.471
EDW-B002	GRAY LEAN CLAY	CL	S-11	40.0'-41.5'	100.00%	2.592
EDW-B003	FILL: DARK GRAY FLY ASH WITH SAND		S-1	0.0'-1.5'	100.00%	2.469
EDW-B003	FILL: DARK GRAY FLY ASH WITH SAND AND GRAVEL		S-6	15.0'-16.5'	100.00%	2.772
EDW-B004	GRAY LEAN CLAY WITH SAND	CL	S-14	50.0'-51.5'	100.00%	2.617
EDW-B005	DARK GRAY AND GREENISH GRAY LEAN CLAY WITH SAND - ORGANICS AND SHALE NOTED	CL	S-12	45.0'-46.5'	100.00%	2.521
EDW-B011	FILL: DARK GRAY FLY ASH - CLAY NOTED		S-8	25.0'-29.0'	100.00%	2.691
EDW-B014	FILL: DARK GRAY FLY ASH		S-7	20.0'-22.5'	100.00%	2.524
EDW-B014	BLUISH GRAY LEAN CLAY WITH SAND AND GRAVEL	CL	S-11	40.0'-40.5'	100.00%	2.719

Soil Resistivity	AASHTO T 288/ ASTM G 57
Soil pH	AASHTO T 289/ ASTM G 51
Soil REDOX	DIPRA
Soil Sulfides	DIPRA
Water Content	AASHTO T 93/ ASTM D 2216

Laboratory Services Group 750 Corporate Woods Parkway Vernon Hills, Illinois 60061 Ph. (224)352-7000 Fax (224)352-7024

Soil Corrosivity Indication Series

Project No.: MR155218 **Client Name: AECOM**
Project Name: DYNERGY EDWARDS **Test Date: 5/11/13/15**

Summary of Test Results

Boring / Sample No.	Resistivity Natural Miller Soil Box(ohms)	Resistivity Saturated Miller Soil Box(ohms)	pH Soil Water Slurry	REDOX (mV)Soil Water Slurry	Sulfides Reaction	As Received WC%	Saturated WC%	Total Points
EDW-B002 S6	**1,720**	**1,550**	**9.77**	**65**	**NEG**	**52.3**	**77.4**	**14.5**
Points	0	8	3	3.5	0			
Description:	DARK GRAY FLY ASH							
EDW-B004 S3	**3,380**	**3,070**	**8.97**	**140**	**NEG**	**21.4**	**36.9**	**3.0**
Points	0	0	3	0	0			
Description:	BROWN AND GRAY LEAN CLAY							
EDW-B005 S12	**1,120**	**960**	**8.38**	**195**	**NEG**	**88.7**	**99.4**	**10.0**
Points	0	10	0	0	0			
Description:	DARK GRAY AND GREENISH GRAY LEAN CLAY WITH SAND							
EDW- B011 S6	**1,760**	**1,600**	**9.85**	**60**	**NEG**	**63.6**	**82.3**	**14.5**
Points	0	8	3	3.5	0			
Description:	DARK GRAY FLY ASH							
EDW-B0014 S7	**1,995**	**1,810**	**10.89**	**35**	**4**	**86.5**	**98.6**	**15.0**
Points	0	8	3	4	0			
Description:	DARK GRAY FLY ASH							

Resistivity:	Points:	pH:	Points:	Redox:	Points:	Sulfides:	Points:	†
<1500 ohms	10	0.0-2.0	5	Negative	5	Positive	3.5	
1500-1800	8	2.0-4.0	3	0 - 50mV	4	Trace	2	
1800-2100	5	4.0-6.5	0	50 - 100mV	3.5	Negative	0	
2100-2500	2	6.5-7.5	0*	100mV+	0			
2500-3000	1	7.5-8.5	0					
3000+	0	8.5 +	3					

*- If Sulfides are present and a low or neg. ReDox, add 3 points

† - THIS SYSTEM IS BASED ON A 25.5 POINT CORROSIVITY RATING SYSTEM DEVELOPED BY THE AMERICAN NATIONAL STANDARDS FOR POLYETHYLENE ENCASEMENT AND DUCTILE-IRON PIPE SYSTEMS. IT SHOULD BE NOTED THAT THESE TEST RESULTS ARE AN INDICATION OF SOIL CHEMISTRY AND SHOULD BE USED AS A INDICATION OF POSSIBLE CORROSIVE CONDITIONS. TERRACON IS NOT LIABLE FOR ANY REMEDIAL MEASURES TAKEN ON THE BASIS OF THESE RESULTS.

Tested by: BCM Checked By: WPQ

Terracon
Consulting Engineers & Scientists

ORGANIC CONTENT TEST
ASTM D-2974
Method C

Laboratory Services Group | *750 Corporate Woods Parkway, Vernon Hills, Illinois 60061* | *Phone: (224) 352-7000 Fax:(224)352-7*

Project No.: MR155218
Project Name: DYNERGY - EDWARDS SITE
Client: AECOM
Date Tested: 11/13/2015

Sample Information

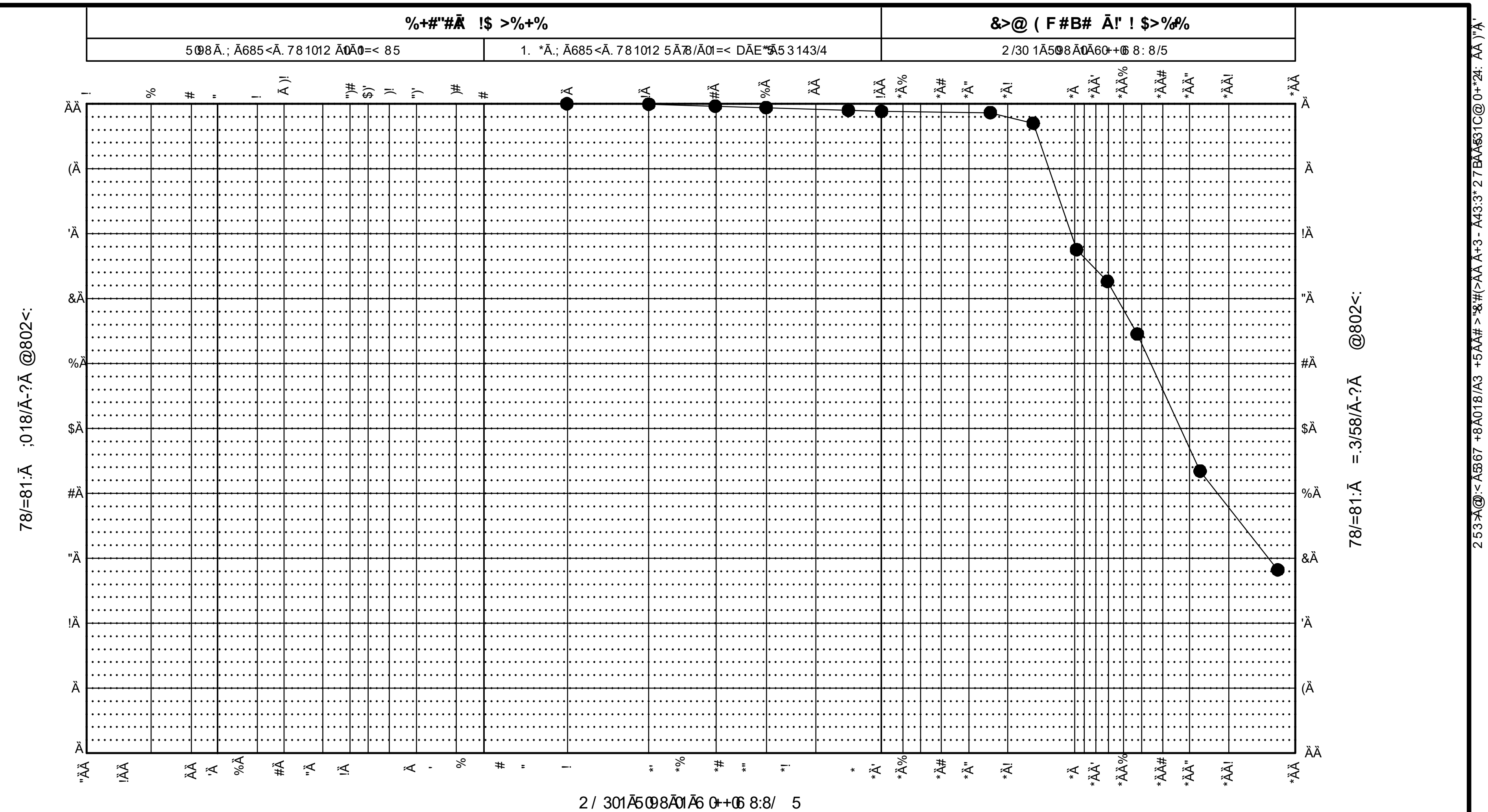
Boring / Source:	EDW-B005
Sample No.:	S-12
Depth (ft.):	45.0-46.5'
Description:	CL

Organic Content Test Data

Tare No.:	C
Tare Wt. (gm):	20.04
Wet Wt. + Tare (gm):	49.66
Dry Wt. + Tare (gm):	36.05
Moisture Content (%):	**85.01**
Wt. of Ash + Tare (gm):	34.63
Percent Ash:	91.13
Organic Content (%):	**8.87**

** Note: Test performed by heating the sample to 440 degrees Centigrade until constant weight of ash is attained.

HALEY & ALDRICH, INC.
GEOTECHNICAL LABORATORY REPORTS



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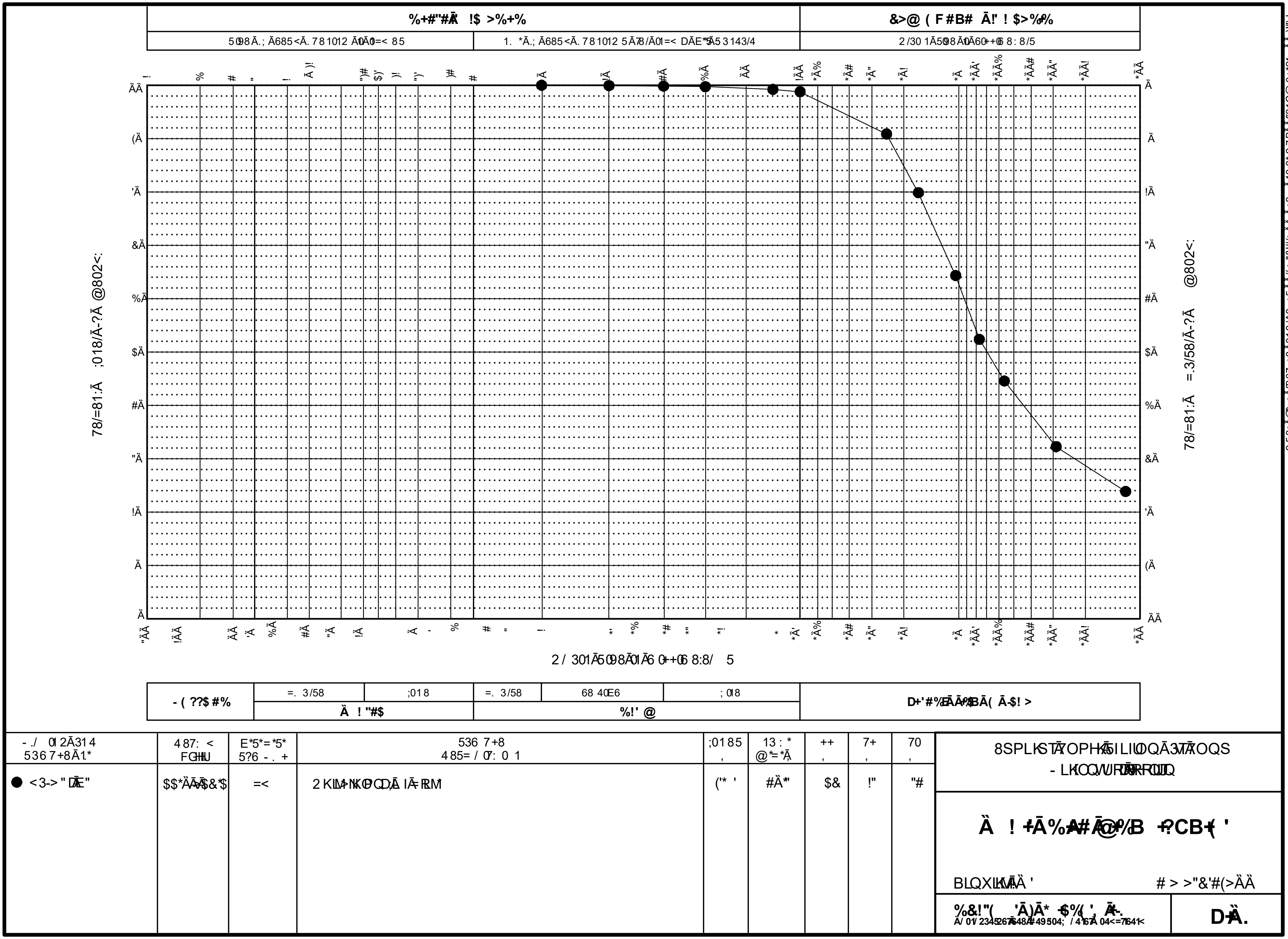
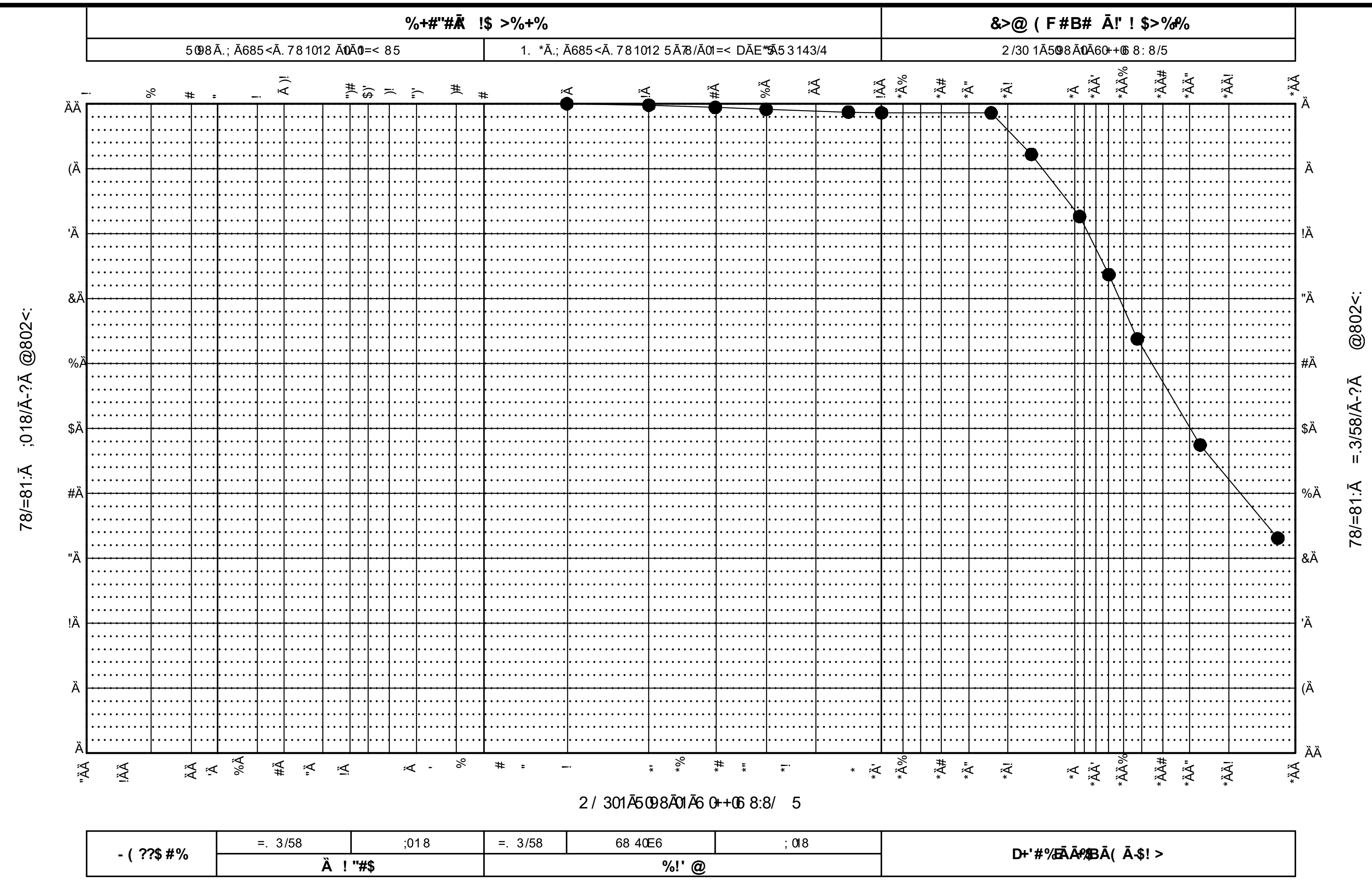
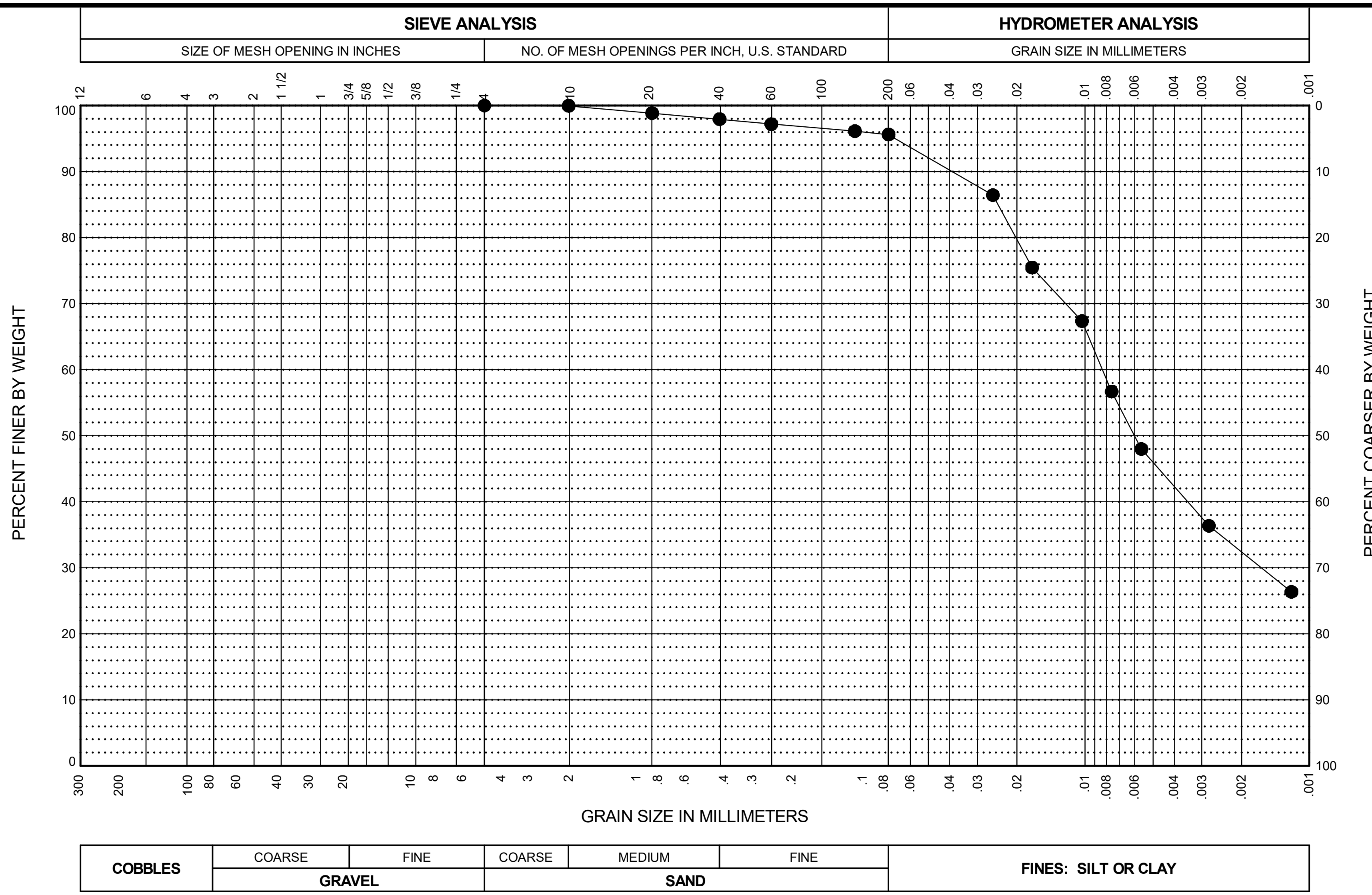






BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SAMPLE DESCRIPTION	FINES %	NAT. W.C. %	LL %	PL %	PI %
● HA-OW-01, U3	28.5 - 30.5	CL	Gray and brown, Lean Clay.	95.6	33.1	48	19	29

Edwards Power Station Ash Pond
Bartonville, Illinois

GRAIN SIZE DISTRIBUTION

January 2018 41-1-37849-001

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG.

GSA- WITH SAMPLE INTERVALS 41-1-37849-001 LAB DATA.GPJ SHAN_WIL.GDT 2/1/18

HYDRAULIC CONDUCTIVITY

Project	Edwards Power Station Ash Pond				Date
Location	Bartonville, Illinois		Tested By	CMB	1/23/18
Job No.	41-1-37849-001		Calculated By	CMB	1/31/18
Boring	HAB-1		Checked By	DPM	1/31/18
Sample	U5		File	41-1-37849-001 HAB-1 U5 D5084	
Depth (ft)	52.7		Procedure	ASTM D5084	
Description	Gray, Fat Clay (CH).		Permeant	Deaired Water	

Permeameter No. 14 — Standpipe Vol (cm^3/cm) Inflow: 1.242 Outflow: 1.239

	Before Test	After Test
Sample Diameter (in)	2.827	2.817
Sample Length (in)	2.114	2.095
Sample Area (cm^2)	40.50	40.21
Sample Volume (cm^3)	217.44	213.97
Sample Wt. (g)	360.63	360.22
Wet Density (pcf)	103.5	105.1
Dry Density (pcf)	67.4	67.4
Saturation (%)	96.9	101.0
Consolidation (psi)	8 min	9 max

	Before Test	After Test
Tare No.	1-5	8
Tare Wt. (g)	2.50	99.87
Wet Soil + Tare (g)	84.76	459.62
Dry Soil + Tare (g)	56.06	330.77
Water Content (%)	53.6	55.8
Porosity	0.597	
Pore Volume (CC)	129.83	
Starting B.P. Saturation (%)	97	

Specific Gravity 2.68 (estimated)

Read Time day	hr	min	P_{cell} psi	P_{in} psi	P_{out} psi	Readings (cm) h_{in}	h_{out}	Water Temp. °C	Inflow PV	Outflow PV	Storage PV	Total PV	i	K @ 20°C cm/s
24	8	37	99.0	91.0	90.0	81.10	30.40	23.2	---	---	---	---	---	---
24	10	15	99.0	91.0	90.0	80.95	30.65	23.2	0.00	0.00	0.00	0.00	22.5	4.3E-08
24	11	55	99.0	91.0	90.0	80.80	30.85	23.4	0.00	0.00	0.00	0.00	22.4	3.7E-08
24	14	1	99.0	91.0	90.0	80.60	31.00	23.4	0.00	0.00	0.00	0.01	22.3	2.9E-08
24	15	46	99.0	91.0	90.0	80.40	31.20	23.3	0.00	0.00	0.00	0.01	22.3	4.0E-08
25	9	21	99.0	91.0	90.0	78.65	33.00	22.8	-0.02	0.02	0.00	0.02	21.6	3.6E-08
25	11	48	99.0	91.0	90.0	78.40	33.20	23.1	0.00	0.00	0.00	0.03	21.5	3.4E-08
29	7	57	99.0	91.0	90.0	70.25	40.80	22.6	-0.08	0.07	0.00	0.10	18.6	3.4E-08
29	10	35	99.0	91.0	90.0	70.05	41.00	22.6	0.00	0.00	0.00	0.10	18.5	3.3E-08
29	12	55	99.0	91.0	90.0	69.85	41.20	22.7	0.00	0.00	0.00	0.10	18.4	3.7E-08
29	15	42	99.0	91.0	90.0	69.60	41.40	22.7	0.00	0.00	0.00	0.10	18.4	3.5E-08
30	7	39	99.0	91.0	90.0	68.35	42.55	22.8	-0.01	0.01	0.00	0.12	17.9	3.3E-08

Average Hydraulic Conductivity at Completion @ 20°C (m/s)	3.4E-10
Average Hydraulic Conductivity at Completion @ 20°C (cm/s)	3.4E-08

HYDRAULIC CONDUCTIVITY

Project	Edwards Power Station Ash Pond
Location	Bartonville, Illinois
Job No.	41-1-37849-001
Boring	HAB-3
Sample	U3
Depth (ft)	56.6
Description	Gray-brown, Fat Clay (CH).

		Date
Tested By	CMB	1/23/18
Calculated By	CMB	1/31/18
Checked By	DPM	1/31/18
File	41-1-37849-001 HAB-3 U3 D5084	
Procedure	ASTM D5084	
Permeant	Deaired Water	

Permeameter No. 16

Standpipe Vol (cm^3/cm) Inflow: 1.247 Outflow: 1.240

	Before Test	After Test
Sample Diameter (in)	2.837	2.837
Sample Length (in)	2.186	2.162
Sample Area (cm^2)	40.78	40.78
Sample Volume (cm^3)	226.44	223.96
Sample Wt. (g)	457.85	458.25
Wet Density (pcf)	126.2	127.7
Dry Density (pcf)	101.7	102.6
Saturation (%)	100.0	104.1
Consolidation (psi)	7 min	8 max

	Before Test	After Test
Tare No.	3-3	12
Tare Wt. (g)	2.54	102.09
Wet Soil + Tare (g)	107.24	559.53
Dry Soil + Tare (g)	86.95	469.51
Water Content (%)	24.0	24.5
Porosity	0.392	
Pore Volume (CC)	88.71	
Starting B.P. Saturation (%)	95	

Specific Gravity 2.68 (estimated)

Read Time day	hr	min	P_{cell} psi	P_{in} psi	P_{out} psi	Readings (cm) h_{in}	h_{out}	Water Temp. °C	Inflow PV	Outflow PV	Storage PV	Total PV	i	K @ 20°C cm/s
24	8	38	98.0	91.0	90.0	92.75	30.60	23.0	---	---	---	---	---	---
24	10	16	98.0	91.0	90.0	92.75	31.40	23.1		0.01	0.01	0.01	23.7	8.1E-08
24	11	56	98.0	91.0	90.0	92.45	31.75	23.2	0.00	0.00	0.00	0.02	23.6	6.5E-08
24	14	2	98.0	91.0	90.0	92.10	32.15	23.4	0.00	0.01	0.00	0.02	23.5	5.9E-08
24	15	47	98.0	91.0	90.0	91.80	32.40	23.4	0.00	0.00	0.00	0.03	23.4	5.2E-08
25	9	22	98.0	91.0	90.0	89.30	34.80	22.9	-0.04	0.03	0.00	0.06	22.5	4.8E-08
25	11	49	98.0	91.0	90.0	89.00	35.10	23.1	0.00	0.00	0.00	0.06	22.4	4.3E-08
29	11	37	98.0	91.0	90.0	62.60	44.85	22.8	---	---	---	---	15.9	---
29	12	56	98.0	91.0	90.0	62.45	44.95	22.9	0.00	0.00	0.00	0.06	15.8	4.7E-08
29	15	43	98.0	91.0	90.0	61.95	45.05	22.8	-0.01	0.00	0.00	0.07	15.7	5.4E-08
30	7	40	98.0	91.0	90.0	60.30	46.70	22.7	-0.02	0.02	0.00	0.09	15.1	5.3E-08

Average Hydraulic Conductivity at Completion @ 20°C (m/s)	4.9E-10
Average Hydraulic Conductivity at Completion @ 20°C (cm/s)	4.9E-08

HYDRAULIC CONDUCTIVITY

Project	Edwards Power Station Ash Pond			Date
Location	Bartonville, Illinois	Tested By	CMB	1/23/18
Job No.	41-1-37849-001	Calculated By	CMB	1/31/18
Boring	HAB-5	Checked By	DPM	1/31/18
Sample	U3	File	41-1-37849-001 HAB-5 U3 D5084	
Depth (ft)	36.3	Procedure	ASTM D5084	
Description	Gray-brown, Fat Clay (CH).	Permeant	Deaired Water	

Permeameter No. 17 — Standpipe Vol (cm^3/cm) Inflow: 1.240 Outflow: 1.240

	Before Test	After Test
Sample Diameter (in)	2.816	2.815
Sample Length (in)	2.132	2.130
Sample Area (cm^2)	40.18	40.15
Sample Volume (cm^3)	217.59	217.23
Sample Wt. (g)	384.42	388.30
Wet Density (pcf)	110.2	111.5
Dry Density (pcf)	78.6	77.8
Saturation (%)	95.8	101.1
Consolidation (psi)	14 min	15 max

	Before Test	After Test
Tare No.	5-3	29
Tare Wt. (g)	2.53	165.59
Wet Soil + Tare (g)	84.89	553.20
Dry Soil + Tare (g)	61.22	436.05
Water Content (%)	40.3	43.3
Porosity	0.530	
Pore Volume (CC)	115.38	
Starting B.P. Saturation (%)	95	

Specific Gravity 2.68 (estimated)

Read Time day	hr	min	P_{cell} psi	P_{in} psi	P_{out} psi	Readings (cm) h_{in}	h_{out}	Water Temp. °C	Inflow PV	Outflow PV	Storage PV	Total PV	i	K @ 20°C cm/s
24	8	39	105.0	91.0	90.0	88.35	32.35	23.2	---	---	---	---	---	---
24	10	17	105.0	91.0	90.0	88.55	34.40	23.2					23.0	
24	11	57	105.0	91.0	90.0	88.00	35.00	23.4	-0.01	0.01	0.00	0.01	22.8	1.2E-07
24	14	3	105.0	91.0	90.0	87.40	35.70	23.4	-0.01	0.01	0.00	0.01	22.5	1.1E-07
24	15	48	105.0	91.0	90.0	86.90	36.20	23.3	-0.01	0.01	0.00	0.02	22.4	1.0E-07
25	9	23	105.0	91.0	90.0	82.50	40.40	22.9	-0.05	0.05	0.00	0.06	20.8	9.0E-08
25	11	50	105.0	91.0	90.0	82.00	40.95	23.1	-0.01	0.01	0.00	0.07	20.6	8.3E-08
29	7	59	105.0	91.0	90.0	64.95	56.80	22.7	-0.18	0.17	-0.01	0.24	14.5	8.2E-08
29	10	36	105.0	91.0	90.0	64.50	57.20	22.7	0.00	0.00	0.00	0.25	14.3	9.1E-08
29	12	57	105.0	91.0	90.0	64.15	57.60	22.9	0.00	0.00	0.00	0.25	14.2	9.0E-08
29	15	44	105.0	91.0	90.0	63.65	58.00	22.9	-0.01	0.00	0.00	0.25	14.0	9.2E-08
30	7	41	105.0	91.0	90.0	61.25	60.20	22.7	-0.03	0.02	0.00	0.28	13.2	8.5E-08

Average Hydraulic Conductivity at Completion @ 20°C (m/s) 8.9E-10

Average Hydraulic Conductivity at Completion @ 20°C (cm/s) 8.9E-08

HYDRAULIC CONDUCTIVITY

Project	Edwards Power Station Ash Pond
Location	Bartonville, Illinois
Job No.	41-1-37849-001
Boring	HA-OW-01
Sample	U3
Depth (ft)	29.3
Description	Gray-brown, Lean Clay (CL).

		Date
Tested By	CMB	1/31/18
Calculated By	CMB	2/7/18
Checked By	DPM	2/7/18
File	41-1-37849-001 HA-OW-01 U3 D5084	
Procedure	ASTM D5084	
Permeant	Deaired Water	

Permeameter No. 17 — Standpipe Vol (cm^3/cm) Inflow: 1.240 Outflow: 1.240

	Before Test	After Test
Sample Diameter (in)	2.821	2.800
Sample Length (in)	1.928	1.875
Sample Area (cm^2)	40.32	39.73
Sample Volume (cm^3)	197.47	189.19
Sample Wt. (g)	376.66	370.79
Wet Density (pcf)	119.0	122.3
Dry Density (pcf)	90.1	93.1
Saturation (%)	100.6	105.5
Consolidation (psi)	11 min	12 max

	Before Test	After Test
Tare No.	1-3	25
Tare Wt. (g)	2.53	161.25
Wet Soil + Tare (g)	77.63	531.39
Dry Soil + Tare (g)	59.36	443.03
Water Content (%)	32.1	31.4
Porosity	0.461	
Pore Volume (CC)	91.12	
Starting B.P. Saturation (%)	96	

Specific Gravity 2.68 (estimated)

Read Time day	hr	min	P_{cell} psi	P_{in} psi	P_{out} psi	Readings (cm) h_{in}	h_{out}	Water Temp. °C	Inflow PV	Outflow PV	Storage PV	Total PV	i	K @ 20°C cm/s
1	12	7	102.0	91.0	90.0	89.85	37.25	22.6	---	---	---	---	---	---
1	15	39	102.0	91.0	90.0	89.75	37.70	22.6	0.00	0.01	0.00	0.01	25.0	2.5E-08
2	7	34	102.0	91.0	90.0	88.65	38.75	22.4	-0.01	0.01	0.00	0.02	24.6	2.2E-08
2	10	26	102.0	91.0	90.0	88.45	38.95	22.4	0.00	0.00	0.00	0.02	24.5	2.3E-08
2	13	18	102.0	91.0	90.0	88.30	39.16	22.5	0.00	0.00	0.00	0.03	24.4	2.0E-08
5	7	34	102.0	91.0	90.0	83.85	43.00	22.4	-0.06	0.05	0.00	0.08	22.7	2.1E-08
5	10	1	102.0	91.0	90.0	83.70	43.10	22.5	0.00	0.00	0.00	0.08	22.7	1.8E-08
5	13	14	102.0	91.0	90.0	83.50	43.30	22.5	0.00	0.00	0.00	0.08	22.6	2.2E-08
5	16	4	102.0	91.0	90.0	83.35	43.45	22.4	0.00	0.00	0.00	0.08	22.5	1.9E-08
6	7	35	102.0	91.0	90.0	82.40	44.30	22.3	-0.01	0.01	0.00	0.10	22.1	2.1E-08

Average Hydraulic Conductivity at Completion @ 20°C (m/s) 2.0E-10

Average Hydraulic Conductivity at Completion @ 20°C (cm/s) 2.0E-08

TABLE I
SUMMARY OF CURRENT SUBSURFACE EXPLORATIONS
DYNEGY
EDWARDS POWER STATION
BARTONVILLE, ILLINOIS

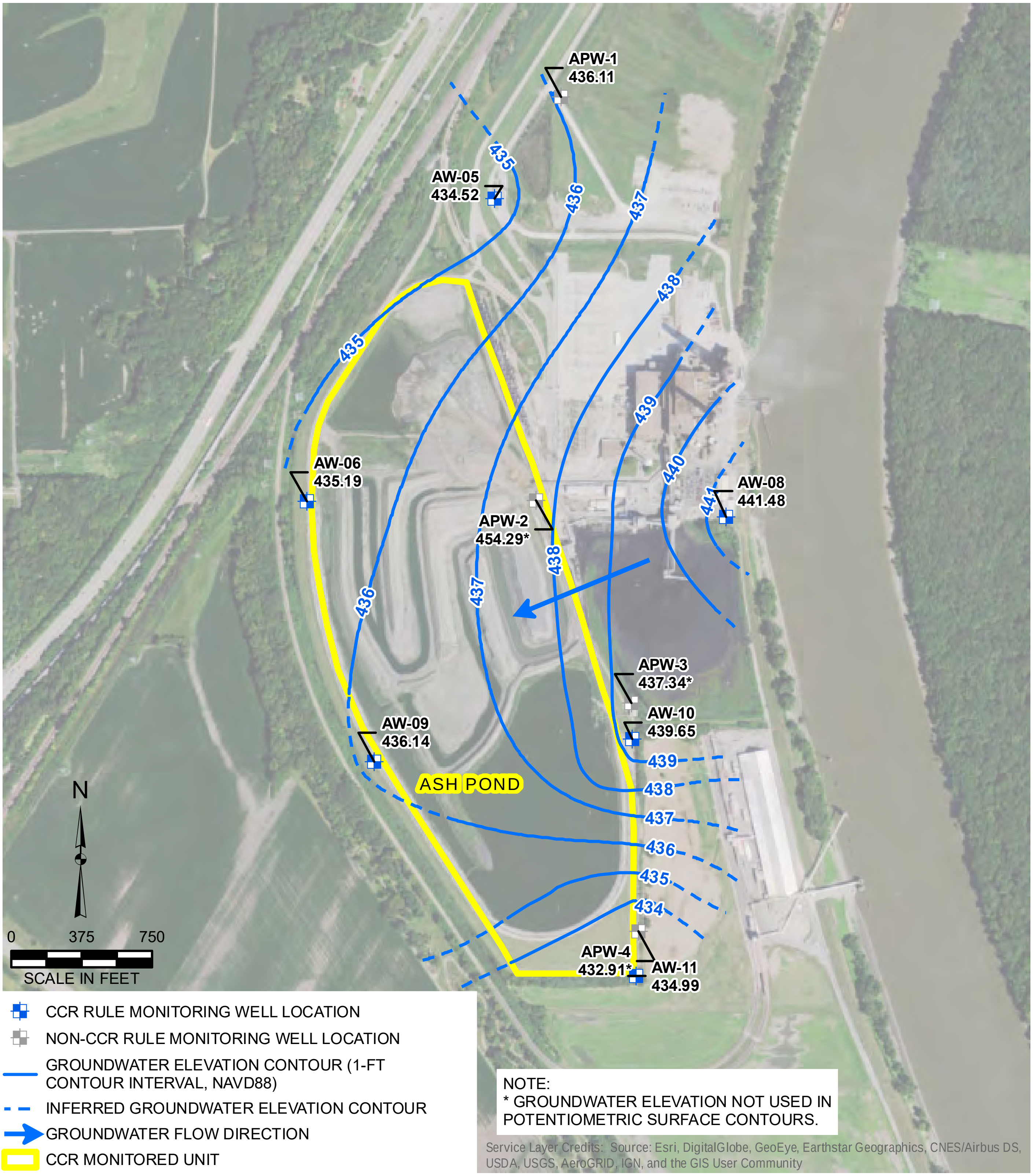
Exploration Designation[1]	Ground Surface El.[2] (ft)	Northing[2]	Easting[2]	Total Exploration Depth (ft)	Water[3]	
					Depth Below Ground Surface (ft)	Elevation (ft)
HAB-01	457.8	1,429,282.52	2,435,251.74	58.8	5.5	452.3
HAB-02	458.4	1,429,903.58	2,435,764.03	38.5	5.0	453.4
HAB-03	469.9	1,430,619.71	2,434,935.46	118.0	15.0	454.9
HAB-04	458.3	1,431,767.36	2,434,995.09	16.5	DRY	DRY
HAB-05	459.2	1,428,320.25	2,435,895.55	41.5	15.0	444.2
HA-OW-01	455.6	1,431,706.38	2,435,054.27	34.5	4.8	450.8

Notes:
1) Technical monitoring of explorations completed during the period 27 November 2017 through 8 December 2017 was performed by Haley & Aldrich, Inc.
2) As drilled locations and ground surface elevations of test borings were determined in the field by Maurer-Stutz, Inc. of Peoria, IL by optical survey. Coordinates are shown in Illinois State Plane West Zone NAD83. Elevations are in units of feet, relative to NAVD88.
3) Water level readings represent the highest water level observed either during drilling, after completion of the boring, or as indicated by subsurface exploration instruments. Refer to the subsurface exploration logs for additional water level data. Water level readings have been made in the subsurface explorations at times and under conditions discussed herein. However, it must be noted that fluctuations in the level of the water may occur due to variations in season, rainfall, temperature, plant operations, and other factors not evident at the time measurements were made and reported.

TABLE II
SUMMARY OF LABORATORY TEST RESULTS
DYNEGY
EDWARDS POWER STATION
BARTONVILLE, ILLINOIS

Exploration Designation	Sample Number	Sample Type	Sample Depth (ft)	USCS Symbol	Material Type	Moisture Content (%)	LL	PL	PI	% Gravel	% Sand	% Fines	Hydraulic Conductivity		
													Dry Density (pcf)	k (cm/sec)	Confining Pressure (psi)
HAB-1	U5	Shelby Tube	51.5-53.5	CH	Alluvial Deposits	57.9	68	29	39	0	1	99	67.4	3.4E-08	8
HAB-3	U3	Shelby Tube	56.0-57.0	CH	Alluvial Deposits	40.3	57	23	34	0	1	99	101.7	4.9E-08	7
HAB-5	U3	Shelby Tube	35.5-37.5	CH	Alluvial Deposits	39.0	64	24	39	0	1	99	78.6	8.9E-08	14
HA-OW-01	U3	Shelby Tube	28.5-30.5	CL	Alluvial Deposits	33.1	48	19	29	0	4	96	90.1	2.0E-08	11

APPENDIX E
GROUNDWATER CONTOUR MAPS AND ELEVATIONS



DRAWN BY/DATE:
SDS 1/23/17
REVIEWED BY/DATE:
ANS 1/25/17
APPROVED BY/DATE:
JJW 2/7/17

EDWARDS ASH POND (UNIT ID: 301)
UPPERMOST AQUIFER UNIT
GROUNDWATER ELEVATION CONTOUR MAP
ROUND 1: DECEMBER 21, 2015

DYNEGY CCR RULE GROUNDWATER MONITORING
EDWARDS POWER STATION
BARTONSVILLE, ILLINOIS

PROJECT NO: 2285

FIGURE NO: 1

Natural Resource Technology
AN OBG COMPANY

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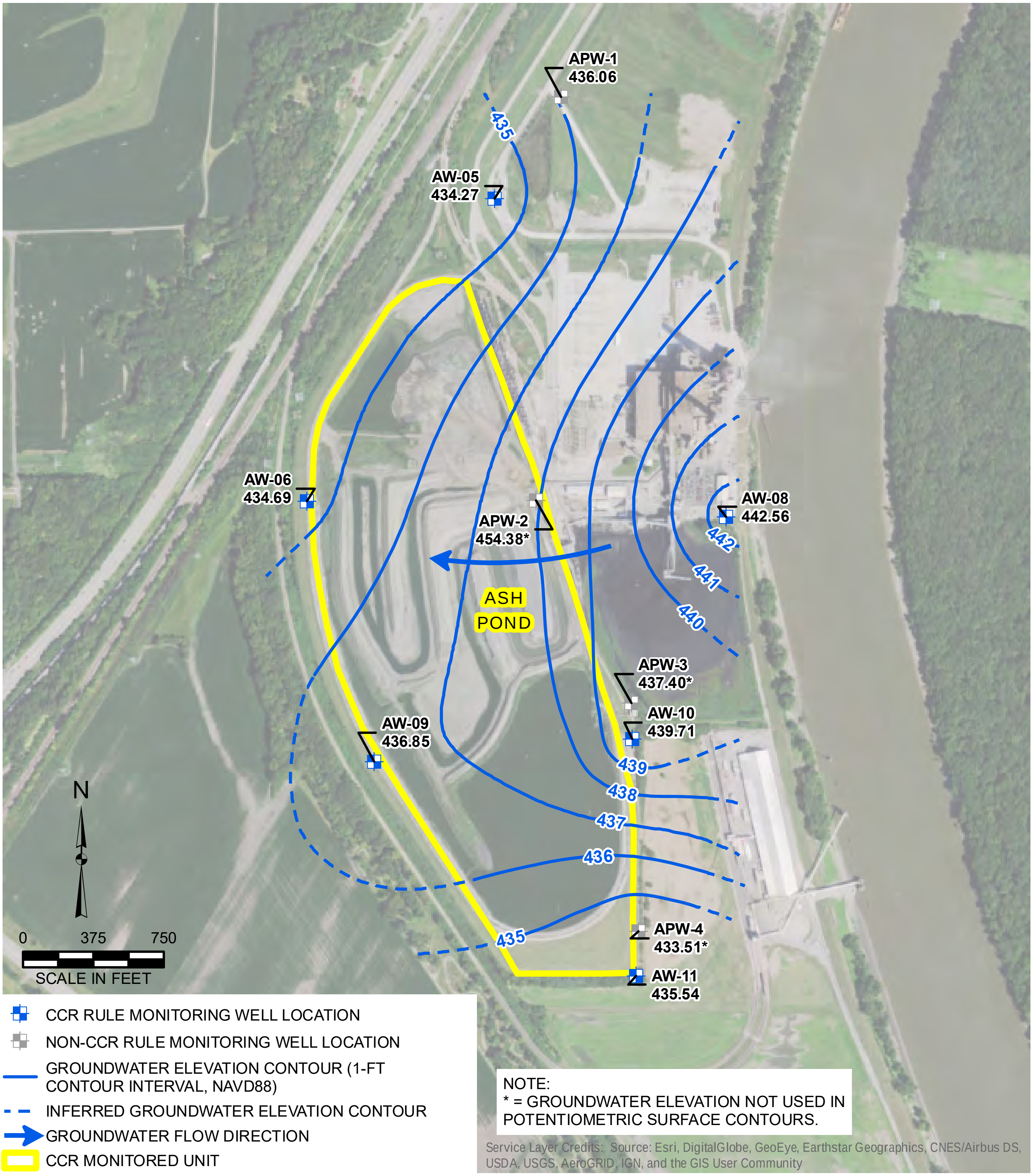

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REVIEWED BY/DATE:
ANS 1/25/17
APPROVED BY/DATE:
JJW 2/8/17

EDWARDS ASH POND (UNIT ID: 301)
UPPERMOST AQUIFER UNIT
GROUNDWATER ELEVATION CONTOUR MAP
ROUND 2: FEBRUARY 17, 2016

DYNEGY CCR RULE GROUNDWATER MONITORING
EDWARDS POWER STATION
BARTONSVILLE, ILLINOIS

PROJECT NO: 2285

FIGURE NO: 1

Natural Resource Technology
AN OBG COMPANY

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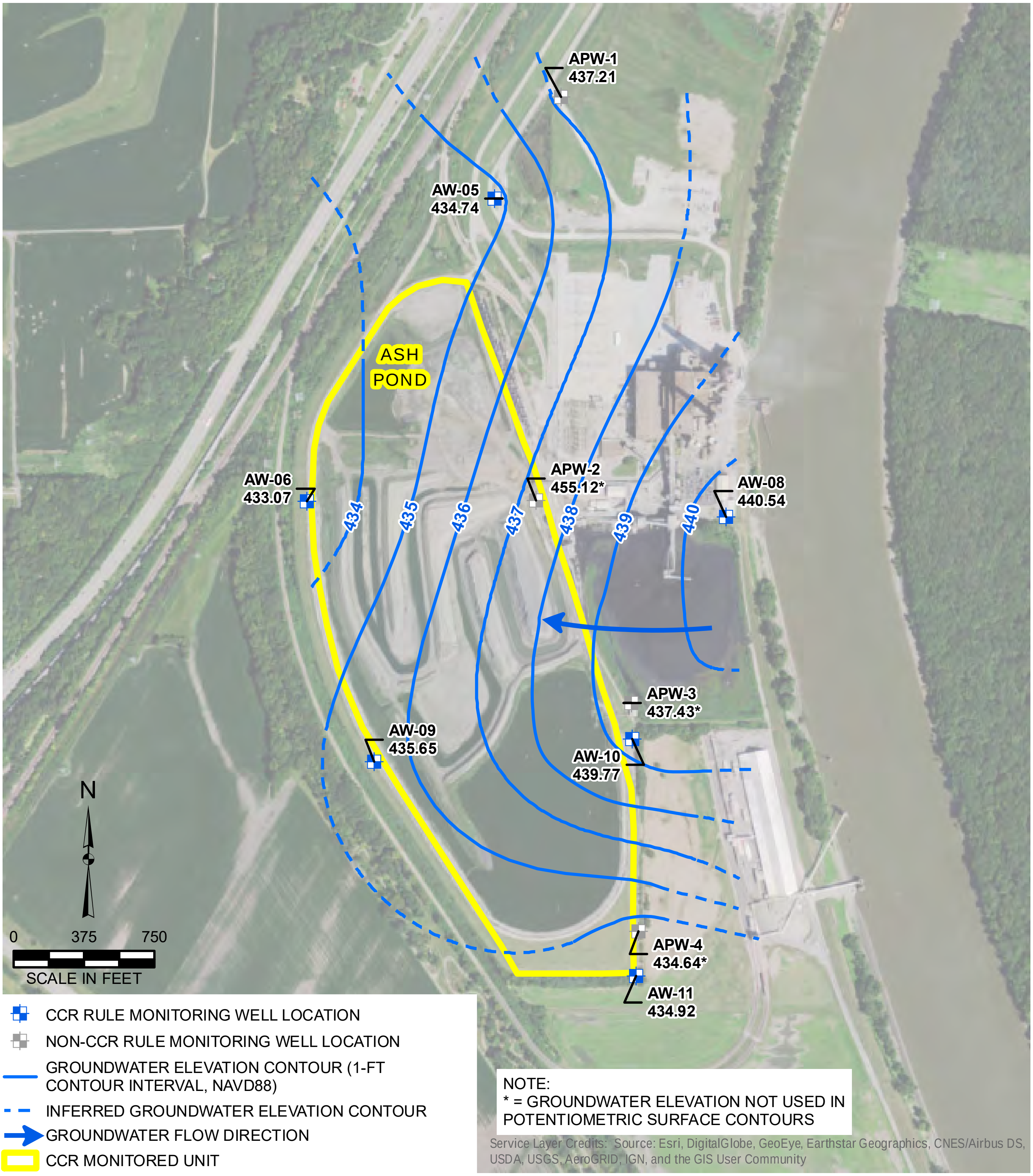

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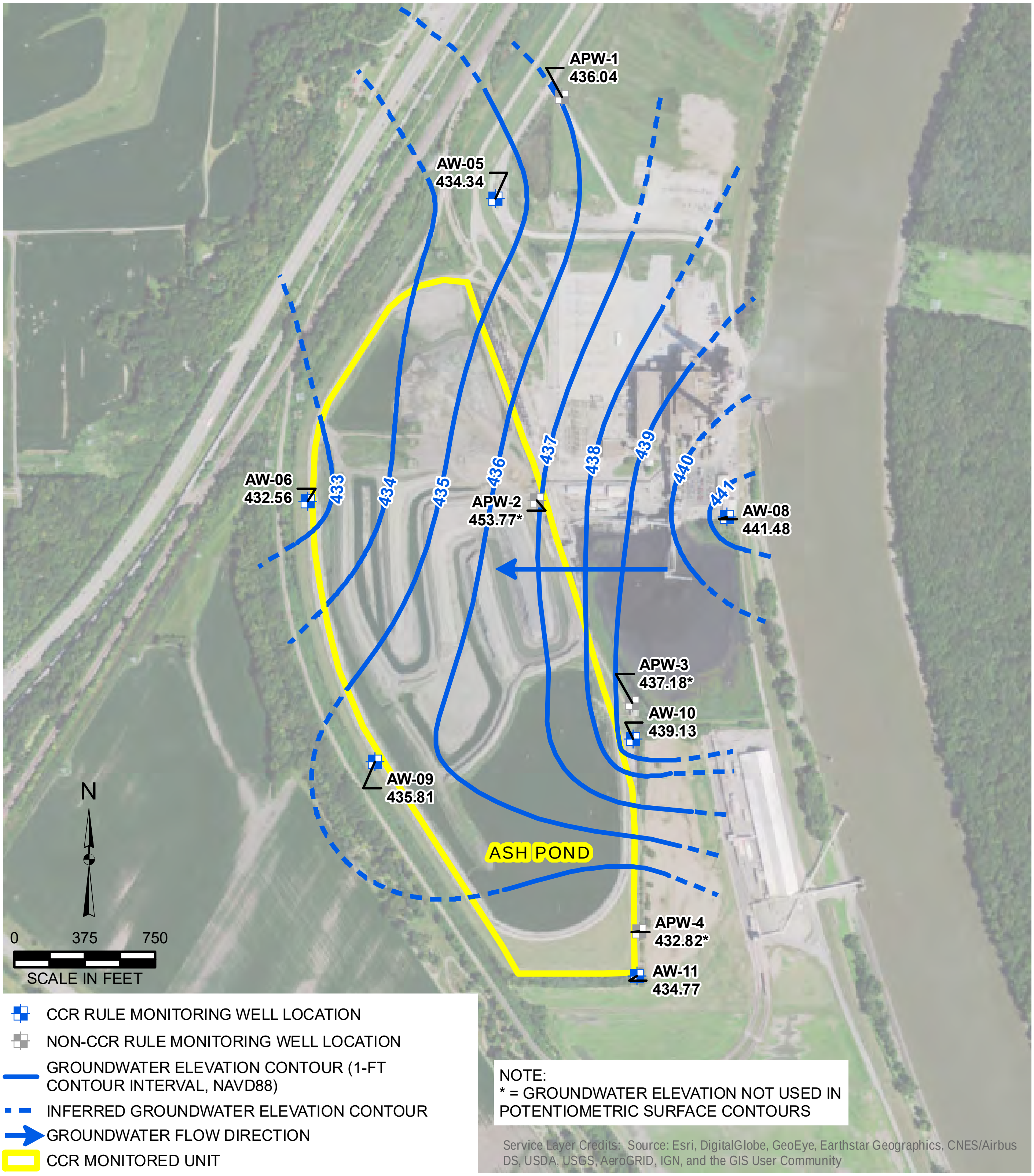
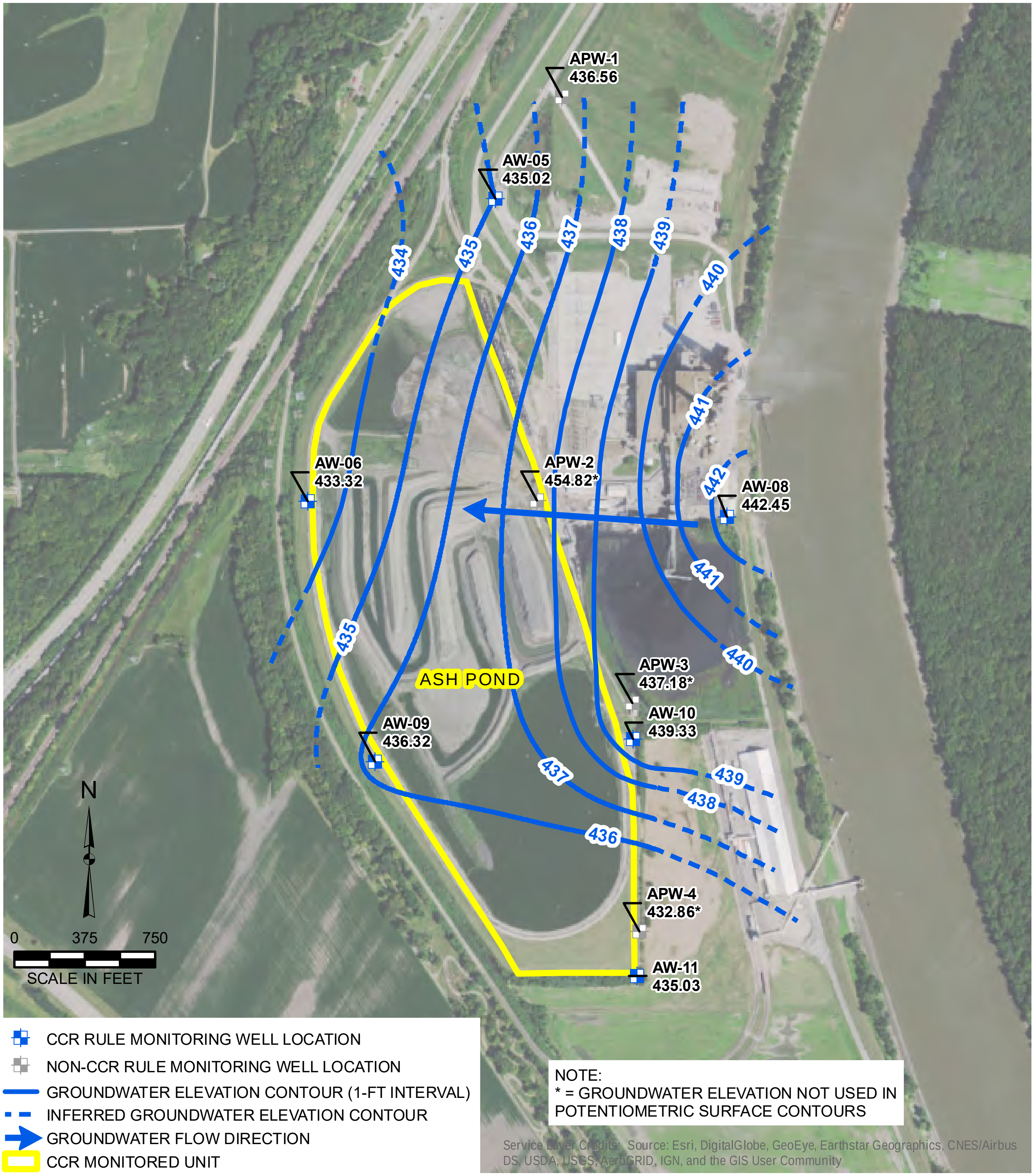
DRAWN BY/DATE: SDS 1/23/17 REVIEWED BY/DATE: ANS 1/25/17 APPROVED BY/DATE: JJW 2/8/17	**EDWARDS ASH POND (UNIT ID: 301) UPPERMOST AQUIFER UNIT GROUNDWATER ELEVATION CONTOUR MAP ROUND 3: MAY 17, 2016** DYNEGY CCR RULE GROUNDWATER MONITORING EDWARDS POWER STATION BARTONSVILLE, ILLINOIS	PROJECT NO: 2285 FIGURE NO: 1 Natural Resource Technology AN OBG COMPANY



DRAWN BY/DATE: SDS 1/23/17 REVIEWED BY/DATE: ANS 1/25/17 APPROVED BY/DATE: JJW 2/8/17	**EDWARDS ASH POND (UNIT ID: 301) UPPERMOST AQUIFER UNIT GROUNDWATER ELEVATION CONTOUR MAP ROUND 4: JULY 21, 2016** DYNEGY CCR RULE GROUNDWATER MONITORING EDWARDS POWER STATION BARTONSVILLE, ILLINOIS	PROJECT NO: 2285 FIGURE NO: 1 Natural Resource Technology AN OBG COMPANY



DRAWN BY/DATE:
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REVIEWED BY/DATE:
ANS 3/6/17
APPROVED BY/DATE:
JJW 9/1/17

EDWARDS ASH POND (UNIT ID: 301)
UPPERMOST AQUIFER UNIT
GROUNDWATER ELEVATION CONTOUR MAP
ROUND 5: NOVEMBER 10, 2016

DYNEGY CCR RULE GROUNDWATER MONITORING
EDWARDS POWER STATION
BARTONSVILLE, ILLINOIS

PROJECT NO: 2285

FIGURE NO: 1

Natural Resource Technology
AN OBG COMPANY

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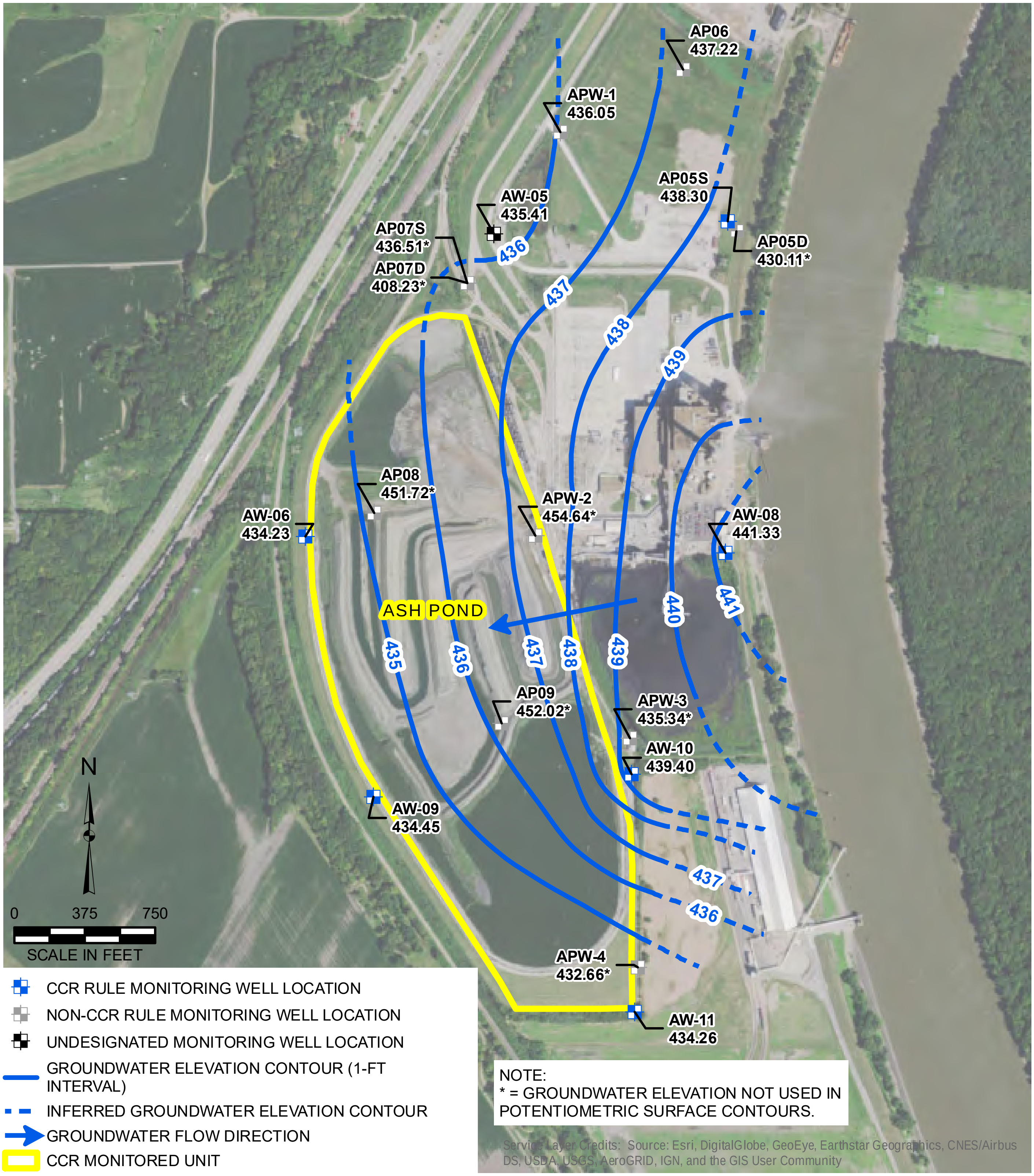

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REVIEWED BY/DATE:
ANS 3/6/17
APPROVED BY/DATE:
JJW 9/1/17

EDWARDS ASH POND (UNIT ID: 301)
UPPERMOST AQUIFER UNIT
GROUNDWATER ELEVATION CONTOUR MAP
ROUND 6: JANUARY 16, 2017

DYNEGY CCR RULE GROUNDWATER MONITORING
EDWARDS POWER STATION
BARTONSVILLE, ILLINOIS

PROJECT NO: 2285

FIGURE NO: 1

Natural Resource Technology
AN OBG COMPANY

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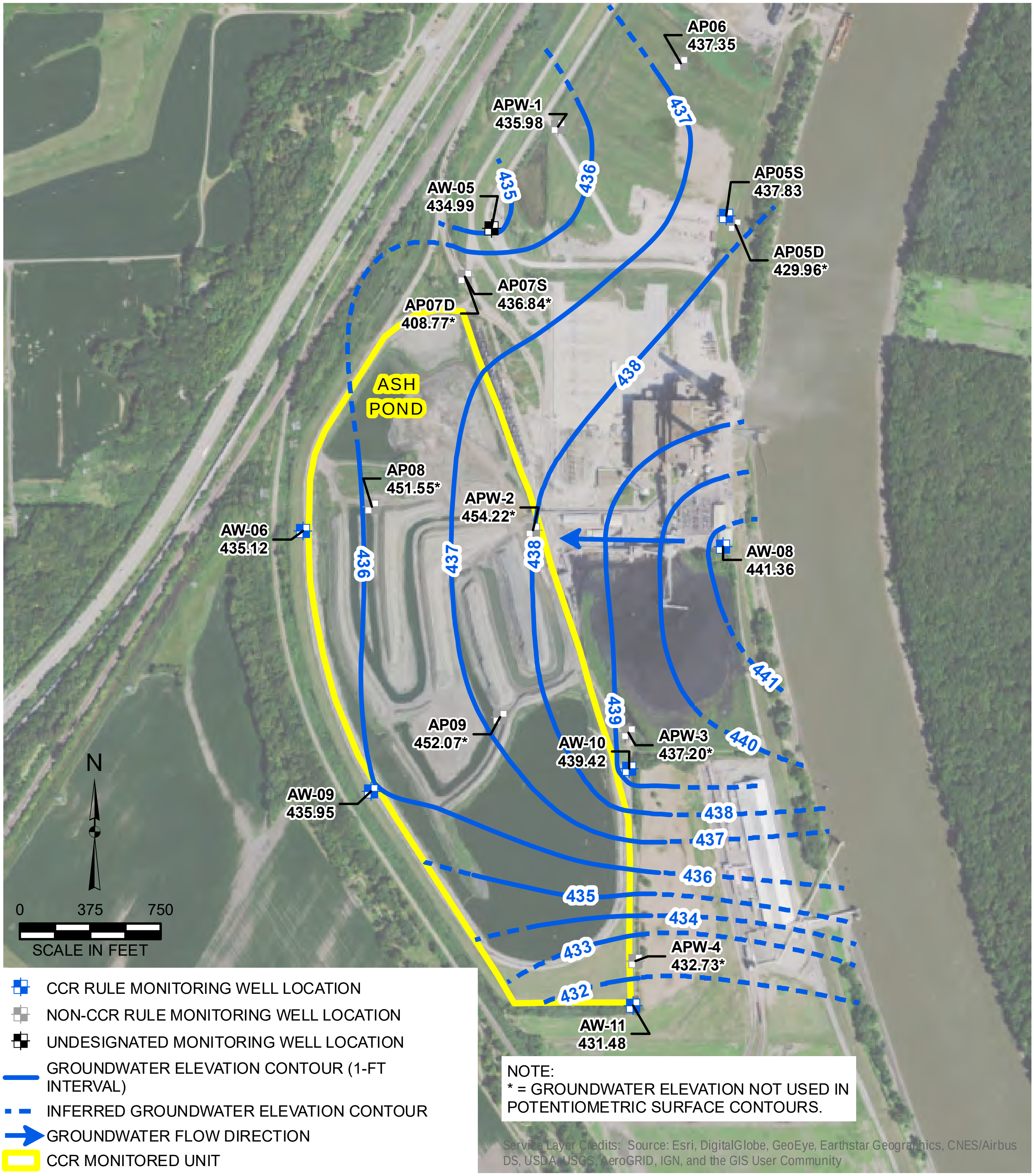

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REVIEWED BY/DATE:
ANS 6/21/17
APPROVED BY/DATE:
JJW 9/1/17

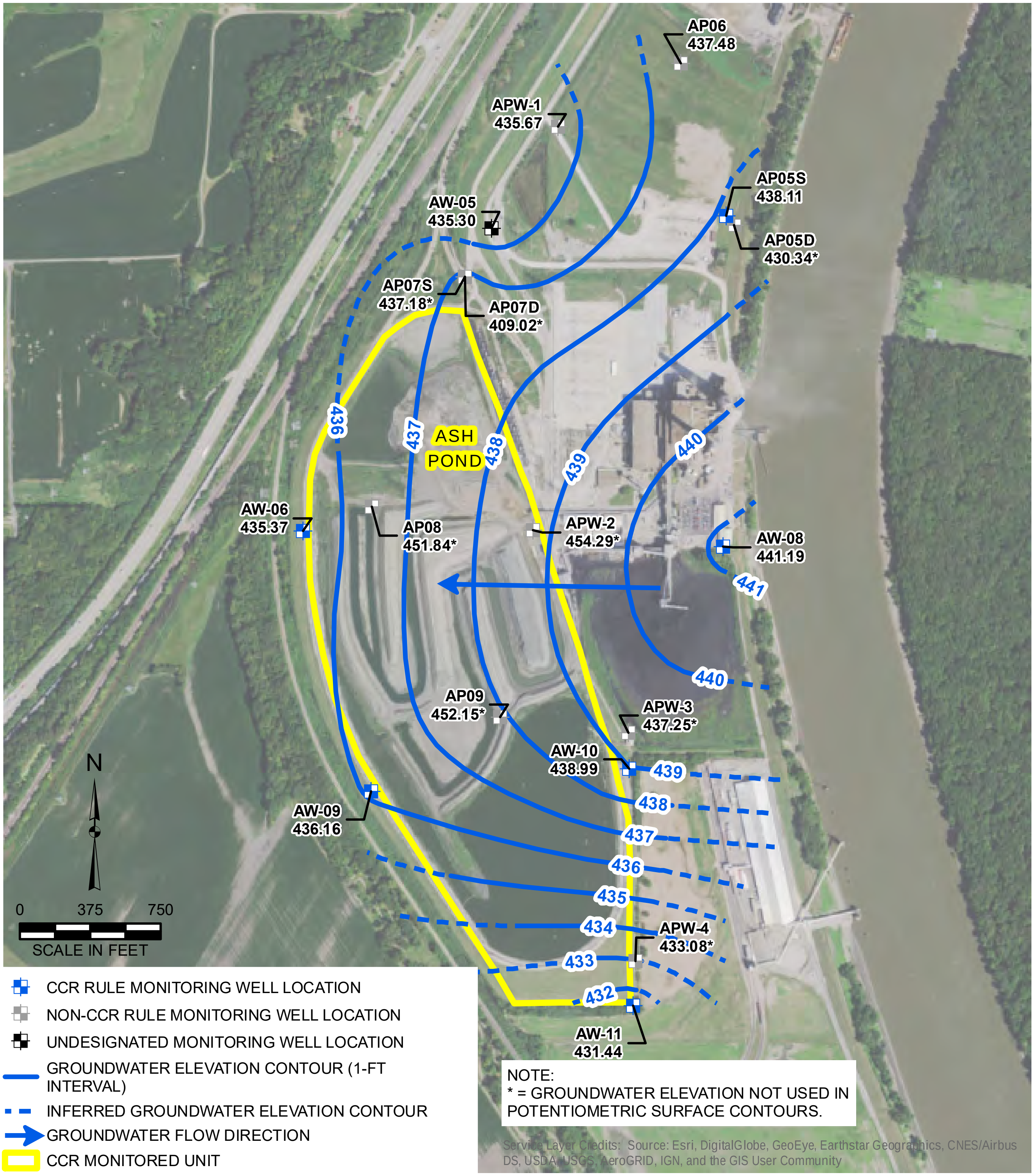
EDWARDS ASH POND (UNIT ID: 301)
UPPERMOST AQUIFER UNIT
GROUNDWATER ELEVATION CONTOUR MAP
ROUND 7: MAY 8, 2017

DYNEGY CCR RULE GROUNDWATER MONITORING
EDWARDS POWER STATION
BARTONSVILLE, ILLINOIS

PROJECT NO: 2285

FIGURE NO: 1

Natural Resource Technology
AN OBG COMPANY



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ANS 7/29/17
APPROVED BY/DATE:
JJW 9/1/17

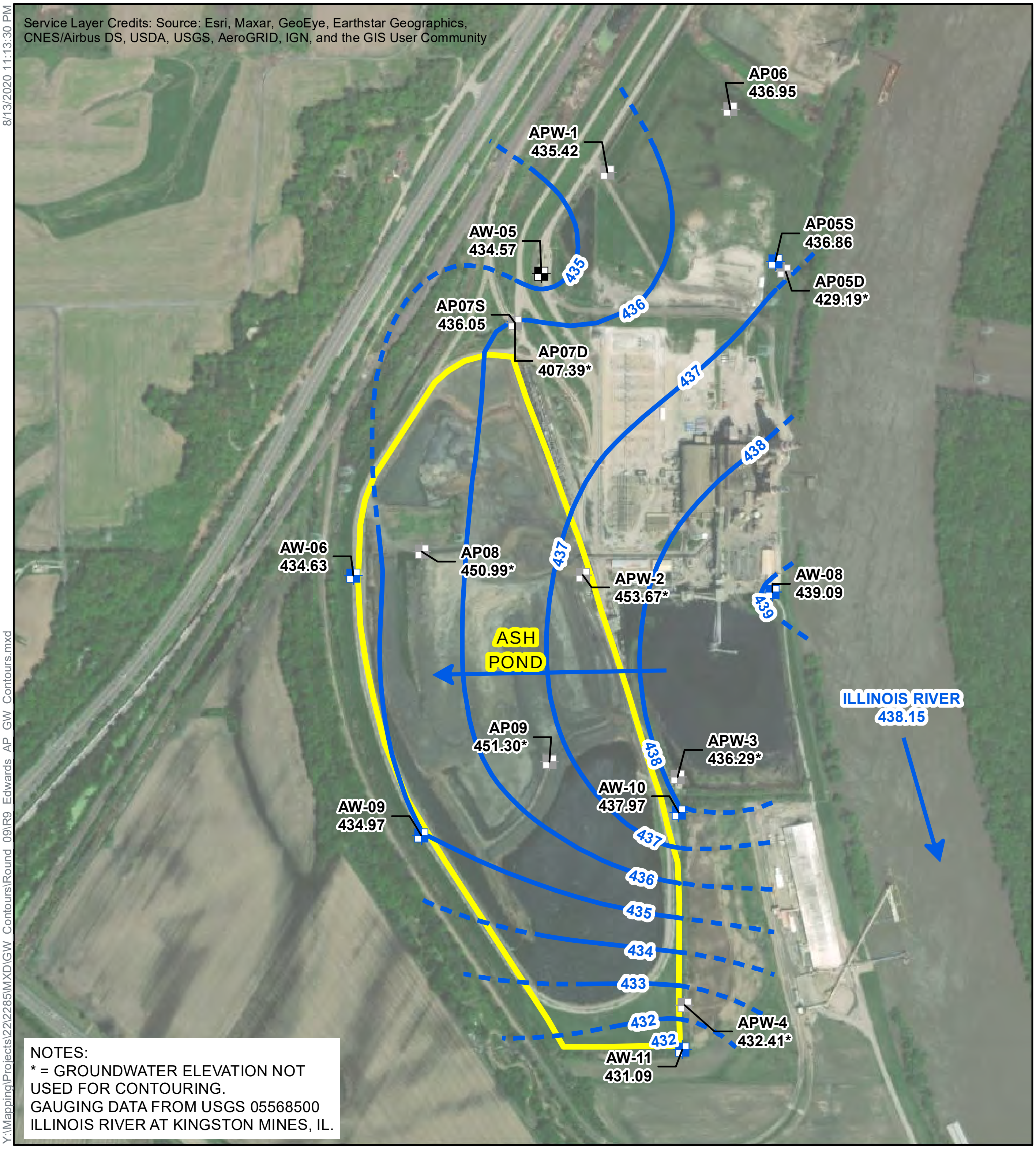
EDWARDS ASH POND (UNIT ID: 301)
UPPERMOST AQUIFER UNIT
GROUNDWATER ELEVATION CONTOUR MAP
ROUND 8: JULY 19, 2017

DYNEGY CCR RULE GROUNDWATER MONITORING
EDWARDS POWER STATION
BARTONSVILLE, ILLINOIS

PROJECT NO: 2285

FIGURE NO: 1

Natural Resource Technology
AN OBG COMPANY



NOTES:
* = GROUNDWATER ELEVATION NOT USED FOR CONTOURING.
GAUGING DATA FROM USGS 05568500 ILLINOIS RIVER AT KINGSTON MINES, IL.

CCR RULE MONITORING WELL LOCATION
NON-CCR RULE MONITORING WELL LOCATION
UNDESIGNATED MONITORING WELL LOCATION
GROUNDWATER ELEVATION CONTOUR (1-FT CONTOUR INTERVAL, NAVD88)
INFERRED GROUNDWATER ELEVATION CONTOUR
GROUNDWATER FLOW DIRECTION
CCR MONITORED UNIT

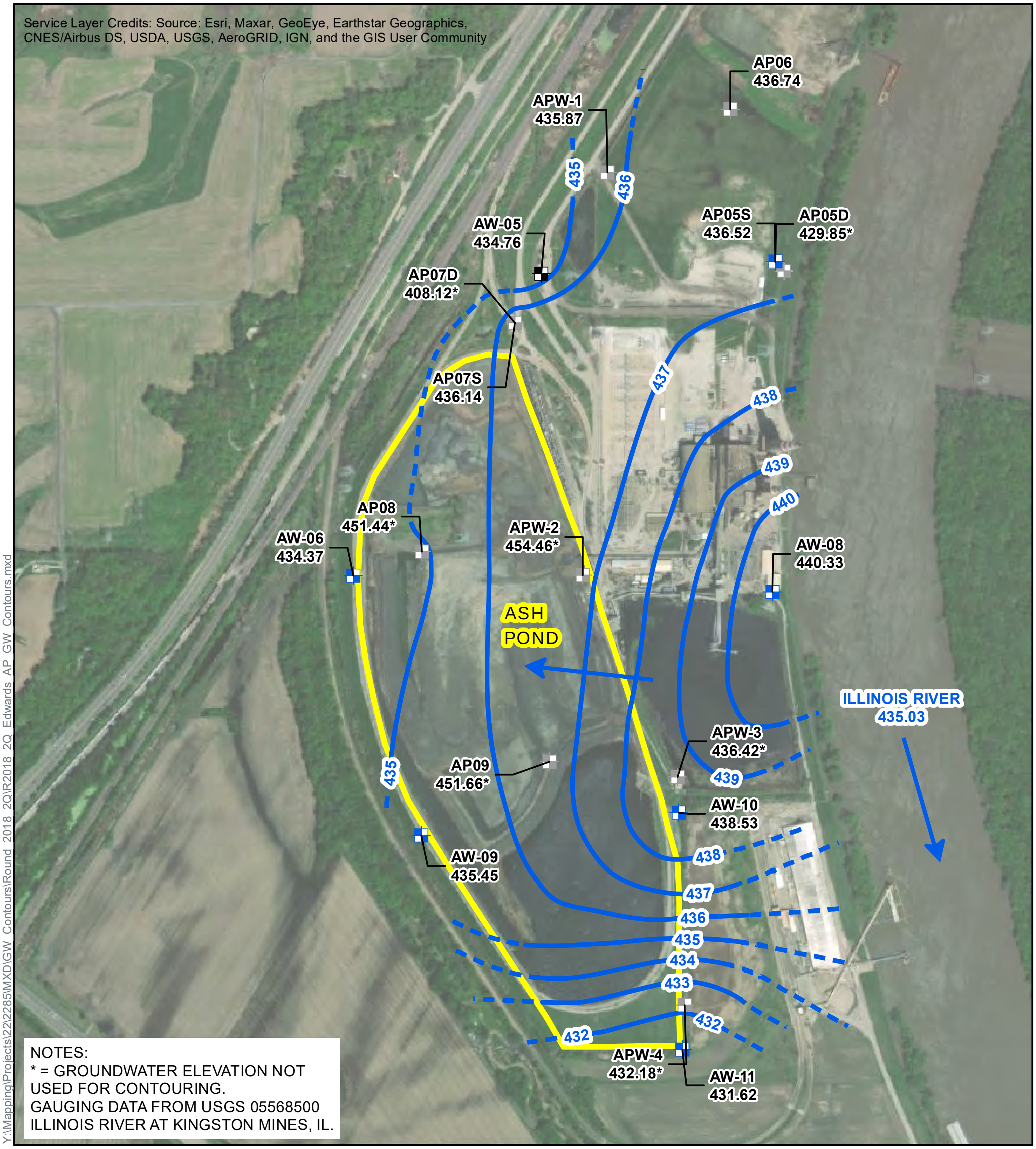
EDWARDS ASH POND (UNIT ID: 301)
GROUNDWATER ELEVATION CONTOUR MAP
NOVEMBER 1, 2017

CCR RULE GROUNDWATER MONITORING
EDWARDS POWER STATION
BARTONVILLE, ILLINOIS

0 187.5 375 750
Feet

N

O'BRIEN & GERE ENGINEERS, INC.



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- CCR RULE MONITORING WELL LOCATION
- NON-CCR RULE MONITORING WELL LOCATION
- UNDESIGNATED MONITORING WELL LOCATION
- GROUNDWATER ELEVATION CONTOUR (1-FT CONTOUR INTERVAL, NAVD88)
- INFERRED GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- CCR MONITORED UNIT

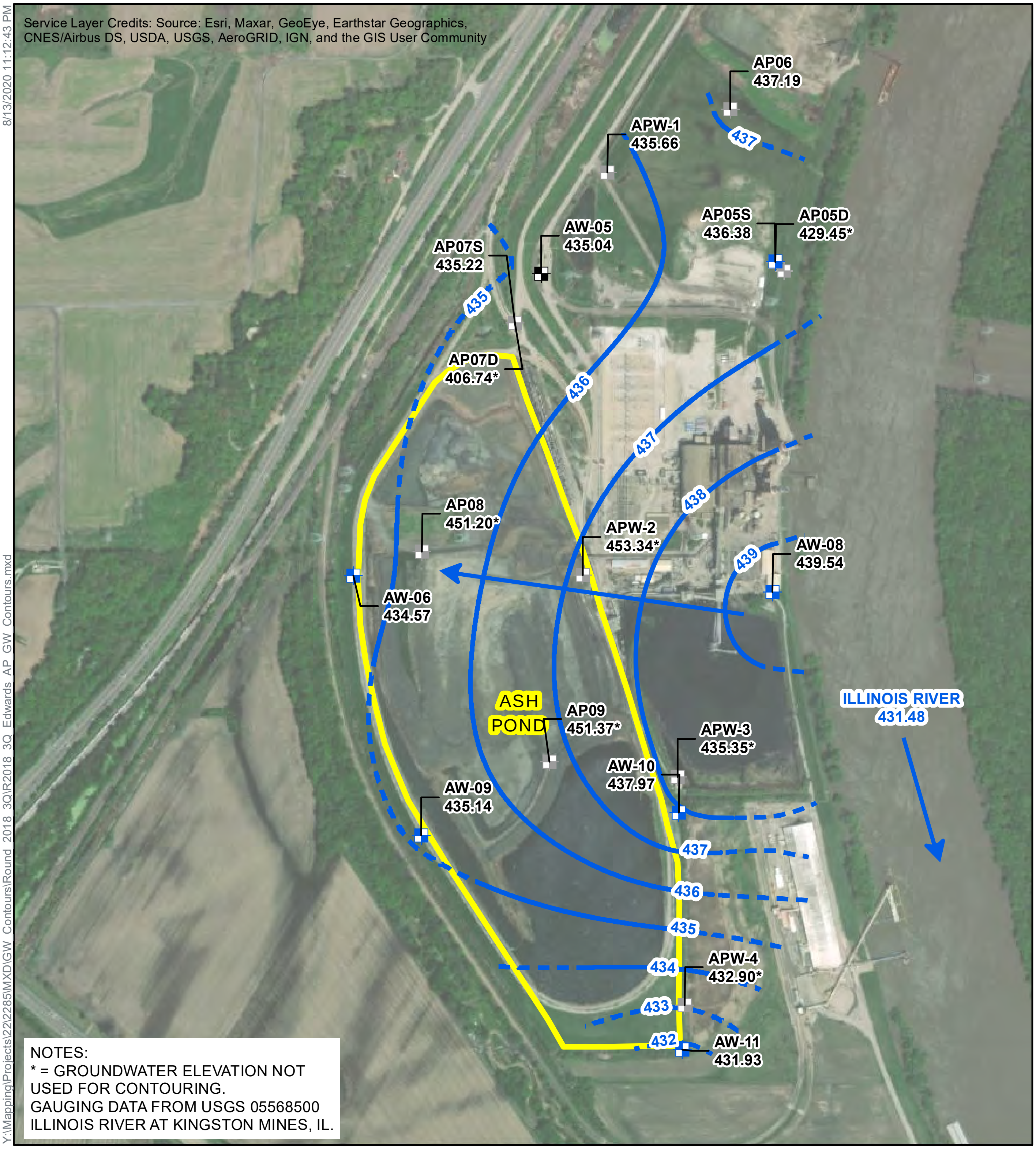
EDWARDS ASH POND (UNIT ID: 301)
GROUNDWATER ELEVATION CONTOUR MAP
MAY 4, 2018

CCR RULE GROUNDWATER MONITORING
EDWARDS POWER STATION
BARTONVILLE, ILLINOIS

0 187.5 375 750
Feet

N

O'BRIEN & GERE ENGINEERS, INC.



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NOTES:
* = GROUNDWATER ELEVATION NOT USED FOR CONTOURING.
GAUGING DATA FROM USGS 05568500 ILLINOIS RIVER AT KINGSTON MINES, IL.

- CCR RULE MONITORING WELL LOCATION
- NON-CCR RULE MONITORING WELL LOCATION
- UNDESIGNATED MONITORING WELL LOCATION
- GROUNDWATER ELEVATION CONTOUR (1-FT CONTOUR INTERVAL, NAVD88)
- INFERRED GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- CCR MONITORED UNIT

EDWARDS ASH POND (UNIT ID: 301) GROUNDWATER ELEVATION CONTOUR MAP
JULY 26, 2018

CCR RULE GROUNDWATER MONITORING
EDWARDS POWER STATION
BARTONVILLE, ILLINOIS

0 187.5 375 750
Feet

N

O'BRIEN & GERE ENGINEERS, INC.

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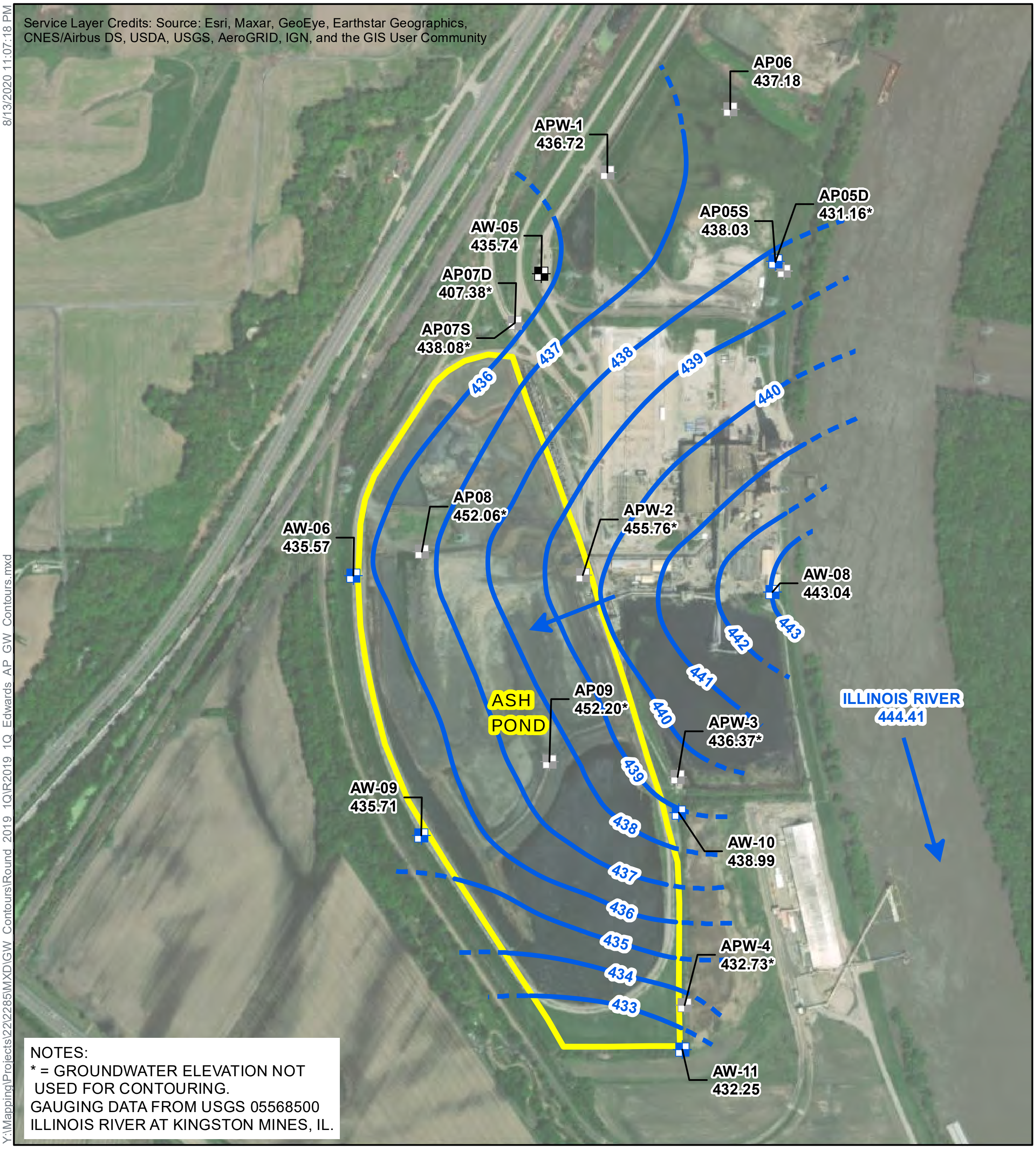


CCR RULE MONITORING WELL LOCATION

NON-CCR RULE MONITORING WELL LOCATION

UNDESIGNATED MONITORING WELL LOCATION

GROUNDWATER ELEVATION CONTOUR (1-FT CONTOUR INTERVAL, NAVD88)

INFERRED GROUNDWATER ELEVATION CONTOUR

GROUNDWATER FLOW DIRECTION

CCR MONITORED UNIT

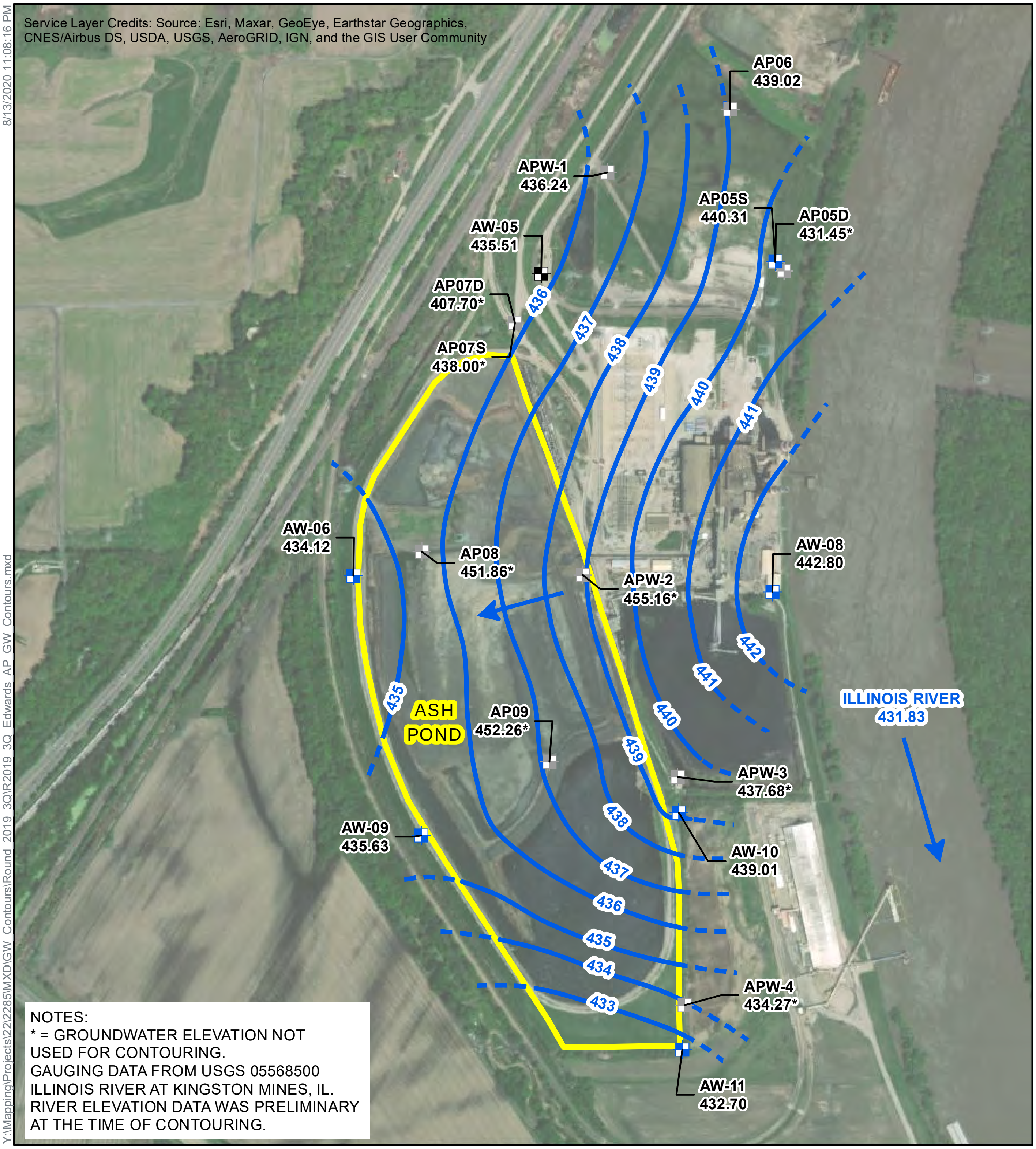
EDWARDS ASH POND (UNIT ID: 301)
GROUNDWATER ELEVATION CONTOUR MAP
FEBRUARY 25, 2019

CCR RULE GROUNDWATER MONITORING
EDWARDS POWER STATION
BARTONVILLE, ILLINOIS

0 187.5 375 750
Feet

N

O'BRIEN & GERE ENGINEERS, INC.



NOTES:
* = GROUNDWATER ELEVATION NOT USED FOR CONTOURING.
GAUGING DATA FROM USGS 05568500 ILLINOIS RIVER AT KINGSTON MINES, IL.
RIVER ELEVATION DATA WAS PRELIMINARY AT THE TIME OF CONTOURING.

- CCR RULE MONITORING WELL LOCATION
- NON-CCR RULE MONITORING WELL LOCATION
- UNDESIGNATED MONITORING WELL LOCATION
- GROUNDWATER ELEVATION CONTOUR (1-FT CONTOUR INTERVAL, NAVD88)
- INFERRED GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- CCR MONITORED UNIT

EDWARDS ASH POND (UNIT ID: 301)
GROUNDWATER ELEVATION CONTOUR MAP
AUGUST 6, 2019

CCR RULE GROUNDWATER MONITORING
EDWARDS POWER STATION
BARTONVILLE, ILLINOIS

0 187.5 375 750
Feet

N

O'BRIEN & GERE ENGINEERS, INC.

