

From: [Warren, Rebecca E.](#)
To: [ELLIOTT, MIKE](#)
Cc: [Hummel, Lindsey](#)
Subject: SW ID 22-01 Gallagher Landfill Piezometer Installation Report
Date: Wednesday, July 3, 2024 10:00:39 AM
Attachments: [SW ID 22-01 Gal LF PZ Install Rpt 7-2024.pdf](#)

**** This is an EXTERNAL email. Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email. ****

Good Morning Mike,

Attached to this email is the Gallagher RWS Type I Landfill Piezometer Installation Report. Please let me know if there are any questions with the report.

Thank you,

Becky

Rebecca E Warren, L.P.G.

Lead Environmental Specialist
Duke Energy
1000 East Main Street, WP50-2C-HYB
Plainfield, IN 46168
317-292-7224 | cell
317-838-2161 | office
Rebecca.Warren@duke-energy.com



Duke Energy
WP50-2C / 1000 East Main Street
Plainfield, IN 46168

July 3, 2024

Ms. Lindsey Hummel
Environmental Manager
Permitting Branch
Office of Land Quality, IDEM
100 North Senate Avenue, IGCN 1154
Indianapolis, IN. 46204

RE: Gallagher RWS Type I Landfill SW ID# 22-01
Piezometer Installation Report

Ms. Hummel:

Duke Energy Indiana, LLC. (DEI) respectfully submits to the Indiana Department of Environmental Management (IDEM) the enclosed piezometer installation report for the Gallagher Station RWS Type I Landfill SW ID# 22-01.

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 persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge, 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. I further certify that I am authorized to submit this information. If you have any questions or require additional information regarding this submittal, please call me at 317-838-6027.

Sincerely,
Duke Energy Indiana, LLC.

A handwritten signature in black ink, appearing to read "Rebecca Warren".

Rebecca E. Warren L.P.G.
Lead Environmental Specialist
EHS Waste & Groundwater Programs

Attachment



ATLAS

PIEZOMETER INSTALLATION REPORT

PZ-24-1, PZ-24-2, PZ-24-3, AND PZ-24-4

PREPARED FOR:

Ms. Rebecca Warren
Senior Environmental Specialist
Duke Energy Indiana, LLC
Gallagher Generating Station
RWS Type I Landfill
Floyd County, Indiana

PREPARED BY:

Atlas Technical Consultants LLC
7988 CenterPoint Dr.
Suite 100
Indianapolis, IN 46256

July 2, 2024



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July 2, 2024

Ms. Rebecca Warren
Duke Energy Indiana, LLC
1000 East Main Street
Plainfield, Indiana 46168

Re: Piezometers PZ-24-1, PZ-24-2, PZ-24-3, and PZ-24-4 Installation Report
Duke Energy Indiana LLC
Gallagher Generating Station
Restricted Waste Site Type 1 Landfill - SW ID 22-01
Floyd County, Indiana
Atlas Project 170DUK0016

Dear Ms. Warren:

Atlas Technical Consultants, LLC (Atlas) is pleased to submit this report documenting the installation of piezometers at the Gallagher Generating Station RWS Type 1 Landfill (Site). Four (4) piezometers (PZ-24-1, PZ-24-2, PZ-24-3, and PZ-24-4) were installed between April 18 and April 30, 2024 with field work completed on May 16, 2024. The piezometers were installed to provide additional groundwater elevation points and data to improve the delineation of groundwater flow mapping and to assist with the delineation of boron in the area downgradient from the Landfill.

This piezometer report includes a narrative description of the field activities, soil boring logs, piezometer construction diagrams, survey information, and Indiana Department of Natural Resources (IDNR) Record of Water Well (ROWW) for each installed piezometer.

Respectfully submitted,
Atlas Technical Consultants LLC

Samanta Lax, L.P.G.
Senior Project Geologist

Robert T. Duncan, L.P.G.
Principal Geologist



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1. INTRODUCTION

The Gallagher Generating Station is located between the west bank of the Ohio River and SR 111 approximately one mile south of New Albany, Indiana and directly across the Ohio River from Louisville, Kentucky.

This Piezometer Installation Report describes the field work related to installation of four (4) piezometers, including the drilling methods, unconsolidated sediment sampling, and piezometer installation details for down and side gradient locations to the RWS I Landfill at locations described in the Piezometer Installation Work Plan (VFC # 83567383) dated December 1, 2023 and approved by IDEM on December 11, 2023.

The piezometers were installed to monitor the hydraulic gradient between the Landfill and the river in three locations, PZ-24-1, PZ-24-2, and PZ-24-3, and side gradient in one location, PZ-24-4, to the south of the Landfill, to serve as groundwater elevation monitoring and possibly groundwater sampling locations as needed during future assessment monitoring events. The piezometer locations are shown in **Figure 1**.

2. PIEZOMETER INSTALLATION ACTIVITIES

2.1 Drilling Methods

Prior to clearing underground utilities and mobilizing a drilling crew, Atlas personnel staked the boring locations after assessing the topography, and ground conditions for rig access. Atlas contacted Indiana 811 and contracted with Mason Underground Utility Locators to clear the locations by clearing a 20-foot long by 20-foot-wide area using ground penetration radar and EM locating techniques at each location. The utility clearing was performed on April 18, 2024.