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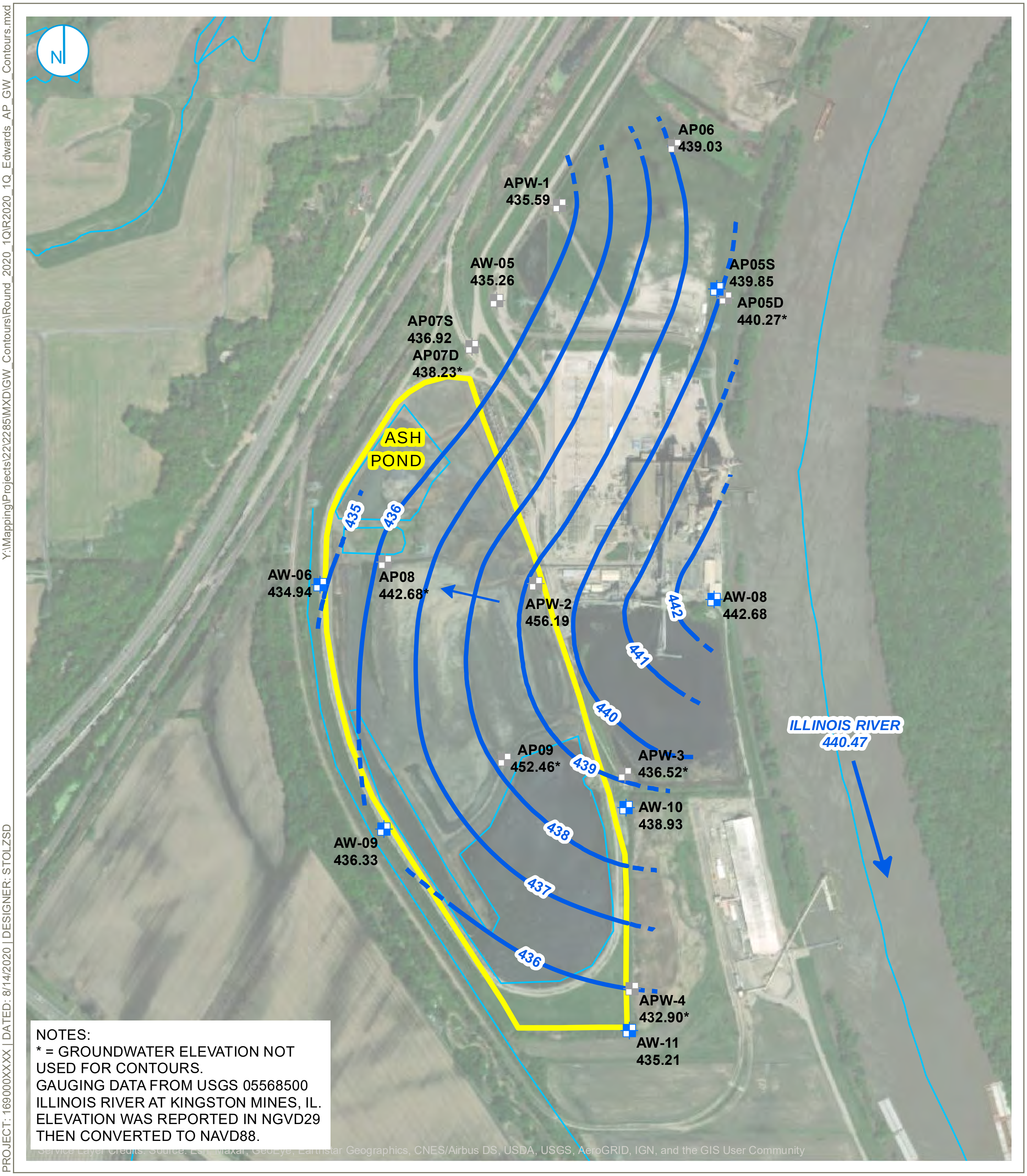

CCR RULE MONITORING WELL

NON-CCR RULE MONITORING WELL

GROUNDWATER ELEVATION CONTOUR (1-FT CONTOUR INTERVAL, NAVD88)

INFERRED GROUNDWATER ELEVATION CONTOUR

GROUNDWATER FLOW DIRECTION

CCR MONITORED UNIT

SURFACE WATER FEATURE

0 450 900 Feet

GROUNDWATER ELEVATION CONTOUR MAP
FEBRUARY 27, 2020

EDWARDS ASH POND (UNIT ID: 301)
VISTRA ENERGY
EDWARDS POWER STATION
BARTONVILLE, ILLINOIS

RAMBOLL US CORPORATION
A RAMBOLL COMPANY

TABLE E-1. GROUNDWATER ELEVATION RESULTS

TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
AP05S	01/16/2017	438.30
AP05S	05/08/2017	437.83
AP05S	06/07/2017	438.37
AP05S	06/22/2017	438.08
AP05S	07/19/2017	438.11
AP05S	07/31/2017	438.35
AP05S	08/07/2017	438.44
AP05S	08/23/2017	438.53
AP05S	11/01/2017	436.86
AP05S	05/04/2018	436.52
AP05S	07/26/2018	436.38
AP05S	08/27/2018	436.59
AP05S	02/25/2019	438.03
AP05S	08/06/2019	440.31
AP05S	02/27/2020	439.85
AP05S	08/31/2020	438.32
AP05S	09/01/2020	438.19
AP05S	02/09/2021	437.61
AP05S	02/10/2021	437.61
AP05S	02/11/2021	437.95
AP05S	02/23/2021	437.84
AP05S	03/02/2021	437.93
AP05S	03/08/2021	437.93
AP05S	03/22/2021	438.43
AP05S	03/24/2021	438.43
AP05S	04/12/2021	438.59
AP05S	04/13/2021	438.41
AP05S	05/04/2021	438.43
AP05S	05/07/2021	438.41
AP05S	06/15/2021	438.30
AP05S	06/16/2021	438.25
AP05S	06/28/2021	438.24
AP05S	06/29/2021	438.27
AP05S	07/21/2021	438.67
AP05S	07/22/2021	438.68
AP05S	08/30/2021	438.13
AP05D	01/16/2017	430.11
AP05D	05/08/2017	429.96
AP05D	07/19/2017	430.34
AP05D	11/01/2017	429.19
AP05D	05/04/2018	429.85
AP05D	07/26/2018	429.45
AP05D	02/25/2019	431.16
AP05D	08/06/2019	431.45
AP05D	02/27/2020	440.27

TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
AP05D	08/31/2020	440.23
AP05D	02/09/2021	439.14
AP05D	02/10/2021	439.14
AP05D	02/11/2021	430.80
AP05D	03/02/2021	435.81
AP05D	03/08/2021	435.81
AP05D	03/22/2021	433.33
AP05D	03/24/2021	433.33
AP05D	04/12/2021	431.96
AP05D	04/15/2021	432.63
AP05D	05/04/2021	432.29
AP05D	05/07/2021	433.08
AP05D	06/15/2021	435.02
AP05D	06/28/2021	433.14
AP05D	07/21/2021	437.15
AP05D	08/30/2021	438.36
AP06	01/16/2017	437.22
AP06	05/08/2017	437.35
AP06	07/19/2017	437.48
AP06	11/01/2017	436.95
AP06	05/04/2018	436.74
AP06	07/26/2018	437.19
AP06	02/25/2019	437.18
AP06	08/06/2019	439.02
AP06	02/27/2020	439.03
AP06	08/31/2020	436.24
AP06	02/09/2021	438.27
AP06	02/11/2021	437.92
AP06	03/02/2021	438.67
AP06	03/22/2021	438.98
AP06	04/12/2021	438.77
AP06	05/04/2021	438.02
AP06	06/15/2021	436.60
AP06	06/28/2021	437.92
AP06	07/21/2021	438.04
AP06	08/30/2021	436.85
AP07S	01/16/2017	436.51
AP07S	05/08/2017	436.84
AP07S	07/19/2017	437.18
AP07S	11/01/2017	436.05
AP07S	05/04/2018	436.14
AP07S	07/26/2018	435.22
AP07S	02/25/2019	438.08
AP07S	08/06/2019	438.00
AP07S	02/27/2020	436.92

TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
AP07S	08/31/2020	435.45
AP07S	02/09/2021	436.14
AP07S	02/10/2021	436.14
AP07S	02/11/2021	436.12
AP07S	03/02/2021	436.50
AP07S	03/04/2021	436.50
AP07S	03/22/2021	436.73
AP07S	03/24/2021	436.73
AP07S	04/12/2021	436.61
AP07S	04/13/2021	436.50
AP07S	05/04/2021	436.23
AP07S	05/05/2021	436.13
AP07S	06/15/2021	435.97
AP07S	06/16/2021	436.30
AP07S	06/28/2021	436.37
AP07S	07/21/2021	436.26
AP07S	07/22/2021	436.21
AP07S	08/30/2021	435.75
AP07D	01/16/2017	408.23
AP07D	05/08/2017	408.77
AP07D	07/19/2017	409.02
AP07D	11/01/2017	407.39
AP07D	05/04/2018	408.12
AP07D	07/26/2018	406.74
AP07D	02/25/2019	407.38
AP07D	08/06/2019	407.70
AP07D	02/27/2020	438.23
AP07D	08/31/2020	437.77
AP07D	02/09/2021	437.76
AP07D	02/10/2021	437.76
AP07D	02/11/2021	429.88
AP07D	03/02/2021	431.15
AP07D	03/08/2021	431.15
AP07D	03/22/2021	415.52
AP07D	03/24/2021	415.52
AP07D	04/12/2021	407.02
AP07D	04/13/2021	407.18
AP07D	05/04/2021	402.41
AP07D	05/05/2021	402.50
AP07D	06/15/2021	399.23
AP07D	06/28/2021	397.79
AP07D	07/21/2021	399.78
AP07D	07/22/2021	399.87
AP07D	08/30/2021	400.21
AP08	01/16/2017	451.72

TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
AP08	01/18/2017	451.72
AP08	05/08/2017	451.55
AP08	07/19/2017	451.84
AP08	11/01/2017	450.99
AP08	05/04/2018	451.44
AP08	07/26/2018	451.20
AP08	02/25/2019	452.06
AP08	08/06/2019	451.86
AP08	02/27/2020	453.97
AP08	08/31/2020	451.28
AP08	02/09/2021	452.60
AP08	02/11/2021	452.58
AP08	03/02/2021	452.85
AP08	03/22/2021	453.59
AP08	04/12/2021	453.16
AP08	05/04/2021	452.70
AP08	06/15/2021	452.40
AP08	06/28/2021	452.92
AP08	07/21/2021	452.97
AP08	08/30/2021	451.89
AP09	01/17/2017	452.02
AP09	01/18/2017	452.02
AP09	05/08/2017	452.07
AP09	07/19/2017	452.15
AP09	11/01/2017	451.30
AP09	05/04/2018	451.66
AP09	07/26/2018	451.37
AP09	02/25/2019	452.20
AP09	08/06/2019	452.26
AP09	02/27/2020	452.46
AP09	08/31/2020	451.49
AP09	02/09/2021	451.96
AP09	02/11/2021	451.84
AP09	03/02/2021	451.95
AP09	03/22/2021	451.95
AP09	04/12/2021	451.86
AP09	05/04/2021	452.12
AP09	06/15/2021	451.61
AP09	06/28/2021	452.09
AP09	07/21/2021	452.19
AP09	08/30/2021	451.96
APW-01	12/21/2015	436.11
APW-01	02/17/2016	436.06
APW-01	05/17/2016	437.21
APW-01	07/21/2016	436.04

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TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
APW-01	11/10/2016	436.56
APW-01	01/16/2017	436.05
APW-01	05/08/2017	435.98
APW-01	07/19/2017	435.67
APW-01	11/01/2017	435.42
APW-01	05/04/2018	435.87
APW-01	07/26/2018	435.66
APW-01	02/25/2019	436.72
APW-01	08/06/2019	436.24
APW-01	02/27/2020	435.59
APW-01	08/31/2020	434.34
APW-01	02/09/2021	435.24
APW-01	02/11/2021	435.14
APW-01	03/02/2021	435.42
APW-01	03/22/2021	435.38
APW-01	04/12/2021	435.56
APW-01	05/04/2021	435.19
APW-01	06/15/2021	433.62
APW-01	06/17/2021	434.54
APW-01	06/28/2021	435.32
APW-01	06/29/2021	435.57
APW-01	07/21/2021	435.05
APW-01	07/22/2021	435.00
APW-01	08/30/2021	434.98
APW-02	12/21/2015	454.29
APW-02	02/17/2016	454.38
APW-02	05/17/2016	455.12
APW-02	07/21/2016	453.77
APW-02	11/10/2016	454.82
APW-02	01/16/2017	454.64
APW-02	05/08/2017	454.22
APW-02	07/19/2017	454.29
APW-02	11/01/2017	453.67
APW-02	05/04/2018	454.46
APW-02	07/26/2018	453.34
APW-02	02/25/2019	455.76
APW-02	08/06/2019	455.16
APW-02	02/27/2020	456.19
APW-02	08/31/2020	455.43
APW-02	02/09/2021	455.40
APW-02	02/10/2021	450.37
APW-02	02/11/2021	450.37
APW-02	03/02/2021	455.31
APW-02	03/03/2021	455.31
APW-02	03/22/2021	455.21

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TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
APW-02	03/24/2021	455.21
APW-02	04/12/2021	455.43
APW-02	04/13/2021	455.44
APW-02	05/04/2021	455.43
APW-02	05/06/2021	455.46
APW-02	06/15/2021	455.70
APW-02	06/28/2021	455.63
APW-02	07/21/2021	455.69
APW-02	08/30/2021	455.55
APW-03	12/21/2015	437.34
APW-03	02/17/2016	437.40
APW-03	05/17/2016	437.43
APW-03	07/21/2016	437.18
APW-03	11/10/2016	437.18
APW-03	01/16/2017	435.34
APW-03	05/08/2017	437.20
APW-03	07/19/2017	437.25
APW-03	11/01/2017	436.29
APW-03	05/04/2018	436.42
APW-03	07/26/2018	435.35
APW-03	02/25/2019	436.37
APW-03	08/06/2019	437.68
APW-03	02/27/2020	436.52
APW-03	08/31/2020	435.69
APW-03	02/09/2021	436.78
APW-03	02/10/2021	429.81
APW-03	02/11/2021	429.81
APW-03	03/02/2021	436.47
APW-03	03/04/2021	436.47
APW-03	03/22/2021	436.75
APW-03	03/24/2021	436.75
APW-03	04/12/2021	436.25
APW-03	04/13/2021	436.10
APW-03	05/04/2021	436.06
APW-03	05/07/2021	435.94
APW-03	06/15/2021	435.64
APW-03	06/28/2021	436.22
APW-03	07/21/2021	436.13
APW-03	08/30/2021	435.57
APW-04	12/21/2015	432.91
APW-04	02/17/2016	433.51
APW-04	05/17/2016	434.64
APW-04	07/21/2016	432.82
APW-04	11/10/2016	432.86
APW-04	01/16/2017	432.66

TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
APW-04	05/08/2017	432.73
APW-04	07/19/2017	433.08
APW-04	11/01/2017	432.41
APW-04	05/04/2018	432.18
APW-04	07/26/2018	432.90
APW-04	02/25/2019	432.73
APW-04	08/06/2019	434.27
APW-04	02/27/2020	432.90
APW-04	08/31/2020	431.05
APW-04	02/09/2021	432.44
APW-04	02/10/2021	432.30
APW-04	02/11/2021	432.30
APW-04	03/02/2021	432.74
APW-04	03/04/2021	432.74
APW-04	03/22/2021	432.75
APW-04	04/12/2021	432.91
APW-04	04/13/2021	432.84
APW-04	05/04/2021	432.40
APW-04	05/07/2021	432.31
APW-04	06/15/2021	431.79
APW-04	06/28/2021	431.21
APW-04	07/21/2021	432.13
APW-04	08/30/2021	431.98
AW-05	11/09/2015	434.06
AW-05	12/21/2015	434.52
AW-05	02/17/2016	434.27
AW-05	05/17/2016	434.74
AW-05	07/21/2016	434.34
AW-05	11/10/2016	435.02
AW-05	01/16/2017	435.41
AW-05	05/08/2017	434.99
AW-05	07/19/2017	435.30
AW-05	11/01/2017	434.57
AW-05	05/04/2018	434.76
AW-05	07/26/2018	435.04
AW-05	02/25/2019	435.74
AW-05	08/06/2019	435.51
AW-05	02/27/2020	435.26
AW-05	08/31/2020	434.16
AW-05	02/09/2021	435.10
AW-05	02/11/2021	435.03
AW-05	03/02/2021	435.17
AW-05	03/22/2021	435.28
AW-05	04/12/2021	435.55
AW-05	05/04/2021	435.16

TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
AW-05	06/15/2021	434.68
AW-05	06/17/2021	434.27
AW-05	06/28/2021	435.12
AW-05	07/21/2021	434.91
AW-05	07/22/2021	434.79
AW-05	08/30/2021	434.44
AW-06	11/09/2015	434.65
AW-06	12/21/2015	435.19
AW-06	02/17/2016	434.69
AW-06	05/17/2016	433.07
AW-06	07/21/2016	432.56
AW-06	11/10/2016	433.32
AW-06	01/16/2017	434.23
AW-06	05/08/2017	435.12
AW-06	07/19/2017	435.37
AW-06	11/01/2017	434.63
AW-06	05/04/2018	434.37
AW-06	07/26/2018	434.57
AW-06	02/25/2019	435.57
AW-06	08/06/2019	434.12
AW-06	02/27/2020	434.94
AW-06	08/31/2020	433.60
AW-06	02/09/2021	434.40
AW-06	02/11/2021	434.50
AW-06	02/23/2021	434.81
AW-06	03/02/2021	434.62
AW-06	03/22/2021	434.70
AW-06	04/12/2021	434.85
AW-06	05/04/2021	434.48
AW-06	06/15/2021	434.26
AW-06	06/28/2021	434.60
AW-06	07/21/2021	434.40
AW-06	08/30/2021	436.01
AW-08	11/09/2015	439.28
AW-08	12/21/2015	441.48
AW-08	02/17/2016	442.56
AW-08	05/17/2016	440.54
AW-08	07/21/2016	441.48
AW-08	11/10/2016	442.45
AW-08	01/16/2017	441.33
AW-08	05/08/2017	441.36
AW-08	07/19/2017	441.19
AW-08	11/01/2017	439.09
AW-08	05/04/2018	440.33
AW-08	07/26/2018	439.54

TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
AW-08	08/27/2018	439.63
AW-08	02/25/2019	443.04
AW-08	08/06/2019	442.80
AW-08	02/27/2020	442.68
AW-08	08/31/2020	440.09
AW-08	09/01/2020	440.07
AW-08	02/09/2021	438.28
AW-08	02/10/2021	434.16
AW-08	02/11/2021	434.16
AW-08	02/23/2021	438.16
AW-08	03/02/2021	437.77
AW-08	03/05/2021	437.77
AW-08	03/22/2021	439.27
AW-08	03/24/2021	439.27
AW-08	04/12/2021	440.09
AW-08	04/13/2021	440.01
AW-08	05/04/2021	439.47
AW-08	05/07/2021	439.38
AW-08	06/15/2021	440.14
AW-08	06/16/2021	440.16
AW-08	06/28/2021	439.41
AW-08	07/21/2021	441.74
AW-08	08/30/2021	439.49
AW-09	11/09/2015	435.03
AW-09	12/21/2015	436.14
AW-09	02/17/2016	436.85
AW-09	05/17/2016	435.65
AW-09	07/21/2016	435.81
AW-09	11/10/2016	436.32
AW-09	01/16/2017	434.45
AW-09	05/08/2017	435.95
AW-09	07/19/2017	436.16
AW-09	11/01/2017	434.97
AW-09	05/04/2018	435.45
AW-09	07/26/2018	435.14
AW-09	02/25/2019	435.71
AW-09	08/06/2019	435.63
AW-09	02/27/2020	436.33
AW-09	08/31/2020	435.29
AW-09	02/09/2021	435.73
AW-09	02/11/2021	435.67
AW-09	02/23/2021	435.76
AW-09	03/02/2021	434.63
AW-09	03/22/2021	435.77
AW-09	04/12/2021	435.96

TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
AW-09	05/04/2021	435.63
AW-09	06/15/2021	435.64
AW-09	06/28/2021	436.51
AW-09	07/21/2021	435.90
AW-09	08/30/2021	435.35
AW-10	11/09/2015	438.64
AW-10	12/21/2015	439.65
AW-10	02/17/2016	439.71
AW-10	05/17/2016	439.77
AW-10	07/21/2016	439.13
AW-10	11/10/2016	439.33
AW-10	01/16/2017	439.40
AW-10	05/08/2017	439.42
AW-10	07/19/2017	438.99
AW-10	11/01/2017	437.97
AW-10	05/04/2018	438.53
AW-10	07/26/2018	437.97
AW-10	08/27/2018	438.62
AW-10	02/25/2019	438.99
AW-10	08/06/2019	439.01
AW-10	02/27/2020	438.93
AW-10	08/31/2020	438.84
AW-10	02/23/2021	438.84
AW-10	03/02/2021	438.84
AW-10	03/22/2021	438.84
AW-10	03/23/2021	438.84
AW-10	04/12/2021	438.85
AW-10	05/04/2021	438.80
AW-10	06/15/2021	438.62
AW-10	06/28/2021	438.61
AW-10	07/21/2021	438.60
AW-10	08/30/2021	437.93
AW-11	11/09/2015	434.19
AW-11	12/21/2015	434.99
AW-11	02/17/2016	435.54
AW-11	05/17/2016	434.92
AW-11	07/21/2016	434.77
AW-11	11/10/2016	435.03
AW-11	01/16/2017	434.26
AW-11	05/08/2017	431.48
AW-11	07/19/2017	431.44
AW-11	11/01/2017	431.09
AW-11	05/04/2018	431.62
AW-11	07/26/2018	431.93
AW-11	02/25/2019	432.25

TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
AW-11	08/06/2019	432.70
AW-11	02/27/2020	435.21
AW-11	08/31/2020	434.18
AW-11	02/09/2021	434.17
AW-11	02/11/2021	434.13
AW-11	02/23/2021	434.63
AW-11	03/02/2021	434.51
AW-11	03/22/2021	434.60
AW-11	04/12/2021	434.65
AW-11	05/04/2021	434.56
AW-11	06/15/2021	433.40
AW-11	06/28/2021	434.38
AW-11	07/21/2021	434.56
AW-11	08/30/2021	434.05
AW-12	02/09/2021	435.75
AW-12	03/02/2021	436.97
AW-12	03/04/2021	436.97
AW-12	03/22/2021	437.06
AW-12	03/24/2021	437.06
AW-12	04/12/2021	436.81
AW-12	05/04/2021	436.66
AW-12	05/07/2021	436.29
AW-12	06/15/2021	435.14
AW-12	06/28/2021	436.75
AW-12	07/21/2021	438.01
AW-12	08/30/2021	435.86
AW-13	02/09/2021	435.52
AW-13	03/02/2021	435.84
AW-13	03/04/2021	435.84
AW-13	03/22/2021	435.86
AW-13	03/23/2021	435.86
AW-13	04/12/2021	435.92
AW-13	05/04/2021	435.83
AW-13	05/07/2021	435.77
AW-13	06/15/2021	435.56
AW-13	06/28/2021	435.40
AW-13	07/21/2021	435.98
AW-13	08/30/2021	435.28
AW-14	02/09/2021	433.03
AW-14	03/02/2021	432.94
AW-14	03/04/2021	432.94
AW-14	03/22/2021	432.79
AW-14	04/12/2021	432.95
AW-14	05/04/2021	432.99
AW-14	05/06/2021	432.41

TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
AW-14	06/15/2021	372.50
AW-14	06/28/2021	432.87
AW-14	07/21/2021	433.04
AW-14	08/30/2021	432.21
AW-15	02/09/2021	433.03
AW-15	02/12/2021	433.03
AW-15	03/02/2021	433.50
AW-15	03/05/2021	433.50
AW-15	03/22/2021	433.68
AW-15	04/12/2021	433.76
AW-15	05/04/2021	433.69
AW-15	05/06/2021	433.60
AW-15	06/15/2021	433.65
AW-15	06/28/2021	433.59
AW-15	07/21/2021	433.65
AW-15	08/30/2021	434.43
AW-15C	02/09/2021	433.32
AW-15C	02/12/2021	431.22
AW-15C	03/02/2021	433.50
AW-15C	03/04/2021	433.50
AW-15C	03/22/2021	433.66
AW-15C	04/12/2021	433.80
AW-15C	04/13/2021	433.64
AW-15C	05/04/2021	433.71
AW-15C	05/06/2021	433.61
AW-15C	06/15/2021	433.63
AW-15C	06/28/2021	433.58
AW-15C	07/21/2021	433.67
AW-15C	08/30/2021	431.51
AW-15S	02/09/2021	431.91
AW-15S	02/12/2021	434.01
AW-15S	03/02/2021	431.19
AW-15S	03/04/2021	431.19
AW-15S	03/22/2021	431.33
AW-15S	04/12/2021	431.13
AW-15S	04/26/2021	431.15
AW-15S	05/04/2021	429.82
AW-15S	05/06/2021	430.14
AW-15S	06/15/2021	431.00
AW-15S	06/17/2021	430.24
AW-15S	06/28/2021	429.86
AW-15S	06/29/2021	429.06
AW-15S	07/21/2021	431.25
AW-15S	08/30/2021	430.87
AW-16	02/09/2021	437.63

TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
AW-16	03/02/2021	437.61
AW-16	03/03/2021	437.61
AW-16	03/22/2021	437.67
AW-16	03/24/2021	437.67
AW-16	04/12/2021	437.79
AW-16	04/23/2021	437.78
AW-16	05/04/2021	437.74
AW-16	05/05/2021	437.68
AW-16	06/15/2021	437.77
AW-16	06/24/2021	437.89
AW-16	06/28/2021	437.79
AW-16	06/29/2021	437.81
AW-16	07/21/2021	437.74
AW-16	08/30/2021	437.41
AW-17	02/09/2021	436.85
AW-17	03/02/2021	437.20
AW-17	03/03/2021	437.20
AW-17	03/22/2021	437.42
AW-17	03/23/2021	437.42
AW-17	04/12/2021	437.58
AW-17	04/23/2021	437.48
AW-17	05/04/2021	437.40
AW-17	05/05/2021	437.20
AW-17	06/15/2021	437.34
AW-17	06/24/2021	437.30
AW-17	06/28/2021	437.24
AW-17	06/29/2021	437.30
AW-17	07/21/2021	437.70
AW-17	08/30/2021	437.03
AW-18	02/09/2021	435.27
AW-18	03/02/2021	435.17
AW-18	03/03/2021	435.17
AW-18	03/22/2021	435.38
AW-18	03/23/2021	435.38
AW-18	04/12/2021	435.37
AW-18	04/13/2021	435.25
AW-18	05/04/2021	435.04
AW-18	05/05/2021	434.97
AW-18	06/15/2021	434.98
AW-18	06/23/2021	435.03
AW-18	06/28/2021	435.23
AW-18	06/29/2021	435.34
AW-18	07/21/2021	435.25
AW-18	08/30/2021	434.68
AW-19	02/09/2021	447.65

TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
AW-19	03/02/2021	447.64
AW-19	03/03/2021	447.64
AW-19	03/22/2021	447.71
AW-19	03/23/2021	447.71
AW-19	04/12/2021	447.55
AW-19	05/04/2021	447.36
AW-19	05/05/2021	447.33
AW-19	06/15/2021	447.09
AW-19	06/23/2021	447.15
AW-19	06/28/2021	447.40
AW-19	06/29/2021	447.42
AW-19	07/21/2021	447.22
AW-19	08/30/2021	446.88
AW-20	02/09/2021	445.11
AW-20	03/02/2021	445.23
AW-20	03/03/2021	445.23
AW-20	03/22/2021	445.41
AW-20	03/23/2021	445.41
AW-20	04/12/2021	445.29
AW-20	05/04/2021	445.08
AW-20	05/05/2021	445.07
AW-20	06/15/2021	444.55
AW-20	06/28/2021	445.08
AW-20	07/21/2021	445.24
AW-20	08/30/2021	444.25
AW-21	02/09/2021	444.04
AW-21	03/02/2021	444.20
AW-21	03/03/2021	444.20
AW-21	03/22/2021	444.42
AW-21	03/23/2021	444.42
AW-21	04/12/2021	444.17
AW-21	05/04/2021	443.74
AW-21	05/05/2021	443.72
AW-21	06/15/2021	442.83
AW-21	06/23/2021	443.13
AW-21	06/28/2021	443.79
AW-21	06/29/2021	443.82
AW-21	07/21/2021	443.46
AW-21	08/30/2021	442.68
AW-22	02/09/2021	451.45
AW-22	02/12/2021	451.45
AW-22	03/02/2021	451.64
AW-22	03/03/2021	451.64
AW-22	03/22/2021	451.80
AW-22	03/23/2021	451.80

TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
AW-22	04/12/2021	451.55
AW-22	04/23/2021	451.53
AW-22	05/04/2021	451.46
AW-22	05/05/2021	451.29
AW-22	06/15/2021	451.30
AW-22	06/28/2021	451.44
AW-22	07/21/2021	451.54
AW-22	08/30/2021	452.04
P002	02/09/2021	448.41
P002	02/12/2021	448.41
P002	03/02/2021	448.50
P002	03/03/2021	448.50
P002	03/22/2021	448.60
P002	03/23/2021	448.60
P002	04/12/2021	448.42
P002	04/13/2021	448.33
P002	05/04/2021	448.31
P002	06/15/2021	448.19
P002	06/28/2021	448.33
XPW01A	02/09/2021	452.42
XPW01A	03/02/2021	452.72
XPW01A	03/04/2021	452.72
XPW01A	03/22/2021	452.88
XPW01A	03/23/2021	452.88
XPW01A	04/12/2021	452.65
XPW01A	05/04/2021	452.41
XPW01A	06/15/2021	452.13
XPW01A	06/28/2021	452.98
XPW01A	07/21/2021	452.63
XPW01A	08/30/2021	452.32
XPW02	02/09/2021	452.97
XPW02	03/02/2021	453.17
XPW02	03/03/2021	453.17
XPW02	03/22/2021	454.08
XPW02	03/23/2021	454.08
XPW02	04/12/2021	453.73
XPW02	05/04/2021	453.23
XPW02	06/15/2021	452.90
XPW02	06/28/2021	453.47
XPW02	07/21/2021	453.67
XPW02	07/22/2021	453.55
XPW02	08/30/2021	452.36
XPW03	02/09/2021	450.74
XPW03	03/02/2021	450.72
XPW03	03/03/2021	450.72

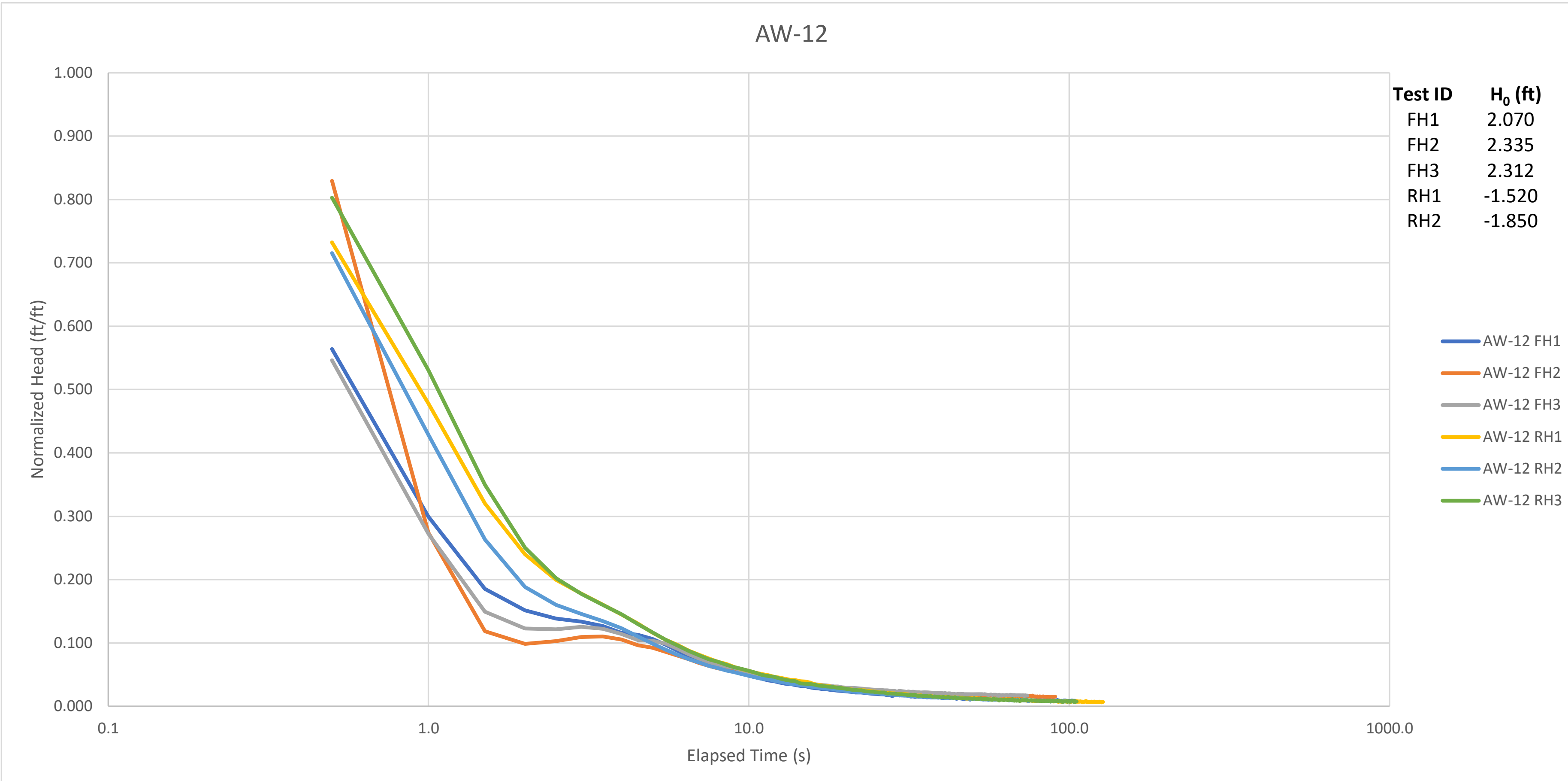
TABLE E-1. GROUNDWATER ELEVATIONS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

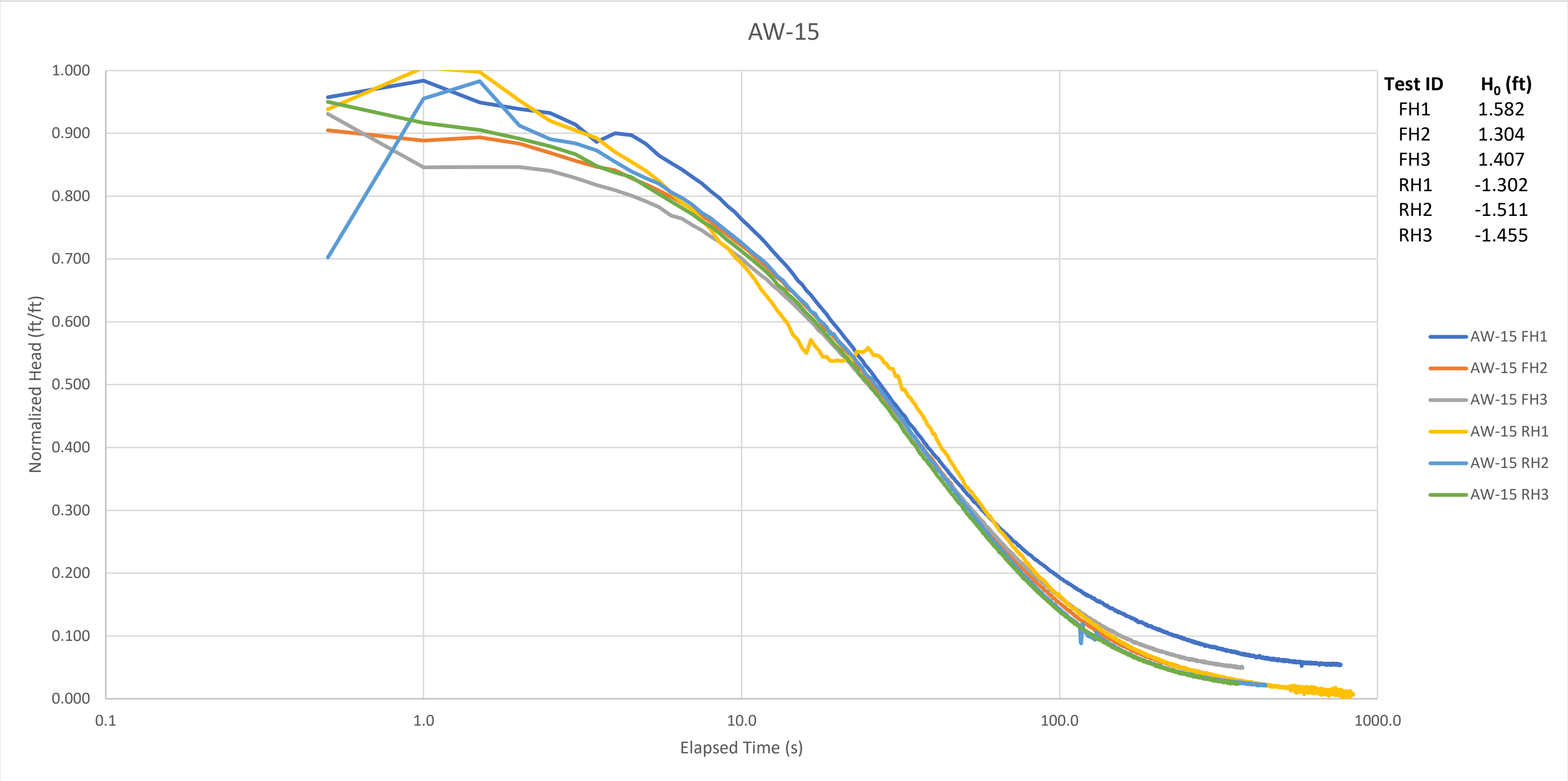
Sample Location	Sample Date	Groundwater Elevation (ft NAVD88)
XPW03	03/22/2021	450.77
XPW03	03/23/2021	450.77
XPW03	04/12/2021	450.62
XPW03	05/04/2021	450.84
XPW03	06/15/2021	450.38
XPW03	06/28/2021	450.86
XPW03	07/21/2021	451.03
XPW03	07/22/2021	450.86
XPW03	08/30/2021	450.76
SG-01	06/15/2021	625.21

Notes:
ft NAVD88 = feet relative to the North American Vertical Datum 1988, GEOID 12A
generated 10/05/2021, 4:08:22 PM CDT

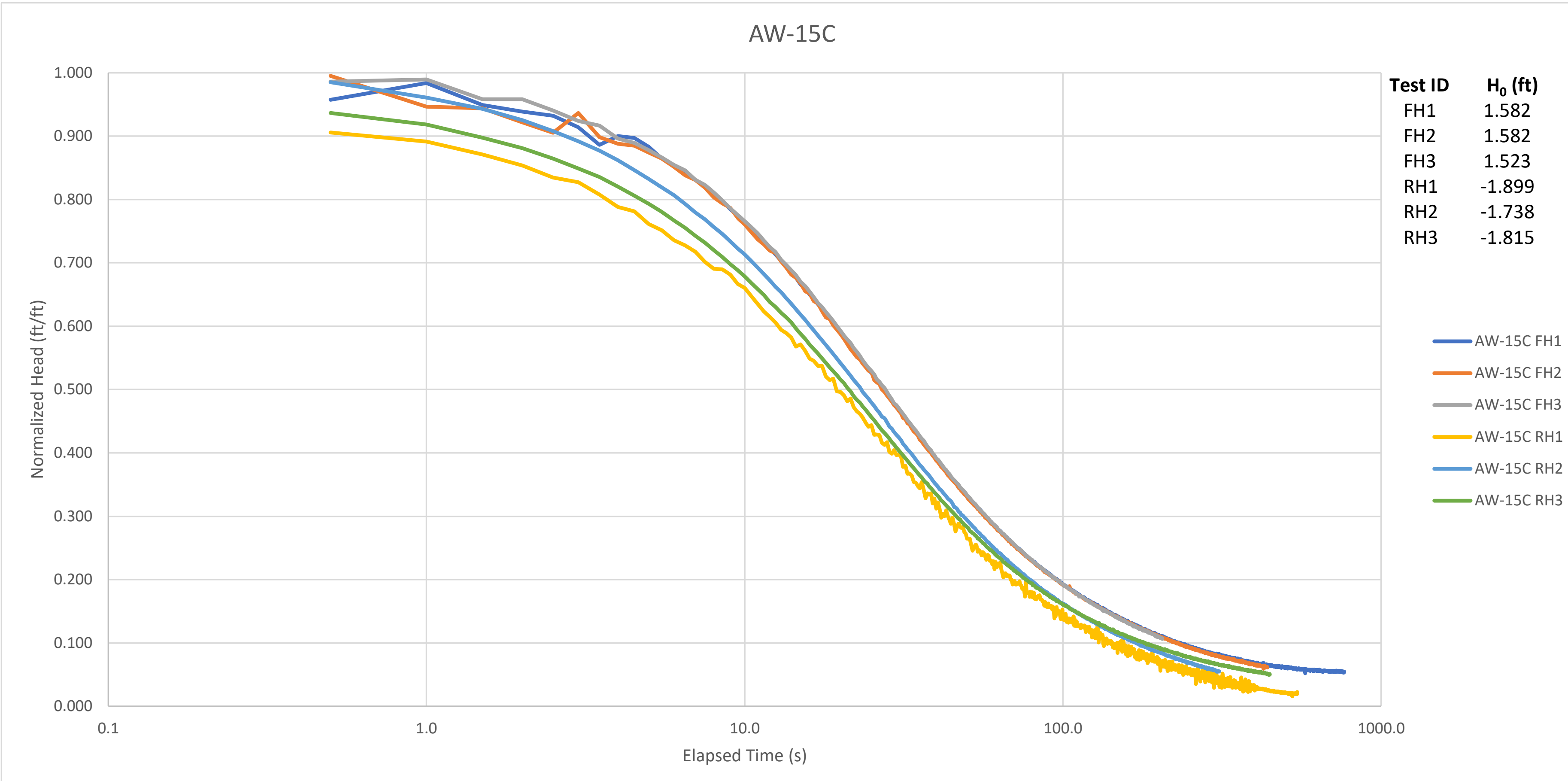
RAMBOLL

APPENDIX F
HYDRAULIC CONDUCTIVITY TEST DATA

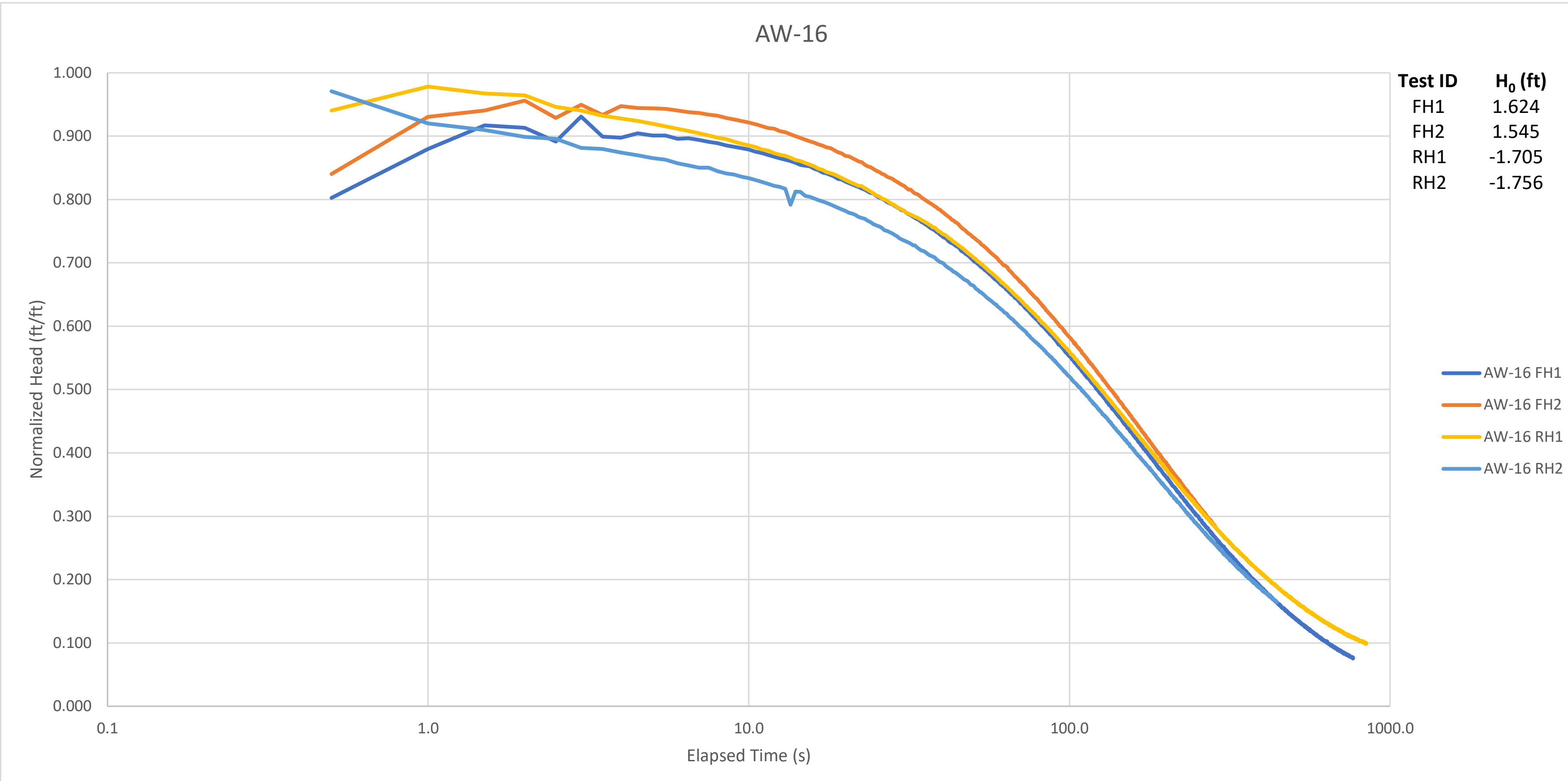

AW-12
Normalized Head (ft/ft)
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
0.1
1.0
10.0
100.0
1000.0
Elapsed Time (s)
Test ID H$_0$ (ft)
FH1 2.070
FH2 2.335
FH3 2.312
RH1 -1.520
RH2 -1.850
AW-12 FH1
AW-12 FH2
AW-12 FH3
AW-12 RH1
AW-12 RH2
AW-12 RH3



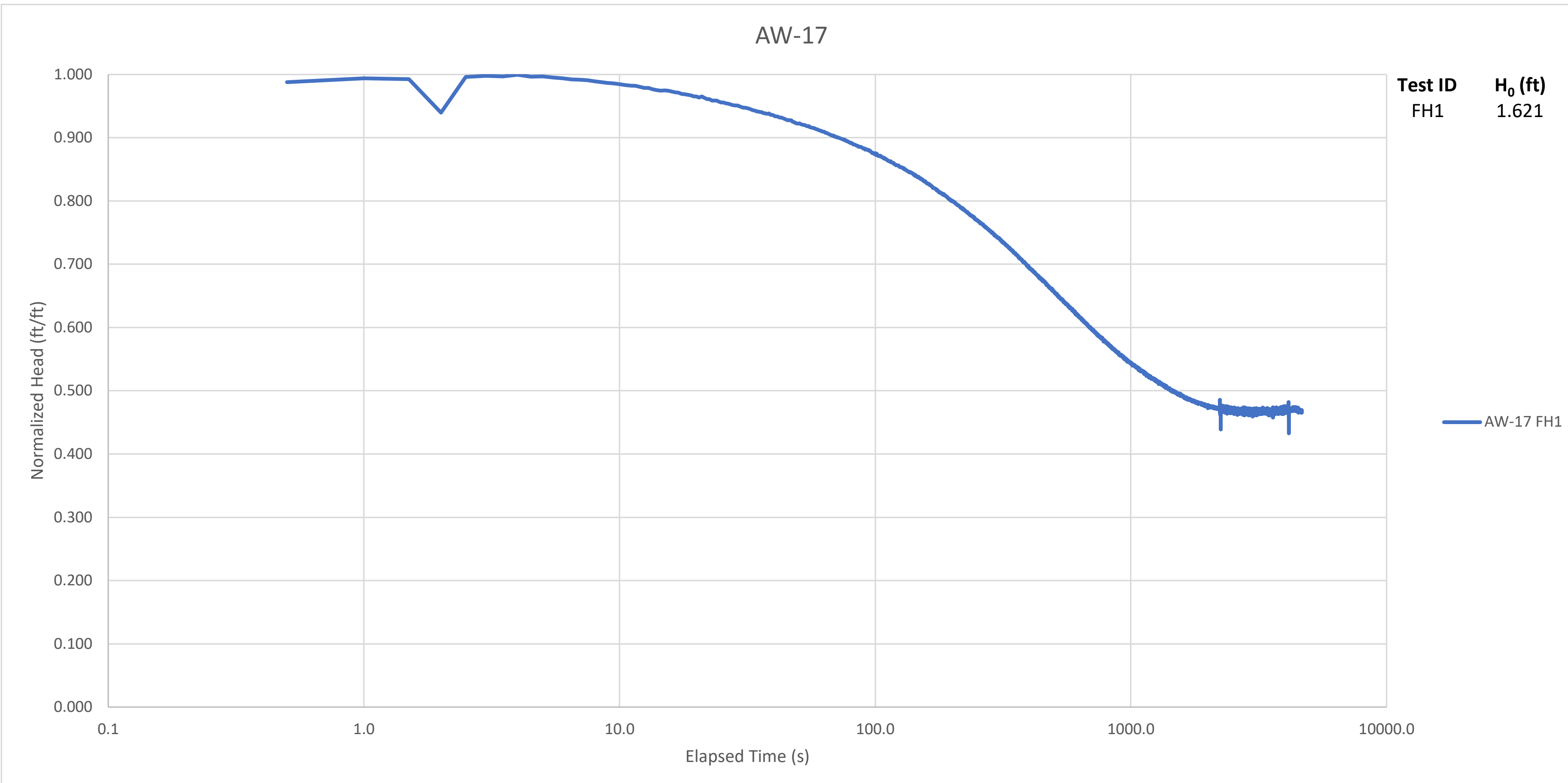
AW-15
Normalized Head (ft/ft)
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
0.1
1.0
10.0
100.0
1000.0
Elapsed Time (s)
Test ID H0 (ft)
FH1 1.582
FH2 1.304
FH3 1.407
RH1 -1.302
RH2 -1.511
RH3 -1.455
AW-15 FH1
AW-15 FH2
AW-15 FH3
AW-15 RH1
AW-15 RH2
AW-15 RH3


AW-15C
Normalized Head (ft/ft)
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
0.1
1.0
10.0
100.0
1000.0
Elapsed Time (s)
Test ID H_0 (ft)
FH1 1.582
FH2 1.582
FH3 1.523
RH1 -1.899
RH2 -1.738
RH3 -1.815
AW-15C FH1
AW-15C FH2
AW-15C FH3
AW-15C RH1
AW-15C RH2
AW-15C RH3

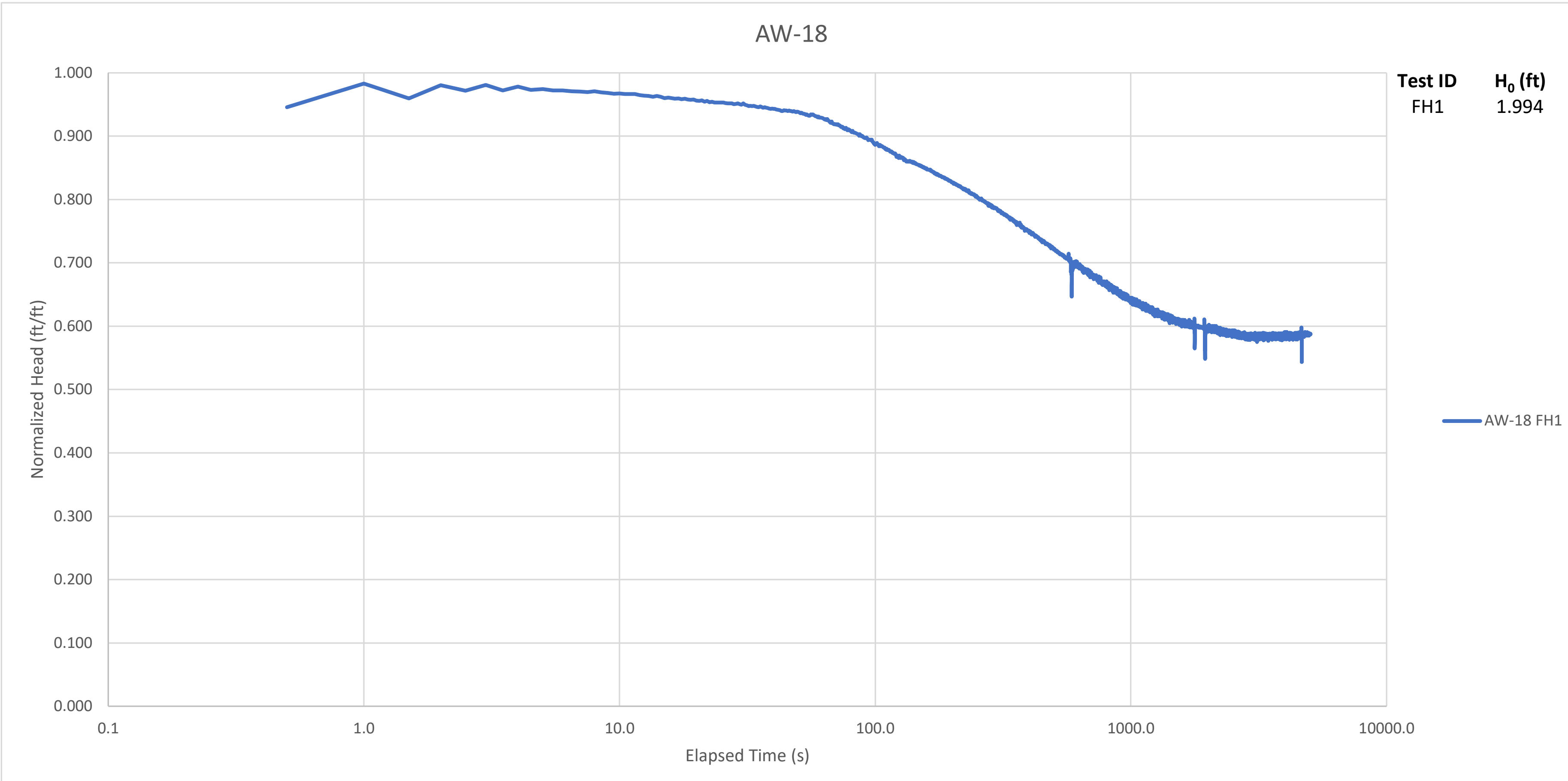
RAMBOLL

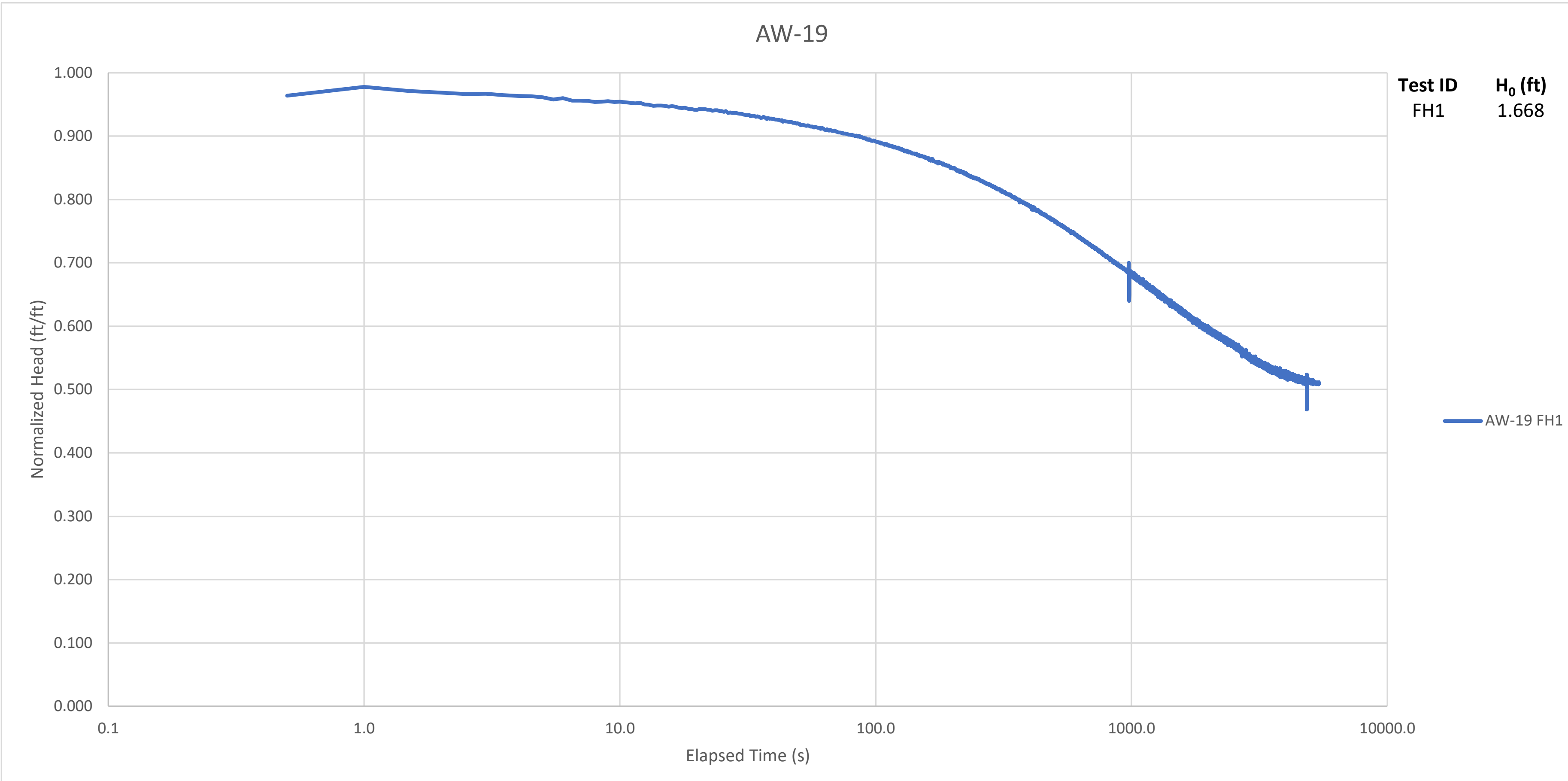


AW-16
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
Normalized Head (ft/ft)
0.1
1.0
10.0
100.0
1000.0
Elapsed Time (s)
Test ID
H_0 (ft)
FH1 1.624
FH2 1.545
RH1 -1.705
RH2 -1.756
AW-16 FH1
AW-16 FH2
AW-16 RH1
AW-16 RH2

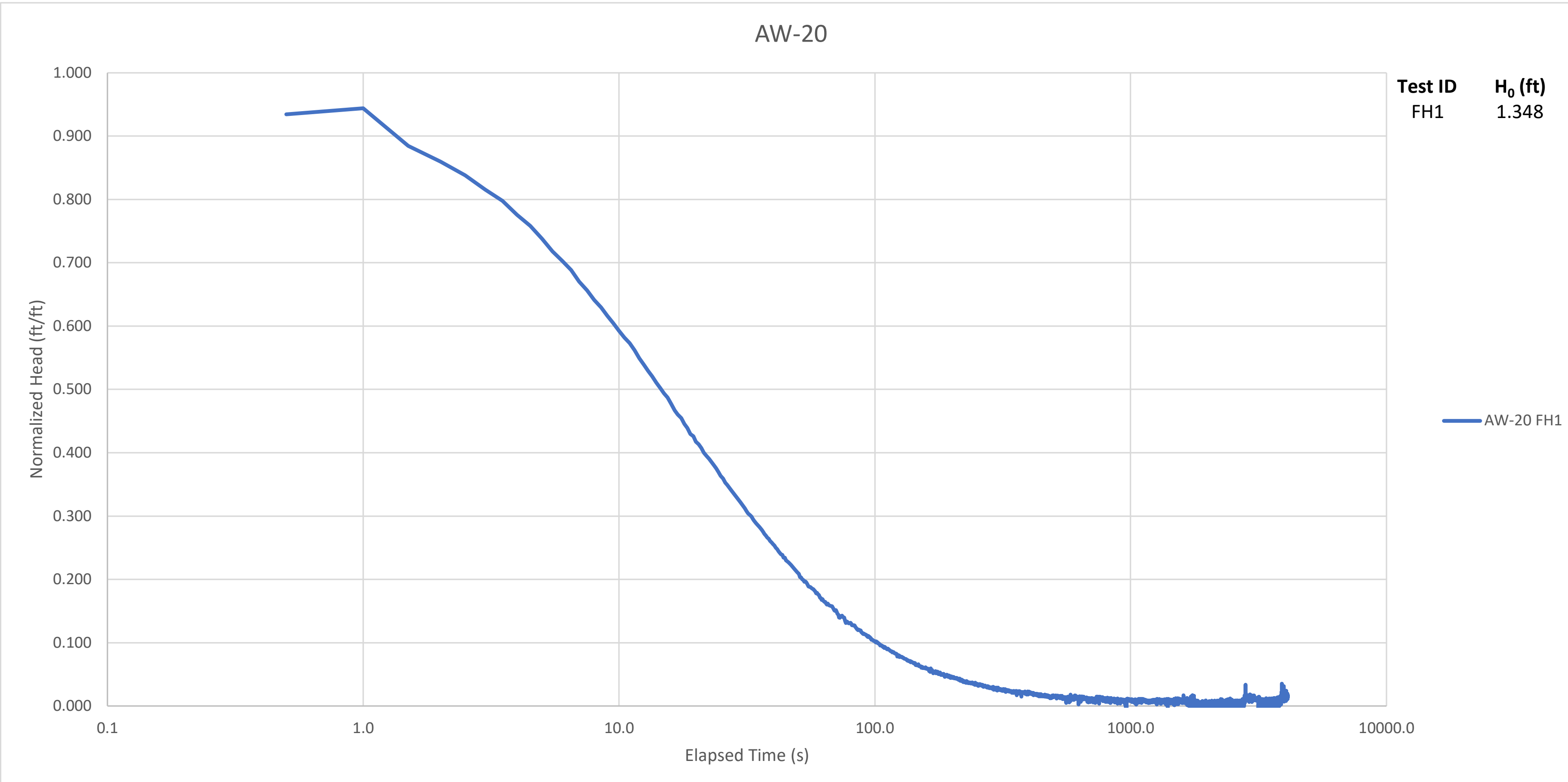


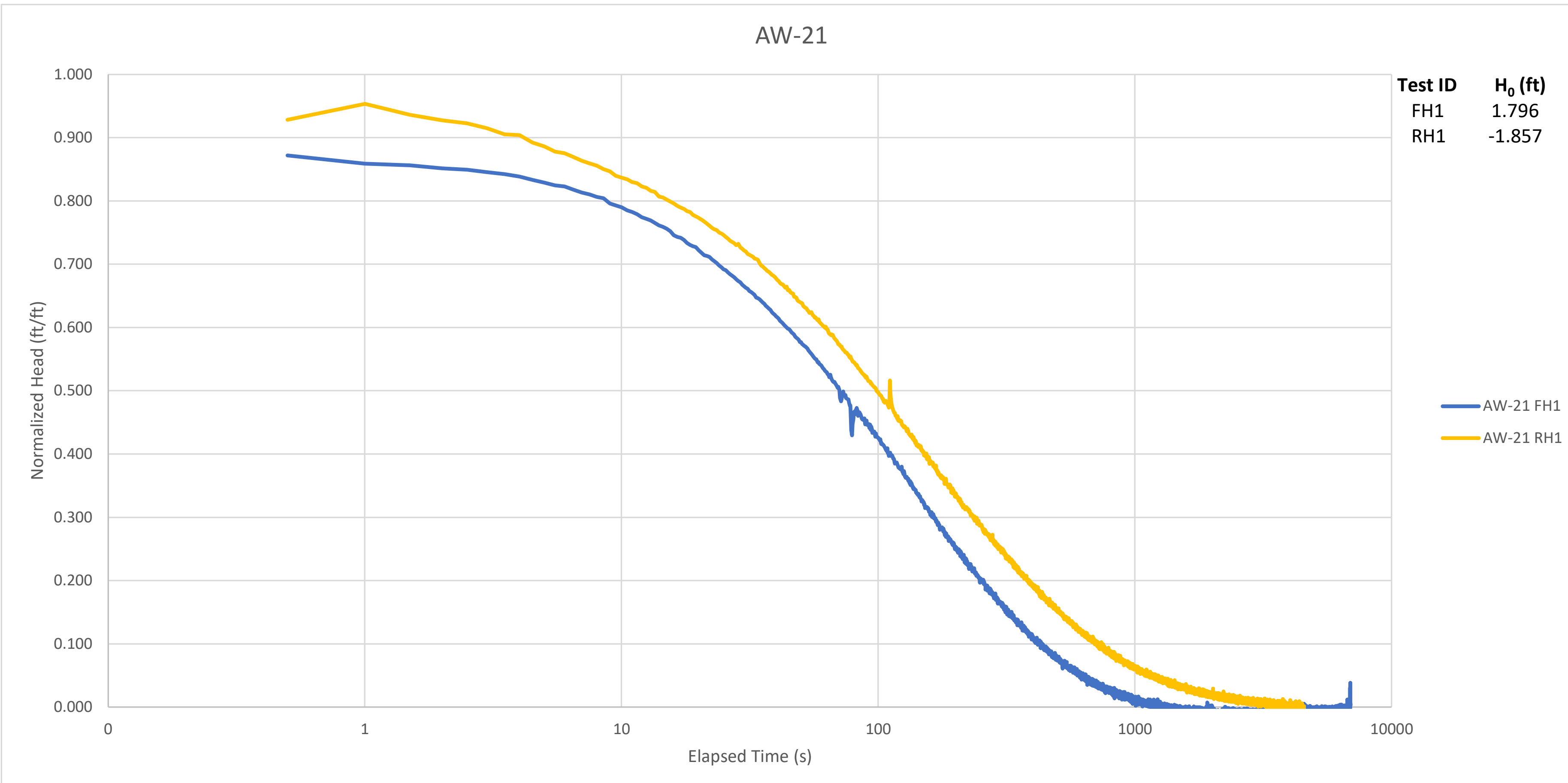
AW-17
Test ID
FH1
H_0 (ft)
1.621
Normalized Head (ft/ft)
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
0.1
1.0
10.0
100.0
1000.0
10000.0
Elapsed Time (s)
AW-17 FH1

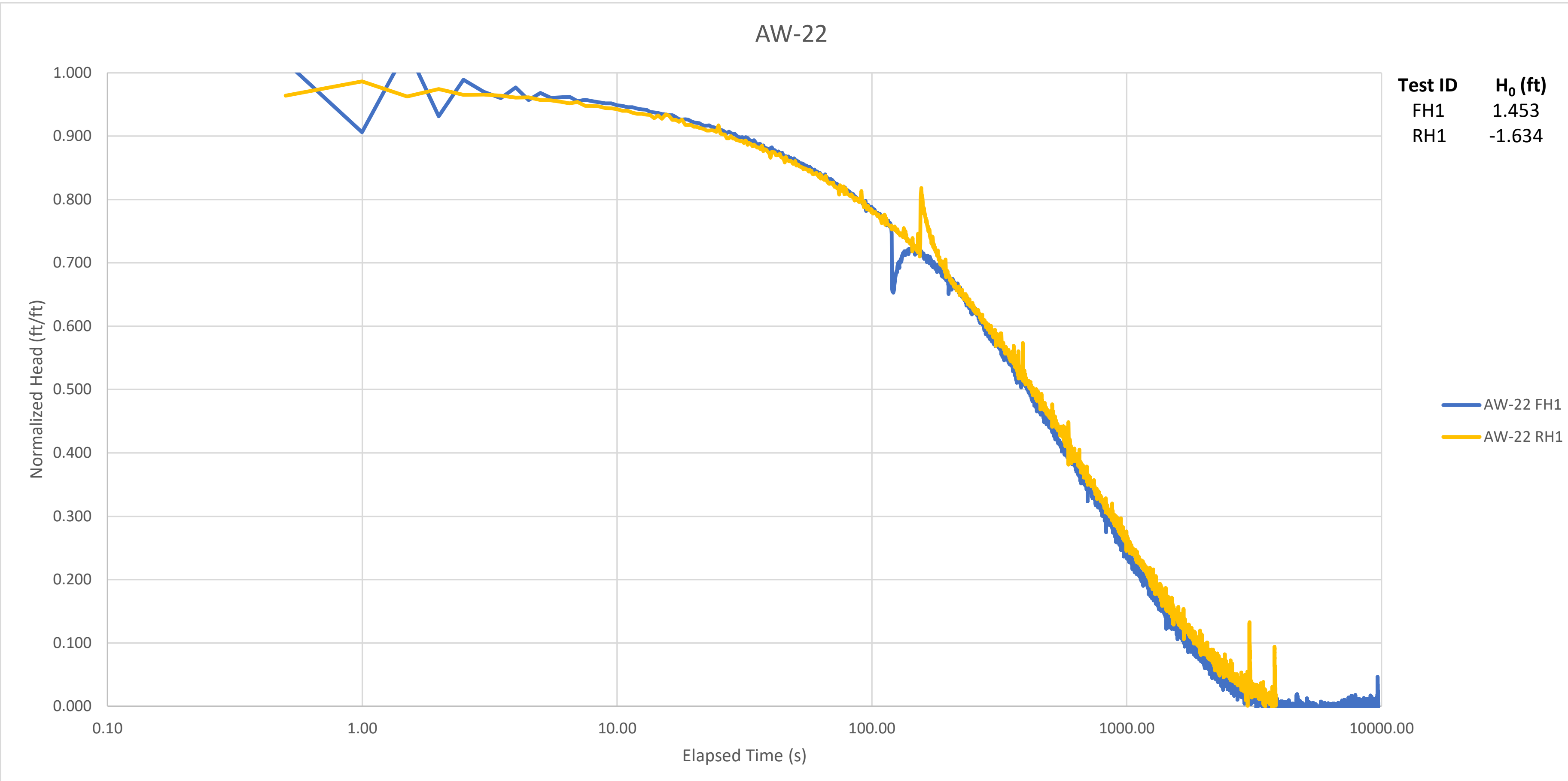

AW-18
Test ID
H$_0$ (ft)
FH1
1.994
AW-18 FH1
Normalized Head (ft/ft)
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
0.1
1.0
10.0
100.0
1000.0
10000.0
Elapsed Time (s)

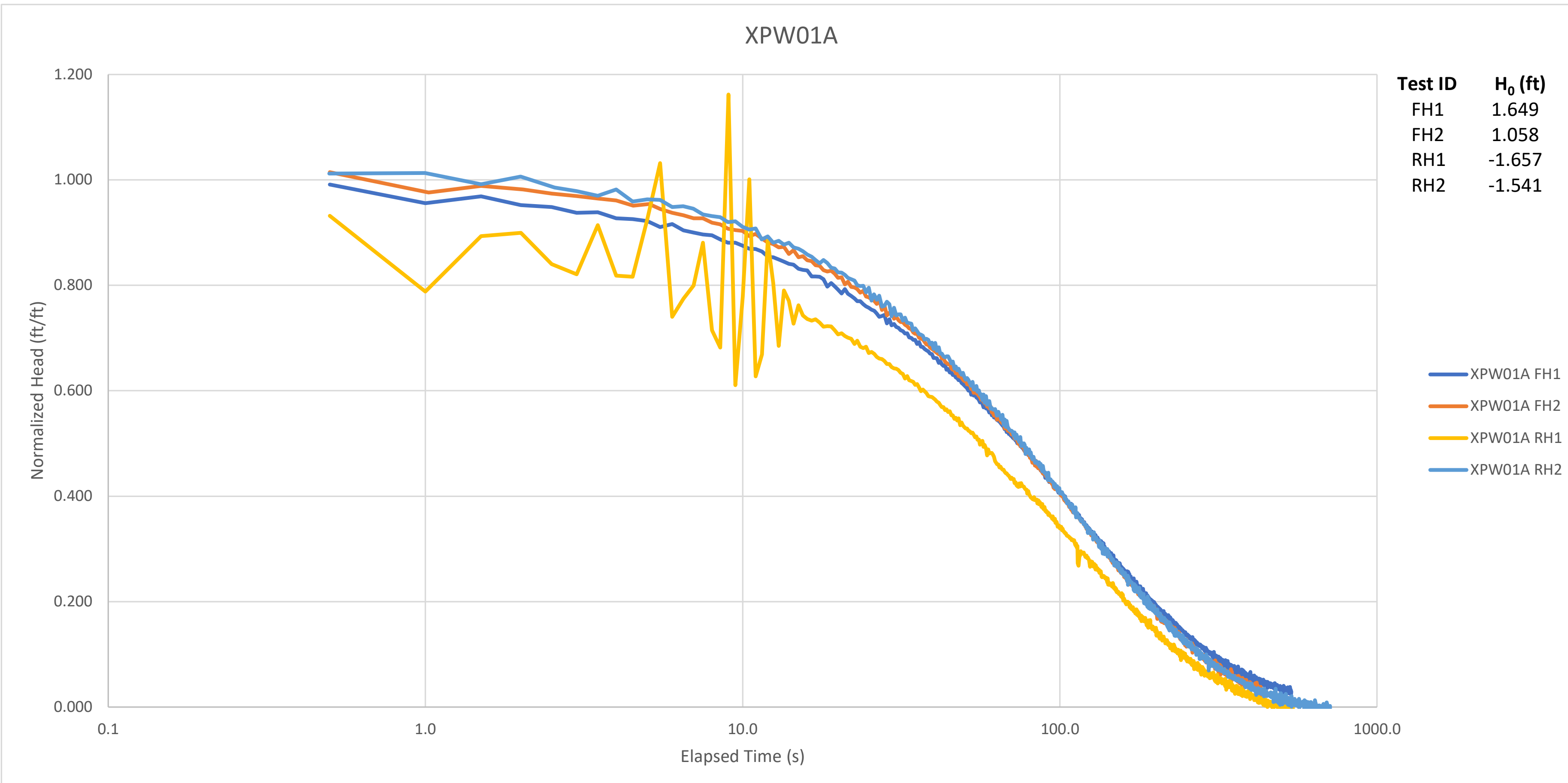


AW-19
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
Normalized Head (ft/ft)
0.1
1.0
10.0
100.0
1000.0
10000.0
Elapsed Time (s)
Test ID
FH1
H_0 (ft)
1.668
AW-19 FH1

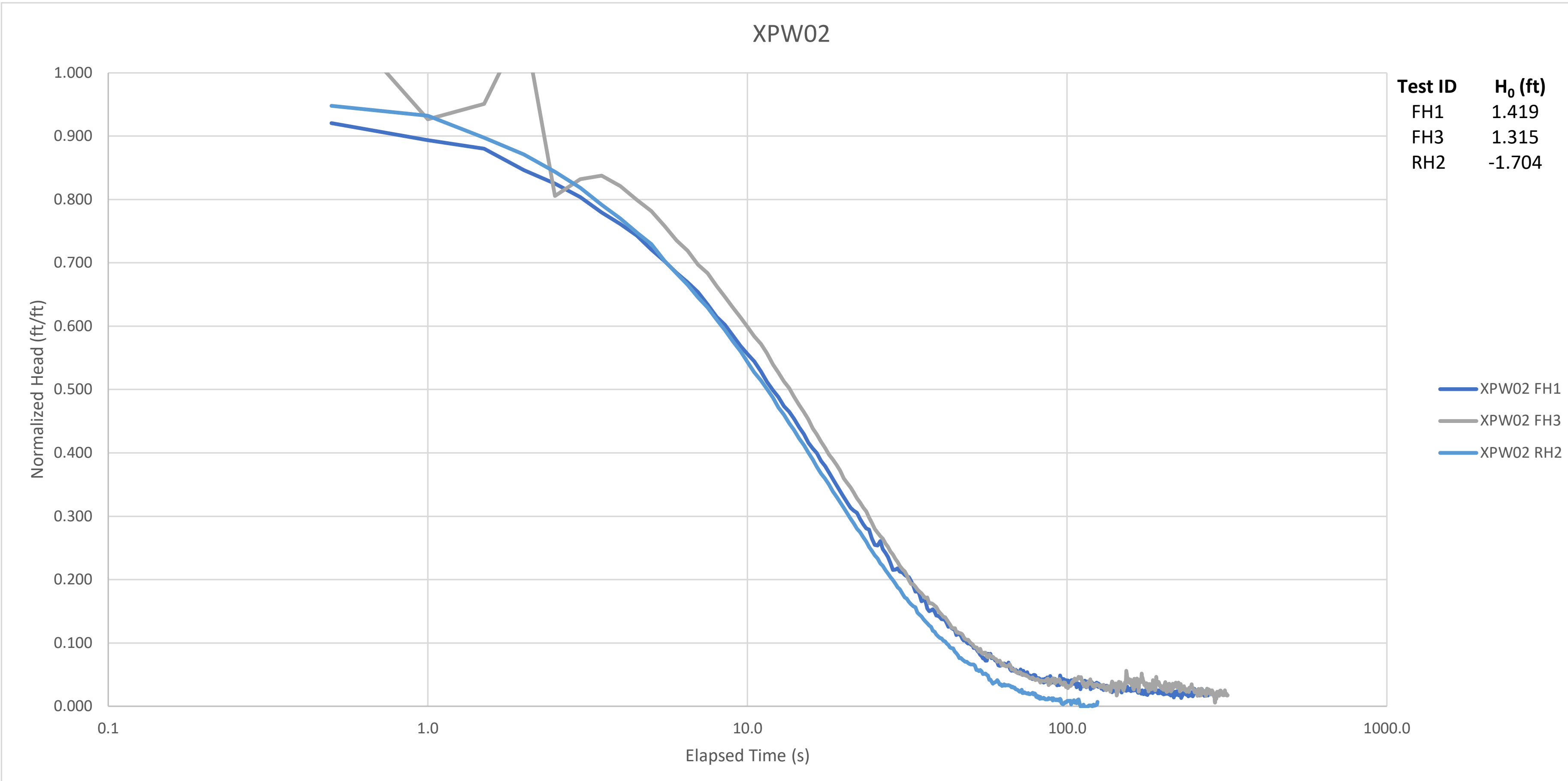

AW-20
Test ID
H_0 (ft)
FH1
1.348
Normalized Head (ft/ft)
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
0.1
1.0
10.0
100.0
1000.0
10000.0
Elapsed Time (s)
AW-20 FH1


AW-21
Test ID H0 (ft)
FH1 1.796
RH1 -1.857
Normalized Head (ft/ft)
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
0
1
10
100
1000
10000
Elapsed Time (s)
AW-21 FH1
AW-21 RH1

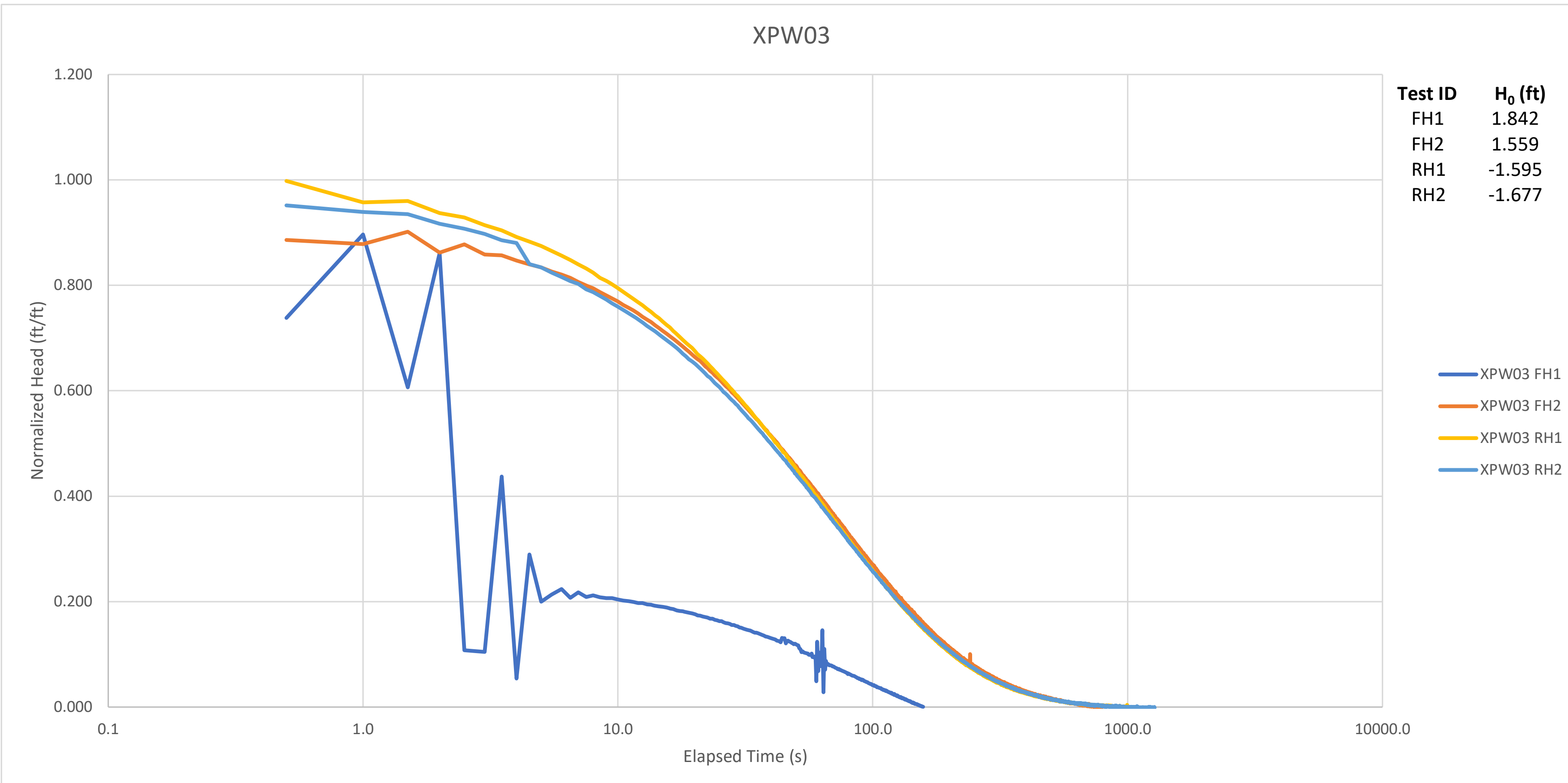

AW-22
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
Normalized Head (ft/ft)
0.10
1.00
10.00
100.00
1000.00
10000.00
Elapsed Time (s)
Test ID H0 (ft)
FH1 1.453
RH1 -1.634
AW-22 FH1
AW-22 RH1

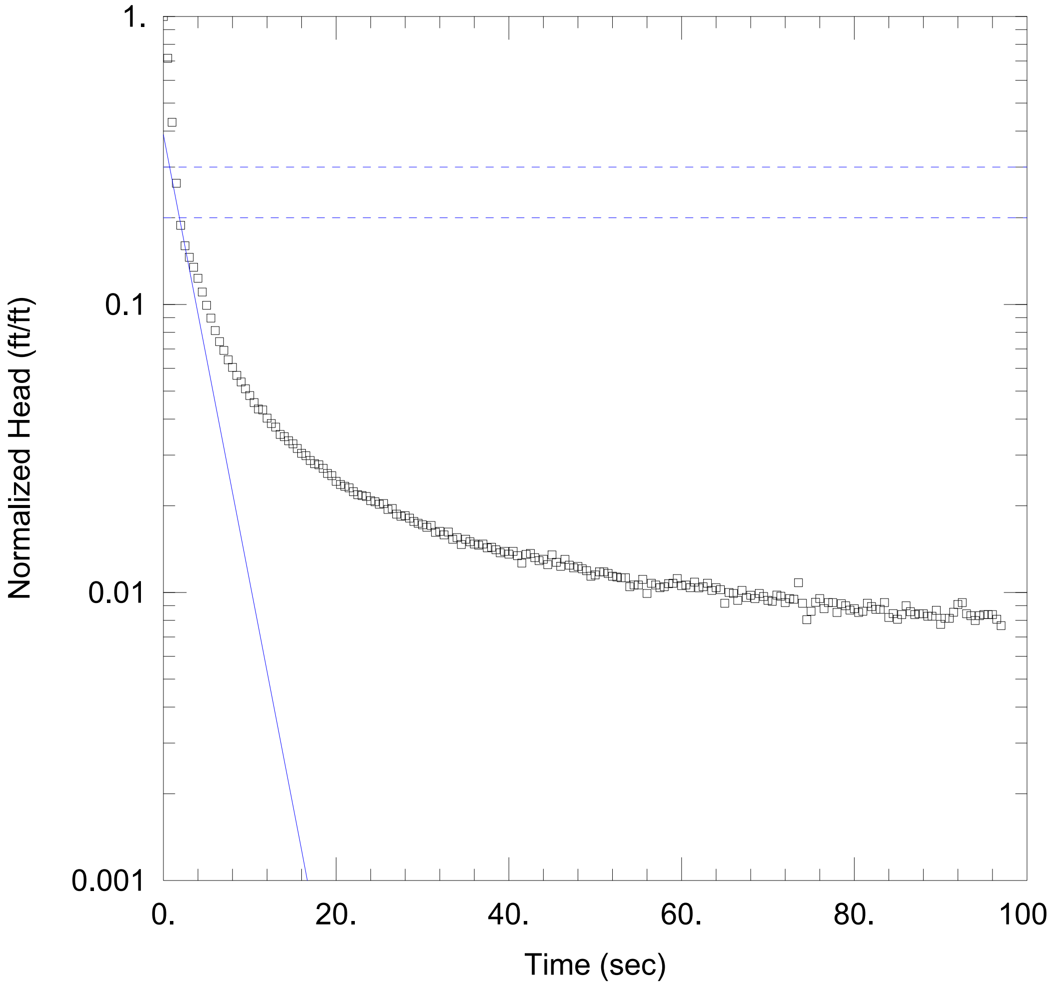


XPW01A
1.200
1.000
0.800
0.600
0.400
0.200
0.000
Normalized Head (ft/ft)
0.1
1.0
10.0
100.0
1000.0
Elapsed Time (s)
Test ID
H_0 (ft)
FH1
1.649
FH2
1.058
RH1
-1.657
RH2
-1.541
XPW01A FH1
XPW01A FH2
XPW01A RH1
XPW01A RH2


XPW02
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
Normalized Head (ft/ft)
0.1
1.0
10.0
100.0
1000.0
Elapsed Time (s)
Test ID
H_0 (ft)
FH1
1.419
FH3
1.315
RH2
-1.704
XPW02 FH1
XPW02 FH3
XPW02 RH2

RAMBOLL


XPW03
1.200
1.000
0.800
0.600
0.400
0.200
0.000
Normalized Head (ft/ft)
0.1
1.0
10.0
100.0
1000.0
10000.0
Elapsed Time (s)
Test ID H0 (ft)
FH1 1.842
FH2 1.559
RH1 -1.595
RH2 -1.677
XPW03 FH1
XPW03 FH2
XPW03 RH1
XPW03 RH2



AW-12 RH2

PROJECT INFORMATION

Company: Ramboll
Client: IPRG
Project: 1940100457-001
Location: Bartonville, IL
Test Well: AW-12
Test Date: 3/26/21

AQUIFER DATA

Saturated Thickness: 8. ft
Anisotropy Ratio (Kz/Kr): 1.

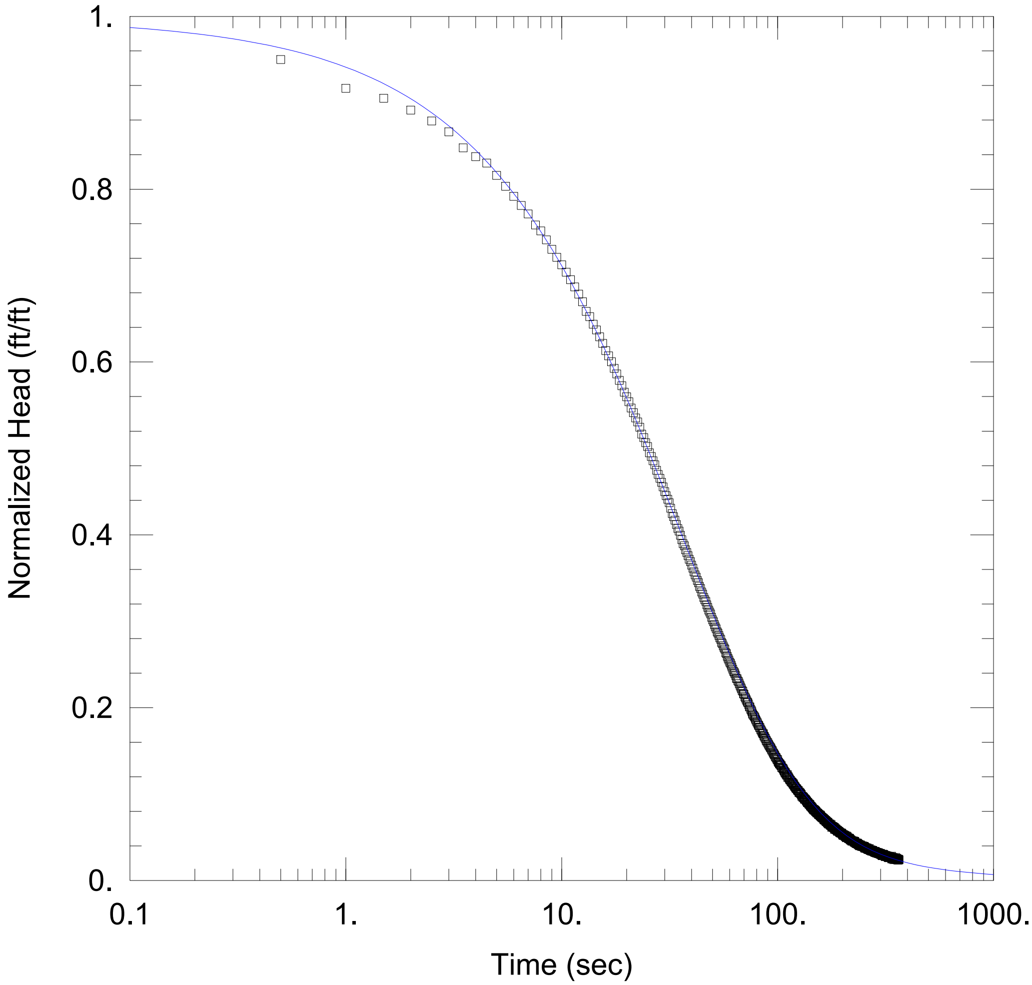
WELL DATA (AW-12)

Initial Displacement: -1.85 ft
Static Water Column Height: 26.87 ft
Total Well Penetration Depth: 4. ft
Screen Length: 4. ft
Casing Radius: 0.08625 ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.01541 cm/sec
y0 = -0.7181 ft



AW-15 RH3

PROJECT INFORMATION

Company: Ramboll
Client: IPRG
Project: 1940100457-001
Location: Bartonville, IL
Test Well: AW-15
Test Date: 3/26/21

AQUIFER DATA

Saturated Thickness: 1.1 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (AW-15)

Initial Displacement: -1.455 ft
Total Well Penetration Depth: 1.1 ft
Casing Radius: 0.08625 ft
Static Water Column Height: 32.64 ft
Screen Length: 1.1 ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

T = 0.2498 cm^2/sec
S = 0.0004365

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
170.5	-0.09726	358.	-0.03627
171.	-0.09813	358.5	-0.03592
171.5	-0.09536	359.	-0.03433
172.	-0.097	359.5	-0.03553
172.5	-0.0949	360.	-0.03482
173.	-0.09536	360.5	-0.03584
173.5	-0.09506	361.	-0.03465
174.	-0.09481	361.5	-0.03491
174.5	-0.09536	362.	-0.03449
175.	-0.0934	362.5	-0.03449
175.5	-0.09326	363.	-0.03592
176.	-0.09269	363.5	-0.03543
176.5	-0.09258	364.	-0.03522
177.	-0.09444	364.5	-0.03506
177.5	-0.09229	365.	-0.03476
178.	-0.08948	365.5	-0.03491

SOLUTION

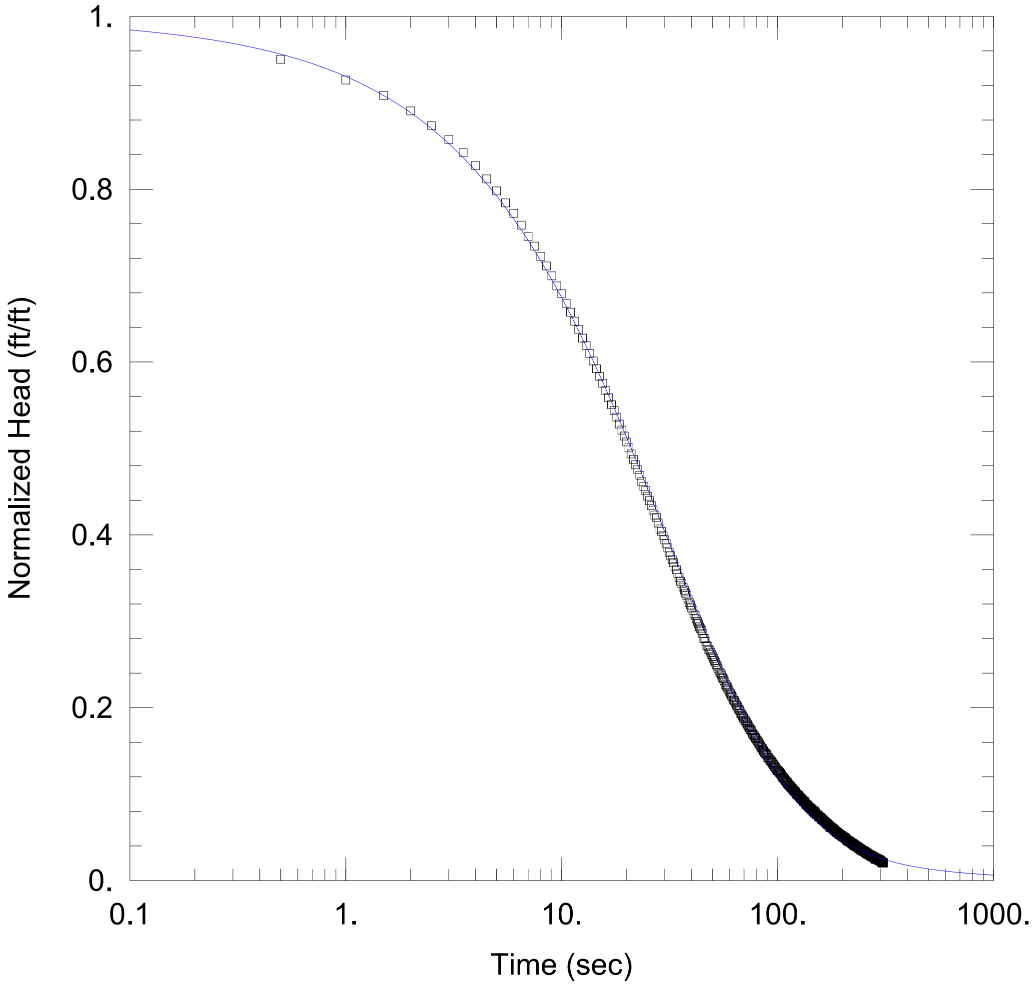
Slug Test
Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.2498	cm^2/sec
S	0.0004365	

K = T/b = 0.007449 cm/sec
Ss = S/b = 0.0003968 1/ft



AW-15C RH2	
PROJECT INFORMATION	
Company: Ramboll	
Client: IPRG	
Project: 1940100457-001	
Location: Bartonville, IL	
Test Well: AW-15C	
Test Date: 3/25/21	
AQUIFER DATA	
Saturated Thickness: 11. ft	Anisotropy Ratio (Kz/Kr): 1.
WELL DATA (AW-15C)	
Initial Displacement: -1.738 ft	Static Water Column Height: 44.27 ft
Total Well Penetration Depth: 11. ft	Screen Length: 11. ft
Casing Radius: 0.08625 ft	Well Radius: 0.25 ft
SOLUTION	
Aquifer Model: Confined	Solution Method: Cooper-Bredehoeft-Papadopulos
T = 0.2765 cm^2/sec	S = 0.000631

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
142.5	-0.143	300.	-0.039
143.	-0.144	300.5	-0.038
143.5	-0.144	301.	-0.038
144.	-0.142	301.5	-0.039
144.5	-0.141	302.	-0.039
145.	-0.142	302.5	-0.038
145.5	-0.141	303.	-0.037
146.	-0.139	303.5	-0.037
146.5	-0.138	304.	-0.036
147.	-0.14	304.5	-0.035
147.5	-0.137	305.	-0.036
148.	-0.139	305.5	-0.036
148.5	-0.135	306.	-0.035
149.	-0.14	306.5	-0.036
149.5	-0.137	307.	-0.036
150.	-0.136	307.5	-0.036
150.5	-0.135	308.	-0.037
151.	-0.133	308.5	-0.035
151.5	-0.132	309.	-0.035
152.	-0.132	309.5	-0.035
152.5	-0.132	310.	-0.036
153.	-0.132		

SOLUTION

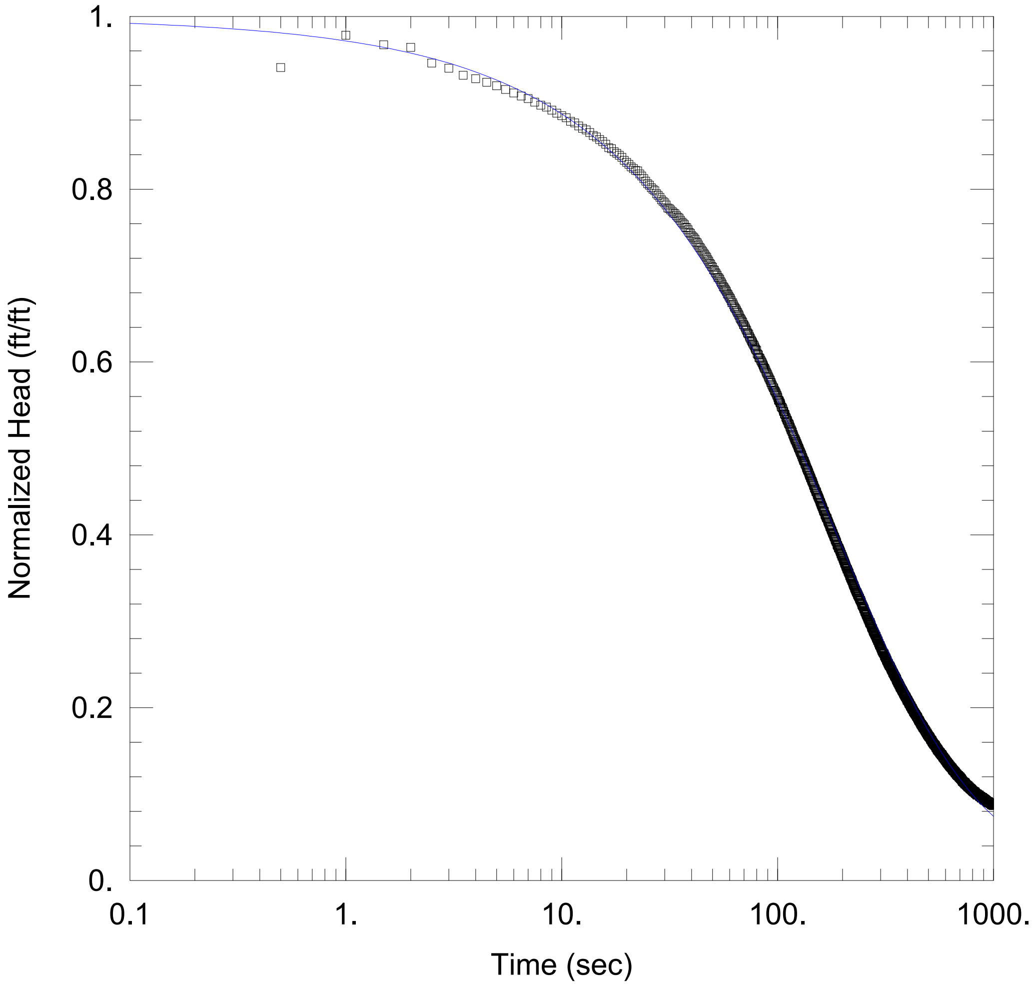
Slug Test
Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.2765	cm^2/sec
S	0.000631	

K = T/b = 0.0008246 cm/sec
Ss = S/b = 5.736E-5 1/ft



AW-16 RH1

PROJECT INFORMATION

Company: Ramboll
Client: IPRG
Project: 1940100457-001
Location: Bartonville, IL
Test Well: AW-16
Test Date: 3/25/21

AQUIFER DATA

Saturated Thickness: 1.5 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (AW-16)

Initial Displacement: -1.705 ft
Total Well Penetration Depth: 5. ft
Casing Radius: 0.08625 ft
Static Water Column Height: 38.27 ft
Screen Length: 5. ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

T = 0.035 cm^2/sec
S = 0.001995

SOLUTION

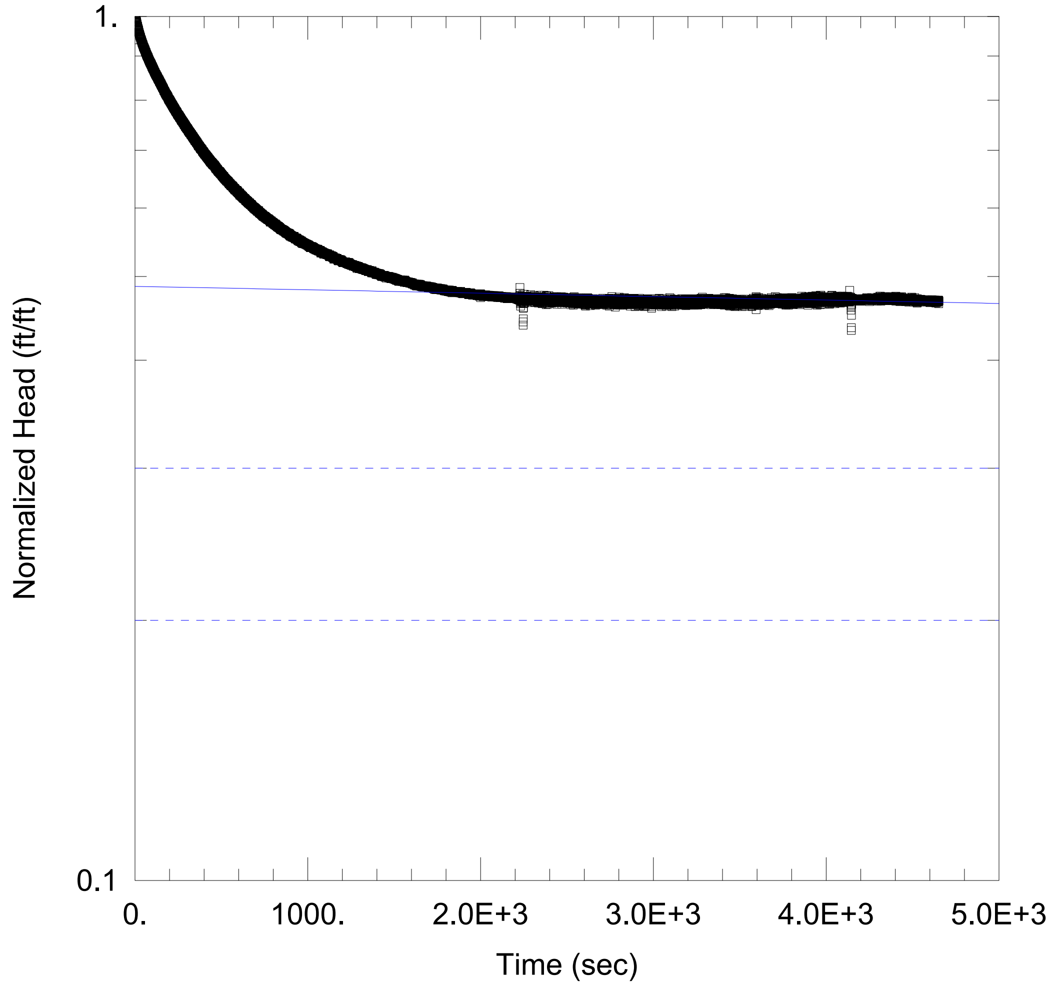
Slug Test
Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.035	cm^2/sec
S	0.001995	

K = T/b = 0.0007656 cm/sec
Ss = S/b = 0.00133 1/ft



AW-17 FH1

PROJECT INFORMATION

Company: Ramboll
Client: IPRG
Project: 1940100457-001
Location: Bartonville, IL
Test Well: AW-17
Test Date: 3/25/21

AQUIFER DATA

Saturated Thickness: 3.9 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (AW-17)

Initial Displacement: 1.621 ft
Total Well Penetration Depth: 3.9 ft
Casing Radius: 0.08625 ft

Static Water Column Height: 33.31 ft
Screen Length: 3.9 ft
Well Radius: 0.25 ft

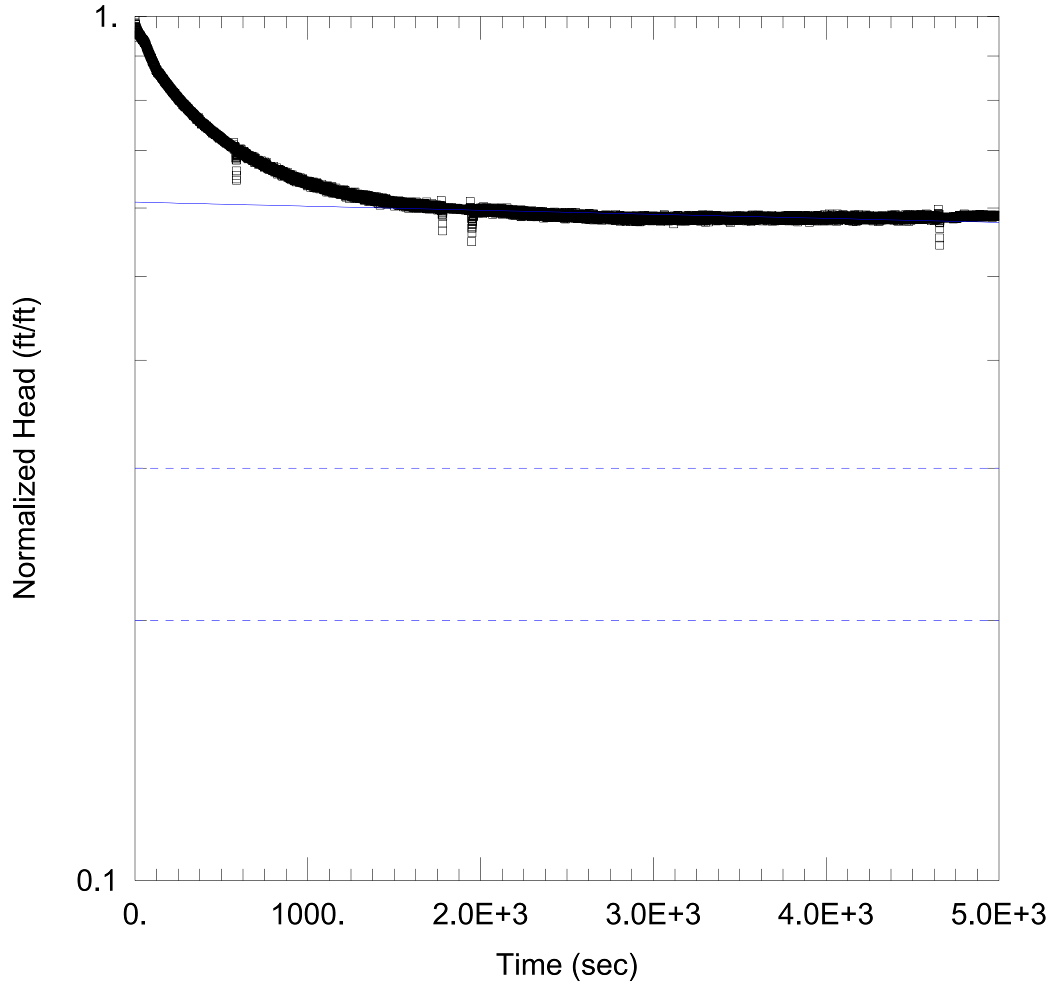
SOLUTION

Aquifer Model: Confined

Solution Method: Bouwer-Rice

K = 4.687E-7 cm/sec

y0 = 0.7895 ft



AW-18 FH1

PROJECT INFORMATION

Company: Ramboll
Client: IPRG
Project: 1940100457-001
Location: Bartonville, IL
Test Well: AW-18
Test Date: 3/25/21

AQUIFER DATA

Saturated Thickness: 7.2 ft
Anisotropy Ratio (Kz/Kr): 1.

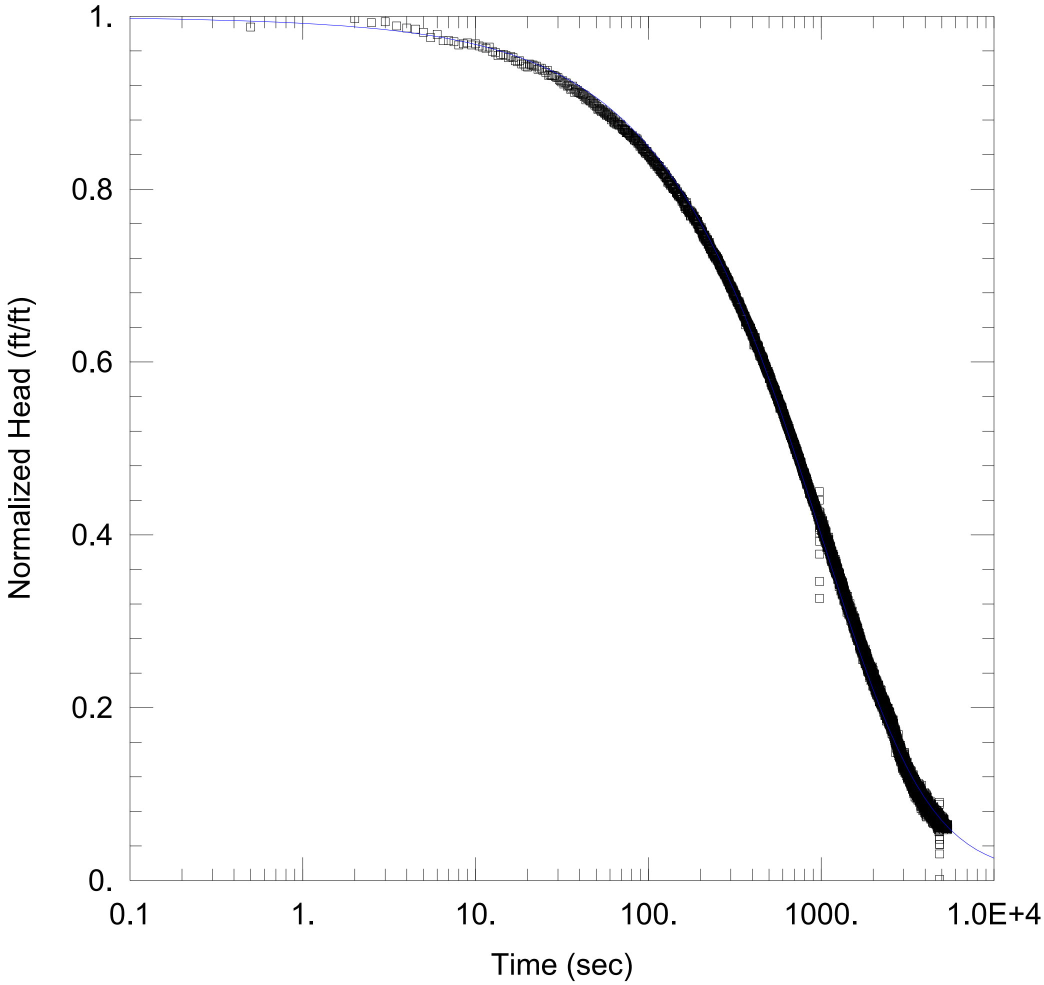
WELL DATA (AW-18)

Initial Displacement: 1.994 ft
Total Well Penetration Depth: 1.2 ft
Casing Radius: 0.08625 ft
Static Water Column Height: 24.97 ft
Screen Length: 1.2 ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 7.343E-7 cm/sec
y0 = 1.216 ft



AW-19 FH1

PROJECT INFORMATION

Company: Ramboll
Client: IPRG
Project: 1940100457-001
Location: Bartonville, IL
Test Well: AW-19
Test Date: 3/25/21

AQUIFER DATA

Saturated Thickness: 6.5 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (AW-19)

Initial Displacement: 0.818 ft
Total Well Penetration Depth: 5. ft
Casing Radius: 0.08625 ft

Static Water Column Height: 28.39 ft
Screen Length: 5. ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined

Solution Method: Cooper-Bredehoeft-Papadopulos

T = 0.008186 cm^2/sec

S = 0.000721

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2681.	0.14	5387.	0.051
2681.5	0.13	5387.5	0.051
2682.	0.135	5388.	0.05
2682.5	0.134	5388.5	0.05
2683.	0.135	5389.	0.05
2683.5	0.135	5389.5	0.051
2684.	0.136	5390.	0.05
2684.5	0.136	5390.5	0.052
2685.	0.133	5391.	0.051
2685.5	0.138	5391.5	0.05
2686.	0.137	5392.	0.051
2686.5	0.136	5392.5	0.05
2687.	0.137	5393.	0.051
2687.5	0.137	5393.5	0.05
2688.	0.134	5394.	0.05
2688.5	0.143	5394.5	0.051
2689.	0.133	5395.	0.053
2689.5	0.134	5395.5	0.052
2690.	0.132	5396.	0.049
2690.5	0.129	5396.5	0.05
2691.	0.139	5397.	0.051
2691.5	0.138	5397.5	0.052
2692.	0.137	5398.	0.052
2692.5	0.134	5398.5	0.053
2693.	0.134	5399.	0.05
2693.5	0.13	5399.5	0.049
2694.	0.137	5400.	0.05
2694.5	0.136	5400.5	0.05
2695.	0.137	5401.	0.049
2695.5	0.134	5401.5	0.05
2696.	0.132	5402.	0.049
2696.5	0.133	5402.5	0.05
2697.	0.134	5403.	0.049
2697.5	0.142	5403.5	0.051
2698.	0.134	5404.	0.05
2698.5	0.135	5404.5	0.05
2699.	0.134		

SOLUTION

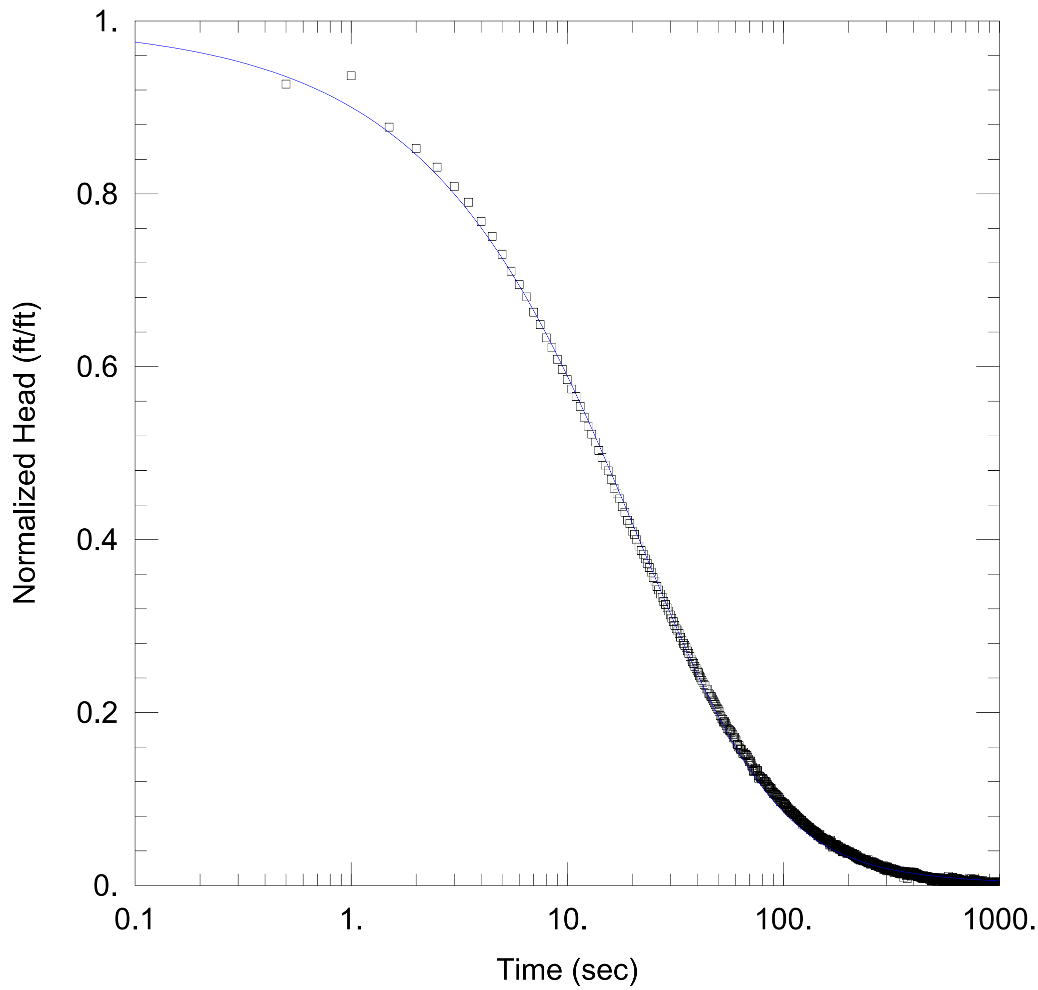
Slug Test
Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.008186	cm^2/sec
S	0.000721	

K = T/b = 4.132E-5 cm/sec
Ss = S/b = 0.0001109 1/ft



AW-20 FH1

PROJECT INFORMATION

Company: Ramboll
Client: IPRG
Project: 1940100457-001
Location: Bartonville, IL
Test Well: AW-20
Test Date: 4/26/21

AQUIFER DATA

Saturated Thickness: 4.2 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (AW-20)

Initial Displacement: 1.348 ft
Total Well Penetration Depth: 0.7 ft
Casing Radius: 0.08625 ft
Static Water Column Height: 27.43 ft
Screen Length: 0.7 ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

T = 0.3262 cm^2/sec
S = 0.001523

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2051.5	-0.01633	4117.5	0.01078
2052.	-0.01155	4118.	0.00906
2052.5	-0.0067	4118.5	0.01181
2053.	-0.00585	4119.	0.01042
2053.5	-0.00294	4119.5	0.01162
2054.	-0.00769	4120.	0.01006
2054.5	-0.00864	4120.5	0.01078
2055.	-0.00811	4121.	0.011
2055.5	-0.0063	4121.5	0.01
2056.	-0.0128	4122.	0.01146
2056.5	-0.00571		

SOLUTION

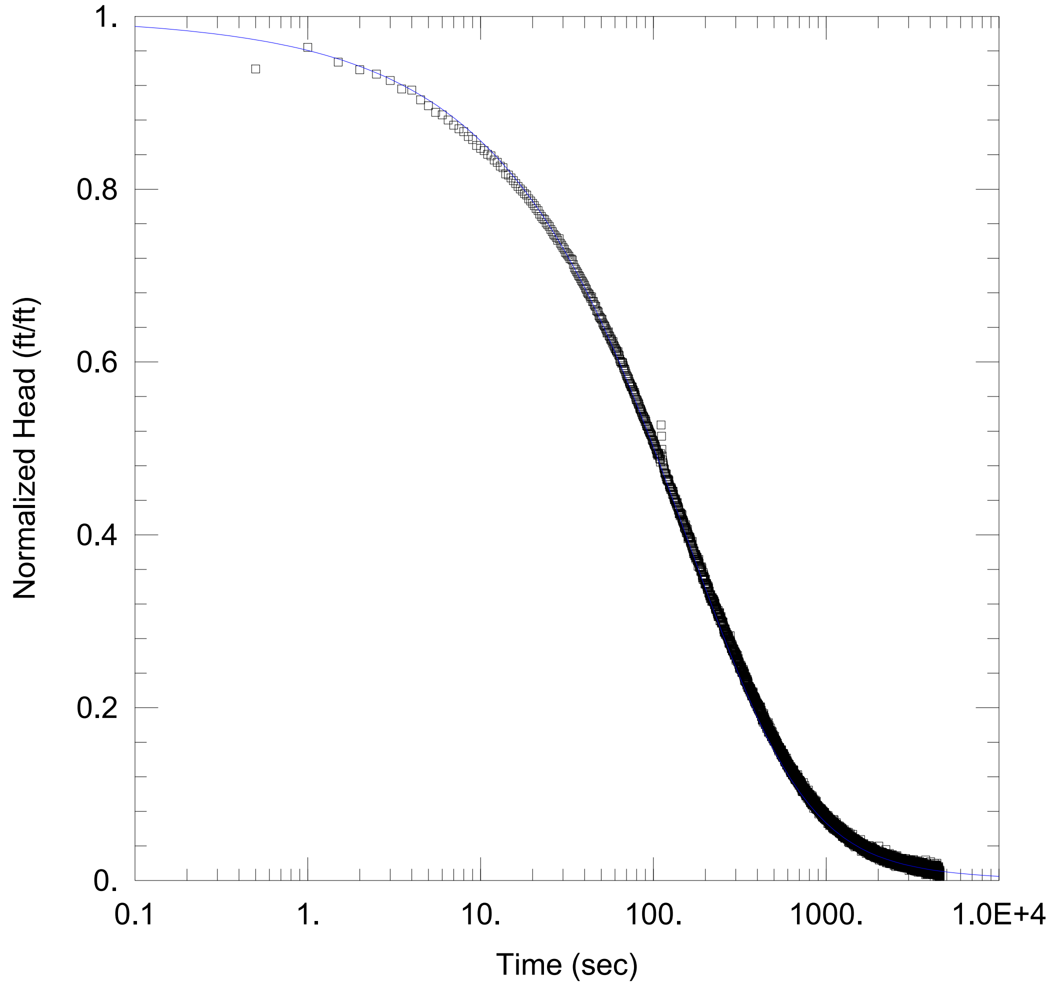
Slug Test
Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.3262	cm^2/sec
S	0.001523	

K = T/b = 0.002548 cm/sec
Ss = S/b = 0.0003626 1/ft



AW-21 RH1

PROJECT INFORMATION

Company: Ramboll
Client: IPRG
Project: 1940100457-001
Location: Bartonville, IL
Test Well: AW-21
Test Date: 4/26/21

AQUIFER DATA

Saturated Thickness: 4.6 ft
Anisotropy Ratio (Kz/Kr): 1.

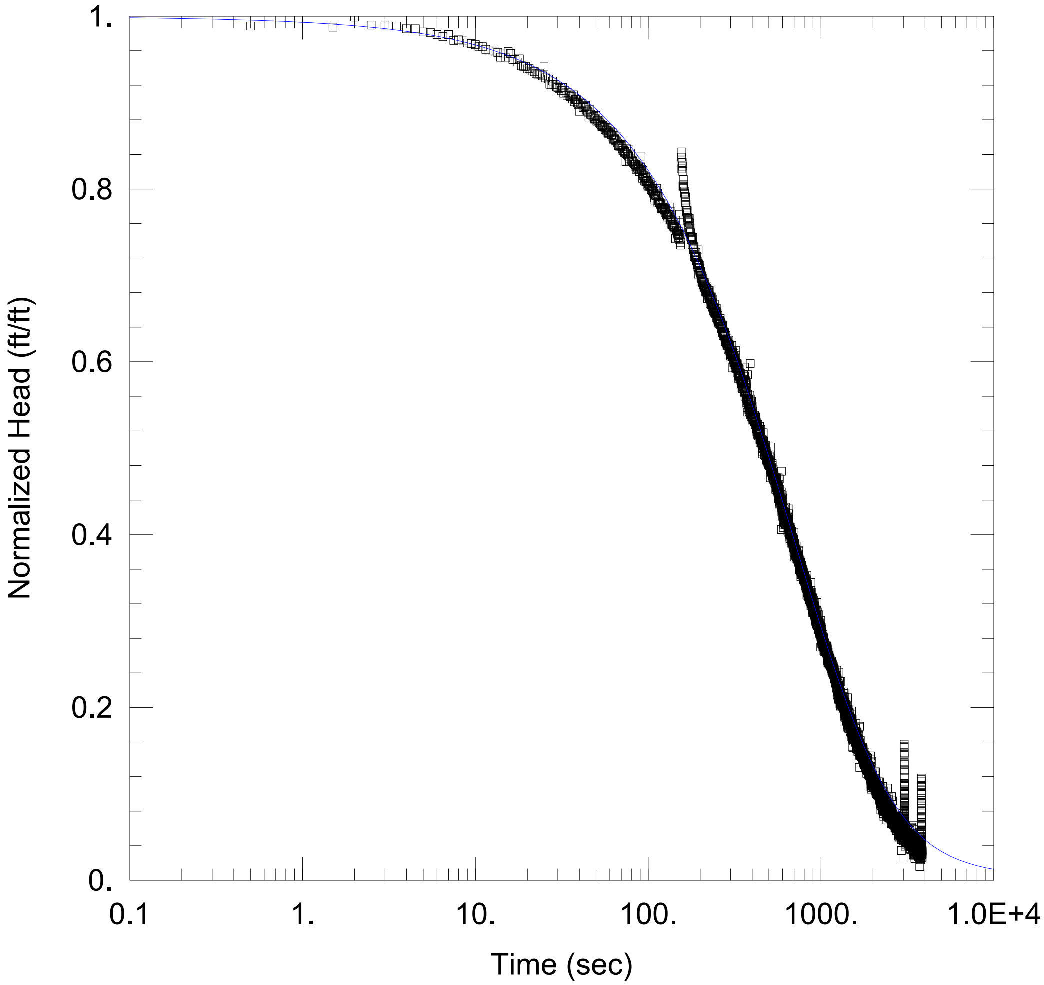
WELL DATA (AW-21)

Initial Displacement: -1.857 ft
Total Well Penetration Depth: 1.6 ft
Casing Radius: 0.08625 ft
Static Water Column Height: 22.48 ft
Screen Length: 1.6 ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos
T = 0.03465 cm^2/sec
S = 0.004463

K = T/b = 0.0002471 cm/sec
Ss = S/b = 0.0009703 1/ft



AW-22 RH1

PROJECT INFORMATION

Company: Ramboll
Client: IPRG
Project: 1940100457-001
Location: Bartonville, IL
Test Well: AW-22
Test Date: 4/26/21

AQUIFER DATA

Saturated Thickness: 4.5 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (AW-22)

Initial Displacement: -1.634 ft
Total Well Penetration Depth: 1.5 ft
Casing Radius: 0.08625 ft
Static Water Column Height: 40.37 ft
Screen Length: 1.5 ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

T = 0.01475 cm^2/sec
S = 0.000209

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
1916.5	-0.198	3849.5	-0.055
1917.	-0.204	3850.	-0.049
1917.5	-0.199	3850.5	-0.056
1918.	-0.2	3851.	-0.057
1918.5	-0.206	3851.5	-0.052
1919.	-0.199	3852.	-0.053
1919.5	-0.208	3852.5	-0.056
1920.	-0.205	3853.	-0.044
1920.5	-0.197		

SOLUTION

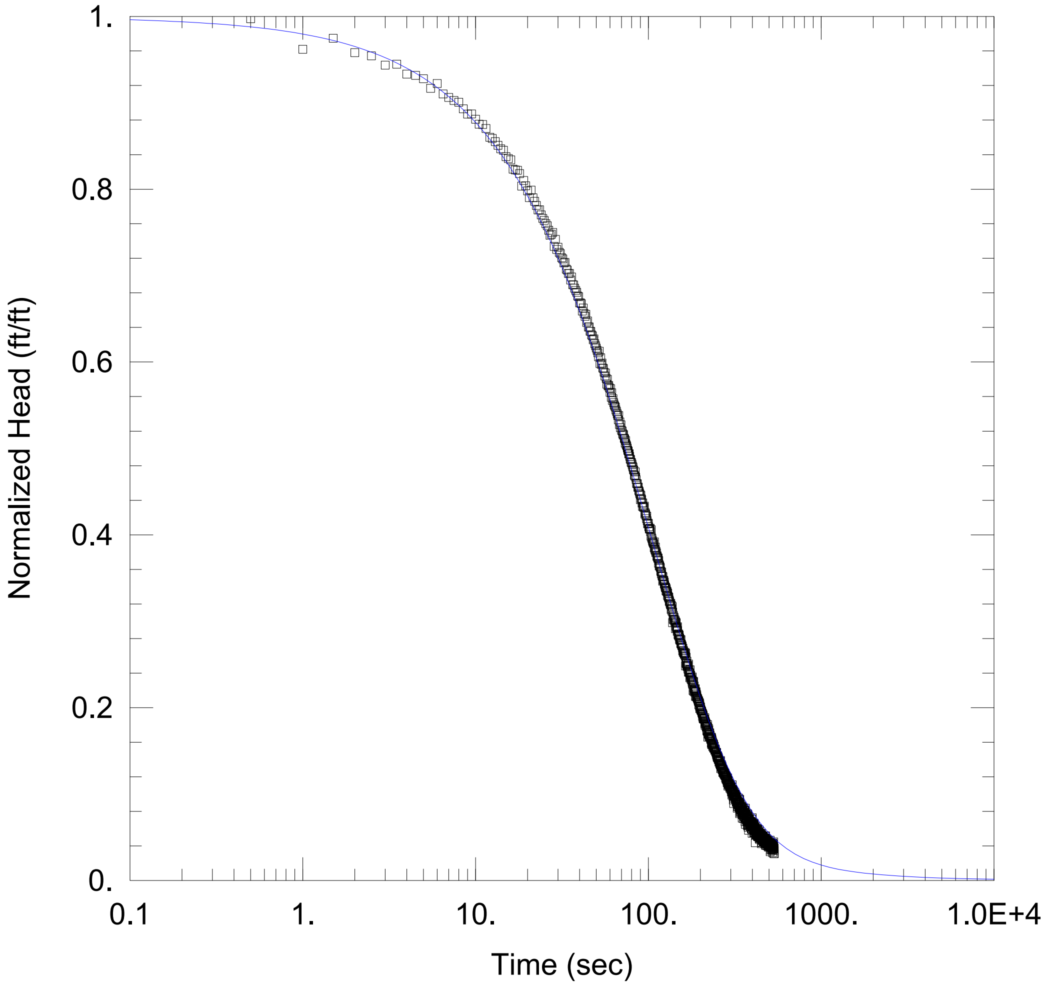
Slug Test
Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.01475	cm^2/sec
S	0.000209	

K = T/b = 0.0001075 cm/sec
Ss = S/b = 4.644E-5 1/ft



XPW01A FH1

PROJECT INFORMATION

Company: Ramboll
Client: IPRG
Project: 1940100457-001
Location: Bartonville, IL
Test Well: XPW01A
Test Date: 4/26/21

AQUIFER DATA

Saturated Thickness: 12. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (XPW01A)

Initial Displacement: 1.649 ft
Total Well Penetration Depth: 12. ft
Casing Radius: 0.08625 ft
Static Water Column Height: 34.39 ft
Screen Length: 12. ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

T = 0.1187 cm^2/sec
S = 5.41E-5

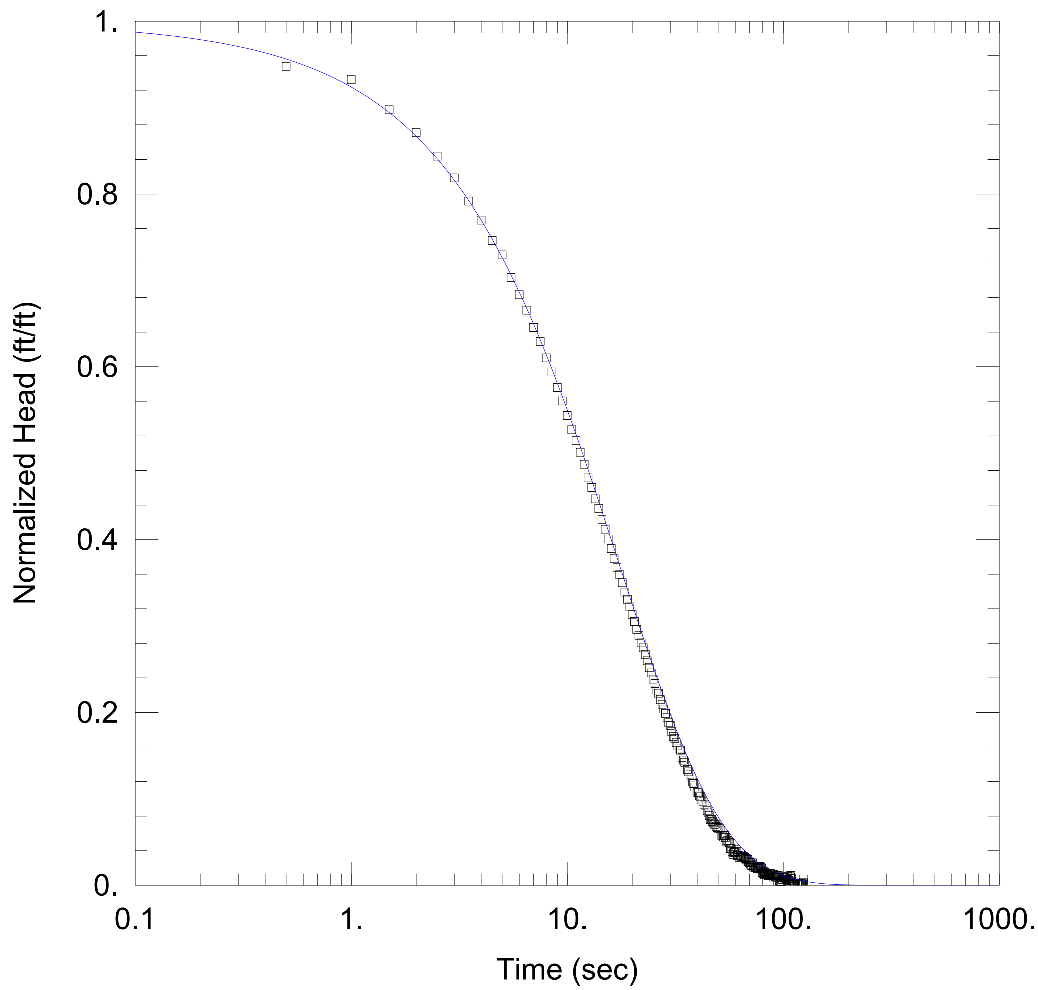
Slug Test
Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.1187	cm^2/sec
S	5.41E-5	

K = T/b = 0.0003245 cm/sec
Ss = S/b = 4.509E-6 1/ft



XPW02 RH2

PROJECT INFORMATION

Company: Ramboll
Client: IPRG
Project: 1940100457-001
Location: Bartonville, IL
Test Well: XPW02
Test Date: 4/26/21

AQUIFER DATA

Saturated Thickness: 42.4 ft

WELL DATA (XPW02)

Initial Displacement: -1.704 ft
Total Well Penetration Depth: 28.45 ft
Casing Radius: 0.08625 ft

Static Water Column Height: 28.45 ft
Screen Length: 10. ft
Well Radius: 0.25 ft

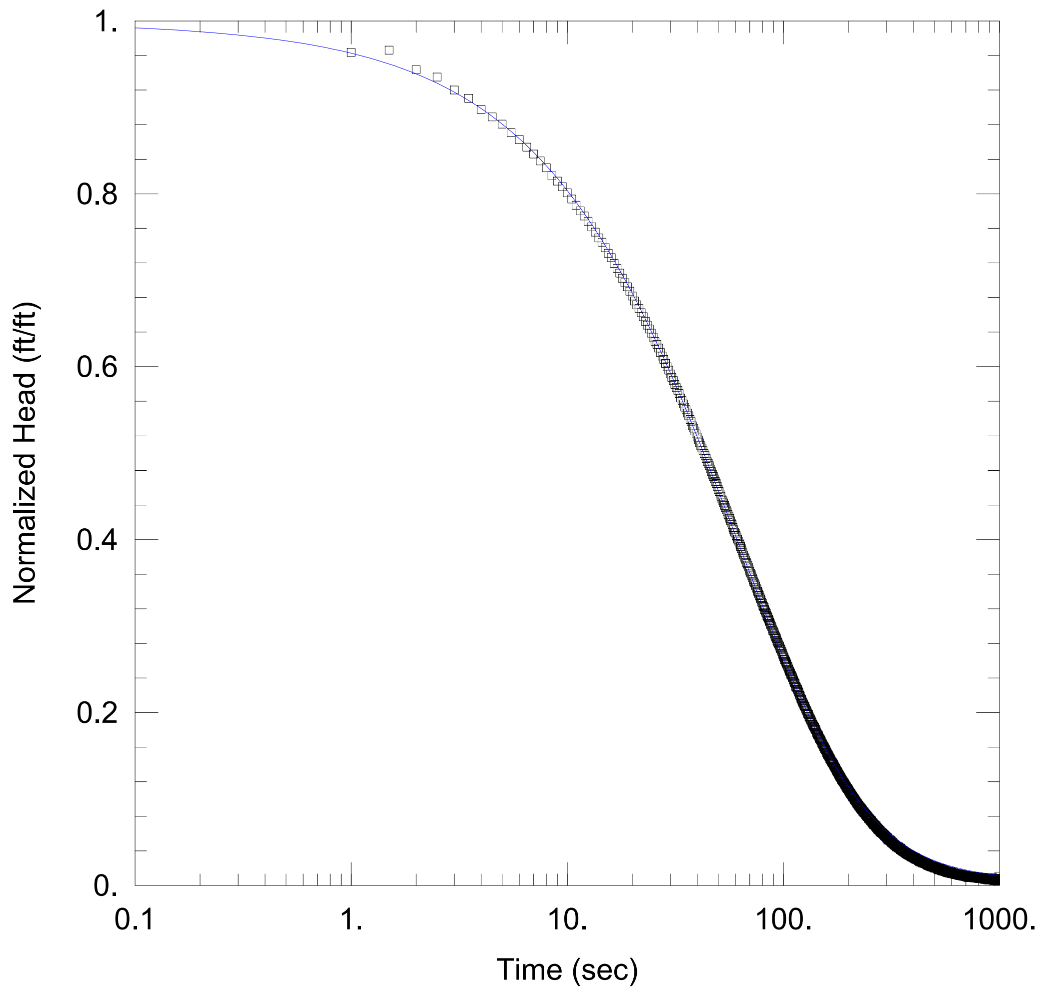
SOLUTION

Aquifer Model: Unconfined

Solution Method: KGS Model

Kr = 0.001787 cm/sec
Kz/Kr = 1.

Ss = 7.211E-6 ft^{-1}



XPW03 RH1

PROJECT INFORMATION

Company: Ramboll
Client: IPRG
Project: 1940100457-001
Location: Bartonville, IL
Test Well: XPW03
Test Date: 4/27/21

AQUIFER DATA

Saturated Thickness: 9.6 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (XPW03)

Initial Displacement: -1.595 ft
Total Well Penetration Depth: 9.6 ft
Casing Radius: 0.08625 ft
Static Water Column Height: 25.21 ft
Screen Length: 9.6 ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

T = 0.1608 cm^2/sec
S = 0.0002548

Parameter	Estimate	
T	0.1608	cm^2/sec
S	0.0002548	

K = T/b = 0.0005494 cm/sec
Ss = S/b = 2.654E-5 1/ft

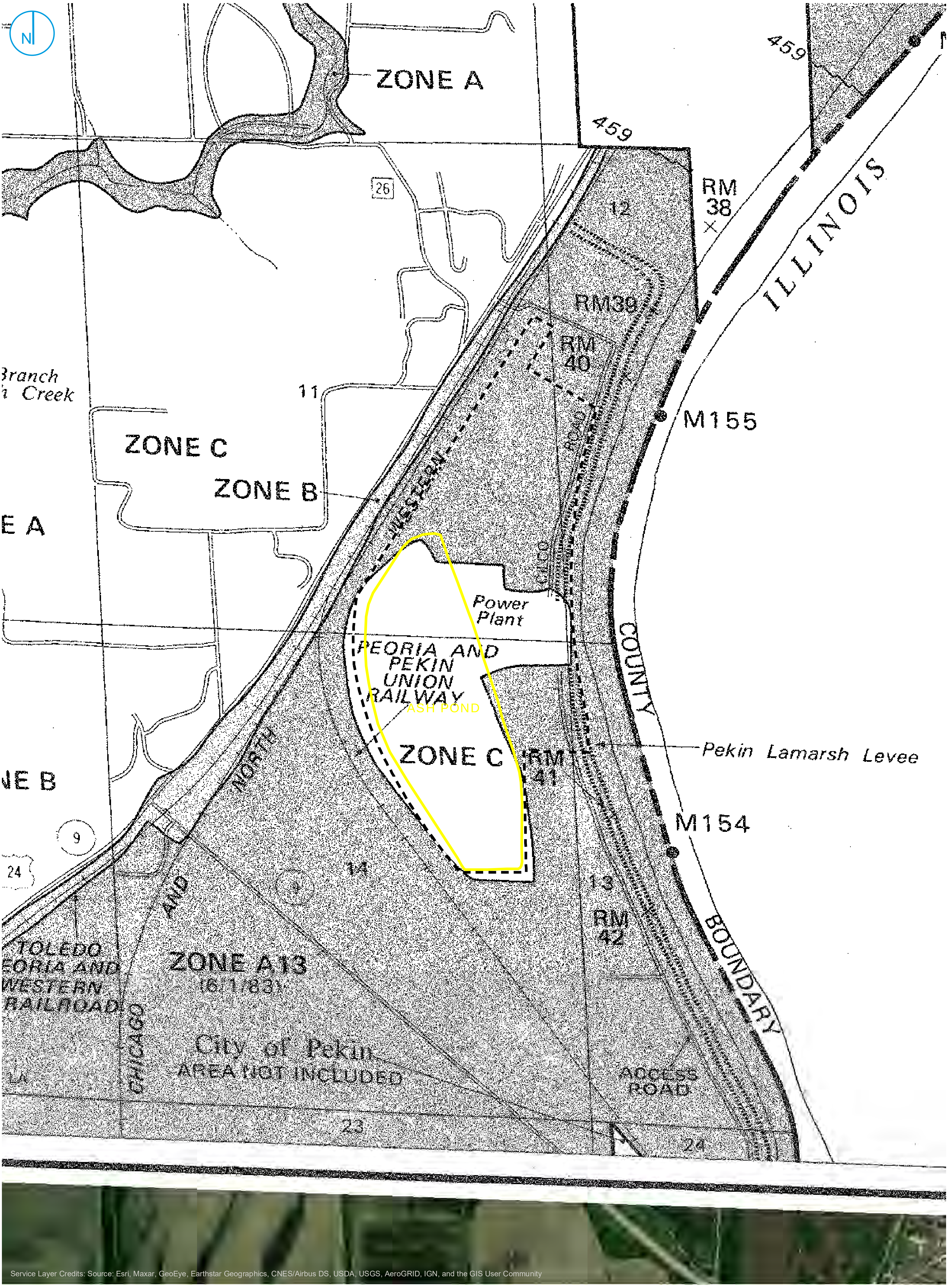
NRT HYDRAULIC CONDUCTIVITY TEST DATA

Table 2
Summary of Field and Laboratory Hydraulic Conductivity Tests
Hydrogeologic Monitoring Plan
Edwards Power Station

Field Tests						
Well ID	**Analysis Method**	**Hydraulic Conductivity (cm/sec, falling head test)**	**Hydraulic Conductivity (cm/sec, rising head test)**	**Well Geometric Mean (cm/sec)**	**Approximate Screened Elevation (ft)**	**Interpreted Unit**
Uppermost Aquifer						
APW1	KGS	2.60E-03	2.70E-03	2.65E-03	430.4-420.4	Clay-Shale Contact
AP05S	KGS	2.40E-03	2.60E-03	2.50E-03	408.5-403.5	Clay-Siltstone Contact
AP06	Hvorslev	3.30E-04	5.40E-04	4.22E-04	419.6-414.8	Clay
AP07S	KGS	6.00E-04	5.70E-04	5.85E-04	428.4-423.6	Sand/ Silty Sand
AW05	KGS	1.00E-03	1.30E-03	1.14E-03	424.7-420.1	Clay-Shale Contact
AW06	KGS	7.20E-06	4.00E-06	5.37E-06	422.6-418.1	Clay-Shale Contact
AW08	B&R	3.50E-06	9.50E-06	5.77E-06	413.1-403.5	Silt-Shale Contact
AW09	B&R	1.00E-05	4.50E-05	2.12E-05	411.2-406.7	Silt-Shale Contact
AW10	KGS	3.50E-05	4.10E-05	3.79E-05	410.0-405.4	Silt-Shale Contact
AW11	KGS	3.10E-03	3.40E-03	3.25E-03	413.0-408.4	Thin Sand, Clay-Shale Contact
Additional Monitored Units						
AP05D	KGS	4.50E-08	2.70E-06	3.49E-07	394-384	Siltstone (w/ thin sandstone)
AP07D	KGS	1.50E-07	8.00E-08	1.10E-07	403.3-393.8	Siltstone (w/ thin sandstone)
AP08	KGS	2.80E-03	2.60E-03	2.70E-03	448.1-438.5	CCR
AP09	KGS	1.30E-03	1.60E-03	1.44E-03	447.5-437.9	CCR

Laboratory Tests			
Well/ Soil Boring ID	**Approximate Sample Elevation (ft)**	**Hydraulic Conductivity (cm/sec)**	**Interpreted Unit**
EDW-B002	447.0	9.2E-05	CCR Unit
EDW-B003	430.0	6.8E-05	
Geometric Mean		**7.9E-05**	
EDW-B004	425.0	7.2E-07	Clay

APPENDIX G
FEMA FLOOD HAZARD MAP



PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations*
100-Year Flood Boundary
500-Year Flood Boundary
ZONE B
ZONE A1
ZONE A5
ZONE B

0 500 1,000
Feet

NOTE
GIS DATA OF THE NATIONAL FLOOD HAZARD LAYER NOT AVAILABLE FOR PEORIA COUNTY.

FLOODPLAIN MAP

APPENDIX G

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

ATTACHMENT I

Intended for
Illinois Power Resources Generating, LLC

Date
October 25, 2021

Project No.
1940100806-004

GROUNDWATER MONITORING PLAN

ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL Bright ideas. Sustainable change.

GROUNDWATER MONITORING PLAN
EDWARDS POWER PLANT ASH POND

Project name	**Edwards Power Plant Ash Pond**
Project no.	**1940100806-004**
Recipient	**Illinois Power Resources Generating, LLC**
Document type	**Groundwater Monitoring Plan**
Revision	**FINAL**
Date	**October 25, 2021**

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Senior Managing Hydrogeologist

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Senior Managing Engineer

Scott S. Woods
Hydrogeologist

Nathaniel R. Keller
Senior Hydrogeologist

LICENSED PROFESSIONAL CERTIFICATIONS

35 I.A.C. § 845.630 Groundwater Monitoring Systems (PE)

I, Eric J. Tlachac, a qualified professional engineer in good standing in the State of Illinois, certify that the groundwater monitoring system described in this document (Groundwater Monitoring Plan, Edwards Power Plant Ash Pond), has been designed and constructed to meet the requirements of 35 I.A.C. § 845.630. The monitoring system was developed based on information included in the Hydrogeologic Site Characterization Report (Ramboll 2021; included in the Operating Permit to which this Groundwater Monitoring Plan is attached).

Eric J. Tlachac
Qualified Professional Engineer
062-063091
Illinois
Date: October 25, 2021

LICENSED PROFESSIONAL ENGINEER
ERIC J. TLACHAC
062-063091
STATE OF ILLINOIS

35 I.A.C. § 845.630 Groundwater Monitoring Systems (PG)

I, Brian G. Hennings, a qualified professional geologist in good standing in the State of Illinois, certify that the groundwater monitoring system described in this document (Groundwater Monitoring Plan, Edwards Power Plant Ash Pond), has been designed and constructed to meet the requirements of 35 I.A.C. § 845.630. The monitoring system was developed based on information included in the Hydrogeologic Site Characterization Report (Ramboll 2021; included in the Operating Permit to which this Groundwater Monitoring Plan is attached).

Brian G. Hennings
Professional Geologist
196.001482
Illinois
Date: October 25, 2021

LICENSED PROFESSIONAL GEOLOGIST
BRIAN G. HENNINGS
196.001482
ILLINOIS

CONTENTS

TABLES (IN TEXT)

TABLES (ATTACHED)

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

35 I.A.C.	Title 35 of the Illinois Administrative Code
40 C.F.R.	Title 40 of the Code of Federal Regulations
ASD	Alternate Source Demonstration
bgs	below ground surface
CCR	coal combustion residuals
cm/s	centimeters per second
EPP	Edwards Power Plant
ft/ft	feet per feet
ft/day	feet per day
GMP	Groundwater Monitoring Plan
GWPS	Groundwater Protection Standard
HCR	Hydrogeologic Site Characterization Report
ID	identification
IEPA	Illinois Environmental Protection Agency
IPRG	Illinois Power Resources Generating, LLC
LEL	lower explosive limit
NAVD88	North American Vertical Datum of 1988
NID	National Inventory of Dams
No.	Number
NRT	Natural Resources Technology, Inc.
Part 845	Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Title 35 of the Illinois Administrative Code § 845
PMP	Potential Migration Pathway
QA/QC	quality assurance/quality control
Ramboll	Ramboll Americas Engineering Solutions, Inc.
RL	Reporting Limit
SI	Surface Impoundment
TDS	total dissolved solids
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

1.1 Overview

In accordance with requirements of the Standards for the Disposal of Coal Combustion Residuals (CCR) in Surface Impoundments (SIs): Title 35 of the Illinois Administrative Code (35 I.A.C.) § 845 (Part 845) (Illinois Environmental Protection Agency [IEPA], April 15, 2021), Ramboll Americas Engineering Solutions, Inc. (Ramboll) has prepared this Groundwater Monitoring Plan (GMP) on behalf of Edwards Power Plant (EPP) (**Figure 1-1**), operated by Illinois Power Resources Generating, LLC (IPRG). This report will apply specifically to the CCR Unit referred to as the Ash Pond (Vistra identification [ID] number [No.] 301, IEPA ID No. W1438050005-01, and National Inventory of Dams (NID) No. IL50710). The Ash Pond is a 91-acre unlined CCR SI used to manage CCR and non-CCR waste streams at the EPP. This GMP includes Part 845 content requirements specific to 35 I.A.C. § 845.630 (Groundwater Monitoring System), 35 I.A.C. § 845.640 (Groundwater Sampling and Analysis), and 35 I.A.C. § 845.650 (Groundwater Monitoring Program) for the Ash Pond at EPP.

A checklist which identifies the specific requirements of 35 I.A.C. § 845.630, 35 I.A.C. § 845.640, and 35 I.A.C. § 845.650 is included in **Table 1-1**. The table provides references to sections, tables, and figures included in this document to locate the information that meets specific requirements of 35 I.A.C. § 845.630, 35 I.A.C. § 845.640, and 35 I.A.C. § 845.650.

During field activities in 2021 methane was detected above 10% of the lower explosive limit (LEL) at borehole monitoring well locations AW-13, AW-14, AW-15, AW-15C, AW-16, AW-17, AW-22, and P002. Levels quickly dissipated after venting the monitoring wells to the atmosphere. A methane monitoring plan must be used for the safe completion of field activities, including groundwater sampling at EPP.

1.2 Site Location and Background

The EPP is located in Peoria County between Mapleton and Bartonville in Section 11, Township 7 North, Range 7 East (**Figure 1-1**). The EPP is located on the floodplain of the Illinois River adjacent to a levee and has one CCR SI, the Ash Pond, covering approximately 91 surface acres.

The EPP is situated in a predominantly agricultural area with industrial properties bordering the property. Historically, several coal mines were operated at depths of 100 to 160 feet below ground surface (bgs) in the vicinity of the EPP. The EPP property is bordered by a salt processing facility to the north, railroad right-of-way and former Orchard Mines to the west, the Illinois River and fertilizer production facility to the east, and agricultural land to the south. **Figure 1-1** shows the location of the EPP; **Figure 1-2** is a site map showing the location of the Ash Pond (a Part 845 regulated CCR Unit and the subject of this GMP).

The Ash Pond was investigated in 2013, as requested by IEPA. Results of the investigation (Natural Resources Technology, Inc. [NRT], 2013) indicated that there were exceedances of Class I Groundwater Standards for pH, chloride, iron, manganese, total dissolved solids (TDS), and sulfate. The exceedances were not attributed to the Ash Pond. Additional wells were installed in 2015 to comply with Title 40 of the Code of Federal Regulations (40 C.F.R.) § 257, and again in 2021 to collect additional data to meet the requirements of 35 I.A.C. § 845.620.

1.3 Conceptual Model

Significant site investigation has been completed at the EPP to characterize the geology, hydrogeology, and groundwater quality. Based on extensive investigation and monitoring, the Ash Pond has been well characterized and detailed in the Hydrogeologic Site Characterization Report (HCR; included in the Operating Permit to which this Plan is attached). A conceptual site model has been developed and is discussed below.

Four hydrogeologic units are present at the EPP and described as follows from the surface downward:

- **CCR:** Saturated CCR consisting primarily of fly ash within the Ash Pond. CCR is present at thicknesses up to 46.5 feet and at elevations as low as 413.9 feet North American Vertical Datum of 1988 (NAVD88) in the central and northern portion of the Ash Pond**.**
- **Upper Cahokia Formation/Potential Migration Pathway (PMP):** Low permeability clays and silts of the Upper Cahokia Formation are present at the surface. This unit is considered a PMP at elevations similar to the base of the Ash Pond, and in places where thin discontinuous sand lenses occur within the Upper Cahokia Formation adjacent to the Ash Pond.
- **Uppermost Aquifer:** Thin (generally less than 4 feet), moderate permeability sand, silty sand, and clayey gravel material within the Lower Cahokia Formation, bedrock, and/or weathered shale bedrock, where present. In locations where higher permeability materials and coarser grained material are absent, the uppermost aquifer is interpreted as the interface between the Lower Cahokia Formation and shale bedrock.
- **Bedrock Confining Unit:** Thick, very low permeability shales and siltstones of the Carbondale and Modesto Formations. This unit was encountered at elevations ranging from approximately 400 to 422 feet NAVD88 with higher bedrock elevations occurring beneath the northern portion of the Ash Pond.

In general, the Upper Cahokia Formation consists of low permeability clays and silts, with limited occurrences of thin discontinuous sand lenses. In several locations, generally near the southern and western portions of the unit, coarser grained materials are present at the base of the Lower Cahokia Formation and/or the top of the bedrock is weathered resulting in relatively higher hydraulic conductivities. Because the interface is laterally continuous, and has relatively higher conductivity, the unlithified/lithified contact was designated as the uppermost aquifer.

Occasional sand lenses within the Upper Cahokia Formation, and clay intervals downgradient at elevations similar to the base of ash in the Ash Pond were identified as PMPs. The underlying bedrock is interpreted as the lower confining unit and has hydraulic conductivities are generally an order of magnitude lower than those measured in the uppermost aquifer.

Groundwater occurs within both the unlithified materials and bedrock and consistently flows from east to west/southwest at the central portion of the Ash Pond towards what is interpreted as a former channel of the Illinois River, and south/southeast at the south end of the Ash Pond (**Figure 1-3**). Based on calculations in the HCR, horizontal gradients range from 0.0014 to 0.0041 feet per feet (ft/ft) and groundwater velocity in the uppermost aquifer ranges from 1.7×10^{-4} to 2.7×10^{-1} feet per day (ft/day) in the north-central and southern portions of the unit, respectively. Calculation of vertical gradients indicate variable results with groundwater migrating from the lower bedrock confining unit into the uppermost aquifer during the winter season (as observed in February). Upward gradients measured in February 2021 were larger in well nests nearer to the Illinois River, indicating the Illinois River may be a regional discharge zone for the bedrock near the Ash Pond.

Part 845 parameters were monitored in uppermost aquifer and PMP monitoring wells as part of groundwater quality evaluations performed between 2015 and present. These data were supplemented with installation and sampling of additional locations in 2021. The results indicate that the following parameters were detected at concentrations greater than the applicable 35 I.A.C. § 845.600 groundwater protection standards (GWPSs) and are considered potential exceedances:

- Arsenic – at downgradient uppermost aquifer wells AW-05, AW-09, AW-10, AW-11, AW-13, AW-14, AW-19 and AW-20; downgradient bedrock well AP-07D; and upgradient wells AP05S and AW-08.
- Boron - at downgradient uppermost aquifer wells AW-05, AW-18, AW-19, AW-20, and AW-21; and PMP wells AP07S and AW-15S.
- Chloride – at downgradient uppermost aquifer well AW-05; PMP monitoring well AW-04; and at bedrock monitoring wells AP05D and AP07D.
- Cobalt - at downgradient uppermost aquifer wells AW-05, AW-06, AW-09, AW-10, AW-11, AW-14, and AW-17; PMP monitoring well AW-15S; downgradient bedrock well AP07D; and upgradient well AP05S.
- Lithium - at downgradient uppermost aquifer wells AW-05, AW-06, AW-09, AW-10, AW-11, AW-15, AW-16, and AW-17; downgradient bedrock well AP07D; and upgradient uppermost aquifer well AP05S and bedrock well AP05D.
- Sulfate – at downgradient uppermost aquifer well AW-05, and at downgradient PMP well AW-15S.
- Total Dissolved Solids (TDS) - at downgradient uppermost aquifer wells APW-01 and AW-05; at downgradient PMP well AW-15S, and bedrock monitoring wells AP07D, and AW-15C.
- Barium, beryllium, chromium, fluoride, lead, radium 226 and 228 combined, and thallium were also detected at concentrations greater than their respective standard at one or more locations during monitoring; however, the occurrences were infrequent and/or isolated and individual locations are not listed.

Concentration results for the above parameters were compared directly to 35 I.A.C. § 845.600 standards, without an evaluation of background concentrations. Evaluation of background groundwater quality will be completed as part of this GMP, and compliance with Part 845 will be determined following the first round of groundwater sampling. The first round of groundwater sampling for compliance will be completed the quarter following issuance of the Operating Permit and in accordance with this GMP.

2. GROUNDWATER MONITORING

2.1 Existing Monitoring Well Network and Analysis

Between 2010 and 2012, groundwater samples were collected from several new wells (APW-01 through APW-04) to assess groundwater quality in the vicinity of the Ash Pond as part of an investigation requested by IEPA. Results of the investigation (NRT, 2013) indicated that CCR constituents had not impacted groundwater in the vicinity of the Ash Pond. However, exceedances of Class I Groundwater Standards were reported for pH, chloride, iron, manganese, TDS, and sulfate.

In 2015 and 2016, additional well installation and groundwater sampling was initiated to meet the requirements of 40 C.F.R. § 257. Groundwater samples were collected, and totals analyses were completed for Appendix III and Appendix IV parameters. In 2021, additional wells were installed to comply with Part 845; wells were sampled for the parameters listed in 35 I.A.C. § 845.600. A review and summary of data from both the 40 C.F.R. § 257 and proposed Part 845 monitoring programs was included in the HCR (included in the Operating Permit to which this Plan is attached) and are discussed in the following sections.

2.1.1 40 C.F.R. § 257 Monitoring

The 40 C.F.R. § 257 monitoring well network consists of six monitoring wells screened in the uppermost aquifer, including two background monitoring wells (AP05S and AW-08) and four compliance wells (AW-06, AW-09, AW-10, and AW-11). The boring logs, well construction forms, and other related monitoring well forms are available in the Operating Records as required by 40 C.F.R. § 257.91 for the CCR Unit, and are included in Appendix C of the HCR (included in the Operating Permit to which this Plan is attached).

Detection monitoring was initiated in May 2018 following the initial eight rounds of background sampling. Details on the procedures and techniques used to fulfill the groundwater sampling and analysis program requirements are found in the Sampling and Analysis Plan for the Ash Pond (NRT, 2017).

Groundwater samples are collected semi-annually and analyzed for the laboratory and field parameters summarized in **Table A** below.

Table A. 40 C.F.R. § 257 Groundwater Monitoring Program Parameters

Field Parameters[1]			
Groundwater Elevation	pH		
Appendix III Parameters (Total, except TDS)			
Boron	Chloride	Sulfate	
Calcium	Fluoride	TDS	
Appendix IV Parameters (Total)			
Antimony	Cadmium	Lead	Selenium
Arsenic	Chromium	Lithium	Thallium
Barium	Cobalt	Mercury	Radium 226 and 228 combined
Beryllium	Fluoride	Molybdenum	

[1]Dissolved oxygen, temperature, specific conductance, oxidation/reduction potential, and turbidity are recorded during sample collection.

Results and analysis of groundwater sampling are reported annually by January 31 of the following year and made available on the CCR public website as required by 40 C.F.R. § 257.

2.1.2 Part 845 Well Installation and Monitoring

In 2021, 13 additional monitoring wells (AW-12, AW-13, AW-14, AW-15, AW-15S, AW-15C, AW-16, AW-17, AW-18, AW-19, AW-20, AW-21 and AW-22) were installed around the Ash Pond to assess the vertical and horizontal lithology, stratigraphy, chemical properties, and physical properties of geologic layers to a minimum of 100 feet bgs as specified in 35 I.A.C. § 845.620(b). Additionally, three leachate monitoring wells (XPW01A, XPW02, and XPW03) were installed within the Ash Pond to characterize the CCR materials.

Prospective monitoring wells were sampled for eight rounds between February and August 2021 and the results were assessed for selection of the Ash Pond Part 845 monitoring well network. Groundwater samples were collected and analyzed for 35 I.A.C. § 845.600 parameters as summarized in **Table B** below. Subsequently, one additional well, APW-01, was installed in September 2021 on the east side of the Ash Pond between well APW-02 and the Illinois River. This well will be sampled quarterly for eight rounds following approval of this GMP to establish baseline at this location.

Table B. Part 845 Groundwater Monitoring Program Parameters

Field Parameters[1]			
pH	Turbidity	Groundwater Elevation	
Metals (Total)			
Antimony	Boron	Cobalt	Molybdenum
Arsenic	Cadmium	Lead	Selenium
Barium	Calcium	Lithium	Thallium
Beryllium	Chromium	Mercury	
Inorganics (Total)			
Fluoride	Sulfate	Chloride	TDS
Other (Total)			
Radium 226 and 228 combined			

[1] Dissolved oxygen, temperature, specific conductivity, and oxidation/reduction potential were recorded during sample collection.

Data and results from the Part 845 background monitoring were included in the water quality discussion included in the HCR (included in the Operating Permit to which this Plan is attached). The data collected from background locations during the Part 845 monitoring was used to evaluate and calculate background concentrations for the Ash Pond. This evaluation and discussion are included in **Section 3.2** of this GMP.

Data collected from the 40 C.F.R. § 257 monitoring network from 2015 to 2020, and from the Part 845 background monitoring was used for selection of the Part 845 monitoring well network proposed in **Section 2.2**.

2.2 Proposed Part 845 Monitoring Well Network

The groundwater monitoring network proposed in this plan will include fourteen monitoring wells screened in the Lower Cahokia Formation (wells AP05S, AW-05, AW-06, AW-08, AW-09, AW-10, AW-11, AW-14, AW-15, AW-16, AW-17, AW-18, AW-19, and AW-21), or across the unlithified-lithified interface (*i.e.,* uppermost aquifer), three wells screened in shallow unlithified materials (*i.e.,* PMP) surrounding the Ash Pond (AW-01, AP07S, and AW-15S), three temporary water level only wells screened in CCR materials (XPW01A, XPW02, and XPW03), and one temporary water level only surface water staff gage (SG-01). The proposed network is summarized in **Table C** below and displayed on **Figure 2-1**. Seventeen wells (two background and 15 compliance) will be used to monitor groundwater concentrations within the hydrostratigraphic units.

The groundwater samples collected from the 17 wells will be used to monitor and evaluate groundwater quality and demonstrate compliance with the groundwater quality standards listed in 35 I.A.C. § 845.600(a). The proposed monitoring wells will yield groundwater samples that represent the quality of downgradient groundwater at the CCR boundary (as required in 35 I.A.C. § 845.630(a)(2)). Monitoring well depths and construction details are listed in **Table 2-1** and summarized in **Table C** below.

Table C. Proposed Part 845 Monitoring Well Network

Well ID	Monitored Unit	Well Screen Interval (feet bgs)	Well Type [4]
AP05S	UA	33-38	Background
AP07S	PMP	30-35	Compliance
AW-01[1]	PMP	TBD	Compliance
AW-05	UA	16-20	Compliance
AW-06	UA	37-41	Compliance
AW-08	UA	48-57	Background
AW-09	UA	47-52	Compliance
AW-10	UA	28-32	Compliance
AW-11	UA	24-29	Compliance
AW-14	UA	24-29	Compliance
AW-15	UA	33-38	Compliance
AW-15S	PMP	8-18	Compliance
AW-16	UA	55-60	Compliance
AW-17	UA	51-56	Compliance
AW-18	UA	46-51	Compliance
AW-19	UA	35-40	Compliance
AW-21	UA	32-37	Compliance
XPW01A[2,3]	CCR	33-43	WLO
XPW02[2,3]	CCR	36-46	WLO
XPW03[2,3]	CCR	27-37	WLO
SG-01[2,4]	Surface Water	NA	WLO

[1] Well location is planned, construction details unavailable.
[2] Location is temporary pending implementation of impoundment closure per an approved Construction Permit Application.
[3] Well is to be used for water level data collection only.
[4] SG-01 is a surface water level measuring point.
[5] Well type refers to the role of the well in the monitoring network.
NA – Not applicable, surface water location.
PMP – potential migration pathway
TBD – To be determined
UA – uppermost aquifer
WLO – water level only

2.3 Well Abandonment

No wells are currently proposed for abandonment.

3. APPLICABLE GROUNDWATER QUALITY STANDARDS

3.1 Groundwater Classification

Per 35 I.A.C. § 620.210, groundwater within the uppermost aquifer at the Ash Pond meets the definition of a Class I, Potable Resource Groundwater based on the following criteria:

- Groundwater in the uppermost aquifer extends 10 feet or more below the land surface.
- Hydraulic conductivity exceeds the 1 x 10^{-4} centimeters per second (cm/s) criterion.

Field hydraulic conductivity tests performed on the unlithified geologic materials that include moderate permeability sand, silty sand, and clayey gravel units which includes the Lower Cahokia Formation and the bedrock interface) and lithified materials (shales and siltstones of the Carbondale and Modesto formations) at the EPP had geometric mean hydraulic conductivities exceeding 1 x 10^{-4} cm/s. Based on this information groundwater is classified as Class I – Potable Resource Groundwater.

3.2 Statistical Evaluation of Background Groundwater Data

A Statistical Analysis Plan (**Appendix A**) has been developed to describe procedures that will be used to establish background conditions and implement compliance monitoring as necessary and required by 35 I.A.C. § 845.640 and 35 I.A.C. § 845.650. The Statistical Analysis Plan was prepared in accordance with the requirements of 35 I.A.C. § 845.640(f), with reference to the acceptable statistical procedures provided in United States Environmental Protection Agency's (USEPA)'s *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (*Unified Guidance,* March 2009), and is intended to provide a logical process and framework for conducting the statistical analysis of the data obtained during groundwater monitoring.

In accordance with 35 I.A.C. § 845.640(f)(1), the statistical method chosen for analysis of background groundwater quality was either the tolerance interval or the prediction interval procedure for each constituent listed in 35 I.A.C. § 845.600(a)(1) at this CCR unit per 35 I.A.C. § 845.640(f)(1)(C). A comparison of the statistical background concentrations and groundwater quality standards listed in 35 I.A.C. § 845.600(a)(1) and the resulting GWPSs are summarized in **Table 3-1**.

3.3 Applicable Groundwater Quality Standards

The applicable GWPS will be established in accordance with 35 I.A.C. § 845.600(a) (greater of the background concentration or numerical limit specified in 35 I.A.C. § 845.600(a)(1)). The results of the statistical analysis of background groundwater data (**Table 3-1**) indicate that most background concentrations in the uppermost aquifer are below the groundwater quality standards listed in 35 I.A.C. § 845.600. Therefore, for these parameters, the groundwater quality standards listed in 35 I.A.C. § 845.600 will be applied to the results from the proposed groundwater monitoring network. The exceptions include arsenic, barium, cobalt, lead, lithium, pH, and radium 226 and 228 combined where the background concentration is greater (or lower for pH lower limit) than the 35 I.A.C. § 845.600 standard. In these instances, the GWPS will be the background concentration.

Under most circumstances, the GWPS will be compared to the lower confidence limit for the observed concentrations for each constituent in each compliance well. Exceptions are when there are high percentages (greater than 50 percent) of non-detects in compliance well data, for which a future mean (for 50 to 70 percent non-detects) or median (for greater than 70 percent non-detects) will be compared to the GWPS. Consistent with the *Unified Guidance*, the same general statistical method of confidence interval testing against a fixed GWPS is recommended in compliance and corrective action programs. Confidence intervals provide a flexible and statistically accurate method to test how a parameter estimated from a single sample compares to a fixed numerical limit. Confidence intervals explicitly account for variation and uncertainty in the sample data used to construct them.

Evaluation of the applicable standards will occur in conjunction with the analysis of groundwater quality results. Background calculations and the resulting concentrations may be updated as appropriate, in accordance with the Statistical Analysis Plan included in **Appendix A**.

4. GROUNDWATER MONITORING PLAN

The groundwater monitoring plan will monitor and evaluate groundwater quality to demonstrate compliance with the groundwater quality standards included in 40 C.F.R. § 257.94(e), 40 C.F.R. § 257.95(h), and 35 I.A.C. § 845.600(a). The groundwater monitoring program will include sampling and analysis procedures that are consistent and that provide an accurate representation of groundwater quality at the background and Compliance wells as required by 35 I.A.C. § 845.630. As discussed in **Section 2**, two monitoring networks exist: the 40 C.F.R. § 257 network and the proposed Part 845 network. Both networks will continue to be monitored until USEPA approves Part 845. It is expected that upon USEPA approval of Part 845, the 40 C.F.R. § 257 network monitoring and reporting will be eliminated, and the proposed Part 845 monitoring and reporting included in this Plan will continue until requirements of Part 845 have been achieved.

4.1 Monitoring Networks and Parameters

4.1.1 40 C.F.R. § 257 Groundwater Monitoring

The existing 40 C.F.R. § 257 monitoring program was discussed in detail in **Section 2.1.1**. Six wells (two background and four compliance) are sampled for Appendix III and Appendix IV parameters on a semi-annual frequency. No changes are proposed to this monitoring network. Well locations and parameters will continue to be monitored and reported as required by 40 C.F.R. § 257 until USEPA approves Part 845.

4.1.2 Part 845 Groundwater Monitoring

The proposed Part 845 Monitoring Network will consist of two background monitoring wells (wells AP05S and AW-08), fifteen compliance monitoring wells (wells AW-01, AP07S, AW-05, AW-06, AW-09, AW-10, AW-11, AW-14, AW-15, AW-15S, AW-16, AW-17, AW-18, AW-19, and AW-21), three temporary water level only wells (wells XPW01A, XPW02, and XPW03), and one temporary water level only surface water staff gage (SG-01) (**Figure 2-1**). These monitoring wells are screened within the uppermost aquifer (AP05S, AW-05, AW-06, AW-08, AW-09, AW-10, AW-11, AW-14, AW-15, AW-16, AW-17, AW-18, AW-19, and AW-21), the PMP (AW-01, AP07S and AW-15S), and the CCR materials (XPW01A, XPW02, and XPW03). Groundwater samples will be collected and analyzed for the laboratory and field parameters summarized in **Table D** below.

Table D. Part 845 Groundwater Monitoring Program Parameters

Field Parameters[1]			
Groundwater Elevation	Turbidity	pH	
Metals (Total)			
Antimony	Boron	Cobalt	Molybdenum
Arsenic	Cadmium	Lead	Selenium
Barium	Calcium	Lithium	Thallium
Beryllium	Chromium	Mercury	
Inorganics (Total)			
Fluoride	Sulfate	Chloride	TDS
Other (Total)			
Radium 226 and 228 combined			

[1] Dissolved oxygen, temperature, specific conductivity, and oxidation/reduction potential will be recorded during sample collection.

All parameters listed above were sampled a minimum of eight times by October 18, 2021 to establish background groundwater quality in accordance with 35 I.A.C. § 845.650 (b)(1)(A). Discussion of background groundwater quality was included in **Section 3.2**.

4.2 Sampling Schedule

Groundwater sampling for the Part 845 monitoring well network will initially be performed quarterly according to the following schedule:

Table E. Part 845 Sampling Schedule

Frequency	Duration
Monthly (groundwater elevations only)	Begins: the quarter following approval of this plan and issuance of the Operating Permit.
	Ends: Following the 30-year post closure care period and following IEPA approval of documentation that groundwater concentrations are below standards in 35 I.A.C. § 845.600 and concentrations exceeding background are not increasing and meet requirements in 35 I.A.C. § 845.780 (c)(2)(B)(i) and (ii).
Quarterly (groundwater quality)	Begins: the quarter following approval of this plan and issuance of the Operating Permit.
	Ends: Following the 30-year post closure care period and following IEPA approval of documentation that groundwater concentrations are below standards in 35 I.A.C. § 845.600 and concentrations exceeding background are not increasing and meet requirements in 35 I.A.C. § 845.780 (c)(2)(B)(i) and (ii), or upon IEPA approval of an alternate schedule as allowed by 35 I.A.C. § 845.650(b)(4).
Semi-annual (groundwater quality)	Begins: Following 5 years of quarterly groundwater monitoring and IEPA approval of a demonstration that groundwater concentrations are below standards in 35 I.A.C. § 845.600 and not exhibiting statistically-significant increasing trends, monitoring effectiveness is not compromised by a semi-annual schedule, and sufficient data has been collected to characterize groundwater.
	Ends: Following detection of a statistically-significant increasing trend in groundwater concentrations or an exceedance of the standards in 35 I.A.C. § 845.600 (quarterly monitoring shall be resumed in these circumstances), or following the 30-year post closure care period and following IEPA approval of documentation that groundwater concentrations are below standards in 35 I.A.C. § 845.600 and concentrations exceeding background are not increasing and meet requirements in 35 I.A.C. § 845.780 (c)(2)(B)(i) and (ii).

4.3 Groundwater Sample Collection

Groundwater sampling procedures have been developed and the collection of groundwater samples is being implemented to meet the requirements of 35 I.A.C. § 845.640. In addition to groundwater well samples, quality assurance samples will be collected as described in **Section 4.5** (**Table 4-1**).

4.3.1 Methane Monitoring Plan

Methane, a decomposition product of organic materials, is a colorless, odorless, flammable gas. Methane is known to be present in aquifers throughout Illinois, due to both natural and anthropogenic processes (coal mining). Methane may accumulate in the borehole, well, protective casing or in the general work area near a well or boring. During field activities in 2021 methane was detected above 10% of the lower explosive limit (LEL) at borehole monitoring well locations AW-13, AW-14, AW-15, AW-15C, AW-16, AW-17, AW-22, and P002. Levels quickly dissipated after venting the monitoring wells to the atmosphere. A methane monitoring plan was established for the safe completion of field activities, including groundwater sampling at EPP. Anyone accessing any monitoring well at EPP must follow a methane monitoring plan to manage and mitigate potential hazards associated with the presence of methane gas in groundwater.

4.4 Laboratory Analysis

Laboratory analysis will be performed consistent with the requirements of 35 I.A.C. § 845.640(j) by a state-certified laboratory using methods approved by IEPA and USEPA. Laboratory methods may be modified based on laboratory equipment availability or procedures, but the Reporting Limit (RL) for all parameters analyzed, regardless of method, will be lower than the applicable groundwater quality standard. RLs for the applicable parameters are summarized in **Table 4-2**. Concentrations lower than the RL will be reported as less than the RL.

4.5 Quality Assurance Program

Consistent with the requirements of 35 I.A.C. § 845.640(a)(5), the sampling and analysis program includes procedures and techniques for quality assurance and quality control (QA/QC). Additional quality assurance samples to be collected will include the following:

- Field duplicates will be collected at a frequency of one per group of ten or fewer investigative water samples.
- One equipment blank sample will be collected and analyzed for each day of sampling. If dedicated sampling equipment is used, then equipment blank samples will not be collected.

The duplicate and equipment blank quality assurance samples will be supplemented by the laboratory QA/QC program, which typically includes:

- Regular generation of instrument calibration curves to assure instrument reliability.
- Laboratory control samples and/or quality control check standards that have been spiked, and analyses to monitor the performance of the analytical method.
- Matrix spike/matrix spike duplicate analyses to determine percent recoveries and relative percent differences for each of the parameters detected.
- Analysis of replicate samples to check the precision of the instrumentation and/or methodology employed for all analytical methods.
- Analysis of method blanks to assure that the system is free of contamination.

Water quality meters used to measure pH and turbidity will be calibrated according to manufacturer's specifications. At a minimum, it is recommended that calibration of pH occur daily prior to sampling and checked for accuracy at the end of each day. Unusual or suspect pH measurements during sampling events will be flagged, evaluated, and additional calibration may be performed throughout the sampling events. Turbidity meters will be checked daily, prior to and following sampling. Unusual measurements or erratic meter performance will be flagged and evaluated for overall effects on the data prior to reporting.

4.6 Groundwater Monitoring System Maintenance Plan

Consistent with the requirements of 35 I.A.C. § 845.630(e)(2), maintenance will be performed as needed to assure that the monitoring wells provide representative groundwater samples.

Monitoring wells will be inspected during each groundwater sampling event; inspections will consist of the following:

- Visual inspection, clearing of vegetation, replacement of markers, and painting of protective casings as needed to assure that monitoring wells are clearly marked and accessible.
- Visual inspection and repair or replacement of well aprons as needed to assure that they are intact, drain water away from the well, and have not heaved.
- Visual inspection and repair or replacement of protective casings as needed to assure that they are undamaged, and that locks are present and functional.
- Checks to assure that well caps are intact and vented, unless in flood-prone areas in which case caps will not be vented.
- Annual measurement of monitoring well depths to determine the degree of siltation within the wells. Wells will be redeveloped as needed to remove siltation from the screened interval if it impedes flow of water into the well.
- Checks to assure that wells are clear of internal obstructions, and flow freely.

If maintenance of a monitoring well cannot address an identified deficiency, a replacement well will be installed.

4.7 Statistical Analysis

Statistical analysis will be consistent with procedures listed in 35 I.A.C. § 845.640(f). A Statistical Analysis Plan, provided in **Appendix A**, has been developed to summarize the statistical procedures that will be used to evaluate the groundwater results.

4.8 Data Reporting

Data reporting for the 40 C.F.R. § 257 monitoring well network will be consistent with recordkeeping, notification, and internet posting requirements described in 40 C.F.R. § 257.105 through 257.107.

Groundwater monitoring and analysis completed as part of the Part 845 monitoring under an approved monitoring program will be reported to IEPA within 60 days after completion of sampling and the data placed in the facility’s operating record as required by 35 I.A.C. § 845.610(b)(3)(D). Within 14 days of posting to the operating record, information will be posted to the publicly accessible internet site “Illinois CCR Rule Compliance Data and Information” as required by 35 I.A.C. § 845.810(d). Information will also be submitted to IEPA annually by January 31, as required by 35 I.A.C. § 845.550, for data collected the preceding year. The report will include the status of the groundwater monitoring and corrective action plan for the Ash Pond in addition to other requirements detailed in 35 I.A.C. § 845.610(e).

4.9 Compliance with Applicable On-site Groundwater Protection Standards

In accordance with 35 I.A.C. § 845.600(a)(1), the groundwater protection standard at the waste boundary will be the higher of either the 35 I.A.C. § 845.600 standard or the concentration determined by background groundwater monitoring.

As provided in 35 I.A.C. § 845.780(c)(2), at the end of the 30-year post-closure care period, groundwater monitoring will continue to be conducted in post-closure care until the groundwater results show the concentrations are:

- Below the GWPS in 35 I.A.C. § 845.600.
- Not increasing for those constituents over background, using the statistical procedures and performance standards in 35 I.A.C. § 845.640(f) and (g), provided that:
  - Concentrations have been reduced to the maximum extent feasible; and
  - Concentrations are protective of human health and the environment.

If one or more constituents are detected and confirmed by an immediate resample, to be greater than the GWPS in any sampling event, an Alternate Source Demonstration (ASD) will be evaluated as described in **Section 4.10**.

4.10 Alternate Source Demonstrations

As allowed in 35 I.A.C. § 845.650(e), following detection of an exceedance of the GWPS, an ASD will be evaluated and, if completed, submitted to IEPA within 60 days. The ASD will provide lines of evidence that a source other than the CCR SI caused the contamination and the CCR SI did not contribute to the contamination, or that the exceedance of the GWPS resulted from error in sampling, analysis, statistical evaluation, natural variation in groundwater quality, or a change in the potentiometric surface and groundwater flow direction.

The ASD will include information and analysis that supports the conclusions and a certification of accuracy by a qualified professional engineer. Once the ASD is approved by IEPA, the Part 845 groundwater monitoring will continue as defined in **Section 4.1.2**.

If an ASD is not completed and submitted, or IEPA does not approve the ASD, a notification of the exceedance will be provided to IEPA and placed in the operating record. Additional actions will also be completed as required by 35 I.A.C §§ 845.650(d)(1) through (3); including, initiation of an assessment of corrective measures under 35 I.A.C § 845.660. As allowed in 35 I.A.C § 845.650(e)(7) a petition for review of IEPA's non-concurrence under I.A.C. 35 105 may also be filed.

4.11 Assessment of Corrective Measures and Corrective Action

As described in 35 I.A.C. § 845.660, if the ASD summarized in **Section 4.10** has not been approved by IEPA, an assessment of corrective measures will be initiated within 90 days of the detection of a result exceeding 35 I.A.C. § 845.600 standards (*i.e.,* receipt of laboratory data). The assessment of corrective measures will include at least the following (35 I.A.C. § 845.660(c)):

- The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination;
- The time required to begin and complete the corrective action plan; and
- The institutional requirements, such as State or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the corrective action plan.

Within one year of completing the assessment of corrective measures, a corrective action plan will be developed to identify the selected remedy in accordance with 35 I.A.C. § 845.670. If closure of the CCR unit is required, a closure alternatives analysis will be completed as specified in 35 I.A.C. § 845.710. The analysis and selected alternative will be submitted to IEPA in a Closure Plan as specified by 35 I.A.C. § 845.720. Groundwater monitoring proposed in this Addendum will continue as specified until the post closure care period has expired and IEPA has approved termination of post-closure care.

5. REFERENCES

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TABLES

TABLE 1-1. PART 845 REQUIREMENTS CHECKLIST
GROUNDWATER MONITORING PLAN
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Part 845 Reference	Part 845 Components	Location of Information in GMP
845.630	**Groundwater Monitoring Systems**	
845.630(a)(2)	Potential contaminant pathways must be monitored.	Sections 1.3, 2.2, 3.1, & 4.1.2
845.630(a) 845.630(b) 845.630(c)	At least two upgradient wells and four downgradient wells (min. 1 and 3, but requires additional documentation)	Sections 2.2 & 4.1.1 Table 2-1 Figure 2-1
845.630(a) 845.630(b) 845.630(c)	Downgradient Well Density	Figure 2-1
845.630(a)(2)	Downgradient wells at waste boundary	Figure 2-1
845.640	**Groundwater Sampling and Analysis Requirements**	
845.640(a)	Consistent sampling and analysis procedures	Section 4 Tables 4-1 & 4-2
845.640(b)	Methods are appropriate	Section 4 Tables 4-1 & 4-2
845.640(c)	Groundwater elevations must be measured in each well prior to purging, each time groundwater is sampled.	Section 4.3
845.640 (d)(e)(f)(g)(h)	Establishement of background and application of statistical methods	Sections 3 & 4.7 Appendix A
845.640(i)	Analyze total recoverable metals	Section 4.1.2 & 4.4
845.640(j)	Analyze groundwater samples using a certified laboratory	Section 4.4

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TABLE 1-1. PART 845 REQUIREMENTS CHECKLIST
GROUNDWATER MONITORING PLAN
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Part 845 Reference	Part 845 Components	Location of Information in GMP
845.650	**Groundwater Monitoring Program**	
845.650(a)	Must include monitoring for all constituents with a groundwater protection standard in Section 845.600(a), calcium, and turbidity	Section 4.1.2
845.650(b)(c)	Groundwater Monitoring Frequency	Sections 4.1.2 & 4.2
845.650(d)(e)	Exceedances of the groundwater protection standard	Sections 4.9, 4.10 & 4.11
845.650(b)(2) and (3)	Staff gauge/ piezometer to monitor head in impoundment	Sections 2.2 & 4.1.2 Figure 2-1 (XPW01A, XPW02, & XPW03)
NA	Staff gauge/ piezometer to monitor head of neighboring surface water body	Sections 2.2 & 4.1.12 Figure 2-1 (SG-01)

Notes:
[O: CJC 08/10/21; C: LDC 10/05/21]

GMP = Groundwater Monitoring Plan

NA = Not Applicable

TABLE 2-1. MONITORING WELL LOCATIONS AND CONSTRUCTION DETAILS
GROUNDWATER MONITORING PLAN
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Well Number	Type	HSU	Date Constructed	Top of PVC Elevation (ft)	Measuring Point Elevation (ft)	Measuring Point Description	Ground Elevation (ft)	Screen Top Depth (ft BGS)	Screen Bottom Depth (ft BGS)	Screen Top Elevation (ft)	Screen Bottom Elevation (ft)	Well Depth (ft BGS)	Bottom of Boring Elevation (ft)	Screen Length (ft)	Screen Diameter (inches)	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)
AP05S	B	UA	11/29/2016	443.53	443.53	Top of PVC	441.13	32.87	37.64	408.26	403.49	38.06	403.10	4.8	2	40.598807	-89.66191
AP07S	C	UCF	12/02/2016	461.08	461.08	Top of PVC	458.31	29.95	34.74	428.36	423.57	35.00	423.30	4.8	2	40.59793	-89.666919
AW-01[1]	C	PMP	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AW-05	C	UA	07/22/2015	--	443.37	Top of Disk	440.55	15.87	20.47	424.68	420.08	21.10	419.50	4.6	2	40.598645	-89.666407
AW-06	C	UA	08/03/2015	--	461.57	Top of Disk	459.19	36.60	41.09	422.59	418.10	41.69	416.90	4.5	2	40.594237	-89.670051
AW-08	B	UA	07/21/2015	--	462.54	Top of Disk	460.66	47.55	57.19	413.11	403.47	57.70	403.00	9.6	2	40.593964	-89.661996
AW-09	C	UA	08/03/2015	--	461.45	Top of Disk	458.32	47.14	51.62	411.18	406.70	52.23	406.10	4.5	2	40.590422	-89.668777
AW-10	C	UA	07/23/2015	--	439.93	Top of Disk	437.64	27.62	32.23	410.02	405.41	32.74	404.90	4.6	2	40.590733	-89.663826
AW-11	C	UA	07/28/2015	--	439.87	Top of Disk	437.16	24.21	28.81	412.95	408.35	29.31	407.20	4.6	2	40.587261	-89.663781
AW-14	C	UA	01/08/2021	439.40	439.40	Top of PVC	436.83	24.00	29.00	412.83	407.83	29.00	401.80	5	2	40.58729	-89.665621
AW-15	C	UA	01/08/2021	441.51	441.51	Top of PVC	438.95	33.00	38.00	405.95	400.95	38.00	399.00	5	2	40.587964	-89.666822
AW-15S	C	UCF	01/08/2021	440.71	440.71	Top of PVC	437.92	8.00	18.00	429.92	419.92	18.00	417.90	10	2	40.587955	-89.666841
AW-16	C	UA	01/08/2021	461.79	461.79	Top of PVC	459.45	55.00	60.00	404.45	399.45	60.00	396.50	5	2	40.589457	-89.667799
AW-17	C	UA	01/08/2021	462.10	462.10	Top of PVC	459.69	51.00	56.00	408.69	403.69	56.00	402.70	5	2	40.591698	-89.669404
AW-18	C	UA	01/09/2021	462.65	462.65	Top of PVC	460.28	46.00	51.00	414.28	409.28	51.00	405.30	5	2	40.593044	-89.669822
AW-19	C	UA	01/09/2021	460.74	460.74	Top of PVC	458.53	35.00	40.00	423.53	418.53	40.00	415.50	5	2	40.595434	-89.66972
AW-21	C	UA	01/10/2021	460.61	460.61	Top of PVC	458.28	32.00	37.00	426.28	421.28	37.00	420.30	5	2	40.597294	-89.667734
XPW01A	WLO	CCR	01/09/2021	464.16	464.16	Top of PVC	460.99	33.00	43.00	427.99	417.99	43.00	418.00	10	2	40.596306	-89.667345
XPW02	WLO	CCR	01/09/2021	473.79	473.79	Top of PVC	471.16	36.00	46.00	435.16	425.16	46.00	424.20	10	2	40.594351	-89.668312
XPW03	WLO	CCR	01/10/2021	466.04	466.04	Top of PVC	462.62	27.00	37.00	435.62	425.62	37.00	422.60	10	2	40.591416	-89.666188
SG-01	WLO	SW	--	--	--	--	--	--	--	--	--	--	--	--	--	40.596075	-89.661625

TABLE 2-1. MONITORING WELL LOCATIONS AND CONSTRUCTION DETAILS
GROUNDWATER MONITORING PLAN
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Well Number	Type	HSU	Date Constructed	Top of PVC Elevation (ft)	Measuring Point Elevation (ft)	Measuring Point Description	Ground Elevation (ft)	Screen Top Depth (ft BGS)	Screen Bottom Depth (ft BGS)	Screen Top Elevation (ft)	Screen Bottom Elevation (ft)	Well Depth (ft BGS)	Bottom of Boring Elevation (ft)	Screen Length (ft)	Screen Diameter (inches)	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)

Notes:
[1] Well location is planned, construction details unavailable.
All elevation data are presented relative to the North American Vertical Datum 1988 (NAVD88), GEOID 12A
Type refers to the role of the well in the monitoring network: background (B), compliance (C), or water level measurements only (WLO)
WLO wells are temporary pending implementation of impoundment closure per an approved Construction Permit application
-- = data not available
BGS = below ground surface
CCR = Coal Combustion Residual
ft = foot or feet
HSU = Hydrostratigraphic Unit
PMP = potential migration pathway
PVC = polyvinyl chloride
SW = surface water
UA = uppermost aquifer
UCF = Upper Cahokia Formation

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TABLE 3-1. BACKGROUND GROUNDWATER QUALITY AND STANDARDS
GROUNDWATER MONITORING PLAN
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Parameter	Background Concentration	845 Limit	Groundwater Protection Standard	Unit
Antimony, total	0.003	0.006	0.006	mg/L
Arsenic, total	0.03	0.010	0.030	mg/L
Barium, total	2.07	2.0	2.1	mg/L
Beryllium, total	0.0019	0.004	0.004	mg/L
Boron, total	0.535	2	2	mg/L
Cadmium, total	0.001	0.005	0.005	mg/L
Chloride, total	56	200	200	mg/L
Chromium, total	0.048	0.1	0.1	mg/L
Cobalt, total	0.028	0.006	0.028	mg/L
Fluoride, total	0.396	4.0	4.0	mg/L
Lead, total	0.033	0.0075	0.033	mg/L
Lithium, total	0.071	0.04	0.071	mg/L
Mercury, total	0.0002	0.002	0.002	mg/L
Molybdenum, total	0.0062	0.1	0.1	mg/L
pH (field)	7.1 / 6.3	9.0 / 6.5	9.0 / 6.3	SU
Radium 226 and 228 combined	9.6[1]	5	9.6	pCi/L
Selenium, total	0.0032	0.05	0.05	mg/L
Sulfate, total	6	400	400	mg/L
Thallium, total	0.001	0.002	0.002	mg/L
Total Dissolved Solids	1050	1200	1200	mg/L

Notes:
For pH, the values presented are the upper / lower limits
Groundwater protection standards for calcium and turbidity do not apply per 35 I.A.C. § 845.600(b)
mg/L = milligrams per liter
SU = standard units
pCi/L = picocuries per liter
[1] The background calculation method prescribed by the Statistical Analysis Plan based upon the observed distribution of the background data resulted in an unreasonably elevated background value; therefore, a non-parametric calculation method was utilized, resulting in a more representative background value.

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TABLE 4-1. SAMPLING AND ANALYSIS SUMMARY

GROUNDWATER MONITORING PLAN
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Parameter	Analytical Method [1]	Number of Samples	Field Duplicates [2]	Field Blanks [3]	Equipment Blanks [3]	MS/MSD [4]	Total	Container Type	Minimum Volume [5]	Preservation (Cool to 4 °C for all samples)	Sample Hold Time from Collection Date
Metals											
Metals [6]	6020, Li - EPA 200.7	17	2	0	0	1	20	plastic	600 mL	HNO_3 to pH<2	6 months
Mercury	7470A or 6020	17	2	0	0	1	20	plastic	400 mL	HNO_3 to pH<2	28 days
Inorganic Parameters											
Fluoride	9214 or EPA 300	17	2	0	0	1	20	plastic	300 mL	Cool to 4 °C	28 days
Chloride	9251 or EPA 300	17	2	0	0	1	20	plastic	100 mL	Cool to 4 °C	28 days
Sulfate	9036 or EPA 300	17	2	0	0	1	20	plastic	50 mL	Cool to 4 °C	28 days
Total Dissolved Solids	SM 2540 C	17	2	0	0	1	20	plastic	200 mL	Cool to 4 °C	7 days
Radium											
Radium 226	9315 or EPA 903	17	0	0	0	0	17	plastic	1000 mL	HNO_3 to pH<2	6 months
Radium 228	9320 or EPA 904	17	0	0	0	0	17	plastic	1000 mL	HNO_3 to pH<2	6 months
Field Parameters											
pH	SM 4500-H+ B	17	NA	NA	NA	NA	17	flow-through cell	NA	none	immediately
Dissolved Oxygen [8]	SM 4500-O/405.1	17	NA	NA	NA	NA	17	flow-through cell	NA	none	immediately
Temperature [8]	SM 2550	17	NA	NA	NA	NA	17	flow-through cell	NA	none	immediately
Oxidation/Reduction Potential [8]	SM 2580 B	17	NA	NA	NA	NA	17	flow-through cell	NA	none	immediately
Specific Conductance [8]	SM 2510 B	17	NA	NA	NA	NA	17	flow-through cell	NA	none	immediately
Turbidity [7]	SM 2130 B	17	NA	NA	NA	NA	17	flow-through cell or hand-held turbidity meter	NA	none	immediately

[O: CJC 08/10/21; C: LDC 09/20/21]

Notes:

[1] Analytical method numbers are from SW-846 unless otherwise indicated. Analytical methods may be updated with more recent versions as appropriate.
[2] Field duplicates will be collected at a frequency of one per group of 10 or fewer investigative water sample. Field duplicates will not be collected for radium analysis.
[3] Field blanks will be collected at the discretion of the project manager; Equipment blanks will be collected at a rate of 1 per sampling event if non-dedicated equipment is used.
[4] Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples will be collected at a frequency of one per group of 20 or fewer investigative water samples per CCR unit/multi-unit. Additional volume to be determined by laboratory.
[5] Sample volume is estimated and will be determined by the laboratory.
[6] Metals = antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, lead, lithium, molybdenum, selenium, thallium. Metals may be analyzed via ICP/ ICP-MS USEPA methods 6010 or 6020 depending on laboratory instrument availability.
[7] If turbidity exceeds 10 NTUs, a duplicate sample filtered through a .45 micron filter may be collected for metals analysis in addition to the unfiltered sample. Both samples would be submitted for analysis.
[8] Parameter collected for quality assurance and quality control for field sampling purposes only; not required to be collected or reported under Part 845; collection of parameter may be discontinued without notification.

< = less than
°C = degrees Celsius
HNO_3 = nitric acid
mL = milliliter
NA = not applicable
NTU = nephelometric turbidity unit

TABLE 4-2. DETECTION AND REPORTING LIMITS FOR PART 845 PARAMETERS

GROUNDWATER MONITORING PLAN

EDWARDS POWER PLANT

ASH POND

BARTONVILLE, ILLINOIS

Constituent	CAS	Unit	Analytical Methods [1]	USEPA MCL [2]	IL Part 845.600	RL [4, 5]	MDL [5]
Metals							
Antimony	7440-36-0	mg/L	6020	0.006	0.006	0.003	0.00036
Arsenic	7440-38-2	mg/L	6020	0.01	0.01	0.001	0.00013
Barium	7440-39-3	mg/L	6020	2	2	0.001	0.00028
Beryllium	7440-41-7	mg/L	6020	0.004	0.004	0.001	0.000017
Boron	7440-42-8	mg/L	6020	NS	2	0.01	0.0023
Cadmium	7440-43-9	mg/L	6020	0.005	0.005	0.001	0.000042
Calcium	7440-70-2	mg/L	6020	NS	NS	0.15	0.15
Chromium	7440-47-3	mg/L	6020	0.1	0.1	0.004	0.00027
Cobalt	7440-48-4	mg/L	6020	0.006	0.006	0.002	0.000017
Lead	7439-92-1	mg/L	6020	0.015	0.0075	0.001	0.000025
Lithium	7439-93-2	mg/L	6020 or EPA 200.7	0.04	0.04	0.02	0.0001
Mercury	7439-97-6	mg/L	6020 or 7470A	0.002	0.002	0.0002	0.000078
Molybdenum	7439-98-7	mg/L	6020	0.1	0.1	0.001	0.000063
Selenium	7782-49-2	mg/L	6020	0.05	0.05	0.001	0.00032
Thallium	7440-28-0	mg/L	6020	0.002	0.002	0.001	0.000062
Inorganics							
Fluoride	7681	mg/L	9214 or EPA 300	4	4	0.25	0.065
Chloride	16887-00-6	mg/L	9251 or EPA 300	250 [3]	200	1	0.15
Sulfate	18785-72-3	mg/L	9036 or EPA 300	250 [3]	400	1	0.24
Total Dissolved Solids	10052	mg/L	SM 2540C	500 [3]	1200	17	--
Other							
Radium 226 and 228 Combined	7440-14-4	pCi/L	9315/9320 or EPA 903/904	5	5	-- [6]	-- [7]
Field							
pH	NA	SU	SM 4500-H+ B	NS	6.5-9.0	NA	NA
Oxidation/Reduction Potential	NA	mV	SM 2580 B	NS	NS	NA	NA
Dissolved Oxygen	NA	mg/L	SM 4500-O/405.1	NS	NS	NA	NA
Temperature	NA	°C	SM 2550	NS	NS	NA	NA
Specific Conductivity	NA	µS/cm	SM 2510 B	NS	NS	NA	NA

TABLE 4-2. DETECTION AND REPORTING LIMITS FOR PART 845 PARAMETERS

GROUNDWATER MONITORING PLAN

EDWARDS POWER PLANT

ASH POND

BARTONVILLE, ILLINOIS

Constituent	CAS	Unit	Analytical Methods [1]	USEPA MCL [2]	IL Part 845.600	RL [4, 5]	MDL [5]
Turbidity	NA	NTU	SM 2130 B	NS	NS	NA	NA

[O: CJC 08/10/21, C: LDC 09/20/21]

Notes:

[1] Analytical method numbers are from SW-846 unless otherwise indicated. Metals will be analyzed via Method 6020 or 6010 depending on laboratory equipment availablity. Selected method will ensure reporting limits (RL) are below Title 35 of the Illinois Adminiatrative Code (35 I.A.C.) 845.600 groundwater protection standards.

[2] USEPA MCL = United States Environmental Protection Agency Maximum Contaminant Level.

[3] USEPA SMCL = United States Environmental Protection Agency Secondary Maximum Contaminant Level.

[4] RLs will be less than the 35 I.A.C. § 845.600 groundwater protection standards.

[5] RLs and method detection limits (MDLs) will vary depending on the laboratory performing the work.

[6] All radium results will be reported (values may be positive or negative) and will include uncertainty and the calculated MDC.

[7] Laboratories calculate a minimum detectable concentration (MDC) based on the sample.

µS/cm = microSiemens per centimeter

°C = degrees Celsius

CAS = Chemical Abstract Number

MDL = Method detection limit as established by the laboratory

mg/L = milligrams per liter

mV = millivolts

NS = No standard

NTU = nephelometric turbidity unit

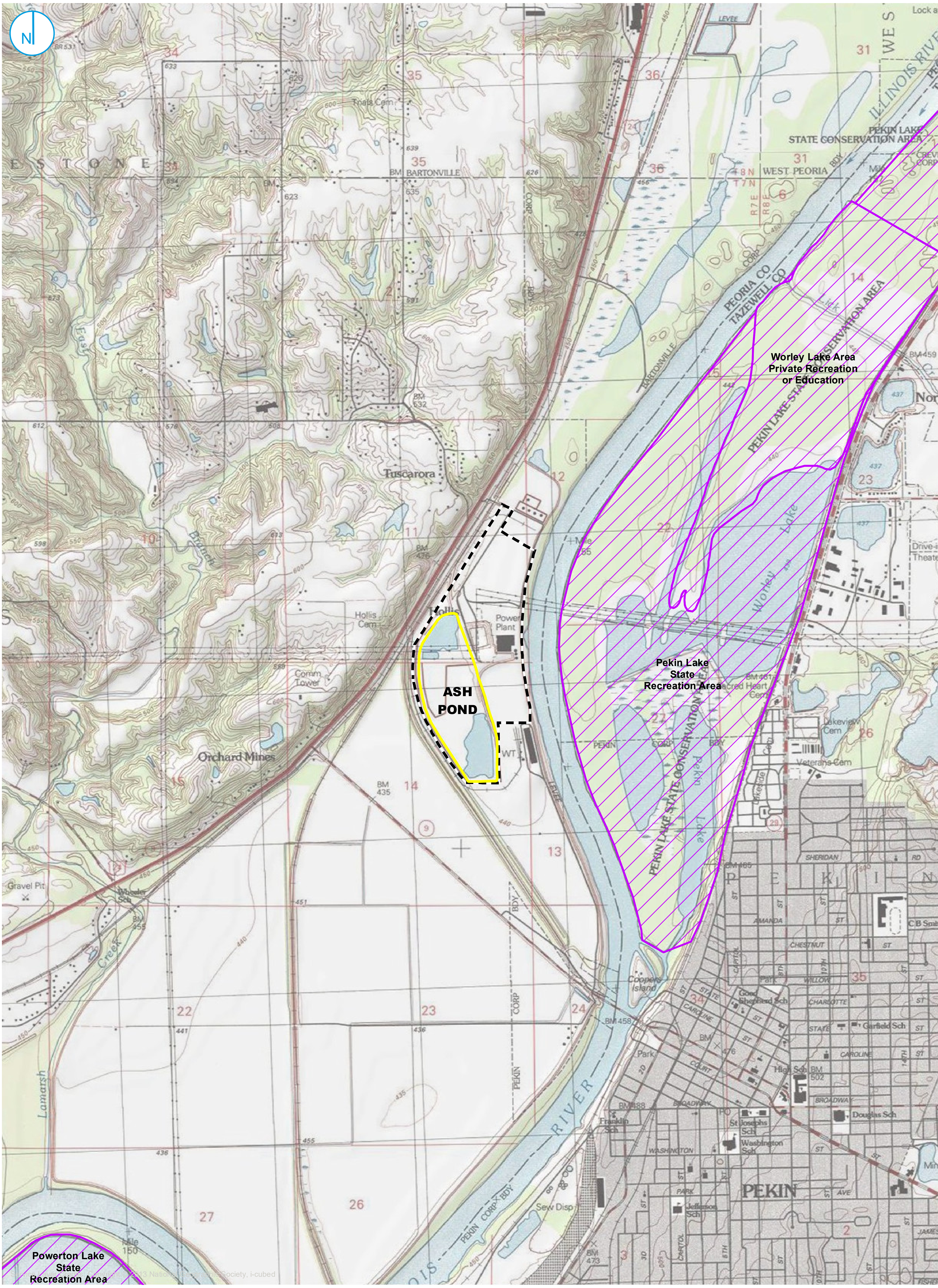
pCi/L = picoCuries per liter

RL = Reporting limit as established by the laboratory

SM = Standard Methods for the Examination of Water and Wastewater

SU = standard units

FIGURES



PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY
PROTECTED AREA

0 1,000 2,000 Feet

SITE LOCATION MAP

FIGURE 1-1

GROUNDWATER MONITORING PLAN
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

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ENGINEERING SOLUTIONS, INC.

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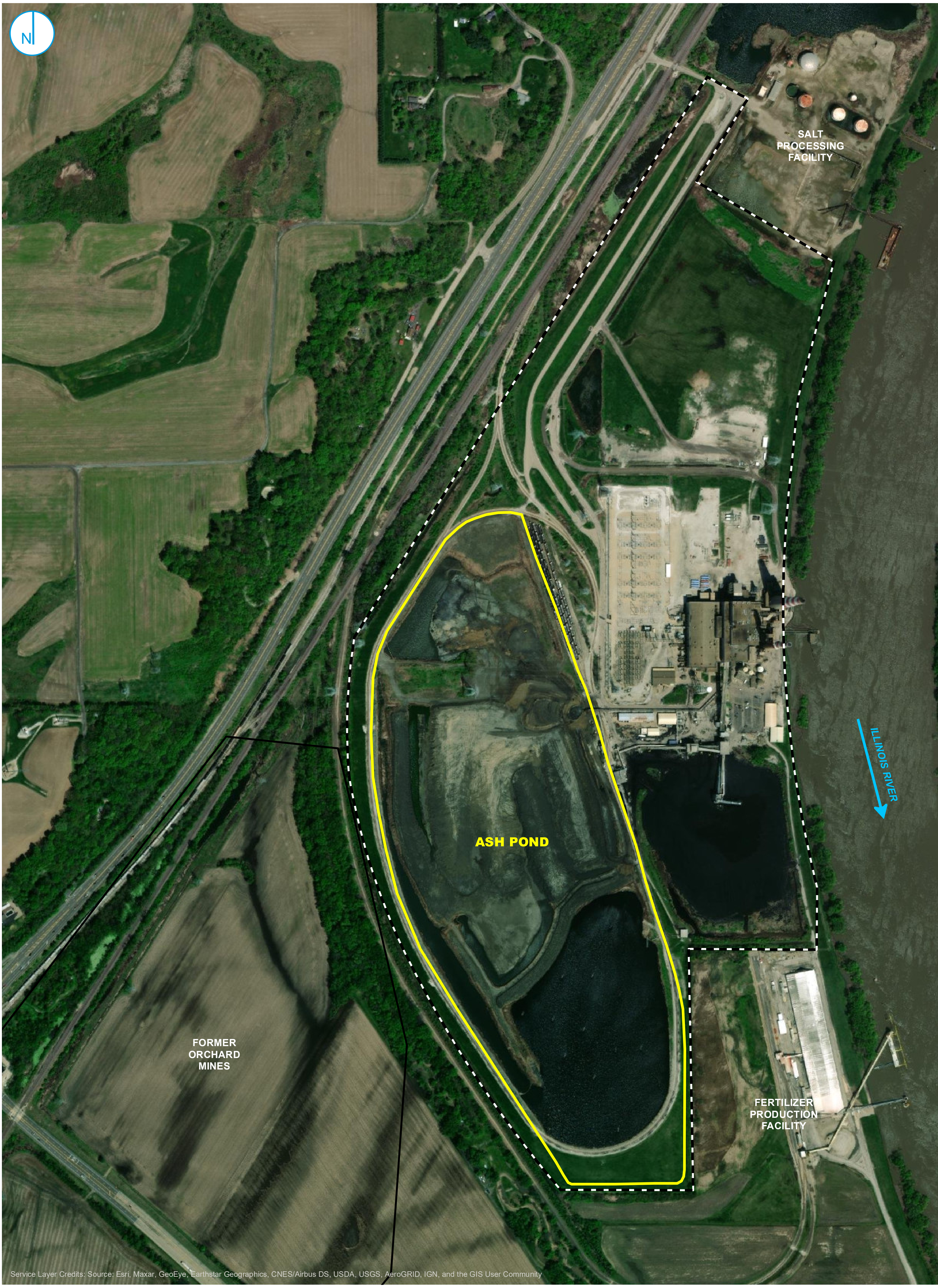


PART 845 REGULATED UNIT (SUBJECT UNIT)
FORMER ORCHARD MINES AREA
PROPERTY BOUNDARY

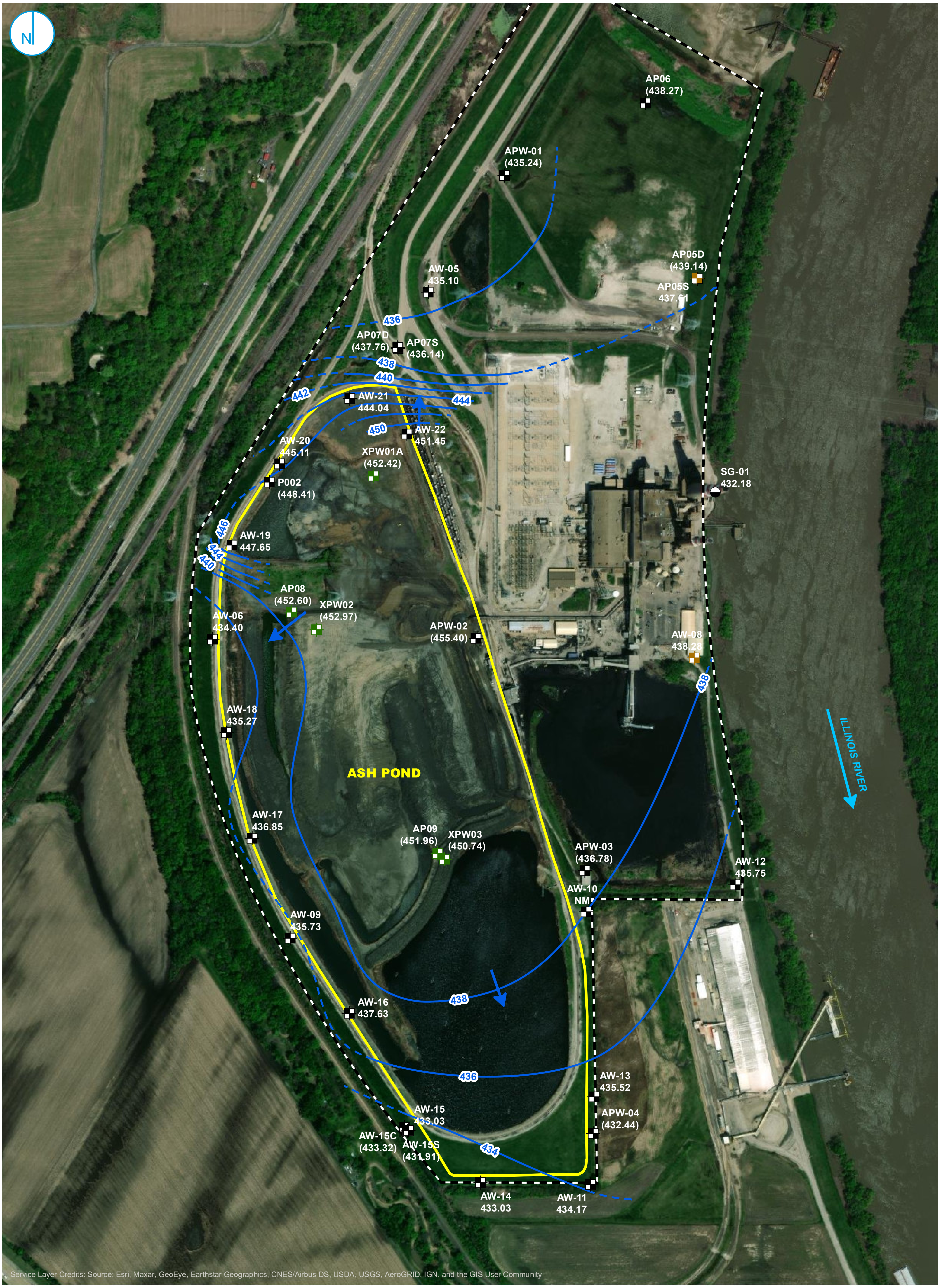
0 250 500 Feet

SITE MAP

FIGURE 1-2

GROUNDWATER MONITORING PLAN
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.



BACKGROUND WELL
MONITORING WELL
SOURCE SAMPLE LOCATION
STAFF GAGE
PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

GROUNDWATER ELEVATION CONTOUR (2-FT CONTOUR INTERVAL, NAVD88)
INFERRED GROUNDWATER ELEVATION CONTOUR
GROUNDWATER FLOW DIRECTION

0 212.5 425 Feet

NOTES
1. PARENTHESIS INDICATES WELL NOT USED FOR CONTOURING
2. ELEVATION CONTOURS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988

UPPERMOST AQUIFER GROUNDWATER ELEVATION CONTOURS FEBRUARY 9, 2021

FIGURE 1-3

GROUNDWATER MONITORING PLAN
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

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BACKGROUND WELL
COMPLIANCE WELL
SOURCE SAMPLE LOCATION
STAFF GAGE

PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

NOTE
* = APPROXIMATE LOCATION, PENDING COMPLETION OF SURVEY

0 200 400 Feet

PROPOSED PART 845 GROUNDWATER MONITORING NETWORK

FIGURE 2-1

GROUNDWATER MONITORING PLAN
ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

APPENDIX A
STATISTICAL ANALYSIS PLAN

Prepared for
Illinois Power Resources Generating, LLC

Date
October 25, 2021

Project No.
1940100806-004

STATISTICAL ANALYSIS PLAN

ASH POND
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL Bright ideas. Sustainable change.

STATISTICAL ANALYSIS PLAN
EDWARDS POWER PLANT ASH POND

Project Name	**Edwards Power Plant Ash Pond**
Project No.	**1940100806-004**
Recipient	**Illinois Power Resources Generating, LLC**
Document Type	**Statistical Analysis Plan**
Version	**FINAL**
Date	**October 25, 2021**

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Project Statistician

LICENSED PROFESSIONAL CERTIFICATIONS

This certification is based on the description of the statistical methods selected to evaluate groundwater as presented in the following Statistical Analysis Plan; Edwards Power Plant Ash Pond. The procedures described in the plan will be used to establish background conditions and implement compliance monitoring as necessary and required by 35 I.A.C. § 845.640 and 35 I.A.C. § 845.650. The Statistical Analysis Plan was prepared in accordance with the requirements of 35 I.A.C. § 845.640(f), with reference to the acceptable statistical procedures provided in the United States Environmental Protection Agency (USEPA)'s *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (*Unified Guidance,* March 2009), and is intended to provide a logical process and framework for conducting the statistical analysis of the data obtained during groundwater monitoring. In accordance with 35 I.A.C. § 845.640(f)(1), the statistical method chosen for analysis of background groundwater quality will be either the tolerance interval or the prediction interval procedure for each constituent listed in 35 I.A.C. § 845.600(a)(1) at this CCR unit per 35 I.A.C. § 845.640(f)(1)(C). Groundwater Protection Standards (GWPS) will be established in accordance with 35 I.A.C. § 845.600(a) (greater of the background concentration or numerical limit specified in 35 I.A.C. § 845.600(a)(1)). The GWPS will be compared to the lower confidence limit for the observed concentrations for each constituent in each compliance well. Consistent with the *Unified Guidance*, the same general statistical method of confidence interval testing against a fixed GWPS is recommended in compliance and corrective action programs. Confidence intervals provide a flexible and statistically accurate method to test how a parameter estimated from a single sample compares to a fixed numerical limit. Confidence intervals explicitly account for variation and uncertainty in the sample data used to construct them.

Description of the statistical methods chosen for analysis of groundwater monitoring data and application of these methods for determining exceedances of the GWPS identified in 35 I.A.C. § 845.600(a) is provided in this Statistical Analysis Plan.

35 I.A.C. § 845.640 Statistical Analysis (PE)

I, Eric J. Tlachac, a qualified professional engineer in good standing in the State of Illinois, certify that the statistical methods summarized above and described in this document (Statistical Analysis Plan; Edwards Power Plant Ash Pond) are appropriate for evaluating the groundwater monitoring data collected as described in the attached document and are in substantial compliance with 35 I.A.C. § 845.640.

Eric J. Tlachac
Qualified Professional Engineer
062-063091
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Date: October 25, 2021

35 I.A.C. § 845.640 Statistical Analysis (PG)

*I, Brian G. Hennings, a qualified professional geologist in good standing in the State of Illinois, certify that the statistical methods described in this document (*Statistical Analysis Plan; *Edwards Power Plant Ash Pond) are appropriate for evaluating the groundwater monitoring data collected as described in the attached document and are in substantial compliance with 35 I.A.C.* § *845.640.*

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35 I.A.C. § 845.640 Statistical Analysis

*I, Rachel A. Banoff, a qualified professional, certify that the statistical methods described in this document (*Statistical Analysis Plan; *Edwards Power Plant Ash Pond), are appropriate for evaluating the groundwater monitoring data collected as described in the attached document and are in substantial compliance with 35 I.A.C.* § *845.640.*

Rachel A. Banoff, EIT
Project Statistician
Date: October 25, 2021

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TABLES (IN TEXT)

ACRONYMS AND ABBREVIATIONS

§	Section
35 I.A.C.	Title 35 of the Illinois Administrative Code
ANOVA	analysis of variance
CCR	coal combustion residuals
COC	constituents of concern
GWPS	groundwater protection standard
IEPA	Illinois Environmental Protection Agency
LCL	lower confidence limit
LTL	lower tolerance limit
MSE	mean squared error
P	probability
Part 845	Residuals in Surface Impoundments: Title 35 of the Illinois Administrative Code § 845
RCRA	Resource Conservation and Recovery Act
RL	reporting limit
ROS	regression on order statistics
SI	surface impoundment
SSI	statistically significant increase
SWFPR	site-wide false positive rate
Unified Guidance	*Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (USEPA, 2009)
UPL	upper prediction limit
USEPA	United States Environmental Protection Agency
UTL	upper tolerance limit

1. INTRODUCTION

In April 2021, the Illinois Environmental Protection Agency (IEPA) issued a final rule for the regulation and management of Coal Combustion Residuals (CCR) in surface impoundments (SIs) under the Standards for the Disposal of CCR in Surface Impoundments: Title 35 of the Illinois Administrative Code (35 I.A.C.) § 845 (Part 845). Facilities regulated under Part 845 are required to develop and sample a groundwater monitoring well network to evaluate whether impounded CCR materials are impacting downgradient groundwater quality. The groundwater quality evaluation must include selection and certification by a qualified professional engineer of the statistical procedures to be used. The procedures described in the evaluation will be used to establish background conditions and implement compliance and corrective action monitoring as necessary and required by 35 I.A.C. § 845.640 and 35 I.A.C. § 845.650. This Statistical Analysis Plan was prepared in accordance with the requirements of 35 I.A.C. § 845.640(f), with reference to the acceptable statistical procedures provided in United States Environmental Protection Agency's (USEPA's) *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (*Unified Guidance*) (March 2009).

This Statistical Analysis Plan does not include procedures for groundwater sample collection and analysis, as these activities are conducted in accordance with the Sampling and Analysis Plan prepared for each CCR unit in accordance with 35 I.A.C. § 845.640. This Statistical Analysis Plan will be used as the primary reference for evaluating groundwater quality during operation and post-closure care.

1.1 Statistical Analysis Objectives

This Statistical Analysis Plan is intended to provide a logical process and framework for conducting the statistical analyses of data obtained during groundwater monitoring conducted in accordance with the Sampling and Analysis Plan for each CCR unit. The Statistical Analysis Plan will enable a qualified professional engineer to certify that the selected statistical methods are appropriate for evaluating the groundwater monitoring data for the applicable CCR unit(s).

1.2 Statistical Analysis Plan Approach

The main sections of this Statistical Analysis Plan should be viewed as a "generic" outline of statistical methods utilized for each CCR unit and constituent required to be monitored. The statistical analysis of the groundwater monitoring data, however, will be conducted on an individual-constituent or well basis, and may involve the use of appropriate statistical procedures depending on multiple factors such as detection frequency and normality distributions.

The CCR Rule outlines two phases of groundwater monitoring:

- Background Monitoring in accordance with 35 I.A.C. § 845.650(b)(1)
- Compliance Monitoring in accordance with 35 I.A.C. § 845.650

Each phase of the groundwater monitoring program requires specific statistical procedures to accomplish the intended purpose. During the background monitoring phase, background groundwater quality will be established utilizing upgradient and background wells and downgradient groundwater quality data will be collected to facilitate statistics in subsequent phases. Compliance Monitoring is then initiated through the evaluation of the downgradient groundwater monitoring data for exceedances of the groundwater protection standard (GWPS) established by Part 845 (concentration specified in 35 I.A.C. § 845.600 or an IEPA-approved background concentration). The developed statistical analysis plan will be implemented for each monitoring phase and in accordance with the statistical procedures.

2. BACKGROUND MONITORING AND DATA PREPARATION

The background and compliance monitoring wells were sampled and analyzed for constituents, as listed in Part 845 (antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chloride, chromium, cobalt, fluoride, lead, lithium, mercury, molybdenum, pH, radium 226 and 228 combined, selenium, sulfate, thallium, total dissolved solids, and turbidity), during the baseline phase of the groundwater monitoring program.

The background monitoring well(s) were placed upgradient of the CCR unit, or at an alternative background location, where they are not affected by potential leakage from the CCR unit. Compliance monitoring wells were placed at the waste boundary of the CCR unit, along the same groundwater flow path. As 35 I.A.C. § 845.630(a) specifies, the location of these wells ensures that background accurately represents the quality of unaffected groundwater, while compliance wells accurately represent groundwater quality at the waste boundary and monitor all potential contaminant pathways.

As required by 35 I.A.C. § 845.650(a)(1), eight sampling events were completed within 180 days of April 21, 2021. As outlined, groundwater sampling procedures included sampling of the background and compliance wells using low-flow sampling methods, collection of one field quality control sample per event, and groundwater samples were not field filtered before laboratory analysis of total recoverable metals.

Following completion of the eight sampling events, background groundwater quality was established for Part 845 constituents. Groundwater monitoring will be conducted quarterly for at least the first five years. In accordance with 35 I.A.C. § 845.650(b)(4), after the first five years, a request to reduce the monitoring frequency to semiannual may be submitted to IEPA if all of the following can be demonstrated:

- Groundwater monitoring effectiveness will not be compromised by the reduced frequency
- Sufficient data has been collected to characterize groundwater
- Monitoring to date does not show any statistically significant increasing trends
- The concentrations of monitored constituents at the compliance monitoring wells are below the applicable GWPSs established in 35 I.A.C. § 845.600

The following subsections outline the statistical tests and procedures (methods) that will be utilized to evaluate data collected for each constituent in both background and compliance wells for Background and Compliance Monitoring. When necessary and contingent upon equivalent statistical power, an alternative test not included in this Statistical Analysis Plan may be chosen due to site-specific data requirements.

2.1 Sample Independence

Independence of sample results is a major assumption for most statistical analyses. To ensure physical independence of groundwater sampling results, the minimum time between sampling events must be longer than the time required for groundwater to move through the monitoring well. The sampling schedules for both the baseline and compliance monitoring periods are specified in 35 I.A.C. § 845.650(b) and may conflict with the statistical assumption of independence of sample results.

2.2 Non-Detect Data Processing

The reporting limit (RL) will be used as the lower level for the reporting of non-detected groundwater quality data. For all summary statistics (box plots, timeseries, etc.), the RL will be substituted for concentrations reported below the RL, including non-detects. With professional judgement, analytical results between the RL and the method detection limit, *i.e.,* estimated values, typically identified with a "J" flag, may be utilized if provided by the laboratory.

For all statistical test procedures:

- If the frequency of non-detect data are less than or equal to 15 percent, half of the RL will be substituted for these data
- If the non-detect frequency is between 15 percent and 50 percent, either the Kaplan-Meier or robust regression on order statistics (ROS) will be used to estimate the mean and standard deviation adjusted for the presence of left-censored values
- If the non-detect frequency is greater than 50 percent, a non-parametric test will be used
- If only one background result is detected that value will be used as the non-parametric upper prediction limit (UPL)

2.3 Testing for Normality

Many statistical analyses assume that sample data are normally distributed (parametric). However, environmental data are frequently not normally distributed (nonparametric). 35 I.A.C. § 845.640(g) requires the knowledge of the background data distribution for comparison to compliance results. The *Unified Guidance* document recommends the Shapiro-Wilk normality test for sample sizes of 50 or less, and the Shapiro-Francia normality test for sample sizes greater than 50.

When possible, transformation of datasets to achieve normal distributions is preferred.

2.4 Testing for Outliers

Part 845 constituents will be screened for the existence of outliers using a method described by the *Unified Guidance*. Outliers are extreme data points that may represent an anomaly or erroneous data point. To test for outliers, one or more of the following outlier tests will be utilized:

- Dixon's test, for well-constituent pairs with less than 25 samples, assumes normally distributed data.
- Rosner's test, for well-constituent pairs with more than 20 samples, assumes normally distributed data.
- Grubb's test for well-constituent pairs with seven or more samples, assumes normally distributed data.
- Time series, box-whisker plots, and probability plots provide visual tools to identify potential outliers, and evaluation of seasonal, spatial, or temporal variability for both normally and non-normally distributed data.

Data quality control, groundwater geochemistry, and sampling procedures will be evaluated as potential sources of error leading to an outlier result. The outlier tests cannot be used alone to determine whether a value is a true outlier that should be excluded from future statistical analysis. Corroborating evidence needed to exclude values includes a discrete data reporting or analytical error, or potential laboratory bias. Absent corroborating evidence, the flagged values are considered true, but extreme, values in the data set. Professional judgement will be used to exclude extreme outliers from further statistical analyses. Outliers will be retained in the database.

With professional judgement, a confirmatory sample may be collected to allow for the distinction between an outlier and a true representation of groundwater quality at the monitoring point. If re-sampling is conducted, this sample will be collected within 90 days following outlier identification. If the confirmatory sample indicates the original result as an outlier, it will be reported as such.