Atlas personnel mobilized to the facility on April 22, 2024, to install the piezometers. Boreholes were advanced utilizing a Diedrich D-50 hollow stem auger drill rig. Soil samples were collected utilizing continuous split-spoon sampling technology. The drilling equipment was decontaminated with a high-pressure water wash prior to the start of drilling for each piezometer. Each soil boring was drilled with hollow stem augers with nominal 8.25-inch bore and 4.25-inch inside diameter.

2.2 Soil Lithology and Sampling Methods

Materials encountered in the boreholes consist of a blanket of generally cohesive deposits – silt loam, clay loam, and sandy clay to depths ranging from 17.2 to 32.3 feet below ground surface (ft-bgs). These deposits are underlain by sandy loam to loamy sand, which were the screened zones. Black shale bedrock (new Albany Shale) was encountered in all locations, ranging in depths from 26.1 to 34.3 ft-bgs.

The soil boring logs with soil descriptions and depths are included as **Appendix A**.

Continuous split spoon samples were collected at each boring and inspected by an Atlas field geologist. These samples were classified in the field in accordance with the United States Department of Agriculture (USDA) Soil Classification System and were then placed in glass jars.

2.3 Piezometer Construction

Each piezometer was constructed with a nominal two-inch Schedule 40 PVC casing with a 0.010-inch slotted screen. The zone around and approximately two (2) feet above the screen was backfilled either with unconsolidated sediments that cave into the boring when the augers are removed or with granular material (No. 4 sand) supplied by Atlas. The approximate upper one (1) foot of the filter pack consists of fine (No. 7), inert sand. The remainder of the borehole was backfilled with bentonite grout to within two (2) feet below ground surface (ft-bgs), followed by addition of bentonite chips to a depth of approximately one (1) ft-bgs. A lockable watertight CAMLOCK stick-up protective casing was installed at the ground surface and set into a 5' x 5' concrete pad at each location. Each of these piezometers is protected by four (4) 3-inch diameter steel, concrete-filled bollards that extend approximately three (3) to four (4) feet from the ground surface. The protective covers, pads and bollards installation was completed on April 30, 2024.

Piezometer construction details are included in **Table 1**. Piezometer construction diagrams are provided in **Appendix B**. Indiana Record of Water Well (Installation) Forms are provided in **Appendix E**.

2.4 Piezometer Development

Atlas personnel developed the piezometers on May 29 and 30, 2024. Each well was developed utilizing a disposable bailer and a submersible pump. The wellhead was surged then purged until the formation water became visibly clearer and at least ten (10) well volumes had been produced. Development water was collected in 5-gallon buckets and then disposed at least 25 feet away from the well nest. Details of each piezometer development are included on corresponding piezometers well construction diagrams provided in **Appendix B**.

2.5 Hydraulic Conductivity Testing

Atlas personnel performed two (2) slug tests (rising head and falling head) on each piezometer on May 30, 2024. The slug tests were initially performed by inserting (falling head slug test) and removing (rising head slug test) a displacement slug into the piezometer and recording the rate of return of the groundwater level in the piezometer as it equilibrates to the original static conditions. Slug test measurements were recorded by an In-Situ, Inc. (In-Situ) Troll 700 data logger (data logger) capable of downhole measurement of pressure conditions. The data logger measured and recorded the rate of decline or rise in the water level using a downhole pressure sensitive transducer.

Prior to the falling head test, Atlas measured the static water level in the well from the top of the casing. The pressure transducer was placed in the piezometer. After insertion of the pressure transducer, the water level was allowed to stabilize. The falling head test was begun immediately before submerging the slug in the well and was allowed to run until the water level had recovered. The rising head test was started immediately before the removal of the slug from the water column and was allowed to run until the water level had recovered. Recovery times to reach 0.1 ft (of initial level) for PZ-24-1 and PZ-24-3 were over 5 and 10 minutes, respectively, and for PZ-24-2 and PZ-24-4 were over 20 minutes.

The recorded data were transferred to AQTESOLV® software to produce log displacement versus time plots. For this investigation, the collected data were analysed using the Bouwer and Rice analytical model for confined aquifers. Based on in-situ slug tests, hydraulic conductivities in the screened formations range from 5.61×10^{-5} to 2.22×10^{-4} centimeters per second (cm/s). These values are generally consistent with the ranges of hydraulic conductivity cited in literature for coarse to fine-grained sand aquifers, which is similar to the deposits encountered at the Site. The values of hydraulic

conductivity (K) calculated for the rising and falling head tests are summarized in **Table 2** and AQTESOLV® plots are provided in **Appendix C**.

2.6 Soil Lab Analysis Results

Soil lab results are included in **Appendix D** and shown in **Table 3**.

2.7 Piezometer Surveying

Atlas coordinated with Jacobi, Toombs & Lanz for the surveying of the piezometer locations (coordinates), ground elevations, and well riser elevations for each piezometer on May 16, 2024. Horizontal locations and the ground surface elevation were measured to the nearest 0.1 foot. The elevation of the well riser was measured to the nearest 0.01 foot.