2.5 Trend Analysis

Statistical analyses supporting the lack of trend are a fundamental step to confirm the assumption that groundwater quality values are stationary or constant over time at a CCR unit. These analyses allow for evaluation of variation in the background and compliance data for each constituent over time. A statistically significant increasing trend in background data could indicate an existing release from the CCR unit or alternate source, requiring further investigation. In addition, statistically significant trending background data can result in increased standard deviation and, therefore, greater prediction or control limits. Consequently, the increased prediction or control limit will have less power or ability to identify a release from the CCR unit.

A linear regression, coupled with a t-test for slope significance at a 95 percent confidence level (0.05 significance level), may be used on datasets for each constituent with few non-detects and a normally distributed variance of the mean to evaluate time trends. The Theil-Sen trend line, coupled with the Mann-Kendall test for slope significance at a 95 percent confidence level (0.05 significance level), will be used for datasets with frequent non-detects or non-normal variance. Similarly, trend analyses could also be used on compliance data to evaluate a possible release from the CCR unit.

2.6 Spatial Variation

Spatial trends and/or variation between background wells could indicate an existing release from a CCR unit. If the spatial variability is not due to an existing release, intrawell comparisons in compliance wells may be used to account for spatial variability and monitor for a future release. However, the CCR unit being monitored was placed into service prior to the start of groundwater monitoring and it is unknown whether a previous release has occurred. Accordingly, intrawell comparisons in compliance wells cannot be used to determine the occurrence of a future release. Interwell comparisons between compliance wells and background wells will be used.

2.7 Temporal Variation

Time series plots can be used to identify temporal dependence. Potentially significant temporal components of variability can be identified by graphing single constituent data from multiple wells together on a time series plot. With temporal dependence, the time series plot as a pattern of parallel traces, in which the individual wells will tend to rise and fall together across the sequence of sampling dates. Time series plots can be helpful by plotting multiple constituents over time for the same well, or averaging values for each constituent across wells on each sampling event and then plotting the averages over time. In either case, the plots can signify whether the general concentration pattern over time is simultaneously observed for different constituents. If so, it may indicate that a group of constituents is highly correlated in groundwater or that the same artifacts of sampling and/or lab analysis impacted the results of several monitoring parameters.

Hydrologic factors such as drought, recharge patterns or regular (*e.g.,* seasonal) water table fluctuations may be responsible for the temporal variation. In these cases, it may be useful to test for the presence of a significant temporal effect by first constructing a parallel time series plot and then running a formal one-way analysis of variance (ANOVA) ($\alpha = 0.05$) for temporal effects. A one-way ANOVA for temporal effects considers multiple well data sets for individual sampling events or seasons as the relevant statistical factor. If event-specific analytical differences or seasonality appear to be an important temporal factor, the one-way ANOVA for temporal effects can be used to formally identify seasonality, parallel trends, or changes in lab performance that affect other temporal effects. The one-way ANOVA for temporal effects assumes that the data groups are normally distributed with constant variance. It is also assumed that for each of a series of background wells, measurements are collected at each well on sampling events or dates common to all the wells. Results of the ANOVA can also be used to create temporally stationary residuals, where the temporal effect has been 'subtracted from' the original measurements. These stationary residuals may be used to replace the original data in subsequent statistical testing.

If the data cannot be normalized, a similar test for a temporal or seasonal effect can be performed using the Kruskal-Wallis test ($\alpha = 0.05$). Each sampling event should be treated as a separate 'well,' while each well is treated as a separate 'sampling event.' In this case, no residuals can be computed since the Kruskal-Wallis test employs ranks of the data rather than the measurements themselves.

Where both spatial and temporal variation occur, two-way ANOVA can be considered where both well location and sampling event/season are treated as statistical factors. This procedure is described in Davis (1994).

2.8 Updating Background

Updating the background dataset periodically by adding recent results to an existing background dataset can improve the statistical power and accuracy of the statistical analysis, especially for non-parametric prediction intervals. The *Unified Guidance* recommends updating statistical limits (background) when at least four to eight new measurements (every 1 to 2 years under a quarterly monitoring program), are available for comparison to historical data. Professional judgement will be used to evaluate whether any background data appear to be affected by a release and need to be excluded from a background update. A t-test for equal means (if normal data distribution) or appropriate non-parametric test (if non-normal data distribution) such as a Mann-Whitney (or Wilcoxon) rank-sum or box-whisker plots, will be conducted to evaluate whether the two groups of background sample populations are statistically different prior to updating any background datasets. A 0.05 significance level will be utilized when evaluating the two populations, with the null hypothesis that they are equivalent. In addition, time series graphs or other trend evaluation statistics will be conducted on the new background dataset to verify the absence of a release or changing groundwater quality. If the tests indicate that there are no statistical differences between the two background populations, the new data will be combined with the existing dataset. If the two populations are found to be different, the data will be reviewed to evaluate the cause of the difference. If the differences appear to be caused by a release (if the new data are significantly higher, or lower for pH), then the previous background dataset may continue to be used. Furthermore, verified outliers will not be added to an existing background dataset. In accordance with the *Unified Guidance*, continual background updates will not be conducted due to the lack of sufficient samples for a statistical comparison.

3. COMPLIANCE MONITORING

Compliance monitoring is designed to monitor groundwater for evidence of a release by comparing Part 845 constituents in compliance wells to both background concentrations and the GWPS. Compliance Monitoring will begin the 1st quarter following approval of this Groundwater Monitoring Plan and issuance of the Operating Permit. The selected Compliance Monitoring statistical method used to compare compliance groundwater quality data for each constituent to the GWPS will provide for adequate statistical power, error levels and individual test false positive rates, and be appropriate for the distribution and detection frequency of the background dataset. Statistical power is the ability of a statistical test to detect a true exceedance.

In accordance with 35 I.A.C. § 845.610(b)(3)(D), compliance monitoring statistical analyses will be completed and submitted to IEPA within 60 days after completion of sampling.

3.1 GWPS Establishment and Exceedance Determination

In accordance with 35 I.A.C. § 845.600(a), the GWPS will be the constituent concentrations specified in 35 I.A.C. § 845.600(a)(1) except for when the background concentration is greater, or no concentration is specified (*i.e.,* for calcium and turbidity), in which case the GWPS will be the background concentration. The GWPS based on background concentration will be calculated using a parametric upper tolerance limit (UTL), a parametric UPL for a future mean, or a non-parametric UPL for a future median.

Statistical calculations that will be utilized in Compliance Monitoring procedures are summarized in **Table A** below and listed in **Sections 3.1.1** through **3.1.7**. Depending on the distribution of the data and the percentage of non-detects, it may be more appropriate to use a parametric model over a non-parametric model. As necessary, other techniques as mentioned in the *Unified Guidance* and/or new methods will be implemented.

Table A. Statistical Calculations Used in Compliance Monitoring Procedures

Compliance Monitoring						
Significant Trend?	Background Data			Compliance Data		
	Percent Non-Detects	Distribution	GWPS Determination	Percent Non-Detects	Distribution	Method to Determine Exceedance
No	0 ≤ 50	Normal	35 I.A.C § 845.600(a)(1) constituent concentration or The Upper Tolerance Limit	≤75	Normal	Parametric Lower Confidence Limit around a Normal Mean
				≤75	Log-Normal	Parametric Lower Confidence Limit around a Lognormal Geometric Mean
				NA	Non-Normal	Non-Parametric Lower Confidence Limit around a Median
				>75	Unknown/ Cannot be determined	
	50 ≤ 70	Normal	The Upper Prediction Limit for a Future Mean	NA	NA	Future mean
	>70	Non-Normal	Upper Prediction Limit for a Future Median	NA	NA	Future median
	100	Non-Normal	Double Quantification Rule	NA	NA	Individual Retesting Values
Yes	0 ≤ 50	Normal	UCL of Confidence Band around Linear Regression	≤75	Residuals after subtracting trend are normal, equal variance	Lower Limit from Confidence Band around Linear Regression
	50 ≤ 100	Non-Normal	UCL of Confidence Band around Thiel-Sen trend line	≤75	Residuals not normal	Lower Limit from Confidence Band around Thiel-Sen

3.1.1 The Upper Tolerance Limit

The UTL will be used to calculate the GWPS when pooled background data are normally distributed, with a non-detect frequency of 50 percent or less. When non-detect frequency is 15 percent or less, half the RL will be substituted for non-detects. The *Unified Guidance* recommends 95 percent confidence level and 95 percent coverage (95/95 tolerance interval).

- When non-detect frequency is 15 percent or less, half the RL will be substituted for non-detects (simple substitution), and the normal mean and standard deviation will be calculated.

- The Kaplan-Meier or the ROS method will be used when the detection frequency is between 15 percent and 50 percent. The Kaplan-Meier method assesses the linearity of a censored probability plot to determine whether the background sample can be approximately normalized. If so, then the Kaplan-Meier method will be used to compute estimates of the mean and standard deviation adjusted for the presence of left-censored values. The Kaplan-Meier or ROS estimate of the mean and standard deviation will be substituted for the sample mean and standard deviation.
- If background normality cannot be achieved, non-parametric UTLs will not be calculated until a minimum of 60 background samples have been collected (to achieve 95 percent coverage).

The parametric UTL on a future mean will be calculated from the background dataset as follows:

$$UTL = \overline{x} + \kappa\,(n, \gamma, \alpha - 1) \cdot s$$

$\overline{x}$ = background sample mean

s = background sample standard deviation

$\kappa\,(n, \gamma, \alpha - 1)$ = one-sided normal tolerance factor based on the chosen coverage (γ) and confidence level (α -1) and the size of the background dataset (n). Values are tabulated in Table 17-3 in Appendix D of the *Unified Guidance*. If exact values are not provided, then κ values can be estimated by linear interpolation.

If the UTL is constructed on the logarithms of original observations to achieve normality, where $\overline{y}$ and s_y are the log-mean and log-standard deviation, the limit will be exponentiated for back-transformation to the concentration scale as follows:

$$UTL = \exp\left[\overline{y} + \kappa\,(n, \gamma, \alpha - 1) \cdot s_y\right]$$

$\overline{y}$ = background sample log-mean

s_y = background sample log-standard deviation

When the GWPS is based on the 35 I.A.C. § 845.600(a)(1) constituent concentrations or a UTL derived from the background dataset, an exceedance in compliance wells relative to the GWPS will be evaluated using confidence intervals. A confidence interval defines the upper and lower bound of the true mean of a constituent concentration in groundwater within a specified confidence range.

- Non-detects in compliance data will be handled similarly to upgradient analyses, with half the RL substituted for non-detects when the frequency is 15 percent or less.
- The Kaplan-Meier, or the ROS method, will be used when the detection frequency is between 15 percent and 50 percent to compute estimates of the mean and standard deviation adjusted for the presence of left-censored values. These estimates will then be substituted for the sample mean and standard deviation.

Once the GWPS is established for background data using the UTL, either parametric or non-parametric confidence intervals will be computed for each constituent in compliance wells to identify GWPS exceedances.

3.1.2 Parametric Confidence Intervals around a Mean

If compliance data are approximately normal, one-sided parametric confidence intervals around a sample mean will be constructed for each constituent and well pair. The lower confidence limit (LCL) will be calculated as:

$$LCL_{1-\alpha} = \overline{x} - t_{1-\alpha,n-1} \cdot \frac{s}{\sqrt{n}}$$

$\overline{x}$ = compliance sample mean

s = compliance sample standard deviation

n = compliance sample size

$t_{1-\alpha,n-1}$ = obtained from a Student's t-table with (n–1) degrees of freedom (Table 16-1 in Appendix D of the *Unified Guidance*)

The chosen t value will aim to achieve both a low false-positive rate, and high statistical power. Minimum α values are tabulated in Table 22-2 of Appendix D of the *Unified Guidance*. The selected minimum α value, from which the t value will be derived, will have at least 80 percent power (1-β = 0.8) when the underlying mean concentration is twice the GWPS.

If compliance data are distributed lognormally, the LCL will be computed around the lognormal geometric mean as:

$$LCL_{1-\alpha} = \exp\left(\overline{y} - t_{1-\alpha,n-1} \cdot \frac{s_y}{\sqrt{n}}\right)$$

$\overline{y}$ = compliance sample log-mean

s_y = compliance sample log-standard deviation

3.1.3 Non-Parametric Confidence Intervals around a Median

Non-parametric confidence intervals around the median will be computed if the compliance data contain greater than 50 percent non-detects or are not normally distributed. The mathematical algorithm used to construct non-parametric confidence intervals is based on the probability (*P*) that any randomly selected measurement in a sample of n concentration measurements will be less than an unknown *P* x 100th percentile of interest (where *P* is between 0 and 1). Then the probability that the measurement will exceed the *P* x 100th percentile is (1–*P*). The number of sample values falling below the *P* x 100th percentile out of a set of n should follow a binomial distribution with parameters n and success probability *P*, where 'success' is defined as the event that a sample measurement is below the *P* x 100th percentile. The probability that the interval formed by a given pair of order statistics will contain the percentile of interest will then be determined by a cumulative binomial distribution *Bin(x;n,p)*, representing the probability of *x* or fewer successes occurring in *n* trials with success probability p. *P* will be set to 0.50 for an interval around the median.

The sample size n will be ordered from least to greatest. Given *P* = 0.50, candidate interval endpoints will be chosen by ordered data values with ranks close to the product of (n+1) x 0.50. If the result of (n+1) x 0.50 is a fraction (for even-numbered sample sizes), the rank values immediately above and below will be selected as possible candidate endpoints. If the result of (n+1) x 0.50 is an integer (for odd-numbered sample sizes), one will be added to and subtracted from the result to get the upper and lower candidate endpoints. The ranks of the endpoints will be denoted L* and U*. For a one-sided LCL, the confidence level associated with endpoint L* will be computed as:

$$1 - \alpha = Bin(L^* - 1; n, 0.50) = \sum_{x=L^*}^{n} \binom{n}{x} \left(\frac{1}{2}\right)^n$$

If the candidate endpoint(s) do not achieve the desired confidence level, new candidate endpoints (L*–1) and (U*+1) and achieved confidence levels will be calculated. If one candidate endpoint equals the data minimum or maximum, only the rank of the other endpoint will be changed. Achievable confidence levels are tabulated using these equations in Table 21-11 in Appendix D of the *Unified Guidance*.

Both parametric and non-parametric confidence limits will then be compared to the GWPS. The CCR unit is considered to be in compliance if the LCL is equal to or lower than the GWPS for all detected constituents at all compliance monitoring wells. A GWPS exceedance is determined if the LCL exceeds the GWPS.

3.1.4 The Upper Prediction Limit for a Future Mean

The parametric UPL for a future mean will be used to calculate the GWPS if the pooled background data contain 50 to 70 percent non-detects and normality can be achieved. The Kaplan-Meier or ROS methods will be used to estimate the mean and standard deviation. The non-parametric UPL for a future median will be calculated as the GWPS if background samples cannot be normalized or contain greater than 70 percent non-detects. The parametric UPL for a future mean will be calculated from the background dataset at follows:

$$UPL_{1-\alpha} = \overline{x} + \kappa s$$

$\overline{x}$ = background sample mean

s = background standard deviation

κ = multiplier based on the order (p) of the future mean to be predicted, the number of compliance wells to be tested (w), the background sample size (n) the number (c) of constituents of concern (COCs), the "1-of-m" retesting scheme, and the evaluation schedule (annual, semi-annual, quarterly). Values are tabulated in 19-5 to 19-9 in Appendix D of the *Unified Guidance*.

The mean of order p will be computed for each well and compared against the UPL. For any compliance point mean that exceeds the limit, p additional resamples may be collected at that well for a 1-of-2 retesting scheme. Resample means will then be compared to the UPL. A GWPS exceedance has been deemed to occur at a compliance well when the initial mean and all resample means exceed the UPL.

3.1.5 The Non-Parametric Upper Prediction Limit for a Future Median

The non-parametric UPL for a future median will be used to calculate the GWPS if the pooled background data contain greater than 70 percent non-detects and normality cannot be achieved. Non-parametric methods assume that the data does not have an underlying distribution. To calculate the non-parametric UPL on a future value, the target per-constituent false positive rate (a_{const}) will be determined as follows:

$$\alpha_{const} = 1 - (1 - \alpha)^{1/c}$$

α = the site-wide false positive rate (SWFPR) of 0.10 recommended by the *Unified Guidance*

c = the number of monitoring constituents

The number of yearly statistical evaluation (nE) will be multiplied by the number of compliance wells (w) to determine the look-up table entry, w*. The background sample size (n) and w* will be used to select an achievable per-constituent false positive rate value in Table 19-24 of Appendix D in the *Unified Guidance*. The chosen achievable per-constituent false positive rate value will determine the type of non-parametric prediction limit (maximum or 2nd highest value in background) and a retesting scheme for a future median. The background data will be sorted in ascending order, and the upper prediction limit will be set to the appropriate order statistic previously determined by the achievable per-constituent false positive rate value in Table 19-24. If all constituent measurements in a background sample are non-detect, the Double Quantification rule will be used. The use of the Double Quantification rule in Compliance Monitoring will only be applicable if the RL is above the 35 I.A.C. § 845.600(a)(1) constituent concentration or a constituent concentration is not specified in § 845.600(a)(1). This scenario is highly unlikely. The constituent will also be removed from calculations identifying the target false positive rate.

Two initial measurements per compliance well will be collected. If both do not exceed the upper prediction limit, a third initial measurement will not be collected since the median of order 3 will also not exceed the limit. If both exceed the prediction limit, a third initial measurement will not be collected since the median will also exceed the limit. If one initial measurement is above and one below the limit, a third initial observation may be collected to determine the position of the median relative to the UPL. Up to three resamples will be collected in order to assess the resample median. In all cases, if two or more of the compliance point observations are non-detect, the median will be set equal to the RL. The median value for each compliance well will be compared to the UPL. For the 1-of-2 retesting scheme, if any compliance point median exceeds the limit, up to three additional resamples will may be collected from that well. The resample median will be computed and compared to the UPL. A GWPS exceedance has been deemed to occur at a compliance well when either the initial median, or both the initial median and resample median exceed the UPL.

If the concentrations of detected constituents are below the established GWPS, Compliance Monitoring will continue.

3.1.6 Parametric Linear Regression and Confidence Band

If the t-test detects a significant trend in the parametric linear regression line using either background or compliance data for a particular constituent, confidence bands accounting for trends will be constructed to account for the trend-induced variation. If this is not accounted for, a wider confidence interval will inevitably be calculated for a given confidence level and sample size (n). A wider confidence interval will result in less statistical power, or ability to demonstrate an exceedance or return to compliance. When a linear trend line has been estimated, a series of confidence intervals is estimated at each point along the trend. This creates a simultaneous confidence band that follows the trend line. As the underlying population mean increases or decreases, the confidence band does also to reflect this change at that point in time.

Linear regression will be used when background or compliance data are approximately normally distributed, with a constant sample variance around the mean, and the frequency of non-detects is low. The linear regression of concentration against sampling date (time) will be computed as follows:

$$\hat{b} = \sum_{i=1}^{n}(t_i - \bar{t}) \cdot x_i/(n-1) \cdot s_t^2$$

x_i = i^{th} concentration value and

t_i = i^{th} sampling date

$\bar{t}$ = sampling mean date

s_t^2 = variance of the sampling dates

This estimate leads to the following regression equation:

$$\hat{x} = \bar{x} + \hat{b} \cdot (\mathrm{t} - \bar{t})$$

$\bar{x}$ = mean concentration level

$\hat{x}$ = estimated mean concentration at time t

The regression residuals will also be computed at each sampling event to ensure uniformity and lack of significant skewness. Regression residuals will be computed at each sampling event as follows:

$$r_i = x_i - \hat{x}_i$$

The estimated variance around the regression line, or mean squared error (MSE) will be computed as follows:

$$s_e^2 = \frac{1}{n-2}\sum_{i=1}^{n} r_i^2$$

The confidence intervals around a linear regression trend line given confidence level (1-ɑ) and a point in time (t_0), will be computed as follows:

$$LCL_{1-\alpha} = \hat{x}_0 - \sqrt{2s_e^2 \cdot F_{1-2\alpha,2,\mathrm{n}-1} \cdot \left[\frac{1}{n} + \frac{(t_0 - \bar{t})^2}{(n-1) \cdot s_t^2}\right]}$$

$$UCL_{1-\alpha} = \hat{x}_0 - \sqrt{2s_e^2 \cdot F_{1-2\alpha,2,\mathrm{n}-2} \cdot \left[\frac{1}{n} + \frac{(t_0 - \bar{t})^2}{(n-1) \cdot s_t^2}\right]}$$

$\hat{x}_0$ = estimated mean concentration from the regression equation at time t_0

$F_{1-2\alpha,2,\mathrm{n}-2}$ = upper $(1\text{-}2\alpha)^{th}$ percentage point from an F-distribution with 2 and (n-2) degrees of freedom

For background data, the UCL around the linear regression line will be used as the GWPS for the trending constituent. For compliance data, confidence bands around the linear regression line will be compared to the GWPS. The CCR unit is considered to be in compliance if the LCL is equal to or lower than the GWPS for all detected constituents at all compliance wells. A GWPS exceedance is determined when the LCL based on the trend line first exceeds the GWPS.

3.1.7 Non-Parametric Thiel-Sen Trend Line and Confidence Band

If the Mann-Kendall test detects a significant trend in the non-parametric Thiel-Sen line using either background or compliance data for a particular constituent, confidence bands accounting for trends will be constructed to account for the trend-induced variation. The Thiel-Sen trend line will be used as a non-parametric alternative to linear regression when trend residuals cannot be normalized or if there are a higher percentage of non-detects in either background or compliance data. The Thiel-Sen trend line estimates the median concentration over time by combining the median pairwise slope with the median concentration value and the median sample date. To compute the Thiel-Sen line, the data will first be ordered by sampling event x1, x2, xn. All possible distinct pairs of measurements (x_i, x_j) for j > i will be considered and the simple pairwise slope estimate will be computed for each pair as follows:

$$m_{ij} = (x_j - x_i)/(j - i)$$

With a sample size of n, there will be a total of N = n(n-1)/2 pairwise estimates (m_{ij}). If a given observation is a non-detect, half the RL will be substituted. The N pairwise slope estimates (m_{ij}) will be ordered from least to greatest (renamed m(1), m(2),..m(N)). The Thiel-Sen estimate of slope (Q) will be calculated as the median value of the list depending on whether N is even or odd as follows:

$$Q = \begin{cases} m_{([N+1]/2)} \; if\ N\ is\ odd \\ (m_{(N/2)} + m_{([N+2]/2)})/2 \; if\ N\ is\ even \end{cases}$$

The sample concentration magnitude will be ordered from least to greatest, x(1), x(2), to x(n) and the median concentration will be calculated as follows:

$$\tilde{x} = \begin{cases} x_{([n+1]/2)} \; if\ n\ is\ odd \\ (x_{(n/2)} + x_{([n+2]/2)})/2 \; if\ n\ is\ even \end{cases}$$

The median sampling date ($\tilde{t}$) with ordered times (t(1), t(2), to t(n)) will also be determined in this way. The Thiel-Sen trend line will then be computed for an estimate at any time (t) of the expected median concentration (x) as follows:

$$x = \tilde{x} + Q \cdot (\mathrm{t} - \tilde{t}) = (\tilde{x} - Q \cdot \tilde{t}) + Q \cdot \mathrm{t}$$

To construct a confidence band around the Thiel-Sen line, sample pairs (ti, xi) will be formed with a sample date (ti) and the concentration measurement from that date (xi). Bootstrap samples (B) will be formed by repeatedly sampling n pairs at random with replacement from the original sample pairs. This will be repeated 500 times. For each bootstrap sample, a Thiel-Sen trend line will be constructed using the equation above. A series of equally spaced time points (tj) will be identified along the range of sampling dates represented in the original sample, j =1 to m. The Thiel-Sen trend line associated with each bootstrap replicate will be used to compute an estimated concentration ($\hat{x}_j^B$). An LCL will be constructed for the lower α^{th} percentile $\hat{x}_j^{[\alpha]}$ from the distribution of estimated concentrations at each time point (tj). For a UCL, compute the upper $(1-\alpha)^{th}$ percentile, $\hat{x}_j^{[1-\alpha]}$ at each time point (tj).

For background data, the UCL around the Thiel-Sen trend line will be used as the GWPS for the trending constituent. For compliance data, confidence bands around the Thiel-Sen trend line will be compared to the GWPS. The CCR unit is considered to be in compliance if the LCL is equal to or lower than the GWPS for all detected constituents at all compliance wells. A GWPS exceedance is confirmed when the LCL based on the trend line first exceeds the GWPS.

3.2 Determination of Statistically Significant Increases over Background

In accordance with 35 I.A.C. §§ 845.610(b)(3)(B) and 845.640(h), individual monitoring event concentrations for each constituent detected in the compliance monitoring wells during compliance monitoring sampling events will be compared to the background concentration as determined by the methods described above. An exceedance of the background concentration for any constituent measured at any compliance monitoring well, or constituent detection if not detected in the background samples, constitutes a Statistically Significant Increase (SSI). An exception to this method is pH, where two-sided (upper and lower) tolerance limits are established from the distribution of the background groundwater quality data. An exceedance of either the UTL or lower tolerance limit (LTL) would constitute an SSI for pH.

4. REFERENCES

Davis, C.B., 1994. *Environmental Regulatory Statistics.* In GP Patil & CR Rao (Eds.) *Handbook of Statistics, Volume 12: Environmental Statistics*, Chapter 26. New York: Elsevier Science B.V.

United States Environmental Protection Agency (USEPA), 2009. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities: Unified Guidance*. EPA 530-R-09-007. March 2009.

ATTACHMENT J

Memorandum

BURNS McDONNELL

Date: 25 October 2021

Subject: 35 I.A.C. Section 845.430 – Slope Maintenance Documentation for Ash Pond at Edwards Power Plant

Illinois Power Resources Generating, LLC operates the coal-fired Edwards Power Plant (Plant) located in Peoria County, Illinois. The Edwards Ash Pond is an inactive surface impoundment storing coal combustion residuals (CCR). The requirements for the Edwards Ash Pond are found in 35 Ill. Admin. Code 845, Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (Part 845).

Pursuant to Part 845, Section 845.230(d)(2)(F), the initial operating permit application for existing or inactive CCR surface impoundments that have not completed an Agency approved closure before prior to July 30, 2021, must contain 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. This statement addresses the requirements of Part 845, Section 845.430 Slope Maintenance, which states:

> *Section 845.430:* *The slopes and pertinent surrounding areas of the CCR surface impoundment must be designed, constructed, operated, and maintained with one of the forms of slope protection specified in subsection (a) that meets all the performance standards of subsection (b).*
>
> *Section 845.430(a):* *Slope protection must consist of one of the following: 1) A vegetative cover consisting of grassy vegetation; 2) An engineered cover consisting of a single form or combination of forms of engineered slope protection measures; or 3) A combination of the forms of cover specified in subsections (a)(1) or (a)(2).*
>
> *Section 845.430(b):* *Any form of cover for slope protection must meet the following performance standards: 1) The cover must be installed and maintained on the slopes and pertinent surrounding areas of the CCR surface impoundment; 2) The cover must provide protection against surface erosion, wave action, and adverse effects of rapid drawdown; 3) The cover must be maintained to allow for the observation of, and access to, the slopes and pertinent surrounding areas during routine and emergency events; 4) Woody vegetation must be removed from the slopes or pertinent surrounding areas. Any removal of woody vegetation with a diameter greater than 1/2 inch must be directed by a person familiar with the design and operation of the CCR surface impoundment and in consideration of the complexities of removal of a tree or a shrubbery, who must ensure the removal does not create a risk of destabilizing the CCR surface impoundment or otherwise adversely affect the stability and safety of the CCR surface impoundment or*

> *personnel undertaking the removal; and 5) The height of vegetation must not exceed 12 inches.*

Slope protection, consisting of vegetative cover, was installed on the slopes and pertinent surrounding areas of the Edwards Ash Pond, and is inspected, maintained and repaired as needed. Based on observations from weekly inspections conducted in accordance with Section 845.540(a), and the 2020 annual inspections conducted by Hanson Professional Services Inc., the vegetative cover is described to be in good working condition with a maximum vegetation height of 12 inches. The owner's Operations and Maintenance Plan (O&M Plan) provides details for maintaining grass and removing woody vegetation and addressing erosion features on the slopes. Based on a review of the documentation described above, the owner is implementing the O&M Plan, including the completion of repairs and maintenance as needed and when issues are identified during weekly and/or annual inspections. The slope maintenance portion of the O&M Plan and the Annual Inspection performed by Hanson in 2020 are included in Attachment J. The surface impoundment slope protection (vegetative cover) installed and maintained on the slopes and pertinent areas around the slopes is depicted in the aerial photograph provided below.

Source: Imagery ©2021 Maxar Technologies, USDA Farm Service Agency, Map data ©2021 (accessed via Google® on 10/20/21)

Excerpt from the Edwards Operations and Maintenance Manual

1.1 Maintenance Program - The plant's impoundment and flood prevention structures shall be inspected and maintained in a manner to ensure safe and environmentally responsible operations. A regular maintenance program shall be performed and shall consist of the following inspection items:

1. Earth embankments: Walk the crest, side slopes, and downstream toe of the dam concentrating on surface erosion, seepage, cracks, settlement, slumps, slides, and animal burrows. Frequency of inspection: Quarterly.
2. Vegetation: Grass should be a thick vigorous growth to stabilize the earth embankment soils and prevent erosion form occurring. Note the height of the grass, if greater than 1-foot a mowing of the area should be scheduled before the next inspection. There should be NO trees on the earth embankment and none within a minimum of 20-feet of the embankment toe or other structures. Frequency of inspection: Quarterly.
3. Pond Outlet Structure: Check for any debris or other obstructions around the concrete inlet which may block or restrict the flow of water. Check for the development of any rusty areas on the concrete, and seepage, cracking, breaking, or spalling of concrete. Check for settlement or cracking in the walkway structure. Frequency of inspection: Quarterly.
4. Outlet Pipe Slide Gate: Check the structure for development of any rusty areas on the concrete, and seepage, cracking, breaking, or spalling of concrete. Check the slide gate stem, grease the stem, and operate the slide gate through its full range of motion to ensure proper operation. Check for buildup of debris in the manhole. Frequency of inspection: Quarterly.
5. Pond/Levee Perimeter: Check the perimeter of the embankment and levee for a distance of at least 100 feet from the toe for signs of seepage or boils. Inspection frequency for levee will be determined by Dam Safety Engineer during flood events. Frequency of ash pond embankment inspection: Quarterly for ash pond embankment.
6. Special Inspections – Special inspections of the levees and ash pond berms shall be performed after earthquakes, floods, water level exceedance in the ponds, or heavy rainfall events. Inspection and report shall be equal to an annual inspection level of detail. Water level in the pond should be noted after a heavy rainfall. Dam Safety staff shall accompany plant personnel on special inspections. Frequency: As required.

Hanson Professional Services Inc.
1525 South 6th Street
Springfield, Illinois 62707
(217)788-2450
Fax: (217) 788-5241
www.hanson-inc.com

December 4, 2020

Jason Campbell
Dam Safety Manager
Operations Support
Dynegy Inc.
133 South 4th Street, Suite 306
Springfield, IL 62701-1232

RE: Report on 2020 Dam Inspection
Dynegy Midwest Generation
7800 South Cilco Lane
Bartonville, IL 61607-9352

Dear Mr. Campbell:

The report prepared for the 2020 inspection of the Edwards Ash Pond is attached. Items requiring maintenance and observation are noted and summarized below:

- Remove trees at east side wall section and north side crest.
- Spray thick vegetation on interior slope of pond, east downstream slope, and at connector pipe outlet.
- Fill animal burrows on west side exterior slope.
- Repair depression/ruts/burrows at northwest toe.
- Remove beaver dam from west side ditch.
- Repair mowing ruts on east, south, and west side exterior slopes.
- The buried/under water conduit from the pond to its discharge at the Illinois River cannot be inspected from the ground surface. Video inspection of the pond discharge conduit is recommended.

Please contact me if you have any questions.

Sincerely,

HANSON PROFESSIONAL SERVICES INC.

James P. Knutelski, P.E.
Geotechnical Engineer

Attachment

Dam Inspection Report

Name of Dam: Edwards Ash Pond   Dam ID No.: NA

Permit Number: NA   Class of Dam: NA

Location: NE 1/4 Section 14 Township 7N Range 7E

Owner: Dynegy Midwest Generation (Name)   309 633 2836 (Telephone Number (Day))

7800 South Cilco Lane (Street)   309 633 2836 (Telephone Number (Night))

Bartonville (City)   61607 (Zip Code)   County: Peoria

Type of Dam: Earth Embankment

Type of Spillway: Morning glory overflow with conduit and sluice gate to prevent backflow.

Date(s) Inspected: 6-Nov-20

Weather When Inspected: Clear

Temperature When Inspected: 70 F

Pool Elevation When Inspected: 447.6

Tailwater Elevation When Inspected: Illinois River at about EL 432 based on river gages.

Inspection Personnel:

Name	Title
James P. Knutelski	Hanson Geotechnical Engineer
Jason Campbell	Dynegy Dam Safety
Mark Davis	Dynegy Plant
Paul Mauer	IDNR-OWR

LICENSED PROFESSIONAL ENGINEER
JAMES P. KNUTELSKI
062-054206
OF ILLINOIS

12/4/2020

Professional Engineer's Seal

Exp 11/30/21

The Department of Nautural Resources is requesting information that is necessary to accomplish the statutory purpose as outlined under the River, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams".

CONDITION CODES

NE -	No evidence of a problem
GC -	Good condition
MM -	Item needing minor maintenance and/or repairs within the year, the safety or integrity of the item is not yet imperiled
IM -	Item needing immediate maintenance to restore or ensure its safety or integrity
EC -	Emergency condition which if not immediately repaired or other appropriate measures taken could lead to failure of the dam
OB -	Condition requires regular observation to ensure that the condition does not become worse
NA -	Not applicable to this dam
NI -	Not inspected - list the reason for non-inspection under deficiencies

EARTH EMBANKMENT

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Surface Cracks	NE		
Vertical and Horizontal Alignment of Crest	GC		
Unusual Movement or Cracking At or Beyond Toe	NE		
Sloughing or Erosion of Embankment and Abutment Slopes	MM	Mower ruts - east, south, and west sides. Minor depressions/erosion NW toe - due to collapsed burrows.	Repair slopes, fill holes and seed disturbed areas.
Upstream Face Slope Protection	MM	Thick vegetation on upstream slope in riprap.	Continue to spray interior slope where thick vegetation is present.
Seepage	NE		
Filter and Filter Drains	NA		

EARTH EMBANKMENT

(Continued)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Animal Damage	MM	Small burrows observed on west side exterior slope.	Fill all animal burrows.
Embankment Drainage Ditches	MM	Beaver dam in west side ditch.	Remove dam.
Vegetative Cover	MM	North side crest and east side wall section - small trees.	Continue to mow north side slope. Continue to spray east side riprap and perimeter ditch on west, east, and south sides. Remove trees.
Debris	NE		
Other			
Other			

PRINCIPAL SPILLWAY

X Drop Inlet Spillway ☐ Overflow Spillway Structure ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NE		
Structure to Embankment Junction	NE		
Drains	NA		
Seepage Around or Into Structure	NE		
Surface Cracks	NE		
Structural Cracks	NE		

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

X Drop Inlet Spillway ☐ Overflow Spillway Structure ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Alignment of Abutment Walls	NA		
Construction Joints	NE		
Filter and Filter Drains	NA		
Trash Racks	GC		
Bridge and Piers	GC		
Differential Settlement	NE		
Other (Name)			

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

X Conduit   X Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NI	Under water and under ground	See note below concerning video inspection.
Joint Separation	NI/NE	Under water and under ground	No sinkholes or settlement indicating ground loss was observed on ground surface above conduit.
Seepage Around or Into Conduit	NI	Under water and under ground	
Surface Cracks	NI	Under water and under ground	
Structural Cracks	NI	Under water and under ground	
Trash Racks	NA		
Differential Settlement	NI	Under water and under ground	
Alignment	NI	Under water and under ground	
General	OB	Buried/under water conduit from Primary to Secondary Ponds and from Secondary Pond to Discharge can not be inspected from ground surface.	Video inspection is recommended within the next 12 months. Video inspection was attempted but not successful during 2020 inspection due to flow volume in pipe. Inspection will proceed when flow can be reduced.

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

X Principal Spillway ☐ Dewatering ☐ Other: ______________

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Gate Sill	NI, NE	Under water/under ground	See previous note on recommended video inspection.
Gate Seals	NI, NE	Under water/under ground	
Gate and Frame	NI, OB	Under water/under ground. Some concrete spalling at slab on ground surface.	Monitor concrete during inspections for structural integrity.
Operating Machinery	GC		
Emergency Operating Machinery	NA		
Other (Name)			
Other			

SUMMARY OF MAINTENANCE DONE AND/OR

REPAIRS MADE SINCE THE LAST INSPECTION

DATE OF PRESENT INSPECTION: 6-Nov-20

DATE OF LAST INSPECTION: 5-Sep-19

1. EARTH EMBANKMENT DAMS
   Mowed embankments; Sprayed vegetation in riprap and toe of slopes.

2. CONCRETE MASONRY DAMS
   NA

3. PRINCIPAL SPILLWAY
   None reported.

4. OUTLET WORKS
   NA

5. EMERGENCY SPILLWAY
   NA

Owner's Maintenance Statement

I, ______________________________, owner of Edwards Ash Pond dam,

Dam Identification Number ____________, in Peoria County,

am maintaining the dam in accordance with the accepted maintenance plan which is part of

Permit Number __________.

____
Signature

____
Date

Owner's Operation and Maintenance Plan Statement

I, ______________________________, owner of Edwards Ash Pond dam,

Dam Identification Number ____________, in Peoria County,

have reviewed the operation and maintenance plan including the Emergency Action Plan (EAP),

which is part of, Permit Number ______________.

I _____ have enclosed the appropriate revisions or

_____ have determined that no revisions to the plan are necessary.

____
Signature

____
Date

The Department of Nautural Resources is requesting information that is necessary to accomplish the statutory purpose as outlined under the River, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams".

Outlet from plant

East side wall section – remove trees at base of wall

East side downstream slope

East side downstream slope – repair minor rutting

East side crest

East side upstream slope – spray/remove thick vegetation

South side downstream slope

South side filled area

West side upstream slope

West side upstream slope

West side – connector pipe outlet – spray riprap at pipe outlet

West side downstream slope

West side downstream slope animal burrow – fill

West side downstream slope – repair depressions and erosion

West side downstream slope – repair depressions and erosion

West side ditch – remove dam

West side crest

North side downstream slope

North side crest/downstream slope – remove trees

Pond outlet structure

Outlet gate structure at Illinois River

Outlet gate structure at Illinois River

Outlet at Illinois River

ATTACHMENT K

POST-CLOSURE PLAN FOR EXISTING CCR SURFACE IMPOUNDMENT
40 CFR § 257.104 and 35 I.A.C. 845.780
REV 0 – 10/30/2021

SITE INFORMATION			
Site Name / Address	Edwards Power Plant / 7800 South CILCO Lane, Bartonville, IL 61607		
Owner Name / Address	Illinois Power Resources Generating, LLC / 6555 Sierra Drive Irving, Texas 75039		
CCR Unit	Ash Pond	Closure Method and Final Cover Type	Close In-Place Clayey Soil Cover with Vegetation

POST-CLOSURE PLAN DESCRIPTION	
40 CFR § 257.104(c)(1) and 35 I.A.C. 845.780(c)(1) – Length of post-closure care period.	Post-closure care will be conducted for a period of 30 years as required by 40 CFR § 257.104(c)(1) and 35 I.A.C. 845.780(c)(1), except as provided by 40 CFR § 257.104(c)(2) and 35 I.A.C. 845.780(c)(2).
40 CFR § 257.104(c)(2) and 35 I.A.C. 845.780(c)(2) – Circumstances extending the post closure care period.	If at the end of the post-closure care period the CCR unit is operating under assessment monitoring in accordance with §257.95, the post-closure care as described in this plan will continue until returning to detection monitoring in accordance with §257.95. Under 35 I.A.C. 845.780(c)(2), the post-closure care period will be extended until groundwater monitoring data demonstrate that concentrations are below the groundwater protection standards in Section 845.600 and are not increasing for those constituents over background, using the statistical procedures and performance standards in Section 845.640(f) and (g), provided that concentrations have been reduced to the maximum extent feasible and concentrations are protective of human health and the environment.
40 CFR § 257.104(d)(1)(i) and 35 I.A.C. 845.780(d)(1)(A) – A description of the monitoring and maintenance activities required in 40 CFR § 257.104(b) and 35 I.A.C. 845.780(b), and the frequency at which these activities will be performed, to maintain the integrity and effectiveness of the final cover system, maintain the groundwater monitoring system and monitor the groundwater.	Pursuant to § 257.104(b)(1) and 35 I.A.C. 845.780(b)(1), throughout the post-closure care period, periodic visual observations of the final cover system and stormwater management system will be performed at least annually for evidence of settlement, subsidence, erosion, or other damage that may adversely affect the integrity and effectiveness of the final cover system. When practical, visual observations of the final cover will be made concurrent with groundwater monitoring activities. Noted evidence of damage, such as rills, surface cracks and settlement, will be repaired to maintain the integrity and effectiveness of the final cover system. Vegetation will be established and maintained on the final cover system, including storm drainage areas, where appropriate, to provide long-term erosion control. Established vegetation and the slope design of the final cover system will prevent potential erosion and damage that may be caused by run-on and run-off. Repair activities may include, but are not limited to, replacing and compacting soil cover, repairing drainage channels that have been eroded, filling in depressions with soil, regrading, and reseeding areas of failed vegetation, as necessary.

	Pursuant to § 257.104(b)(3) and 35 I.A.C. 845.780(b)(3), the groundwater monitoring system will be maintained, and groundwater will be monitored as required by 40 CFR § 257.90 through 40 CFR § 257.98 and 35 I.A.C. 845.600 through 35 I.A.C. 845.680. Monitoring wells will be inspected during each groundwater sampling event. Monitoring wells and associated instrumentation will be maintained so that they perform to the design specifications throughout the life of the monitoring program. Groundwater monitoring frequency will be at least quarterly, except as provided in 40 CFR § 257.94(d) and 35 I.A.C. 845.650(b)(4).
40 CFR § 257.104(d)(1)(ii) and 35 I.A.C. 845.780(d)(1)(B) – The name, address, telephone number and email address of the person or office to contact about the facility during the post-closure care period.	Illinois Power Resources Generating, LLC 6555 Sierra Drive Irving, Texas 75039 800.633.4704 ccr@dynegy.com
40 CFR § 257.104(d)(1)(iii) and 35 I.A.C. 845.780(d)(1)(C) – A description of the planned uses of the property during the post-closure period.	The CCR unit is located at an operating electric generation facility. Planned uses of the property during the post-closure period are currentlyunknown, except for post-closure care of the CCR unit. Post-closure use of the property will not disturb the integrity of the final cover system or other components of the containment system, or the function of the monitoring systems unless necessary to comply with the requirements of 40 CFR Part § 257, Subpart D and 35 I.A.C. Part 845. Any other disturbance will be conducted following a demonstration that it will not increase the potential threat to human health or the environment, as required by 40 CFR § 257.104(d)(1)(iii) and 35 I.A.C. 845.780 (d)(1)(C). The demonstration will be certified by a qualified professional engineer and submitted to the Illinois Environmental Protection Agency (IEPA). Per 40 C.F.R. § 257.104(d)(1)(iii) notification shall be provided to the State Director that the demonstration has been placed in the operating record and on the owners or operator's publicly accessible internet site. Following closure of the CCR unit, a notation on the deed to the property, or some other instrument that is normally examined during title search, will be recorded in accordance with 40 CFR § 257.102(i) and 35 I.A.C. 845.760(h). The notation will notify potential purchasers of the property that the land has been used as a CCR unit and its use is restricted under the post-closure care requirements in 40 CFR § 257.104(d)(1)(iii) and 35 I.A.C. 845.780(d)(1)(C) or groundwater monitoring requirements per 35 I.A.C. 845.740(b). Within 30 days of recording the deed notation, a notification stating that the notation has been recorded will be submitted to the IEPA and placed in the facility's operating record per 35 I.A.C. 845.760(h)(3). The notification will be placed on the owner or operator's publicly accessible CCR Web site in accordance with 40 CFR § 257.107(i)(9) and 35 I.A.C. 845.810(e) and placed in the facility's operating record as required by 35 I.A.C. 845.800(d)(26) and §257.105(i)(9).

40 CFR § 257.104(d)(3) and 35 I.A.C. 845.780(d)(3) - Amendments to the initial or subsequent written post-closure plan.	Pursuant to 40 C.F.R. § 257.104(d), the initial post closure care plan for the Edwards Ash Pond was prepared on October 17, 2016. That plan is being amended pursuant to 40 C.F.R. § 257.104(d)(3)(i). This plan also serves as the initial post-closure care plan, prepared in accordance with 35 I.A.C. 845.780(d). Pursuant to § 257.104(d)(3) and 35 I.A.C. 845.780(d)(3), an operating permit modification application to amend the initial or any subsequent written post-closure care plan developed under 35 I.A.C. 845.780 (d)(1) and § 257.104(d)(1) will be submitted to IEPA. The written post-closure care plan will be amended whenever there is a change in the operation of the CCR surface impoundment that would substantially affect the written post-closure care plan in effect; or unanticipated events necessitate a revision of the written post-closure care plan, after post-closure activities have started. The written post-closure care plan will be amended at least 60 days before a planned change in the operation of the facility or CCR surface impoundment, or within 60 days after an unanticipated event requires the need to revise the existing plan. If the plan is revised after post-closure activities have started, a request to modify the operating permit, including an amended written post-closure care plan, will be submitted to the IEPA within 30 days following the triggering event.
40 CFR § 257.104(d)(4) and 35 I.A.C. 845.780(d)(4) – Qualified professional engineering certification.	Certification by a qualified professional engineer will be appended to this plan and any amendment of this plan.
35 I.A.C. 845.780(e) – Termination of post-closure care.	Upon completion of the post-closure period, a request to terminate post-closure care will be submitted to the IEPA. The request will include a certification by a qualified professional engineer verifying that post-closure care has been completed in accordance with the post-closure care plan specified in 35 I.A.C. 845.780(d) and the requirements of 35 I.A.C. 845.780.
40 C.F.R. § 257.104(e) and 35 I.A.C. 845.780(f) – Notification of completion of the post-closure care period.	A notification of completion of post-closure care will be prepared and placed in the facility's operating record within 30 days after IEPA approval of the request to terminate post-closure care. The notification will be placed in the facility's operating record in accordance with 35 I.A.C. 845.800(d)(31) and § 257.105(i)(13). The notification will be placed on the owner or operator's publicly accessible CCR Internet site in accordance with the requirements of § 257.107(i) (13) and 35 I.A.C. 845.810(e). The IEPA will be notified when the notification has been placed in the operating record and on the owner or operator's publicly accessible Internet site in accordance with the requirements of § 257.106(i)(13).

Certification Statement 40 CFR § 257.104 (d)(4) and 35 I.A.C. 845.780(d)(4) – Amended/Initial Written Post Closure Plan for a CCR Surface Impoundment

CCR Unit: Illinois Power Resources Generating, LLC; Edwards Power Plant; Ash Pond

I, John R. Hesemann, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above referenced CCR Unit, that the information contained in the amended/initial written post closure plan, dated October 30, 2021, meets the requirements of 40 CFR § 257.104 and 35 I.A.C. 845.780.

John R. Hesemann

Printed Name

9/28/2021

Date

JOHN ROBERT HESEMANN
062-058523
LICENSED PROFESSIONAL ENGINEER OF
ILLINOIS

John R. Hesemann

Exp: 11/30/2021

ATTACHMENT M

HISTORY OF POTENTIAL EXCEEDANCES

This presentation of the History of Potential Exceedances, and any corrective action taken to remediate groundwater, is provided to meet the requirements of Title 35 of the Illinois Administrative Code (35 I.A.C.) § 845.230(d)(2)(M) for the Edwards Power Plant Ash Pond, Illinois Environmental Protection Agency (IEPA) ID No. W1438050005-01.

Note

Groundwater concentrations from 2015 to 2021 presented in the Hydrogeologic Site Characterization Report (HCR) Table 4-1, and evaluated and summarized in the following tables, are considered potential exceedances because the methodology used to determine them is proposed in the Statistical Analysis Plan (Appendix A to Groundwater Monitoring Plan [GMP]), which has not been reviewed or approved by IEPA at the time of submittal of the 35 I.A.C. § 845 Operating Permit application.

Alternate sources for potential exceedances as allowed by 35 I.A.C. § 845.650(e) have not yet been evaluated. These will be evaluated and presented in future submittals to IEPA as appropriate.

Table 1 summarizes how the potential exceedances were determined. Table 2 is a summary of all potential exceedances.

Background Concentrations

Background monitoring wells identified in the GMP include AP05S and AW-08.

For monitoring wells that have been historically monitored in accordance with Title 40, Code of Federal Regulations, Part 257, Subpart D (Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments), background concentrations calculated from sampling events in 2015-2017 were compared to the standards identified in 35 I.A.C. § 845.600(a)(1). For constituents with calculated background concentrations in 2015-2017 greater than the standards in 35 I.A.C. § 845.600(a)(1), those calculated background concentrations were used as Groundwater Protection Standards (GWPSs) for comparing to statistical calculation results for each compliance well to determine potential exceedances. Compliance well statistical calculations consider concentrations from all sampling events in 2015-2021.

For all other monitoring wells, either newly constructed in 2021 or existing wells not monitored under Title 40, Code of Federal Regulations, Part 257, Subpart D, background concentrations calculated from the eight sampling events required by 35 I.A.C. § 845.650(b)(1)(A), to be collected within 180 days from April 21, 2021, were compared to the standards identified in 35 I.A.C. § 845.600(a)(1). For constituents with calculated background concentrations greater than the standards in 35 I.A.C. § 845.600(a)(1), those calculated background concentrations were used as GWPSs. Compliance well statistical calculations from that same time period were compared to the GWPSs to determine potential exceedances.

Corrective Action

No corrective actions have been taken to remediate the groundwater.

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AP05D	BCU	845	Antimony, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
AP05D	BCU	845	Arsenic, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	0.000187	0.030	0.030	0.01	Background
AP05D	BCU	845	Barium, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	0.044	2.1	2.1	2	Background
AP05D	BCU	845	Beryllium, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard
AP05D	BCU	845	Boron, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	0.83	2.0	0.54	2	Standard
AP05D	BCU	845	Cadmium, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AP05D	BCU	845	Chloride, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	122	200	56	200	Standard
AP05D	BCU	845	Chromium, total	mg/L	02/10/2021 - 05/07/2021	CI around median	0	0.10	0.048	0.1	Standard
AP05D	BCU	845	Cobalt, total	mg/L	02/10/2021 - 05/07/2021	Future median	0.002	0.028	0.028	0.006	Background
AP05D	BCU	845	Fluoride, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	0.21	4.0	0.40	4	Standard
AP05D	BCU	845	Lead, total	mg/L	02/10/2021 - 05/07/2021	Future median	0.001	0.033	0.033	0.0075	Background
AP05D	BCU	845	Lithium, total	mg/L	02/10/2021 - 05/07/2021	Future median	0.077	0.071	0.071	0.04	Background
AP05D	BCU	845	Mercury, total	mg/L	02/10/2021 - 05/07/2021	CI around median	0	0.002	0.0002	0.002	Standard
AP05D	BCU	845	Molybdenum, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	0.000229	0.10	0.0062	0.1	Standard
AP05D	BCU	845	pH (field)	SU	02/10/2021 - 05/07/2021	CI around mean	7.2	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AP05D	BCU	845	Radium-226 + Radium 228, tot	pCi/L	02/10/2021 - 05/07/2021	CI around mean	-0.0573	9.6	9.6	5	Background
AP05D	BCU	845	Selenium, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.001	0.050	0.0032	0.05	Standard
AP05D	BCU	845	Sulfate, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	-10.9	400	6.5	400	Standard
AP05D	BCU	845	Thallium, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AP05D	BCU	845	Total Dissolved Solids	mg/L	02/10/2021 - 05/07/2021	CI around mean	420	1200	1050	1200	Standard
AP07S	UCF	845	Antimony, total	mg/L	02/10/2021 - 07/22/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
AP07S	UCF	845	Arsenic, total	mg/L	02/10/2021 - 07/22/2021	All ND - Last	0.001	0.030	0.030	0.01	Background
AP07S	UCF	845	Barium, total	mg/L	02/10/2021 - 07/22/2021	CI around mean	0.072	2.1	2.1	2	Background
AP07S	UCF	845	Beryllium, total	mg/L	02/10/2021 - 07/22/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard

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EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AP07S	UCF	845	Boron, total	mg/L	02/10/2021 - 07/22/2021	CB around linear reg	8.0	2.0	0.54	2	Standard
AP07S	UCF	845	Cadmium, total	mg/L	02/10/2021 - 07/22/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AP07S	UCF	845	Chloride, total	mg/L	02/10/2021 - 07/22/2021	CI around mean	73	200	56	200	Standard
AP07S	UCF	845	Chromium, total	mg/L	02/10/2021 - 07/22/2021	CI around median	0.004	0.10	0.048	0.1	Standard
AP07S	UCF	845	Cobalt, total	mg/L	02/10/2021 - 07/22/2021	Future median	0.0021	0.028	0.028	0.006	Background
AP07S	UCF	845	Fluoride, total	mg/L	02/10/2021 - 07/22/2021	CI around median	0.25	4.0	0.40	4	Standard
AP07S	UCF	845	Lead, total	mg/L	02/10/2021 - 07/22/2021	Future median	0.001	0.033	0.033	0.0075	Background
AP07S	UCF	845	Lithium, total	mg/L	02/10/2021 - 07/22/2021	All ND - Last	0.020	0.071	0.071	0.04	Background
AP07S	UCF	845	Mercury, total	mg/L	02/10/2021 - 07/22/2021	CI around median	0.0002	0.002	0.0002	0.002	Standard
AP07S	UCF	845	Molybdenum, total	mg/L	02/10/2021 - 07/22/2021	CI around median	0.001	0.10	0.0062	0.1	Standard
AP07S	UCF	845	pH (field)	SU	02/10/2021 - 07/22/2021	CI around mean	6.4	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AP07S	UCF	845	Radium-226 + Radium 228, tot	pCi/L	02/10/2021 - 07/22/2021	CI around mean	0.27	9.6	9.6	5	Background
AP07S	UCF	845	Selenium, total	mg/L	02/10/2021 - 07/22/2021	All ND - Last	0.001	0.050	0.0032	0.05	Standard
AP07S	UCF	845	Sulfate, total	mg/L	02/10/2021 - 07/22/2021	CI around median	150	400	6.5	400	Standard
AP07S	UCF	845	Thallium, total	mg/L	02/10/2021 - 07/22/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AP07S	UCF	845	Total Dissolved Solids	mg/L	02/10/2021 - 07/22/2021	CB around linear reg	1340	1200	1050	1200	Standard
AP07D	BCU	845	Antimony, total	mg/L	02/10/2021 - 07/22/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
AP07D	BCU	845	Arsenic, total	mg/L	02/10/2021 - 07/22/2021	CI around mean	-0.00541	0.030	0.030	0.01	Background
AP07D	BCU	845	Barium, total	mg/L	02/10/2021 - 07/22/2021	CI around mean	-1.15	2.1	2.1	2	Background
AP07D	BCU	845	Beryllium, total	mg/L	02/10/2021 - 07/22/2021	CI around mean	-0.00218	0.004	0.0019	0.004	Standard
AP07D	BCU	845	Boron, total	mg/L	02/10/2021 - 07/22/2021	CI around mean	1.1	2.0	0.54	2	Standard
AP07D	BCU	845	Cadmium, total	mg/L	02/10/2021 - 07/22/2021	CI around mean	0.00026	0.005	0.001	0.005	Standard
AP07D	BCU	845	Chloride, total	mg/L	02/10/2021 - 07/22/2021	CI around mean	498	200	56	200	Standard
AP07D	BCU	845	Chromium, total	mg/L	02/10/2021 - 07/22/2021	CI around mean	-0.0958	0.10	0.048	0.1	Standard

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ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AP07D	BCU	845	Cobalt, total	mg/L	02/10/2021 - 07/22/2021	Future median	0.028	0.028	0.028	0.006	Background
AP07D	BCU	845	Fluoride, total	mg/L	02/10/2021 - 07/22/2021	CI around mean	0.94	4.0	0.40	4	Standard
AP07D	BCU	845	Lead, total	mg/L	02/10/2021 - 07/22/2021	Future median	0.030	0.033	0.033	0.0075	Background
AP07D	BCU	845	Lithium, total	mg/L	02/10/2021 - 07/22/2021	Future median	0.15	0.071	0.071	0.04	Background
AP07D	BCU	845	Mercury, total	mg/L	02/10/2021 - 07/22/2021	CI around mean	0.000111	0.002	0.0002	0.002	Standard
AP07D	BCU	845	Molybdenum, total	mg/L	02/10/2021 - 07/22/2021	CI around mean	0.00759	0.10	0.0062	0.1	Standard
AP07D	BCU	845	pH (field)	SU	02/10/2021 - 07/22/2021	CI around mean	7.4	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AP07D	BCU	845	Radium-226 + Radium 228, tot	pCi/L	02/10/2021 - 07/22/2021	CI around mean	-3.03	9.6	9.6	5	Background
AP07D	BCU	845	Selenium, total	mg/L	02/10/2021 - 07/22/2021	CI around mean	-0.000081	0.050	0.0032	0.05	Standard
AP07D	BCU	845	Sulfate, total	mg/L	02/10/2021 - 07/22/2021	CI around mean	33	400	6.5	400	Standard
AP07D	BCU	845	Thallium, total	mg/L	02/10/2021 - 07/22/2021	CI around median	0	0.002	0.001	0.002	Standard
AP07D	BCU	845	Total Dissolved Solids	mg/L	02/10/2021 - 07/22/2021	CI around mean	658	1200	1050	1200	Standard
APW-01	UCF	845	Antimony, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.003	0.006	0.003	0.006	Standard
APW-01	UCF	845	Arsenic, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.018	0.030	0.030	0.01	Background
APW-01	UCF	845	Barium, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.13	2.1	2.1	2	Background
APW-01	UCF	845	Beryllium, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.001	0.004	0.0019	0.004	Standard
APW-01	UCF	845	Boron, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.84	2.0	0.54	2	Standard
APW-01	UCF	845	Cadmium, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.001	0.005	0.001	0.005	Standard
APW-01	UCF	845	Chloride, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	160	200	56	200	Standard
APW-01	UCF	845	Chromium, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.013	0.10	0.048	0.1	Standard
APW-01	UCF	845	Cobalt, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.0065	0.028	0.028	0.006	Background
APW-01	UCF	845	Fluoride, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.25	4.0	0.40	4	Standard
APW-01	UCF	845	Lead, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.0075	0.033	0.033	0.0075	Background
APW-01	UCF	845	Lithium, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.020	0.071	0.071	0.04	Background

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ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
APW-01	UCF	845	Mercury, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.0002	0.002	0.0002	0.002	Standard
APW-01	UCF	845	Molybdenum, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.0024	0.10	0.0062	0.1	Standard
APW-01	UCF	845	pH (field)	SU	06/17/2021 - 07/22/2021	Most recent sample	6.9	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
APW-01	UCF	845	Radium-226 + Radium 228, tot	pCi/L	06/17/2021 - 07/22/2021	Most recent sample	1.7	9.6	9.6	5	Background
APW-01	UCF	845	Selenium, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.0011	0.050	0.0032	0.05	Standard
APW-01	UCF	845	Sulfate, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	300	400	6.5	400	Standard
APW-01	UCF	845	Thallium, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.001	0.002	0.001	0.002	Standard
APW-01	UCF	845	Total Dissolved Solids	mg/L	06/17/2021 - 07/22/2021	Most recent sample	1100	1200	1050	1200	Standard
APW-02	UCF	845	Antimony, total	mg/L	02/10/2021 - 05/06/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
APW-02	UCF	845	Arsenic, total	mg/L	02/10/2021 - 05/06/2021	CI around median	0	0.030	0.030	0.01	Background
APW-02	UCF	845	Barium, total	mg/L	02/10/2021 - 05/06/2021	CI around mean	0.14	2.1	2.1	2	Background
APW-02	UCF	845	Beryllium, total	mg/L	02/10/2021 - 05/06/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard
APW-02	UCF	845	Boron, total	mg/L	02/10/2021 - 05/06/2021	CI around mean	0.019	2.0	0.54	2	Standard
APW-02	UCF	845	Cadmium, total	mg/L	02/10/2021 - 05/06/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
APW-02	UCF	845	Chloride, total	mg/L	02/10/2021 - 05/06/2021	CI around mean	8.9	200	56	200	Standard
APW-02	UCF	845	Chromium, total	mg/L	02/10/2021 - 05/06/2021	CI around geomean	0.00177	0.10	0.048	0.1	Standard
APW-02	UCF	845	Cobalt, total	mg/L	02/10/2021 - 05/06/2021	Future median	0.002	0.028	0.028	0.006	Background
APW-02	UCF	845	Fluoride, total	mg/L	02/10/2021 - 05/06/2021	CI around mean	0.21	4.0	0.40	4	Standard
APW-02	UCF	845	Lead, total	mg/L	02/10/2021 - 05/06/2021	Future median	0.001	0.033	0.033	0.0075	Background
APW-02	UCF	845	Lithium, total	mg/L	02/10/2021 - 05/06/2021	All ND - Last	0.020	0.071	0.071	0.04	Background
APW-02	UCF	845	Mercury, total	mg/L	02/10/2021 - 05/06/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
APW-02	UCF	845	Molybdenum, total	mg/L	02/10/2021 - 05/06/2021	All ND - Last	0.001	0.10	0.0062	0.1	Standard
APW-02	UCF	845	pH (field)	SU	02/10/2021 - 05/06/2021	CI around mean	6.5	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
APW-02	UCF	845	Radium-226 + Radium 228, tot	pCi/L	02/10/2021 - 05/06/2021	CI around mean	-0.097	9.6	9.6	5	Background

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EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
APW-02	UCF	845	Selenium, total	mg/L	02/10/2021 - 05/06/2021	All ND - Last	0.001	0.050	0.0032	0.05	Standard
APW-02	UCF	845	Sulfate, total	mg/L	02/10/2021 - 05/06/2021	CI around mean	-1.75	400	6.5	400	Standard
APW-02	UCF	845	Thallium, total	mg/L	02/10/2021 - 05/06/2021	CI around median	0	0.002	0.001	0.002	Standard
APW-02	UCF	845	Total Dissolved Solids	mg/L	02/10/2021 - 05/06/2021	CI around mean	367	1200	1050	1200	Standard
APW-03	UCF	845	Antimony, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
APW-03	UCF	845	Arsenic, total	mg/L	02/10/2021 - 05/07/2021	CI around median	0	0.030	0.030	0.01	Background
APW-03	UCF	845	Barium, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	0.25	2.1	2.1	2	Background
APW-03	UCF	845	Beryllium, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard
APW-03	UCF	845	Boron, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	0.12	2.0	0.54	2	Standard
APW-03	UCF	845	Cadmium, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
APW-03	UCF	845	Chloride, total	mg/L	02/10/2021 - 05/07/2021	CI around geomean	25	200	56	200	Standard
APW-03	UCF	845	Chromium, total	mg/L	02/10/2021 - 05/07/2021	CI around median	0	0.10	0.048	0.1	Standard
APW-03	UCF	845	Cobalt, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.002	0.028	0.028	0.006	Background
APW-03	UCF	845	Fluoride, total	mg/L	02/10/2021 - 05/07/2021	CI around median	0	4.0	0.40	4	Standard
APW-03	UCF	845	Lead, total	mg/L	02/10/2021 - 05/07/2021	Future median	0.0012	0.033	0.033	0.0075	Background
APW-03	UCF	845	Lithium, total	mg/L	02/10/2021 - 05/07/2021	Future median	0.020	0.071	0.071	0.04	Background
APW-03	UCF	845	Mercury, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
APW-03	UCF	845	Molybdenum, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.001	0.10	0.0062	0.1	Standard
APW-03	UCF	845	pH (field)	SU	02/10/2021 - 05/07/2021	CI around mean	6.4	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
APW-03	UCF	845	Radium-226 + Radium 228, tot	pCi/L	02/10/2021 - 05/07/2021	CI around mean	0.14	9.6	9.6	5	Background
APW-03	UCF	845	Selenium, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.001	0.050	0.0032	0.05	Standard
APW-03	UCF	845	Sulfate, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	-1.09	400	6.5	400	Standard
APW-03	UCF	845	Thallium, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
APW-03	UCF	845	Total Dissolved Solids	mg/L	02/10/2021 - 05/07/2021	CI around mean	712	1200	1050	1200	Standard

RAMBOLL

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
APW-04	UCF	845	Antimony, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
APW-04	UCF	845	Arsenic, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	0.00228	0.030	0.030	0.01	Background
APW-04	UCF	845	Barium, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	0.26	2.1	2.1	2	Background
APW-04	UCF	845	Beryllium, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard
APW-04	UCF	845	Boron, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	0.50	2.0	0.54	2	Standard
APW-04	UCF	845	Cadmium, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
APW-04	UCF	845	Chloride, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	110	200	56	200	Standard
APW-04	UCF	845	Chromium, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	0.000546	0.10	0.048	0.1	Standard
APW-04	UCF	845	Cobalt, total	mg/L	02/10/2021 - 05/07/2021	Future median	0.002	0.028	0.028	0.006	Background
APW-04	UCF	845	Fluoride, total	mg/L	02/10/2021 - 05/07/2021	CI around median	0	4.0	0.40	4	Standard
APW-04	UCF	845	Lead, total	mg/L	02/10/2021 - 05/07/2021	Future median	0.001	0.033	0.033	0.0075	Background
APW-04	UCF	845	Lithium, total	mg/L	02/10/2021 - 05/07/2021	Future median	0.020	0.071	0.071	0.04	Background
APW-04	UCF	845	Mercury, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
APW-04	UCF	845	Molybdenum, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	0.00038	0.10	0.0062	0.1	Standard
APW-04	UCF	845	pH (field)	SU	02/10/2021 - 05/07/2021	CI around mean	6.8	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
APW-04	UCF	845	Radium-226 + Radium 228, tot	pCi/L	02/10/2021 - 05/07/2021	CI around geomean	0.26	9.6	9.6	5	Background
APW-04	UCF	845	Selenium, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.001	0.050	0.0032	0.05	Standard
APW-04	UCF	845	Sulfate, total	mg/L	02/10/2021 - 05/07/2021	CI around mean	15	400	6.5	400	Standard
APW-04	UCF	845	Thallium, total	mg/L	02/10/2021 - 05/07/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
APW-04	UCF	845	Total Dissolved Solids	mg/L	02/10/2021 - 05/07/2021	CI around mean	543	1200	1050	1200	Standard
AW-05	UA	845	Antimony, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.003	0.006	0.003	0.006	Standard
AW-05	UA	845	Arsenic, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.0032	0.030	0.030	0.01	Background
AW-05	UA	845	Barium, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.11	2.1	2.1	2	Background
AW-05	UA	845	Beryllium, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.001	0.004	0.0019	0.004	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AW-05	UA	845	Boron, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	2.9	2.0	0.54	2	Standard
AW-05	UA	845	Cadmium, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.001	0.005	0.001	0.005	Standard
AW-05	UA	845	Chloride, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	67	200	56	200	Standard
AW-05	UA	845	Chromium, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.004	0.10	0.048	0.1	Standard
AW-05	UA	845	Cobalt, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.002	0.028	0.028	0.006	Background
AW-05	UA	845	Fluoride, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.27	4.0	0.40	4	Standard
AW-05	UA	845	Lead, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.001	0.033	0.033	0.0075	Background
AW-05	UA	845	Lithium, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.020	0.071	0.071	0.04	Background
AW-05	UA	845	Mercury, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.0002	0.002	0.0002	0.002	Standard
AW-05	UA	845	Molybdenum, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.002	0.10	0.0062	0.1	Standard
AW-05	UA	845	pH (field)	SU	06/17/2021 - 07/22/2021	Most recent sample	7.1	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AW-05	UA	845	Radium-226 + Radium 228, tot	pCi/L	06/17/2021 - 07/22/2021	Most recent sample	3.8	9.6	9.6	5	Background
AW-05	UA	845	Selenium, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.001	0.050	0.0032	0.05	Standard
AW-05	UA	845	Sulfate, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	300	400	6.5	400	Standard
AW-05	UA	845	Thallium, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	0.001	0.002	0.001	0.002	Standard
AW-05	UA	845	Total Dissolved Solids	mg/L	06/17/2021 - 07/22/2021	Most recent sample	1100	1200	1050	1200	Standard
AW-06	UA	257	Antimony, total	mg/L	11/10/2015 - 02/23/2021	All ND - Last	0.003	0.006	0.0041	0.006	Standard
AW-06	UA	257	Arsenic, total	mg/L	11/10/2015 - 02/23/2021	CI around geomean	0.00274	0.019	0.019	0.01	Background
AW-06	UA	257	Barium, total	mg/L	11/10/2015 - 02/23/2021	CI around mean	0.19	2.0	0.79	2	Standard
AW-06	UA	257	Beryllium, total	mg/L	11/10/2015 - 02/23/2021	Future median	0.001	0.014	0.014	0.004	Background
AW-06	UA	257	Boron, total	mg/L	11/10/2015 - 02/23/2021	CB around linear reg	0.028	2.0	0.43	2	Standard
AW-06	UA	257	Cadmium, total	mg/L	11/10/2015 - 02/23/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AW-06	UA	257	Chloride, total	mg/L	11/10/2015 - 02/23/2021	CB around linear reg	12	200	44	200	Standard
AW-06	UA	257	Chromium, total	mg/L	11/10/2015 - 02/23/2021	CI around median	0.004	0.10	0.004	0.1	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AW-06	UA	257	Cobalt, total	mg/L	11/10/2015 - 02/23/2021	CI around median	0.002	0.006	0.0053	0.006	Standard
AW-06	UA	257	Fluoride, total	mg/L	11/10/2015 - 02/23/2021	CI around mean	0.31	4.0	0.38	4	Standard
AW-06	UA	257	Lead, total	mg/L	11/10/2015 - 02/23/2021	CI around mean	0.00244	0.0075	0.001	0.0075	Standard
AW-06	UA	257	Lithium, total	mg/L	11/10/2015 - 02/23/2021	CI around mean	0.019	0.054	0.054	0.04	Background
AW-06	UA	257	Mercury, total	mg/L	11/10/2015 - 02/23/2021	CI around median	0.0002	0.002	0.0002	0.002	Standard
AW-06	UA	257	Molybdenum, total	mg/L	11/10/2015 - 02/23/2021	CI around mean	0.00469	0.10	0.023	0.1	Standard
AW-06	UA	257	pH (field)	SU	11/10/2015 - 02/23/2021	CI around median	7.1	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
AW-06	UA	257	Radium-226 + Radium 228, tot	pCi/L	11/10/2015 - 02/23/2021	CI around mean	0.70	5.0	2.9	5	Standard
AW-06	UA	257	Selenium, total	mg/L	11/10/2015 - 02/23/2021	CI around median	0.001	0.050	0.0012	0.05	Standard
AW-06	UA	257	Sulfate, total	mg/L	11/10/2015 - 02/23/2021	CB around linear reg	19	400	81	400	Standard
AW-06	UA	257	Thallium, total	mg/L	11/10/2015 - 02/23/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AW-06	UA	257	Total Dissolved Solids	mg/L	11/10/2015 - 02/23/2021	CI around mean	486	1200	955	1200	Standard
AW-09	UA	257	Antimony, total	mg/L	11/10/2015 - 02/23/2021	All ND - Last	0.003	0.006	0.0041	0.006	Standard
AW-09	UA	257	Arsenic, total	mg/L	11/10/2015 - 02/23/2021	CI around mean	0.00832	0.019	0.019	0.01	Background
AW-09	UA	257	Barium, total	mg/L	11/10/2015 - 02/23/2021	CI around mean	0.27	2.0	0.79	2	Standard
AW-09	UA	257	Beryllium, total	mg/L	11/10/2015 - 02/23/2021	CB around T-S line	-0.00359	0.014	0.014	0.004	Background
AW-09	UA	257	Boron, total	mg/L	11/10/2015 - 02/23/2021	CB around linear reg	-0.217	2.0	0.43	2	Standard
AW-09	UA	257	Cadmium, total	mg/L	11/10/2015 - 02/23/2021	CI around median	0.001	0.005	0.001	0.005	Standard
AW-09	UA	257	Chloride, total	mg/L	11/10/2015 - 02/23/2021	CB around linear reg	13	200	44	200	Standard
AW-09	UA	257	Chromium, total	mg/L	11/10/2015 - 02/23/2021	CI around geomean	0.00648	0.10	0.004	0.1	Standard
AW-09	UA	257	Cobalt, total	mg/L	11/10/2015 - 02/23/2021	CI around geomean	0.00476	0.006	0.0053	0.006	Standard
AW-09	UA	257	Fluoride, total	mg/L	11/10/2015 - 02/23/2021	CI around median	0.25	4.0	0.38	4	Standard
AW-09	UA	257	Lead, total	mg/L	11/10/2015 - 02/23/2021	CI around geomean	0.0021	0.0075	0.001	0.0075	Standard
AW-09	UA	257	Lithium, total	mg/L	11/10/2015 - 02/23/2021	CI around geomean	0.020	0.054	0.054	0.04	Background

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AW-09	UA	257	Mercury, total	mg/L	11/10/2015 - 02/23/2021	CI around median	0.0002	0.002	0.0002	0.002	Standard
AW-09	UA	257	Molybdenum, total	mg/L	11/10/2015 - 02/23/2021	CI around mean	0.014	0.10	0.023	0.1	Standard
AW-09	UA	257	pH (field)	SU	11/10/2015 - 02/23/2021	CI around mean	6.8	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
AW-09	UA	257	Radium-226 + Radium 228, tot	pCi/L	11/10/2015 - 02/23/2021	CI around median	0.47	5.0	2.9	5	Standard
AW-09	UA	257	Selenium, total	mg/L	11/10/2015 - 02/23/2021	CI around median	0.001	0.050	0.0012	0.05	Standard
AW-09	UA	257	Sulfate, total	mg/L	11/10/2015 - 02/23/2021	CB around linear reg	-17	400	81	400	Standard
AW-09	UA	257	Thallium, total	mg/L	11/10/2015 - 02/23/2021	CI around median	0.001	0.002	0.001	0.002	Standard
AW-09	UA	257	Total Dissolved Solids	mg/L	11/10/2015 - 02/23/2021	CI around median	670	1200	955	1200	Standard
AW-10	UA	257	Antimony, total	mg/L	11/09/2015 - 03/23/2021	All ND - Last	0.003	0.006	0.0041	0.006	Standard
AW-10	UA	257	Arsenic, total	mg/L	11/09/2015 - 03/23/2021	CI around geomean	0.00663	0.019	0.019	0.01	Background
AW-10	UA	257	Barium, total	mg/L	11/09/2015 - 03/23/2021	CI around median	0.88	2.0	0.79	2	Standard
AW-10	UA	257	Beryllium, total	mg/L	11/09/2015 - 03/23/2021	Future median	0.001	0.014	0.014	0.004	Background
AW-10	UA	257	Boron, total	mg/L	11/09/2015 - 03/23/2021	CI around mean	0.46	2.0	0.43	2	Standard
AW-10	UA	257	Cadmium, total	mg/L	11/09/2015 - 03/23/2021	CI around median	0.001	0.005	0.001	0.005	Standard
AW-10	UA	257	Chloride, total	mg/L	11/09/2015 - 03/23/2021	CI around mean	86	200	44	200	Standard
AW-10	UA	257	Chromium, total	mg/L	11/09/2015 - 03/23/2021	CI around geomean	0.00576	0.10	0.004	0.1	Standard
AW-10	UA	257	Cobalt, total	mg/L	11/09/2015 - 03/23/2021	CI around geomean	0.0038	0.006	0.0053	0.006	Standard
AW-10	UA	257	Fluoride, total	mg/L	11/09/2015 - 03/23/2021	CI around median	0.25	4.0	0.38	4	Standard
AW-10	UA	257	Lead, total	mg/L	11/09/2015 - 03/23/2021	CI around geomean	0.00179	0.0075	0.001	0.0075	Standard
AW-10	UA	257	Lithium, total	mg/L	11/09/2015 - 03/23/2021	CB around T-S line	-0.121	0.054	0.054	0.04	Background
AW-10	UA	257	Mercury, total	mg/L	11/09/2015 - 03/23/2021	CI around median	0.0002	0.002	0.0002	0.002	Standard
AW-10	UA	257	Molybdenum, total	mg/L	11/09/2015 - 03/23/2021	CI around geomean	0.00143	0.10	0.023	0.1	Standard
AW-10	UA	257	pH (field)	SU	11/09/2015 - 03/23/2021	CI around mean	6.9	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
AW-10	UA	257	Radium-226 + Radium 228, tot	pCi/L	11/09/2015 - 03/23/2021	CI around mean	2.1	5.0	2.9	5	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AW-10	UA	257	Selenium, total	mg/L	11/09/2015 - 03/23/2021	CI around median	0.001	0.050	0.0012	0.05	Standard
AW-10	UA	257	Sulfate, total	mg/L	11/09/2015 - 03/23/2021	CI around median	1.0	400	81	400	Standard
AW-10	UA	257	Thallium, total	mg/L	11/09/2015 - 03/23/2021	CI around median	0.001	0.002	0.001	0.002	Standard
AW-10	UA	257	Total Dissolved Solids	mg/L	11/09/2015 - 03/23/2021	CI around median	1000	1200	955	1200	Standard
AW-11	UA	257	Antimony, total	mg/L	11/09/2015 - 02/23/2021	All ND - Last	0.003	0.006	0.0041	0.006	Standard
AW-11	UA	257	Arsenic, total	mg/L	11/09/2015 - 02/23/2021	CI around mean	0.00896	0.019	0.019	0.01	Background
AW-11	UA	257	Barium, total	mg/L	11/09/2015 - 02/23/2021	CI around mean	0.81	2.0	0.79	2	Standard
AW-11	UA	257	Beryllium, total	mg/L	11/09/2015 - 02/23/2021	Future median	0.001	0.014	0.014	0.004	Background
AW-11	UA	257	Boron, total	mg/L	11/09/2015 - 02/23/2021	CI around mean	0.21	2.0	0.43	2	Standard
AW-11	UA	257	Cadmium, total	mg/L	11/09/2015 - 02/23/2021	CI around median	0.001	0.005	0.001	0.005	Standard
AW-11	UA	257	Chloride, total	mg/L	11/09/2015 - 02/23/2021	CB around linear reg	26	200	44	200	Standard
AW-11	UA	257	Chromium, total	mg/L	11/09/2015 - 02/23/2021	CI around median	0.004	0.10	0.004	0.1	Standard
AW-11	UA	257	Cobalt, total	mg/L	11/09/2015 - 02/23/2021	CI around geomean	0.00346	0.006	0.0053	0.006	Standard
AW-11	UA	257	Fluoride, total	mg/L	11/09/2015 - 02/23/2021	CI around median	0.25	4.0	0.38	4	Standard
AW-11	UA	257	Lead, total	mg/L	11/09/2015 - 02/23/2021	CI around geomean	0.00173	0.0075	0.001	0.0075	Standard
AW-11	UA	257	Lithium, total	mg/L	11/09/2015 - 02/23/2021	CI around geomean	0.028	0.054	0.054	0.04	Background
AW-11	UA	257	Mercury, total	mg/L	11/09/2015 - 02/23/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
AW-11	UA	257	Molybdenum, total	mg/L	11/09/2015 - 02/23/2021	CI around mean	0.00403	0.10	0.023	0.1	Standard
AW-11	UA	257	pH (field)	SU	11/09/2015 - 02/23/2021	CI around median	6.9	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
AW-11	UA	257	Radium-226 + Radium 228, tot	pCi/L	11/09/2015 - 02/23/2021	CI around mean	1.6	5.0	2.9	5	Standard
AW-11	UA	257	Selenium, total	mg/L	11/09/2015 - 02/23/2021	CI around median	0.001	0.050	0.0012	0.05	Standard
AW-11	UA	257	Sulfate, total	mg/L	11/09/2015 - 02/23/2021	CI around median	1.0	400	81	400	Standard
AW-11	UA	257	Thallium, total	mg/L	11/09/2015 - 02/23/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AW-11	UA	257	Total Dissolved Solids	mg/L	11/09/2015 - 02/23/2021	CI around median	880	1200	955	1200	Standard

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EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AW-12	UA	845	Antimony, total	mg/L	02/11/2021 - 05/07/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
AW-12	UA	845	Arsenic, total	mg/L	02/11/2021 - 05/07/2021	CI around mean	0.000344	0.030	0.030	0.01	Background
AW-12	UA	845	Barium, total	mg/L	02/11/2021 - 05/07/2021	CI around median	0	2.1	2.1	2	Background
AW-12	UA	845	Beryllium, total	mg/L	02/11/2021 - 05/07/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard
AW-12	UA	845	Boron, total	mg/L	02/11/2021 - 05/07/2021	CI around mean	0.20	2.0	0.54	2	Standard
AW-12	UA	845	Cadmium, total	mg/L	02/11/2021 - 05/07/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AW-12	UA	845	Chloride, total	mg/L	02/11/2021 - 05/07/2021	CI around mean	33	200	56	200	Standard
AW-12	UA	845	Chromium, total	mg/L	02/11/2021 - 05/07/2021	CI around median	0	0.10	0.048	0.1	Standard
AW-12	UA	845	Cobalt, total	mg/L	02/11/2021 - 05/07/2021	All ND - Last	0.002	0.028	0.028	0.006	Background
AW-12	UA	845	Fluoride, total	mg/L	02/11/2021 - 05/07/2021	CI around mean	-0.419	4.0	0.40	4	Standard
AW-12	UA	845	Lead, total	mg/L	02/11/2021 - 05/07/2021	Future median	0.001	0.033	0.033	0.0075	Background
AW-12	UA	845	Lithium, total	mg/L	02/11/2021 - 05/07/2021	Future median	0.026	0.071	0.071	0.04	Background
AW-12	UA	845	Mercury, total	mg/L	02/11/2021 - 05/07/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
AW-12	UA	845	Molybdenum, total	mg/L	02/11/2021 - 05/07/2021	CI around median	0	0.10	0.0062	0.1	Standard
AW-12	UA	845	pH (field)	SU	02/11/2021 - 05/07/2021	CI around mean	6.4	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AW-12	UA	845	Radium-226 + Radium 228, tot	pCi/L	02/11/2021 - 05/07/2021	CI around mean	0.50	9.6	9.6	5	Background
AW-12	UA	845	Selenium, total	mg/L	02/11/2021 - 05/07/2021	CI around median	0	0.050	0.0032	0.05	Standard
AW-12	UA	845	Sulfate, total	mg/L	02/11/2021 - 05/07/2021	CI around median	0	400	6.5	400	Standard
AW-12	UA	845	Thallium, total	mg/L	02/11/2021 - 05/07/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AW-12	UA	845	Total Dissolved Solids	mg/L	02/11/2021 - 05/07/2021	CI around mean	755	1200	1050	1200	Standard
AW-13	UA	845	Antimony, total	mg/L	02/11/2021 - 05/07/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
AW-13	UA	845	Arsenic, total	mg/L	02/11/2021 - 05/07/2021	CI around mean	0.00962	0.030	0.030	0.01	Background
AW-13	UA	845	Barium, total	mg/L	02/11/2021 - 05/07/2021	CI around mean	1.1	2.1	2.1	2	Background
AW-13	UA	845	Beryllium, total	mg/L	02/11/2021 - 05/07/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AW-13	UA	845	Boron, total	mg/L	02/11/2021 - 05/07/2021	CI around mean	0.27	2.0	0.54	2	Standard
AW-13	UA	845	Cadmium, total	mg/L	02/11/2021 - 05/07/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AW-13	UA	845	Chloride, total	mg/L	02/11/2021 - 05/07/2021	CI around mean	72	200	56	200	Standard
AW-13	UA	845	Chromium, total	mg/L	02/11/2021 - 05/07/2021	CI around median	0	0.10	0.048	0.1	Standard
AW-13	UA	845	Cobalt, total	mg/L	02/11/2021 - 05/07/2021	Future median	0.002	0.028	0.028	0.006	Background
AW-13	UA	845	Fluoride, total	mg/L	02/11/2021 - 05/07/2021	All ND - Last	0.25	4.0	0.40	4	Standard
AW-13	UA	845	Lead, total	mg/L	02/11/2021 - 05/07/2021	Future median	0.001	0.033	0.033	0.0075	Background
AW-13	UA	845	Lithium, total	mg/L	02/11/2021 - 05/07/2021	Future median	0.030	0.071	0.071	0.04	Background
AW-13	UA	845	Mercury, total	mg/L	02/11/2021 - 05/07/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
AW-13	UA	845	Molybdenum, total	mg/L	02/11/2021 - 05/07/2021	CI around mean	0.0003	0.10	0.0062	0.1	Standard
AW-13	UA	845	pH (field)	SU	02/11/2021 - 05/07/2021	CI around mean	6.7	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AW-13	UA	845	Radium-226 + Radium 228, tot	pCi/L	02/11/2021 - 05/07/2021	CI around median	0	9.6	9.6	5	Background
AW-13	UA	845	Selenium, total	mg/L	02/11/2021 - 05/07/2021	All ND - Last	0.001	0.050	0.0032	0.05	Standard
AW-13	UA	845	Sulfate, total	mg/L	02/11/2021 - 05/07/2021	CI around mean	0.17	400	6.5	400	Standard
AW-13	UA	845	Thallium, total	mg/L	02/11/2021 - 05/07/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AW-13	UA	845	Total Dissolved Solids	mg/L	02/11/2021 - 05/07/2021	CI around mean	897	1200	1050	1200	Standard
AW-14	UA	845	Antimony, total	mg/L	02/11/2021 - 07/21/2021	CI around median	0.003	0.006	0.003	0.006	Standard
AW-14	UA	845	Arsenic, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.00745	0.030	0.030	0.01	Background
AW-14	UA	845	Barium, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.60	2.1	2.1	2	Background
AW-14	UA	845	Beryllium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard
AW-14	UA	845	Boron, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.16	2.0	0.54	2	Standard
AW-14	UA	845	Cadmium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AW-14	UA	845	Chloride, total	mg/L	02/11/2021 - 07/21/2021	CI around geomean	23	200	56	200	Standard
AW-14	UA	845	Chromium, total	mg/L	02/11/2021 - 07/21/2021	CI around median	0.004	0.10	0.048	0.1	Standard

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TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AW-14	UA	845	Cobalt, total	mg/L	02/11/2021 - 07/21/2021	Future median	0.0029	0.028	0.028	0.006	Background
AW-14	UA	845	Fluoride, total	mg/L	02/11/2021 - 07/21/2021	CI around median	0.25	4.0	0.40	4	Standard
AW-14	UA	845	Lead, total	mg/L	02/11/2021 - 07/21/2021	Future median	0.001	0.033	0.033	0.0075	Background
AW-14	UA	845	Lithium, total	mg/L	02/11/2021 - 07/21/2021	Future median	0.020	0.071	0.071	0.04	Background
AW-14	UA	845	Mercury, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
AW-14	UA	845	Molybdenum, total	mg/L	02/11/2021 - 07/21/2021	CI around geomean	0.000625	0.10	0.0062	0.1	Standard
AW-14	UA	845	pH (field)	SU	02/11/2021 - 07/21/2021	CI around mean	6.7	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AW-14	UA	845	Radium-226 + Radium 228, tot	pCi/L	02/11/2021 - 07/21/2021	CI around mean	1.8	9.6	9.6	5	Background
AW-14	UA	845	Selenium, total	mg/L	02/11/2021 - 07/21/2021	CI around median	0.001	0.050	0.0032	0.05	Standard
AW-14	UA	845	Sulfate, total	mg/L	02/11/2021 - 07/21/2021	CI around geomean	0.73	400	6.5	400	Standard
AW-14	UA	845	Thallium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AW-14	UA	845	Total Dissolved Solids	mg/L	02/11/2021 - 07/21/2021	CI around mean	845	1200	1050	1200	Standard
AW-15	UA	845	Antimony, total	mg/L	02/12/2021 - 06/17/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
AW-15	UA	845	Arsenic, total	mg/L	02/12/2021 - 06/17/2021	CI around mean	0.00172	0.030	0.030	0.01	Background
AW-15	UA	845	Barium, total	mg/L	02/12/2021 - 06/17/2021	CI around mean	1.3	2.1	2.1	2	Background
AW-15	UA	845	Beryllium, total	mg/L	02/12/2021 - 06/17/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard
AW-15	UA	845	Boron, total	mg/L	02/12/2021 - 06/17/2021	CI around mean	0.28	2.0	0.54	2	Standard
AW-15	UA	845	Cadmium, total	mg/L	02/12/2021 - 06/17/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AW-15	UA	845	Chloride, total	mg/L	02/12/2021 - 06/17/2021	CI around mean	35	200	56	200	Standard
AW-15	UA	845	Chromium, total	mg/L	02/12/2021 - 06/17/2021	All ND - Last	0.004	0.10	0.048	0.1	Standard
AW-15	UA	845	Cobalt, total	mg/L	02/12/2021 - 06/17/2021	Future median	0.002	0.028	0.028	0.006	Background
AW-15	UA	845	Fluoride, total	mg/L	02/12/2021 - 06/17/2021	CI around mean	-0.0421	4.0	0.40	4	Standard
AW-15	UA	845	Lead, total	mg/L	02/12/2021 - 06/17/2021	All ND - Last	0.001	0.033	0.033	0.0075	Background
AW-15	UA	845	Lithium, total	mg/L	02/12/2021 - 06/17/2021	Future median	0.039	0.071	0.071	0.04	Background

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TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AW-15	UA	845	Mercury, total	mg/L	02/12/2021 - 06/17/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
AW-15	UA	845	Molybdenum, total	mg/L	02/12/2021 - 06/17/2021	CI around median	0	0.10	0.0062	0.1	Standard
AW-15	UA	845	pH (field)	SU	02/12/2021 - 05/06/2021	CI around mean	6.5	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AW-15	UA	845	Radium-226 + Radium 228, tot	pCi/L	02/12/2021 - 06/17/2021	CI around mean	0.67	9.6	9.6	5	Background
AW-15	UA	845	Selenium, total	mg/L	02/12/2021 - 06/17/2021	All ND - Last	0.001	0.050	0.0032	0.05	Standard
AW-15	UA	845	Sulfate, total	mg/L	02/12/2021 - 06/17/2021	Most recent sample	1.0	400	6.5	400	Standard
AW-15	UA	845	Thallium, total	mg/L	02/12/2021 - 06/17/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AW-15	UA	845	Total Dissolved Solids	mg/L	02/12/2021 - 06/17/2021	CI around mean	775	1200	1050	1200	Standard
AW-15C	BCU	845	Antimony, total	mg/L	02/12/2021 - 07/21/2021	CI around median	0	0.006	0.003	0.006	Standard
AW-15C	BCU	845	Arsenic, total	mg/L	02/12/2021 - 07/21/2021	CI around mean	0.00233	0.030	0.030	0.01	Background
AW-15C	BCU	845	Barium, total	mg/L	02/12/2021 - 07/21/2021	CI around mean	2.9	2.1	2.1	2	Background
AW-15C	BCU	845	Beryllium, total	mg/L	02/12/2021 - 07/21/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard
AW-15C	BCU	845	Boron, total	mg/L	02/12/2021 - 07/21/2021	CI around mean	0.59	2.0	0.54	2	Standard
AW-15C	BCU	845	Cadmium, total	mg/L	02/12/2021 - 07/21/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AW-15C	BCU	845	Chloride, total	mg/L	02/12/2021 - 07/21/2021	CI around mean	46	200	56	200	Standard
AW-15C	BCU	845	Chromium, total	mg/L	02/12/2021 - 07/21/2021	CI around median	0	0.10	0.048	0.1	Standard
AW-15C	BCU	845	Cobalt, total	mg/L	02/12/2021 - 07/21/2021	Future median	0.002	0.028	0.028	0.006	Background
AW-15C	BCU	845	Fluoride, total	mg/L	02/12/2021 - 07/21/2021	CI around median	0	4.0	0.40	4	Standard
AW-15C	BCU	845	Lead, total	mg/L	02/12/2021 - 07/21/2021	Future median	0.001	0.033	0.033	0.0075	Background
AW-15C	BCU	845	Lithium, total	mg/L	02/12/2021 - 07/21/2021	Future median	0.047	0.071	0.071	0.04	Background
AW-15C	BCU	845	Mercury, total	mg/L	02/12/2021 - 07/21/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
AW-15C	BCU	845	Molybdenum, total	mg/L	02/12/2021 - 07/21/2021	CI around mean	-0.000404	0.10	0.0062	0.1	Standard
AW-15C	BCU	845	pH (field)	SU	02/12/2021 - 07/21/2021	CI around mean	6.7	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AW-15C	BCU	845	Radium-226 + Radium 228, tot	pCi/L	02/12/2021 - 07/21/2021	CI around mean	3.9	9.6	9.6	5	Background

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AW-15C	BCU	845	Selenium, total	mg/L	02/12/2021 - 07/21/2021	All ND - Last	0.001	0.050	0.0032	0.05	Standard
AW-15C	BCU	845	Sulfate, total	mg/L	02/12/2021 - 07/21/2021	CI around median	0	400	6.5	400	Standard
AW-15C	BCU	845	Thallium, total	mg/L	02/12/2021 - 07/21/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AW-15C	BCU	845	Total Dissolved Solids	mg/L	02/12/2021 - 07/21/2021	CI around mean	876	1200	1050	1200	Standard
AW-15S	UCF	845	Antimony, total	mg/L	02/12/2021 - 07/21/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
AW-15S	UCF	845	Arsenic, total	mg/L	02/12/2021 - 07/21/2021	CI around median	0.001	0.030	0.030	0.01	Background
AW-15S	UCF	845	Barium, total	mg/L	02/12/2021 - 07/21/2021	CI around median	0.093	2.1	2.1	2	Background
AW-15S	UCF	845	Beryllium, total	mg/L	02/12/2021 - 07/21/2021	CI around median	0.001	0.004	0.0019	0.004	Standard
AW-15S	UCF	845	Boron, total	mg/L	02/12/2021 - 07/21/2021	CI around mean	5.3	2.0	0.54	2	Standard
AW-15S	UCF	845	Cadmium, total	mg/L	02/12/2021 - 07/21/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AW-15S	UCF	845	Chloride, total	mg/L	02/12/2021 - 07/21/2021	CB around linear reg	31	200	56	200	Standard
AW-15S	UCF	845	Chromium, total	mg/L	02/12/2021 - 07/21/2021	CI around median	0.004	0.10	0.048	0.1	Standard
AW-15S	UCF	845	Cobalt, total	mg/L	02/12/2021 - 07/21/2021	Future median	0.002	0.028	0.028	0.006	Background
AW-15S	UCF	845	Fluoride, total	mg/L	02/12/2021 - 07/21/2021	CI around median	0.25	4.0	0.40	4	Standard
AW-15S	UCF	845	Lead, total	mg/L	02/12/2021 - 07/21/2021	Future median	0.001	0.033	0.033	0.0075	Background
AW-15S	UCF	845	Lithium, total	mg/L	02/12/2021 - 07/21/2021	Future median	0.020	0.071	0.071	0.04	Background
AW-15S	UCF	845	Mercury, total	mg/L	02/12/2021 - 07/21/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
AW-15S	UCF	845	Molybdenum, total	mg/L	02/12/2021 - 07/21/2021	CI around mean	0.00299	0.10	0.0062	0.1	Standard
AW-15S	UCF	845	pH (field)	SU	02/12/2021 - 07/21/2021	CI around mean	6.7	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AW-15S	UCF	845	Radium-226 + Radium 228, tot	pCi/L	02/12/2021 - 07/21/2021	CI around mean	0.22	9.6	9.6	5	Background
AW-15S	UCF	845	Selenium, total	mg/L	02/12/2021 - 07/21/2021	CB around linear reg	0.00012	0.050	0.0032	0.05	Standard
AW-15S	UCF	845	Sulfate, total	mg/L	02/12/2021 - 07/21/2021	CB around linear reg	548	400	6.5	400	Standard
AW-15S	UCF	845	Thallium, total	mg/L	02/12/2021 - 07/21/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AW-15S	UCF	845	Total Dissolved Solids	mg/L	02/12/2021 - 07/21/2021	CI around mean	1220	1200	1050	1200	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AW-16	UA	845	Antimony, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
AW-16	UA	845	Arsenic, total	mg/L	02/11/2021 - 07/21/2021	CB around T-S line	0.00163	0.030	0.030	0.01	Background
AW-16	UA	845	Barium, total	mg/L	02/11/2021 - 07/21/2021	CB around linear reg	1.0	2.1	2.1	2	Background
AW-16	UA	845	Beryllium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard
AW-16	UA	845	Boron, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.48	2.0	0.54	2	Standard
AW-16	UA	845	Cadmium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AW-16	UA	845	Chloride, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	51	200	56	200	Standard
AW-16	UA	845	Chromium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.004	0.10	0.048	0.1	Standard
AW-16	UA	845	Cobalt, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.002	0.028	0.028	0.006	Background
AW-16	UA	845	Fluoride, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.25	4.0	0.40	4	Standard
AW-16	UA	845	Lead, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.033	0.033	0.0075	Background
AW-16	UA	845	Lithium, total	mg/L	02/11/2021 - 07/21/2021	Future median	0.043	0.071	0.071	0.04	Background
AW-16	UA	845	Mercury, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
AW-16	UA	845	Molybdenum, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.10	0.0062	0.1	Standard
AW-16	UA	845	pH (field)	SU	02/11/2021 - 07/21/2021	CI around median	6.4	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AW-16	UA	845	Radium-226 + Radium 228, tot	pCi/L	02/11/2021 - 07/21/2021	CI around mean	4.5	9.6	9.6	5	Background
AW-16	UA	845	Selenium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.050	0.0032	0.05	Standard
AW-16	UA	845	Sulfate, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	1.0	400	6.5	400	Standard
AW-16	UA	845	Thallium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AW-16	UA	845	Total Dissolved Solids	mg/L	02/11/2021 - 07/21/2021	CI around mean	1020	1200	1050	1200	Standard
AW-17	UA	845	Antimony, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
AW-17	UA	845	Arsenic, total	mg/L	02/11/2021 - 07/21/2021	CI around geomean	0.00489	0.030	0.030	0.01	Background
AW-17	UA	845	Barium, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	1.0	2.1	2.1	2	Background
AW-17	UA	845	Beryllium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AW-17	UA	845	Boron, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.42	2.0	0.54	2	Standard
AW-17	UA	845	Cadmium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AW-17	UA	845	Chloride, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	54	200	56	200	Standard
AW-17	UA	845	Chromium, total	mg/L	02/11/2021 - 07/21/2021	CI around median	0.004	0.10	0.048	0.1	Standard
AW-17	UA	845	Cobalt, total	mg/L	02/11/2021 - 07/21/2021	Future median	0.0023	0.028	0.028	0.006	Background
AW-17	UA	845	Fluoride, total	mg/L	02/11/2021 - 07/21/2021	CI around median	0.25	4.0	0.40	4	Standard
AW-17	UA	845	Lead, total	mg/L	02/11/2021 - 07/21/2021	Future median	0.001	0.033	0.033	0.0075	Background
AW-17	UA	845	Lithium, total	mg/L	02/11/2021 - 07/21/2021	Future median	0.064	0.071	0.071	0.04	Background
AW-17	UA	845	Mercury, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
AW-17	UA	845	Molybdenum, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.000861	0.10	0.0062	0.1	Standard
AW-17	UA	845	pH (field)	SU	02/11/2021 - 07/21/2021	CI around mean	6.5	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AW-17	UA	845	Radium-226 + Radium 228, tot	pCi/L	02/11/2021 - 07/21/2021	CI around mean	2.5	9.6	9.6	5	Background
AW-17	UA	845	Selenium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.050	0.0032	0.05	Standard
AW-17	UA	845	Sulfate, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	1.0	400	6.5	400	Standard
AW-17	UA	845	Thallium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AW-17	UA	845	Total Dissolved Solids	mg/L	02/11/2021 - 07/21/2021	CI around mean	754	1200	1050	1200	Standard
AW-18	UA	845	Antimony, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
AW-18	UA	845	Arsenic, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.00297	0.030	0.030	0.01	Background
AW-18	UA	845	Barium, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.66	2.1	2.1	2	Background
AW-18	UA	845	Beryllium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard
AW-18	UA	845	Boron, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.58	2.0	0.54	2	Standard
AW-18	UA	845	Cadmium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AW-18	UA	845	Chloride, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	68	200	56	200	Standard
AW-18	UA	845	Chromium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.004	0.10	0.048	0.1	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AW-18	UA	845	Cobalt, total	mg/L	02/11/2021 - 07/21/2021	Future median	0.002	0.028	0.028	0.006	Background
AW-18	UA	845	Fluoride, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	-0.927	4.0	0.40	4	Standard
AW-18	UA	845	Lead, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.033	0.033	0.0075	Background
AW-18	UA	845	Lithium, total	mg/L	02/11/2021 - 07/21/2021	Future median	0.070	0.071	0.071	0.04	Background
AW-18	UA	845	Mercury, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
AW-18	UA	845	Molybdenum, total	mg/L	02/11/2021 - 07/21/2021	CB around linear reg	-0.00959	0.10	0.0062	0.1	Standard
AW-18	UA	845	pH (field)	SU	02/11/2021 - 07/21/2021	CI around median	6.4	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AW-18	UA	845	Radium-226 + Radium 228, tot	pCi/L	02/11/2021 - 07/21/2021	CI around mean	1.8	9.6	9.6	5	Background
AW-18	UA	845	Selenium, total	mg/L	02/11/2021 - 07/21/2021	CI around median	0.001	0.050	0.0032	0.05	Standard
AW-18	UA	845	Sulfate, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	1.8	400	6.5	400	Standard
AW-18	UA	845	Thallium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AW-18	UA	845	Total Dissolved Solids	mg/L	02/11/2021 - 07/21/2021	CI around mean	742	1200	1050	1200	Standard
AW-19	UA	845	Antimony, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
AW-19	UA	845	Arsenic, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.00994	0.030	0.030	0.01	Background
AW-19	UA	845	Barium, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.17	2.1	2.1	2	Background
AW-19	UA	845	Beryllium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard
AW-19	UA	845	Boron, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	2.5	2.0	0.54	2	Standard
AW-19	UA	845	Cadmium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AW-19	UA	845	Chloride, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	79	200	56	200	Standard
AW-19	UA	845	Chromium, total	mg/L	02/11/2021 - 07/21/2021	CI around median	0.004	0.10	0.048	0.1	Standard
AW-19	UA	845	Cobalt, total	mg/L	02/11/2021 - 07/21/2021	Future median	0.002	0.028	0.028	0.006	Background
AW-19	UA	845	Fluoride, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.28	4.0	0.40	4	Standard
AW-19	UA	845	Lead, total	mg/L	02/11/2021 - 07/21/2021	CB around linear reg	-0.00183	0.033	0.033	0.0075	Background
AW-19	UA	845	Lithium, total	mg/L	02/11/2021 - 07/21/2021	Future median	0.021	0.071	0.071	0.04	Background

RAMBOLL

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AW-19	UA	845	Mercury, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
AW-19	UA	845	Molybdenum, total	mg/L	02/11/2021 - 07/21/2021	CI around geomean	0.00296	0.10	0.0062	0.1	Standard
AW-19	UA	845	pH (field)	SU	02/11/2021 - 07/21/2021	CI around mean	6.7	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AW-19	UA	845	Radium-226 + Radium 228, tot	pCi/L	02/11/2021 - 07/21/2021	CI around mean	0.11	9.6	9.6	5	Background
AW-19	UA	845	Selenium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.050	0.0032	0.05	Standard
AW-19	UA	845	Sulfate, total	mg/L	02/11/2021 - 07/21/2021	CB around linear reg	35	400	6.5	400	Standard
AW-19	UA	845	Thallium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AW-19	UA	845	Total Dissolved Solids	mg/L	02/11/2021 - 07/21/2021	CI around mean	523	1200	1050	1200	Standard
AW-20	UA	845	Antimony, total	mg/L	02/11/2021 - 05/05/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
AW-20	UA	845	Arsenic, total	mg/L	02/11/2021 - 05/05/2021	CI around mean	0.011	0.030	0.030	0.01	Background
AW-20	UA	845	Barium, total	mg/L	02/11/2021 - 05/05/2021	CI around mean	0.12	2.1	2.1	2	Background
AW-20	UA	845	Beryllium, total	mg/L	02/11/2021 - 05/05/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard
AW-20	UA	845	Boron, total	mg/L	02/11/2021 - 05/05/2021	CI around mean	2.1	2.0	0.54	2	Standard
AW-20	UA	845	Cadmium, total	mg/L	02/11/2021 - 05/05/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AW-20	UA	845	Chloride, total	mg/L	02/11/2021 - 05/05/2021	CI around mean	86	200	56	200	Standard
AW-20	UA	845	Chromium, total	mg/L	02/11/2021 - 05/05/2021	CI around median	0	0.10	0.048	0.1	Standard
AW-20	UA	845	Cobalt, total	mg/L	02/11/2021 - 05/05/2021	Future median	0.002	0.028	0.028	0.006	Background
AW-20	UA	845	Fluoride, total	mg/L	02/11/2021 - 05/05/2021	CI around mean	0.24	4.0	0.40	4	Standard
AW-20	UA	845	Lead, total	mg/L	02/11/2021 - 05/05/2021	Future median	0.001	0.033	0.033	0.0075	Background
AW-20	UA	845	Lithium, total	mg/L	02/11/2021 - 05/05/2021	Future median	0.020	0.071	0.071	0.04	Background
AW-20	UA	845	Mercury, total	mg/L	02/11/2021 - 05/05/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
AW-20	UA	845	Molybdenum, total	mg/L	02/11/2021 - 05/05/2021	CI around mean	0.00216	0.10	0.0062	0.1	Standard
AW-20	UA	845	pH (field)	SU	02/11/2021 - 05/05/2021	CI around mean	6.5	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AW-20	UA	845	Radium-226 + Radium 228, tot	pCi/L	02/11/2021 - 05/05/2021	CI around mean	0.12	9.6	9.6	5	Background

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AW-20	UA	845	Selenium, total	mg/L	02/11/2021 - 05/05/2021	All ND - Last	0.001	0.050	0.0032	0.05	Standard
AW-20	UA	845	Sulfate, total	mg/L	02/11/2021 - 05/05/2021	CI around mean	37	400	6.5	400	Standard
AW-20	UA	845	Thallium, total	mg/L	02/11/2021 - 05/05/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AW-20	UA	845	Total Dissolved Solids	mg/L	02/11/2021 - 05/05/2021	CI around mean	701	1200	1050	1200	Standard
AW-21	UA	845	Antimony, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
AW-21	UA	845	Arsenic, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.000778	0.030	0.030	0.01	Background
AW-21	UA	845	Barium, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.064	2.1	2.1	2	Background
AW-21	UA	845	Beryllium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard
AW-21	UA	845	Boron, total	mg/L	02/11/2021 - 07/21/2021	CI around median	11	2.0	0.54	2	Standard
AW-21	UA	845	Cadmium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AW-21	UA	845	Chloride, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	94	200	56	200	Standard
AW-21	UA	845	Chromium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.004	0.10	0.048	0.1	Standard
AW-21	UA	845	Cobalt, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.002	0.028	0.028	0.006	Background
AW-21	UA	845	Fluoride, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.32	4.0	0.40	4	Standard
AW-21	UA	845	Lead, total	mg/L	02/11/2021 - 07/21/2021	Future median	0.001	0.033	0.033	0.0075	Background
AW-21	UA	845	Lithium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.020	0.071	0.071	0.04	Background
AW-21	UA	845	Mercury, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
AW-21	UA	845	Molybdenum, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	0.015	0.10	0.0062	0.1	Standard
AW-21	UA	845	pH (field)	SU	02/11/2021 - 07/21/2021	CI around median	6.7	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AW-21	UA	845	Radium-226 + Radium 228, tot	pCi/L	02/11/2021 - 07/21/2021	CI around mean	0.30	9.6	9.6	5	Background
AW-21	UA	845	Selenium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.050	0.0032	0.05	Standard
AW-21	UA	845	Sulfate, total	mg/L	02/11/2021 - 07/21/2021	CI around median	41	400	6.5	400	Standard
AW-21	UA	845	Thallium, total	mg/L	02/11/2021 - 07/21/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AW-21	UA	845	Total Dissolved Solids	mg/L	02/11/2021 - 07/21/2021	CI around mean	627	1200	1050	1200	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AW-22	UA	845	Antimony, total	mg/L	02/12/2021 - 05/05/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
AW-22	UA	845	Arsenic, total	mg/L	02/12/2021 - 05/05/2021	CI around mean	0.000857	0.030	0.030	0.01	Background
AW-22	UA	845	Barium, total	mg/L	02/12/2021 - 05/05/2021	CI around mean	0.65	2.1	2.1	2	Background
AW-22	UA	845	Beryllium, total	mg/L	02/12/2021 - 05/05/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard
AW-22	UA	845	Boron, total	mg/L	02/12/2021 - 05/05/2021	CI around mean	0.19	2.0	0.54	2	Standard
AW-22	UA	845	Cadmium, total	mg/L	02/12/2021 - 05/05/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
AW-22	UA	845	Chloride, total	mg/L	02/12/2021 - 05/05/2021	CI around mean	38	200	56	200	Standard
AW-22	UA	845	Chromium, total	mg/L	02/12/2021 - 05/05/2021	CI around median	0	0.10	0.048	0.1	Standard
AW-22	UA	845	Cobalt, total	mg/L	02/12/2021 - 05/05/2021	All ND - Last	0.002	0.028	0.028	0.006	Background
AW-22	UA	845	Fluoride, total	mg/L	02/12/2021 - 05/05/2021	CI around median	0	4.0	0.40	4	Standard
AW-22	UA	845	Lead, total	mg/L	02/12/2021 - 05/05/2021	Future median	0.001	0.033	0.033	0.0075	Background
AW-22	UA	845	Lithium, total	mg/L	02/12/2021 - 05/05/2021	Future median	0.020	0.071	0.071	0.04	Background
AW-22	UA	845	Mercury, total	mg/L	02/12/2021 - 05/05/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
AW-22	UA	845	Molybdenum, total	mg/L	02/12/2021 - 05/05/2021	CI around mean	0.000825	0.10	0.0062	0.1	Standard
AW-22	UA	845	pH (field)	SU	02/12/2021 - 05/05/2021	CI around mean	6.5	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
AW-22	UA	845	Radium-226 + Radium 228, tot	pCi/L	02/12/2021 - 05/05/2021	CI around mean	0.62	9.6	9.6	5	Background
AW-22	UA	845	Selenium, total	mg/L	02/12/2021 - 05/05/2021	CI around median	0	0.050	0.0032	0.05	Standard
AW-22	UA	845	Sulfate, total	mg/L	02/12/2021 - 05/05/2021	All ND - Last	1.0	400	6.5	400	Standard
AW-22	UA	845	Thallium, total	mg/L	02/12/2021 - 05/05/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
AW-22	UA	845	Total Dissolved Solids	mg/L	02/12/2021 - 05/05/2021	CI around mean	494	1200	1050	1200	Standard
P002	UCF	845	Antimony, total	mg/L	02/12/2021 - 05/04/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
P002	UCF	845	Arsenic, total	mg/L	02/12/2021 - 05/04/2021	CI around mean	0.00432	0.030	0.030	0.01	Background
P002	UCF	845	Barium, total	mg/L	02/12/2021 - 05/04/2021	CI around mean	0.091	2.1	2.1	2	Background
P002	UCF	845	Beryllium, total	mg/L	02/12/2021 - 05/04/2021	All ND - Last	0.001	0.004	0.0019	0.004	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
P002	UCF	845	Boron, total	mg/L	02/12/2021 - 05/04/2021	CI around mean	1.0	2.0	0.54	2	Standard
P002	UCF	845	Cadmium, total	mg/L	02/12/2021 - 05/04/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
P002	UCF	845	Chloride, total	mg/L	02/12/2021 - 05/04/2021	CI around mean	66	200	56	200	Standard
P002	UCF	845	Chromium, total	mg/L	02/12/2021 - 05/04/2021	All ND - Last	0.004	0.10	0.048	0.1	Standard
P002	UCF	845	Cobalt, total	mg/L	02/12/2021 - 05/04/2021	Future median	0.0044	0.028	0.028	0.006	Background
P002	UCF	845	Fluoride, total	mg/L	02/12/2021 - 05/04/2021	CI around mean	0.29	4.0	0.40	4	Standard
P002	UCF	845	Lead, total	mg/L	02/12/2021 - 05/04/2021	All ND - Last	0.001	0.033	0.033	0.0075	Background
P002	UCF	845	Lithium, total	mg/L	02/12/2021 - 05/04/2021	All ND - Last	0.020	0.071	0.071	0.04	Background
P002	UCF	845	Mercury, total	mg/L	02/12/2021 - 05/04/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
P002	UCF	845	Molybdenum, total	mg/L	02/12/2021 - 05/04/2021	CI around mean	0.00149	0.10	0.0062	0.1	Standard
P002	UCF	845	pH (field)	SU	02/12/2021 - 05/04/2021	CI around mean	6.3	6.3/9.0	6.3/7.1	6.5/9	Background/Standard
P002	UCF	845	Radium-226 + Radium 228, tot	pCi/L	02/12/2021 - 05/04/2021	CI around mean	-0.0361	9.6	9.6	5	Background
P002	UCF	845	Selenium, total	mg/L	02/12/2021 - 05/04/2021	All ND - Last	0.001	0.050	0.0032	0.05	Standard
P002	UCF	845	Sulfate, total	mg/L	02/12/2021 - 05/04/2021	CI around mean	0.93	400	6.5	400	Standard
P002	UCF	845	Thallium, total	mg/L	02/12/2021 - 05/04/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
P002	UCF	845	Total Dissolved Solids	mg/L	02/12/2021 - 05/04/2021	CI around mean	722	1200	1050	1200	Standard

RAMBOLL

Notes:
Potential exceedance of GWPS
HSU = hydrostratigraphic unit:
BCU = Bedrock Confining Unit
UA = Uppermost Aquifer
UCF = Upper Cahokia Formation
Program = regulatory program data were collected under:
257 = 40 C.F.R. Part 257 Subpart D (Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments)
845 = 35 I.A.C. Part 845 (Sampling events completed to assess well locations for inclusion in the Part 845 monitoring well network)
mg/L = milligrams per liter
pCi/L = picoCuries per liter
SU = standard units
Sample Count = number of samples from Sampled Date Range used to calculate the Statistical Result
Statistical Calculation = method used to calculate the statistical result:
All ND - Last = All results were below the reporting limit, and the last determined reporting limit is shown
CB around linear reg = Confidence band around linear regression
CB around T-S line = Confidence band around Thiel-Sen line
CI around geomean = Confidence interval around the geometric mean
CI around mean = Confidence interval around the mean
CI around median = Confidence interval around the median
Future median = Median of the three most recent samples
Most recent sample = Result for the most recently collected sample used due to insufficient data
Statistical Result = calculated in accordance with Statistical Analysis Plan using constituent concentrations observed at monitoring well during all sampling events within the specified date range
For pH, the values presented are the lower / upper limits
GWPS = Groundwater Protection Standard
GWPS Source:
Standard = standard specified in 35 I.A.C. § 845.600(a)(1)
Background = background concentration (see cover page for additional information)

TABLE 2. SUMMARY OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
EDWARDS POWER PLANT
ASH POND
BARTONVILLE, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
AP05D	BCU	845	Lithium, total	mg/L	02/10/2021 - 05/07/2021	Future median	0.077	0.071	0.071	0.04	Background
AP07S	UCF	845	Boron, total	mg/L	02/10/2021 - 07/22/2021	CB around linear reg	8.0	2.0	0.54	2	Standard
AP07S	UCF	845	Total Dissolved Solids	mg/L	02/10/2021 - 07/22/2021	CB around linear reg	1340	1200	1050	1200	Standard
AP07D	BCU	845	Chloride, total	mg/L	02/10/2021 - 07/22/2021	CI around mean	498	200	56	200	Standard
AP07D	BCU	845	Lithium, total	mg/L	02/10/2021 - 07/22/2021	Future median	0.15	0.071	0.071	0.04	Background
AW-05	UA	845	Boron, total	mg/L	06/17/2021 - 07/22/2021	Most recent sample	2.9	2.0	0.54	2	Standard
AW-15C	BCU	845	Barium, total	mg/L	02/12/2021 - 07/21/2021	CI around mean	2.9	2.1	2.1	2	Background
AW-15S	UCF	845	Boron, total	mg/L	02/12/2021 - 07/21/2021	CI around mean	5.3	2.0	0.54	2	Standard
AW-15S	UCF	845	Sulfate, total	mg/L	02/12/2021 - 07/21/2021	CB around linear reg	548	400	6.5	400	Standard
AW-15S	UCF	845	Total Dissolved Solids	mg/L	02/12/2021 - 07/21/2021	CI around mean	1220	1200	1050	1200	Standard
AW-19	UA	845	Boron, total	mg/L	02/11/2021 - 07/21/2021	CI around mean	2.5	2.0	0.54	2	Standard
AW-20	UA	845	Boron, total	mg/L	02/11/2021 - 05/05/2021	CI around mean	2.1	2.0	0.54	2	Standard
AW-21	UA	845	Boron, total	mg/L	02/11/2021 - 07/21/2021	CI around median	11	2.0	0.54	2	Standard

Notes:
HSU = hydrostratigraphic unit:
BCU = Bedrock Confining Unit
UA = Uppermost Aquifer
UCF = Upper Cahokia Formation
Program = regulatory program data were collected under:
257 = 40 C.F.R. Part 257 Subpart D (Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments)
845 = 35 I.A.C. Part 845 (Sampling events completed to assess well locations for inclusion in the Part 845 monitoring well network)
mg/L = milligrams per liter
pCi/L = picoCuries per liter
SU = standard units
Sample Count = number of samples from Sampled Date Range used to calculate the Statistical Result
Statistical Calculation = method used to calculate the statistical result:
CB around linear reg = Confidence band around linear regression
CI around mean = Confidence interval around the mean
CI around median = Confidence interval around the median
Future median = Median of the three most recent samples
Most recent sample = Result for the most recently collected sample used due to insufficient data
Statistical Result = calculated in accordance with Statistical Analysis Plan using constituent concentrations observed at monitoring well during all sampling events within the specified date range
For pH, the values presented are the lower / upper limits
GWPS = Groundwater Protection Standard
GWPS Source:
Standard = standard specified in 35 I.A.C. § 845.600(a)(1)
Background = background concentration (see cover page for additional information)

ATTACHMENT N

Certification of Financial Assurance Requirements

On June 17, 2021, Illinois Power Resources Generating, LLC provided financial assurance in the form of a performance bond to the Illinois Environmental Protection Agency in the amount of $29,038,597 for Ash Pond 1 at the Edwards Power Plant.[1]

I, Matthew A. Goering, Senior Vice President of Illinois Power Resources Generating, LLC, do hereby certify to the best of my knowledge for the above referenced CCR Unit that the financial assurance instrument satisfies the requirements of 35 I.A.C. Part 845, Subpart I.

____

Matthew A. Goering
Senior Vice President
Illinois Power Resources Generating, LLC

[1] In the operating permit applications, Ash Pond 1 is referred to as the Ash Pond.

ATTACHMENT O

Stantec Consulting Services Inc.
1859 Bowles Avenue Suite 250, Fenton MO 63026-1944

October 12, 2016
File: let_025_175666013_certification
Revision 0

Initial Hazard Potential Classification Assessment
EPA Final CCR Rule
Ash Pond
Edwards Power Station
Peoria County, Illinois

1.0 PURPOSE

This report documents Stantec's certification of the initial hazard potential classification assessment for the Edwards Power Station Ash Pond.

40 CFR 257.73(a)(2) requires the owner or operator of an existing CCR surface impoundment to conduct an initial hazard potential classification assessment and document the hazard potential classification, and the basis for the classification, of the CCR unit as either a high hazard potential CCR surface impoundment, a significant hazard potential CCR surface impoundment, or a low hazard potential CCR surface impoundment.

2.0 FINDINGS

A breach analysis was performed to evaluate potential hazards associated with a failure of the Ash Pond perimeter containment dike. The breach analysis involved transferring stored volumes within the Ash Pond for various scenarios to evaluate potential impacts to downstream areas. Breaches were evaluated at two different scenarios: 1) pond elevation at embankment crest, and 2) peak elevation produced by the Probable Maximum Precipitation (PMP) storm event. Two breach locations were selected at the southeast and southwest embankments of the Ash Pond due to potentially impacted features along their anticipated breach flow paths.

Results from the breach analysis indicate that multiple areas, including two mobile homes, to the west and south of the Ash Pond may be impacted by a failure of the Ash Pond's perimeter dike. Due to resultant breach flood depths at these locations, it was concluded that a failure of the Ash Pond's perimeter dike will probably cause loss of human life.

40 CFR 257.53 defines a "high hazard potential CCR surface impoundment" as a diked surface impoundment where failure or mis-operation will probably cause loss of human life.

Based on the results of the analysis summarized above, the Ash Pond was assigned a High hazard potential classification per 40 CFR 257.53.

3.0 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I, Matthew Hoy, being a Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief that;

1. the information contained in this report and the underlying data in the operating record was prepared in accordance with the accepted practice of engineering and is accurate as of the date of my signature below; and

2. the initial hazard potential classification assessment for the Edwards Power Station Ash Pond was conducted in accordance with the requirements specified in 40 CFR 257.73.

SIGNATURE ______________________ DATE 10/12/2016

ADDRESS: Stantec Consulting Services Inc.
1859 Bowles Avenue Suite 250
Fenton MO 63026-1944

TELEPHONE: (636) 343-3880

ATTACHMENT P

AECOM

Submitted to
Illinois Power Resources
Generating, LLC
7800 S. Cilco Lane
Bartonville, IL 61607

Submitted by
AECOM
1001 Highlands Plaza Drive West
Suite 300
St. Louis, MO 63110

October 2016

CCR Rule Report: Initial Structural Stability Assessment

For

Ash Pond

At Edwards Power Station

1 Introduction

This Coal Combustion Residual (CCR) Rule Report documents that the Ash Pond at the Illinois Power Resources Generating, LLC Edwards Power Station meets the structural stability assessment requirements specified in 40 Code of Federal Regulations (CFR) §257.73(d), except as noted herein. The Ash Pond is located near Bartonville, Illinois in Peoria County, approximately 0.1 miles west of the Edwards Power Station. The Ash Pond serves as the wet impoundment basin for CCR materials produced by the Edwards Power Station.

The Ash Pond is an existing CCR surface impoundment as defined by 40 CFR §257.53. The CCR Rule requires that an initial structural stability assessment for an existing CCR surface impoundment be completed by October 17, 2016. In general, the initial structural stability assessment must document that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices.

The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer stating that the initial structural stability assessment was conducted in accordance with the requirements of 40 CFR § 257.73(d). The owner or operator must prepare a periodic structural stability assessment every five years.

2 Initial Structural Stability Assessment

40 CFR §257.73(d)(1)
The owner or operator of the CCR unit must conduct initial and periodic structural stability assessments and document whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein. The assessment must, at a minimum, document whether the CCR unit has been designed, constructed, operated, and maintained with [the standards in (d)(1)(i)-(vii)].

An initial structural stability assessment has been performed to document that the design, construction, operation and maintenance of the Ash Pond is consistent with recognized and generally accepted good engineering practices. The results of the structural stability assessment are discussed in the following sections. Based on the assessment and its results, the design, construction, operation, and maintenance of the Ash Pond were found to be consistent with recognized and generally accepted good engineering practices, and meets the standards in 257.73(d)(1)(i)-(vii), except as noted herein.

2.1 Foundations and Abutments (§257.73(d)(1)(i))

CCR unit designed, constructed, operated, and maintained with stable foundations and abutments.

The stability of the foundations was evaluated using soil data from field investigations and reviewing design drawings, operational and maintenance procedures, and conditions observed in the field by AECOM. Additionally, slope stability analyses were performed to evaluate slip surfaces passing through the foundations and the abutments.

The foundation consists of soft to stiff soil. Slope stability analyses exceed the criteria listed in §257.73(e)(1) for slip surfaces passing through the foundation and abutments. The slope stability analyses are discussed in the *CCR Rule Report: Initial Safety Factor Assessment for Ash Pond at Edwards Power Station* (October 2016). A review of operational and maintenance procedures as well as current and past performance of the dikes has determined appropriate processes are in place for continued operational performance.

Based on the conditions observed by AECOM, the Ash Pond was designed and constructed with stable foundations. Operational and maintenance procedures are in place to address any issues related to the stability of foundations. Therefore, the Ash Pond meets the requirements in §257.73(d)(1)(i).

2.2 Slope Protection (§257.73(d)(1)(ii))

CCR unit designed, constructed, operated, and maintained with adequate slope protection to protect against surface erosion, wave action and adverse effects of sudden drawdown.

The adequacy of slope protection was evaluated by reviewing design drawings, operational and maintenance procedures, and conditions observed in the field by AECOM.

Based on this evaluation, adequate slope protection was designed and constructed at the Ash Pond. No evidence of significant areas of erosion or wave action were observed. The interior slopes are covered with vegetation in some areas and crushed stone in other areas. The exterior slopes are covered in vegetation with some limited areas of crushed stone. Operational and maintenance procedures to repair the vegetation and crushed stone as needed are appropriate to protect against surface erosion and wave action. Intentional or unintentional sudden drawdown of the pool in the Ash Pond is not expected to occur due to the characteristics of the spillway structure.

Because sudden drawdown conditions are not expected to occur, slope protection to protect against the adverse effects of sudden drawdown is not required. Therefore, the Ash Pond meets the requirements in §257.73(d)(1)(ii).

2.3 Dike Compaction (§257.73(d)(1)(iii))

CCR unit designed, constructed, operated, and maintained with dikes mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit.

The density of the dike materials was evaluated using soil data from field investigations and reviewing design drawings, operational and maintenance procedures, and conditions observed in the field by AECOM. Additionally, slope stability analyses were performed to evaluate slip surfaces passing through the dike over the range of expected loading conditions as defined within §257.73(e)(1).

Based on this evaluation, the dike consists of soft to very stiff material that is stiff on average, which is indicative of mechanically compacted dikes. Slope stability analyses factors of safety exceed the criteria listed in §257.73(e)(1) for slip surfaces passing through the dike. The slope stability analyses are discussed in the *CCR Rule Report: Initial Safety Factor Assessment for the Ash Pond at Edwards Power Station* (October 2016); therefore, the original design and construction of the Ash Pond included sufficient dike compaction and density. Operational and maintenance procedures are in place to identify and mitigate deficiencies in order to maintain sufficient compaction of the dikes to withstand the range of loading conditions. Therefore, the Ash Pond meets the requirements in §257.73(d)(1)(iii).

2.4 Vegetated Slopes (§257.73(d)(1)(iv))[1]

CCR unit designed, constructed, operated, and maintained with vegetated slopes of dikes and surrounding areas, except for slopes which have an alternate form or forms of slope protection.

The adequacy of slope vegetation was evaluated by reviewing design drawings, operational and maintenance procedures, and conditions observed in the field by AECOM.

Based on this evaluation, the vegetation on the exterior and interior slopes is adequate as no substantial bare or overgrown areas were observed. Crushed stone is present in some locations on the interior and exterior slopes, which is an alternate form of slope protection. Therefore, the original design and construction of the Ash Pond included adequate vegetation of the dikes and surrounding areas. Adequate operational and maintenance procedures are in place to regularly manage vegetation growth, including mowing and seeding any bare areas, as evidenced by the conditions observed by AECOM. Therefore, the Ash Pond meets the requirements in §257.73(d)(1)(iv).

[1] As modified by court order issued June 14, 2016, Utility Solid Waste Activities Group v. EPA, D.C. Cir. No. 15-1219 (order granting remand and vacatur of specific regulatory provisions).

2.5 Spillways (§257.73(d)(1)(v))

CCR unit designed, constructed, operated, and maintained with a single spillway or a combination of spillways configured as specified in [paragraph (A) and (B)]:

(A) All spillways must be either:

(1) of non-erodible construction and designed to carry sustained flows; or

(2) earth- or grass-lined and designed to carry short-term, infrequent flows at non-erosive velocities where sustained flows are not expected.

(B) The combined capacity of all spillways must adequately manage flow during and following the peak discharge from a:

(1) Probable maximum flood (PMF) for a high hazard potential CCR surface impoundment; or

(2) 1000-year flood for a significant hazard potential CCR surface impoundment; or

(3) 100-year flood for a low hazard potential CCR surface impoundment.

The spillway was evaluated using design drawings, operational and maintenance procedures, and conditions observed in the field by AECOM. Additionally, hydrologic and hydraulic analyses were completed to evaluate the capacity of the spillway relative to inflow estimated for the probable maximum flood event for the high hazard potential Ash Pond. The hazard potential classification assessment was performed by Stantec in 2016 in accordance with §257.73(a)(2).

The primary spillway is comprised of a drop inlet riser structure that is constructed of either a corrugated metal pipe (CMP) or reinforced concrete pipe (RCP), and a CMP outlet pipe. The CMP and concrete (if present) are non-erodible materials designed to carry sustained flows. The capacity of the spillway was evaluated using hydrologic and hydraulic analysis performed per §257.82(a). The analysis found that the spillway can adequately manage flow during peak discharge resulting from the Probable Maximum Flood storm event without overtopping of the embankments. The hydrologic and hydraulic analyses are discussed in the *CCR Rule Report: Initial Inflow Design Flood Control System Plan for Ash Pond at Edwards Power Station* (October 2016). Operational and maintenance procedures are in place to repair any issues with the spillway and remove debris or other obstructions from the spillway, as evidenced by the conditions observed by AECOM. As a result, these procedures are appropriate for maintaining the spillway. Therefore, the Ash Pond meets the requirements in §257.73(d)(1)(v).

2.6 Stability and Structural Integrity of Hydraulic Structures (§257.73(d)(1)(vi))

CCR unit designed, constructed, operated, and maintained with hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit that maintain structural integrity and are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure.

Two hydraulic structures are present which pass through the dike of the Ash Pond: the CMP primary spillway outlet pipe and a high-density polyethylene (HDPE) sewer force main. The stability and structural integrity of the pipes were evaluated using design drawings, operational and maintenance procedures, inspections, and conditions observed in the field by AECOM. No other hydraulic structures are known to pass through the dike of or underlie the base of the Edwards Ash Pond.

The evaluation of design drawings and operational and maintenance procedures and conditions observed in the field did not identify any issues with either hydraulic structure. However, the evaluation of the stability and structural integrity of both hydraulic structures has not been fully completed, as high pipe flows in the primary spillway, required for operation of the Edwards Power Station, preclude closed circuit television (CCTV) inspection. Additionally, access issues preclude complete inspection of the sewer force main pipe, although a partial inspection was performed which found the inspected portions of the hydraulic structure to be free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris that may negatively affect the operation of the hydraulic structure.

Based on this evaluation, the hydraulic structures at the Edwards Power Station cannot be certified to meet the requirements of §257.73(d)(1)(vi) because a complete CCTV inspection of both hydraulic structures has not yet been performed, thus, precluding completion of the evaluation of the stability and structural integrity of the pipes. In accordance with §257.73(d)(2), AECOM recommends that a CCTV pipe inspection of both hydraulic structures be completed as soon as feasible and that this assessment be updated once the inspection is completed.

2.7 Downstream Slope Inundation/Stability (§257.73(d)(1)(vii))

CCR unit designed, constructed, operated, and maintained with, for CCR units with downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream or lake, downstream slopes that maintain structural stability during low pool of the adjacent water body or sudden drawdown of the adjacent water body.

The structural stability of the downstream slopes of the Ash Pond was evaluated by comparing the location of the Ash Pond relative to adjacent water bodies using published Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), aerial imagery, and conditions observed in the field by AECOM.

Based on this evaluation, water bodies are not expected to inundate the downstream slopes of the Ash Pond. Although the Ash Pond is shown within the 100-year flood zone for the Illinois River on the FEMA FIRM map for the area, the Ash Pond is located behind a United States Army Corps of Engineers (USACE) levee. The levee was constructed to an elevation of 462 feet, which is 3 feet higher than the 100-year elevation of the Illinois River listed on the FIRM map (459 feet). Therefore, inundation of the downstream slopes is not expected to occur.

Based on this evaluation, the requirements in §257.73(d)(1)(vii) are not applicable to the Ash Pond, as inundation of the downstream slopes is not expected to occur.

3 Certification Statement

CCR Unit: Illinois Power Resources Generating, LLC; Edwards Power Station; Ash Pond

I, Victor A. Modeer, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this CCR Rule Report, and the underlying data in the operating record, has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the initial structural stability assessment dated October 13, 2016 was conducted in accordance with the requirements of 40 CFR § 257.73(d).

VICTOR A. MODEER JR.
Printed Name

10/13/16
Date

VICTOR ALBERT MODEER JR.
062-043112
REGISTERED
PROFESSIONAL
ENGINEER
OF
ILLINOIS
11/30/17

About AECOM

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ATTACHMENT Q

AECOM

Submitted to
Illinois Power Resources Generating, LLC
7800 S. Cilco Lane
Bartonville, IL 61607

Submitted by
AECOM
1001 Highlands Plaza Drive West
Suite 300
St. Louis, MO 63110

October 2016

CCR Rule Report: Initial Safety Factor Assessment

For

Ash Pond

At Edwards Power Station

1 Introduction

This Coal Combustion Residual (CCR) Rule Report documents that the Ash Pond at the Illinois Power Resources Generating, LLC Edwards Power Station meets the safety factor assessment requirements specified in 40 Code of Federal Regulations (CFR) §257.73(e). The Ash Pond is located near Bartonville, Illinois in Peoria County, approximately 0.1 miles west of the Edwards Power Station. The Ash Pond serves as the wet impoundment basin for CCR material produced by the Edwards Power Station.

The Ash Pond is an existing CCR surface impoundment as defined by 40 CFR §257.53. The CCR Rule requires that the initial safety factor assessment for an existing CCR surface impoundment be completed by October 17, 2016.

The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer stating that the initial safety factor assessment meets the requirements of 40 CFR § 257.73(e). The owner or operator must prepare a safety factor assessment every five years.

2 Initial Safety Factor Assessment

40 CFR §257.73(e)(1)
The owner or operator must conduct initial and periodic safety factor assessments for each CCR unit and document whether the calculated factors of safety for each CCR unit achieve the minimum safety factors specified in (e)(1)(i) through (iv) of this section 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.

(i) The calculated static factor of safety under the long-term, maximum storage pool loading condition must equal or exceed 1.50.
(ii) The calculated static factor of safety under the maximum surcharge pool loading condition must equal or exceed 1.40.
(iii) The calculated seismic factor of safety must equal or exceed 1.00.
(iv) For dikes constructed of soils that have susceptibility to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.20.

A geotechnical investigation program and stability analyses were performed to evaluate the design, performance, and condition of the earthen dikes of the Ash Pond. The exploration consisted of auger borings, cone penetrating testing, and laboratory program including index, strength, and consolidation testing. Data collected from the geotechnical investigation, available design drawings, construction records, inspection reports, previous engineering investigations, and other pertinent historic documents were utilized to perform the safety factor assessment and geotechnical analyses.

In general, the subsurface conditions at the Ash Pond consist of a soft to very stiff compacted ash and clay dike, overlying stiff alluvial clay, overlying soft to medium stiff alluvial clay, which in turn overlies shale bedrock. Phreatic water is typically located above the embankment/foundation interface beneath the crest of the dike, and at the embankment/foundation interface near the toe of the dike.

Ten (10) representative cross sections were analyzed using limit equilibrium slope stability analysis software to evaluate stability of the perimeter dike system and foundations. The cross sections were located to represent critical surface geometry, subsurface stratigraphy, and phreatic conditions across the site. Each cross section was evaluated for each of the loading conditions stipulated in §257.73(e)(1).

The Soils Susceptible to Liquefaction loading condition, §257.73(e)(1)(iv), was not evaluated because a liquefaction susceptibly evaluation did not find soils susceptible to liquefaction within the Ash Pond dikes. As a result, this loading condition is not applicable to the Ash Pond at the Edwards Power Station.

Results of the Initial Safety Factor Assessments, for the critical cross-section, (i.e., the lowest calculated factor of safety out of the cross sections analyzed for each loading condition) are listed in Table 1.

Table 1 – Summary of Initial Safety Factor Assessment

Loading Conditions	§257.73(e)(1) Subsection	Minimum Factor of Safety	Calculated Factor of Safety
Maximum Storage Pool Loading	(i)	1.50	1.54
Maximum Surcharge Pool Loading	(ii)	1.40	1.54
Seismic	(iii)	1.00	1.08
Soils Susceptible to Liquefaction	(iv)	1.20	Not Applicable

Based on this evaluation, the Ash Pond meets the requirements in §257.73(e)(1).

3 Certification Statement

CCR Unit: Illinois Power Resources Generating, LLC; Edwards Power Station; Ash Pond

I, Victor A. Modeer, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this CCR Rule Report, and the underlying data in the operating record, has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the initial safety factor assessment dated October 13, 2016 meets the requirements of 40 CFR §257.73(e).

VICTOR A MODEER JR
Printed Name

10/13/16
Date

VICTOR ALBERT MODEER JR.
062-043112
REGISTERED
PROFESSIONAL
ENGINEER
OF
ILLINOIS
11/30/17

About AECOM

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More information on AECOM and its services can be found at www.aecom.com.

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ATTACHMENT R

AECOM

Submitted to
Illinois Power Resources
Generation, LLC
7800 S. Cilco Lane
Bartonville, IL 61607

Submitted by
AECOM
1001 Highlands Plaza Drive West
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St. Louis, MO 63110

October 2016

CCR Rule Report: Initial Inflow Design Flood Control System Plan

For

Ash Pond

At Edwards Power Station

1 Introduction

This Coal Combustion Residual (CCR) Rule Report documents that the initial inflow design flood control system plan for Ash Pond at the Illinois Power Resources Generating, LLC Edwards Power Station meets the requirements specified in 40 Code of Federal Regulations (CFR) §257.82. The Ash Pond is located near Bartonville, Illinois in Peoria County, approximately 0.1 miles west of the Edwards Power Station. The Ash Pond serves as the wet impoundment basin for CCR materials produced by the Edwards Power Station.

The Ash Pond is an existing CCR surface impoundment as defined by 40 CFR §257.53. The CCR Rule requires that the initial inflow design flood control system plan for an existing CCR surface impoundment be prepared by October 17, 2016. The plan must document how the inflow design flood control system has been designed and constructed to meet the requirements of 40 CFR §257.82 and be supported by appropriate engineering calculations.

The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer stating that the inflow design flood control system meets the requirements of 40 CFR §257.82. The owner or operator must prepare an inflow design flood control system plan every five years.

2 Initial Inflow Design Flood Control System Plan

40 CFR §257.82
(a) The owner or operator of an existing … CCR surface impoundment … must design, construct, operate, and maintain an inflow design flood control system as specified in paragraphs (a)(1) and (2) of this section.
(1) The inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge of the inflow design flood specified in paragraph (a)(3) of this section.
(2) The inflow design flood control system must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood specified in paragraph (a)(3) of this section.
(3) The inflow design flood is:
(i) For a high hazard potential CCR surface impoundment, …, the probable maximum flood;
(ii) For a significant hazard potential CCR surface impoundment, …, the 1,000-year flood;
(iii) For a low hazard potential CCR surface impoundment, …, the 100-year flood; or
(iv) For an incised CCR surface impoundment, the 25-year flood.
(b) Discharge from the CCR unit must be handled in accordance with the surface water requirements under §257.3-3.

Analyses completed for the initial inflow design flood control system plan of the Ash Pond are described in the following subsections. Data and analysis results in the following subsections are based on spillway design information shown on design drawings, construction information, topographic surveys, information about operational and maintenance procedures provided by Illinois Power Resources Generating, LLC, and field measurements collected by AECOM. The analysis approach and results of the hydrologic and hydraulic analyses are presented in the following subsections.

The Ash Pond is comprised of three interior sub-basins (referred to as the Process Water Pond, the Fly Ash Pond, and the Clarification Pond) surrounded by a perimeter earthen dike.

The Ash Pond has a high hazard potential based on the initial hazard potential classification assessment performed by Stantec in 2016 in accordance with 257.73(a)(2).

2.1 Initial Inflow Design Flood Control Systems (§257.82(a))

An initial inflow design flood control system plan, supported by a hydraulic and hydrologic analysis, was developed for the Ash Pond by evaluating the effects of a 24-hour duration design storm for the Probable Maximum Flood (PMF) Inflow Design Flood (IDF) using a hydrologic HydroCAD (Version 10.0) computer model and a starting water surface elevation of 449.5 feet for the Process Water Pond and 447.2 feet for the Fly Ash Pond and Clarification Pond. The computer model evaluated the Ash Pond's ability to collect and control the PMF IDF under existing operational and maintenance procedures. Rainfall data for the PMF IDF was obtained from the National Weather Service Hydrometeorological Report No. 51 for the 10-square mile all-season Probable Maximum Precipitation. The PMF rainfall depth is 32.8 inches.

The HydroCAD model results for the Ash Pond indicate that the CCR unit has sufficient storage capacity and spillway structures to adequately manage (1) flow into the CCR unit during and following the peak discharge of the PMF IDF and (2) flow from the CCR unit to collect and control the peak discharge resulting from the PMF IDF. The peak water surcharge elevation is 457.8 feet in the Process Water Pond and 457.4 feet in the Fly Ash Pond and Clarification Pond during the IDF, and the minimum crest elevation of the Ash Pond dike is 458.8 feet in the Process Water Pond and 459.6 feet in the Fly Ash Pond and Clarification Pond. Therefore, overtopping is not expected.

Based on this evaluation, the Ash Pond meets the requirements in §257.82(a).

2.2 Discharge from the CCR Unit (§257.82(b))

40 CFR §257.82(b) provides that the discharge from the CCR unit must be handled in accordance with the surface water requirements under 40 CFR §257.3-3, which states the following:

> *(a) For purposes of section 4004(a) of the Act, a facility shall not cause a discharge of pollutants into waters of the United States that is in violation of the requirements of the National Pollutant Discharge Elimination System (NPDES) under section 402 of the Clean Water Act, as amended.*
> *(b) For purposes of section 4004(a) of the Act, a facility shall not cause a discharge of dredged material or fill material to waters of the United States that is in violation of the requirements under section 404 of the Clean Water Act, as amended.*
> *(c) A facility or practice shall not cause non-point source pollution of waters of the United States that violates applicable legal requirements implementing an areawide or Statewide water quality management plan that has been approved by the Administrator under section 208 of the Clean Water Act, as amended.*
> *(d) Definitions of the terms Discharge of dredged material, Point source, Pollutant, Waters of the United States, and Wetlands can be found in the Clean Water Act, as amended, 33 U.S.C. 1251 et seq., and implementing regulations, specifically 33 CFR part 323 (42 FR 37122, July 19, 1977).*

The handling of discharge was evaluated by reviewing design drawings, operational and maintenance procedures, conditions observed in the field by AECOM, and the inflow design flood control system plan developed per §257.82(a).

Based on this evaluation, outflow from the Ash Pond is ultimately routed through a NPDES-permitted discharge into the Illinois River. Hydraulic and hydrologic analyses performed as part of the initial inflow design flood control system plan found that the Ash Pond adequately manages outflow during the PMF, as overtopping of the Ash Pond embankments is not expected.

Therefore, discharge of pollutants in violation of the NPDES permit is not expected as all discharge is routed and controlled through the existing spillway system and NPDES-permitted outfall during both normal and IDF conditions. Based on this evaluation, the Ash Pond meets the requirements in §257.82(b).

3 Certification Statement

CCR Unit: Illinois Power Resources Generating, LLC; Edwards Power Station; Ash Pond

I, Victor A. Modeer, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this CCR Rule Report, and the underlying data in the operating record, has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the initial inflow design flood control system plan dated October 13, 2016 meets the requirements of 40 CFR §257.82.

VICTOR A MODEER JR.

Printed Name

10/13/16

Date

VICTOR ALBERT MODEER JR.
062-043112
REGISTERED
PROFESSIONAL
ENGINEER
OF
ILLINOIS

11/30/17

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ATTACHMENT S

PART 845 SAFETY AND HEALTH PLAN

EDWARDS POWER PLANT ASH POND

CONTENTS

APPENDICES

ACRONYMS & ABBREVIATIONS

%	Percent
§	Section
35 I.A.C.	Title 35 of the Illinois Administrative Code
29 C.F.R.	Title 29 of the Code of Federal Regulations
ACGIH	American Conference of Governmental Industrial Hygienists
CCR	Coal Combustion Residual
EPP	Edwards Power Plant
IPRG	Illinois Power Resources Generating, LLC
HAZWOPER	Hazardous Waste Operations and Emergency Response
ID	identification
IDLH	Immediately Dangerous to Life and Health
IEPA	Illinois Environmental Protection Agency
kV	kilovolt
NID	National Inventory of Dams
NIOSH	National Institute for Occupational Safety and Health
No.	number
OSHA	Occupational Safety and Health Administration
Part 845	35 I.A.C. Part 845: Residuals in Surface Impoundments
PEL	Permissible Exposure Level
PFAS	Per- and polyfluoroalkyl substances
PFD	Personal Flotation Device
PNOR	particulates not otherwise recognized
POC	Point of Contact
PPE	personal protective equipment
ppm	parts per million
SDS	Safety Data Sheet
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
TWA	time-weighted averages
USCG	United States Coast Guard

REVISION SUMMARY

Revision Date	**Description of Changes** (Section title or number – description)	**Responsible Party** (individual name or title, company / agency name, document reference and date)

PREFACE

Illinois Power Resources Generating, LLC (IPRG) has prepared this Safety and Health Plan in accordance with requirements set forth in Title 35 of the Illinois Administrative Code (35 I.A.C.) Part 845: Residuals in Surface Impoundments (Part 845), Section (§) 845.530. IPRG assessed health and safety hazards of its coal combustion residual (CCR) surface impoundments to develop and update this Safety and Health Plan.

This document describes the minimum anticipated protective measures necessary for worker health and safety at the Edwards Power Plant (EPP) Ash Pond (Vistra identification [ID] number [No.] 301, Illinois Environmental Protection Agency [IEPA] ID No. W1438050005-01, National Inventory of Dams [NID] No. IL50710). Employees of IPRG, contract workers, and third-party contractors must read and comply with the contents of this document. The contents of this document are not intended to cover all situations that may arise nor to waive any provisions specified in Federal, State, and local regulations or site owner / contractor health and safety requirements.

Third-party contractors are accountable for the health and safety of their employees. Third-party contractors are required to prepare a Safety and Health Plan that meets the minimum requirements herein. However, no requirements or provisions within this plan shall be construed as an assumption of IPRG of their legal responsibilities as an employer.

This Safety and Health Plan will be reviewed and updated annually, at a minimum. The Safety and Health Plan will also be updated if facility operations change, or a new hazard is identified.

1. INTRODUCTION

This Safety and Health Plan has been developed to outline the requirements to be met by employees of Illinois Power Resources Generating, LLC (IPRG), contract workers, and third-party contractors while performing any activity to construct, operate, or close the EPP Ash Pond. This Safety and Health Plan has been developed to meet the requirements of 35 I.A.C. § 845.530 and describes the responsibilities, training requirements, protective equipment, and safety procedures necessary to minimize the risk of injury, fires, explosion, chemical spills, material damage incidents, and near misses related to CCR activities. This Safety and Health Plan incorporates by reference the Occupational Safety and Health Administration (OSHA) regulations contained in Title 29 of the Code of Federal Regulations (29 C.F.R.) § 1910 and 29 C.F.R. § 1926.

The requirements and guidelines in this Safety and Health Plan are based on a review of available information and data, and an evaluation of identified on-site hazards. This Safety and Health Plan will be reviewed with persons assigned to work in the EPP Ash Pond and will be available on-site.

1.1 Site Description/History

The EPP is located in Peoria County between Mapleton and Bartonville in Section 11, Township 7 North, Range 7 East. The EPP is located near the Illinois River adjacent to a levee and has one CCR surface impoundment, the Ash Pond, covering approximately 91 surface acres. The EPP property is bordered by a salt processing facility to the north, railroad right-of-way and former Orchard Mines to the west, the Illinois River and fertilizer production facility to the east, and agricultural land to the south (Appendix A).

1.2 Facility Personnel

The following table outlines key IPRG personnel with respect to facility operations and health and safety. The Plant Control Room is the first point of contact for plant communication, including emergencies.

Name	Position	Phone Number
Mark Davis	Point-of-Contact (POC)/Environmental Manager	309-633-2861 (office) 309-241-4219 (mobile)
Brad Cantrell	Safety Supervisor	309-633-2417
Security	Security	309-633-2440
Control Room	Control Room (24/7)	309-633-2425
Kevin Largent	Managing Director	309-633-2410
Operations Shift Supervisor	Shift Supervisor (24/7)	309-633-2409 309-633-2425
Rick Kelley	Chemistry Supervisor	309-633-2474
Jason Huber	Railroad Supervisor	309-634-6617 (office) 309-202-1767 (mobile)
Coal Yard Transfer House	Coal Yard Transfer House	309-633-2424
Matt Ballance	Engineering Manager	618-343-7739 (office) 618-792-7274 (mobile)
Jason Campbell	Dam Safety Manager	271-753-8904 (Springfield) 217-622-3491 (mobile)
Stu Cravens	Senior Technical Expert	217-390-1503 (mobile)
Vic Modeer	Engineering Manager	618-541-0878

1.3 Responsibilities

The following persons have responsibilities associated with communicating and implementing the Safety and Health Plan for the EPP Ash Pond.

1.3.1 IPRG Point of Contact

The IPRG Point of Contact (POC) is a management-level person who is requiring employees, contract workers, or third-party contractors to enter the EPP Ash Pond. The IPRG POC is responsible to communicate Safety and Health Plan information and requirements to employees, contract workers, and third-party contractors, and oversee work performed in the EPP Ash Pond to the extent necessary to confirm implementation of Safety and Health Plan requirements.

1.3.2 IPRG Employees

IPRG employees are directly hired by IPRG. They are required to implement and/or follow Safety and Health Plan requirements as applicable to their work and exercise their "stop work authority" if safety requirements are unclear or unanticipated site conditions or hazards are observed.

1.3.3 Contract Workers

Contract workers are those hired by IPRG through an agency firm. Similar to IPRG employees, contract workers are required to implement and/or follow Safety and Health Plan requirements as applicable to their work and exercise their "stop work authority" if safety requirements are unclear or unanticipated site conditions or hazards are observed.

1.3.4 Third-Party Contractor Employees

Third-party contractor employees work for firms under contract to IPRG. Third-party contractors include prime contractors and all of their lower tier subcontractors. Similar to IPRG employees, third-party contractors are required to implement Safety and Health Plan requirements as applicable to their work and exercise their "stop work authority" if safety requirements are unclear or unanticipated site conditions or hazards are observed.

1.3.5 Third-Party Contractor Safety Competent Person

Third-party contractors will be required to designate a Safety Competent Person. The Safety Competent Person must be in a management position (*e.g.,* superintendent, foreman, etc.) with OSHA 30-hour construction safety certification who may perform other duties, unless IPRG requires a dedicated Safety Competent Person. A Safety Competent Person must be on site at all times when the subcontractor has employees performing work for IPRG and must possess a sound working knowledge of pertinent OSHA regulations, this Safety and Health Plan, and other applicable safety requirements related to the scope of work. Third-party contractors must also designate a backup Safety Competent Person that possesses the same authority and training. The competent person will ensure timely correction of safety deficiencies identified by IPRG. The Safety Competent Person is responsible to ensure Safety and Health Plan requirements have been communicated to lower-tier subcontractors and enforce Safety and Health Plan requirements.

2. SITE ACCESS & CONTROL

This section outlines requirements for ensuring that only authorized personnel and visitors are permitted at the EPP Ash Pond.

2.1 Facility Security

Elements of site control include restricting access to the EPP Ash Pond to persons until they have met the training requirements outlined in this Safety and Health Plan and have been authorized to do so by the EPP POC or their representative.

Prior to arriving to the facility all personnel must notify the IPRG POC. Upon arrival all personnel must check in at Security.

Upon arrival to the Site, all IPRG employees, contract workers, and third-party contractors must check in/out at Security. A COVID-19 screening must also be completed per Section 3.9.

2.2 Third-Party Contractor Management

Prior to working at EPP, all third-party contractors must maintain an active registration with ISNetworld and maintain a grade of A or B. Lower tier subcontractors are currently not required to be registered in ISNetworld, but this requirement may change at the discretion of IPRG.

2.3 Third-Party Contractor Safety and Health Plan

Prior to being authorized to conduct work at the EPP Ash Pond, third-party contractors must develop and submit a Safety and Health Plan. The third-party contractor's Safety and Health Plan must be specific to the scope of work that they will be performing at the EPP Ash Pond. The third-party contractor's Safety and Health Plan must meet or exceed all the requirements in this Safety and Health Plan, other IPRG requirements, and applicable regulations. All lower tier subcontractors of third-party contractors must meet the requirements in this Safety and Health Plan as well as the requirements outlined in the Safety and Health Plan of the third-party with whom they are contracted.

2.4 Authorized Personnel

At a minimum, authorized personnel who will be granted unescorted access to the project include IPRG employees, contract workers, and third-party contractors that meet the following:

- Reviewed this Safety and Health Plan and other applicable safety planning documentation.
- Have completed all the training, medical surveillance, and drug screen and background investigation requirements as outlined in Section 3 of this Safety and Health Plan.
- Have completed the Site Orientation/General Awareness Training.

2.5 Visitors

Visitors must be escorted by Authorized Personnel through the EPP Ash Pond if they have not reviewed this Safety and Health Plan or completed the training requirements outlined in Section 3 of this Safety and Health Plan. Visitors may not undertake any activity to construct, operate, or close a CCR surface impoundment.

2.6 Communication

Communication between workers and emergency services must be maintained at all times. Cellular service is consistently available and can be relied upon to summon emergency services.

3. TRAINING & MEDICAL REQUIREMENTS

Project personnel must be properly trained for the type of work being performed and in accordance with 35 I.A.C. § 845.530, 29 C.F.R. § 1926 and 29 C.F.R. § 1910, and IPRG policies. Additionally, personnel working in areas regulated by the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) standards (29 C.F.R. § 1910.120 and 29 C.F.R. § 1926.65) must have current medical surveillance. All employees, contractors, and third-party contractors must complete the following prior to beginning any activity to construct, operate, or close the EPP Ash Pond.

3.1 HAZWOPER Training

35 I.A.C. § 845.530(c)(2)(E) requires that all employees, contract workers, and third-party contractors be trained in accordance with 29 C.F.R. § 1910.120 and 29 C.F.R. § 1926.65. The following training will be completed as required by job function:

- **OSHA 40-Hour Training** per 29 C.F.R. § 1910.120 and 29 C.F.R. § 1926.65, for those personnel who are expected to have extensive contact with contaminated materials and/or may be required to wear a respirator.
- **OSHA 24-Hour Training** per 29 C.F.R. § 1910.120 and 29 C.F.R. § 1926.65, for those personnel who are expected to have minimal contact with contaminated materials and will NOT be required to wear a respirator.
- **OSHA 8-hour Supervisor Training** per 29 C.F.R. § 1910.120 and 29 C.F.R. § 1926.65, for Site Supervisors, Foremen, Superintendents, and others who will be directing and managing site activities.
- **OSHA 8-hour Refresher** per 29 C.F.R. § 1910.120 and 29 C.F.R. § 1926.65, completed within 12 months of initial 40-hour or 24-hour training and annually thereafter.

The following matrix outlines HAZWOPER training requirements based on typical job functions at the EPP Ash Pond. It is not intended to be all inclusive, new job functions must be evaluated per 29 C.F.R. § 1910.120 and 29 C.F.R. § 1926.65.

Training	Job Function
OSHA 40-hour	Ash handlers
OSHA 24-hour	Personnel not required to handle CCR materials
OSHA 8-hour Supervisor Training	Third-Party Contractor Safety Competent Persons
OSHA 8-hour refresher	All personnel

3.2 OSHA Construction Outreach Training

35 I.A.C. § 845.530(c)(2)(E) requires that all employees, contract workers, and third-party contractors complete an OSHA 10-hour or 30-hour construction safety training. These trainings will be completed as follows:

- All employees, contract workers, and third-party contract employees: OSHA 10-hour or 30-hour construction outreach training.
- Supervisors, superintendents, foreman and safety professionals: OSHA 30-hour construction outreach training.

3.3 EPP Ash Pond Safety and Health Plan Review

Pursuant to 35 I.A.C. § 845.530(d)(e), before beginning any activity at the EPP Ash Pond, and annually thereafter, all IPRG employees, contract workers, and third-party contractors must review the content of this HASP. After reviewing this Safety and Health Plan all personnel will understand the following:

- Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment
- Communications or alarm systems outlined in Section 6
- Response to fires and explosions outlined in Section 6
- Response to a spill or release of CCR
- Information about chemical hazards and hazardous materials outlined in Section 5
- The use of engineering controls, administrative controls, and personal protective equipment (PPE) outlined in Section 4

All personnel will acknowledge this HASP by signing the *Safety and Health Plan Acknowledgment Form (Appendix B).*

3.4 Emergency and Monitoring Equipment Training

All IPRG employees, contract workers, and third-party contractors must be aware of how to respond to alarms and other emergencies as outlined in Section 6 of this plan. Individuals may only use facility emergency and monitoring equipment if they have been trained in their use and authorized to do so by the designated POC. Additionally, a written release may need to be completed as required by Vistra Corporate Procedure FFA-POL-0006.

Individual IPRG employees and contract workers may be responsible for using, inspecting, repairing, and replacing facility emergency monitoring equipment. These individuals will be trained in accordance with procedures identified by IPRG. These individuals will review and adhere to the manufacturer’s instructions, where applicable.

Third-party contractors are responsible for inspecting, repairing, and replacing any owned emergency (*i.e.*, fire extinguishers) and monitoring equipment (*i.e.*, air monitoring equipment). Third-party contractors will maintain procedures for using, inspecting, repairing, and replacing owned emergency and monitoring equipment that is consistent with the manufacturer’s requirements. Third-party contractor employees who are responsible for this equipment will be trained in procedures for using, inspecting, and repairing owned equipment by their employer.

3.5 Ammonia Safety & Emergency Response

IPRG uses anhydrous ammonia in quantities that potentially pose a health risk to persons working on the EPP Ash Pond following a major release. All employees, contract workers, and third-party contractors must complete ammonia safety and emergency response training as required and provided by IPRG. Ammonia safety and emergency response training is covered in the Site Orientation/General Awareness Training.

3.6 Hazard Communication

All employees, contract workers, and third-party contractors must be trained in chemical hazards (if any) associated with their work in accordance with 29 C.F.R. § 1910.1200. Work tasks performed on the EPP Ash Pond may include exposure to compounds identified in the Hazard Communication section of this Safety and Health Plan and is included as part of the Safety and Health Plan Review outlined in Section 3.3.

3.7 Medical Surveillance

All employees, contract workers, and third-party contractors engaged in operations specified in 29 C.F.R. § 1910.120 and 29 C.F.R. § 1926.65 and meet one of the criteria outlined in 29 C.F.R. § 1910.120(f)(2) and 29 C.F.R. § 1926.65(f)(2) must participate in a medical surveillance program that is administered by their employer. The criteria for participating in a medical surveillance program are:

- All employees who are or may be exposed to hazardous substances at or above the established permissible exposure limit, without regard to the use of respirators, for 30 days or more a year;

- All employees who wear a respirator for 30 days or more a year; or
- All employees who are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation.

The medical surveillance program must result in documentation that an individual is cleared to work on sites covered by 29 C.F.R. § 1910.120 and 20 C.F.R. § 1926.65 and is medically fit to wear a respirator when applicable.

3.8 Drug Screen and Background Investigations

IPRG requires that contract worker agencies and third-party contractors are responsible for ensuring that all personnel have completed and passed a drug and alcohol test and background investigation prior to on-site work as described in Appendix C.

3.9 COVID-19 Site Entry Guidelines

All personnel entering Vistra work sites shall review and adhere to the site entry guidelines provided in Appendix D.

3.10 Document Management

IPRG will maintain employee and contract employee training and medical surveillance records in the site files located in the Main Plant Building. Third-party contractors are responsible for maintaining training and medical surveillance documentation for their employees. Third-party contractors will produce documentation upon IPRG request.

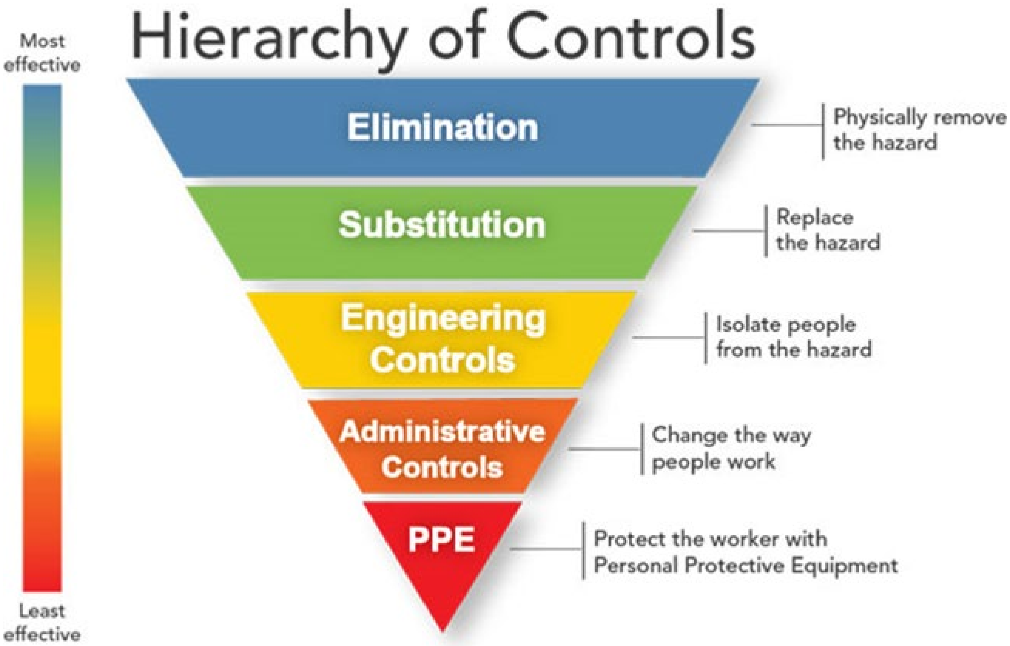
3.11 Industrial Hygiene Sampling Records

Upon receipt of exposure sampling results IPRG and third-party contractors must distribute exposure sampling results to employees within 15 business days unless otherwise required by applicable regulation. All personnel exposure sampling results and records must be maintained by the employee’s company for at least 30 years following termination of employment.

4. HAZARD & CONTROLS

The following section outlines general controls for the hazards and controls. Third-party contractors are still responsible for developing a Safety and Health Plan that incorporates requirements of this Safety and Health Plan, other safety requirements for the EPP, as well as the third-party contractor's safety policies and procedures. Safety and Health Plans developed by third-party contractors must be specific to the site and the anticipated work means and methods. Safety and Health Plans that consist of only standard operating procedures or are not otherwise specific to the work performed at the EPP Ash Pond will not be accepted by IPRG.

IPRG requires that a hierarchy of controls be considered when performing work at the EPP Ash Pond. Implement controls that favor elimination, substitution, and engineering over the use of administrative controls and PPE when feasible. See the figure below for additional guidance (courtesy of the National Institute for Occupational Safety and Health [NIOSH]).



4.1 Ash/Unstable Surfaces

Prior to working in or on an ash pond, third-party contractors must notify the facility POC. Work in or on an ash pond may not begin until the facility POC has approved the work. Upon completion of the work, third-party contractors must notify the POC that they have left the ash pond.

When working on ash ponds or unstable surfaces the following requirements must be implemented where applicable and feasible. The following table summarizes safety controls for work performed in ash ponds and on unstable surfaces and are aligned to the hierarchy of controls:

Elimination	Substitution	Engineering	Administrative	PPE
Change the work task or work methods so that work on ash ponds is no longer required	Use the lightest available tracked equipment to reduce ground pressure	Use crane mats or other cribbing to support heavy equipment on ash ponds	Traverse compacted paths that have previously been used by heavy equipment	Use a restraint (tethering) system to prevent falls or slips into unstable ash pond surfaces or surface water that represents a drowning hazard

Elimination	Substitution	Engineering	Administrative	PPE
			If an unstable condition exists, complete a Next Level Up Pre-Job Brief prior to accessing the ash pond.	
			Approach the ash pond from the most stable direction	
			Inspect travel paths for recent terrain shifts, particularly following heavy rains or rapid dewatering	
			Working alone on ash ponds is prohibited without pre-approval from the POC.	
			When a drowning hazard exists, implement requirements for working on/near water as outlined in Section 4.4.	
			Implement an emergency response plan with trained responders for falls into (or engulfment by) ash	

4.2 Ash Inhalation/Airborne Exposure

Ash that becomes airborne due to site activities or environmental conditions may result in an exposure to its components as outlined in Section 5.1. IPRG and third-party contractors are responsible for ensuring their respective employees' and contract workers' exposures are below occupational exposure limits. Upon request, third-party contractors must demonstrate to IPRG that exposure control methods are adequate. The following table summarizes airborne exposure controls and is aligned to the hierarchy of controls:

Elimination	Substitution	Engineering	Administrative	PPE
Change the work task or work methods so that work on ash ponds is no longer required	Substitute manual work methods for those that can be completed from the cab of a vehicle	Continually wet work areas to reduce the amount of ash that becomes airborne Equip vehicles and heavy equipment cabs with filters. Clean and change filters as required	Conduct air monitoring or exposure sampling to confirm that airborne exposure is below regulatory limits	If exposure levels are above the PEL, equip employees with respirators appropriate to the level of exposure

4.3 Stuck Vehicles/Equipment

If a vehicle or piece of equipment becomes stuck, a third-party towing or wrecking company who is trained in vehicle extraction must be retained and the IPRG POC will be notified. Third-party contractors may extract their own vehicle if they have an approved extraction plan and a competent person is on site to implement the extraction. The extraction plan shall be included as part of the third-party contractor’s reviewed and approved Safety and Health Plan. The above notifications are still required.

The hazards presented by stuck vehicles/equipment must not be underestimated. While the weight of the stuck equipment can be calculated, it’s impossible to precisely calculate the other forces that are pulling against the towing vehicle which requires special training and experience to properly size towing equipment and select towing techniques. This is especially true for “complex” or high-hazard extractions involving equipment stuck at axle depth (or beyond) or sloped surfaces or any area where extraction activities could trigger shifts in the ground surface. No chains shall be used to remove stuck vehicles/equipment.

The following table summarizes safety controls related to stuck vehicles and equipment and are aligned to the hierarchy of controls:

Elimination	Substitution	Engineering	Administrative	PPE
Change the work task or work methods so that work on ash ponds is no longer required	Use the lightest available tracked equipment to reduce ground pressure Substitute tracked equipment for wheeled equipment	Use crane mats or other cribbing to support heavy equipment on ash ponds Lighten the load – Remove materials from stuck vehicles or equipment prior to extraction if possible	Only persons trained in vehicle extraction are permitted to remove stuck vehicles/equipment A professional towing/wrecking service is required Prepare for spills (damage to fuel or hydraulic systems)	All persons involved in removing stuck equipment must wear PPE that includes hard hat, safety boots, safety glasses, high visibility vests, and cut resistant gloves

4.4 Working Near/Over Water

All employees, contract workers, and third-party contractors must wear a United States Coast Guard (USCG) approved personal floatation device (PFD), when within 6 feet of water, over water, and/or wading in water where the danger of drowning exists. The PFD must be properly secured to the wearer, free of all defects including rips, tears, stress, and fading, and be kept clean and free of excessive dirt and oil.

If the possibility of falling into water has been eliminated through the use of guardrails, fall restraint, or other method, the use of a PFD is no longer required.

When performing work on water from a vessel, at least one lifesaving rescue vessel (*e.g.,* a skiff) shall be immediately available at locations where employees are working over, in, on, or adjacent to water where the danger of drowning exists. However, if the water is so shallow that rescuers could simply walk/run into the water body without endangering themselves and/or others or the work was being conducted very close to shore (*e.g.,* the length of the skiff from shore would be greater than the working distance from shore and/or the skiff would foul on the bottom), a skiff would not be required.

The following table summarizes the requirements for working over/near water where a drowning hazard exists and are aligned to the hierarchy of controls:

Elimination	Substitution	Engineering	Administrative	PPE
Change the work task or work methods so that work near a drowning hazard is no longer required		Install guardrails that separate work areas from the drowning hazard	All work to be performed by at least two people where each is equipped with proper safety gear and capable of summoning emergency rescue	All personnel are required to wear suitable PFDs
		Utilize equipment (crowd-control barricades, safety fence, etc.) that will keep personnel at least 6 feet from a drowning hazard	When working on water use of a rescue skiff as outlined above	
			Use of a ring buoy with 90 feet of braided polycarbonate (or equivalent) line	
			Ring buoys must be positioned within 100 feet of work (maximum of 200 feet spacing)	

4.5 Heavy Equipment

All heavy equipment operators must be competent and authorized to operate each piece of heavy equipment. Forklift and telehandler (*e.g.,* Lull, JLG) operators must have a license or certificate that indicates they have passed a written test and "road" test for the equipment they will be operating within the last 3 years. Third-party contractors will provide proof of qualification upon request of IPRG.

Persons working around heavy equipment must implement the “25 Foot Rule.” The 25 Foot Rule requires that persons get the operator’s attention and permission prior to approaching closer than 25 feet to heavy equipment. Persons must walk quickly through blind spots. Loitering in heavy equipment blind spots (especially to the rear) must be avoided.

Temporary fuel storage tanks will be labelled as to their content and be protected from collision by Site vehicles using solid barricades including balusters, chain link fence, or equivalent. Spill kit (55-gallon sorbent capacity contained in an overpack) and one 20-pound Type ABC fire extinguisher will be located within 45 feet of fueling areas. Tanks will be rated for above ground use and will be double walled or have secondary containment in case of a leak. Tanks and dispensing hose will be bonded and grounded. On-site filling of fuel storage tanks will be completed with trucks that have automatic over-flow shutoffs. These trucks will be properly bonded to the storage tank and meet all of the other storage tank requirements. Temporary secondary containment must be provided in the refueling area that includes the storage tank and dispensing hoses.

Elimination	Substitution	Engineering	Administrative	PPE
		Heavy equipment (and vehicles) must be equipped with backup alarms, horns, roll-over protection (when feasible)	Operators must be competent and authorized	Operators must use seatbelts when equipped
		Vehicles and heavy equipment operated at night must have headlights, tail lamps, and reflectors	Forklift operators must have a current license or certificate (within 3 years)	High visibility vests are required when working around heavy equipment
			All vehicles and equipment must be turned off when not in use	
			Operators must inspect equipment daily prior to use	
			Persons working near heavy equipment must follow the “25 Foot Rule” and avoid lingering in blind spots as outlined above	
			Always obey site speed limits – 15 mph unless otherwise posted	

4.6 Overhead Powerlines

All overhead powerlines must be assumed to be energized until confirmed otherwise. The minimum clearance distance for equipment working near energized power lines must be in accordance with the table found in 29 C.F.R. § 1926.1408(h). The location and clearance distances for powerlines at EPP can be found in Appendix F.

The following table summarizes safety controls for work near energized power lines:

Elimination	Substitution	Engineering	Administrative	PPE
Plan to work away from powerlines	Use heavy equipment with shorter booms/attachments to avoid coming close to power lines	Contact the utility owner to deenergize the line	Install signs to warn personnel of overhead powerlines	

Elimination	Substitution	Engineering	Administrative	PPE
		Contact the utility owner to install insulated sleeves over energized lines	Install a non-conductive distance marker to delineate minimum clearance	
			Use a dedicated spotter to ensure equipment does not enter minimum clearance distances	

4.7 Severe Weather

Severe weather conditions include but are not limited to high winds, electrical storms, heavy rain, and tornados can cause hazardous conditions at CCR surface impoundments. The primary control for severe weather is monitoring weather reports prior to beginning work and as work occurs throughout the day.

Monitor lightning using a commercially available mobile application if cellular service is available. When lightning is observed within 10 miles of the CCR surface impoundment, or a storm is imminent, take shelter in the nearest solid structure or fully enclosed vehicle. If possible, secure all tools, materials, and equipment prior to the storm arriving. Work may resume 30 minutes after the last lightning strike is observed within 10 miles. The severe weather shelter location is the basement of the Rotary Car Dumper House on the southwest side of the plant; the location will be reviewed during the Site Orientation Training.

Do not conduct work on a CCR surface impoundment when there is a risk for tornados in the area. If on a CCR surface impoundment and a tornado forms, seek the nearest substantial shelter. The tornado shelter location is the basement of the Rotary Car Dumper House on the southwest side of the plant; the location will be reviewed during the Site Orientation Training. If no shelter is available, attempt to evacuate to a shelter using a vehicle. If a tornado forms and you are not in a shelter, take one of the following actions:

- Stay in a vehicle with the seat belt on, keep your head below the windows and cover it with your hands
- If there is an area which is noticeably lower than the work area, lie in that area and cover your head with your hands.

The following table summarizes safety controls related to severe weather:

Elimination	Substitution	Engineering	Administrative	PPE
Plan outdoor tasks on days with low potential for severe weather.			Prior to beginning outdoor work monitor the day’s weather.	
			Periodically monitor weather throughout the day. Use a weather app which issues alerts for severe weather and lightning, assuming cell service is available	

Elimination	Substitution	Engineering	Administrative	PPE
			Utilize a weather radio if cellular service is inconsistent	
			Stop all outdoor work and seek shelter when lightning is observed	

4.8 Heat Stress

Heat stress can be a significant hazard, especially for workers wearing protective clothing. Depending on the ambient conditions and the work being performed, heat stress can occur very rapidly, within as little as 15 minutes. Employees, contract workers, and third-party contractors will be instructed in the identification of a heat stress victim, the first-aid treatment procedures for the victim, and in the prevention of heat stress incidents.

Workers will be encouraged to immediately report any heat-related problems that they experience or observe in fellow workers. Any worker exhibiting signs of heat stress and exhaustion should be made to rest in a cool location and drink plenty of water. Emergency help by a medical professional is required immediately for anyone exhibiting symptoms of heat stroke, such as red, dry skin, confusion, delirium, or unconsciousness. Heat stroke is a life-threatening condition that must be treated immediately by competent medical authority.

4.8.1 Heat Stress Prevention

To prevent heat stress, IPRG employees, contract workers, and third-party contractors will implement heat stress prevention measures as outlined in OSHA's Heat Index (below). A summary of these precautions is described below.

Heat Index	Risk Level	Protective Measures
Less than 91°F	Lower (Caution)	Basic heat safety and planning
91°F to 103°F	Moderate	Implement precautions and heighten awareness
103°F to 115°F	High	Additional precautions to protect workers
Greater than 115°F	Very High to Extreme	Triggers even more aggressive protective measures

Know the Symptoms: Some symptoms associated with heat stress are: Employees should be aware of these symptoms with themselves and with their co-workers:

- Elevated heart rate, lack of concentration, difficulty focusing on a task, fatigue
- Irritability and/or sickness

- Cramps, rash, headache
- Loss of desire to drink water
- Fainting
- Skin clammy, moist, and pale (severe heat exhaustion)
- Skin extremely dry and red (heat stroke)

Acclimatize: When high heat stress conditions arise, employees should be exposed to the heat for short work periods followed by longer periods of work. Acclimatization usually takes five (5) days and should be provided for all new employees and employees returning from an absence of two (2) weeks or more. Contact Corporate Health and Safety for proper procedures.

Hydration & Pace of Work: Make sure all employees intake plenty of water throughout the work day (sometimes as much as a quart per worker per hour) and let employees know where the drinking water is located. Adjust your work pace and expectations on how much work can be done during periods of high heat stress. Workers cannot do as much during periods of high heat stress compared with similar periods of low heat stress. After acclimatization, workers may be able to resume a more "normal" work pace as long as fluid intake is adequate.

Work/Rest Periods: If possible, heavy work should be scheduled during the cooler parts of the day (*i.e.,* early morning) and rest periods should be taken in cool areas for longer periods.

Personal Protective Equipment (PPE): Employees using PPE (*i.e.*, Tyvek® suits or other equipment which may retain heat) can be more susceptible to heat stress due to the fact that heat/sweat often cannot escape the suits and/or the equipment. Persons wearing PPE that contributes to heat stress require more hydration, longer rest periods, or a reduced pace of work. Also, more careful monitoring of each person's health status is required by co-workers and management.

The following table summarizes safety controls for heat related illnesses:

Elimination	Substitution	Engineering	Administrative	PPE
Perform outdoor, strenuous, tasks at cooler times of day/year	Use mechanized equipment in place of manual labor	Install fans or air conditioning units in the work area	Train all personnel to know the signs of heat stress/stroke and how to prevent it	Implement the use of cooling vests or other similar PPE
		Install a canopy to provide shade to work areas	Allow workers to acclimatize to the work environment	
		Provide cool, shaded break areas	Adjust work pace to allow for the effects of heat	
			Implement work/rest periods	

4.9 Cold Stress

The four environmental conditions that cause cold-related stress are low temperatures, high/cool winds (wind chill), dampness, and cold water. One, or any combination of these factors, can cause cold-related hazards. Cold stress, including frostbite and hypothermia, can result in severe health effects. Employees, contract employees, and third-party contractors will be instructed in the identification of a cold stress victim, the first-aid treatment procedures for the victim and in the prevention of heat stress incidents.

A dangerous situation of rapid heat loss may arise for any individual exposed to high winds and cold temperatures. Major risk factors for cold-related stresses include:

- Wearing inadequate or wet clothing thus increasing the effects of cold on the body.
- Taking certain drugs or medications such as alcohol, nicotine, caffeine, and medication thus inhibiting the body's response to the cold and/or impairing judgment.
- Having a cold or certain disease, such as diabetes, heart, vascular and thyroid problems, and thereby increasing susceptibility to the winter elements.
- Lower body-fat composition or other physiological differences. Statistics show that men experience far greater death rates due to cold exposure than women, potentially attributable to participation in risk-taking activities, lower body-fat composition and/or other physiological differences.
- Becoming exhausted or immobilized, especially due to injury or entrapment, thus speeding up the effects of cold weather.

The following table provides the resulting equivalent chill temperature to exposed skin because of increasing wind speeds at decreasing actual temperatures. Personnel shall be aware of predicted weather conditions before beginning site work and stay apprised of changes.

TABLE 2. Cooling Power or Wind on Exposed Flesh Expressed as Equivalent Temperature (under calm conditions)*

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	−10	−20	−30	−40	−50	−60
	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	−10	−20	−30	−40	−50	−60
5	48	37	27	16	6	−5	−15	−26	−36	−47	−57	−68
10	40	28	16	4	−9	−24	−33	−46	−58	−70	−83	−95
15	36	22	9	−5	−18	−32	−45	−58	−72	−85	−99	−112
20	32	18	4	−10	−25	−39	−53	−67	−82	−96	−110	−121
25	30	16	0	−15	−29	−44	−59	−74	−88	−104	−118	−133
30	28	13	−2	−18	−33	−48	−63	−79	−94	−109	−125	−140
35	27	11	−4	−20	−35	−51	−67	−82	−98	−113	−129	−145
40	26	10	−6	−21	−37	−53	−69	−85	−100	−116	−132	−148
(Wind speeds greater than 40 mph have little additional effect.)	LITTLE DANGER In < hr with dry skin. Maximum danger of false sense of security				INCREASING DANGER Danger from freezing of exposed flesh within one minute.				GREAT DANGER Flesh may freeze within 30 seconds.			
	Trenchfoot and immersion foot may occur at any point on this chart.											

*Developed by U.S. Army Research Institute of Environmental Medicine, Natick, MA.

Equivalent chilll temperature requiring dry clothing to maintain core body tempearture above 36°C (96.8°F) per cold stress TLV

The following table summarizes safety controls for preventing cold stress:

Elimination	Substitution	Engineering	Administrative	PPE
Perform work during warm parts of the day or warmer parts of the year		Install heaters in enclosed work areas	Train all personnel on the symptoms of cold stress and how to prevent it	All personnel must wear multiple layers of clothing
		Provide a warm break area	Implement work/rest schedule	Utilize hand/foot warmers when required

An additional hazard in cold weather conditions is the increased risk for slips from the accumulation of ice and snow in general work areas, ruts where water is accumulated, and heavy equipment. The following table outlines controls that may be used for preventing slips:

Elimination	Substitution	Engineering	Administrative	PPE
Perform work during warm parts of the day or in areas free of accumulated areas		Clear snow in work areas		Use traction control devices (*i.e.,* YakTrax) on work boots to provide additional traction.
		Apply salt/sand to icy areas		
		Use equipment to access work areas		

4.10 Biological Hazards

The following are biological hazards that may be present at the EPP Ash Pond.

4.10.1 Ticks (Lyme Disease) & Mites

Although Lyme disease has been detected throughout the continental United States, it is prevalent primarily in certain areas in New England, the Mid-Atlantic and the northern Midwest states. Although Lyme disease is the most common tickborne illness, other tickborne illnesses include southern tick-associated rash illness, Rocky Mountain spotted fever, ehrlichiosis, and tularemia. More information on Lyme disease and other tickborne illnesses can be found from the CDC.

Prevention

- Standard field gear (work boots, socks, and light-colored coveralls) provides good protection against tick bites, particularly if the joints are taped. However, even when wearing field gear, the following precautions shall be taken when working in areas that might be infested with ticks:
    - Wear long pants and long-sleeved shirts that fit tightly at the ankles and wrists, tape cuffs if necessary
    - Wear light colored clothing so ticks can be easily spotted
    - Per- and polyfluoroalkyl substances (PFAS)-free tick repellents (DEET and Permethrin) must be used when walking in all overgrown areas. DEET (≥25 percent [%]) must be applied to skin while permethrin must be applied to clothes and allowed to dry. Spray outer clothing, particularly your pant legs and socks, BUT NOT YOUR SKIN, with an insect repellent that contains permethrin. For heavily infested tick areas, wear spun polypropylene coveralls that have been sprayed with permethrin.
    - Inspect clothing frequently
    - Inspect head and body thoroughly when you return from the field, particularly on your lower legs and areas covered with hair
    - When walking in wooded areas, wear a hard hat, and avoid contact with bushes, tall grass, or brush as much as possible

Removal

- Remove any ticks by tugging with tweezers or special tick removal tools
- Do not squeeze or crush the tick
- DO NOT use matches, a lit cigarette, nail polish, or any other type of chemical to "coax" the tick out

Treatment

- Disinfect the area with alcohol or a similar antiseptic after removal

- Notify the Safety Competent Person of the embedded tick
- For several days to several weeks after removal of the tick, look for the signs of the onset of Lyme disease, such as a rash.
- No further treatment is necessary for ticks embedded <48 hours.
- If other signs or symptoms of Lyme are observed (fever/chills, aches, and pains), then notify the Safety Competent Person and seek medical attention.

The following table summarizes safety controls to reduce the hazards associated with ticks and mites.

Elimination	Substitution	Engineering	Administrative	PPE
Use mechanical equipment to remove overgrown vegetation		Remove overgrowth and excessive vegetation from walkways and work areas (provide safe access)	Train personnel on tick and mite prevention. Areas of vegetation overgrowth and/or debris piles should be considered “high risk” areas	Wear light-colored long sleeved shirt tucked into pants. Tuck pant legs into socks
			Perform frequent tick checks in the field and a thorough tick check after completing work activities	Apply Permethrin to clothes and DEET (20% or more) to exposed skin
			Call licensed pesticide contractors to remove infestations of bees, wasps, fire ants, etc.	

4.10.2 Insect Bites/Stings

Stinging/biting insects at the EPP Ash Pond include spiders, wasps, and bees. Contact with these insects may result in project personnel experiencing adverse health effects that range from being mildly uncomfortable to being life-threatening. Therefore, insects present a serious hazard to project personnel, and extreme caution must be exercised whenever Site and weather conditions increase the risk of encountering stinging insects. Some of the factors related to stinging insects that increase the degree of risk associated with accidental contact are as follows:

- The nests for these insects are frequently found in remote wooded or grassy areas or equipment staging areas where equipment has not been moved recently.
- Some people are hypersensitive to the toxins injected by a sting, and when stung, experience a violent and immediate allergic reaction resulting in a life-threatening condition known as anaphylactic shock. Anaphylactic shock manifests itself very rapidly and is characterized by extreme swelling of the body, eyes, face, mouth, and respiratory passages.
- The hypersensitivity needed to cause anaphylactic shock, can in some people accumulate over time and exposure, therefore even if someone has been stung previously and not experienced an allergic reaction, there is no guarantee that they will not have an allergic reaction if they are stung again
- Spider bites generally only cause localized reactions such as swelling, pain, and redness. However, bites from a Black Widow or Brown Recluse, or if you are allergic to spiders, can cause symptoms that are more serious.

- ***If a worker knows that they are hypersensitive to bee, wasp, or hornet stings, or other insects, they must inform the Safety Competent Person prior to site work. Persons who have been prescribed epi-pens by their physician must have an epi-pen on the Site.***
- Inspect any clothing or PPE that has been left for a period of time prior to putting it on. Shake out the clothing and inspect the inside of safety shoes/boots prior to putting them on
- Nests in active work areas must be eradicated. Small nests may be handled by Site personnel using consumer-type insecticide. A pest control contractor should be hired to handle large or difficult to reach nests.

The following table outlines safety controls to reduce the risk of hazards associated with stinging/biting insects.

Elimination	Substitution	Engineering	Administrative	PPE
Use mechanical equipment to remove overgrown vegetation		Remove overgrowth and excessive vegetation from walkways and work areas (provide safe access)	Train personnel on stinging/biting insect prevention. Areas of vegetation overgrowth and/or debris piles should be considered “high risk” areas	Wear light-colored long sleeved shirt tucked into pants. Tuck pant legs into socks
		Eradicate nests in the work area as outlined above.	Instruct personnel to inspect/shake out clothing and work boots that have been left for a period of time.	Apply Permethrin to clothes and DEET (20% or more) to exposed skin – NOTE this will not repel bees/wasps
			Instruct employees who are hypersensitive to insect bites/stings to carry their epi-pen while on site	

4.10.3 Venomous Snakes

There are four species of venomous snakes in Illinois, they are:

- Copperhead
- Cottonmouth Water Moccasin
- Timber rattlesnake
- Eastern Massasauga

Generally, these snakes are found in the southern one-third of the state, with the Cottonmouth Water Moccasin found mostly in the southernmost portions of Illinois. Snakes are generally found in tall grass, wood piles, or other covered areas. Snakes are generally not aggressive towards humans, but if they are encountered avoid the snake and do not provoke it. If bitten by a snake that may be venomous seek medical treatment.

The following table outlines safety controls to reduce the hazard associated with venomous snakes.

Elimination	Substitution	Engineering	Administrative	PPE
Use mechanical equipment to remove overgrown vegetation		Remove debris piles, overgrowth and excessive vegetation from walkways and work areas (provide safe access)	Train personnel on the identification of venomous snakes. Areas of vegetation overgrowth and/or debris piles should be considered “high risk” areas	If working in area with snakes cannot be avoided, wear snake chaps
			Instruct personnel to not disturb snakes if they identify one in their work area	
			Use caution when moving staged tools or materials into which snakes may have moved	

4.10.4 Poisonous Plants and Plant Hazards

Poison ivy and poison oak may be present at the Site. Poison ivy thrives in all types of light and usually grows in the form of a trailing vine; however, it can also grow as a bush and can attain heights of 10 feet or more. Poison ivy has pointed leaves that grow in clusters of three. Poison oak resembles poison ivy except that the poison oak leaves are more rounded rather than jagged like poison ivy, and the underside of poison oak leaves are covered with hair.

The skin reaction associated with contacting these plants is caused by the body's allergic reaction to toxins contained in oils produced by the plant. Becoming contaminated with the oils does not require contact with just the leaves. Contamination can be achieved through contact with other parts of the plant such as the branches, stems or berries, or contact with contaminated items such as tools and clothing. The allergic reaction associated with exposure to these plants will generally cause the following signs and symptoms:

Symptoms

- Blistering at the site of contact, usually occurring within 12 to 48 hours after contact and in many cases, persons experience almost immediate irritation.
- Reddening, swelling, itching, and burning at the site of contact.
- Pain, if the reaction is severe.
- Conjunctivitis, asthma, and other allergic reactions if the person is extremely sensitive to the poisonous plant toxin.

Prevention

- The best treatment appears to be removal of the irritating oil before it has had time to cause inflammation by wiping exposed skin with rubbing alcohol followed by washing with soap and water.
- A visual Site inspection and identification of the plants should be completed prior to starting work so that all individuals are aware of the potential exposure. Avoid contact with any poisonous plants on the Site, and keep a steady watch to identify, report, and mark poisonous plants found on the Site.
- Avoid contact with, and wash daily, contaminated tools, equipment, and clothing.
- Barrier creams (Ivy Block®) and orally administered desensitization may prove effective and should be tried to find the best preventive solution.

- Keeping the skin covered as much as possible (*i.e.*, long pants and long-sleeved shirts) in areas where these plants are known to exist will limit much of the potential exposure. PFAS-free spun polypropylene coveralls or Tyvek® may be worn to prevent contact of skin and clothes with poison ivy.

The following table outlines safety controls to mitigate the hazards associated with poisonous plants.

Elimination	Substitution	Engineering	Administrative	PPE
Use mechanical equipment to remove overgrown vegetation		Remove overgrowth and excessive vegetation from walkways and work areas (provide safe access)	Train personnel on the identification of poisonous plants	Wear pants and long sleeves when working in overgrown areas
			Instruct personnel to avoid areas where poisonous plants have been identified	Consider the use of a coverall when working in areas where these plants are present, especially for hypersensitive employees.
			Provide isopropyl alcohol along with soap and water to remove oils from skin, tools, and equipment.	

4.11 Working Alone

As outlined in Section 4.1, working alone while on the Ash Pond must be pre-approved by the POC. Working alone is prohibited for tasks deemed to be high risk by IPRG including, but not limited to, handling highly hazardous chemicals (sulfuric acid), work over/near water, excavation and trenching, hot work (grinding, welding and torch cutting), and elevated work that requires personal fall arrest. Third-party contractors are responsible for identifying potential high-risk tasks in their Safety and Health Plan and requiring that a buddy system be implemented while high risk work is performed. The buddy must be located in a safe area but may perform other tasks that do not prevent observing the person performing high risk work. Working alone may occur on and around other parts of the EPP Ash Pond when there is no drowning hazard or risk of severe injury due to high-risk work.

Elimination	Substitution	Engineering	Administrative	PPE
	Modify work methods by substituting lower hazard methods for high hazard methods	Varies depending on the hazard, but for example, could include installing guardrails (temporary or permanent) which mitigates a fall hazard reducing the risk to levels where working alone may be permitted	Prohibit working alone on ash ponds and for other high hazard tasks without prior approval from the POC.	

Elimination	Substitution	Engineering	Administrative	PPE
			Implement a buddy system whenever feasible (required for high hazard work)	
			Implement a worker check-in, emergency alerting, and monitoring system	

4.12 Railroad Safety

Railroad tracks are located around the west side of the Ash Pond. Prior to conducting work at the Ash Pond, all contractors shall notify the POC who will coordinate with the railroad supervisor. Working near the railroad will be prohibited when trains are scheduled to use the tracks. Safety requirements for working near a railroad will be covered during the Site Orientation Training.

5. HAZARD COMMUNICATION

As required by 35 I.A.C. § 845.530, the OSHA HAZWOPER standards (29 C.F.R. § 1910.120 and 29 C.F.R. § 1926.65) and OSHA Hazard Communication Standard, site personnel, subcontractors, and visitors must be informed of chemical hazards associated with their work area. The information in this section is based on:

- Recommendations in the most recent "NIOSH Pocket Guide to Chemical Hazards" by the Department of Health and Human Services, Centers for Disease Control and Prevention, and the NIOSH Pocket Guide.
- Requirements set forth in the OSHA regulations from as defined in Chapter 17 of 29 C.F.R. § 1910.1200(c) for all hazards not otherwise classified.

5.1 Coal Combustion Residuals

Primary exposure to CCR is through inhalation and skin contact. CCR is typically a fine, black, grey, or tan particulate. CCR is comprised of several components. The following table outlines the components of the CCR. The exact percentage of each component will vary based on the type of ash and location at the surface impoundment.

Chemical	Percentage	PEL	IDLH	ACGIH TLV	Symptoms of Exposure & Health Effects
Crystalline Silica	20-60% (total)	0.05 mg/m^3 (respirable)	25 mg/m^3 (respirable)	0.025 mg/m^3 (respirable)	Cough, dyspnoea (breathing difficulty), wheezing; decreased pulmonary function, progressive respiratory symptoms (silicosis); irritation eyes; [potential occupational carcinogen]
Iron oxide	1-10%	5 mg/m^3	2500 mg/m^3	5 mg/m^3	Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis (siderosis)
Calcium oxide	10-30%	5 mg/m^3	25 mg/m^3	2 mg/m^3	irritation eyes, skin, upper respiratory tract; ulcer, perforation nasal septum; pneumonitis; dermatitis
Titanium dioxide	<3%	15 mg/m^3	ND	10 mg/m^3	Lung fibrosis; [potential occupational carcinogen]
Aluminosilicates	10-60%	15 mg/m^3 (PNOR)	ND	10 mg/m^3 (PNOR)	irritation eyes, skin, throat, upper respiratory system
Magnesium oxide	2-10%				
Magnesium dioxide	<2%				
Phosphorous pentoxide	≤2%				
Sodium oxide	1-10%				
Potassium oxide	≤1%				
Bromide salt	<0.1%				

Footnotes:

All values are 8-hour time-weighted averages (TWAs) unless otherwise indicated.

- PEL: Permissible Exposure Limit, the concentration an employee may be exposed to for an 8-hour work day for a 40-hour work week for which nearly all employees may be repeatedly exposed without adverse health effects.
- IDLH: IMMEDIATELY Dangerous to Life and Health, contaminant concentration which present the possibility for severe health consequences if exposed to the IDLH concentration without the appropriate personal protective equipment (PPE).
- ACGIH TLV: American Conference of Governmental Industrial Hygienists Threshold Limit Value
- mg/m^3 = milligrams per cubic meter of air
- PNOR: Particulates Not Otherwise Regulated
- ND: Not Determined

5.2 Anhydrous Ammonia

Anhydrous ammonia is used at the EPP. Ammonia is extremely corrosive, and exposure to it may result in chemical burns to the skin, eyes, and lungs. The Permissible Exposure Limit (PEL) is 50 parts per million (ppm), Threshold Limit Value (TLV) of 35 ppm, Short Term Exposure Limit (STEL) of 35 ppm, and with an Immediately Dangerous to Life and Health (IDLH) level of 300 ppm. Ammonia is also flammable at concentrations ranging from 15% to 28% by volume in air.

When released, anhydrous ammonia will form a visible, dense, white cloud that will travel along the ground on a cool day. If a white cloud is observed at the plant, evacuate the area immediately, do not enter the cloud. Ammonia emergency response training is provided in the Site Orientation/General Awareness Training.

5.3 Safety Data Sheets

Pursuant to 35 I.A.C. § 845.530(b)(3), IPRG will provide Safety Data Sheets (SDSs) to all employees, contract workers, and third-party contractors for the CCR located in the EPP Ash Pond. Third-party contractors will provide SDSs to Rick Kelley (Chemistry Supervisor) and Mark Davis (Environmental Manager) prior to bringing a material on site. SDSs are provided in Appendix E.

5.4 Signage

The absence of any of the following signage does not mean that a potential hazard does not exist. Signage will be posted by IPRG, but employees, contract workers, and third-party contractors must remain vigilant for changing site conditions.

To aid in hazard communication and pursuant to 35 I.A.C. § 845.530(f), IPRG will post the following signs at the EPP Ash Pond:

- Signs identifying the hazards of CCR, including dust inhalation when handling CCR.
- Signs identifying unstable CCR areas that make the operation of heavy equipment hazardous.
- Signs identifying the necessary safety measures and necessary precautions, including the proper use of PPE.

The following signs may also be posted at the CCR units to aid in hazard communication:

- Anhydrous ammonia hazard communication signs or labels on all tanks, drums, or other storage containers. “Anhydrous ammonia” labels on piping.
- Overhead electrical lines that may be struck by heavy equipment of vehicles will have signs warning drivers of their presence.

6. EMERGENCY RESPONSE PLAN

This emergency response section details actions to be taken in the event of site emergencies. This section is consistent with the EPP Ash Pond and Levee Emergency Response Plan. All personnel on site must be familiar with emergency signals and the content of this section.

6.1 Emergency Phone Numbers & Notifications

Emergency Number	
Site Address	**Emergency Phone Number**
7800 Cilco Lane Peoria, IL	911 or Peoria Fire: 309-674-3131
	Control Room: 309-633-2425

Medical Treatment	
Local Hospital	**Phone Number**
OSF Saint Francis Medical Center 530 NE Glen Oak Ave Peoria, IL 61637	309-655-2000

Detailed notifications are outlined in the EPP Ash Pond and Levee Emergency Response Plan. Notifications will be made by the Operations Shift Supervisor. Initial notification will be made to the Operations Shift Supervisor at 309-633-2409 or 309-633-2425.

6.2 Evacuation Signal

Numerous evacuation signals are used at the facility depending on the nature of the incident. Emergency evacuation signals are reviewed in the Site Orientation/General Awareness Training.

Upon hearing an evacuation signal, all personnel will leave the work area and proceed to the muster point.

6.3 Muster Point

The muster point for the EPP Ash Pond is located at the main plant parking lot in front of Building A, unless directed otherwise. The muster point is shown in Appendix A.

6.4 Calls for Emergency Support

In the case of an emergency, site personnel will call 309-633-2425. The Control Room will coordinate the arrival of on-site emergency personnel. The individual calling for emergency support will briefly explain the nature of the emergency and site conditions as follows:

- Indicate his/her name
- Location of emergency
- Description of emergency conditions that may require special rescue equipment, such as confined spaces, excavations, and elevated work platforms
- Potential chemical hazards and recommended PPE

6.5 Fire & Explosion Response Plan

Trained site personnel may respond to incipient stage fires using a 20-pound Type ABC dry chemical fire extinguisher or hose. An incipient stage fire is a fire which is in the initial or beginning stage and which can be controlled or extinguished by portable fire extinguishers, Class II standpipe or small hose systems without the need for protective clothing or breathing apparatus. Personnel shall only attempt to extinguish the fire if it is safe to do so.

A fire that CANNOT be readily extinguished with a fire extinguisher will require evacuation of the work area personnel to Muster Point areas per this Safety and Health Plan. If personal injuries result from any fire or explosion, the procedures outlined in the Personal Injury Response Plan will also be followed.

All fires or explosions must be reported to the contacts outlined in Section 6.1 of this Safety and Health Plan.

6.6 Injury Response Plan

Treatment for minor injuries will be provided on site using available first aid supplies and personnel trained in first aid. All third-party contractors must have at least one individual on site who is trained in first aid, CPR, and AED use. Third-party contractors must provide their own first aid kits and AED. For minor injuries that are not life-threatening but require further medical attention, employees should be treated by occupational physicians at occupational clinics whenever possible. Treatment of minor injuries by emergency room or personal physicians should be avoided. When injured workers are released back to work with restrictions, all subcontractors are expected to accommodate those restrictions.

Emergency medical incidents include puncture wounds to the head, chest, and abdomen, serious head and spinal cord injuries, and loss of consciousness must be treated at the hospital emergency room listed in Section 6.1 of this Safety and Health Plan.

All injuries must be reported to the contacts outlined in Section 6.1 of this Safety and Health Plan.

6.7 Spill Response Plan

In general, IPRG employees, contract workers, and third-party contractors are trained and equipped to handle small spills associated with their work. Third-party contractors must include an approved spill response plan in their Safety and Health Plan. Site personnel will generally respond to spills as follows:

- Stop the leak immediately if it can be done without directly contacting the leaking material.
- Remove or stop all ignition sources (hot work, generators, etc.) that are within 25 feet of any part of the spill.
- On-site personnel should immediately secure the area to prevent unauthorized entry into the spill area.
- Although not likely given the anticipated types of spills, site personnel must immediately initiate evacuation if a spill may cause an explosion, death, or serious injury.
- Site personnel may only respond to incipient stage fires regardless if such fires are associated with a spill.
- PPE for spills to open areas generally requires Modified Level D PPE (poly-coat Tyvek®, nitrile gloves, and boot covers or boot decontamination). Over-boots or boot covers may also be used if persons cleaning the spill would have to walk on spilled materials. Latex gloves are not acceptable and will degrade with exposure to petroleum products.

6.8 CCR Spill or Release Response Plan

Response to minor or incidental spills of CCR will be managed as outlined in the General Spill Response Plan. An incidental release is a release of a hazardous substance which does not pose a significant safety or health hazard to employees in the immediate vicinity or to the employee cleaning it up, nor does it have the potential to become an emergency within a short time frame. Incidental releases are limited in quantity, exposure potential, or toxicity and present minor safety or health hazards to employees in the immediate work area or those assigned to clean them up. An incidental spill may be safely cleaned up by employees who are familiar with CCR. Response to major releases of CCR will be in accordance with the EPP Ash Pond and Levee Emergency Response Plan.

6.9 Ammonia Response Plan

The EPP Emergency Response Plan outlines the procedure for responding to an ammonia release.

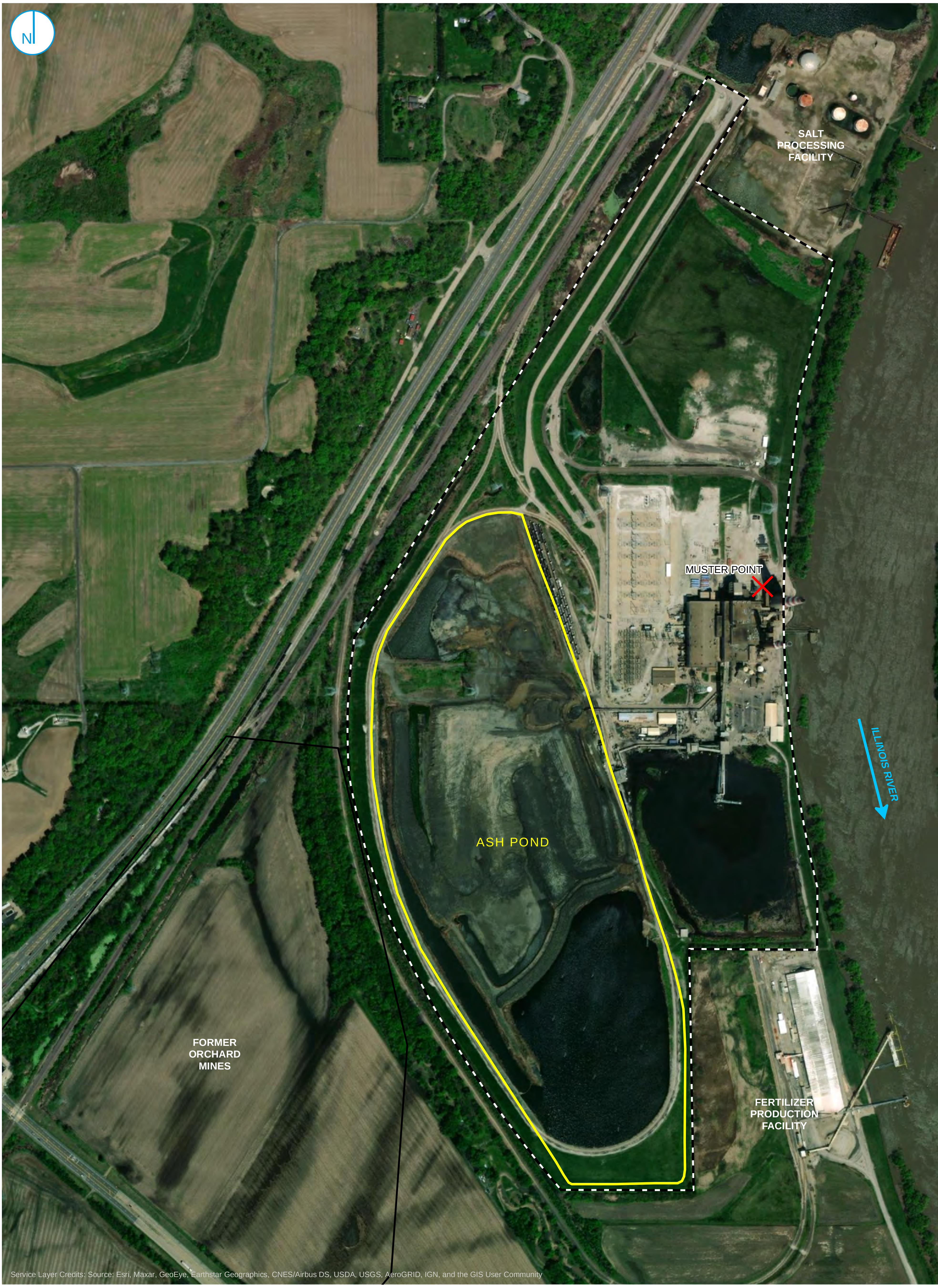
6.10 Ash Pond Rescue

Ash ponds may be unstable and represent an engulfment hazard if persons and equipment traverse the surface, berms, or other unstable areas. Special training is required on behalf of emergency responders to retrieve persons and equipment who become trapped in unstable ash. **Untrained persons must not enter unstable areas** in an attempt to conduct rescue because of the significant potential that they will also become victims. Call the EPP emergency number and state that an "ash pond rescue" is required. The EPP emergency contact will notify the designated service to perform the ash pond rescue. On-site personnel should remain on stand-by to support the ash pond rescue team as necessary.

6.11 Incident Reporting

All incidents must be reported to the contacts outlined in Section 6.1 of this Safety and Health Plan. An Incident Report must be completed for all injuries, illnesses, spills, fire, explosion, or property damage. The absence of an injury does not preclude the need to complete an Incident Report as such incidents will be classified as "near miss" or "other." It will include, but is not limited to, the nature of the problem, time, location, and corrective actions taken to prevent recurrence.

APPENDIX A
SITE MAP



PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY
FORMER ORCHARD MINES AREA

0 250 500
Feet

SITE MAP

APPENDIX A

PART 845 SAFETY AND HEALTH PLAN
EDWARDS POWER PLANT
BARTONVILLE, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

APPENDIX B
SAFETY AND HEALTH PLAN ACKNOWLEDGMENT FORM

SAFETY AND HEALTH PLAN ACKNOWLEDGEMENT FORM

I HEREBY CERTIFY THAT I HAVE READ AND UNDERSTOOD ALL HEALTH AND SAFETY PROCEDURES AS STATED HEREIN:

Name and Affiliation (printed)	Signature	Date

APPENDIX C
DRUG SCREEN POLICIES AND SUPPLEMENTAL TERMS

Drug and Background Investigations

Contractor is solely responsible for ensuring that all members of Contractor Project Team have completed and passed all drug and alcohol tests and background investigations required under this Attachment and under Contractor's own programs before assigning such personnel to perform Work. Contractor is also solely responsible for ensuring that such testing and investigations are performed in accordance with all applicable laws.

1. Required Investigations. Except as otherwise required by applicable law, Required Investigations shall consist of all of the following:

   1.1 a 7-panel drug screening;

   1.2 a background investigation that includes a criminal records check in all counties where the applicable person has resided for at least the last seven (7) years;

   1.3 a third-party verification of previous employment and the highest education level completed by the applicable person;

   1.4 a check of the National Sex Offender Registry and Terrorist Watch List (Denied Parties); and

   1.5 a check of Motor Vehicles Record (if work to be performed by the applicable person requires driving as part of the defined duties).

2. Notices to Tested Persons Regarding Background Checks. All background checks will be conducted in compliance with applicable provisions of the Fair Credit Reporting Act.
3. Forms and Testing Organization for Drug Tests. Except for those positions subject to Department of Transportation ("DOT") drug and alcohol testing regulations, all drug testing shall be performed using the Universal Toxicology four part "Non-DOT" Chain of Custody and Request Form with white and blue top page, and shall be conducted by an independent third-party organization.

4. Pass/Fail Standards – Background Checks. A person shall be deemed to have failed the applicable background check if:

   4.1 information is reported through the background check process indicating that such person has failed to disclose or misrepresented information requested at any time about such a person's criminal background history; or

   4.2 such person has ever committed any felony constituting a violent crime, crime against a person, sexual offense or fraud; or

   4.3 such person has committed any other felony, or has been incarcerated for a felony, within ten (10) years prior to the date of such background check (i.e., for these felonies there must be a ten (10) year lapse in time from the later of the commission and the end of any period of incarceration); or

   4.4 such person has committed any misdemeanor that:

      4.4.1 involves violence that is sexually related; or

4.4.2 consists of a DUI that is the second (or more) DUI in the last two (2) years prior to the date of the background check; or

4.4.3 consists of a theft-related offense; provided that there can be no more than one theft by check and it must have been for an amount less that $100; or

4.4.4 consists of any drug-related misdemeanor committed at any time within forty-eight (48) months prior to the date of the background check.

4.4 For purposes of both felonies and misdemeanors, a person is deemed to have committed the applicable offense if he/she is convicted or enters a plea of guilty or nolo contendere for such offense (to include, without limitation, sentences of probation and deferred adjudication).

5. Pass/Fail Standards – Drug Tests. A person shall be deemed to have failed the applicable drug test if any of the following maximum cut-off levels are exceeded, unless there is a legitimate medical explanation for the presence of a tested substance at or above the applicable cut-off level:

5.1 Amphetamines 500ng/mL

5.2 Barbiturates 150ng/mL

5.3 Benzodiazepines 150ng/mL

5.4 Cocaine 150ng/mL

5.5 Marijuana 150ng/mL

5.6 Opiates 2000ng/mL

5.7 Phencyclidine 25ng/mL

For any positions subject to DOT drug and alcohol testing requirements, testing shall be conducted according to the applicable DOT panel and cutoff levels.

6. Other Requirements.

6.1 Background checks and drug tests will be paid for by Contractor without reimbursement by Company.

6.2 Contractor will keep background checks and drug test records while the applicable persons are working pursuant to this Agreement and for three (3) years thereafter.

6.3 Upon request, Contractor will provide a certification to Company that no person required hereunder to pass a background check or drug test has failed such investigation or test. Contractor will not provide the specific results of the background check or drug test of any individual to Company.

6.4 If any person required under this Agreement to pass a background check or drug test fails such check or test, Contractor will not report the specific results of such check or test to Company and will not allow such individual to perform any Work for Company. Although such person may not be assigned to perform any Work for Company, nothing in this Attachment requires Contractor to take any other action with respect to such person’s employment with Contractor.

Supplemental Terms for Onsite Services

1. SAFETY

1.1 Contractor agrees that any safety-related assistance or initiatives undertaken by Company will not relieve Contractor while on Company Property from responsibility for the implementation of, and compliance with, safe working practices, as developed from their own experience, or as imposed by law or regulation, and will not in any way, affect the responsibilities resting with Contractor under the provisions of any agreement to which these policies are attached and to meet all safety requirements as specified by the Occupational Safety & Health Administration (OSHA), the Mine Safety Health Administration (MSHA), including the "Mining Contractor Safety Reference Handbook" located at http://www.vistraenergy.com/wp-content/uploads/2016/12/Contractors-Safety-Handbook_Final-MC-08262016.pdf, the Department of Transportation (DOT) and any other applicable state or federal safety and health laws or regulations.

1.2 In the event that a material safety data sheet, warning label, or other documentation concerning the use of hazardous chemicals at any property owned or controlled by Company or any of its affiliates (collectively, "Company Properties"), applies to any materials or equipment provided by Contractor as an aspect of the Work, such documentation will be provided by Contractor to Company prior to the commencement of any such Work.

1.3 Contractor will report to Company all accidents involving personal injuries (including death) and damage to property occurring directly or indirectly as a result of the Work performed by Contractor hereunder immediately, but in no event, no later than 24 hours after the occurrence of any such accident. Any accident or incident occurring directly or indirectly as a result of the Work which Contractor must report to a regulatory agency (e.g. OSHA, MSHA, TCEQ) must also be reported to Company immediately following notification to the regulatory agency.

2. SECURITY

2.1 It will be the affirmative duty of Contractor to ensure that Contractor Group assists in carrying out all security measures, to include reporting all information or knowledge of matters adversely affecting security to Company's designated security personnel.

2.2 Company reserves the right to exclude any of Contractor's employees from any Company Property by denial of access, suspension or revocation of access authorization, preemptory expulsion, or by any other means, without notice or cause. Former Company employees, and any of Contractor's employees who previously have been excluded from any Company Property, may be brought onto Company property or facilities only if prior approval from Company is obtained. If Contractor terminates a member of Contractor Group performing Work on Company's premises, Contractor shall inform Company immediately, but in no event, no later than twenty-four (24) hours after such employee is terminated in order for Company to remove access to Company Property for such employee.

2.3 Company measures may also include investigations, whether by Company or law enforcement officials. Contractor agrees to cooperate in such investigations and understands that Company reserves the right to require anyone in Contractor Group to authorize appropriate agencies to release his or her criminal records to Contractor as a condition of either initial or continued permission for access to any Company Property. Investigations may include searches of Contractor Group. Such searches may include searches of facilities assigned to Contractor Group, search of all Company Property areas and property at such Company Property areas, searches of including, but not limited to, offices, lockers, desks, lunch boxes, packages and motor vehicles (regardless of ownership). Without limiting the foregoing, Contractor acknowledges and agrees that all members of Contractor Group, to the extent that Company reasonably determines that such members require security badge access prior to entering onto any Company Property, shall be required to comply with Company's standard security badge requirements, including without limitation a background check to be performed by Company.

3. ISNETWORLD

3.1 Contractor agrees to maintain at Contractor's expense a subscription with ISNetworld (www.ISNetworld.com), Company's safety compliance program or any replacement program therefor, as directed by Company, for the Term of the Agreement. Contractor shall also furnish ISNetworld with any information requested by ISNetworld relating to ISNetworld's evaluation of the Contractor's safety program and practices. As a minimum, requested documents will be related to safety, health, and insurance (i.e., regulatory required training, certifications, safety plans, safe and secure workplace practices, insurance certificates, etc.), OSHA and MSHA injury rates and Experience Modification Rate (EMR).

3.2 Contractor has and during the performance of this Agreement shall continue to report full, complete and accurate information to ISNetworld concerning Contractor's employees.

4. MATERIALS, EQUIPMENT AND LABOR. Contractor will be solely responsible for the proper storage, transportation and disposal of any product or waste, other than sandblasting waste, used or generated in connection with the Work in accordance with all applicable Environmental Laws. Contractor will dispose of all waste materials, other than sandblasting waste, at an off-site disposal facility approved for such waste materials pursuant to applicable Environmental Laws and will complete and sign all waste manifests as the generator of such waste. Company will be responsible for the storage, transportation and disposal of any sandblasting waste generated during the performance of the Work.

5. CONDITIONS AFFECTING WORK

5.1 Contractor will investigate and acquaint itself with the conditions affecting the Work, including but not limited to those related to the transportation, disposal, handling and storage of materials and waste; availability of labor, water, electric power and roads; the uncertainties of weather, river stages or similar physical conditions at the site; the conformation and condition of the ground; and the character of equipment and facilities needed preliminary to and during prosecution of the Work. Contractor has satisfied itself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered. Contractor's failure to acquaint itself with any conditions affecting the Work or any available related information will not relieve it from responsibility for properly estimating the difficulty or cost of successfully performing the Work.

5.2 Contractor assumes full responsibility for investigating conditions and determining the existence and magnitude of any hazards to the physical well-being of property of Contractor, the employees, agents, and servants of Contractor, or any other person or entity who is or may become involved in the performance of Work, and any and all other persons in the vicinity of the Work. Contractor will advise all of the above-specified persons or entities of any hazards relating to Work, and will ensure that those persons or entities are advised of and fully understand the nature of the hazards and safety precautions that can be taken to eliminate or minimize dangers relating to the hazards.

5.3 Contractor will provide information to Company regarding hazardous chemicals and/or consumable products that contain constituents listed in 40 CFR 372.65 used at any Company Property. Contractor will report the amount of such material carried on and off the site, the amount actually used and the manner of use. Contractor will provide the maximum quantity of the material stored on site at any one time and if a waste material was collected, where it was disposed of (location name and address). Contractor will provide information on the amount of material used for the previous calendar year by the first of February.

5.4 Contractor will use its best efforts to ensure that the Work is performed so as to minimize any adverse impact upon natural resources and the environment and will use best industry practices in this regard at all times.

5.5 Contractor acknowledges and agrees that all members of Contractor Group performing Work at any Company Generation or Mining Property are required to view Company's "Contractor/Visitor Safety Orientation" video (in the case of Company Generation property), when applicable, and to read and adhere to Company's "Contractor/Visitor Safety Booklet" (in the case of Company Mining property) prior to performing any Work at any Company Generation or Mining Property.

5.6 Contractor will immediately notify Company as soon as Contractor has reason to believe that Contactor, or any employee or other person performing the Work, is not or may not be performing the Work in compliance with applicable Environmental Laws. Contractor will provide Company with written notice to Company of such actual or potential non-compliance within three (3) days following the discovery thereof. Contractor will take immediate steps to ensure compliance with all applicable Environmental Laws and will, if directed by Company, cease all Work until authorized by Company to resume the Work.

5.7 Contractor will report to Company all accidents involving personal injuries (including death) and damage to property occurring directly or indirectly as a result of the Work performed by Contractor hereunder immediately, but in no event, no later than 24 hours after the occurrence of any such accident. Any accident or incident occurring directly or indirectly as a result of the Work which Contractor must report to a regulatory agency (e.g. OSHA, MSHA, TCEQ) must also be reported to Company immediately following notification to the regulatory agency.

6. WORK SITE PERMITS AND LICENSES

6.1 Subject to the following two paragraphs, Contractor will obtain, prior to the commencement of the Work, and provide to Company upon request, all permits, licenses and governmental authorizations, at its sole expense, required for the performance of the Work. Contractor will be solely responsible for maintaining compliance with such permits, licenses and governmental authorizations.

6.2 In the event that a storm water discharge permit is required for the performance of the Work, (i) Contractor will be responsible for filing a Notice of Intent with respect to the Work, in addition to any Notice of Intent that Company may be required to file, and (ii) Contractor will coordinate with

Company in the preparation and execution of a Storm Water Pollution Prevention Plan for the Work Site.

6.3 In the event that the performance of the Work involves the handling or abatement of asbestos-containing materials, Contractor will coordinate with Company in the preparation and filing of all required notification forms.

7. ACCESS. Should Contractor desire access to the Work Site over any land not controlled by Company, it will, at its sole expense, obtain all proper permits or written permission necessary for that access.

8. COMPANY FACILITIES. Contractor will not use Company's sanitary facilities, changehouses, shops, parks, storage buildings, tools, equipment or other facilities unless so directed by Company. Contractor will not discharge, without Company's prior written authorization, any product or waste used or generated in connection with the Work through any (i) Company-permitted outfall, (ii) Company-owned or operated pollution control equipment, or (iii) storm or sanitary sewer located at or in the vicinity of the Work Site. Any request for authorization to discharge will include, at a minimum, either a copy of the Material Safety Data Sheet for the product or a written description of the waste, including a list of the constituents of the waste and the relative concentrations thereof.

9. ENVIRONMENTAL

9.1 In the event that Contractor discovers during the performance of the Work any substance at the Work Site that is not the subject of the Work or has not otherwise been identified by Company for Contractor, which substance Contractor has reason to believe is or may be a Hazardous Substance that (i) has been or may be released or spilled into the soil, surface water, or groundwater or in a building or structure, or (ii) consists of asbestos-containing materials, lead-based paint, batteries, thermostats, lighting equipment, or equipment containing polychlorinated biphenyls, Contractor will immediately stop Work and notify Company of the discovery. Contractor will not resume the Work until receiving authorization from Company to do so.

9.2 The term "Hazardous Substance" means any product, waste, emission or substance defined, listed or designated as a hazardous or toxic substance, hazardous waste, hazardous material or pollutant by or pursuant to any Environmental Law and includes, but is not limited to, any petroleum-based product, substance or waste, including any additives associated therewith, pesticides, fertilizers, solvents, polychlorinated biphenyls, mercury, lead, lead-based paint, asbestos-containing material or explosives.

9.3 Contractor will immediately notify Company in the event of a spill or release of any material which Contractor knows or has reason to believe is a Hazardous Substance, whether onto the ground, into any body of water, a storm or sanitary sewer, or the air, or anywhere on property owned or controlled by Company, including within any building or structure. Contractor will be solely responsible, as may be required by applicable Environmental Laws, for, in consultation with Company, (i) notifying the appropriate governmental agencies of such spill or release caused or permitted by the acts or omissions of Contractor and (ii) for the cleanup and remediation of such spill or release.

10. PROTECTION OF HIGHWAYS AND RAILROADS. Contractor will make suitable arrangements with governmental authorities and railroads for the construction of all structures, whether underneath or over roads, railroads or rights-of-way to protect the public from accident or delay. Contractor will repair, at its

own expense, to the satisfaction of the governmental authorities or other owners, all roads, railroads and bridges that may be damaged by, or given undue wear due to the Work.

11. CLEANING UP

11.1 Contractor will at all times keep the Work Site free of waste materials or rubbish caused by the Work. After completing the Work, Contractor will remove all its waste materials, rubbish, tools, supplies, equipment and surplus materials from and about the Work Site.

11.2 If Contractor fails to keep the Work Site clean or to clean up after completing the Work, Company may do so and charge all costs of cleaning up to Contractor. Those costs may be deducted from the final payment to Contractor.

12. COLLATERAL WORK. Company and other contractors may be working at the Work Site. Company reserves the right to coordinate the performance of Contractor's Work with the work of others. Contractor will cooperate with and will not delay, impede or otherwise impair the work of others. Company does not guarantee Contractor continuous uninterrupted access to the Work Site, but will provide such access as good construction practices will allow, considering the other activities in the area.

13. ALCOHOLIC BEVERAGES, DRUGS AND WEAPONS. Contractor will inform all members of Contractor Group who may be involved in the performance of any Work of the following Company rules relating to alcoholic beverages, drugs and weapons, with which all personnel are expected to comply:

13.1 Bringing, attempting to bring, possessing, using or being under the influence of intoxicants, drugs, or narcotics while on any Company Property, including but not limited to parking areas, is prohibited. Possessing alcoholic beverages in sealed containers is permitted, however, in designated parking areas.

13.2 Prescription or over-the-counter medications that could affect the performance of safety-sensitive work are allowed on Company Property only if they have been previously cleared by Contractor. Contractor must confirm that the medication and dosage do not impair an individual's ability to perform safety-sensitive work before clearing the individual to perform such work while under the influence of the medication.

13.3 Bringing, attempting to bring, possessing or using firearms, whether classified as legal or illegal, while on any Company Property, including but not limited to buildings, parking areas, recreation facilities, equipment and vehicles, is prohibited, unless otherwise required by applicable law. Use or possession of firearms for specific situations is permitted if approved by function or higher level management of Company.

13.4 Off-the-job involvement with intoxicants, illegal drugs, or illegal narcotics that adversely affects Company's business, to include impairing the individual's ability to perform his job or the public trust in the safe operation of Company, is prohibited.

13.5 Any conduct on any Company Property which is in violation of any state or federal law or regulation is considered a violation of these rules and a breach of any agreement to which these policies are attached.

13.6 In order to enforce these rules, all individuals with access to any Company Property as well as the vehicles, offices, lockers and any personal belongings of such individuals on any Company Property are subject to search by Company and its agents, to include security representatives appointed or employed by Company. Individuals may be required to take a blood, urinalysis or Breathalyzer test, or submit to other recognized investigatory tests or procedures as are deemed appropriate or necessary by Company in the investigation of a violation of these rules.

14. TITLE AND RIGHT. Nothing in the Agreement will vest Contractor with any right of property in materials used after they have been attached to or incorporated into the Work, nor materials for which Contractor has received full or partial payment. All those materials, upon being so attached, incorporated or paid for, will become the property of Company. Any gravel, sand, stone, minerals, timber or other materials excavated, uncovered, developed or obtained in the Work, or on any land belonging to Company may be used, in the performance of the Work, provided such materials meet the requirements of this Agreement. Any objects or natural materials or animals excavated or exposed that may have historical significance or constitute a threatened or endangered species must be brought to the attention of Company.

15. PROTECTION AGAINST LIENS AND ENCUMBRANCES

15.1 Contractor will not at any time permit any lien, attachment or other encumbrance ("Encumbrance") by any person or persons whosoever or by reason of any claim or demand against Contractor to be placed or remain on the property of Company, including, but not limited to, the Work Site upon which Work is being performed or equipment and materials that are being furnished. To prevent an Encumbrance from being placed on the property of Company, Contractor will furnish during the progress of any Work, as requested from time to time, verified statements showing Contractor's total outstanding indebtedness in connection with the Work.

15.2 If Contractor allows any indebtedness to accrue to subcontractors or others and fails to pay or discharge that indebtedness within five (5) days after demand, then Company may withhold any money due Contractor until that indebtedness is paid or pay the indebtedness and apply that amount against the money due Contractor.

15.3 If Contractor allows any Encumbrances, whether valid or invalid to be placed on the property of Company, any and all claims or demands for payment to Contractor will be denied by Company until the Encumbrance is removed. If the Encumbrance is not removed immediately, Company may pay that claim or demand and deduct the amount paid, together with all related expenses, including attorneys' fees, from any further payment due Contractor, or at Company's election, Contractor will, upon demand, reimburse Company for the amount paid and all related expenses. Any payment made in good faith by Company will be binding on Contractor.

16. TERMINATION FOR DEFAULT

16.1 If a petition in bankruptcy should be filed by Contractor, or if Contractor should make a general assignment for the benefit of creditors, or if a receiver should be appointed due to the insolvency of Contractor, or if Contractor should refuse or fail to supply enough properly skilled workmen or proper equipment, materials or services or should fail to make prompt payment to subcontractors, or to pay promptly for materials or labor, or disregard laws, ordinances or the instruction of Company's Contract Coordinator, or if Contractor should refuse or fail to abide by the SOW Construction Schedule or otherwise violate any provisions of the Agreement or SOW, then Company, upon a determination by Company's Contract Coordinator that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy available to it after giving Contractor seven (7) days' written notice, terminate the Agreement or the SOW and take possession of the Work Site. In the event of such a termination, Company may use all or part of Contractor's equipment and materials and may finish the Work by whatever method Company may deem expedient. In such event, Contractor will not be entitled to receive any further payment hereunder until the Work is finished. If the unpaid balance of the SOW fees will exceed the expense of finishing the Work, including compensation of Company's Contract Coordinator, other Company personnel, third party engineering companies, or other contractors for additional services, such excess will be paid to Contractor. If the expense of finishing the Work will exceed such unpaid balance, Contractor will pay the difference to Company within fifteen (15) days of receiving an invoice for same. The expenses incurred by Company herein, and the damage incurred through Contractor's default, will be determined by Company's Contract Coordinator, in its sole discretion, and such determination will be binding as between the parties.

16.2 In the event of a termination under the provisions of this Section 3, Contractor will transfer and assign to Company, in accordance with Company's instructions, all Work, all construction records, reports, permits, data and information, other materials (including all Company-supplied materials), supplies, Work in progress and other goods for which Contractor is entitled to receive reimbursement hereunder, and any and all plans, drawings, sketches, specifications, and information in connection with the Work, and will take such action as may be necessary to secure Company, at Company's sole election, the rights of Contractor under any or all orders and subcontracts made in connection with the Work.

16.3 In the event that Company so directs or authorizes, Contractor will sell at a price approved by Company, or retain at a mutually agreeable price, any such materials, supplies, Work in progress, or other goods as referred to in the preceding paragraph. In any event, Company will receive any and all records, plans, drawings, data, permits, specifications, sketches, reports, or other information relating to the Work. The proceeds of any such sale or the agreed price will be paid or credited to Company in such manner as Company may direct so as to reduce the amount payable by Company under this Section 3.

APPENDIX D
COVID-19 SITE ENTRY GUIDELINES

COVID-19 Vistra Site Entry Guidelines – *Effective: June 17, 2021*
These guidelines are applicable to ALL PERSONNEL entering Vistra work sites.

To enter a Vistra work site, each person must answer the following three questions with a "no" answer *and* pass the required temperature testing *unless* they display their Vistra vaccination sticker on their employee badge or hardhat:

Site Entry Questions:

1. In the past 10 days, have you tested positive for COVID-19 or are you currently waiting on test results?

2. In the past 10 days, have you been within six feet of someone, where masks were not worn, who:
   a. has tested positive for COVID-19,
   b. is known to be waiting on test results for COVID-19, or
   c. is under a quarantine order?

3. In the past 10 days, have you or someone who has been within six feet of you where masks were not worn had:
   a. flu-like symptoms,
   b. a deep, dry cough,
   c. recent shortness of breath or difficulty breathing,
   d. new loss of taste or smell, and/or
   e. fever of 100 degrees or above?

Temperature Testing:

You must register a temperature between 96- and 100-degrees Fahrenheit as described in the temperature procedures. (see next page for testing procedures)

- If your temperature is below 96 degrees, retest with a different device.
- If your temperature is 100-degrees Fahrenheit or above, retest on another device preferably an ear thermometer, if your temperature still registers 100-degrees Fahrenheit or above you may not enter the site.

Clearance to enter the site:

- If you have answered **"no"** to all three questions ***and*** passed the temperature test, you may enter the site.
- ***If you have an approved Vistra vaccination sticker, you are cleared to enter the site without the temperature test or answering COVID screening questions.***
- If you passed the temperature test ***and*** answered "Yes" to any of the questions, but have been cleared through VistraTravelerSafety (HR clearance) to enter the Vistra work site for that instance of exposure, testing, or symptoms, you may enter the site.

Anyone *not* cleared to enter the work site must immediately leave the work site and notify their supervisor who will notify HR at VistraTravelerSafety@vistracorp.com for next steps.

Any symptomatic employee, unvaccinated employee exposed to COVID-19 or any employee tested for COVID-19 as described above must be cleared through VistraTravelerSafety prior to returning to work.

Required Temperature Testing Procedures:

All persons entering the site without a Vistra vaccination sticker, who have cleared all questions above, will also submit to temperature testing or self-administer a temperature test as required by the facility management. If a self-administered test is required, then a member of the management team or their designee will witness the testing; however, where that is not practicable, each person must attest that they are only entering the site premises because they have passed the screening questions and temperature test required for entry. Also:

a. Hats may cause false high temperatures and should not be worn for five minutes immediately preceding a forehead temperature test.
b. Each person is responsible for ensuring all self-testing materials and areas touched during testing are sanitized.
c. All personnel should maintain a **distance of at least six feet** from other people during this process or wear required masks.

Temperature Testing Requirements:

1. **All persons entering the site without a Vistra vaccination sticker must register a temperature between 96- and 100-degrees Fahrenheit. Any such person who has a temperature not within that range or who triggers an alarm on a thermal camera** must **retest with a different device**, preferably an **ear thermometer**, if available. If the second test registers a temperature of 100 degrees or above:
   a. That person **may not enter** the Vistra work site and must notify their supervisor, who will notify HR at VistraTravelerSafety@vistracorp.com for next steps.
   b. If there is significant inconsistency between the two tests, repeat another temperature test and use the two closest readings.
2. **Anyone who registers a temperature between 96- and 100-degrees Fahrenheit** may proceed to their work site.
   - **If temperature is below 96 degrees, wait a few minutes and retest with a different device.**

Control rooms and communal areas:

All persons entering the site without a Vistra vaccination sticker should maintain at least six-feet distance from other people as much as possible and should wear face coverings when six-feet distance is not feasible. No one should gather in communal areas (including the temperature-testing area) without a Vistra vaccination sticker. Only operators are allowed in control rooms without plant manager approval.

Vistra Vaccination Sticker protocols:

All persons with a valid Vistra vaccination sticker do not have to socially distance or wear masks while at the site. They will also not be required to quarantine as a part of COVID-19 exposures unless exhibiting COVID-19 symptoms. To be eligible for these protocols, each person must have their approved Vistra vaccination sticker easily visible at all times while at work. If someone who has applied for a Vistra vaccination sticker believes they have specific health conditions that may affect the ability to have a full immune response to the vaccination, please consult your health provider prior to working without a mask.

Any symptomatic employee, unvaccinated employee exposed to COVID-19 or any employee tested for COVID-19 as described above must be cleared through VistraTravelerSafety prior to returning to work.

APPENDIX E
SAFETY DATA SHEETS

DYNEGY

Safety Data Sheet

Section 1
Identification of the Substance and of the Supplier

1.1 Product Identifier

Product Name/Identification:	ASTM Bottom Ash
Synonyms:	Ash; Ashes; Ash residues; Ashes, residues, bottom; Bottom ash; Bottom ash residues; Coal Fly Ash; Pozzolan; Waste solids.
Formula:	UVCB Substance

1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advices Against

Relevant Identified Uses:	Component of wallboard, concrete, roofing material, bricks, cement kiln feed.
Uses Advised Against:	None known.

1.3 Details of the Supplier of the SDS

Manufacturer/Supplier:	Dynegy, Inc.
Street Address:	601 Travis Street, Suite 1400
City, State and Zip Code:	Houston, TX 77002
Customer Service Telephone:	800-633-4704

Section 2
Hazards Identification

2.1 Classification of the Substance

GHS Classification(s) according to OSHA Hazard Communication Standard (29 CFR 1910.1200):

- Eye Irritant, Category 2A
- STOT-SE, Category 3 (Respiratory Irritation)
- Carcinogen, Category 1A
- STOT-RE, Category 1 (Lungs)
- Toxic to Reproduction, Category 2

2.2 Label Elements

Labelling according to 29 CFR 1910.1200 Appendices A, B and C*	
Hazard Pictogram(s):	
Signal word:	**DANGER**
Hazard Statement(s):	*Causes serious eye irritation.* *May cause respiratory irritation.* *May cause damage to lungs after repeated/prolonged exposure via inhalation.* *May cause cancer of the lung.* *Suspected of damaging fertility or the unborn child.*
Precautionary Statement(s):	*Obtain special instructions before use.* *Do not handle until all safety precautions have been read and understood.* *Avoid breathing dust.* *Wash thoroughly after handling.* *Do not eat drink or smoke when using this product.* *Wear protective gloves/protective clothing/eye protection/face protection.* *Use outdoors or in a well-ventilated area.* *If exposed or concerned: Get medical advice/attention.* *Store in a secure area.* *Dispose of product in accordance with local/national regulations.*

** Fly ash and other coal combustion products (CCPs) are UVCB substances (unknown or variable composition or biological). Various CCPs, noted as ashes/ash residuals; Ashes, residues, bottom; Bottom ash; Bottom ash residues; Waste solids, ashes under TSCA are defined as: "The residuum from the burning of a combination of carbonaceous materials. The following elements may be present as oxides: aluminum, calcium, iron, magnesium, nickel, phosphorus, potassium, silicon, sulfur, titanium, and vanadium." Ashes including fly ash and fluidized bed combustion ash are identified by CAS number 68131-74-8. The exact composition of the ash is dependent on the fuel source and flue additives composed of many constituents. The classification of the final substance is dependent on the presence of specific identified oxides as well as other trace elements.*

2.3 Other Hazards

Listed Carcinogens:

-Respirable Crystalline Silica

IARC: [Yes] **NTP:** [Yes] **OSHA:** [Yes] **Other:** **(ACGIH)** [Yes]

Section 3
Composition/Information on Ingredients

Substance	*CAS No.*	*Percentage (%)*	*GHS Classification*
Crystalline Silica	*14808-60-7*	*20 - 40%*	*Repeat Dose STOT, Category 1* *Carcinogen, Category 1A*
Silica, crystalline respirable (RCS)	*14808-60-7*	*See Footnote 1*	*Repeat Dose STOT, Category 1* *Carcinogen. Category 1A*
Aluminosilicates[2]	*Various, see Footnote 2*	*10 - 60%*	*Single Exposure STOT, Category 3*
Calcium oxide (CaO)	*1305-78-8*	*10 - 30%*	*Skin Irritant, Category 2* *Eye Irritant, Category 1* *Single Exposure STOT, Category 3*
Iron oxide	*1309-37-1*	*1 - 10%*	*Not Classified*
Manganese dioxide (MnO_2)	*1313-13-9*	*<2%*	*Skin Irritant, Category 2* *Eye Irritant, Category 2B*
Magnesium oxide	*1309-48-4*	*2 - 10%*	*Not Classified*
Phosphorus pentoxide (P_2O_5)	*1314-56-3*	*≤2%*	*Skin Irritant, Category 2* *Eye Irritant, Category 2B*
Sodium oxide	*1313-59-3*	*1 - 10%*	*Not Classified*
Potassium oxide (K_2O)	*12136-45-7*	*≤1%*	*Skin Irritant Category 2* *Eye Irritant Category 2B*
Titanium dioxide (TiO_2)	*13463-67-7*	*<3%*	*Not Classified*
Bromide salt (calcium)	*7789-41-5*	*See Footnote 3*	*Toxic to Reproduction Category 2*

[1]*The percentage of respirable crystalline silica has not been determined. Therefore, a GHS classification of Carcinogen 1A has been assigned.*
[2]*Aluminosilicates (CAS# 1327-36-2) may be in the form of mullite (CAS# 1302-93-8); aluminosilicate glass; pozzolans (CAS# 71243-67-9); or calcium aluminosilicates such as tricalcium aluminate (C3A), or calcium sulfoaluminate (C4A3S). The form is dependent on the source of the coal and or the process used to create the CCP. Pulverized coal combustion would be more likely to create high levels of pozzolans. Aluminosilicates may have inclusions of calcium, titanium, iron, potassium, phosphorus, magnesium and other metal oxides.*
[3]*Analytical data are not available to demonstrate that the concentration of bromide salt is <0.1%; therefore, a GHS classification of Toxic to Reproduction Category 2 has been assigned.*

Section 4
First Aid Measures

4.1 Description of First Aid Measures

Inhalation:	If product is inhaled and irritation of the nose or coughing occurs, remove person to fresh air. Get medical advice/attention if respiratory symptoms persist.
Skin Contact:	If skin exposure occurs, wash with soap and water.
Eye Contact:	If product gets into the eye, rinse copiously with water for several minutes. Remove contact lenses, if present and easy to do. Seek medical attention/advice if irritation occurs or persists.
Ingestion:	No specific first aid measures are required.

4.2 Most Important Health Effects, Both Acute and Delayed

Acute Effects: Direct exposure may cause respiratory irritation, eye irritation and skin irritation. The product dust can dry and irritate the skin and cause dermatitis and can irritate eyes and skin through mechanical abrasion.

Chronic Effects: Chronic exposure may cause lung damage from repeated exposure. Prolonged inhalation of respirable crystalline silica above certain concentrations may cause lung diseases, including silicosis and lung cancer. Repeated exposure to dusts containing inorganic bromide salts may affect fertility and/or result in effects to the unborn child.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

Seek first aid or call a doctor or Poison Control Center if contact with eyes occurs and irritation remains after rinsing. Get medical advice if inhalation occurs and respiratory symptoms persist.

Section 5
Firefighting Measures

5.1 Extinguishing Media

Suitable Extinguishing Media:	Product is not flammable. Use extinguishing media appropriate for surrounding fire.
Unsuitable Extinguishing Media:	Not applicable, the product is not flammable.

5.2 Special Hazards Arising from the Substance or Mixture

Hazardous Combustion Products:	None known.

5.3 Advice for Firefighters

Special Protective Equipment and Precautions for Firefighters:	As with any fire, wear self-contained breathing apparatus (NIOSH approved or equivalent) and full protective gear.

Section 6
Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Personal precautions/Protective Equipment:	See Section 8.2.2 Individual Protective Measures. For concentrations exceeding Occupational Exposure Levels (OELs), use a self-contained breathing apparatus (SCBA).
Emergency procedures:	Use scooping, water spraying/flushing/misting or ventilated vacuum cleaning systems to clean up spills. Do not use pressurized air.

6.2 Environmental Precautions

Environmental precautions:	Prevent contamination of drains or waterways and dispose according to local and national regulations.

6.3 Methods and Material for Containment and Cleaning Up

Methods and materials for containment and cleaning up:	Do not use brooms or compressed air to clean surfaces. Use dust collection vacuum and extraction systems. Large spills of dry product should be removed by a vacuum system. Dampened material should be removed by mechanical means and recycled or disposed of according to local and national regulations.

See Sections 8 and 13 for additional information on exposure controls and disposal.

Section 7
Handling and Storage

7.1 Precautions for Safe Handling

Practice good housekeeping. Use adequate exhaust ventilation, dust collection and/or water mist to maintain airborne dust concentrations below permissible exposure limits (note: respirable crystalline silica dust may be in the air without a visible dust cloud).

Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment. Maintain and test ventilation and dust collection equipment. In cases of insufficient ventilation, wear a NIOSH approved respirator for silica dust when handling or disposing dust from this product. Avoid contact with skin and eyes. Wash or vacuum clothing that has become dusty. Avoid eating, smoking, or drinking while handling the material.

7.2 Conditions for Safe Storage, Including any Incompatibilities

Minimize dust produced during loading and unloading.

Section 8
Exposure Controls/Personal Protection

8.1 Control Parameters

OCCUPATIONAL EXPOSURE LIMITS					
SUBSTANCE		**OSHA PEL TWA (mg/m^3)**	**NIOSH REL TWA (mg/m^3)**	**ACGIH TLV TWA (mg/m^3)**	**CA - OSHA PEL (mg/m^3)**
Calcium oxide		5	2	2	2
Particulates Not Otherwise Regulated	Total	15	15	10	10
	Respirable	5	5	3	5
Respirable Crystalline Silica	Respirable	0.05	0.05	0.025	0.05
Manganese dioxide (as manganese compounds)	Total	5 (Ceiling)	1 3 (STEL)	0.1	0.2
	Respirable	-	-	0.02	-

8.2 Exposure Controls

8.2.1 Engineering Controls

Provide ventilation to maintain the ambient workplace atmosphere below the occupational exposure limit(s). Use general and local exhaust ventilation and dust collection systems as necessary to minimize exposure.

8.2.2 Personal Protective Equipment (PPE)

Respiratory protection:	Wear a NIOSH approved particulate respirator if exposure to airborne particulates is unavoidable and where occupational exposure limits may be exceeded. If airborne exposures are anticipated to exceed applicable PELs or TLVs, a self-contained breathing apparatus or airline respirator is recommended.
Eye and face protection:	If eye contact is possible, wear protective glasses with side shields. Avoid contact lenses.
Hand and skin protection:	Wear gloves and protective clothing. Wash hands with soap and water after contact with material.

Section 9
Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

Property: Value	Property: Value
Appearance (physical state, color, etc.): Fine tan/ gray particulate	**Upper/lower flammability or explosive limits:** Not applicable
Odor: Odorless[1]	**Vapor Pressure (Pa):** Not applicable
Odor threshold: Not applicable	**Vapor Density:** Not applicable
pH (25 °C) (in water): 8 - 11	**Specific gravity or relative density:** 2.2 – 2.9
Melting point/freezing point (°C): Not applicable	**Water Solubility:** Slight
Initial boiling point and boiling range (°C): Not applicable	**Partition coefficient: n-octane/water:** Not determined
Flash point (°C): Not determined	**Auto ignition temperature (°C):** Not applicable
Evaporation rate: Not applicable	**Decomposition temperature (°C):** Not determined
Flammability (solid, gas): Not combustible	**Viscosity:** Not applicable

[1] The use of urea or aqueous ammonia injected into the flue gas to reduce nitrogen oxides (NOx) emissions may result in the presence of ammonium sulfate or ammonium bisulfate in the ash at less than 0.1%. When ash containing these substances becomes wet under high pH (>9), free ammonia gas may be released resulting in objectionable/nuisance ammonia odor and potential exposure to ammonia gas especially in confined spaces.

Section 10
Stability and Reactivity

10.1 Reactivity:	The material is an inert, inorganic material primarily composed of elemental oxides.
10.2 Chemical stability:	The material is stable under normal use conditions.
10.3 Possibility of hazardous reactions:	The material is a relatively stable, inert material; however, when ash containing ammonia becomes wet under high pH (>9), free ammonia gas may be released resulting in an objectionable/nuisance ammonia odor and potential exposure to ammonia gas especially in confined spaces. Polymerization will not occur.
10.4 Conditions to avoid:	Product can become airborne in moderate winds. Dry material should be stored in silos. Materials stored out of doors should be covered or maintained in a damp condition.
10.5 Incompatible materials:	None known.
10. 6 Hazardous decomposition products:	None known.

Section 11
Toxicological Information

11.1 Information on Toxicological Effects

Endpoint	Data
Acute oral toxicity	LD50 > 2000 mg/kg
Acute dermal toxicity	LD50 > 2000 mg/kg
Acute inhalation toxicity	LD50 > 5.0 mg/L
Skin corrosion/irritation	Does not meet the classification criteria but may cause slight skin irritation. Product dust can dry the skin which can result in irritation.
Eye damage/irritation	Causes serious eye irritation. Positive scores for conjunctiva irritation and chemosis in 2/3 animals based on average of 24, 48 and 72-hour scores with irritation clearing within 21 days; no corneal or iritis effects observed.
Respiratory/skin sensitization	Not a respiratory or dermal sensitizer.
Germ cell mutagenicity	Not mutagenic in in-vitro and in-vivo assays with or without metabolic activation.
Carcinogenicity	Not available. Respirable crystalline silica has been identified as a carcinogen by OSHA, NTP, ACGIH and IARC.
Reproductive toxicity	No developmental toxicity was observed in available animal studies. Reproductive studies on CCPs showed either no reproductive effects, or some effects on male and female reproductive organs and parameters but without a clear dose response. Inorganic bromide salts have been shown to have adverse effects on reproductive parameters in some animal studies.
STOT-SE	CCPs when present as a nuisance dust may result in respiratory irritation.
STOT-RE	In a 180-day inhalation study with fly ash dust, no effects were observed at the highest dose tested. NOEC = 4.2 mg/m^3; it is not possible to assess the level at which toxicologically significant effects may occur. Repeated inhalation exposures to high levels of respirable crystalline silica may result in lung damage (i.e., silicosis).
Aspiration Hazard	Not applicable based product form.

Section 12
Ecological Information

12.1 Toxicity

Fly Ash (CAS# 68131-74-8)	
Toxicity to Fish	LC50 > 100 mg/L
Toxicity to Aquatic Invertebrates	Data indicates that the test substance is not toxic to *Daphnia magna* (EC50 undetermined)
Toxicity to Aquatic Algae and Plants	EC50 = 10 mg/L
Calcium oxide CAS# 1305-78-8	
Toxicity to Fish	LC50 = 50.6 mg/L The findings were closely related to the pH of the test solutions; therefore, pH is considered to be the main reason for the effects.
Toxicity to Aquatic Invertebrates	EC50 = 49.1 mg/L The findings were closely related to the pH of the test solutions; therefore, pH is considered to be the main reason for the effects.
Toxicity to Aquatic Algae and Plants	NOEC =48 mg/L @ 72 hours based on $Ca(OH)_2$ The initial pH of the test medium was not directly related to the biologically relevant effects. The formation of precipitates is likely the result of the reaction between CO_2 dissolved in the medium.

12.2 Persistence and Degradability

Not relevant for inorganic materials.

12.3 Bioaccumulative Potential

This material does not contain any compounds that would bioaccumulate up the food chain.

12.4 Mobility in Soil

No data available.

12.5 Results of PBT and vPvB Assessment

This material does not contain any compounds classified as “persistent, bioaccumulative or toxic” nor as “very persistent/very bioaccumulative”.

12.6 Other Adverse Effects

None known.

Section 13
Disposal Considerations

See Sections 7 and 8 above for safe handling and use, including appropriate industrial hygiene practices.

Dispose of all waste product and containers in accordance with federal, state and local regulations.

Section 14
Transport Information

Regulatory entity: U.S. DOT	Shipping Name:	Not Regulated
	Hazard Class:	Not Regulated
	ID Number:	Not Regulated
	Packing Group:	Not Regulated

Section 15
Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Mixture

- TSCA Inventory Status

  All components are listed on the TSCA Inventory.

- California Proposition 65

  The following substances are known to the State of California to be carcinogens and/or reproductive toxicants:

  - Respirable crystalline silica
  - Titanium dioxide

- State Right-to-Know (RTK)

Component	CAS	MA[1,2]	NJ[3,4]	PA[5]	RI[6]
Ammonium bisulfate	7803-63-6	No	Yes	No	No
Ammonium sulfate	7783-20-2	Yes	No	Yes	No
Calcium oxide	1305-78-8	Yes	Yes	Yes	No
Iron oxide	1309-37-1	Yes	Yes	Yes	No
Magnesium oxide	1309-48-4	No	Yes	No	No
Phosphorus pentoxide (or phosphorus oxide)	1314-56-3	Yes	Yes	Yes	No
Potassium oxide	12136-45-7	No	Yes	No	No
Silica-crystalline (SiO_2), quartz	14808-60-7	Yes	Yes	Yes	No
Sodium oxide	1313-59-3	No	Yes	No	No
Titanium dioxide	13463-67-7	Yes	Yes	Yes	Yes

[1] Massachusetts Department of Public Health, no date
[2] 189th General Court of The Commonwealth of Massachusetts, no date
[3] New Jersey Department of Health and Senior Services, 2010a
[4] New Jersey Department of Health, 2010b
[5] Pennsylvania Code, 1986
[6] Rhode Island Department of Labor and Training, no date

Section 16
Other Information, Including Date of Preparation or Last Revision

16.1 Indication of Changes

Date of preparation or last revision: February 23, 2018

16.2 Abbreviations and Acronyms

- ACGIH: American Conference of Industrial Hygienists
- CA: California
- CAS: Chemical Abstract Services
- CCP: Coal Combustion Product
- CFR: Code of Federal Regulations
- EPA: Environmental Protection Agency
- GHS: Globally Harmonized System of Classification and Labelling
- IARC: International Agency for Research on Cancer
- LC50: Concentration resulting in the mortality of 50 % of an animal population
- LD50: Dose resulting in the mortality of 50 % of an animal population
- MA: Massachusetts
- NA: Not Applicable
- NJ: New Jersey
- NOEC: No observed effect concentration
- NIOSH: National Institute of Occupational Safety and Health
- NOx: Nitrogen oxides
- NTP: US National Toxicology Program
- OEL: Occupational Exposure Limit
- OSHA: Occupational Safety and Health Administration
- PA: Pennsylvania
- PBT: Persistent, Toxic and Bioaccumulative
- PEL: Permissible exposure limit
- PPE: Personal Protective Equipment
- REL: Recommended exposure limit
- RI: Rhode Island
- RCS: Respirable Crystalline Silica
- RTK: Right-to-Know
- SCBA: Self-contained breathing apparatus
- SDS: Safety Data Sheet
- STEL: Short-term exposure limit
- STOT-RE: Specific target organ toxicity-repeated exposure
- STOT-SE: Specific target organ toxicity-single exposure
- TLV: Threshold limit value
- TSCA: Toxic Substances Control Act
- TWA: Time-weighted average
- UEL: Upper explosive limit
- UVCB: Unknown or Variable Composition/Biological
- U.S.: United States
- U.S. DOT: United States of Department of Transportation

16.3 Other Hazards

Hazardous Materials Identification System (HMIS) Degree of hazard (0= low, 4 = extreme)							
Health:	2*	**Flammability:**	0	**Physical Hazards:**	0	**Personal protection:****	

** Chronic Health Effects*
******** *Appropriate personal protection is defined by the activity to be performed.*
See Section 8 for additional information.

DISCLAIMER:

This SDS has been prepared in accordance with the Hazard Communication Rule 29 CFR 1910.1200. Information herein is based on data considered to be accurate as of date prepared. No warranty or representation, express or implied, is made as to the accuracy or completeness of this data and safety information. No responsibility can be assumed for any damage or injury resulting from abnormal use, failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

DYNEGY

Safety Data Sheet

Section 1
Identification of the Substance and of the Supplier

1.1 Product Identifier

Product Name/Identification:	ASTM Class C Fly Ash
Synonyms:	Coal Fly Ash, Pozzolan
Formula:	UVCB Substance

1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advices Against

Relevant Identified Uses:	Component of wallboard, concrete, roofing material, bricks, cement kiln feed.
Uses Advised Against:	None known.

1.3 Details of the Supplier of the SDS

Manufacturer/Supplier:	Dynegy, Inc.
Street Address:	601 Travis Street, Suite 1400
City, State and Zip Code:	Houston, TX 77002
Customer Service Telephone:	800-633-4704

Section 2
Hazards Identification

2.1 Classification of the Substance

GHS Classification(s) according to OSHA Hazard Communication Standard (29 CFR 1910.1200):

- Eye Irritant, Category 2A
- STOT-SE, Category 3 (Respiratory Irritation)
- Carcinogen, Category 1A
- STOT-RE, Category 1 (Lungs)
- Toxic to Reproduction, Category 2

2.2 Label Elements

Labelling according to 29 CFR 1910.1200 Appendices A, B and C*	
Hazard Pictogram(s):	
Signal word:	**DANGER**
Hazard Statement(s):	*Causes serious eye irritation.* *May cause damage to lungs after repeated/prolonged exposure via inhalation.* *May cause respiratory irritation.* *May cause cancer of the lung.* *Suspected of damaging fertility or the unborn child.*
Precautionary Statement(s):	*Obtain special instructions before use.* *Do not handle until all safety precautions have been read and understood.* *Avoid breathing dust.* *Wear protective gloves/protective clothing/eye protection/face protection.* *Wash thoroughly after handling.* *Do not eat drink or smoke when using this product.* *Use outdoors or in a well-ventilated area.* *If exposed or concerned: Get medical advice/attention.* *Store in a secure area.* *Dispose of product in accordance with local/national regulations.*

** Fly ash and other coal combustion products (CCPs) are UVCB substances (unknown or variable composition or biological). Various CCPs, noted as ashes/ash residuals; Ashes, residues, bottom; Bottom ash; Bottom ash residues; Waste solids, ashes under TSCA are defined as: "The residuum from the burning of a combination of carbonaceous materials. The following elements may be present as oxides: aluminum, calcium, iron, magnesium, nickel, phosphorus, potassium, silicon, sulfur, titanium, and vanadium." Ashes including fly ash and fluidized bed combustion ash are identified by CAS number 68131-74-8. The exact composition of the ash is dependent on the fuel source and flue additives composed of many constituents. The* *classification of the final substance is dependent on the presence of specific identified oxides as well as other trace elements.*

2.3 Other Hazards

Listed Carcinogens:

-Respirable Crystalline Silica

IARC: [Yes] **NTP:** [Yes] **OSHA:** [Yes] **Other:** **(ACGIH)** [Yes]

Section 3
Composition/Information on Ingredients

Substance	*CAS No.*	*Percentage (%)*	*GHS Classification*
Crystalline Silica	*14808-60-7*	*30 - 60%*	*Repeat Dose STOT, Category 1* *Carcinogen, Category 1A*
Silica, crystalline respirable (RCS)	*14808-60-7*	*See Footnote 1*	*Repeat Dose STOT, Category 1* *Carcinogen, Category 1A*
Aluminosilicates	*71243-67-9* *1327-36-2*	*30 - 60%*	*Single Exposure STOT, Category 3*
Iron oxide	*1309-37-1*	*1 - 10%*	*Not Classified*
Calcium oxide (CaO)	*1305-78-8*	*20 - 30%*	*Skin Irritant, Category 2* *Eye Irritant, Category 1* *Single Exposure STOT, Category 3*
Magnesium oxide	*1309-48-4*	*2 - 10%*	*Not Classified*
Phosphorus pentoxide (P_2O_5)	*1314-56-3*	*≤2%*	*Skin Irritant, Category 2* *Eye Irritant, Category 2B*
Sodium oxide	*1313-59-3*	*1-8%*	*Not Classified*
Potassium oxide (K_2O)	*12136-45-7*	*≤1%*	*Skin Irritant, Category 2* *Eye Irritant, Category 2B*
Titanium dioxide (TiO_2)	*13463-67-7*	*<3%*	*Not Classified*
Bromide salt (calcium)	*7789-41-5*	*See Footnote 2*	*Toxic to Reproduction, Category 2*

Footnote 1: The percentage of respirable crystalline silica has not been determined. Therefore, a GHS classification of Carcinogen, Category 1A has been assigned.

Footnote 2: Analytical data are not available to demonstrate that the concentration of bromide salt is <0.1%; therefore, a GHS classification of Toxic to Reproduction, Category 2 has been assigned.

Section 4
First Aid Measures

4.1 Description of First Aid Measures

Inhalation:	If product is inhaled and irritation of the nose or coughing occurs, remove person to fresh air. Get medical advice/attention if respiratory symptoms persist.
Skin Contact:	If skin exposure occurs, wash with soap and water.
Eye Contact:	If product gets into the eye, rinse copiously with water for several minutes. Remove contact lenses, if present and easy to do. Seek medical attention/advice if irritation occurs or persists.
Ingestion:	No specific first aid measures are required.

4.2 Most Important Health Effects, Both Acute and Delayed

Acute Effects: Direct exposure may cause respiratory irritation, eye irritation and skin irritation. The product dust can dry and irritate the skin and cause dermatitis and can irritate eyes and skin through mechanical abrasion.

Chronic Effects: Chronic exposure may cause lung damage from repeated exposure. Prolonged inhalation of respirable crystalline silica above certain concentrations may cause lung diseases, including silicosis and lung cancer. Repeated exposure to dusts containing inorganic bromide salts may affect fertility and/or result in effects to the unborn child.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

Seek first aid or call a doctor or Poison Control Center if contact with eyes occurs and irritation remains after rinsing. Get medical advice if inhalation occurs and respiratory symptoms persist.

Section 5
Firefighting Measures

5.1 Extinguishing Media

Suitable Extinguishing Media:	Product is not flammable. Use extinguishing media appropriate for surrounding fire.
Unsuitable Extinguishing Media:	Not applicable, the product is not flammable.

5.2 Special Hazards Arising from the Substance or Mixture

Hazardous Combustion Products:	None known.

5.3 Advice for Firefighters

Special Protective Equipment and Precautions for Firefighters:	As with any fire, wear self-contained breathing apparatus (NIOSH approved or equivalent) and full protective gear.

Section 6
Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Personal precautions/Protective Equipment:	See Section 8.2.2 Individual Protective Measures. For concentrations exceeding Occupational Exposure Levels (OELs), use a self-contained breathing apparatus (SCBA).
Emergency procedures:	Use scooping, water spraying/flushing/misting or ventilated vacuum cleaning systems to clean up spills. Do not use pressurized air.

6.2 Environmental Precautions

Environmental precautions:	Prevent contamination of drains or waterways and dispose according to local and national regulations.

6.3 Methods and Material for Containment and Cleaning Up

Methods and materials for containment and cleaning up:	Do not use brooms or compressed air to clean surfaces. Use dust collection vacuum and extraction systems. Large spills of dry product should be removed by a vacuum system. Dampened material should be removed by mechanical means and recycled or disposed of according to local and national regulations.

See Sections 8 and 13 for additional information on exposure controls and disposal.

Section 7
Handling and Storage

7.1 Precautions for Safe Handling

Practice good housekeeping. Use adequate exhaust ventilation, dust collection and/or water mist to maintain airborne dust concentrations below permissible exposure limits (note: respirable crystalline silica dust may be in the air without a visible dust cloud).

Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment. Maintain and test ventilation and dust collection equipment. In cases of insufficient ventilation, wear a NIOSH approved respirator for silica dust when handling or disposing dust from this product. Avoid contact with skin and eyes. Wash or vacuum clothing that has become dusty. Avoid eating, smoking, or drinking while handling the material.

7.2 Conditions for Safe Storage, Including any Incompatibilities

Minimize dust produced during loading and unloading.

Section 8
Exposure Controls/Personal Protection

8.1 Control Parameters

OCCUPATIONAL EXPOSURE LIMITS						
SUBSTANCE		**OSHA PEL TWA (mg/m^3)**	**NIOSH REL TWA (mg/m^3)**	**ACGIH TLV TWA (mg/m^3)**	**CA - OSHA PEL (mg/m^3)**
Calcium oxide		5	2	2	2
Particulates Not Otherwise Regulated	Total	15	15	10	10
	Respirable	5	5	3	5
Respirable Crystalline Silica	Respirable Crystalline Silica	0.05	0.05	0.025	0.05
Titanium dioxide	Total	15	2.4 (fine) 0.3 (ultrafine)	10	10
Manganese dioxide (as manganese compounds)	Total	5 (Ceiling)	1 3 (STEL)	0.1	0.2
	Respirable	-	-	0.02	-

8.2 Exposure Controls

8.2.1 Engineering Controls

Provide ventilation to maintain the ambient workplace atmosphere below the occupational exposure limit(s). Use general and local exhaust ventilation and dust collection systems as necessary to minimize exposure.

8.2.2 Personal Protective Equipment (PPE)

Respiratory protection:	Wear a NIOSH approved particulate respirator if exposure to airborne particulates is unavoidable and where occupational exposure limits may be exceeded. If airborne exposures are anticipated to exceed applicable PELs or TLVs, a self-contained breathing apparatus or airline respirator is recommended.
Eye and face protection:	If eye contact is possible, wear protective glasses with side shields. Avoid contact lenses.
Hand and skin protection:	Wear gloves and protective clothing. Wash hands with soap and water after contact with material.

Section 9
Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

Property: Value	Property: Value
Appearance (physical state, color, etc.): Fine tan/ gray particulate	**Upper/lower flammability or explosive limits:** Not applicable
Odor: Odorless[1]	**Vapor Pressure (Pa):** Not applicable
Odor threshold: Not applicable	**Vapor Density:** Not applicable
pH (25 °C) (in water): Not Determined	**Specific gravity or relative density:** 2.2 – 2.9
Melting point/freezing point (°C): Not applicable	**Water Solubility:** Slight
Initial boiling point/boiling range (°C): NA	**Partition coefficient: n-octane/water:** NA
Flash point (°C): Not determined	**Auto ignition temperature (°C):** Not applicable
Evaporation rate: Not applicable	**Decomposition temperature (°C):** Not determined
Flammability (solid, gas): Not combustible	**Viscosity:** Not applicable

[1] The use of urea or aqueous ammonia injected into the flue gas to reduce nitrogen oxides (NOx) emissions may result in the presence of ammonium sulfate or ammonium bisulfate in the ash at less than 0.1%. When ash containing these substances becomes wet under high pH (>9), free ammonia gas may be released resulting in objectionable/nuisance ammonia odor and potential exposure to ammonia gas especially in confined spaces.

Section 10
Stability and Reactivity

10.1 Reactivity:	The material is an inert, inorganic material primarily composed of elemental oxides.
10.2 Chemical stability:	The material is stable under normal use conditions.
10.3 Possibility of hazardous reactions:	The material is a relatively stable, inert material; however, when ash containing ammonia becomes wet under high pH (>9), free ammonia gas may be released resulting in an objectionable/nuisance ammonia odor and potential exposure to ammonia gas especially in confined spaces. Polymerization will not occur.
10.4 Conditions to avoid:	Product can become airborne in moderate winds. Dry material should be stored in silos. Materials stored out of doors should be covered or maintained in a damp condition.
10.5 Incompatible materials:	None known.
10. 6 Hazardous decomposition products:	None known.

Section 11
Toxicological Information

11.1 Information on Toxicological Effects

Endpoint	Data
Acute oral toxicity	LD50 > 2000 mg/kg
Acute dermal toxicity	LD50 > 2000 mg/kg
Acute inhalation toxicity	LD50 > 5.0 mg/L
Skin corrosion/irritation	Does not meet the classification criteria but may cause slight skin irritation. Product dust can dry the skin which can result in irritation.
Eye damage/irritation	Causes serious eye irritation. Positive scores for conjunctiva irritation and chemosis in 2/3 animals based on average of 24, 48 and 72-hour scores with irritation clearing within 21 days; No corneal or iritis effects observed.
Respiratory/skin sensitization	Not a respiratory or dermal sensitizer.
Germ cell mutagenicity	Not mutagenic in in-vitro and in-vivo assays with or without metabolic activation.
Carcinogenicity	Not available. Respirable crystalline silica has been identified as a carcinogen by OSHA, NTP, ACGIH and IARC.
Reproductive toxicity	No developmental toxicity was observed in available animal studies. Reproductive studies on CCPs showed either no reproductive effects, or some effects on male and female reproductive organs and parameters but without a clear dose response. Inorganic bromide salts have been shown to have adverse effects on reproductive parameters in some animal studies.
STOT-SE	CCPs when present as a nuisance dust may result in respiratory irritation.
STOT-RE	In a 180-day inhalation study with fly ash dust, no effects were observed at the highest dose tested. NOEC = 4.2 mg/m^3; it is not possible to assess the level at which toxicologically significant effects may occur. Repeated inhalation exposures to high levels of respirable crystalline silica may result in lung damage (i.e., silicosis).
Aspiration Hazard	Not applicable based product form.

Section 12
Ecological Information

12.1 Toxicity

Fly Ash C (CAS# 68131-74-8)	
Toxicity to Fish	LC50 > 100 mg/L
Toxicity to Aquatic Invertebrates	Data indicates that the test substance is not toxic to *Daphnia magna* (EC50 undetermined).
Toxicity to Aquatic Algae and Plants	EC50 = 10 mg/L

Calcium oxide CAS# 1305-78-8	
Toxicity to Fish	LC50 = 50.6 mg/L The findings were closely related to the pH of the test solutions; therefore, pH is considered to be the main reason for the effects.
Toxicity to Aquatic Invertebrates	EC50 = 49.1 mg/L The findings were closely related to the pH of the test solutions; therefore, pH is considered to be the main reason for the effects.
Toxicity to Aquatic Algae and Plants	NOEC =48 mg/L @ 72 hours based on $Ca(OH)_2$ The initial pH of the test medium was not directly related to the biologically relevant effects. The formation of precipitates is likely the result of the reaction between CO_2 dissolved in the medium.

12.2 Persistence and Degradability

Not relevant for inorganic materials.

12.3 Bioaccumulative Potential

This material does not contain any compounds that would bioaccumulate up the food chain.

12.4 Mobility in Soil

No data available.

12.5 Results of PBT and vPvB Assessment

This material does not contain any compounds classified as “persistent, bioaccumulative or toxic” nor as “very persistent/very bioaccumulative”.

12.6 Other Adverse Effects

None known.

Section 13

Disposal Considerations

See Sections 7 and 8 above for safe handling and use, including appropriate industrial hygiene practices.

Dispose of all waste product and containers in accordance with federal, state and local regulations.

Section 14
Transport Information

Regulatory entity: U.S. DOT	Shipping Name:	Not Regulated
	Hazard Class:	Not Regulated
	ID Number:	Not Regulated
	Packing Group:	Not Regulated

Section 15
Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Mixture

- TSCA Inventory Status

  All components are listed on the TSCA Inventory.

- California Proposition 65.

  The following substances are known to the State of California to be carcinogens and/or reproductive toxicants:

  - Respirable crystalline silica

- State Right-to-Know (RTK)

Component	CAS	MA[1,2]	NJ[3,4]	PA[5]	RI[6]
Ammonium bisulfate	7803-63-6	No	Yes	No	No
Ammonium sulfate	7783-20-2	Yes	No	Yes	No
Calcium oxide	1305-78-8	Yes	Yes	Yes	No
Iron oxide	1309-37-1	Yes	Yes	Yes	No
Magnesium oxide	1309-48-4	No	Yes	No	No
Manganese oxide-as manganese compounds	1313-13-9; Various	No	No	Yes	Yes
Phosphorus pentoxide (or phosphorus oxide)	1314-56-3	Yes	Yes	Yes	No
Potassium oxide	12136-45-7	No	Yes	No	No
Silica-crystalline (SiO2), quartz	14808-60-7	Yes	Yes	Yes	No
Sodium oxide	1313-59-3	No	Yes	No	No
Titanium dioxide	13463-67-7	Yes	Yes	Yes	Yes

[1] Massachusetts Department of Public Health, no date
[2] 189th General Court of The Commonwealth of Massachusetts, no date
[3] New Jersey Department of Health and Senior Services, 2010a
[4] New Jersey Department of Health, 2010b
[5] Pennsylvania Code, 1986
[6] Rhode Island Department of Labor and Training, no date

Section 16
Other Information, Including Date of Preparation or Last Revision

16.1 Indication of Changes

Date of preparation or last revision: February 23, 2018

16.2 Abbreviations and Acronyms

- ACGIH: American Conference of Industrial Hygienists
- CA: California
- CAS: Chemical Abstract Services
- CCP: Coal Combustion Product
- CFR: Code of Federal Regulations
- EPA: Environmental Protection Agency

- GHS: Globally Harmonized System of Classification and Labelling
- IARC: International Agency for Research on Cancer
- LC50: Concentration resulting in the mortality of 50 % of an animal population
- LD50: Dose resulting in the mortality of 50 % of an animal population
- MA: Massachusetts
- NA: Not Applicable
- NJ: New Jersey
- NOEC: No observed effect concentration
- NIOSH: National Institute of Occupational Safety and Health
- NOx: Nitrogen oxides
- NTP: US National Toxicology Program
- OEL: Occupational Exposure Limit
- OSHA: Occupational Safety and Health Administration
- PA: Pennsylvania
- PBT: Persistent, Toxic and Bioaccumulative
- PEL: Permissible exposure limit
- PPE: Personal Protective Equipment
- REL: Recommended exposure limit
- RI: Rhode Island
- RCS: Respirable Crystalline Silica
- RTK: Right-to-Know
- SCBA: Self-contained breathing apparatus
- SDS: Safety Data Sheet
- STEL: Short-term exposure limit
- STOT-RE: Specific target organ toxicity-repeated exposure
- STOT-SE: Specific target organ toxicity-single exposure
- TLV: Threshold limit value
- TSCA: Toxic Substances Control Act
- TWA: Time-weighted average
- UEL: Upper explosive limit
- UVCB: Unknown or Variable Composition/Biological
- U.S.: United States
- U.S. DOT: United States of Department of Transportation

16.3 Other Hazards

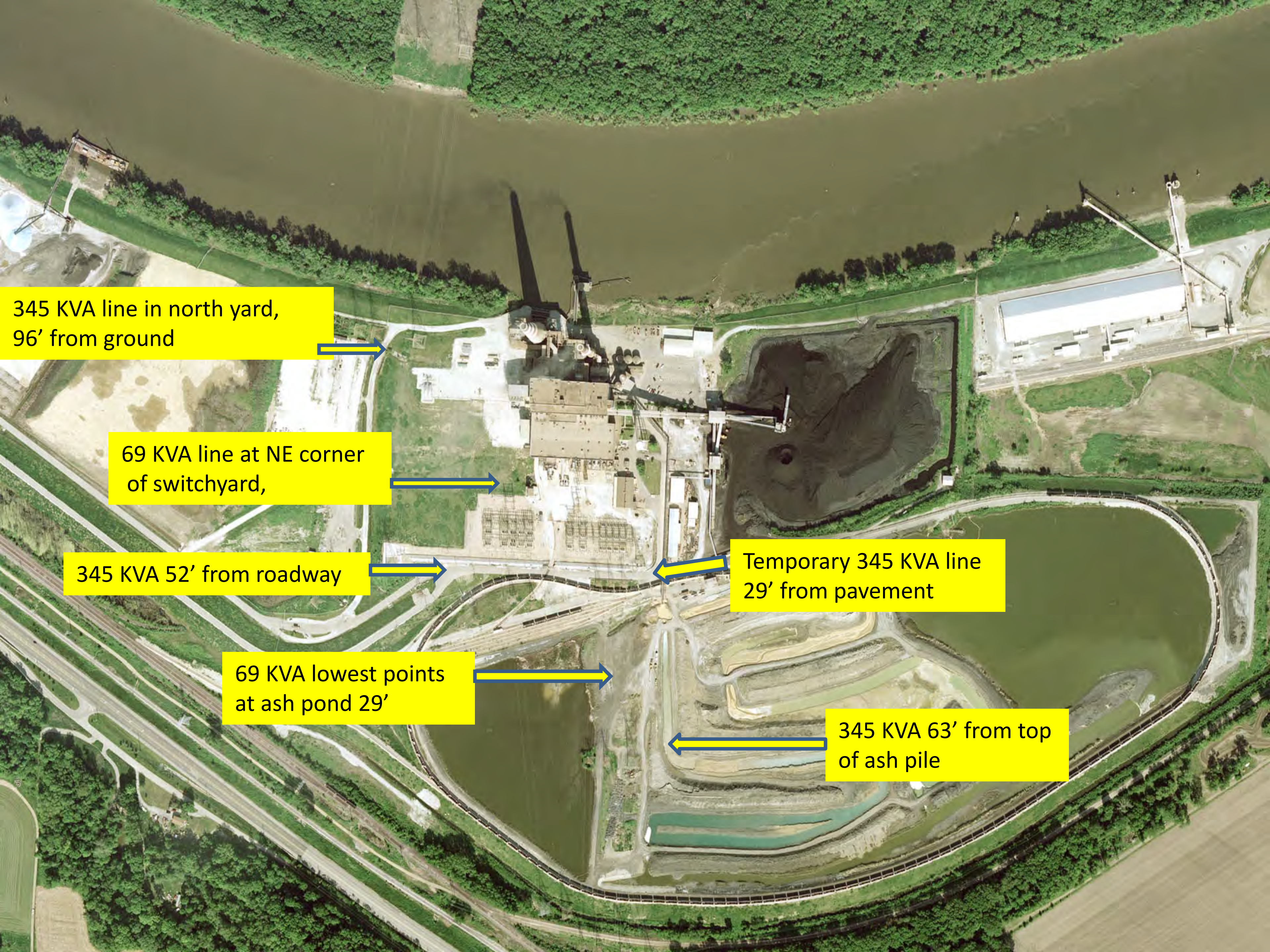
Hazardous Materials Identification System (HMIS) Degree of hazard (0= low, 4 = extreme)								
Health:	2*	**Flammability:**	0	**Physical Hazards:**	0	**Personal protection:****		

** Chronic Health Effects*
****** *Appropriate personal protection is defined by the activity to be performed.*
See Section 8 for additional information.

DISCLAIMER:

This SDS has been prepared in accordance with the Hazard Communication Rule 29 CFR 1910.1200. Information herein is based on data considered to be accurate as of date prepared. No warranty or representation, express or implied, is made as to the accuracy or completeness of this data and safety information. No responsibility can be assumed for any damage or injury resulting from abnormal use, failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

APPENDIX F
OVERHEAD POWER LINE LOCATIONS


345 KVA line in north yard, 96’ from ground
69 KVA line at NE corner of switchyard,
345 KVA 52’ from roadway
Temporary 345 KVA line 29’ from pavement
69 KVA lowest points at ash pond 29’
345 KVA 63’ from top of ash pile


DANGER
Temporary 345 KVA line
29’ from pavement
Three danger signs in this area
05/22/2018 14:52


345 KVA
63' from top
of ash pile
36' from edge of
upper pile to lowest line
69 KVA lowest points
at ash pond 29'
05/24/2018 09:28

Yellow chain & cones installed at ash pond


DANGER
345,000 VOLTS
LOCATED 48'
ABOVE ROAD.
20' MINIMUM
CLEARANCE
REQUIRED.
05/22/2018 14:54


SPEED LIMIT 15
345 KVA 52’ from roadway
05/22/2018 14:56


69 KVA line at NE corner of switchyard, just outside fence line
05/23/2018 14:26

345 KVA line in north yard,
96’ from ground

ATTACHMENT T

Phil Morris
Illinois Power Resources Generating
Luminant
1500 Eastport Plaza Drive
Collinsville, IL 62234

May 19, 2021

Mr. Darin LeCrone, P.E.
Manager, Industrial Unit
Bureau of Water, Division of Water Pollution Control, Permits Section
Illinois Environmental Protection Agency
1021 North Grand Avenue, East
Springfield, IL 62794-9276

Re: CCR Surface Impoundment Category Designation and Justification for Illinois Power Resources Generating, LLC

Dear Mr. LeCrone:

Pursuant to 35 I.A.C. 845.700(c), Illinois Power Resources Generating, LLC submits the information necessary to categorize the CCR surface impoundments located at the Edwards Power Plant and the now retired Duck Creek Power Plant. The following parameters were used in assessing and justifying each assigned category.

- Category 1 – *Impacts to existing potable water supply well or impacts to groundwater quality within the setback of an existing potable water supply well.*
  - This review includes an assessment of potable water wells within 2,500 feet of CCR surface impoundments to determine whether any potential impacts are occurring within the setback zone of any community water supply well established under the Illinois Groundwater Protection Act.
  - This information was developed during the Part 845 rulemaking and is summarized in Attachment 1, Table 2: Impacts to Potable Water Supply.
- Category 2 – *Imminent threat to human health or the environment or have been designated by IEPA under (g)(5)*
  - The surface impoundments at Edwards and Duck Creek Power Plants do not pose an imminent threat to human health or the environment. There are no known conditions at or around the facility where someone or something may be exposed to contaminant concentrations reasonably expected to cause harm
- Category 3 – *Located in areas of environmental justice ("EJ") concern*
  - EJ areas were evaluated using the EJ mapping link from IEPA's webpage located at https://www2.illinois.gov/epa/topics/environmental-justice. Per the IEPA mapping tool, the EJ Status thresholds were determined as twice the state averages for Minority and Low Income consistent with 35 IAC 845.700(g)(6).
  - An EJ map denoting the facilities with impoundments is located in Attachment 2.

- Category 4-7
    - Category 4 - Inactive CCR surface impoundments that have an exceedance of the groundwater protection standards in Section 845.600
    - Category 5 - Existing CCR surface impoundments that have exceedances of the groundwater protection standards in Section 845.600
    - Category 6 - Inactive CCR surface impoundments that are in compliance with the groundwater protection standards in Section 845.600.
    - Category 7 – Existing CCR surface impoundments that are in compliance with the groundwater protection standards in Section 845.600

Based on the information above, category designations have been assigned. The category designations for each CCR impoundment are shown in Attachment 1, Table 1: Category Designations.

If you have any questions regarding this submittal, please contact Phil Morris at 618-343-7794 or phil.morris@vistracorp.com.

Sincerely,

Phil Morris
Senior Environmental Director

Attachments

Attachment 1

Table 1: Category Designation

Facility	Pond Description	Classifications	Potable Water Supply Impacts (Category 1)	Human Health or Environment Threat (Category 2)	Located within Environmental Justice Areas[1] (Category 3)	Standards Exceedances[2] (Categories 4,5,6,7)	Impoundment Category 845.700(g)
Edwards	Ash Pond 1	Existing	No	No	No	Yes	5
Duck Creek	Bottom Ash Basin	Inactive	No	No	Yes	NA[3]	3
	GMF Pond	Inactive	No	No	Yes	NA[3]	3
	GMF Recycle Pond	Inactive	No	No	Yes	NA[3]	3

[1] See Attachment 2 Environmental Justice Area Map

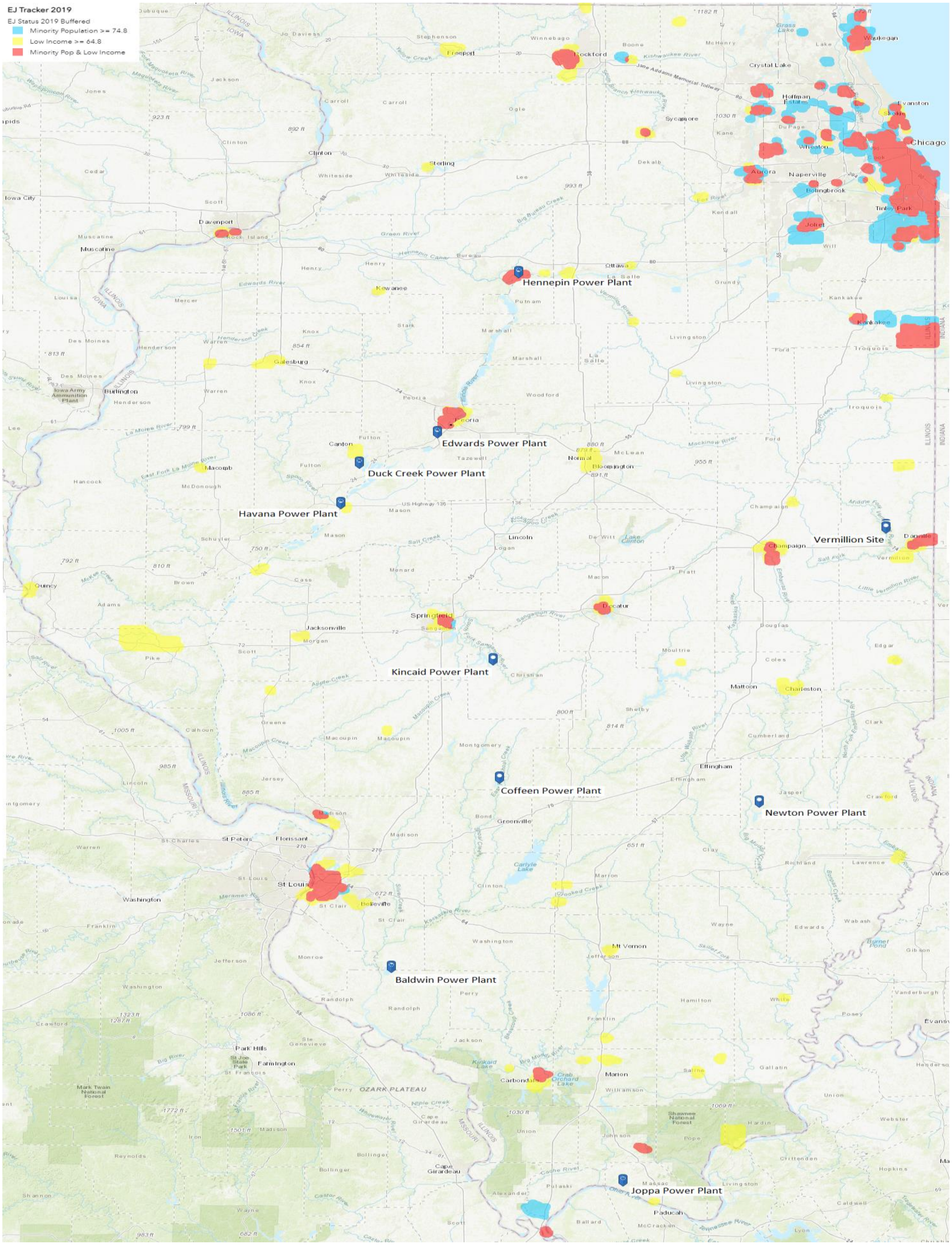
[2] Ground water analyses for purposes of categories 4-7, assumptions have been made based on current groundwater data. However, since sampling and analysis is ongoing and subject to IEPA review and approval, IPGC reserves the right to update its category designations for Categories 4-7.

[3] NA for this determination since the CCR surface impoundment was assign a highest priority category

Table 2: Impacts to Potable Water Supply

Site Name	Private and Semi-Private Wells	Non-Community Water Supply (CWS) Wells	Non-CWS Surface Water Intakes	Community Water Supply Wells	CWS Surface Water Intakes
Edwards	**Present, but not at risk** Seven (7) water wells were identified and one (or possibly two) are located potentially downgradient of the site. Based on Ramboll's review of groundwater data, these wells are unlikely to be impacted by coal ash constituents.	**Present, but not at risk** One non-CWS well was identified; however, it is unlikely to be at risk because of its hydrogeologic location relative to the power plant.	Absent	Absent	Absent
Duck Creek	**Present, but not at risk** Three (3) water wells were identified; however, they are unlikely to be at risk because of their hydrogeologic location relative to the power plant and/or they are abandoned. None of the off-site wells are located in a downgradient direction.	Absent	Absent	Absent	Absent

Attachment 2: EJ Mapping Denoting Facilities with Impoundments



ATTACHMENT U

Geosyntec consultants

1 McBride and Son Center Drive, Suite 202
Chesterfield, MO 63005
PH 636-812-0800
www.geosyntec.com

October 11, 2021

Illinois Power Resources Generating, LLC
7800 South Cilco Lane
Bartonville, Illinois, 61607

Subject: USEPA CCR Rule and IEPA Part 845 Rule Applicability Cross-Reference
2021 USEPA CCR Rule Periodic Certification Report
Ash Pond, Edwards Power Plant, Bartonville, Illinois

At the request of Illinois Power Resources Generating, LLC (IPRG), Geosyntec Consultants (Geosyntec) has prepared this letter to document how the attached 2021 United States Environmental Protection Agency (USEPA) CCR Rule Periodic Certification Report (Report) was prepared in accordance with both the Federal USEPA CCR Rule[1] and the state-specific Illinois Environmental Protection Agency (IEPA) Part 845 Rule[2]. Specific sections of the report and the applicable sections of the USEPA CCR Rule and Illinois Part 845 Rule are cross-referenced in **Table 1**. A certification from a Qualified Professional Engineer for each of the CCR Rule sections listed in **Table 1** is provided in Section 9 of the attached Report. This certification statement is also applicable to each section of the Part 845 Rule listed in **Table 1.**

Table 1 – USEPA CCR Rule and Illinois Part 845 Rule Cross-Reference

Report Section	USEPA CCR Rule		Illinois Part 845 Rule	
3	§257.73 (a)(2)	Hazard Potential Classification	845.440	Hazard Potential Classification Assessment[3]
4	§257.73 (c)(1)	History of Construction	845.220(a)	Design and Construction Plans (Construction History)
5	§257.73 (d)(1)	Structural Stability Assessment	845.450 (a) and (c)	Structural Stability Assessment
6	§257.73 (e)(1)	Safety Factor Assessment	845.460 (a-b)	Safety Factor Assessment
7	§257.82 (a)(1-3)	Adequacy of Inflow Design Control System Plan	845.510(a), (c)(1), (c)(3)	Hydrologic and Hydraulic Capacity Requirements / Inflow Design Flood Control System Plan
	§257.82 (b)	Discharge from CCR Unit	845.510(b)	Discharge from CCR Surface Impoundment

[1] United Stated Environmental Protection Agency, 2015. *40 CFR Parts 257 and 261, Hazardous and Solid Waste Management System, Disposal of Coal Combustion Residuals from Electric Utilities, Final Rule.*
[2] State of Illinois, Joint Committee on Administrative Rule, Administrative Code (2021). *Title 35: Environmental Protection, Subtitle G: Waste Disposal, Chapter I: Pollution Control Board, Subchapter j: Coal Combustion Waste Surface Impoundment, Part 845 Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments.*
[3] "Significant" and "High" hazard, per the CCR Rule[1], are equivalent to Class II and Class I hazard potential, respectively, per Part 845[2].

CLOSING

This letter has been prepared to demonstrate that the content and Qualified Professional Engineer Certification of the 2021 Periodic USEPA CCR Rule Certification Report fulfills the corresponding requirements of Part 845 of Illinois Administrative Code listed in **Table 1**.

Sincerely,

John P. Seymour, P.E.
Senior Principal

Lucas P. Carr, P.E.
Senior Engineer

2021 USEPA CCR RULE PERIODIC CERTIFICATION REPORT
§257.73(a)(2), (c), (d), (e) and §257.82
ASH POND
Edwards Power Plant
Edwards, Illinois

Submitted to

Illinois Power Resources Generating, LLC

7800 South Cilco Lane
Bartonville, Illinois 61607

Submitted by

Geosyntec consultants

engineers | scientists | innovators

1 McBride and Son Center Drive, Suite 202
Chesterfield, Missouri 63005

October 11, 2021

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EXECUTIVE SUMMARY

This Periodic United States Environmental Protection Agency (USEPA) Coal Combustion Residuals (CCR) Rule [1] certification report (Periodic Certification Report) for the Ash Pond (AP) at the Edwards Power Plant (EPP)[1], also known as the Edwards Power Station (EDW), has been prepared in accordance with Rule 40, Code of Federal Regulations (CFR) §257, herein referred to as the "CCR Rule" [1]. The CCR Rule requires that initial certifications for existing CCR surface impoundment, completed in 2016 and subsequently posted originally on the Illinois Power Resource Generating LLC CCR Website; ([2], [3], [4], [5], [6]). These documents are to be updated on a five-year basis.

The initial certification reports developed in 2016 and 2017 were independently reviewed by Geosyntec ([2], [7], [3], [8], [4], [5], [6]). Additionally, field observations, interviews with plant staff, updated engineering analyses, and evaluations were performed to compare conditions in 2021 at the AP relative to those of the 2016 and 2017 initial certifications. These tasks determined that updates are not required for the Hazard Potential Classification. However due to changes at the site, updates were required and were performed for the:

- History of Construction Report,
- Initial Structural Stability Assessment,
- Initial Safety Factor Assessment, and
- Initial Inflow Design Flood Control System Plan.

Geosyntec's evaluations of the initial certification reports and updated analyses identified that the AP meets all requirements for hazard potential classification, history of construction reporting, structural stability, safety factor assessment, and inflow design flood control system planning. **Table 1** provides a summary of the initial 2016 certifications and the updated 2021 periodic certifications.

[1] The AP is also referred to as ID Number W1438050005-01, Ash Pond by the Illinois Environmental Protection Agency (IEPA); CCR unit ID 301 by IPRG; and IL50710 within the National Inventory of Dams (NID) maintained by the Illinois Department of Natural Resources (IDNR). Within this document it is referred to as the AP.

Table 1 – Periodic Certification Summary

	CCR Rule Reference	Requirement Summary	2016 Initial Certification		2021 Periodic Certification	
			Requirement Met?	Comments	Requirement Met?	Comments
Hazard Potential Classification						
3	§257.73(a)(2)	Document hazard potential classification	Yes	Impoundment was determined to have High hazard potential classification [2].	Yes	No changes were identified that may affect this requirement.
History of Construction						
4	§257.73(c)(1)	Compile a history of construction	Yes	A history of Construction report was prepared for the AP. [3].	Yes	A letter listing updates to the History of Construction Report is provided in **Attachment C**.
Structural Stability Assessment						
5	§257.73(d)(1)(i)	Stable foundations and abutments	Yes	Foundations and abutments were found to be stable [8].	Yes	Foundations and abutments were found to be stable after performing updated slope stability analyses.
	§257.73(d)(1)(ii)	Adequate slope protection	Yes	Slope protection was adequate [8].	Yes	No changes were identified that may affect this requirement.
	§257.73(d)(1)(iii)	Sufficiency of dike compaction	Yes	Dike compaction was sufficient for expected ranges in loading conditions [8].	Yes	Dike compaction was found to be sufficient after performing updated slope stability analyses.
	§257.73(d)(1)(iv)	Presence and condition of slope vegetation	Yes	Vegetation was present on interior and exterior slopes and is maintained [8].	Yes	No changes were identified that may affect this requirement.
	§257.73(d)(1)(v)(A) and (B)	Adequacy of spillway design and management	Yes	Spillway was adequately designed and constructed and was expected to adequately manage flow during the calculated Probable Maximum Flood (PMF) [8].	Yes	Spillways were found to e adequately design and constructed and are expected to adequately manager flow during the PMF, after performing updated hydrologic and hydraulic analyses.
	§257.73(d)(1)(vi)	Structural integrity of hydraulic structures	No	Requirement could not be certified in 2016 due to inability to complete a CCTV inspection of all hydraulic structures.	Yes	An inspection was completed in 2020 and met all structural stability requirements. [8].
	§257.73(d)(1)(vii)	Stability of downstream slopes inundated by water body.	Not Applicable	Inundation of exterior slopes was not expected; this requirement was not applicable [8].	Not Applicable	No changes were identified that may affect this requirement.
Safety Factor Assessment						
6	§257.73(e)(1)(i)	Maximum storage pool safety factor must be at least 1.50	Yes	Safety factors were calculated to be 1.54. [5].	Yes	Safety factors from updated slope stability analyses were calculated to be 1.54 and higher.
	§257.73(e)(1)(ii)	Maximum surcharge pool safety factor must be at least 1.40	Yes	Safety factors were calculated to be 1.54 [5].	Yes	Safety factors from updated slope stability analyses were calculated to be 1.58 and higher.
	§257.73(e)(1)(iii)	Seismic safety factor must be at least 1.00	Yes	Safety factors were calculated to be 1.08 [5].	Yes	Safety factors from updated slope stability analyses were calculated to be 1.08 and higher.
	§257.73(e)(1)(iv)	For dike construction of soils that have susceptible to liquefaction, safety factor must be at least 1.20	Not Applicable	Dike soils were not susceptible to liquefaction [5].	Not Applicable	No changes were identified that may affect this requirement.
Inflow Design Flood Control System Plan						
7	§257.82(a)(1), (2), (3)	Adequacy of inflow design control system plan.	Yes	Flood control system adequately managed inflow and peak discharge during the calculated probable maximum flood (PMF) conditions [8].	Yes	The flood control system was found to adequately manage inflow and peak discharge during the PMP, 24-hour, Inflow Design Flood, after performing updated hydrologic and hydraulic analyses.
	§257.82(b)	Discharge from CCR Unit	Yes	Discharge from the CCR Unit is routed through a NPDES-permitted outfall during both normal and PMP, 24-hour Inflow Design Flood conditions [6].	Yes	Discharge from the CCR Unit is routed through a NPDES-permitted outfall during both normal and PMP, 24-hour Inflow Design Flood conditions, after performing updated hydrologic and hydraulic analyses.

SECTION 1

INTRODUCTION AND BACKGROUND

This Periodic United States Environmental Protection Agency (USEPA) Coal Combustion Residual (CCR) Rule [1] Certification Report was prepared by Geosyntec Consultants (Geosyntec) for Illinois Power Resources Generating LLC (IPRG), to document the periodic certification of the Ash Pond (AP) at the Edwards Power Plant (EPP), also known as the Edwards Power Station (EDW), located at 7800 South Cilco Lane Bartonville, Illinois 61607. The location of EPP is provided in **Figure 1**, and a site plan showing the location of the AP is provided in **Figure 2**.

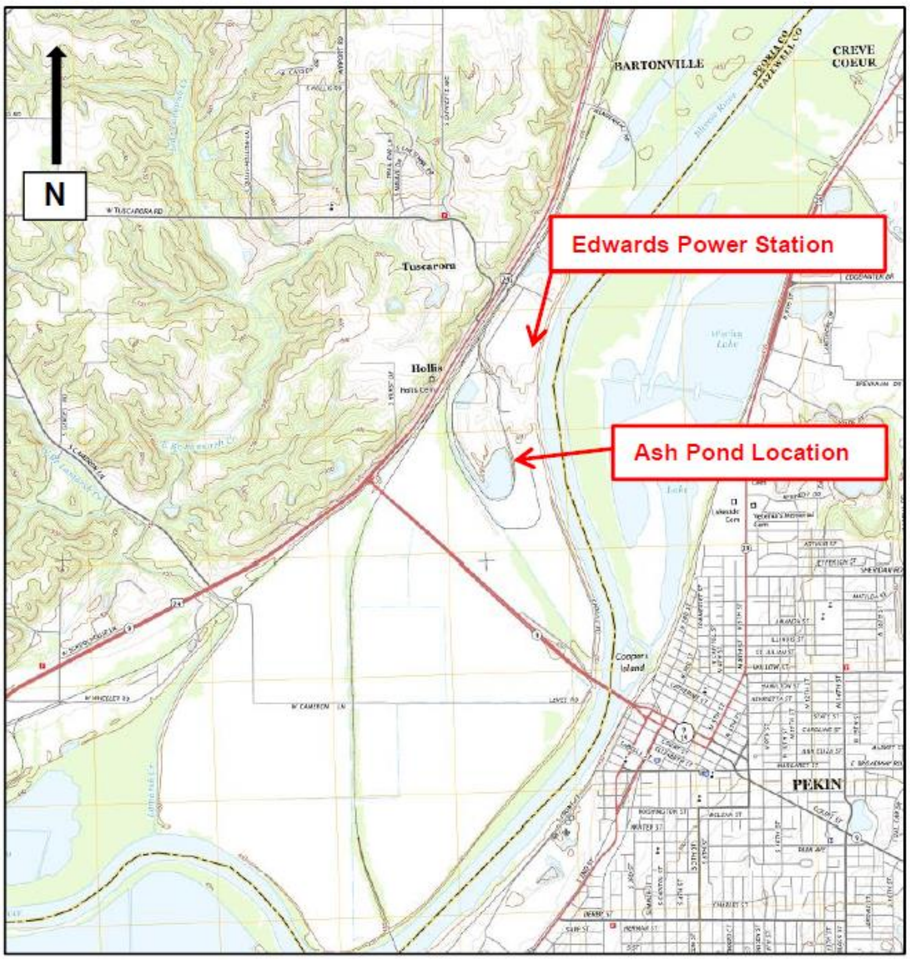

Figure 1 – Site Location Map (from AECOM, 2016)

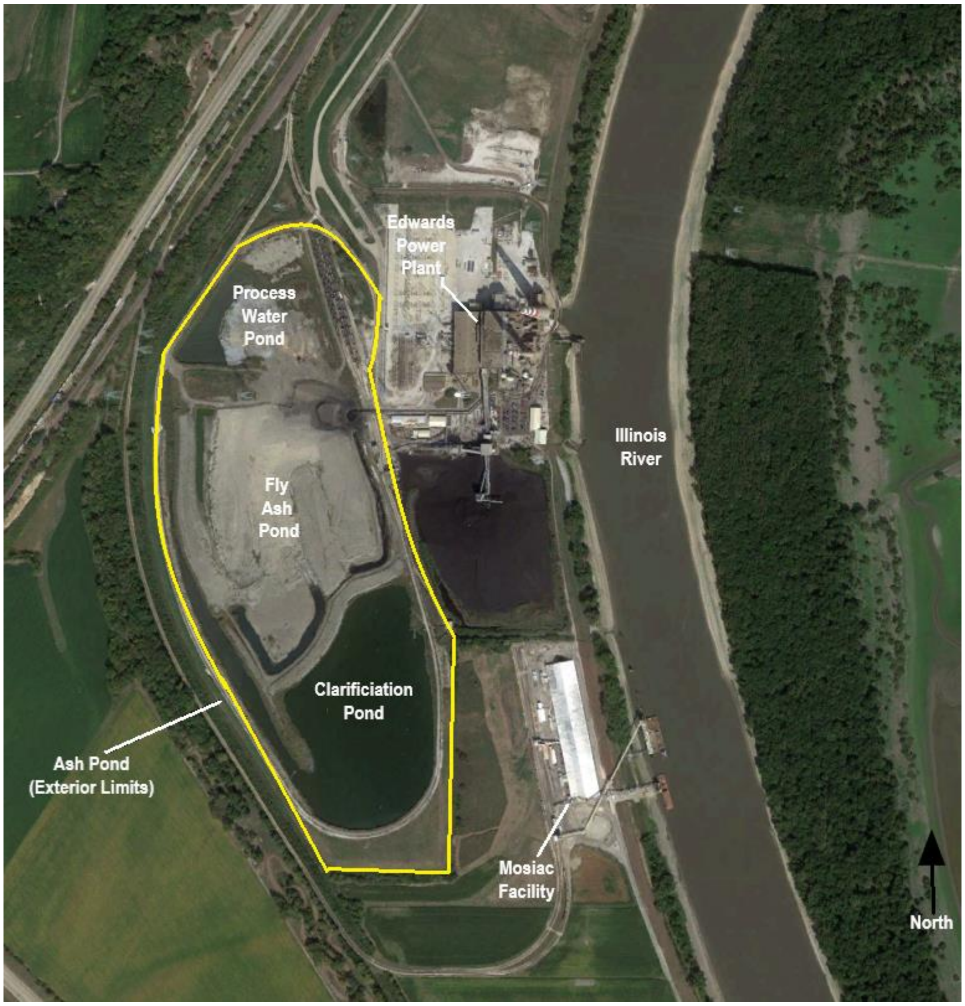

Figure 2 – Site Plan (September 2017)

1.1 AP Description

The AP receives CCR materials and plant process water from the Edwards Power Plant through sluice pipes that discharge into the eastern side of the Ash Pond, immediately west of the Edwards Power Plant. Within the AP, there are three separate sub-basins: The Process Water Pond, the Fly Ash Pond, and the Clarification Pond. The Process Water Pond is located within the northwest portions of the AP, and receives water from miscellaneous sumps, pumps, and processes at the Edwards Power Plant, as well as stormwater. The Process Water Pond transmits outflow to the Clarification Pond, which is located in the southern portion of the AP, through a 24-inch diameter corrugated metal pipe (CMP) culvert. At the time of the initial certification the Fly Ash Pond received sluiced bottom ash and fly ash from the plant and directed it into a settling channel, where ash was mechanically dipped out and stacked in windrows within the Fly Ash Pond [8].

The Fly Ash Pond discharges into the Clarification Pond through a reinforced concrete pipe (RCP) culvert. The Clarification Pond then discharges the clear water to the Illinois River through a 36-

inch diameter vertical drop inlet spillway structure (invert elevation[2] of 447.2 ft), with a skimmer/trash rack structure. Original design drawings indicate that the vertical “morning glory” spillway is a vertical CMP; however, 2004 design drawings for replacement of the skimmer/trash rack indicate that the vertical portions of the spillway may have been replaced with RCP pipe at some time. The pipe material has not been verified as it is typically submerged and high flows into the pipe have prevented inspection. Within the embankment, the spillway structure transitions to a nearly horizontal 36-inch diameter CMP that discharges to the Illinois River at the NPDES outfall. A flap gate backflow prevention device is present at the pipe’s discharge [8].

A sanitary sewer force main, consisting of six-inch diameter high-density polyethylene (HDPE) pipe, crosses the Ash Pond, between the Process Water Pond and the Fly Ash Pond, and is buried at a shallow depth within the Ash Pond. However, the pipe penetrates the west dike of the Ash Pond at a depth of approximately 10 feet. The pipe was installed in 2008 and transmits sewer flow from east to west [8]. It is discharged into a sewer main along the northwest perimeter of the Edwards Power plant property.

The AP earthen embankments were constructed in the 1960s and an engineered raise of the embankment was completed in 2004 to facilitate the addition of a rail loop at the crest of the embankment. The engineered raise included increasing the dike height from its original elevation of approximately 455 feet (based on the 2015 Maurer-Stutz survey) to approximately 460 feet (Clarification Pond) and 461 feet (Process Water Pond) using fly ash as a beneficial use material. The maximum height above the exterior grade of the current embankment is approximately 29 feet. Within the southern portions of the Clarification Pond, the rail loop was constructed approximately 250 feet inside the crest of the earthen embankment out of crushed stone. This effectively cut off a portion of the AP from the Clarification Pond, creating an area which was filled with CCR and vegetated. The original embankment acts as the perimeter of the AP at the southern end of the filled and vegetated area and was also raised in 2004 to a similar elevation as the remainder of the embankment [8].

The perimeter embankment forms the exterior of the impoundment on all but the northeast side of the AP. The northeast side is bordered by the Edwards Power Plant building grounds and switch yard which are at approximately the same elevation as the top of the pond embankment. The perimeter dike was constructed to include a crest width ranging from approximately 15 to 42 feet with narrower crest widths along the northern portion of the embankment, and wider crest widths along the south, east, and west sides of the embankment. Both the rail loop and a gravel crest access road are located at the crest of the embankment.

Based on 2015 LiDAR data from the State of Illinois, the exterior slopes have orientations ranging from 2.5H:1V (southern end of AP) to 3.4H:1V (western side of AP). The interior slopes have a typical orientation of 2H:1V. Based on the 2015 Maurer-Stutz survey, minimum crest elevations range from 458.8 feet for the Process Water Pond to 459.6 feet for the Clarification Pond, although

[2] All elevations in this report are in the North American Vertical Datum of 1988 (NAVD88), unless otherwise noted.

the typical crest elevations are similar to the design crest elevations of 460 feet and 461 feet for each pond, respectively [8]. These elevations and slopes have not been altered since the initial certification.

Initial certifications for the AP for Hazard Potential Classification (§257.73(a)(2)), History of Construction (§257.73(c)), Structural Stability Assessment (§257.73(d)), Safety Factor Assessment (§257.73(e)(1)), and Inflow Design Flood Control System Plan (§257.82) were completed by Stantec and AECOM in 2016 and 2017 and subsequently posted to IPRG's CCR Website ([2], [3], [4], [5], [6]). Additional documentation for the initial certifications included a detailed operating record reports containing calculations and other information prepared for the hazard potential classification by Stantec [7] and for the structural stability assessment, safety factor assessment, and inflow design flood control system plan by AECOM [8]. These operating record reports were not required to be posted and were not posted to IPRG's CCR Website.

1.2 Report Objectives

These following objectives are associated with this report:

- Compare site conditions from 2015/2016, when the initial certifications were developed, to site conditions in 2020/2021, when data for the periodic certification was obtained, and evaluate if updates are required to the:
    - §257.73(a)(2) Hazard Potential Classification [2];
    - §257.73(c) History of Construction [3];
    - §257.73(d) Structural Stability Assessment [4];
    - §257.73(e) Safety Factor Assessment [5], and/or
    - §257.82 Inflow Design Flood Control System Plan [6].
- Independently review the Hazard Potential Classification ([2], [7]), Structural Stability Assessment ([4], [8]), Safety Factor Assessment ([5], [8]), and Inflow Design Flood Control System Plan ([6], [8]) reports to determine if updates may be required based on technical considerations.
    - The History of Construction report [3] was not independently reviewed for technical considerations, as this report contained historical information primarily developed prior to promulgation of the CCR Rule [1] for the AP CCR unit at EPP, and did not include calculations or other information used to certify performance and/or integrity of the impoundments under §257.73(a)(2), §257.73(c)-(e), or §257.82.

- Confirm whether the AP meets all of the requirements associated with §257.73(a)(2), (c), (d), (e), and §257.82, and provide recommendations for compliance with these sections of the CCR Rule [1], if necessary.

SECTION 2

COMPARISION OF INITIAL AND PERIODIC SITE CONDITIONS

2.1 Overview

This section describes the comparison of conditions at the AP between the start of the initial CCR certification program in 2015 and 2016 (initial conditions) and subsequent collection of periodic certification site data in 2020 and 2021 (periodic conditions).

2.2 Review of Annual Inspection Reports

Annual onsite inspections for the AP were performed between 2016 and 2020 ([9], [10], [11], [12], [13]) and were certified by a licensed professional engineer in accordance with §257.83(b). Each inspection report provided the following information relative to the previous inspection:

- A statement that no changes in geometry of the impounding structure were observed since the previous inspection.
- Information on maximum recorded instrumentation readings and water levels.
- Approximate volumes of impounded water and CCR at the time of inspection.
- A statement that no appearances of actual or potential structural weakness or other disruptive conditions were observed
- A statement that no other changes which may have affected the stability or operation of the impounding structure were observed.

In summary, the reports did not indicate any significant changes to the AP between 2015 and 2020. No signs of instability, structural weakness, or changes which may have affected the operation or stability of the AP were noted in the inspection reports.

2.3 Review of Instrumentation Data

Four piezometers, P001, P002, P003 and P004, are present at the AP and were monitored monthly by IPRG between October 28, 2015 and May 13, 2021 [14]. Geosyntec reviewed the piezometer data to evaluate if significant fluctuations, partially increases in phreatic levels, may have occurred between development of the initial structural stability and factor of safety certifications ([8], [4], [5]) and May 13, 2021. Available piezometer readings are plotted in **Attachment A**. The location of the piezometers used for monitoring of phreatic level in AP is shown in **Figure 3**.

Figure 3 – AP Pond Monitoring Well Locations
(Not to Scale, adapted from AECOM, 2015)

In summary, only minor changes in phreatic conditions were observed in the available piezometric data. Phreatic levels varied by a maximum of 2.5 feet. These changes do not significantly differ from the phreatic levels utilized for the initial structural stability and factor of safety certifications ([8], [4], [5]).

2.4 Comparison of Initial to Periodic Topographic Surveys

The initial topographic survey of the AP, conducted by Maurer-Stutz, Inc. in 2015 [15], was compared to the periodic topographic survey of the AP, conducted by IngenAE, LLC (IngenAE) in 2020 [16], using AutoCAD Civil3D 2021 software. This comparison quantified changes in the volume of CCR placed within the AP and considered volumetric changes above and below the starting water surface elevation (SWSE) used for the 2016 inflow design flood control plan hydraulic analysis [8] as required by 40 CFR §257.82. Potential changes to embankment geometry were also evaluated. This comparison is presented in side-by-side views of each survey in **Drawing 1** and a plan view isopach map denoting changes in ground surface elevation in **Drawing 2**. A summary of the water elevations and changes in CCR volumes is provided in **Table 2**.

Table 2 – Initial to Periodic Survey Comparison

Initial Surveyed Pool Elevation (ft)	444.53
Periodic Surveyed Pool Elevation (ft)	447.32
Initial §257.82 Starting Water Surface Elevation (SWSE) (ft)	447.2
Total Change in CCR Volume (CY)	+126,383 (Fill)
Change in CCR Volume Above SWSE (CY)	+90,315 (Fill)
Change in CCR Volume Below SWSE (CY)	+36,069 (Fill)

The comparison indicated that approximately 126,000 CY of CCR was placed in the AP between the initial and periodic surveys. The comparison also indicated a net fill of approximately 90,000 CY of CCR above the SWSE from the IDF and a fill of approximately 36,000 CY of CCR below the SWSE. The surveys also indicated that many interior channels (i.e., serpentines) were filled in, with some fill being placed below the SWSE. Therefore, the site grading has changed significantly since the initial certifications were developed. No significant changes to embankment geometry appeared to have occurred between the initial and periodic surveys.

2.5 Comparison of Initial to Periodic Aerial Photography

Initial aerial photographs of the AP collected by Weaver in 2015 [17] were compared to periodic aerial photographs collected by IngenAE in 2020 [16] to visually evaluate if potential site changes (i.e., changes to the embankment, outlet structures, limits of CCR, other appurtenances) may have occurred. Additionally, an aerial photograph provided by ERIS in 2019 [18] was used for additional comparisons and during the periodic site visit. A comparison of these aerial photographs is provided in **Drawing 2**, and the only change that was identified was all but one of the serpentine ponds have been filled in and do not retain water.

2.6 Comparison of Initial to Periodic Site Visits

An initial site visit to the AP was conducted by AECOM in 2015 and documented with a Site Visit Summary and corresponding photographs [19]. A periodic site visit was conducted by John Seymour, P.E. of Geosyntec on June 10, 2021. The site visit was intended to evaluate potential changes at the site since the initial certifications were prepared (i.e., modification to the embankment, outlet structures or other appurtenances, limits of CCR, maintenance programs, repairs), in addition to performing visual observations of the AP to evaluate if the structural stability requirements (§257.73(d)) were still met. The site visit included walking the perimeter of the AP, visually observing conditions, recording field notes, and collecting photographs. The site visit is documented in a photographic log provided in **Attachment B**. A summary of significant findings from the periodic site visit is provided below:

- All but one of the serpentine ponds were filled in with ash as observed in the site walk and as shown by comparison of aerial photograph.

2.7 Interview with Power Plant Staff

An interview with Mark Davis, Environmental Manager of the Edwards Power Plant was conducted by Mr. John Seymour, P.E. of Geosyntec on June 10, 2021. Mr. Davis was employed at EPP between 2015 and 2021. The interview included a discussion of included a discussion of potential changes that that may have occurred at the AP since development of the initial certifications ([2], [3], [4], [5], [6]). A summary of the interview is provided below.

- Were any construction projects completed for the AP since 2015, and, if so, are design drawings and/or details available?
    - Ash placement in the North Pond that filled in all but one serpentine pond.
- Were there any changes to the purpose of the AP since 2015?
    - In 2017, one of the two serpentine settling channels in the AP was filled in with ponded ash (dewatered/dredged). Only one channel was needed, as all conditioned fly ash was being hauled to the Duck Creek Landfill. Only bottom ash is sluiced to the pond, which is then dredged, dewatered, and stored in the AP.
    - Beginning in 2019 conditioned ash was placed in the North Pond (Process Water Pond) area. Placement of ash was in accordance with the closure design developed by Hanson and Associates.
    - Currently placing unmarketable, conditioned fly ash in the South (Fly Ash) Pond.
- Were there any changes to the to the instrumentation program and/or physical instruments for the AP since 2015?
    - No.
- Have area-capacity curves for the AP been prepared since 2015?
    - No.
- Were there any changes to spillways and/or diversion features for the AP completed since 2015?
    - No.
- Were there any changes to construction specifications, surveillance, maintenance, and repair procedures for the AP since 2015?
    - The site AP O&M Manual and Emergency Action Plan was revised in 2020.

    - An internal inspection of the AP discharge tunnel was completed in 2020; records were reviewed.

- Were there any instances of dike and/or structural instability for the AP since 2015?

    - No; only minor slope erosion has occurred and were addressed as needed.

SECTION 3

HAZARD POTENTIAL CLASSIFICATION - §257.73(a)(2)

3.1 Overview of Initial HPC

The Initial Hazard Potential Classification (Initial HPC) was prepared by Stantec Consulting Services, Inc. (Stantec) in 2016 ([2], [7]), following the requirements of §257.73(a)(2). The Initial HPC included the following information:

- Performing a visual analysis to evaluate potential hazards associated with a failure of the AP perimeter dike, along the east and west embankments of the AP, as the AP is contained by natural high ground to the northeast and south.
- Evaluation of potential breach flow paths were evaluated using elevation data and aerial imagery to evaluate potential impacts to downstream structures, infrastructure, frequently occupied facilities/areas, and waterways [2].
- While a breach map is not included within the Initial HPC, it is included within the Emergency Action Plan [20].

The volume transfer analysis indicated potential impacts to intermittently occupied structures consisting of a motocross and ATV park as well as mobile home trailers. For the motocross and ATV park, the Initial HPC concluded that neither breach would be likely to result in a probable loss of human life by federal standards, as occupancy is not constant. However, due to the probable loss of life within the trailers, the initial HPC recommended a "High" hazard potential classification for the AP [2].

3.2 Review of Initial HPC

Geosyntec performed a review of the Initial HPC ([2], [7]), in terms of technical approach, input parameters, and assessment of the results. The review included the following tasks:

- Review of all report documentation and figures
- Check that correct CCR Rule guidance is referenced and adhered to
- Review of appropriate failure mode selections
- Review for changes to the site and surrounding area
- Review that appropriate breach analysis methodology, model software, and inputs were utilized

- Check that selected HPC is appropriate per results of the breach analysis

Geosyntec performed a review of the Initial HPC ([2], [7]), in terms of technical approach, input parameters, assessment of the results, and applicable requirements of the CCR Rule [1]. No significant technical issues were noted within the technical review, although a detailed review (e.g., check) of the calculations was not performed as the Initial HPC utilized a visual assessment.

3.3 Summary of Site Changes Affecting the Initial HPC

No new structures, infrastructure, frequently occupied facilities/areas, or waterways were present in the probable breach area indicated in the Initial HPC [2].

3.4 Periodic HPC

Geosyntec recommends retaining the “High” hazard potential classification for the AP, per §257.73(a)(2), based on the lack of site changes occurring since the initial HPC was developed, as described in **Section 3.3** no updates to the Initial HPC report ([2], [7]) are recommended at this time.

SECTION 4

HISTORY OF CONSTRUCTION REPORT - §257.73(c)

4.1 Overview of Initial HoC

The Initial History of Construction report (Initial HoC) was prepared by AECOM in 2016 [3], following the requirements of §257.73(c). The Initial HoC included the following information for each CCR surface impoundment:

- The name and address of the owner/operator,
- Location maps,
- Statements of purpose,
- The names and size of the surrounding watershed,
- A description of the foundation and abutment materials,
- A description of the dike materials,
- Approximate dates and stages of construction,
- Available design and engineering drawings,
- A summary of instrumentation and map of instrument locations,
- A statement that area-capacity curves are not available,
- Information on spillway structures,
- A statement that construction specifications are not readily available,
- Inspection and surveillance plans, and
- Information on operational and maintenance procedures.

4.2 Summary of Site Affecting the Initial HoC

Two significant changes were identified at the site that occurred after development of the initial HoC [3] report and are described below:

- A state identification number (ID) of W1438050005-01 was assigned to the AP by the Illinois Environmental Protection Agency (IEPA).

- Revised area-capacity curves and spillway design calculations for the AP were prepare das part of the periodic Inflow Design Flood Control System Plan, as described in **Section 6.3**.

A letter documenting changes to the HoC report is provided in **Attachment C**.

SECTION 5

STRUCTURAL STABILITY ASSESSMENT - §257.73(d)

5.1 Overview of Initial SSA

The Initial Structural Stability Assessment (Initial SSA) was prepared by AECOM in 2016 ([4], [8]), following the requirements of §257.73(d)(1), and included the following evaluations:

- Stability of dike foundations, dike abutments, slope protection, dike compaction, and slope vegetation,

- Spillway stability including capacity, structural stability and integrity; and

- Downstream slope stability under sudden drawdown conditions for a downstream water body.

The Initial SSA concluded that the AP met all structural stability requirements for §257.73(d)(1)(i)-(v) and (vii). A recommended CCTV inspection was completed in 2020 after the inspection could not be completed as part of the initial 2016 certification. It covered the hydraulic structures that pass through the dike of the AP, consisting of the CMP primary spillway outlet pipe and the high-density polyethylene (HDPE) sewer force main to verify that the AP meets the stability and structural integrity criteria for hydraulic outfall structures, per §257.73(d)(1)(vi). Over 750 ft of pipe were inspected after terminating when the camera became blocked by a permanent sample probe. The pipe appeared to be intact and flowing normally.

The Initial SSA referenced the results of the Initial Structural Factor Assessment (Initial SFA) ([5] [8]) to demonstrate stability of the stability of foundations and abutments (§257.73(d)(1)(i)) and sufficiency of dike compaction (§257.73(d)(1)(iii)) portions of the SSA criteria. This included stating that slope stability analyses for slip surfaces passing through the foundation met or exceeded the criteria listed in §257.73(e)(1), for the stability of foundations and abutments. For the sufficiency of dike compaction, this included stating that slope stability analyses for slip surfaces passing through the dike also met or exceeded the §257.73(e)(1) criteria.

5.2 Review of Initial SSA

Geosyntec performed a review of the Initial SSA ([4], [8]) in terms of technical approach, calculation input parameters and methodology, recommendations, and completeness. The review included the following tasks:

- Reviewing photographs collected in 2015 and used to demonstrate compliance with §257.73(d)(1)(i)-(vii).

- Reviewing geotechnical calculations used to demonstrate the stability of foundations, per §257.73(d)(1)(i) and sufficiency of dike compaction, per §257.73(d)(1)(iii), in terms of supporting geotechnical investigation and testing data, input parameters, analysis methodology, selection of critical cross-sections, and loading conditions.

- Review of the methodology used to demonstrate that a downstream water body that could induce a sudden drawdown condition, per §257.73(d)(1)(vii), is not present.

- Completeness and technical approach of closed-circuit television (CCTV) inspections used to evaluate the stability of hydraulic structures, per §257.73(d)(1)(vi).

No significant technical issues were noted within the technical review, although a detailed review (e.g., check) of the calculations was not performed.

5.3 Summary of Site Changes Affecting the Initial SSA

Several changes at the site that occurred after development of the Initial SSA were identified. These changes will require updates to the Initial SSA. Each change and the recommended updates to the Initial SSA ([4], [8]) are described below:

- The Initial SSA utilized the results of the Initial Inflow Design Flood Control System Plan (IDF) to demonstrate compliance with the adequacy of spillway design and management (§257.73(d)(1)(v)(A)-(B)). The Initial IDF was subsequently updated to develop a Periodic IDF, based on site changes, as discussed in **Section 7**.

- The Initial SSA utilized the slope stability analysis results of the Initial Safety Factor Assessment (SFA) as part of the compliance demonstration for the stability of foundations and abutments (§257.73(d)(1)(i)) and sufficiency of dike compaction (§257.73(d)(1)(iii)) as discussed in **Section 5.1**. The Initial SFA slope stability analyses were subsequently updated to develop a Periodic SFA, based on site changes, as discussed in **Section 6**.

5.4 Periodic SSA

The Periodic SFA (**Section 6**) indicates that foundations and abutments are stable and dike compaction is sufficient for expected ranges in loading conditions, as slope stability factors of safety were found to meet or exceed the requirements of §257.73(e)(1). Therefore, the requirements of §257.73(d)(1)(i) and §257.73(d)(1)(iii) are met for the Periodic SSA.

The Periodic IDF (**Section 7**) indicates that spillways are adequately designed and constructed to adequately manage flow during the PMF flood, as the spillways can adequately manage flow during peak discharge from the PMP storm event without overtopping of the embankments. Therefore, the requirements of §257.73(d)(1)(v)(A)-(B) are met for the Periodic SSA.

SECTION 6

SAFETY FACTOR ASSESSMENT - §257.73(e)(1)

6.1 Overview of Initial SFA

The Initial Safety Factor Assessment (Initial SFA) was prepared by AECOM in 2016 ([5], [8]), following the requirements of §257.73(e)(1). The Initial SFA included the following information:

- A geotechnical investigation program with in-situ and laboratory testing;
- An assessment of the potential for liquefaction in the dike and foundation soils;
- The development of ten slope stability cross-sections for limit equilibrium stability analysis utilizing GeoStudio SLOPE/W software; and
- The analysis of all cross-sections for maximum storage pool, maximum surcharge pool, and seismic loading conditions.
  - Liquefaction loading conditions were not evaluated as liquefaction-susceptible soil layers were not identified in the either the embankments or foundation soils.

The Initial SFA concluded that the AP met all safety factor requirements, per §257.73(e), as all calculated safety factors were equal to or higher than the minimum required values.

6.2 Review of Initial SFA

Geosyntec performed a review of the Initial SFA ([5], [8]) in terms of technical approach, calculation input parameters and methodology, recommendations, and completeness. The review included the following tasks:

- Reviewing geotechnical calculations used to demonstrate the acceptable safety factors, per §257.73(e)(1), in terms of:
  - Completeness and adequacy of supporting geotechnical investigation and testing data;
  - Completeness and approach of liquefaction triggering assessments;
  - Input parameters, analysis methodology, selection of critical cross-sections, and loading conditions utilized for slope stability analyses; and
  - Reviewing the contents vs. the applicable CCR Rule requirements [1].

No significant technical issues were noted within the technical review, although a detailed review (e.g., check) of the calculations was not performed.

6.3 Summary of Site Changes Affecting the Initial SFA

Two changes at the site that occurred after development of the Initial SFA were identified. These changes required updates to the Initial SFA and are described below:

- Significant amount of CCR (up to 20 ft high) were placed below and above the SWSE in the Process Water Pond, thereby potentially applying additional load to the AP dike than was present at the time of the Initial SFA.

- The Periodic IDF (**Section 7)** found that the normal pool elevation within the Process Water Pond increased from 449.5 to 450.4 ft, and within Clarification Pond increased from 447.2 to 447.3 ft. This resulted in increases of 0.9 and 0.1 ft, respectively, adding more water loading on the embankment dikes than was considered in the Initial SFA for the maximum storage pool and seismic loading conditions (§257.73(e)(1)(i) and (iii)). Peak water surface elevations during the IDF also increased from 457.8 to 458.6 ft within the Process Water Pond, and from 457.4 to 457.5 within the Clarification Pond resulting in 0.8 and 0.1 ft, respectively. This resulted in an increase of water loading on the embankment dikes than was considered in the Initial SFA for the maximum surcharge pool loading conditions (§257.73(e)(1)(i)).

6.4 Periodic SFA

Geosyntec revised existing slope stability analyses associated with the Initial SFA ([5], [8]), for the ten cross-sections (A, B, C, D, E, F, G, H, I, and J) previously evaluated to account for site changes, as described in **Section 6.3**. The following approach and input data were used to revise the analyses:

- Ground surface geometry was revised for all the loading conditions in cross-section "B" using the 2021 site survey [16] to account for the changes that occurred to CCR grades.

- Water levels in the AP for the maximum storage pool, and seismic slope stability analysis loading conditions were increased to El. 450.4 and El. 447.3 ft for Process Water Pond cross-sections (i.e., A, B, and J) and Clarification Pond cross-sections (i.e., C, D, E, F, G, H, and I), respectively, based on the Periodic IDF.

- Water levels in the AP for the maximum surcharge pool slope stability analysis loading conditions were increased to El. 458.6 and El. 457.5 ft for Process Water Pond cross-sections (i.e., A, B, and J) and Clarification Pond cross-sections (i.e., C, D, E, F, G, H, and I), respectively, based on the Periodic IDF.

- All other analysis input data and settings from the Initial SFA ([5], [8]), were utilized, including, but not limited to, subsurface stratigraphy and soil strengths, phreatic conditions, ground surface geometry, software package and version, slip surface search routines and methods, and input data for the seismic analyses.

Factors of safety from the Periodic SFA are summarized in Table 3 and confirm that the AP meets the requirements of §257.73(e)(1). Slope stability analysis output associated with the Periodic SFA is provided in **Attachment D**.

Table 3 – Factors of Safety from Periodic SFA

	Structural Stability Assessment (§257.73(d)) and Safety Factor Assessment (§257.73(e))			
Cross-Section	**Maximum Storage Pool §257.73(e)(1)(i) Minimum Required = 1.50**	**Maximum Surcharge Pool[1] §257.73(e)(1)(ii) Minimum Required = 1.40**	**Seismic §257.73(e)(1)(iii) Minimum Required = 1.00**	**Dike Liquefaction §257.73(e)(1)(iv) Minimum Required = 1.20**
A	2.02	2.02	1.35	N/A
B	1.59	1.59	1.22	N/A
C	1.83	1.82	1.09	N/A
D	1.79	1.79	1.18	N/A
E	1.54*	1.54*	1.11	N/A
F	2.31	2.31	1.08*	N/A
G	2.12	2.12	1.13	N/A
H	2.08	2.08	1.08*	N/A
I	2.26	2.26	1.30	N/A
J	2.55	1.97	2.08	N/A

Notes:
*Indicates critical cross-section (i.e., lowest calculated factor of safety out of the ten cross-sections analyzed)
N/A – Loading condition is not applicable.

SECTION 7

INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN - §257.82

7.1 Overview of Initial IDF

The Initial Inflow Design Flood Control System Plan (Initial IDF) was prepared by AECOM in 2016 ([6], [8]) following the requirements of §257.82. The Initial IDF included the following information:

- A hydraulic and hydrologic analysis was performed for the PMF design flood event because of the hazard potential classification of "high", which corresponded to a peak surcharge elevation of 457.8 feet in the Process Water Pond and 457.4 feet in the Fly Ash Pond and Clarification Pond.

- The Initial IDF utilized a HydroCAD Version 10 model to evaluate spillway flows and pool level increases during the design flood, with a SWSE of 449.5 ft for the Process Water Pond and 447.2 ft for the Fly Ash Pond and Clarification Pond.

The Initial IDF concluded that the AP met the requirements of §257.82, as the peak water surface elevation estimated by the HydroCAD model was 457.8 ft, relative to a minimum AP dike crest elevation of 458.8 ft in the Process Water Pond and 457.4 ft, relative to a minimum AP dike crest elevation of 459.6 ft in the Fly Ash Pond and Clarification Pond. Therefore, overtopping was not expected. The Initial IDF also evaluated the potential for discharge from the CCR unit and determined that discharge in violation of the existing NDPES for the AP was not expected, as all discharge from the AP during both normal and inflow design flood conditions was expected to be routed through the existing spillway and NDPES-permitted outfall.

7.2 Review of Initial IDF

Geosyntec performed a review of the Initial IDF ([6], [8]) in terms of technical approach, calculation input parameters and methodology, recommendations, and completeness. The review included the following tasks:

- Reviewing the return interval used vs. the hazard potential classification.

- Reviewing the rainfall depth and distribution for appropriateness.

- Performing a high-level review of the inputs to the hydrological modeling.

- Reviewing the hydrologic model parameters for spillway parameters, starting pool elevation, and storage vs. the reference data.

- Reviewing the overall Initial IDF vs. the applicable requirements of the CCR Rule [1].

Several comments were identified during review of the Initial IDF. The comments are described below:

- The initial IDF certification used the National Resource Conservation Service (NRCS) TR-60 Emergency Spillway and Freeboard (ESFB) rainfall distribution. This is a distribution NRCS utilizes in making determination and analysis of auxiliary spillway flow depth and duration. The electronic model files for the initial IDF were unavailable; therefore, the "Spillway Emergency" [21] storm type provided by HydroCAD was used for the updated IDF, which replicates the NRCS 24-hour ESFB design hydrograph rainfall distribution.
    - The ESFB rainfall distribution was found by NRCS to be an accurate representation of a 24-hour Probable Maximum Precipitation (PMP) event per a study applying different rainfall distributions to 24-hour PMP storm events for purposes of evaluating existing high-hazard dams east of the 105th meridian [22]. The following are excerpts from the NRCS study:
        - *"The dimensionless conversion of the ESFB distribution from a 6-hour to a 24-hour pattern has been used with PMP events in a number of states where 24-hour storms are required as a part of the State's dam safety criteria and approval process……Although the ESFB Distribution and the World Curve distribution were developed from entirely independent data sources, the distributions are similar when compared on a volume-duration basis. The world curve supports the ESFB."*
        - *"The World Curve Distribution is a valid basis for design of high hazard structures…It would seem logical to use the World Curve distribution for PMP size event"*
    - The NRCS study [22]found the NRCS ESFB is comparable to the World Curve. The World Curve is developed from worldwide maximum rainfall records and deemed by NRCS to be logical to use for a PMP size event and valid for design of high hazard structures.

7.3 Summary of Site Changes Affecting the Initial IDF

Two changes at the site that occurred after development of the Initial IDF were identified. These changes required updates to the Initial IDF and are described below:

- Approximately 100,030 CY of CCR were placed above the SWSE utilized for the Initial IDF certification in the Process Water Pond, thereby altering the stage-storage curve relative to the Initial IDF. Filling in of the serpentine channel system above and below the SWSE also occurred; however, the storage capacity of the serpentine channels was disregarded in the Initial IDF for conservatism in the model and the filling of the serpentine channels did not have to be accounted for in the updated IDF.

- In 2020, the surveyed water surface elevation (WSE) was 450.4 ft within the Process Water Pond and 447.3 ft in the Clarification Pond [16]; this is higher than the SWSE used in the Initial IDF by 0.9 ft and 0.1 ft, respectively, thereby the SWSE utilized in the Initial IDF were no longer consistent with conditions observed in 2020.

7.4 Periodic IDF

Geosyntec revised the HydroCAD model associated with the Initial IDF to account for the revised rainfall distribution type and additional CCR placement, as described in **Sections 7.2** and **7.3**. The following approach and input data were used for the revised analyses and are referenced in **Attachment E** as appropriate:

- The name of the "Cooling Pond" node in the model was changed to "Process Water Pond" for consistency with the text portion of the 2016 IDF Certification.

- Stage-storage (i.e., area-capacity) curves for both the Process Water Pond and Clarification Pond were updated based on the 2020 site survey [16].

    - A revised stage-volume curve for the AP was prepared based on measuring the storage volume of the AP every two-foot increment of depth from: (i) an elevation at the bottom of the Clarification Pond (434 ft) to an elevation of 460 ft, and (ii) an elevation at the bottom of the Process Water Pond (444 ft) to an elevation of 460 ft. This analysis identified an overall increase of 810 CY (0.5 ac-ft) of storage volume at the Clarification Pond and an overall decrease of 100,030 CY (62 ac-ft) of storage volume from the Cooing Pond compared to the storage volumes used in the 2016 Initial IDF Certification.

- The SWSE within the Process Water Pond was updated from 449.5 ft to 450.4 ft to reflect the 2020 site survey [16]. The discharge structure invert elevation is 449.2 ft; however, the greater elevation of the invert structure and the surveyed WSE was used as the SWSE to provide conservatism in the model.

- The SWSE within the Clarification Pond was updated from 447.2 ft to 447.3 ft to reflect the 2020 site survey [16]. The vertical spillway elevation is 447.2 ft; however, the greater elevation of the invert structure and the surveyed WSE was used as the SWSE to provide conservatism in the model.

- The rainfall distribution type was updated to the "Spillway Emergency" storm type provided by HydroCAD [21], which replicates the NRCS 24-hour ESFB distribution.

- The initial IDF assumed that the tailwater conditions in the Illinois River during the IDF was the historic high-water elevation at Peoria Lock and Dam (NOAA Gauging Station

PRAI2) of 456.7 ft; however, the NOAA gauging station shows a historic high-water elevation of 456.57 ft. Therefore, a link was added in the updated model downstream of the Clarification Pond to represent the Illinois River historic high-water elevation of 456.57 ft at Peoria Lock and Dam [23].

- Drainage area characteristics were updated based on the 2020 site survey, as follows:
  - For the Process Water Pond Watershed, the open water surface area was updated from 5.2 acres to 1.2 acres and the CCR surface was updated from 13.2 acres to 17.2 acres.
  - For the North Ash Pond Watershed, the open water surface area was updated from 4.4 acres to 0.6 acres and the CCR surface was updated from 10.3 acres to 14.1 acres.
  - For the South Ash Pond Watershed, the open water surface area was updated from 4.3 acres to 1.2 acres and the CCR surface was updated from 15.1 acres to 18.2 acres.
  - For the Clarification Pond Watershed, the open water surface area was updated from 25.1 acres to 19.7 acres and the CCR surface was updated from 10.7 acres to 16.1 acres
- Pipes
  - The following updates were made for the 24-inch corrugated metal pipe (CMP) outlet from the Process Water Pond based on the 2020 site survey:
    - The upstream invert elevation was updated from 449.5 ft to 449.15 ft and downstream invert elevation was updated from 449.5 ft to 447.93 ft.
    - The length was updated from 80 ft to 104 ft.

All other input data and settings from the Initial IDF HydroCAD model were utilized, including, but not limited to software package and version, 24-hour PMP rainfall depth, runoff method, analysis time span and analysis time step.

The results of the Updated IDF are summarized in **Table 4** and confirm that the AP meets the requirements of §257.82(a)-(b), as the peak water surface elevation does not exceed the minimum perimeter dike crest elevations. Additionally, all discharge from the AP is routed through the existing spillway system to the NPDES-permitted outfall, during both normal and IDF conditions. Updated area-capacity curves and HydroCAD model output is provided in **Attachment E**.

Table 4 – Water Levels from updated Periodic IDF

	Process Water Pond			Clarification Pond		
Analysis	**Starting WSE (ft)**	**Peak WSE (ft)**	**Min. Dike Crest Elevation (ft)**	**Starting WSE (ft)**	**Peak WSE (ft)**	**Min. Dike Crest Elevation (ft)**
Initial IDF	449.5	457.8	458.8	447.2	457.4	459.6
Periodic IDF Update	450.4	458.6	458.8	447.3	457.5	459.6
Initial to Periodic Change[1]	+0.9	+0.8	-	+0.1	+0.1	-

Notes:
[1]Postive change indicates increase in the WSE relative to the Initial IDF, negative change indicates decrease in the WSE, relative to the Initial IDF.

SECTION 8

CONCLUSIONS

The AP at EPP was evaluated relative to the USEPA CCR Rule periodic assessment requirements for:

- Hazard potential classification (§257.73(a)(2)),
- History of Construction reporting (§257.73(d)),
- Structural stability assessment (§257.73(d)),
- Safety factor assessment (§257.73(e)), and
- Inflow design flood control system planning (§257.82).
- Based on the evaluations presented herein, the referenced requirements are satisfied.

Based on the evaluations presented herein, the referenced requirements are satisfied for this CCR unit.

SECTION 9

CERTIFICATION STATEMENT

CCR Unit: Illinois Power Resources Generating, LLC, Edwards Power Plant, Ash Pond

I, John P. Seymour, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this 2021 USEPA CCR Rule Periodic Certification Report, has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the periodic assessment of the hazard potential classification, history of construction report, structural stability, safety factors, and inflow design flood control system planning, dated October 2021, were conducted in accordance with the requirements of 40 CFR §257.73(a)(2), (c), (d), (e), and §257.82.

John Seymour

10/11/2021
Date

JOHN P. SEYMOUR
062-040562
LICENSED
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS

Exp. 11/30/2021

SECTION 10

REFERENCES

[1] United States Environmental Protection Agency, 40 CFR Parts 257 and 261; Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, 2015.

[2] Stantec Consulting Services Inc., "Initial Hazard Potetnial Classification Assessment, EPA Final CCR Rule, Ash Pond,Edwards Power Plant, Peoria County, Illinois," Fenton, MO, October 12, 2016.

[3] AECOM, "History of Construction, USEPA Final CCR Rule, Edwards Power Plant, Bartonville, Illinois," October 2016.

[4] AECOM, "CCR Rule Report: Initial Structural Stability Assessment For Ash Pond At Edwards Power Plant," St. Louis, MO, October 2016.

[5] AECOM, "CCR Rule Report: Initial Safety Factor Assessment For Ash Pond At Edwards Power Plant," St. Louis, MO, October 2016.

[6] AECOM, "CCR Rule Report: Initial Inflow Design Flood Control System Plan For East Ash Pond At Edwards Power Plant," St. Louis, MO, October 2016.

[7] Stantec Consulting Services, Inc., "Documentation of Initial Hazard Potential Classification Assessment, Ash Pond, Edwards Power Plant, Bartonville, Illinois," October 12, 2016.

[8] AECOM, "CCR Certification Report: Initial Structural Stability Assessment, Initial Safety Factor Assessment, and Initial Inflow Design Flood Control System Plan for Ash Pond at Edwards Power Plant," St. Louis, MO, October 2016.

[9] J. Knutelski and J. Campbell, "Annual CCR Surface Impoundment Inspection Report (per 40 CFR 257.83(b)(2)), Edwards Power Plant, Ash Pond," August 29, 2016.

[10] J. Knutelski and J. Campbell, "Annual CCR Surface Impoundment Inspection Report (per 40 CFR 257.83(b)(2)), Edwards Power Plant, Ash Pond," August 30, 2017.

[11] S. Arends, "Annual Inspection by a Qualified Professional Engineer, 40 CFR §257.83(b), Edwards Power Plant, Ash Pond," August 29, 2018.

[12] J. Knutelski, "Annual Inspection by a Qualified Professional Engineer, 40 CFR 257.83(b), Edwards Power Plant, Ash Pond," September 05, 2019.

[13] J. Knutelski, "Annual Inspection by a Qualified Professional Engineer, 40 CFR §257.83(b), Edwards Power Plant, Ash Pond," November 06, 2020.

[14] Geosyntec Consultants, "Edwards Piezo Measurements_20160211," 2021.

[15] M.-S. Inc., "Edwards Power Plant, 2015 Topogaphy," Dynegy, Collinsville, IL, July 2015.

[16] IngenAE, "Luminant, Illinois Power Rescources Generating, LLC, Edwards Power Plant, December 2020 Topography," Earth City, Missouri, March 12, 2021.

[17] Weaver Consultants Group, "Dynegy, Collinsville, IL, 2015 - Edwards 2015 Existing Aerial Photograph Existing Site Conditions," Collinsville, IL, October 2015.

[18] Envrionmental Risk Information Services (ERIS), "Edwards Power Plant," Toronto ON, CA, 2019.

[19] AECOM, "Draft CCR Unit Initial Site Visit Summary, Dynegy CCR Compliance Program," June 24, 2015.

[20] Illinois Power Resources Generating, "Emergency Action Plan," 2017.

[21] HydroCadTM Software Solutions, LLC, "HydroCad Stormwater Modeling System, Version 10," Chocorua, New Hampshire, 2016.

[22] J. N. Riely and R. C. Moore, "Comparison of Temporal Rainfall Distributions for Near Probable Maximum Precipitation Storm Events for Dam Design," National Water Management Center, National Resources Conservation Service (NRCS), Little Rock, Arkansas.

[23] National Oceanic and Atmospheric Administration, "Advanced Hydrologic Prediction Service, Illinois River at Peoria Lock and Dam," [Online]. Available: https://water.weather.gov/ahps2/hydrograph.php?wfo=ilx&gage=prai2&prob_type=stage&source=hydrograph. [Accessed 18 August 2021].

DRAWINGS

N

INITIAL SURVEY
07-23-2015 TOPOGRAPHY

PERIODIC SURVEY
02-23-2021 TOPOGRAPHY

NOTES:

1. THE INITIAL SURVEY WAS TAKEN FROM THE DRAWING TITLED "TOPOGRAPHIC AND BATHYMETRIC SURVEY, DYNEGY - EDWARDS POWER STATION - BARTONVILLE, IL", PREPARED BY MAURER-STUTZ, INC., DATED JULY 23, 2015.
2. THE PERIODIC SURVEY WAS TAKEN FROM THE DRAWING PACKAGE TITLED "LUMINANT, ILLINOIS POWER RESOURCES GENERATING, LLC, EDWARDS POWER STATION, DECEMBER 2020 TOPOGRAPHY", PREPARED BY INGENAE, DATED FEBRUARY 23, 2021.
3. ALL SURVEY DATA WAS COLLECTED IN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND NORTH AMERICAN DATUM OF 1983 (NAD83) FOR VERTICAL AND HORIZONTAL COORDINATES, RESPECTIVELY.

0 500
SCALE IN FEET

INITIAL TO PERIODIC SURVEY COMPARISON
ASH POND
EDWARDS POWER PLANT
PEORIA, ILLINIOS

Geosyntec consultants

GLP8027.04	MAY 2021	DRAWING 1

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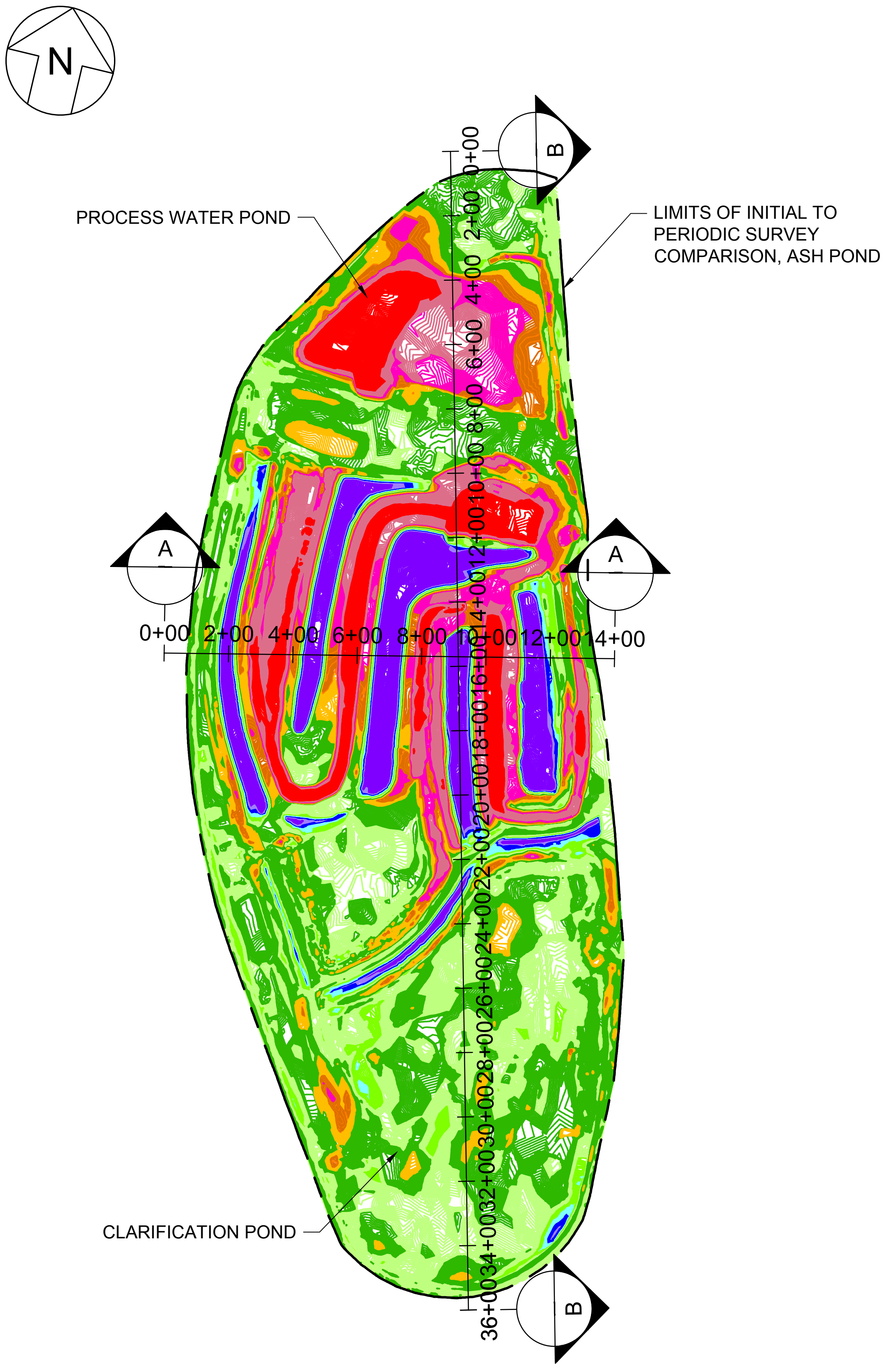

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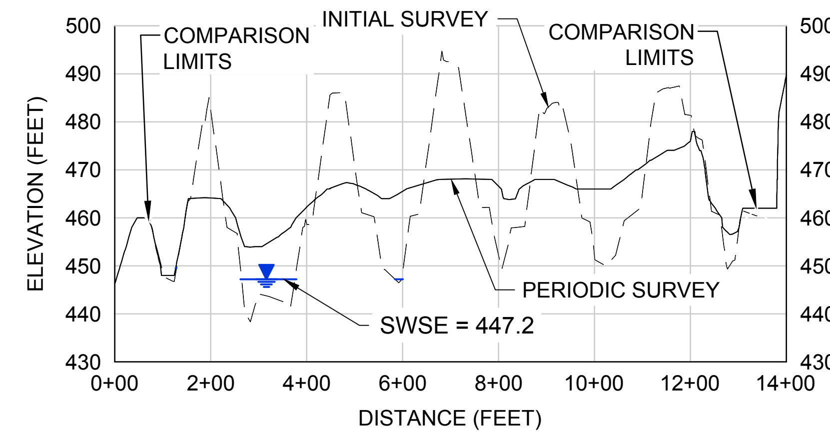
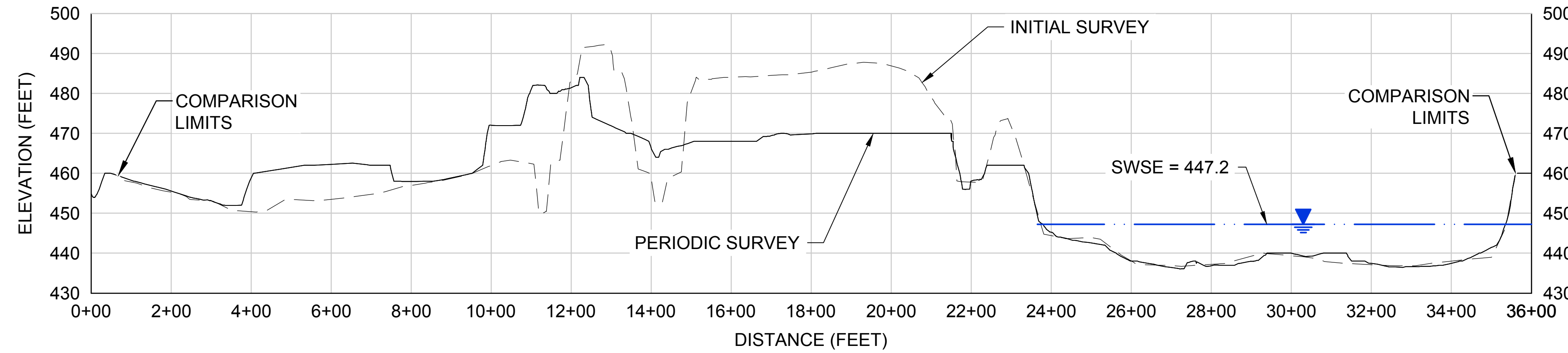
SCALE IN FEET

ISOPACH CONTOUR KEY		
COLOR	MIN ELEV	MAX ELEV
	-34.5	-10
	-10	-8
	-8	-6
	-6	-4
	-4	-2
	-2	0
	0	2
	2	4
	4	6
	6	8
	8	10
	10	19



SECTION A



SECTION B

0 40
VERT: SCALE IN FEET

0 400
HORZ: SCALE IN FEET

INITIAL TO PERIODIC SURVEY COMPARISON SUMMARY			
SURFACE IMPOUNDMENT	CUT	FILL	NET (CU. YD.)
ASH POND	243,495	369,878	126,383 (FILL)
ABOVE SWSE	224,416	314,732	90,315 (FILL)
BELOW SWSE	19,080	55,149	36,069 (FILL)

NOTES:

1. THE INITIAL SURVEY WAS TAKEN FROM THE DRAWING TITLED “TOPOGRAPHIC AND BATHYMETRIC SURVEY, DYNEGY - EDWARDS POWER STATION - BARTONVILLE, IL”, PREPARED BY MAURER-STUTZ, INC., DATED JULY 23, 2015.
2. THE PERIODIC SURVEY WAS TAKEN FROM THE DRAWING PACKAGE TITLED “LUMINANT, ILLINOIS POWER RESOURCES GENERATING, LLC, EDWARDS POWER STATION, DECEMBER 2020 TOPOGRAPHY”, PREPARED BY INGENAE, DATED FEBRUARY 23, 2021.
3. ALL SURVEY DATA WAS COLLECTED IN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND NORTH AMERICAN DATUM OF 1983 (NAD83) FOR VERTICAL AND HORIZONTAL COORDINATES, RESPECTIVELY.
4. THE STARTING WATER SURFACE ELEVATION (SWSE) OF THE ASH POND IS EL. 447.2 FT, AS NOTED IN THE REPORT TITLED “CCR CERTIFICATION REPORT: INITIAL STRUCTURAL STABILITY ASSESSMENT, INITIAL SAFETY FACTOR ASSESSMENT, AND INITIAL INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN FOR ASH POND AT EDWARDS POWER STATION”, PREPARED BY AECOM, DATED OCTOBER, 2016.

SURVEY CPMPARISON ISOPACH
ASH POND
EDWARDS POWER STATION
PEORIA, ILLINIOS

Geosyntec consultants

GLP8027.04 | AUGUST 2021

FIGURE 2

P:\CADD\PROJECTS\VISTRA PONDS\EDWARDS\FIGURES\ISOPACH-1 - Last Saved by: KHanavec on 8/30/21

INITIAL AERIAL
07-23-2015 IMAGERY

PERIODIC AERIAL
02-23-2021 IMAGERY

NOTES:

1. THE INITIAL IMAGERY WAS TAKEN FROM THE DRAWING TITLED "TOPOGRAPHIC AND BATHYMETRIC SURVEY, DYNEGY - EDWARDS POWER STATION - BARTONVILLE, IL", PREPARED BY MAURER-STUTZ, INC., DATED JULY 23, 2015.
2. THE PERIODIC IMAGERY WAS TAKEN FROM THE DRAWING PACKAGE TITLED "LUMINANT, ILLINOIS POWER RESOURCES GENERATING, LLC, EDWARDS POWER STATION, DECEMBER 2020 TOPOGRAPHY", PREPARED BY INGENAE, DATED FEBRUARY 23, 2021.

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SCALE IN FEET

INITIAL TO PERIODIC AERIAL IMAGERY COMPARISON
ASH POND
EDWARDS POWER STATION
PEORIA, ILLINIOS

Geosyntec consultants

DRAWING 3

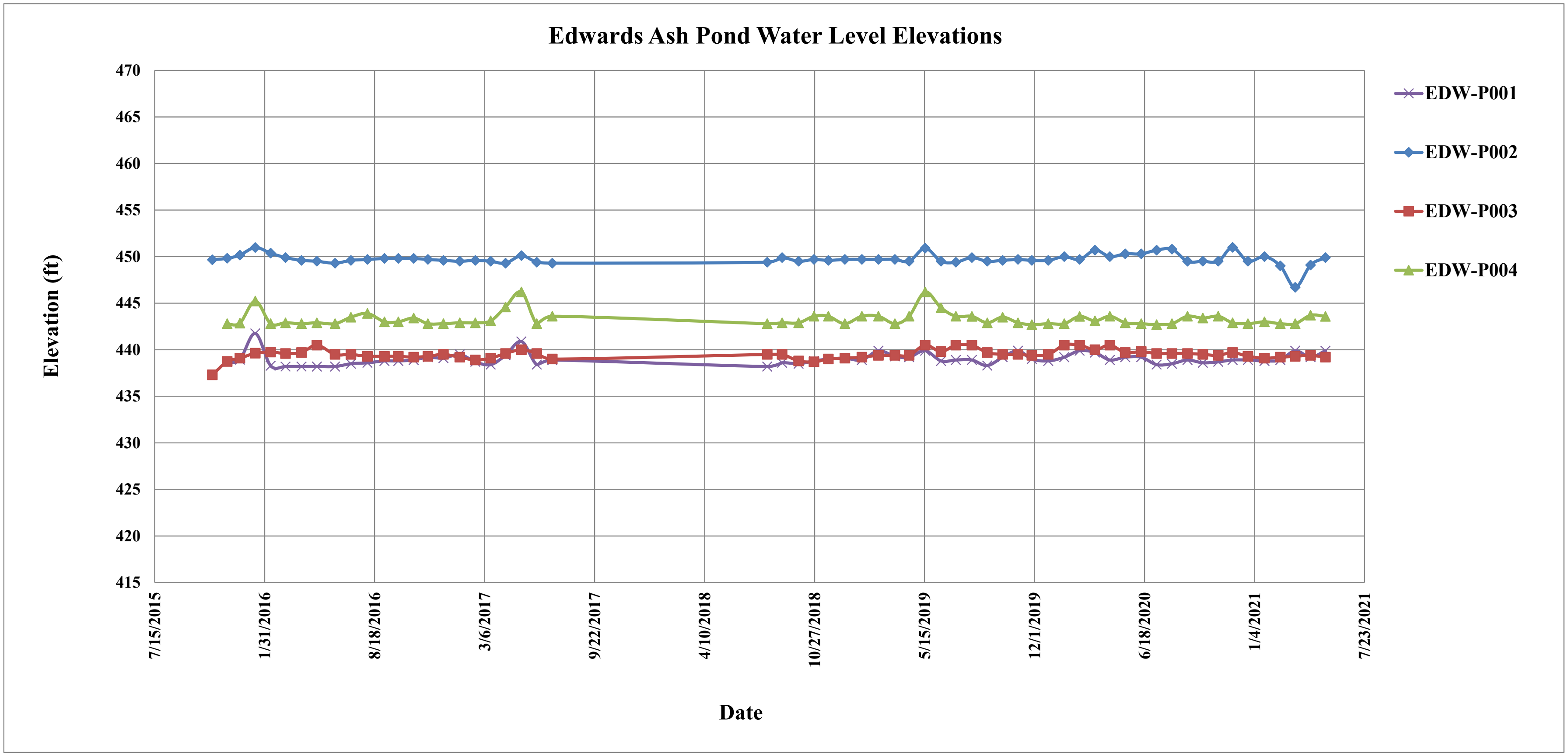
GLP8027.04 | MAY 2021

P:\CADD\PROJECTS\VISTRA PONDS\EDWARDS\FIGURES\GLP802704F02 - Last Saved by: KHanavec on 5/24/21

ATTACHMENTS

Attachment A

AP Piezometer Data Plots



NOTES:
1. Piezometer data was taken from the spreadsheet titled "Edwards Piezo Measurements_20160211", provided by the Edwards Power Plant.

PIEZOMETER DATA
PERIODIC CERTIFICATION
EDWARDS POWER PLANT
EDWARDS, ILLINOIS

Geosyntec consultants

Figure A-1

GLP8027 | 6/15/2021

Attachment B

AP Site Visit Photolog

GEOSYNTEC CONSULTANTS
Photographic Record

Site Owner: Illinois Power Generating Company **Project Number:** GLP8027

CCR Unit: Ash Pond **Site:** Edwards Power Plant

Photo: P-1

Date: 6/10/2021

Direction Facing: S

Comments: Slope along access road to former acid building. Pond is to the right beyond the train.

Photo: P-2

Date: 6/10/2021

Direction Facing: E

Comments: Rip rap placed on steeper slope in place of grass.

Site Owner: Illinois Power Generating Company	**Project Number:** GLP8027
CCR Unit: Ash Pond	**Site:** Edwards Power Plant

Photo: P-3 **Date:** 6/10/2021 **Direction Facing:** S **Comments:** Crest of dam and inside of pond.	
Photo: P-4 **Date:** 6/10/2021 **Direction Facing:** SW **Comments:** Drop inlet spillway structure	

GEOSYNTEC CONSULTANTS	
Site Owner: Illinois Power Generating Company	**Project Number:** GLP8027
CCR Unit: Ash Pond	**Site:** Edwards Power Plant

Photo: P-5	
Date: 6/10/2021	
Direction Facing: Down	
Comments: Drop inlet morning glory spillway structure from above.	

Photo: P-6	
Date: 6/10/2021	
Direction Facing: NW	
Comments: Pond divider dike.	

GEOSYNTEC CONSULTANTS
Photographic Record

Site Owner: Illinois Power Generating Company	**Project Number:** GLP8027
CCR Unit: Ash Pond	**Site:** Edwards Power Plant

Photo: P-7 **Date:** 6/10/2021 **Direction Facing:** S **Comments:** Crest of filled and covered area at south end of pond outside of tracks.	
Photo: P-8 **Date:** 6/10/2021 **Direction Facing:** W **Comments:** Slope of filled and covered area at south end of AP.	

Site Owner: Illinois Power Generating Company	**Project Number:** GLP8027
CCR Unit: Ash Pond	**Site:** Edwards Power Plant

Photo: P-9 **Date:** 6/10/2021 **Direction Facing:** W **Comments:** Water at toe of slope in ditch.	
Photo: P-10 **Date:** 6/10/2021 **Direction Facing:** NE **Comments:** Bottom ash sluiced into clean out area. Pooled bottom ash is to be drained and disposed of on site.	

Geosyntec Consultants
Photographic Record

Site Owner: Illinois Power Generating Company	**Project Number:** GLP8027
CCR Unit: Ash Pond	**Site:** Edwards Power Plant

Photo: P-11

Date: 6/10/2021

Direction Facing: W

Comments: Piled ash is higher than the crest of dam.

Photo: P-12

Date: 6/10/2021

Direction Facing: NNW

Comments: West end of bottom ash clean-out area.

Site Owner: Illinois Power Generating Company	**Project Number:** GLP8027
CCR Unit: Ash Pond	**Site:** Edwards Power Plant

Photo: P-13	
Date: 6/10/2021	
Direction Facing: SSE	
Comments: Piled ash and concrete debris on the left.	

Photo: P-14	
Date: 6/10/2021	
Direction Facing: NNW	
Comments: Filled "serpentine" and ash fill to the right placed higher than the crest.	

GEOSYNTEC CONSULTANTS
Photographic Record

Site Owner: Illinois Power Generating Company	**Project Number:** GLP8027
CCR Unit: Ash Pond	**Site:** Edwards Power Plant

Photo: P-15	
Date: 6/10/2021	
Direction Facing: ENW	
Comments: Ash fill placed higher than the crest; left one remaining serpentine pond to the left.	

Attachment C

Periodic History of Construction Report Update Letter

1 McBride and Son Center Drive, Suite 202
Chesterfield, MO 63005
PH 636-812-0800
www.geosyntec.com

October 11, 2021

Illinois Power Resources Generation, LLC
7800 South Cilco Lane
Bartonville, Illinois 61607

Subject: Periodic History of Construction Report Update Letter
USEPA Final CCR Rule, 40 CFR §257.73(c)
Edwards Power Plant
Bartonville, Illinois

Geosyntec Consultants (Geosyntec) has prepared this Letter at the request of Illinois Power Resources Generation (IPRG) to document updates to the Initial History of Construction (HoC) report for the Edwards Power Plant (EPP), also known as the Edwards Power Station (EPS). The Initial HoC report was prepared by AECOM in October of 2016 [1] in accordance with 40 Code of Federal Regulations (CFR) §257.73(c) of the United States Environmental Protection Agency (USEPA) Coal Combustion Residuals Rule, known as the CCR Rule [2]. This letter also includes information required by Section 845.220(a)(1)(B) (Design and Construction Plans) of the state-specific Illinois Environmental Protection Agency (IEPA) Part 845 CCR Rule [3] that is not expressly required by §257.73(c).

BACKGROUND

The CCR Rule required that, by October 17, 2016, Initial HoC reports to be compiled for existing CCR surface impoundments with: (1) a height of five feet or more and a storage volume of 20 acre-feet or more, or (2) a height of 20 feet or more. The Initial HoC report was required to contain, to the extent feasible, the information specified in 40 CFR §257.73(c)(1)(i)-(xii). The Initial HoC report for EPP, which included the existing CCR surface impoundment, the Ash Pond (AP), was prepared and subsequently posted to IPRG's CCR Website prior to October 17, 2016.

The CCR Rule requires that Initial HoC to be updated if there is a significant change to any information complied in the Initial HoC report, as listed below:

§ 257.73(c)(2): If there is a significant change to any information complied under paragraph (c)(1) of this section, the owner or operator of the CCR unit must update the relevant information and place it in the facility's operating record as required by § 257.105(f)(9).

IRPG retained Geosyntec to review the Initial HoC report, review reasonably and readily available information for the AP generated since the Initial HoC report was prepared, and perform a site visit to EPP to evaluate if significant changes may have occurred since the Initial HoC report was prepared. This Letter contains the results of Geosyntec's evaluation and documents significant changes that have occurred at the AP and EPP, as they pertain the requirements of §257.73(c)(1)(i)-(xii)

UPDATES TO HISTORY OF CONSTRUCTION REPORT

Geosyntec's evaluation for the EPP AP determined that no known significant changes requiring updates to the information in the Initial HoC report pertaining to pertaining to §257.73(c)(1)(ii-viii) of the CCR Rule had occurred since the Initial HoC report had been developed.

However, Geosyntec's evaluation determined that significant changes at the EPP AP pertaining to §257.73(c)(1) (i),(ix)-(x) of the CCR Rule had occurred since the Initial HoC report had been developed. Additionally, information how long the CCR surface impoundments have been operating and the types of CCR in the surface impoundments, as required by Section 845.220(a)(1)(B) of the Part 845 Rule were not included in the Initial HoC report, as this information is not required by the CCR Rule. Each change and the subsequent updates to the Initial HoC report is described within this section.

Section 845.220(a)(1)(B): A statement of ... how long the CCR surface impoundment has been in operation, and the types of CCR that have been placed in the surface impoundment.

<u>*Ash Pond*</u>
The AP is in operation since 1960. As of the date of this report, the AP has been present for approximately 61 years.

CCR placed in the AP has been used to store and dispose sluiced bottom ash and fly ash and to clarify water, including non-CCR station process wastewaters, prior to discharge in accordance with the station's NPDES permit [1].

§ 257.73(c)(1)(i): The name and address of the person(s) owning or operating the CCR unit; the name associated with the CCR unit; and the identification number of the CCR unit if one has been assigned by the state.

The state identification number (ID) for the AP have been assigned by the Illinois Environmental Protection Agency (IEPA). The ID is listed in **Table 1**.

Table 1 – IEPA ID Numbers

CCR Surface Impoundment	State ID
Ash Pond	W1438050005-01

§ 257.73(c)(1)(ix): Area-capacity curves for the CCR unit.

Updated area-capacity curves were prepared for the Process Water Pond and the Clarification Pond for the AP in 2021. These curves are provided in **Figures 1** and **2**.

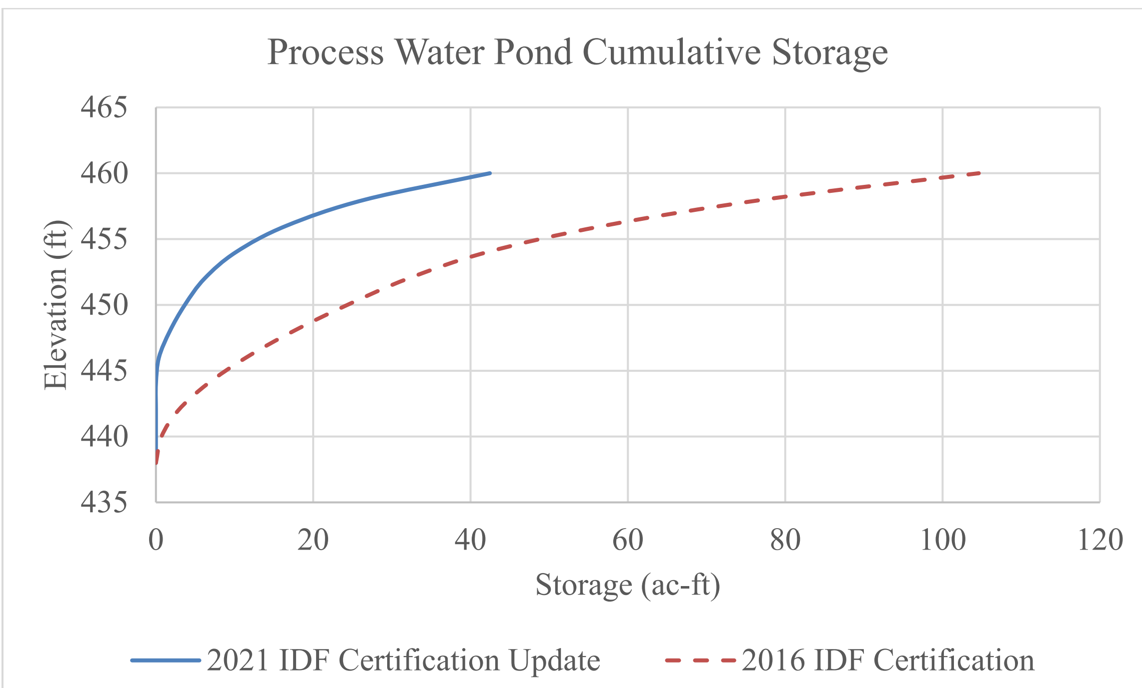


Figure 1 – Area-Capacity Curve for Ash Pond – Process Water Pond

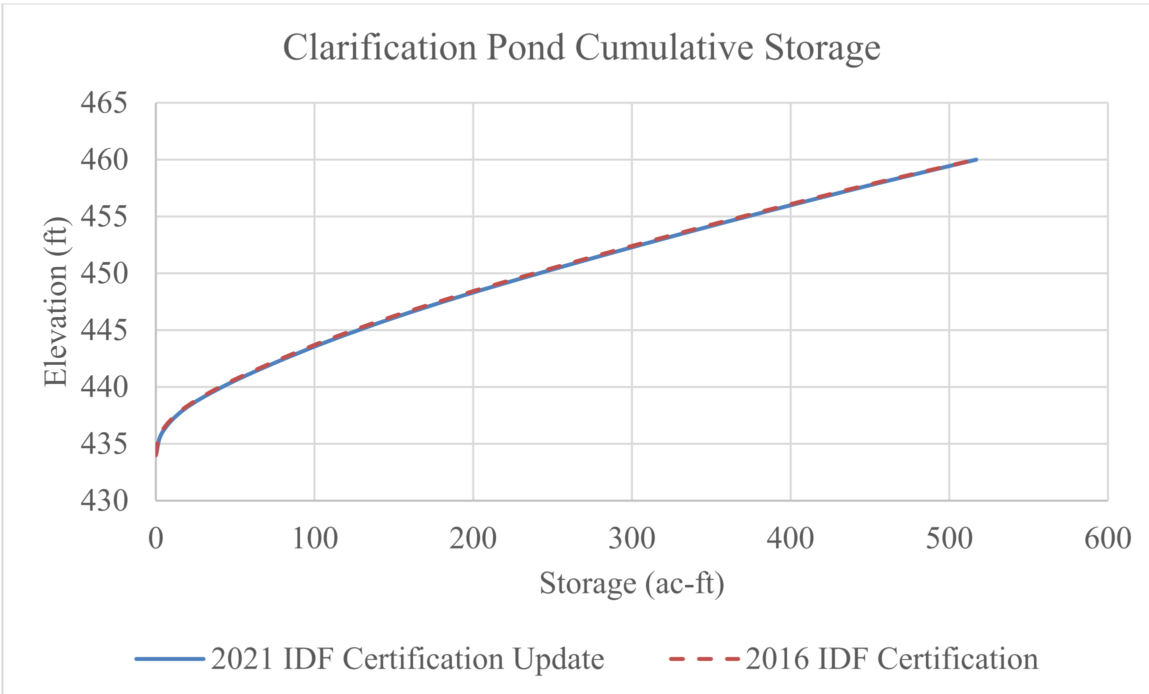


Figure 2 – Area-Capacity Curve for Ash Pond – Clarification Pond

§ 257.73(c)(1)(x): A description of each spillway and diversion design features and capacities and calculations used in their determination.

Updated discharge capacity calculations for the existing spillways were prepared in 2021 using HydroCAD 10 modeling software. The calculations indicate that the AP has sufficient storage capacity and will not overtop the embankments during the 1,000 year 24-hour rainfall event. The results of the calculations are provided in **Table 2**.

Table 2 – Results of Updated Discharge Capacity Calculations

	Process Water Pond	Clarification Pond
Approximate Berm Minimum Elevation[1], ft	458.8	459.6
Approximate Emergency Spillway Elevation[1], ft	Not Applicable	Not Applicable
Starting Water Surface Elevation[1] (SWSE), ft	450.4	447.3
Peak Water Surface Elevation[1] (PWSE), ft	458.6	457.5
Time to Peak, hr	9.3	24.6
Surface Area[2], ac	7.3	29.2
Storage[3], ac-ft	27.2	265.3
Notes:		

[1]Elevations are based on the NAVD88 datum [2]Surface area is defined as the water surface area at the PWSE [2]Storage is defined as the volume between the SWSE and PWSE

CLOSING

This letter has been prepared to document Geosyntec's evaluation of changes that have occurred at the AP at the EPP since the Initial HoC was developed, based on reasonably and readily available information provided by IPRG, observed by Geosyntec during the site visit, or generated by Geosyntec as part of subsequent calculations.

Sincerely,

John Seymour, P.E.
Senior Principal

Lucas P. Carr, P.E.
Senior Engineer

REFERENCES

[1] AECOM, "History of Construction, USEPA 40 CFR § 257.73(c), Edwards Power Station, Bartonville, IL," October 2016.

[2] United Stated Environmental Protection Agency, "40 CFR Parts 257 and 261, Hazardous and Solid Waste Management System, Disposal of Coal Combustion Residuals from Electric Utilities, Final Rule, 2015," 2015.

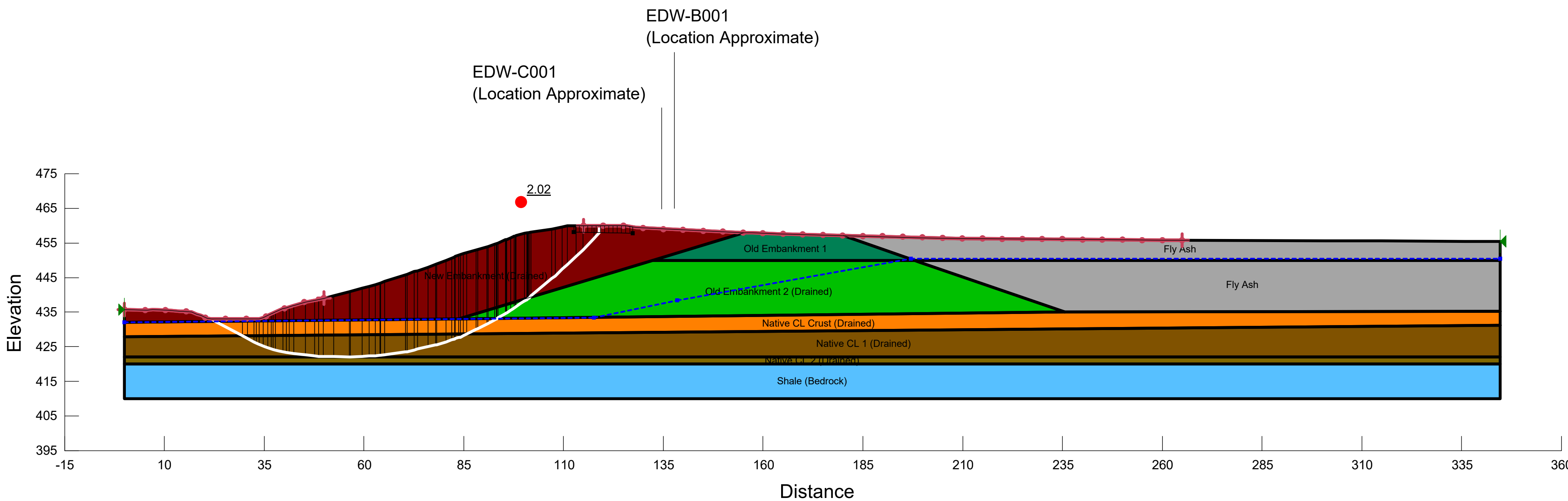
[3] Illinois Environmental Protection Agency, "35 Ill. Adm. Code Part 845, Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments," Springfield, IL, 2021.

Attachment D

Periodic Structural Stability and Safety Factor Assessment Analyses

Edwards Power Plant
Cross-section A
Slope Stability - Steady State

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Fly Ash Unit Weight: 105 pcf Cohesion': 100 psf Phi': 27 ° Piezometric Line: 1
Name: New Embankment (Drained) Unit Weight: 115 pcf Cohesion': 200 psf Phi': 30 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Old Embankment 2 (Drained) Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1



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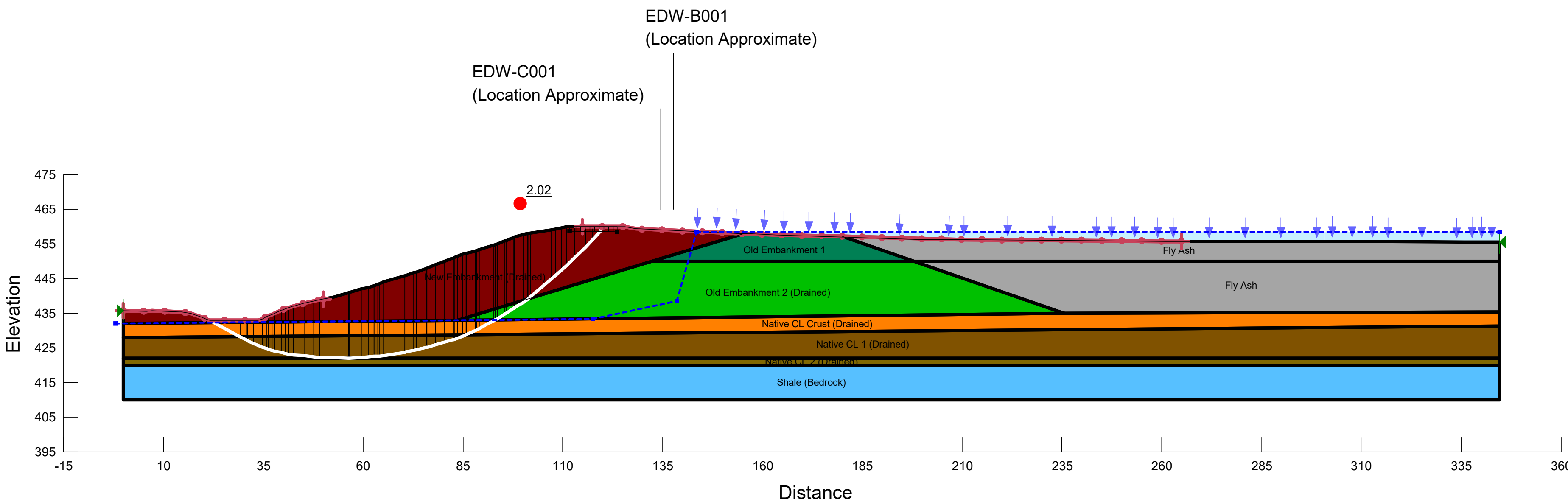
Edwards Power Plant
Cross-section A
Slope Stability - Surcharge Pool

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Fly Ash Unit Weight: 105 pcf Cohesion': 100 psf Phi': 27 ° Piezometric Line: 1
Name: New Embankment (Drained) Unit Weight: 115 pcf Cohesion': 200 psf Phi': 30 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Old Embankment 2 (Drained) Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1



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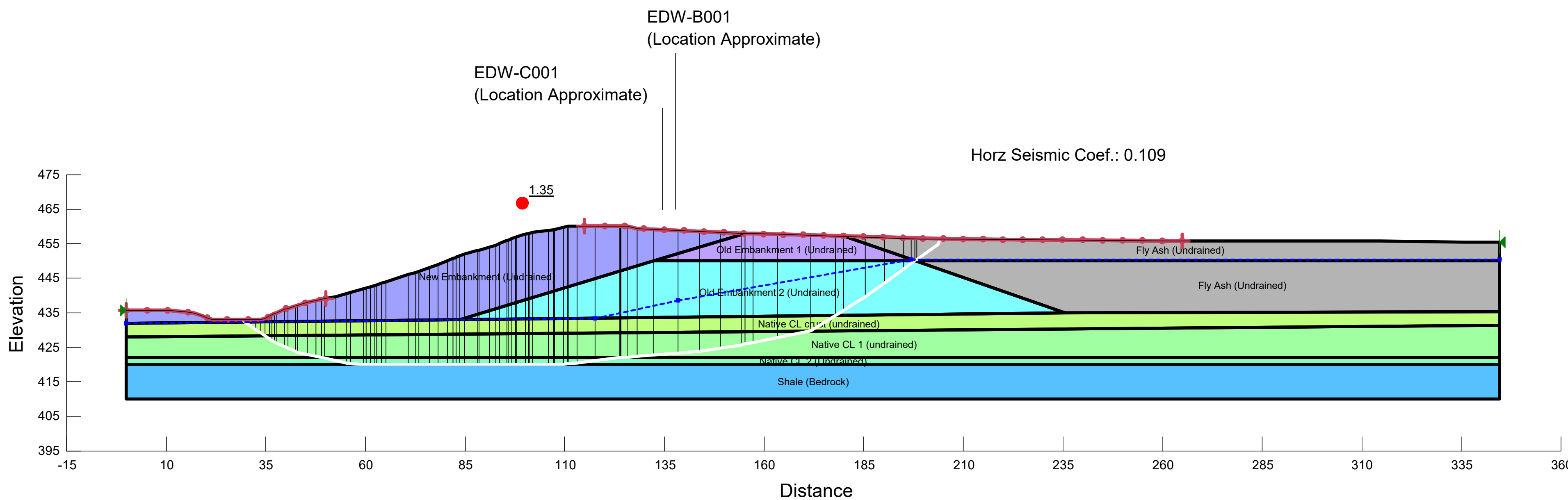
Edwards Power Plant
Cross-section A
Slope Stability - Seismic

Name: Fly Ash (Undrained)   Unit Weight: 105 pcf   Cohesion': 600 psf   Phi': 0 °   Piezometric Line: 1
Name: Old Embankment 1 (Undrained)   Unit Weight: 125 pcf   Cohesion': 2,500 psf   Phi': 0 °   Piezometric Line: 1
Name: Shale (Bedrock)   Unit Weight: 140 pcf   Cohesion': 1,000 psf   Phi': 36 °   Piezometric Line: 1
Name: Native CL 1 (undrained)   Unit Weight: 117 pcf   Cohesion': 650 psf   Phi': 0 °   Piezometric Line: 1
Name: Native CL crust (undrained)   Unit Weight: 120 pcf   Cohesion': 1,250 psf   Phi': 0 °   Piezometric Line: 1
Name: New Embankment (Undrained)   Unit Weight: 115 pcf   Cohesion': 2,500 psf   Phi': 0 °   Piezometric Line: 1
Name: Native CL 2 (Undrained)   Unit Weight: 105 pcf   Cohesion': 700 psf   Phi': 0 °   Piezometric Line: 1
Name: Old Embankment 2 (Undrained)   Unit Weight: 125 pcf   Cohesion': 1,250 psf   Phi': 0 °   Piezometric Line: 1



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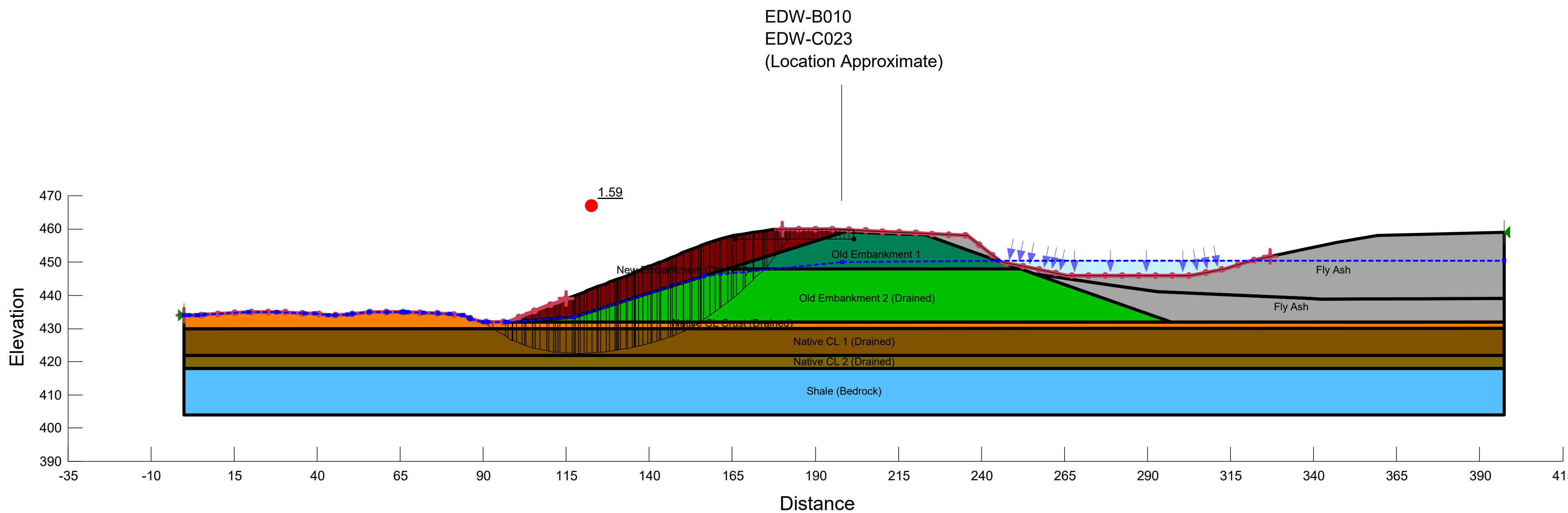
Edwards Power Plant
Cross-section B
Slope Stability - Steady State

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Fly Ash Unit Weight: 105 pcf Cohesion': 100 psf Phi': 27 ° Piezometric Line: 1
Name: New Embankment (Drained) Unit Weight: 115 pcf Cohesion': 200 psf Phi': 30 ° Piezometric Line: 1
Name: Old Embankment 2 (Drained) Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1



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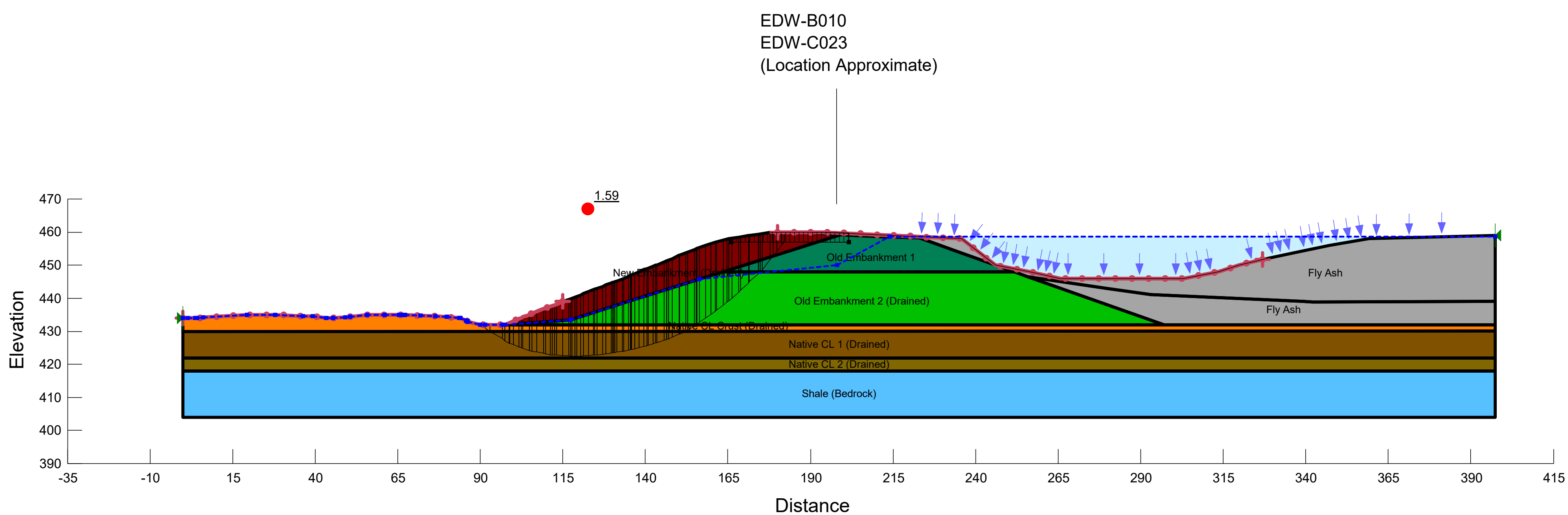
Edwards Power Plant
Cross-section B
Slope Stability - Surcharge Pool

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Fly Ash Unit Weight: 105 pcf Cohesion': 100 psf Phi': 27 ° Piezometric Line: 1
Name: New Embankment (Drained) Unit Weight: 115 pcf Cohesion': 200 psf Phi': 30 ° Piezometric Line: 1
Name: Old Embankment 2 (Drained) Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1



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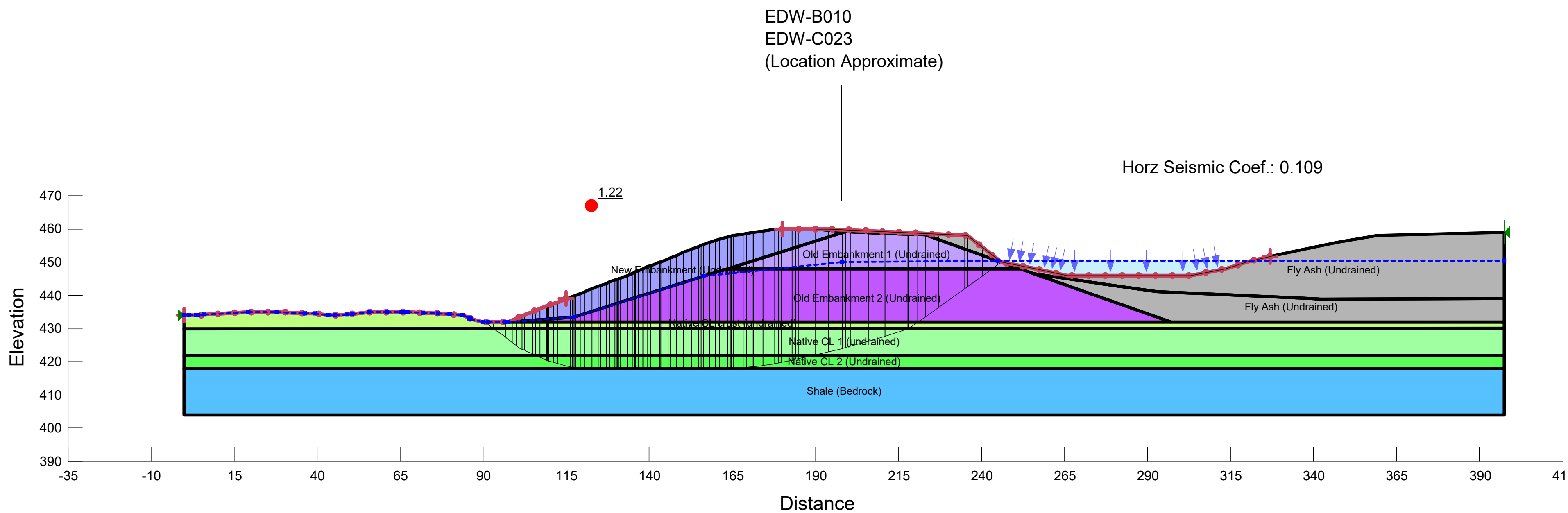
Edwards Power Plant
Cross-section B
Slope Stability - Seismic

Name: Fly Ash (Undrained) Unit Weight: 105 pcf Cohesion': 600 psf Phi': 0 ° Piezometric Line: 1
Name: Old Embankment 1 (Undrained) Unit Weight: 125 pcf Cohesion': 2,500 psf Phi': 0 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Native CL 1 (undrained) Unit Weight: 117 pcf Cohesion': 650 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL crust (undrained) Unit Weight: 120 pcf Cohesion': 1,250 psf Phi': 0 ° Piezometric Line: 1
Name: New Embankment (Undrained) Unit Weight: 115 pcf Cohesion': 2,500 psf Phi': 0 ° Piezometric Line: 1
Name: Old Embankment 2 (Undrained) Unit Weight: 125 pcf Cohesion': 1,250 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL 2 (Undrained) Unit Weight: 105 pcf Cohesion': 700 psf Phi': 0 ° Piezometric Line: 1



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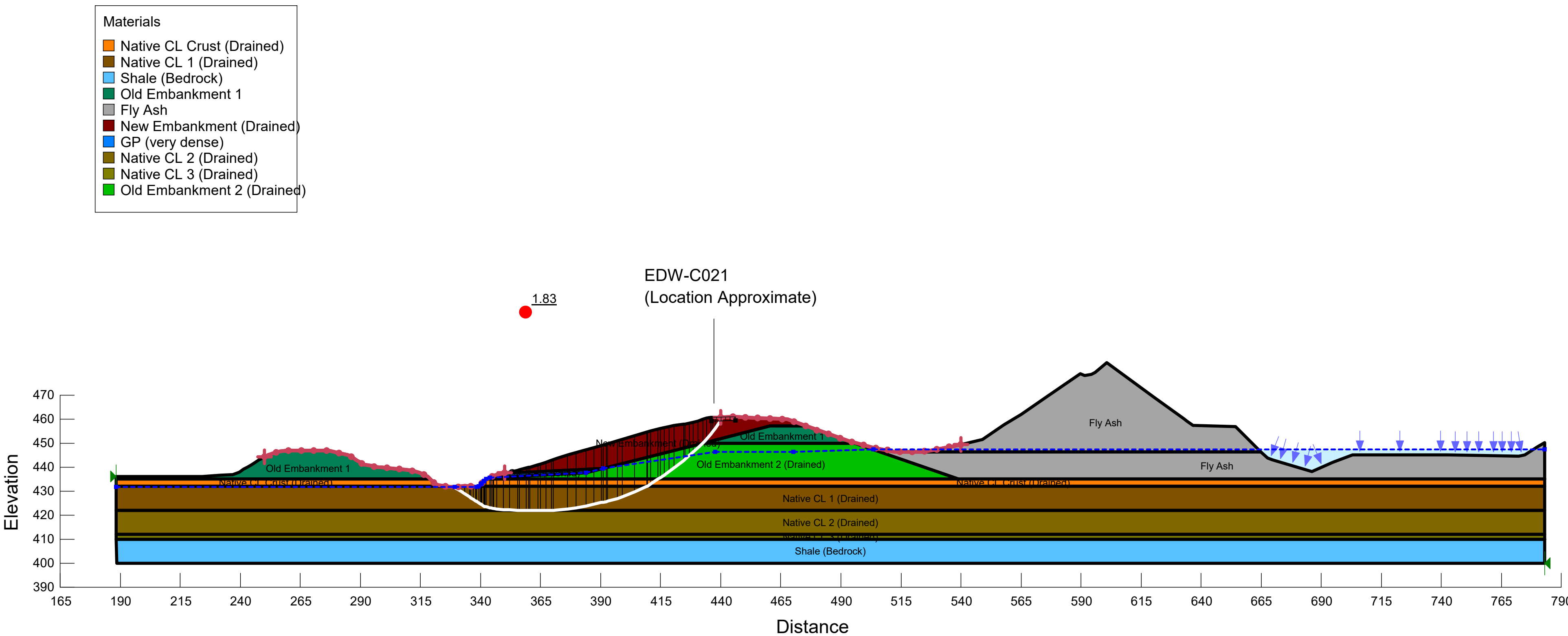
Edwards Power Plant

Cross-section C

Slope Stability - Steady State

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Fly Ash Unit Weight: 105 pcf Cohesion': 100 psf Phi': 27 ° Piezometric Line: 1
Name: New Embankment (Drained) Unit Weight: 115 pcf Cohesion': 200 psf Phi': 30 ° Piezometric Line: 1
Name: GP (very dense) Unit Weight: 135 pcf Cohesion': 0 psf Phi': 36 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 3 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Old Embankment 2 (Drained) Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1



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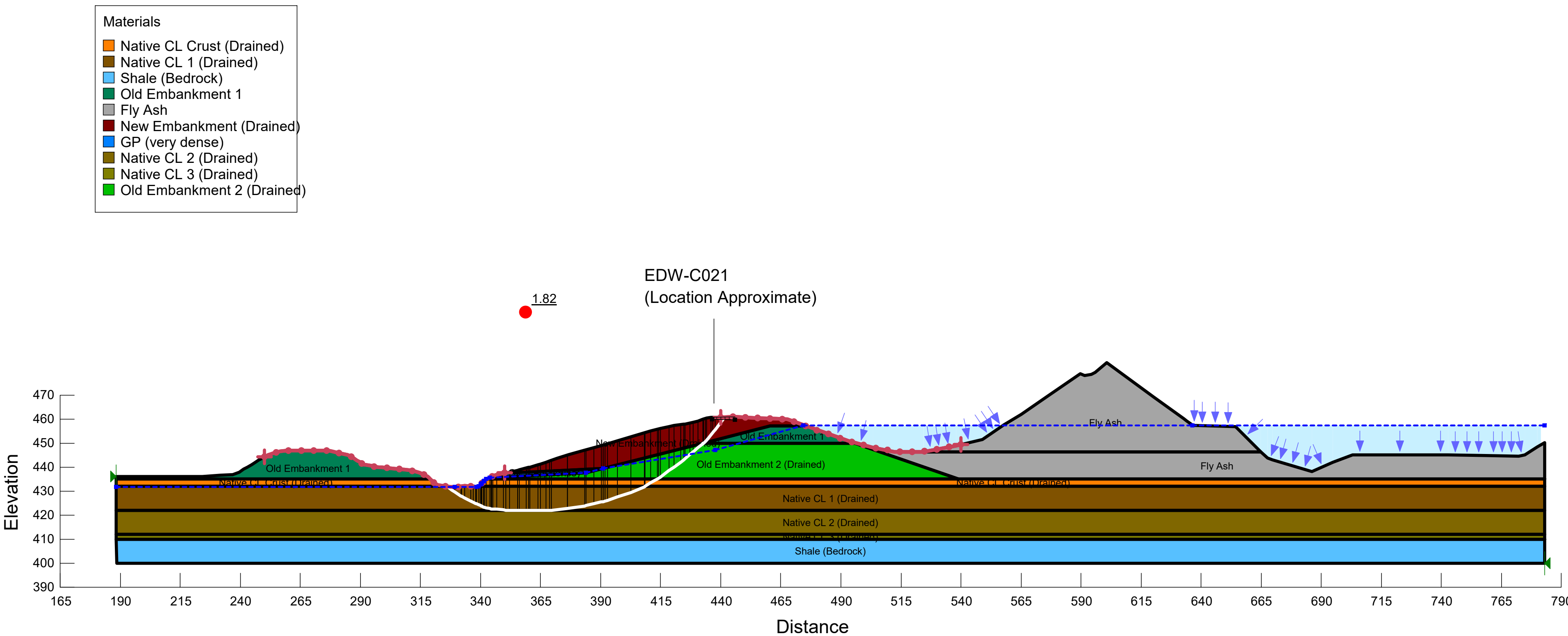
Edwards Power Plant
Cross-section C
Slope Stability - Surcharge Pool

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Fly Ash Unit Weight: 105 pcf Cohesion': 100 psf Phi': 27 ° Piezometric Line: 1
Name: New Embankment (Drained) Unit Weight: 115 pcf Cohesion': 200 psf Phi': 30 ° Piezometric Line: 1
Name: GP (very dense) Unit Weight: 135 pcf Cohesion': 0 psf Phi': 36 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 3 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Old Embankment 2 (Drained) Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1



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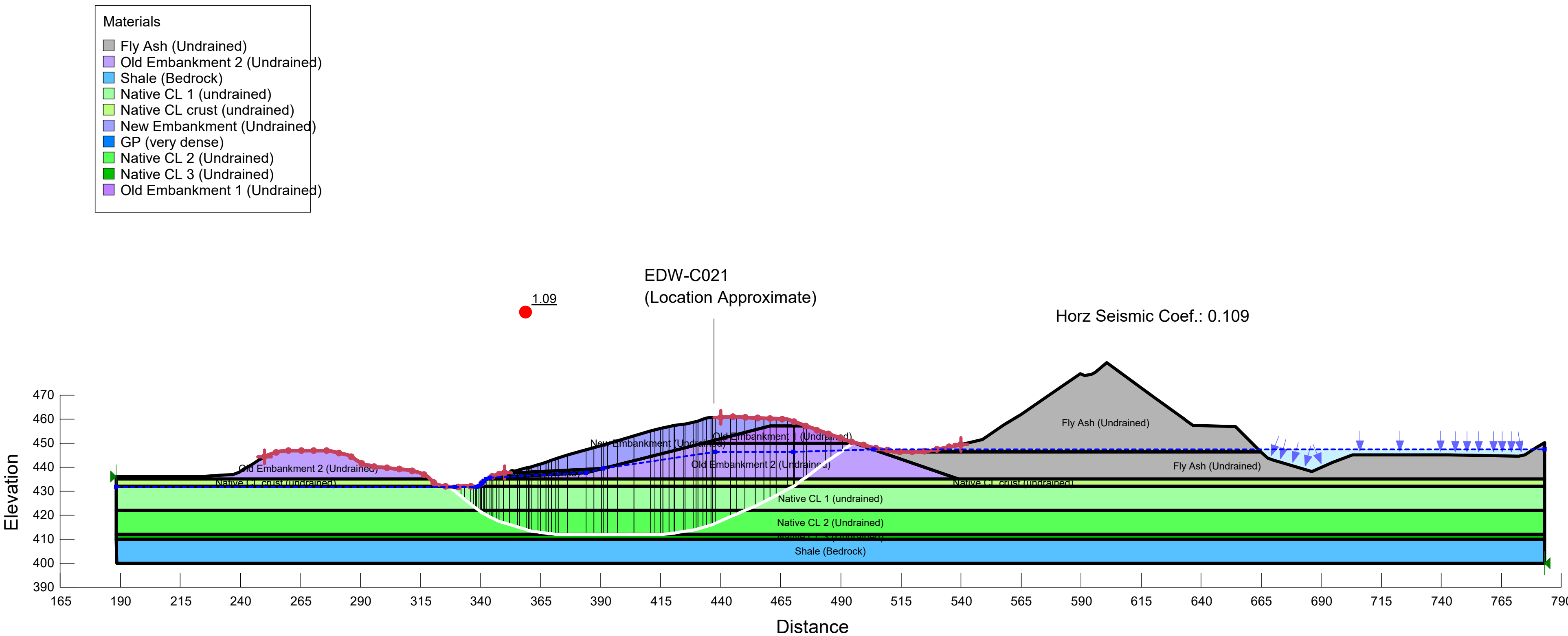
Edwards Power Plant-
section C
Slope Stability - Seismic

Name: Fly Ash (Undrained) Unit Weight: 105 pcf Cohesion': 600 psf Phi': 0 ° Piezometric Line: 1
Name: Old Embankment 2 (Undrained) Unit Weight: 125 pcf Cohesion': 1,250 psf Phi': 0 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Native CL 1 (undrained) Unit Weight: 117 pcf Cohesion': 650 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL crust (undrained) Unit Weight: 120 pcf Cohesion': 1,250 psf Phi': 0 ° Piezometric Line: 1
Name: New Embankment (Undrained) Unit Weight: 115 pcf Cohesion': 2,500 psf Phi': 0 ° Piezometric Line: 1
Name: GP (very dense) Unit Weight: 135 pcf Cohesion': 0 psf Phi': 36 ° Piezometric Line: 1
Name: Native CL 2 (Undrained) Unit Weight: 105 pcf Cohesion': 700 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL 3 (Undrained) Unit Weight: 105 pcf Cohesion': 900 psf Phi': 0 ° Piezometric Line: 1
Name: Old Embankment 1 (Undrained) Unit Weight: 125 pcf Cohesion': 2,500 psf Phi': 0 ° Piezometric Line: 1



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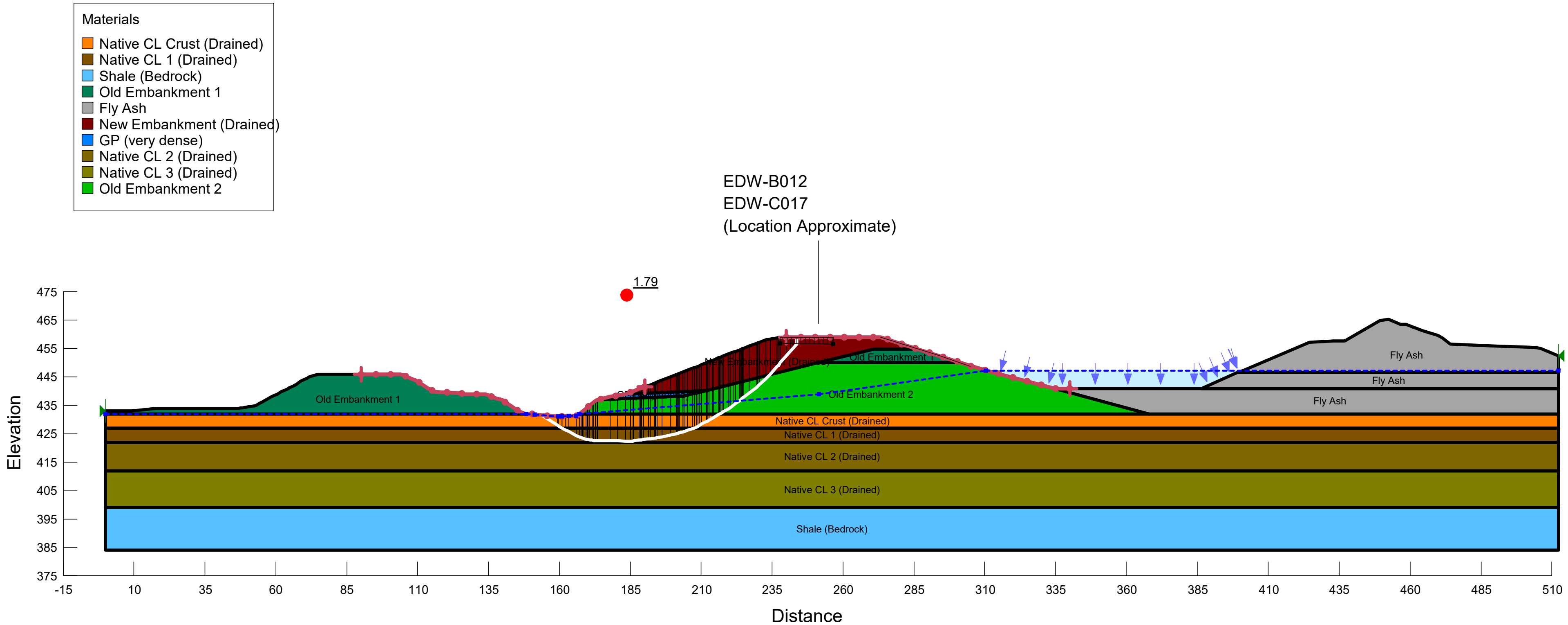
Edwards Power Plant
Cross-section D
Slope Stability - Steady State

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Fly Ash Unit Weight: 105 pcf Cohesion': 100 psf Phi': 27 ° Piezometric Line: 1
Name: New Embankment (Drained) Unit Weight: 115 pcf Cohesion': 200 psf Phi': 30 ° Piezometric Line: 1
Name: GP (very dense) Unit Weight: 135 pcf Cohesion': 0 psf Phi': 36 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 3 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Old Embankment 2 Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1



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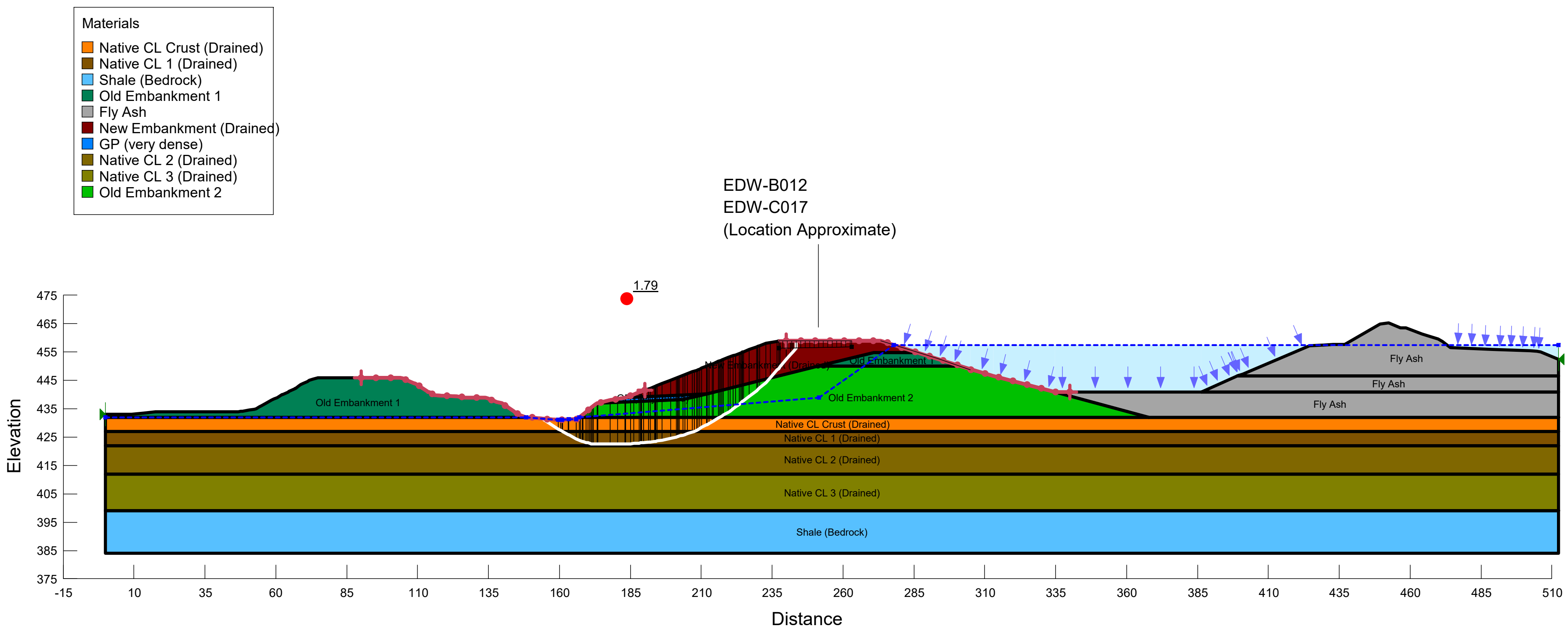
Edwards Power Plant
Cross-section D
Slope Stability - Surcharge Pool

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Fly Ash Unit Weight: 105 pcf Cohesion': 100 psf Phi': 27 ° Piezometric Line: 1
Name: New Embankment (Drained) Unit Weight: 115 pcf Cohesion': 200 psf Phi': 30 ° Piezometric Line: 1
Name: GP (very dense) Unit Weight: 135 pcf Cohesion': 0 psf Phi': 36 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 3 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Old Embankment 2 Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1



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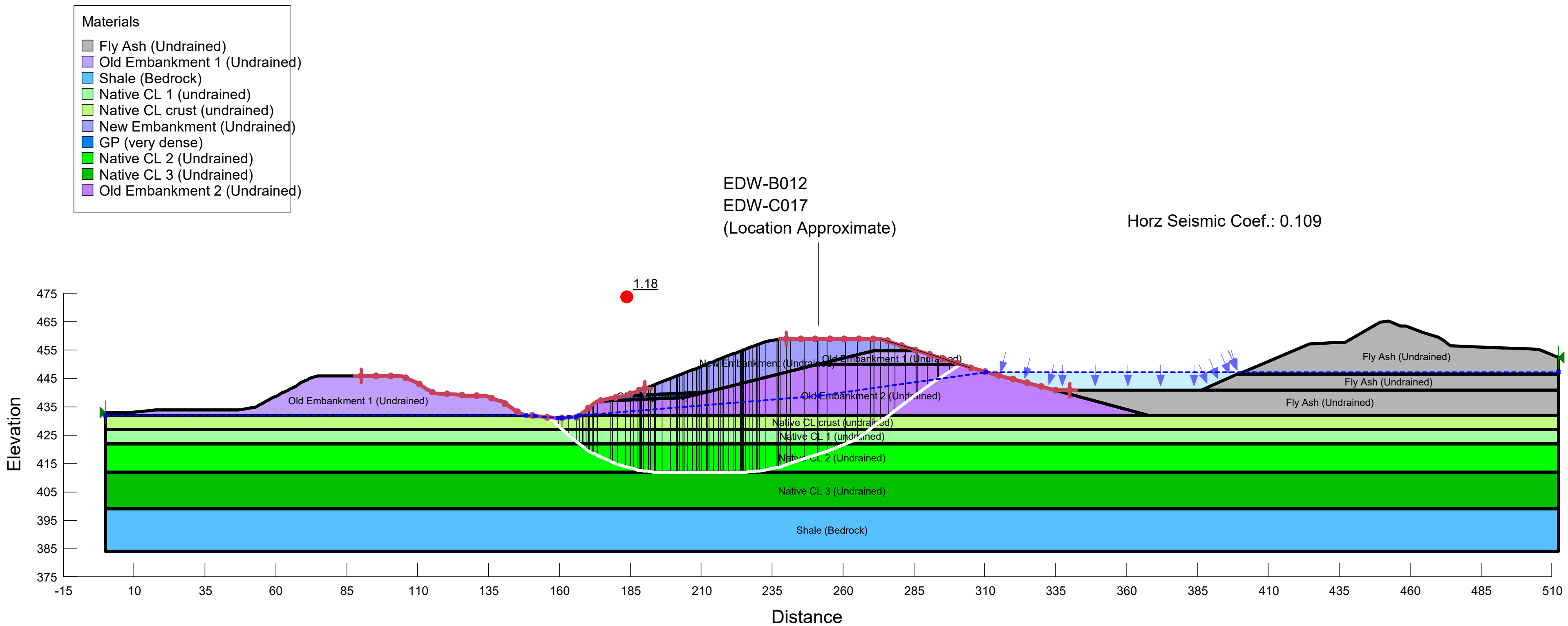
Edwards Power Plant
Cross-section D
Slope Stability - Seismic

Name: Fly Ash (Undrained)   Unit Weight: 105 pcf   Cohesion': 600 psf   Phi': 0 °   Piezometric Line: 1
Name: Old Embankment 1 (Undrained)   Unit Weight: 125 pcf   Cohesion': 2,500 psf   Phi': 0 °   Piezometric Line: 1
Name: Shale (Bedrock)   Unit Weight: 140 pcf   Cohesion': 1,000 psf   Phi': 36 °   Piezometric Line: 1
Name: Native CL 1 (undrained)   Unit Weight: 117 pcf   Cohesion': 650 psf   Phi': 0 °   Piezometric Line: 1
Name: Native CL crust (undrained)   Unit Weight: 120 pcf   Cohesion': 1,250 psf   Phi': 0 °   Piezometric Line: 1
Name: New Embankment (Undrained)   Unit Weight: 115 pcf   Cohesion': 2,500 psf   Phi': 0 °   Piezometric Line: 1
Name: GP (very dense)   Unit Weight: 135 pcf   Cohesion': 0 psf   Phi': 36 °   Piezometric Line: 1
Name: Native CL 2 (Undrained)   Unit Weight: 105 pcf   Cohesion': 700 psf   Phi': 0 °   Piezometric Line: 1
Name: Native CL 3 (Undrained)   Unit Weight: 105 pcf   Cohesion': 900 psf   Phi': 0 °   Piezometric Line: 1
Name: Old Embankment 2 (Undrained)   Unit Weight: 125 pcf   Cohesion': 1,250 psf   Phi': 0 °   Piezometric Line: 1



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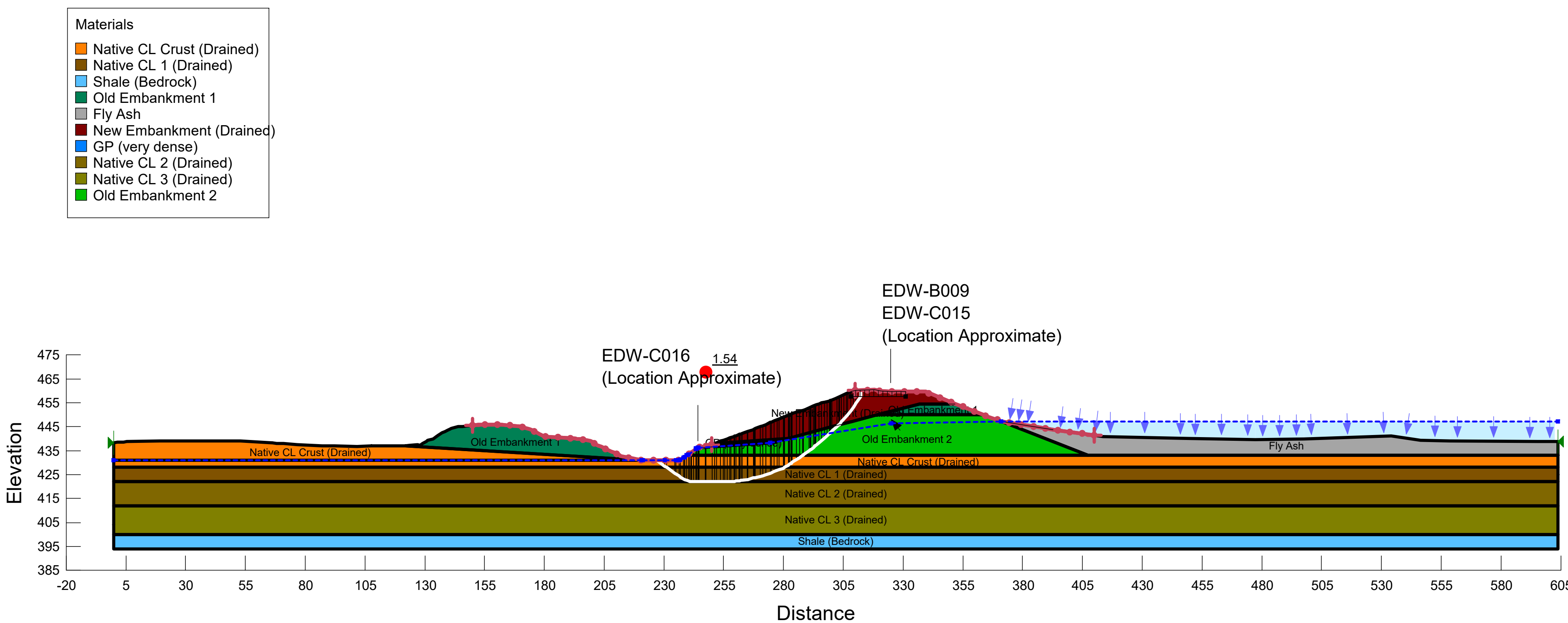
Edwards Power Plant
Cross-section E
Slope Stability - Steady State

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Fly Ash Unit Weight: 105 pcf Cohesion': 100 psf Phi': 27 ° Piezometric Line: 1
Name: New Embankment (Drained) Unit Weight: 115 pcf Cohesion': 200 psf Phi': 30 ° Piezometric Line: 1
Name: GP (very dense) Unit Weight: 135 pcf Cohesion': 0 psf Phi': 36 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 3 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Old Embankment 2 Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1



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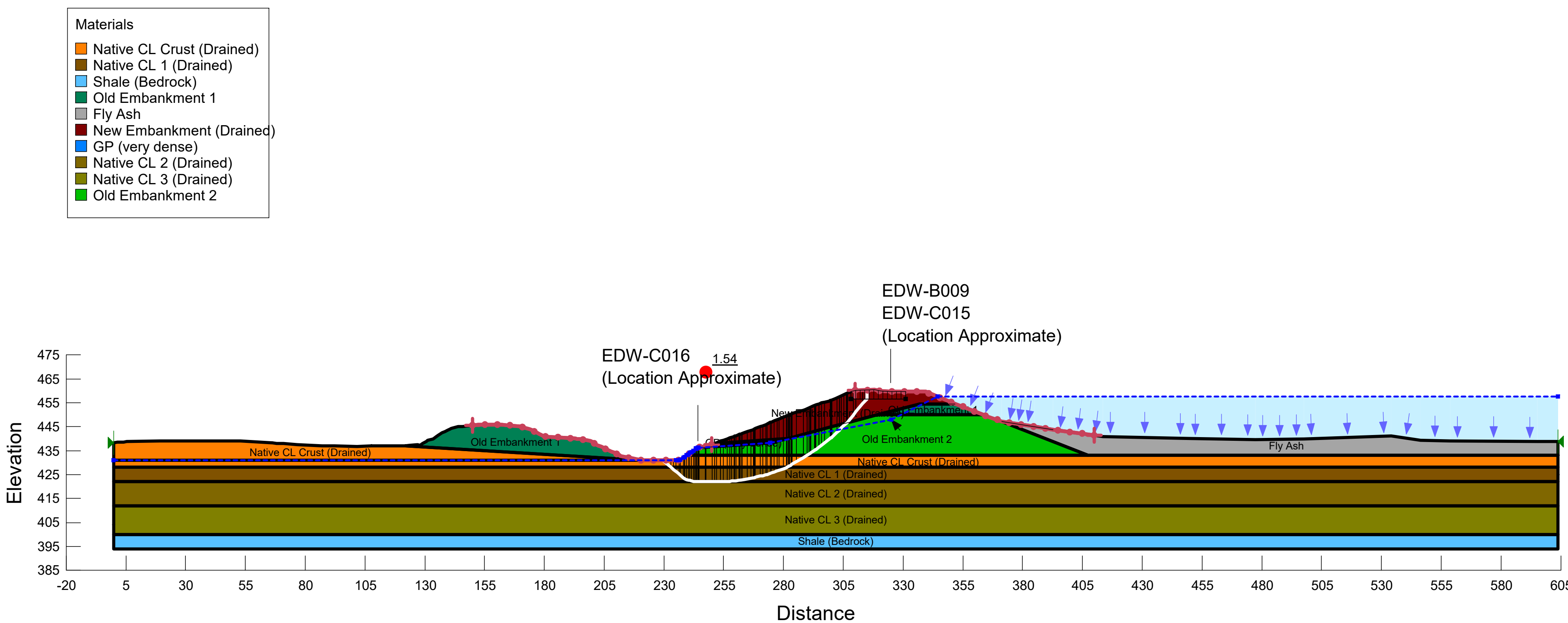
Edwards Power Plant
Cross-section E
Slope Stability - Surcharge Pool

Name: Native CL Crust (Drained)   Unit Weight: 120 pcf   Cohesion': 200 psf   Phi': 27.5 °   Piezometric Line: 1
Name: Native CL 1 (Drained)   Unit Weight: 117 pcf   Cohesion': 100 psf   Phi': 26 °   Piezometric Line: 1
Name: Shale (Bedrock)   Unit Weight: 140 pcf   Cohesion': 1,000 psf   Phi': 36 °   Piezometric Line: 1
Name: Old Embankment 1   Unit Weight: 125 pcf   Cohesion': 200 psf   Phi': 28 °   Piezometric Line: 1
Name: Fly Ash   Unit Weight: 105 pcf   Cohesion': 100 psf   Phi': 27 °   Piezometric Line: 1
Name: New Embankment (Drained)   Unit Weight: 115 pcf   Cohesion': 200 psf   Phi': 30 °   Piezometric Line: 1
Name: GP (very dense)   Unit Weight: 135 pcf   Cohesion': 0 psf   Phi': 36 °   Piezometric Line: 1
Name: Native CL 2 (Drained)   Unit Weight: 105 pcf   Cohesion': 200 psf   Phi': 26 °   Piezometric Line: 1
Name: Native CL 3 (Drained)   Unit Weight: 105 pcf   Cohesion': 200 psf   Phi': 26 °   Piezometric Line: 1
Name: Old Embankment 2   Unit Weight: 125 pcf   Cohesion': 100 psf   Phi': 29 °   Piezometric Line: 1



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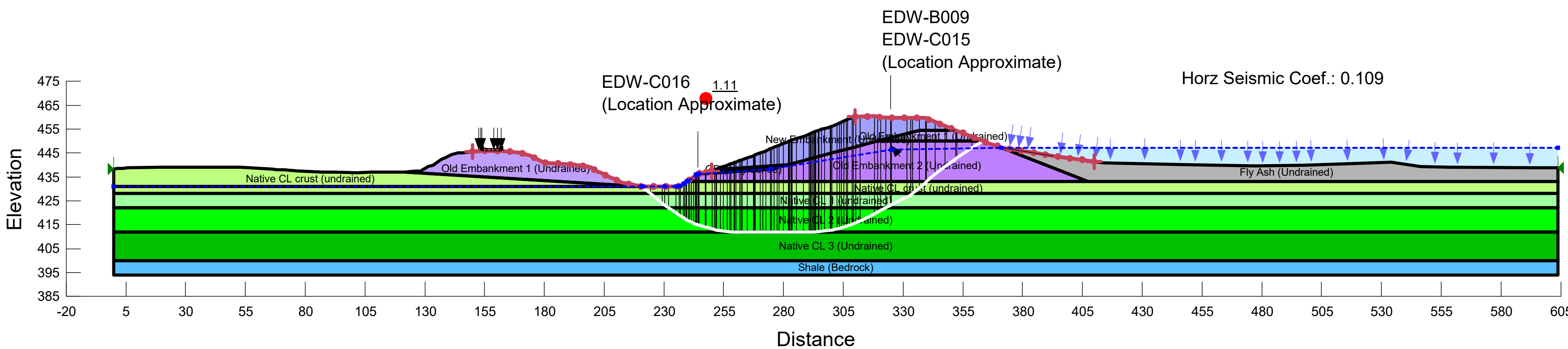
Edwards Power Plant
Cross-section E
Slope Stability - Seismic

Name: Fly Ash (Undrained) Unit Weight: 105 pcf Cohesion': 600 psf Phi': 0 ° Piezometric Line: 1
Name: Old Embankment 1 (Undrained) Unit Weight: 125 pcf Cohesion': 2,500 psf Phi': 0 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Native CL 1 (undrained) Unit Weight: 117 pcf Cohesion': 650 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL crust (undrained) Unit Weight: 120 pcf Cohesion': 1,250 psf Phi': 0 ° Piezometric Line: 1
Name: New Embankment (Undrained) Unit Weight: 115 pcf Cohesion': 2,500 psf Phi': 0 ° Piezometric Line: 1
Name: GP (very dense) Unit Weight: 135 pcf Cohesion': 0 psf Phi': 36 ° Piezometric Line: 1
Name: Native CL 2 (Undrained) Unit Weight: 105 pcf Cohesion': 700 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL 3 (Undrained) Unit Weight: 105 pcf Cohesion': 900 psf Phi': 0 ° Piezometric Line: 1
Name: Old Embankment 2 (Undrained) Unit Weight: 125 pcf Cohesion': 1,250 psf Phi': 0 ° Piezometric Line: 1

Materials

- Fly Ash (Undrained)
- Old Embankment 1 (Undrained)
- Shale (Bedrock)
- Native CL 1 (undrained)
- Native CL crust (undrained)
- New Embankment (Undrained)
- GP (very dense)
- Native CL 2 (Undrained)
- Native CL 3 (Undrained)
- Old Embankment 2 (Undrained)



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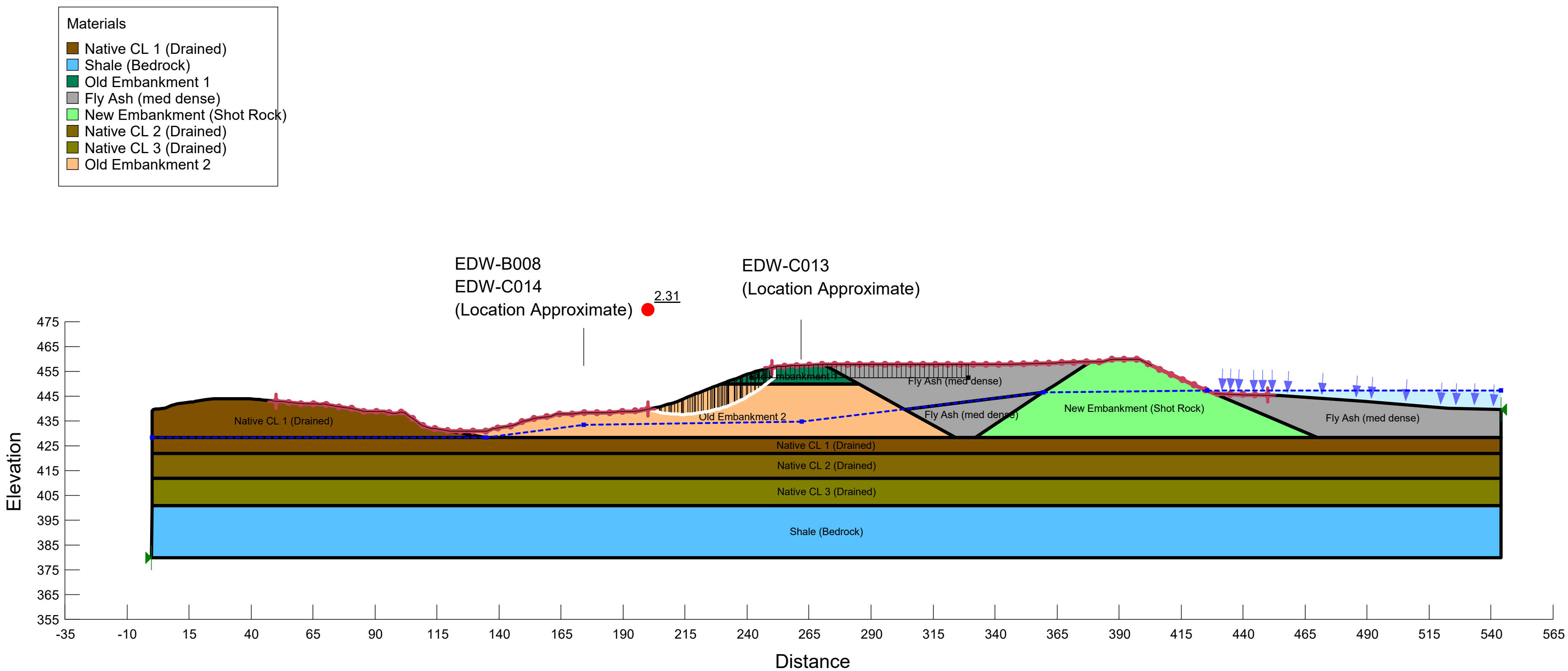
Edwards Power Plant
Cross-section F
Slope Stability - Steady State

Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Fly Ash (med dense) Unit Weight: 105 pcf Cohesion': 100 psf Phi': 27 ° Piezometric Line: 1
Name: New Embankment (Shot Rock) Unit Weight: 120 pcf Cohesion': 0 psf Phi': 32 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 3 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Old Embankment 2 Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1



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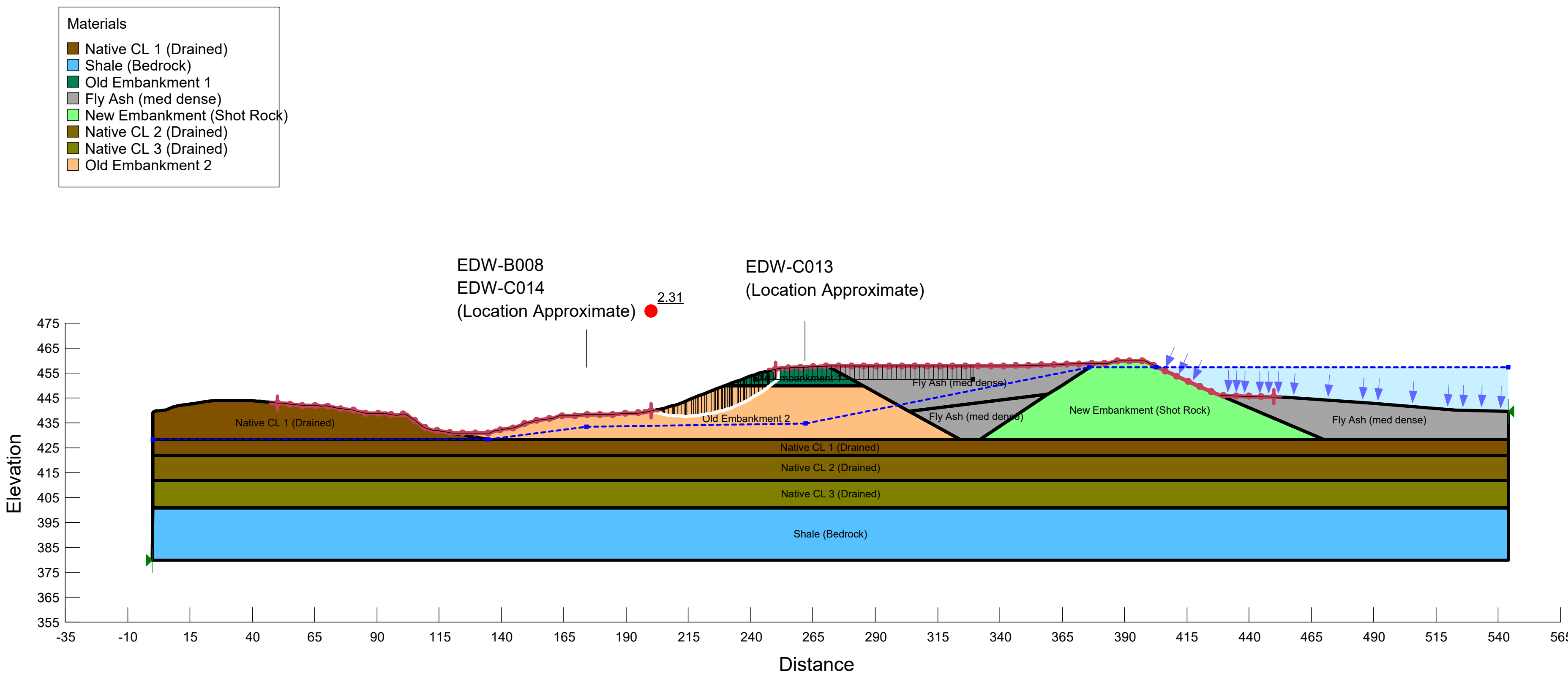
Edwards Power Plant
Cross-section F
Slope Stability - Surcharge Pool

Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Fly Ash (med dense) Unit Weight: 105 pcf Cohesion': 100 psf Phi': 27 ° Piezometric Line: 1
Name: New Embankment (Shot Rock) Unit Weight: 120 pcf Cohesion': 0 psf Phi': 32 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 3 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Old Embankment 2 Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1



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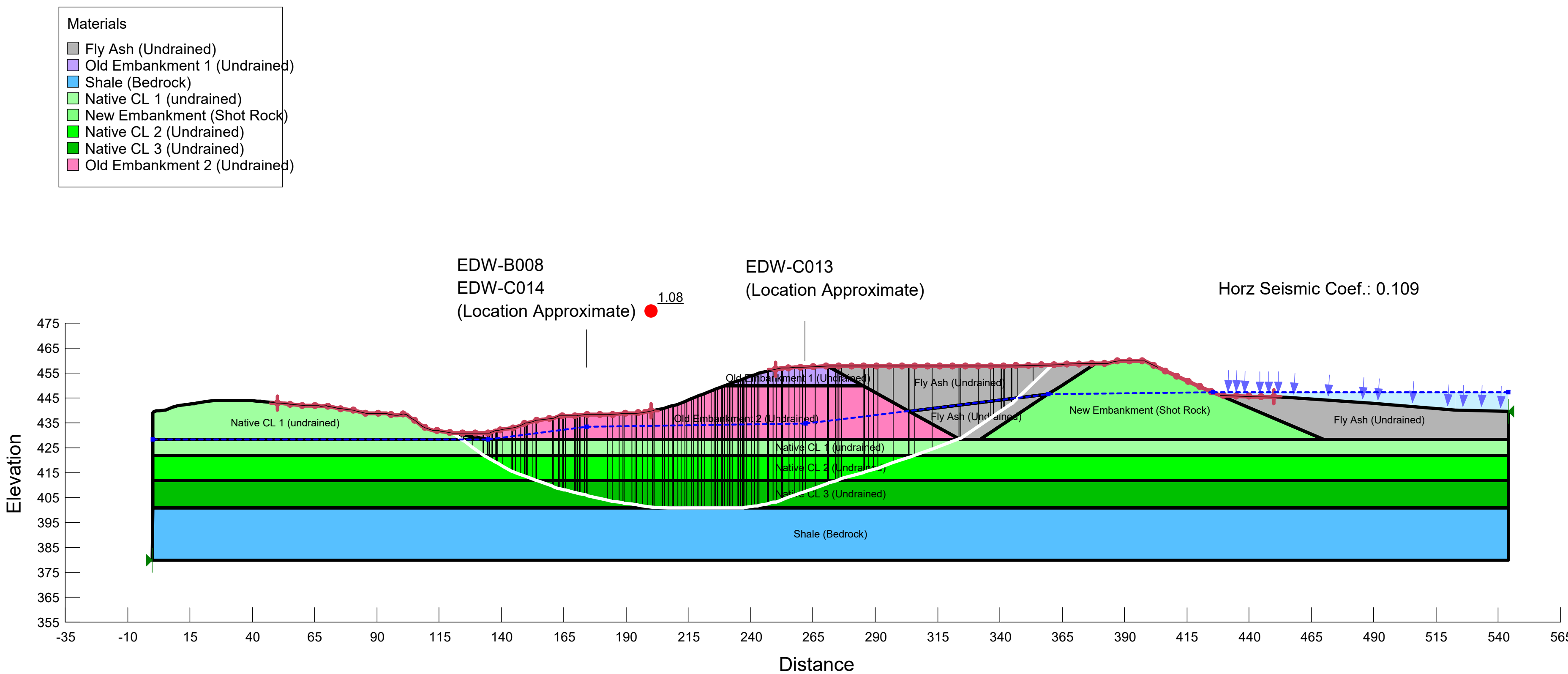
Edwards Power Plant
Cross-section F
Slope Stability - Seismic

Name: Fly Ash (Undrained) Unit Weight: 105 pcf Cohesion': 600 psf Phi': 0 ° Piezometric Line: 1
Name: Old Embankment 1 (Undrained) Unit Weight: 125 pcf Cohesion': 2,500 psf Phi': 0 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Native CL 1 (undrained) Unit Weight: 117 pcf Cohesion': 650 psf Phi': 0 ° Piezometric Line: 1
Name: New Embankment (Shot Rock) Unit Weight: 120 pcf Cohesion': 0 psf Phi': 32 ° Piezometric Line: 1
Name: Native CL 2 (Undrained) Unit Weight: 105 pcf Cohesion': 700 psf Piezometric Line: 1
Name: Native CL 3 (Undrained) Unit Weight: 105 pcf Cohesion': 900 psf Piezometric Line: 1
Name: Old Embankment 2 (Undrained) Unit Weight: 125 pcf Cohesion': 1,250 psf Phi': 0 ° Piezometric Line: 1



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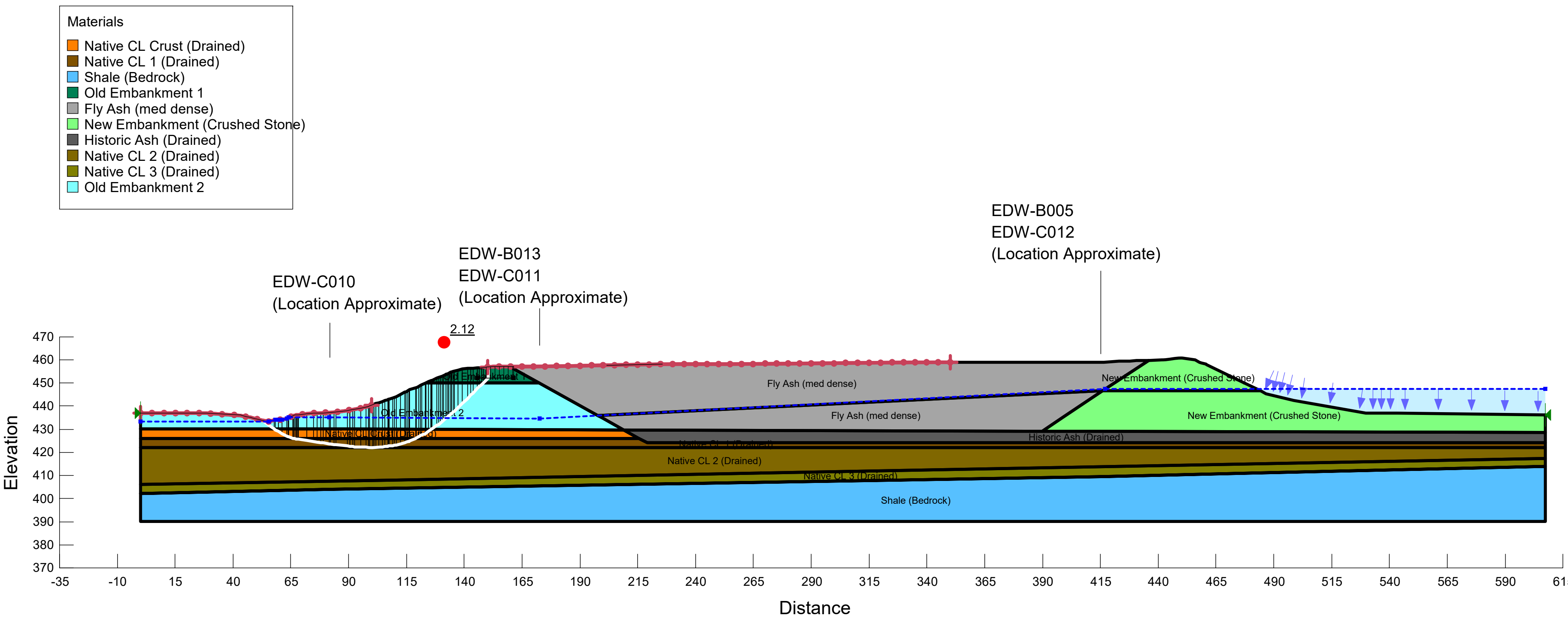
Edwards Power Plant
Cross-section G
Slope Stability - Steady State

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Fly Ash (med dense) Unit Weight: 105 pcf Cohesion': 100 psf Phi': 27 ° Piezometric Line: 1
Name: New Embankment (Crushed Stone) Unit Weight: 120 pcf Cohesion': 0 psf Phi': 32 ° Piezometric Line: 1
Name: Historic Ash (Drained) Unit Weight: 105 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 3 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Old Embankment 2 Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1



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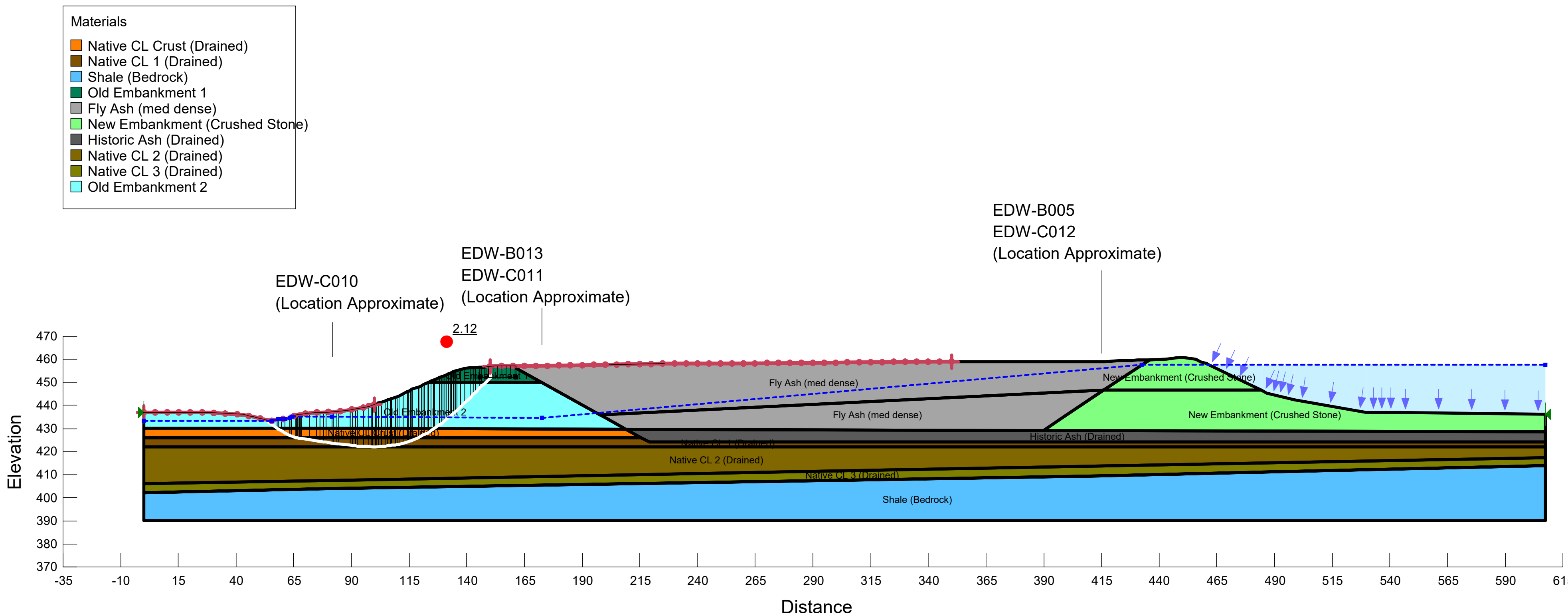
Edwards Power Plant
Cross-section G
Slope Stability - Surcharge Pool

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Fly Ash (med dense) Unit Weight: 105 pcf Cohesion': 100 psf Phi': 27 ° Piezometric Line: 1
Name: New Embankment (Crushed Stone) Unit Weight: 120 pcf Cohesion': 0 psf Phi': 32 ° Piezometric Line: 1
Name: Historic Ash (Drained) Unit Weight: 105 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 3 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Old Embankment 2 Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1



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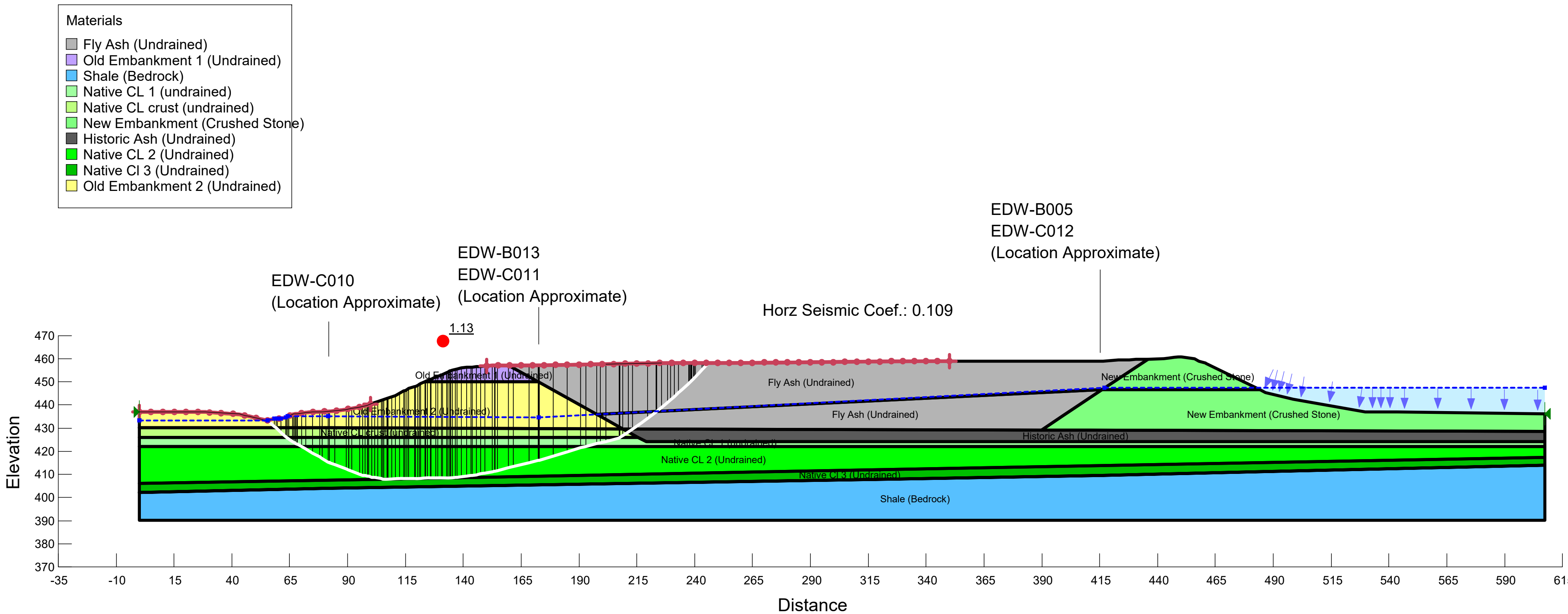
Edwards Power Plant
Cross-section G
Slope Stability - Seismic

Name: Fly Ash (Undrained) Unit Weight: 105 pcf Cohesion': 600 psf Phi': 0 ° Piezometric Line: 1
Name: Old Embankment 1 (Undrained) Unit Weight: 125 pcf Cohesion': 2,500 psf Phi': 0 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Native CL 1 (undrained) Unit Weight: 117 pcf Cohesion': 650 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL crust (undrained) Unit Weight: 120 pcf Cohesion': 1,250 psf Phi': 0 ° Piezometric Line: 1
Name: New Embankment (Crushed Stone) Unit Weight: 120 pcf Cohesion': 0 psf Phi': 32 ° Piezometric Line: 1
Name: Historic Ash (Undrained) Unit Weight: 105 pcf Cohesion': 750 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL 2 (Undrained) Unit Weight: 105 pcf Cohesion': 700 psf Piezometric Line: 1
Name: Native Cl 3 (Undrained) Unit Weight: 105 pcf Cohesion': 900 psf Piezometric Line: 1
Name: Old Embankment 2 (Undrained) Unit Weight: 125 pcf Cohesion': 1,250 psf Phi': 0 ° Piezometric Line: 1



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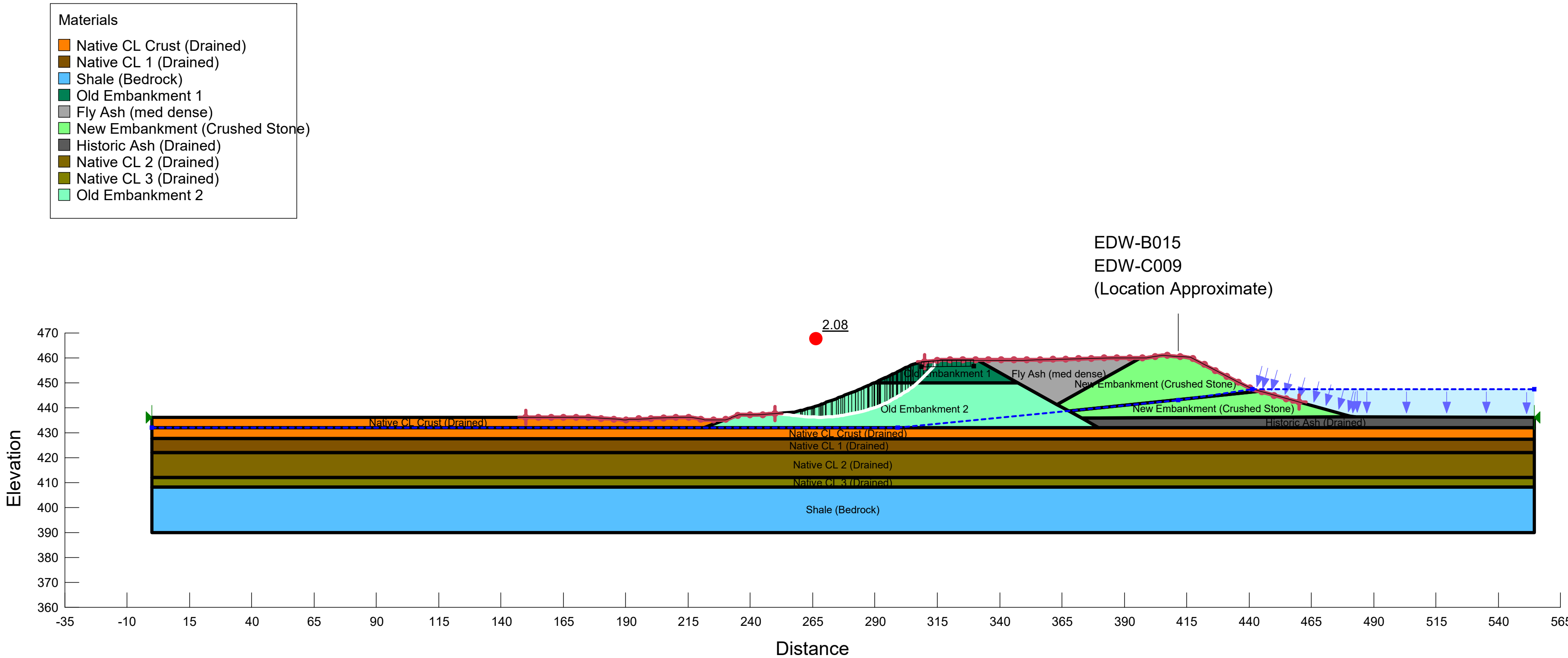
Edwards Power Plant
Cross-section H
Slope Stability - Steady State

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Fly Ash (med dense) Unit Weight: 105 pcf Cohesion': 100 psf Phi': 27 ° Piezometric Line: 1
Name: New Embankment (Crushed Stone) Unit Weight: 120 pcf Cohesion': 0 psf Phi': 32 ° Piezometric Line: 1
Name: Historic Ash (Drained) Unit Weight: 105 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 3 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Old Embankment 2 Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1



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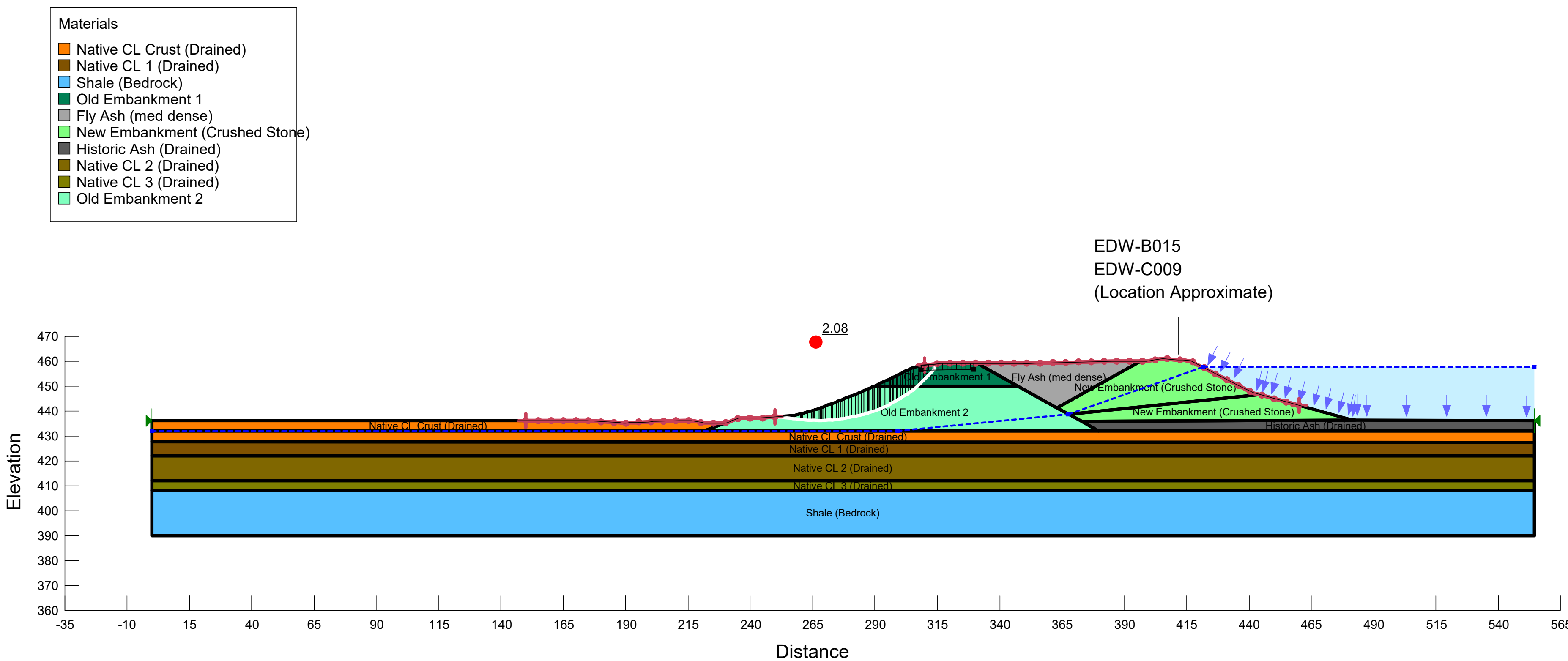
Edwards Power Plant

Cross-section H

Slope Stability - Surcharge Pool

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Fly Ash (med dense) Unit Weight: 105 pcf Cohesion': 100 psf Phi': 27 ° Piezometric Line: 1
Name: New Embankment (Crushed Stone) Unit Weight: 120 pcf Cohesion': 0 psf Phi': 32 ° Piezometric Line: 1
Name: Historic Ash (Drained) Unit Weight: 105 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 3 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Old Embankment 2 Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1



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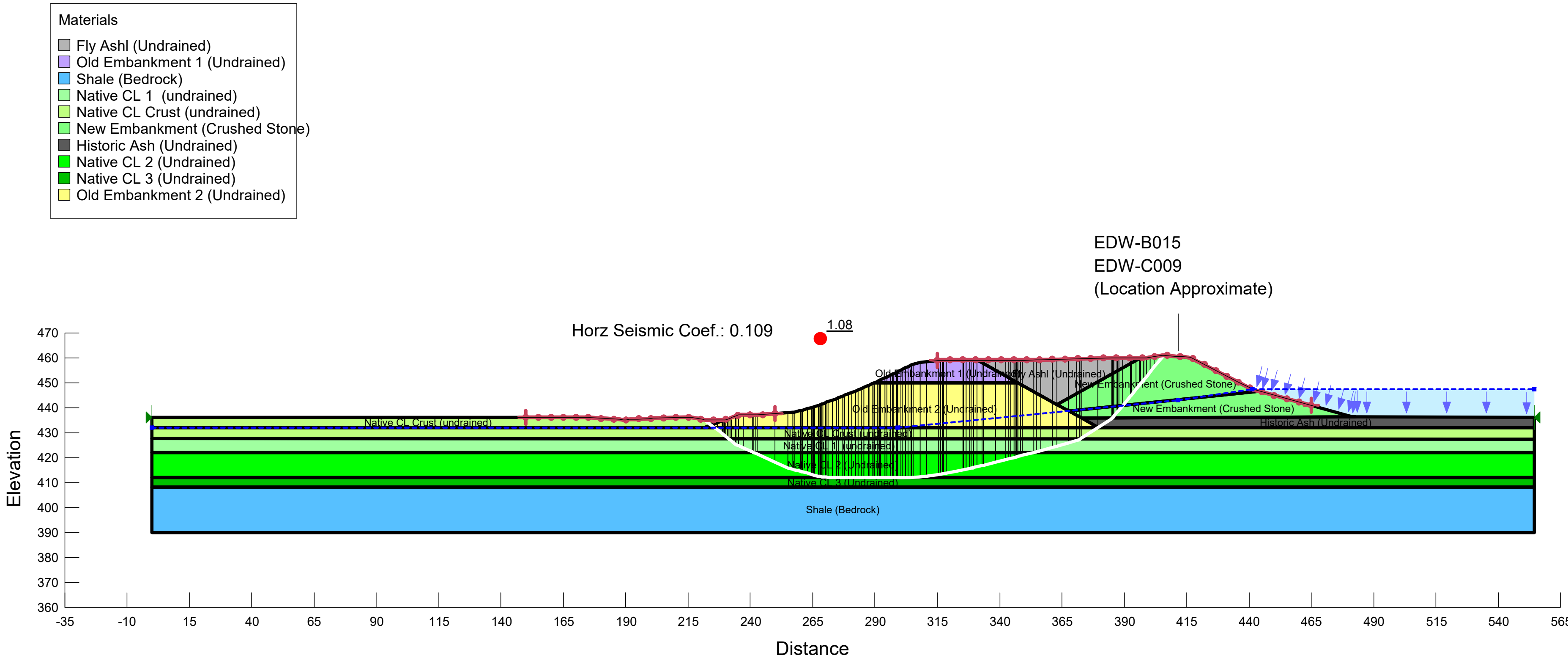
Edwards Power Plant
Cross-section H
Slope Stability - Seismic

Name: Fly Ashl (Undrained) Unit Weight: 105 pcf Cohesion': 600 psf Phi': 0 ° Piezometric Line: 1
Name: Old Embankment 1 (Undrained) Unit Weight: 125 pcf Cohesion': 2,500 psf Phi': 0 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Native CL 1 (undrained) Unit Weight: 117 pcf Cohesion': 650 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL Crust (undrained) Unit Weight: 120 pcf Cohesion': 1,250 psf Phi': 0 ° Piezometric Line: 1
Name: New Embankment (Crushed Stone) Unit Weight: 120 pcf Cohesion': 0 psf Phi': 32 ° Piezometric Line: 1
Name: Historic Ash (Undrained) Unit Weight: 105 pcf Cohesion': 750 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL 2 (Undrained) Unit Weight: 117 pcf Cohesion': 700 psf Piezometric Line: 1
Name: Native CL 3 (Undrained) Unit Weight: 105 pcf Cohesion': 900 psf Piezometric Line: 1
Name: Old Embankment 2 (Undrained) Unit Weight: 125 pcf Cohesion': 1,250 psf Phi': 0 ° Piezometric Line: 1



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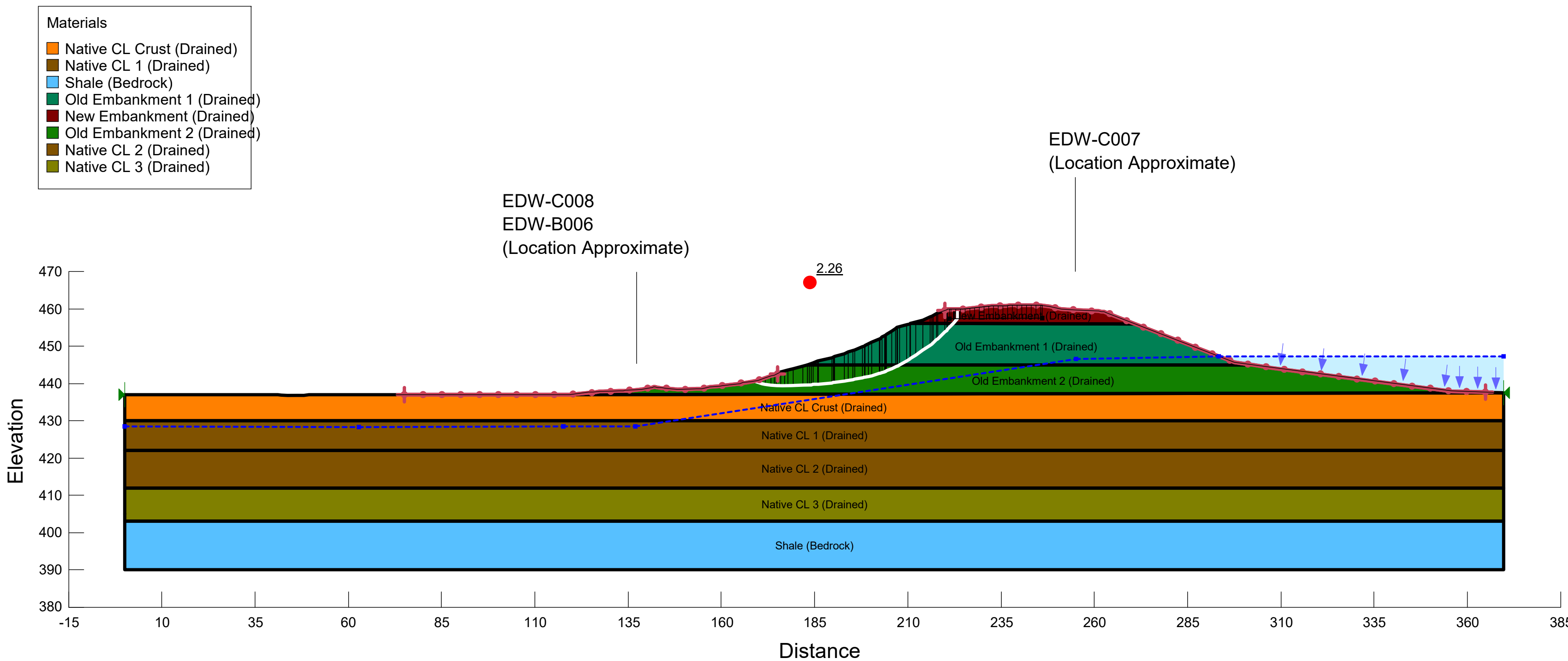
Edwards Power Plant
Cross-section I
Slope Stability - Steady State

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 (Drained) Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: New Embankment (Drained) Unit Weight: 115 pcf Cohesion': 200 psf Phi': 30 ° Piezometric Line: 1
Name: Old Embankment 2 (Drained) Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 3 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1



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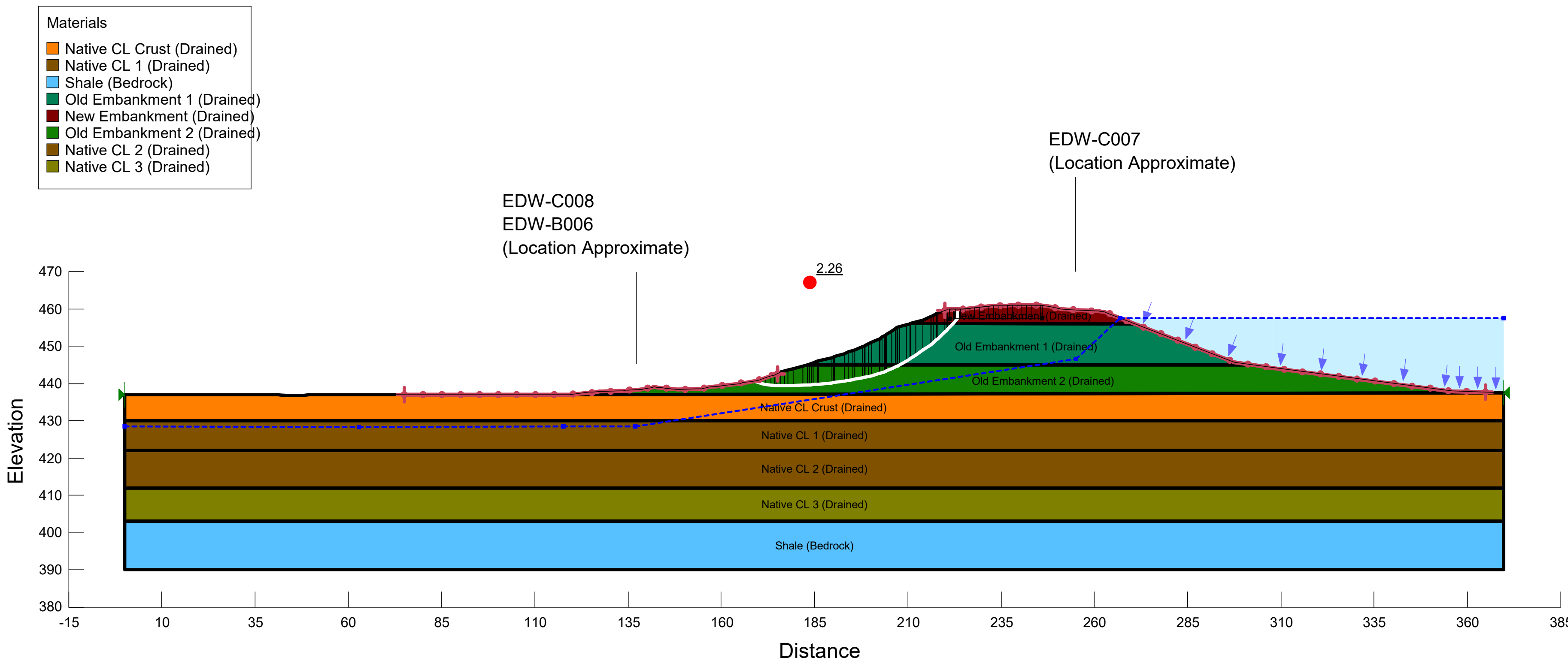
Edwards Power Plant
Cross-section I
Slope Stability - Surcharge Pool

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Old Embankment 1 (Drained) Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: New Embankment (Drained) Unit Weight: 115 pcf Cohesion': 200 psf Phi': 30 ° Piezometric Line: 1
Name: Old Embankment 2 (Drained) Unit Weight: 125 pcf Cohesion': 100 psf Phi': 29 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 3 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1



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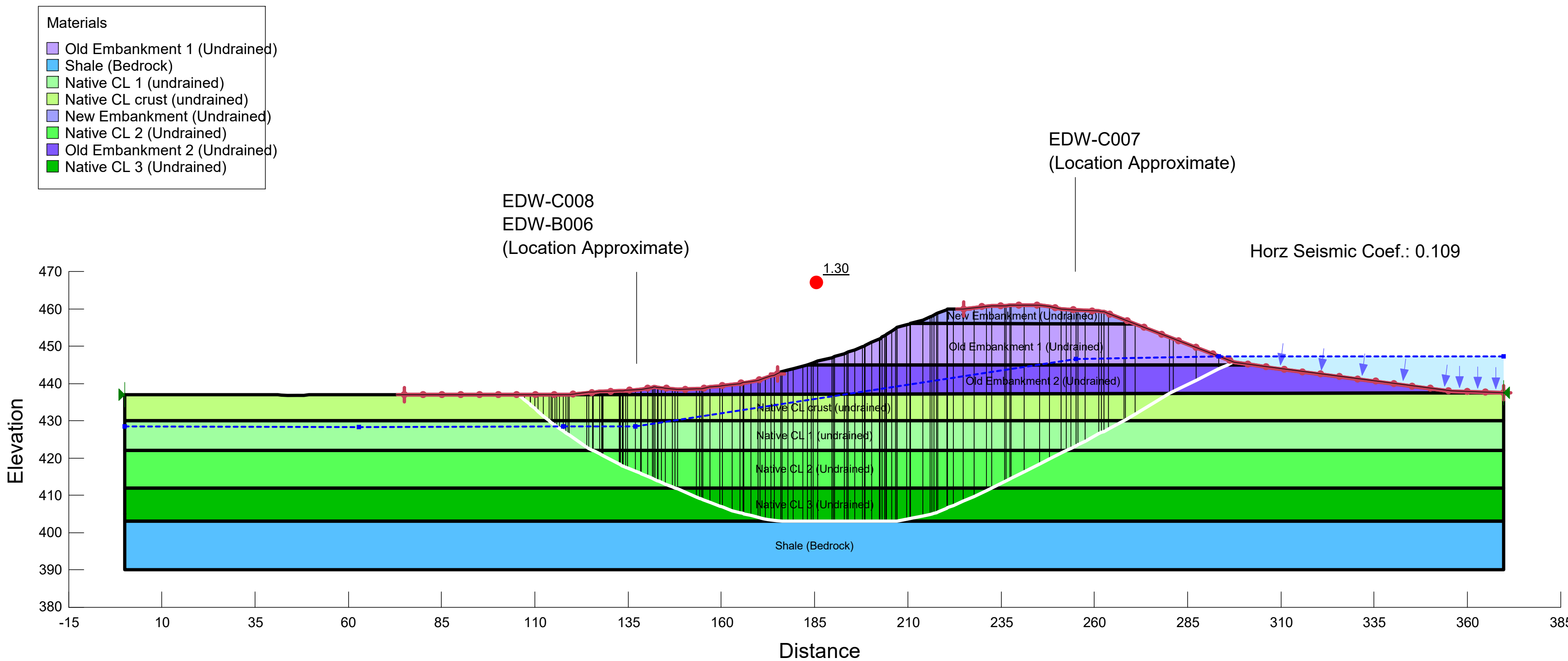
Edwards Power Plant
Cross-section I
Slope Stability - Seismic

Name: Old Embankment 1 (Undrained) Unit Weight: 125 pcf Cohesion': 2,500 psf Phi': 0 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Native CL 1 (undrained) Unit Weight: 117 pcf Cohesion': 650 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL crust (undrained) Unit Weight: 120 pcf Cohesion': 1,250 psf Phi': 0 ° Piezometric Line: 1
Name: New Embankment (Undrained) Unit Weight: 115 pcf Cohesion': 2,500 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL 2 (Undrained) Unit Weight: 105 pcf Cohesion': 700 psf Phi': 0 ° Piezometric Line: 1
Name: Old Embankment 2 (Undrained) Unit Weight: 125 pcf Cohesion': 1,250 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL 3 (Undrained) Unit Weight: 105 pcf Cohesion': 900 psf Piezometric Line: 1



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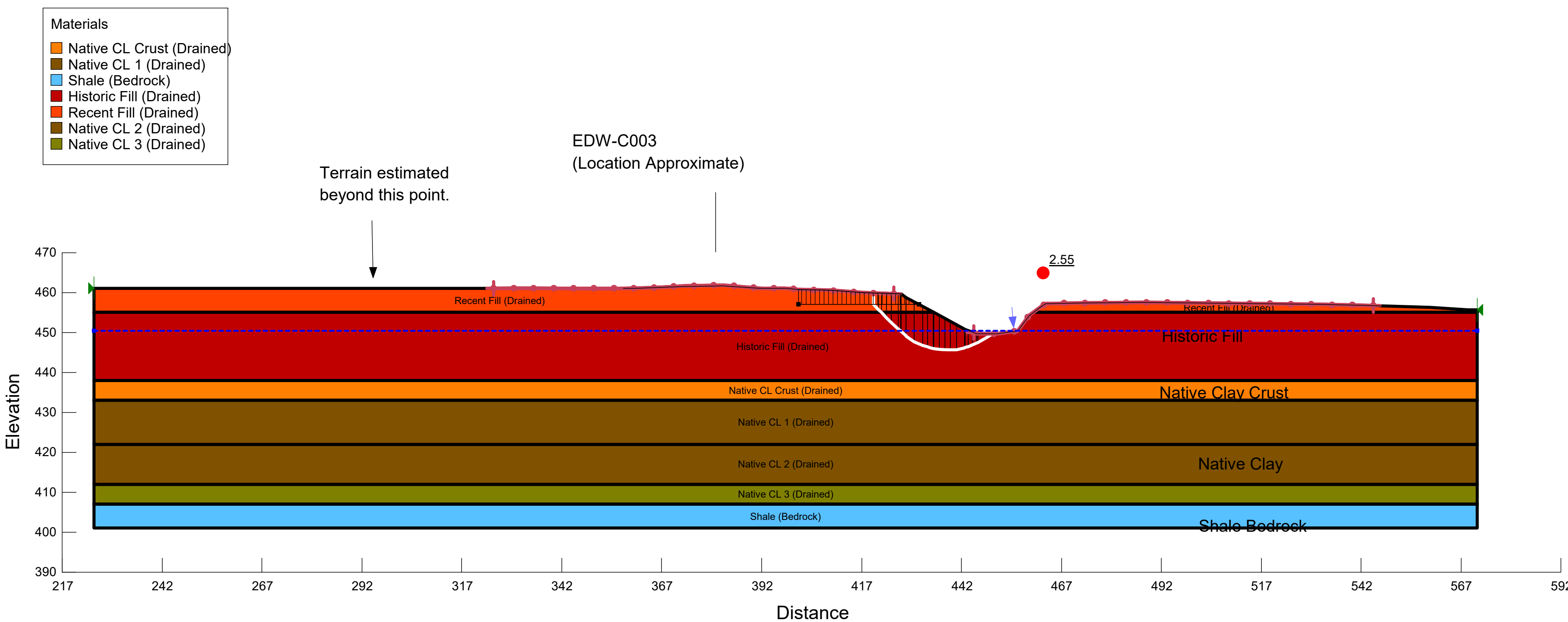
Edwards Power Plant
Cross-section J
Slope Stability - Steady-State

Name: Native CL Crust (Drained)   Unit Weight: 120 pcf   Cohesion': 200 psf   Phi': 27.5 °   Piezometric Line: 1
Name: Native CL 1 (Drained)   Unit Weight: 117 pcf   Cohesion': 100 psf   Phi': 26 °   Piezometric Line: 1
Name: Shale (Bedrock)   Unit Weight: 140 pcf   Cohesion': 1,000 psf   Phi': 36 °   Piezometric Line: 1
Name: Historic Fill (Drained)   Unit Weight: 125 pcf   Cohesion': 200 psf   Phi': 28 °   Piezometric Line: 1
Name: Recent Fill (Drained)   Unit Weight: 115 pcf   Cohesion': 200 psf   Phi': 30 °   Piezometric Line: 1
Name: Native CL 2 (Drained)   Unit Weight: 105 pcf   Cohesion': 200 psf   Phi': 26 °   Piezometric Line: 1
Name: Native CL 3 (Drained)   Unit Weight: 105 pcf   Cohesion': 200 psf   Phi': 26 °   Piezometric Line: 1



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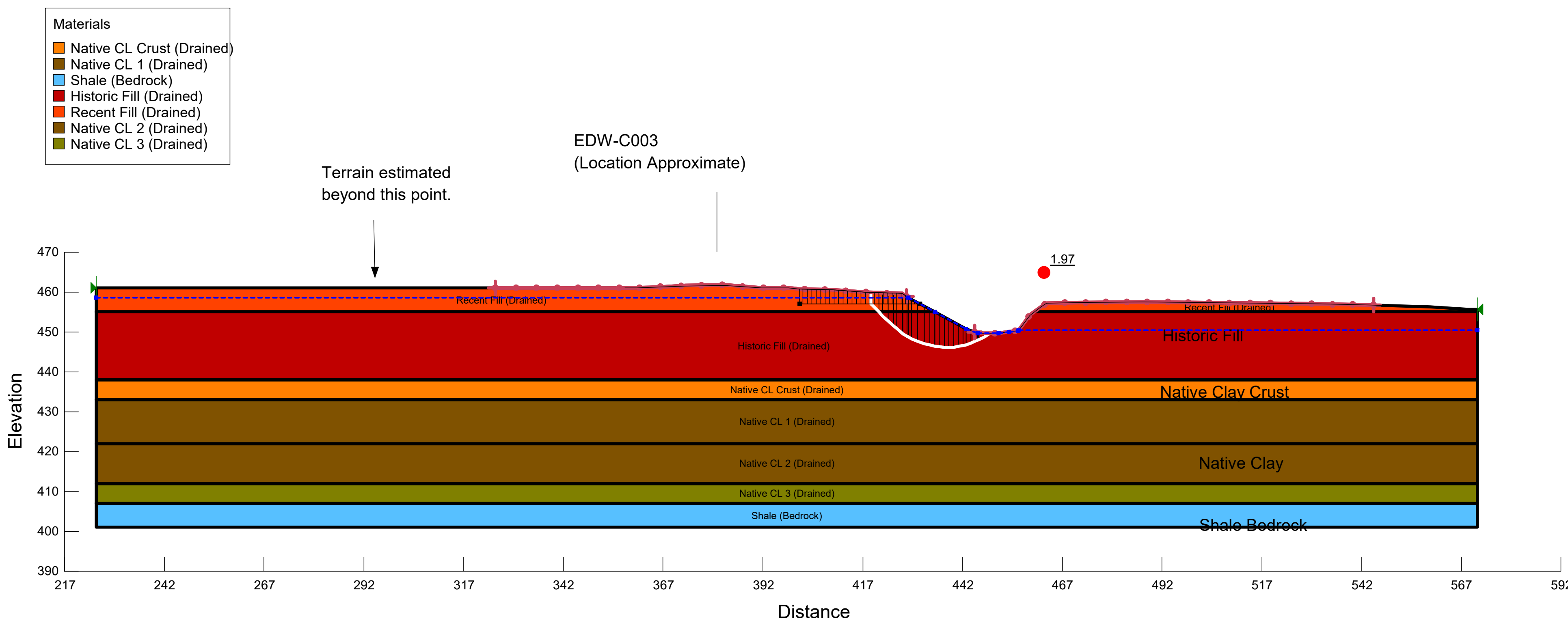
Edwards Power Plant
Cross-section J
Slope Stability - Surcharge Pool

Name: Native CL Crust (Drained) Unit Weight: 120 pcf Cohesion': 200 psf Phi': 27.5 ° Piezometric Line: 1
Name: Native CL 1 (Drained) Unit Weight: 117 pcf Cohesion': 100 psf Phi': 26 ° Piezometric Line: 1
Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Historic Fill (Drained) Unit Weight: 125 pcf Cohesion': 200 psf Phi': 28 ° Piezometric Line: 1
Name: Recent Fill (Drained) Unit Weight: 115 pcf Cohesion': 200 psf Phi': 30 ° Piezometric Line: 1
Name: Native CL 2 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1
Name: Native CL 3 (Drained) Unit Weight: 105 pcf Cohesion': 200 psf Phi': 26 ° Piezometric Line: 1



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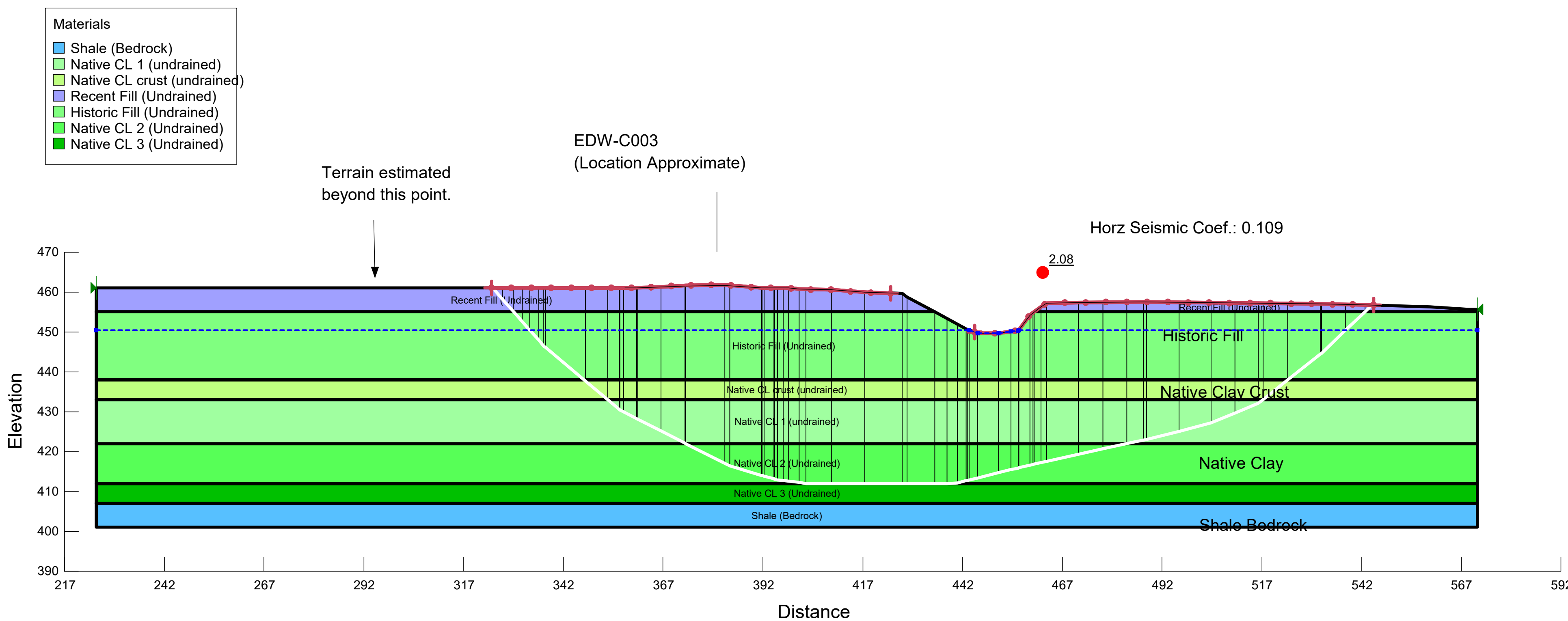
Edwards Power Plant
Cross-section J
Slope Stability - Seismic

Name: Shale (Bedrock) Unit Weight: 140 pcf Cohesion': 1,000 psf Phi': 36 ° Piezometric Line: 1
Name: Native CL 1 (undrained) Unit Weight: 117 pcf Cohesion': 650 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL crust (undrained) Unit Weight: 120 pcf Cohesion': 1,250 psf Phi': 0 ° Piezometric Line: 1
Name: Recent Fill (Undrained) Unit Weight: 115 pcf Cohesion': 1,250 psf Phi': 0 ° Piezometric Line: 1
Name: Historic Fill (Undrained) Unit Weight: 125 pcf Cohesion': 1,000 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL 2 (Undrained) Unit Weight: 105 pcf Cohesion': 700 psf Phi': 0 ° Piezometric Line: 1
Name: Native CL 3 (Undrained) Unit Weight: 105 pcf Cohesion': 900 psf Piezometric Line: 1



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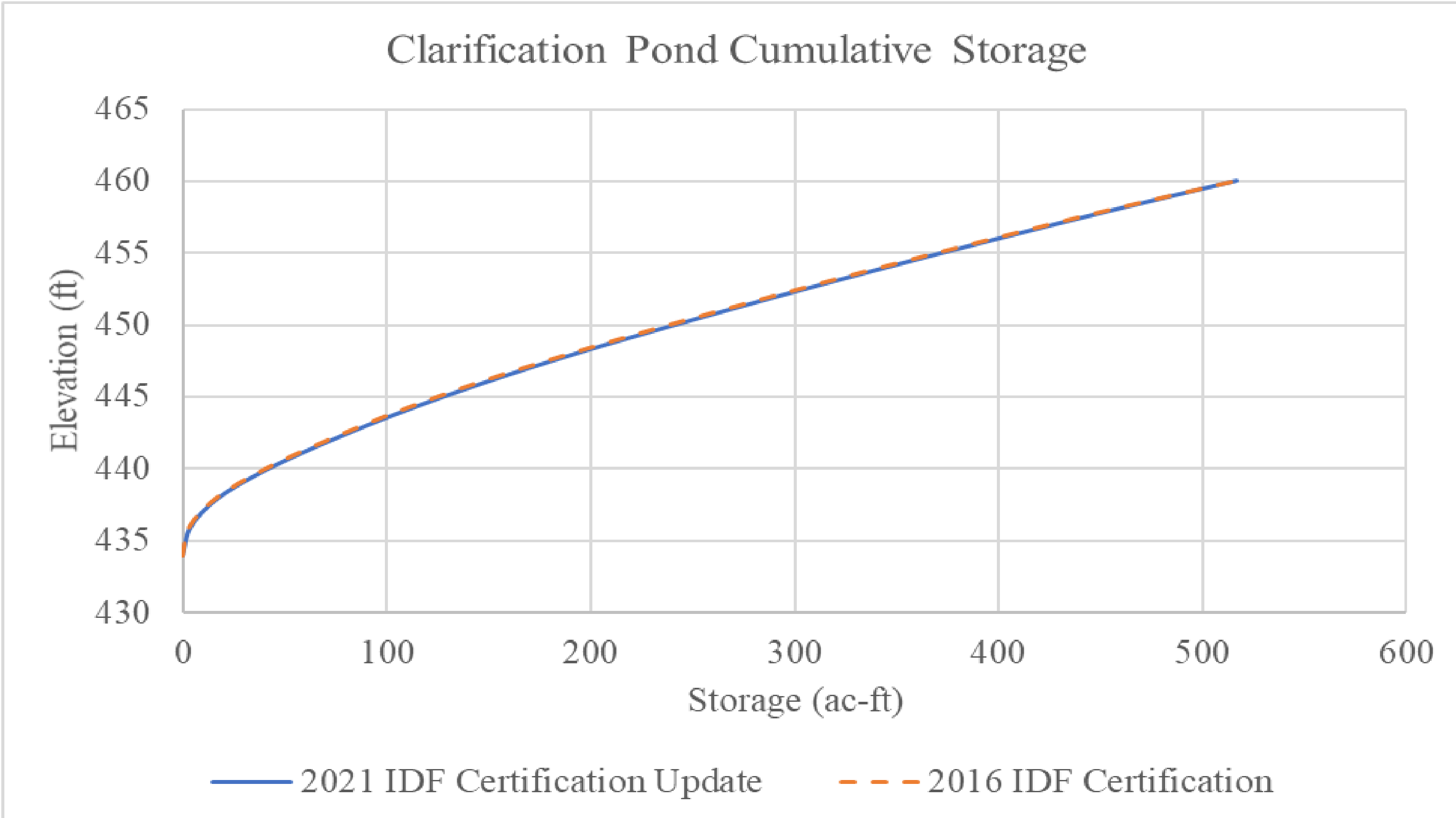
Attachment E

Periodic Inflow Design Flood Control System Plan Analyses

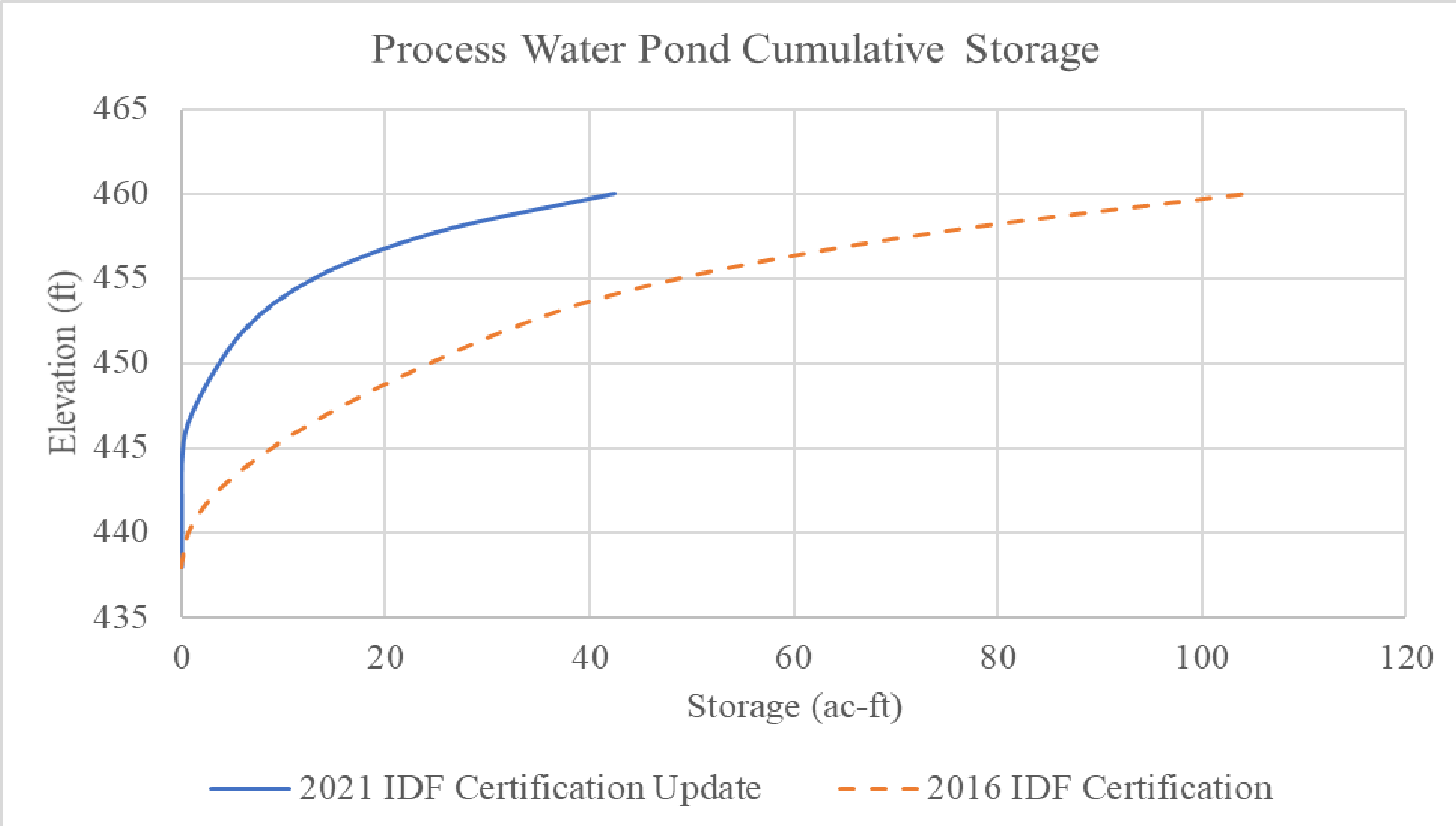


CLARIFICATION POND CUMULATIVE STORAGE
PERIODIC CERTIFICATION
EDWARDS POWER PLANT
EDWARDS, ILLINOIS

Geosyntec consultants

Figure E-1

GLP8027 | 8/30/2021

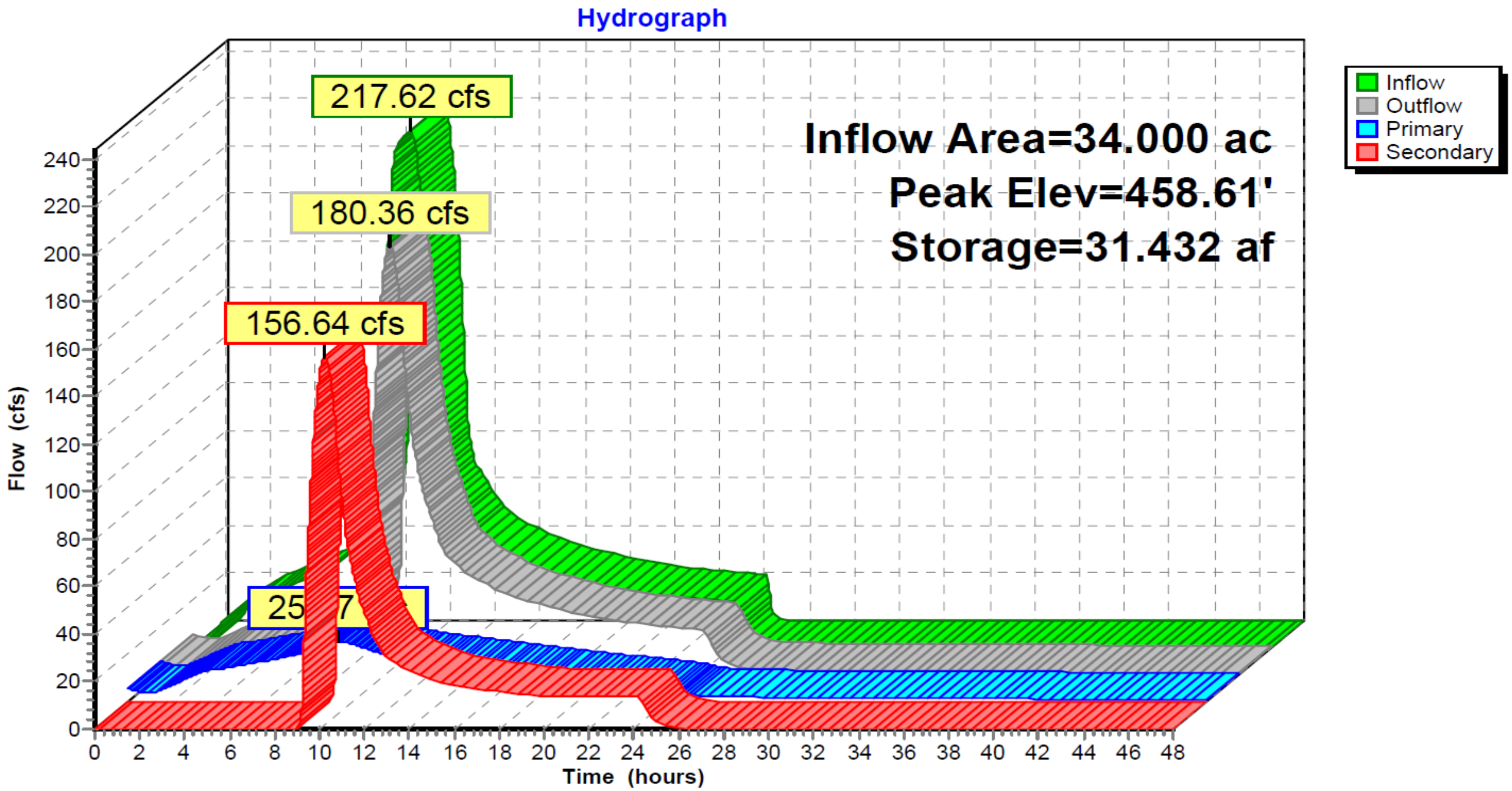


PROCESS WATER POND CUMULATIVE STORAGE
PERIODIC CERTIFICATION
EDWARDS POWER PLANT
EDWARDS, ILLINOIS

Geosyntec consultants

Figure

E-2

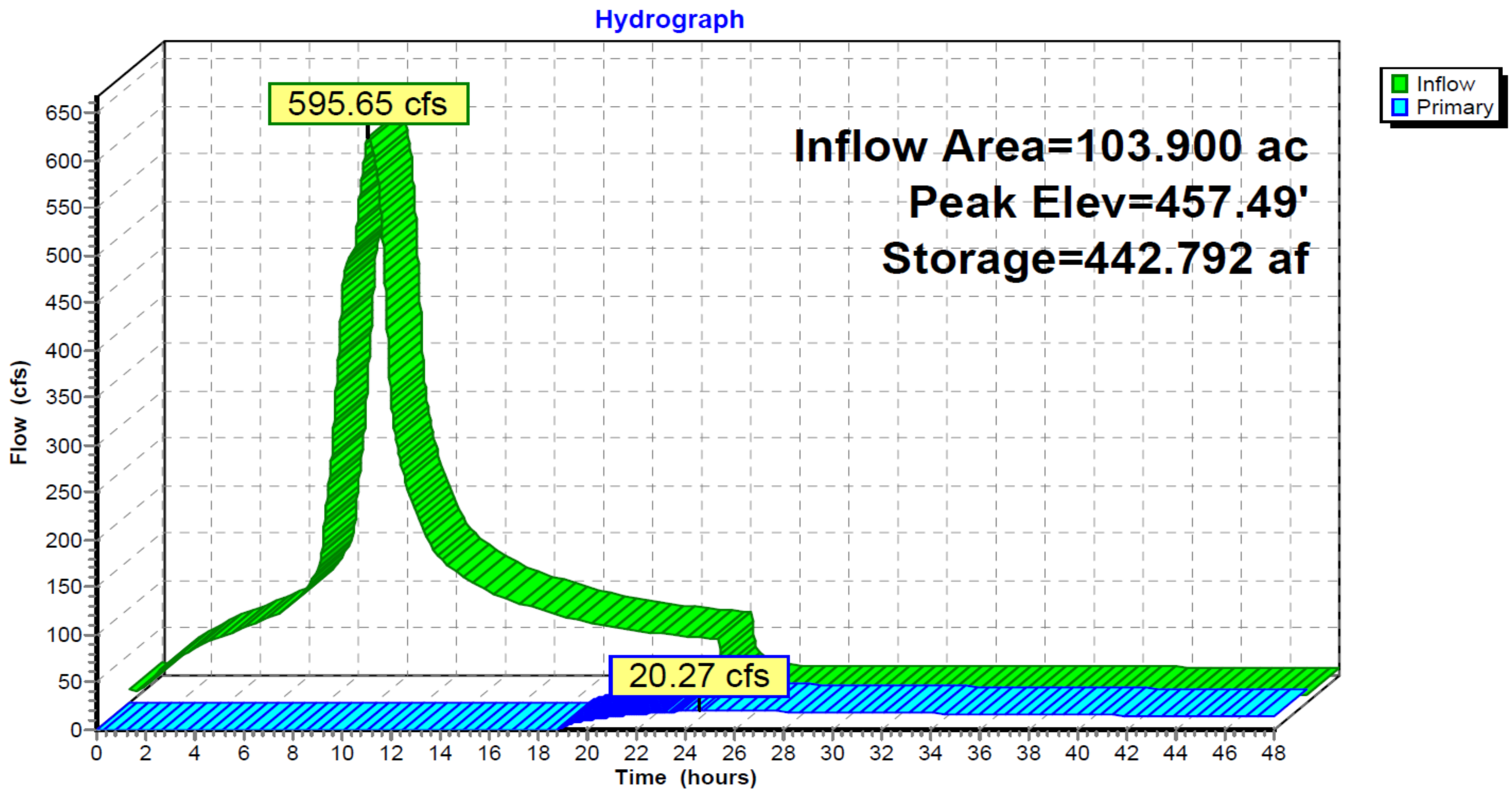


PROCESS WATER POND - HYDROGRAPH
PERIODIC CERTIFICATION
EDWARDS POWER PLANT
EDWARDS, ILLINOIS

Geosyntec consultants

Figure E-3

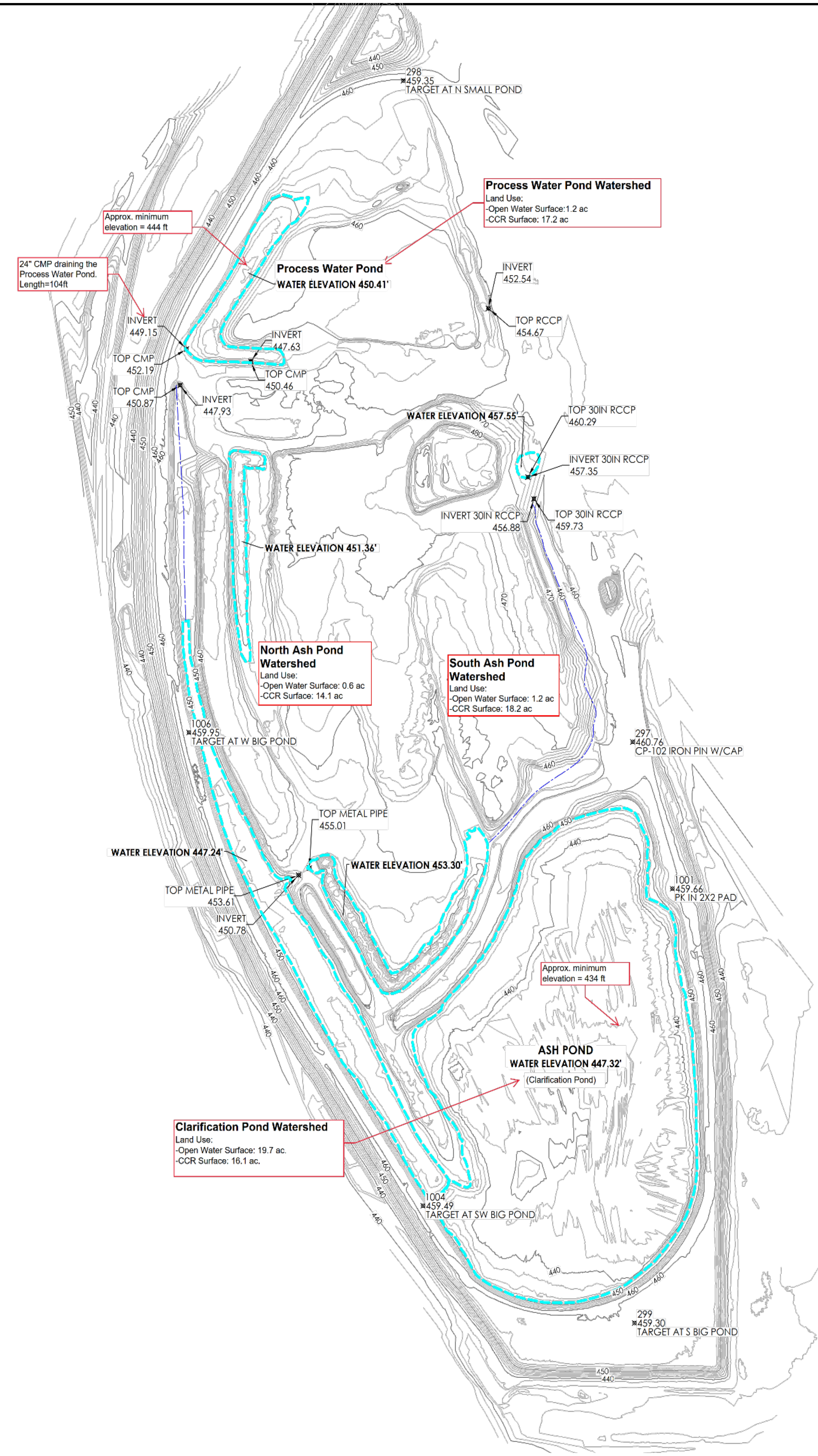
GLP8027 | 8/30/2021



CLARIFICATION POND - HYDROGRAPH
PERIODIC CERTIFICATION
EDWARDS POWER PLANT
EDWARDS, ILLINOIS

Geosyntec consultants

GLP8027	8/30/2021	Figure E-4

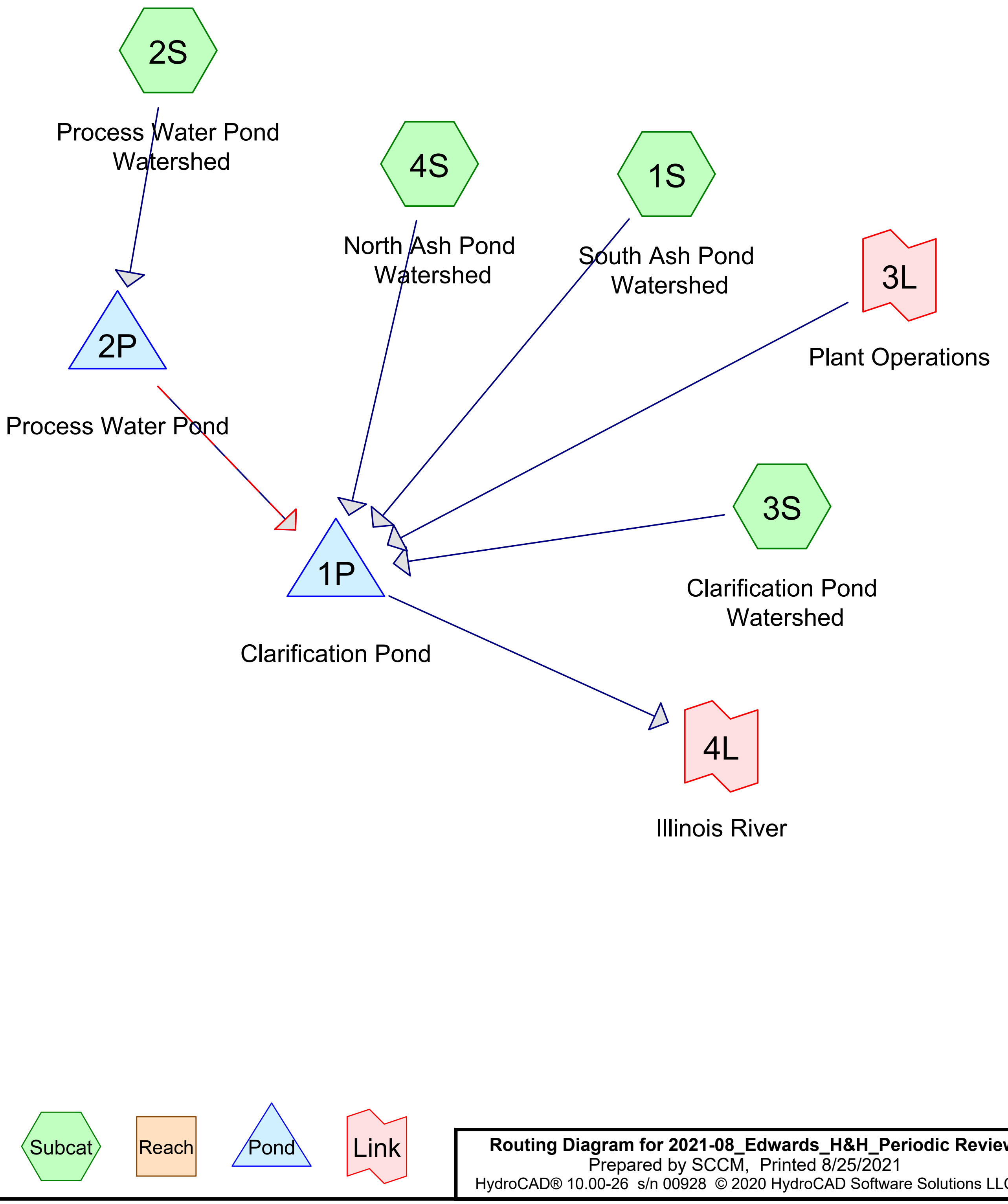


N

Figure based on IngenAE 2020 Site Topo

NOT TO SCALE

Edwards Power Plant Hydrologic Workmap		
Geosyntec consultants		Figure
GLP8027	September 2021	E-5



Routing Diagram for 2021-08_Edwards_H&H_Periodic Review
Prepared by SCCM, Printed 8/25/2021
HydroCAD® 10.00-26 s/n 00928 © 2020 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 1671 IL Peoria

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
15.600	96	Gravel Surface, HSG C (2S)
65.600	91	Urban industrial, 72% imp, HSG C (1S, 2S, 3S, 4S)
22.700	98	Water Surface, HSG C (1S, 2S, 3S, 4S)
103.900	**93**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
103.900	HSG C	1S, 2S, 3S, 4S
0.000	HSG D	
0.000	Other	
103.900		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	15.600	0.000	0.000	15.600	Gravel Surface	2S
0.000	0.000	65.600	0.000	0.000	65.600	Urban industrial, 72% imp	1S, 2S, 3S, 4S
0.000	0.000	22.700	0.000	0.000	22.700	Water Surface	1S, 2S, 3S, 4S
0.000	**0.000**	**103.900**	**0.000**	**0.000**	**103.900**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	434.00	432.00	1,090.5	0.0018	0.011	36.0	0.0	0.0
2	2P	449.15	447.93	104.0	0.0117	0.025	24.0	0.0	0.0

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: South Ash Pond Runoff Area=19.400 ac 73.73% Impervious Runoff Depth=31.64"
Flow Length=3,764' Tc=11.3 min CN=91 Runoff=124.07 cfs 51.155 af

Subcatchment 2S: Process Water Pond Runoff Area=34.000 ac 39.95% Impervious Runoff Depth=32.05"
Flow Length=1,400' Tc=16.8 min CN=94 Runoff=217.62 cfs 90.798 af

Subcatchment 3S: Clarification Pond Runoff Area=35.800 ac 87.41% Impervious Runoff Depth=32.18"
Tc=6.0 min CN=95 Runoff=229.80 cfs 95.994 af

Subcatchment 4S: North Ash Pond Runoff Area=14.700 ac 73.14% Impervious Runoff Depth=31.64"
Flow Length=2,545' Tc=8.0 min CN=91 Runoff=94.08 cfs 38.762 af

Pond 1P: Clarification Pond Peak Elev=457.49' Storage=442.792 af Inflow=595.65 cfs 291.027 af
Outflow=20.27 cfs 39.676 af

Pond 2P: Process Water Pond Peak Elev=458.61' Storage=31.432 af Inflow=217.62 cfs 90.798 af
Primary=25.67 cfs 30.614 af Secondary=156.64 cfs 42.760 af Outflow=180.36 cfs 73.374 af

Link 3L: Plant Operations Manual Hydrograph Inflow=8.00 cfs 31.742 af
Primary=8.00 cfs 31.742 af

Link 4L: Illinois River Inflow=20.27 cfs 39.676 af
Primary=20.27 cfs 39.676 af

Total Runoff Area = 103.900 ac Runoff Volume = 276.709 af Average Runoff Depth = 31.96"
32.69% Pervious = 33.968 ac 67.31% Impervious = 69.932 ac

Summary for Subcatchment 1S: South Ash Pond Watershed

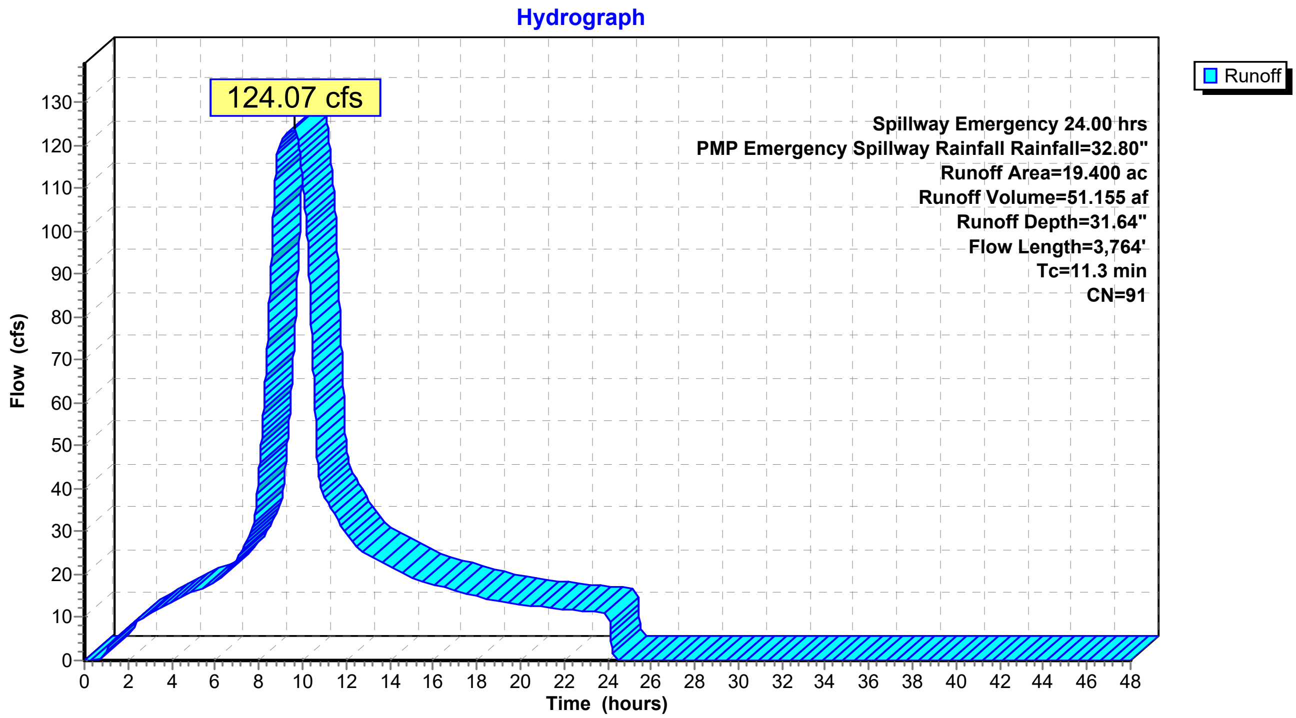
Runoff = 124.07 cfs @ 9.68 hrs, Volume= 51.155 af, Depth=31.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Spillway Emergency 24.00 hrs PMP Emergency Spillway Rainfall Rainfall=32.80"

	Area (ac)	CN	Description
*	1.200	98	Water Surface, HSG C
*	18.200	91	Urban industrial, 72% imp, HSG C
	19.400	91	Weighted Average
	5.096		26.27% Pervious Area
	14.304		73.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	64	0.0400	1.60		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 2.97"
10.6	3,700	0.0020	5.81	3,198.10	**Channel Flow, Channel Flow** Area= 550.0 sf Perim= 84.0' r= 6.55' n= 0.040 Winding stream, pools & shoals
11.3	3,764	Total			

Subcatchment 1S: South Ash Pond Watershed



Summary for Subcatchment 2S: Process Water Pond Watershed

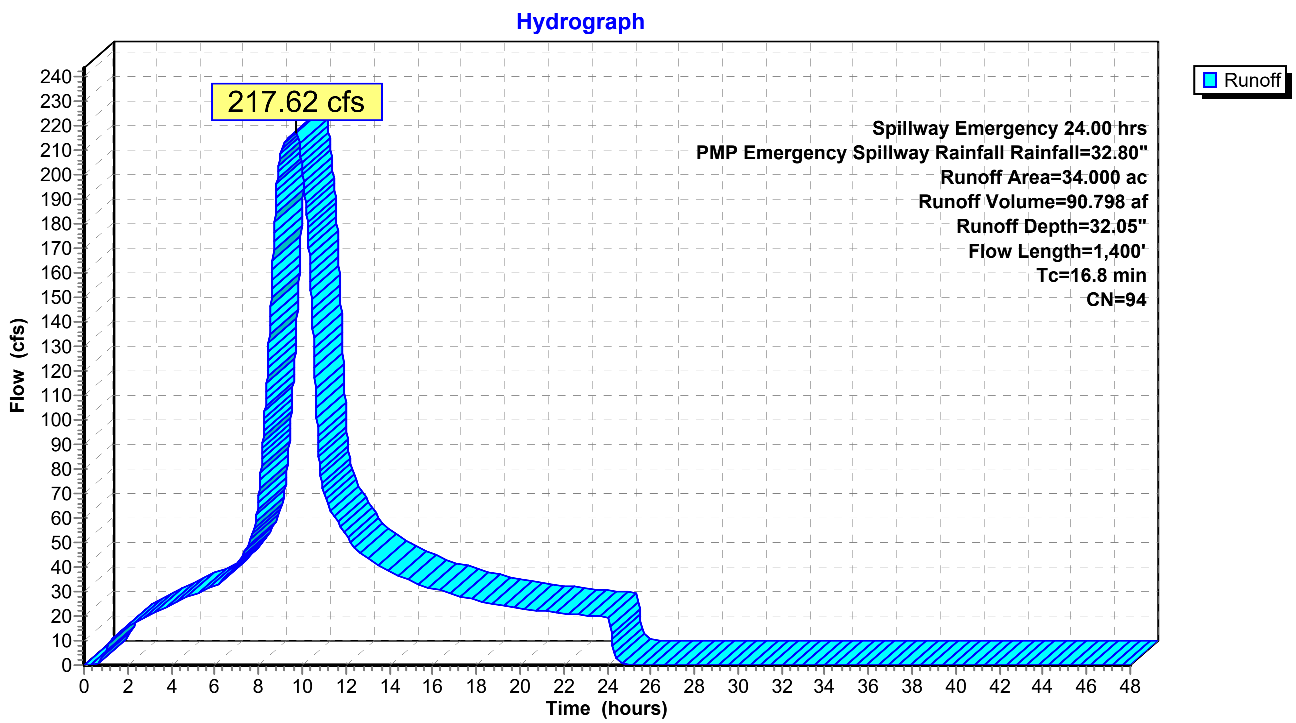
Runoff = 217.62 cfs @ 9.69 hrs, Volume= 90.798 af, Depth=32.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Spillway Emergency 24.00 hrs PMP Emergency Spillway Rainfall Rainfall=32.80"

	Area (ac)	CN	Description
	1.200	98	Water Surface, HSG C
*	15.600	96	Gravel Surface, HSG C
	17.200	91	Urban industrial, 72% imp, HSG C
	34.000	94	Weighted Average
	20.416		60.05% Pervious Area
	13.584		39.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0100	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.97"
15.1	1,300	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
16.8	1,400	Total			

Subcatchment 2S: Process Water Pond Watershed



Summary for Subcatchment 3S: Clarification Pond Watershed

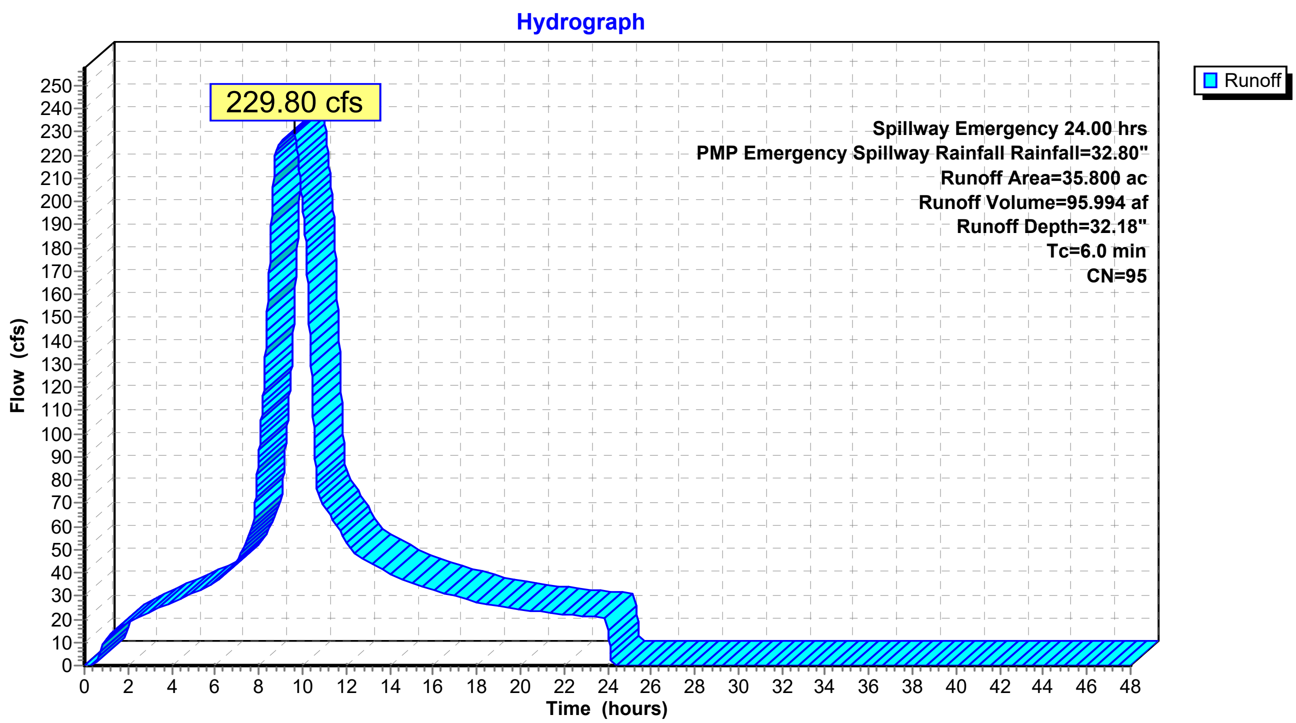
Runoff = 229.80 cfs @ 9.62 hrs, Volume= 95.994 af, Depth=32.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Spillway Emergency 24.00 hrs PMP Emergency Spillway Rainfall Rainfall=32.80"

Area (ac)	CN	Description
19.700	98	Water Surface, HSG C
16.100	91	Urban industrial, 72% imp, HSG C
35.800	95	Weighted Average
4.508		12.59% Pervious Area
31.292		87.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 3S: Clarification Pond Watershed



Summary for Subcatchment 4S: North Ash Pond Watershed

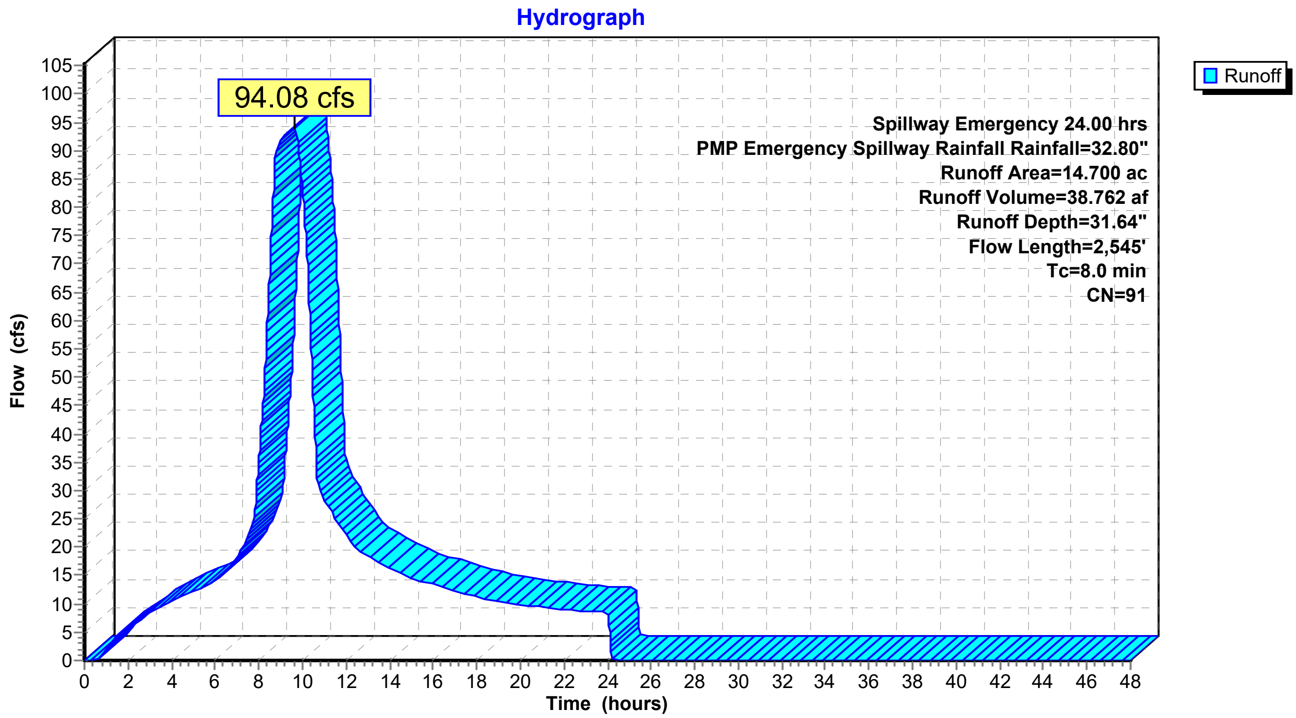
Runoff = 94.08 cfs @ 9.66 hrs, Volume= 38.762 af, Depth=31.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Spillway Emergency 24.00 hrs PMP Emergency Spillway Rainfall Rainfall=32.80"

Area (ac)	CN	Description
0.600	98	Water Surface, HSG C
14.100	91	Urban industrial, 72% imp, HSG C
14.700	91	Weighted Average
3.948		26.86% Pervious Area
10.752		73.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0400	1.75		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.97"
7.0	2,445	0.0020	5.81	3,198.10	**Channel Flow,** Area= 550.0 sf Perim= 84.0' r= 6.55' n= 0.040 Winding stream, pools & shoals
8.0	2,545	Total			

Subcatchment 4S: North Ash Pond Watershed



Summary for Pond 1P: Clarification Pond

Inflow Area = 103.900 ac, 67.31% Impervious, Inflow Depth > 33.61" for PMP Emergency Spillway Rainfall ev
Inflow = 595.65 cfs @ 9.75 hrs, Volume= 291.027 af
Outflow = 20.27 cfs @ 24.56 hrs, Volume= 39.676 af, Atten= 97%, Lag= 888.9 min
Primary = 20.27 cfs @ 24.56 hrs, Volume= 39.676 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 447.32' Surf.Area= 0.000 ac Storage= 177.470 af
Peak Elev= 457.49' @ 24.56 hrs Surf.Area= 0.000 ac Storage= 442.792 af (265.322 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 1,199.2 min (1,991.7 - 792.4)

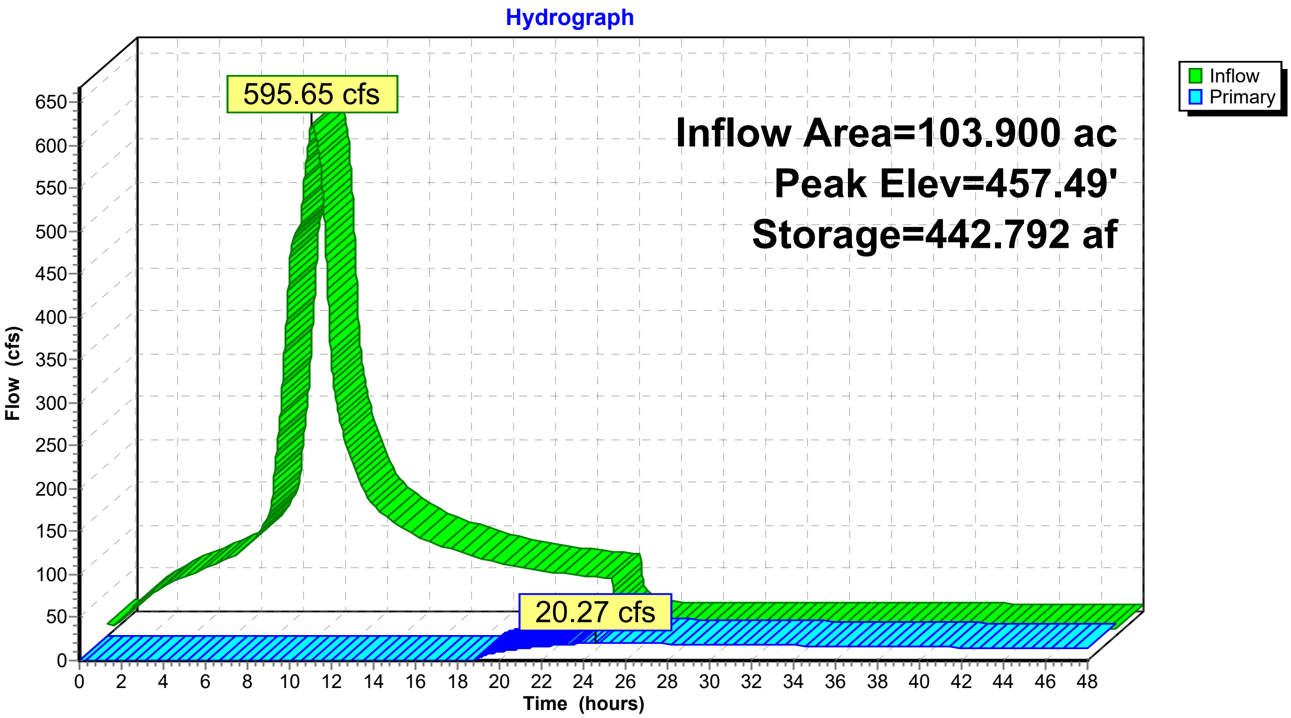
Volume	Invert	Avail.Storage	Storage Description
#1	434.00'	517.029 af	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (acre-feet)
434.00	0.000
436.00	4.022
438.00	17.504
440.00	41.759
442.00	72.854
444.00	108.189
446.00	148.070
448.00	192.615
450.00	241.465
452.00	292.504
454.00	345.457
456.00	400.409
458.00	457.312
460.00	517.029

Device	Routing	Invert	Outlet Devices
#1	Primary	434.00'	**36.0" Round Culvert** L= 1,090.5' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 434.00' / 432.00' S= 0.0018 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	447.20'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=20.32 cfs @ 24.56 hrs HW=457.49' TW=456.57' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 20.32 cfs @ 2.87 fps)
  └─**2=Orifice/Grate** (Passes 20.32 cfs of 32.64 cfs potential flow)

Pond 1P: Clarification Pond



Summary for Pond 2P: Process Water Pond

Inflow Area = 34.000 ac, 39.95% Impervious, Inflow Depth = 32.05" for PMP Emergency Spillway Rainfall ev
Inflow = 217.62 cfs @ 9.69 hrs, Volume= 90.798 af
Outflow = 180.36 cfs @ 10.23 hrs, Volume= 73.374 af, Atten= 17%, Lag= 32.2 min
Primary = 25.67 cfs @ 9.34 hrs, Volume= 30.614 af
Secondary = 156.64 cfs @ 10.24 hrs, Volume= 42.760 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 450.41' Surf.Area= 0.000 ac Storage= 4.187 af
Peak Elev= 458.61' @ 10.24 hrs Surf.Area= 0.000 ac Storage= 31.432 af (27.245 af above start)

Plug-Flow detention time= 312.5 min calculated for 69.187 af (76% of inflow)
Center-of-Mass det. time= 138.2 min (817.0 - 678.8)

Volume	Invert	Avail.Storage	Storage Description
#1	444.00'	42.450 af	**Custom Stage Data** Listed below

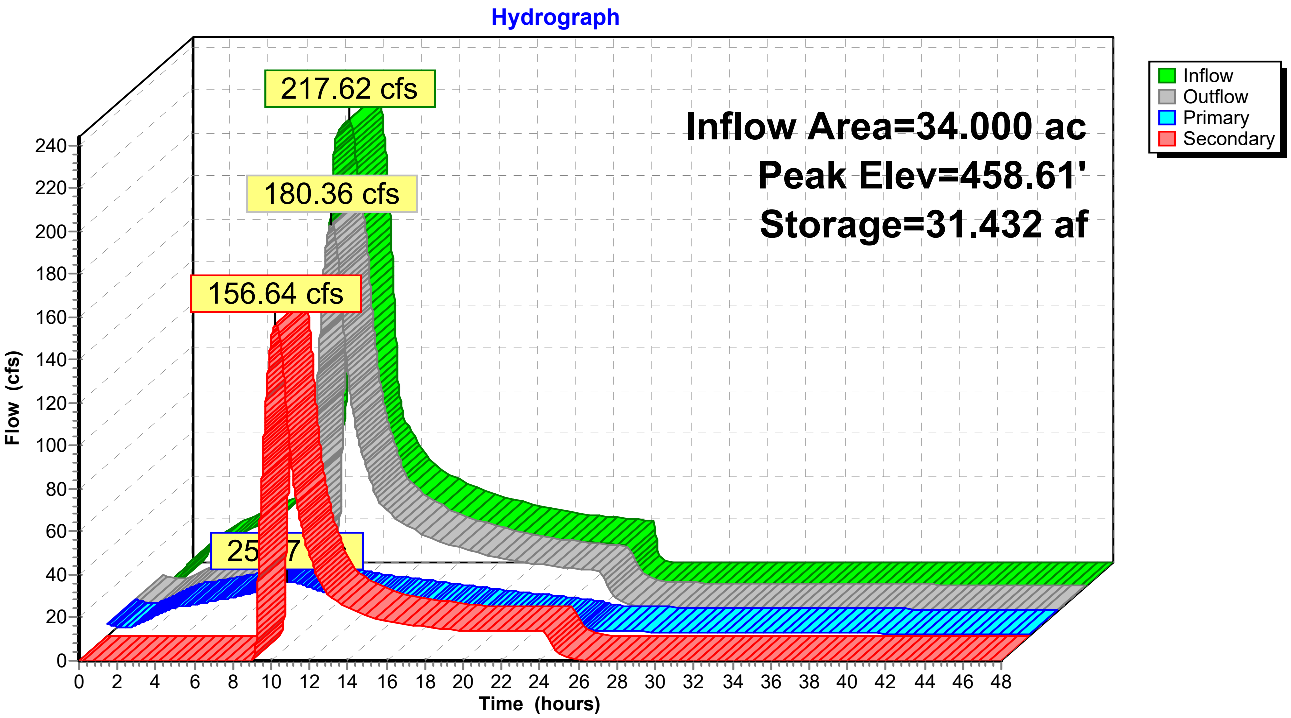
Elevation (feet)	Cum.Store (acre-feet)
444.00	0.000
446.00	0.382
448.00	1.763
450.00	3.674
452.00	6.177
454.00	10.150
456.00	16.537
458.00	26.618
460.00	42.450

Device	Routing	Invert	Outlet Devices
#1	Primary	449.15'	**24.0" Round Culvert** L= 104.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 449.15' / 447.93' S= 0.0117 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#2	Secondary	457.50'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=25.67 cfs @ 9.34 hrs HW=458.00' TW=451.06' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 25.67 cfs @ 8.17 fps)

Secondary OutFlow Max=156.64 cfs @ 10.24 hrs HW=458.61' TW=452.69' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 156.64 cfs @ 2.83 fps)

Pond 2P: Process Water Pond



Summary for Link 3L: Plant Operations

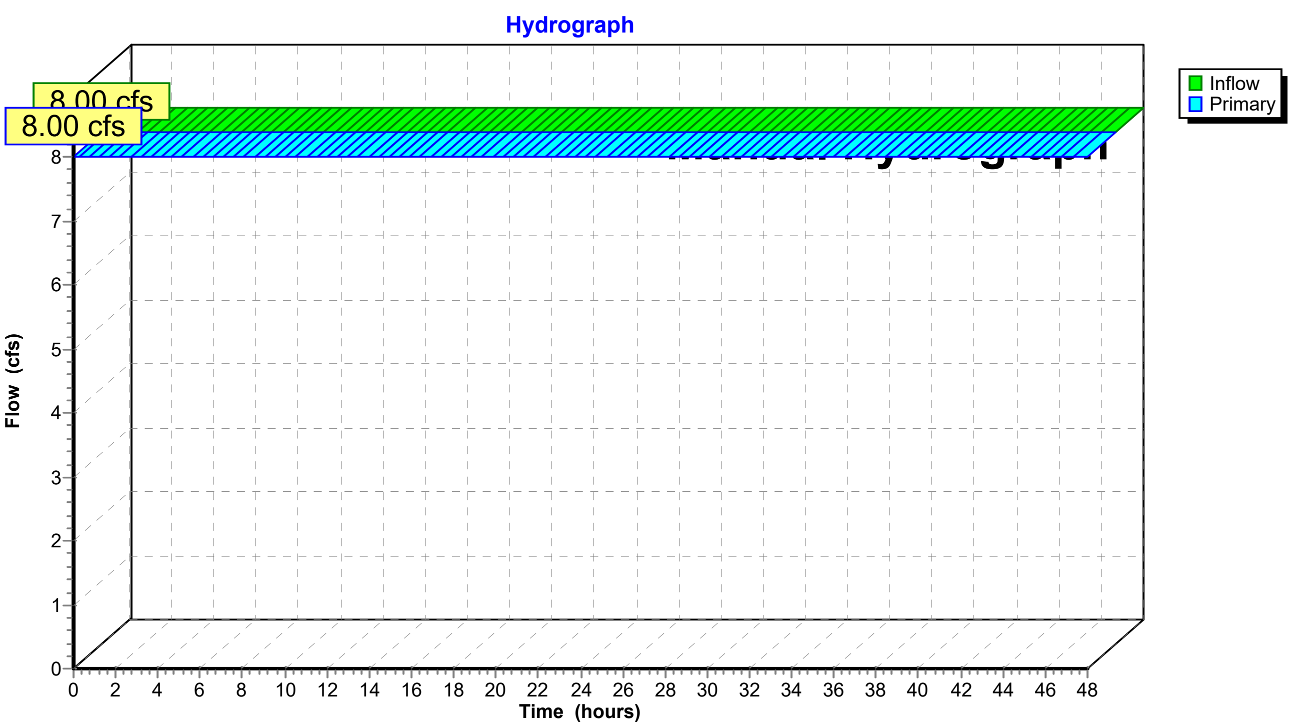
Inflow	=	8.00 cfs @	0.00 hrs, Volume=	31.742 af
Primary	=	8.00 cfs @	0.00 hrs, Volume=	31.742 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

61 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
8.00									

Link 3L: Plant Operations



Summary for Link 4L: Illinois River

Historic Illinois River high water elevation

[80] Warning: Exceeded Pond 1P by 9.25' @ 0.00 hrs (64.44 cfs 66.867 af)

Inflow Area = 103.900 ac, 67.31% Impervious, Inflow Depth > 4.58" for PMP Emergency Spillway Rainfall ev
Inflow = 20.27 cfs @ 24.56 hrs, Volume= 39.676 af
Primary = 20.27 cfs @ 24.56 hrs, Volume= 39.676 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 456.57'

Link 4L: Illinois River