Elevation data are recorded on the soil boring logs provided in **Appendix A** and piezometer construction diagrams in **Appendix B**. A summary table with piezometer coordinates and elevations is included in **Appendix E**. The locations of the piezometers are presented on **Figure 1**.

3. SUMMARY

Four (4) piezometers PZ-24-1, PZ-24-2, PZ-24-3, and PZ-24-4 were installed near the Gallagher Station's RWS Type 1 Landfill to provide additional groundwater elevation points and data to improve the delineation of groundwater flow mapping.

The site lithology consists of a blanket of cohesive deposits – silt loam, clay loam, and sandy clay to depths ranging from 17.2 to 32.3 feet below ground surface (ft-bgs). These deposits are underlain by materials classified as sandy loam to loamy sand. Black shale bedrock (New Albany Shale) was encountered in all four locations with depths between 26.1 and 34.3 ft-bgs.

The piezometers were installed according with Indiana's solid waste regulations (329 IAC 10-21-4) and were fitted with watertight protective covers, and concrete pads and protective bollards.

Representative samples were collected and tested for grain size and cation exchange capacity. Results from hydraulic conductivity testing performed on each well ranged from 5.61×10^{-5} to 2.22×10^{-4} cm/s.

Tables

- Table 1: Piezometer Summary
- Table 2: Hydraulic Conductivity Results
- Table 3: Soil Laboratory Analysis Results

Table 1
Piezometer Coordinates and Elevations
Duke Energy Indiana, LLC
Gallagher Generating Station
Floyd County, IN

Atlas Project No. 170DUK0016

Monitoring Point	Northing	Easting	PVC Elevation	Ground Elevation	Top of Screen Elevation	Bottom of Screen Elevation
PZ-24-1	1094878.79	278699.59	438.95	435.90	413.30	403.60
PZ-24-2	1094341.55	278764.17	438.98	435.80	412.10	402.40
PZ-24-3	1093851.71	278770.76	438.09	434.80	412.80	403.10
PZ-24-4	1093167.65	277919.56	428.49	425.50	409.90	400.20

Coordinate System: Indiana State Plane, East Zone
Horizontal Datum: NAD '83
Vertical Datum: NAVD '88
All elevations in feet above mean sea level

Table 2
Hydraulic Conductivity Results
Duke Energy Indiana, LLC
Gallagher Generating Station
Floyd County, IN

Atlas Project No. 170DUK0016

Well	Type of Test	L, ft	b, ft	D, ft	K, ft/day	K, cm/sec
PZ-24-1	Falling Head	10	6	11.30	0.506	1.78E-04
	Rising Head				0.616	2.17E-04
PZ-24-2	Falling Head	10	2.1	15.30	0.294	1.04E-04
	Rising Head				0.334	1.18E-04
PZ-24-3	Falling Head	10	5.5	12.60	0.410	1.45E-04
	Rising Head				0.630	2.22E-04
PZ-24-4	Falling Head	10	7.9	20.90	0.089	3.15E-05
	Rising Head				0.159	5.61E-05
Average					0.322	1.14E-04

D= Approximate saturated aquifer thickness

b= Aquifer thickness (confined conditions)

L= Well screen length

r = Well casing radius = 0.083 ft

R = Well bore radius = 0.33 ft

K= Hydraulic conductivity

Table 3
Summary of Soil Laboratory Test Results
Duke Energy Indiana, LLC
Gallagher Generating Station
Floyd County, IN







Atlas Project No. 170DUK0016

Boring Number	Sample Depth, ft	Size Fractions per IDEM Modified Wentworth, Percent				Total Sand, Silt, and Clay	Recalculated Fine Soil Fraction, Percent			USDA Soil Classification	CEC, meq/100g
		gravel	sand	silt	clay		sand	silt	clay		
PZ-24-1	28-30	0.0	47.2	45.8	7.0	100.0	47.2	45.8	7.0	loam/ sandy loam	6.34
	30-32	0.3	47.1	48.4	4.2	99.7	47.2	48.5	4.2	sandy loam	8.26
PZ-24-2	28-30	0.0	28.2	59.9	11.9	100.0	28.2	59.9	11.9	silt loam	6.27
	32-34	1.3	66.0	30.0	2.7	98.7	66.9	30.4	2.7	sandy loam	3.72
PZ-24-3	24-26	0.0	31.9	56.2	11.9	100.0	31.9	56.2	11.9	silt loam	6.62
	30-32	0.4	46.5	44.1	9.0	99.6	46.7	44.3	9.0	loam	3.59
PZ-24-4	18-20	0.4	41.5	50.9	7.2	99.6	41.7	51.1	7.2	silt loam	5.23
	24-26	0.5	58.3	36.3	4.9	99.5	58.6	36.5	4.9	sandy loam	4.24

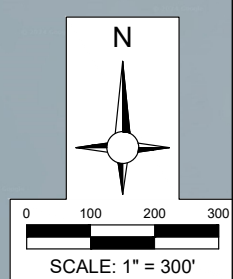
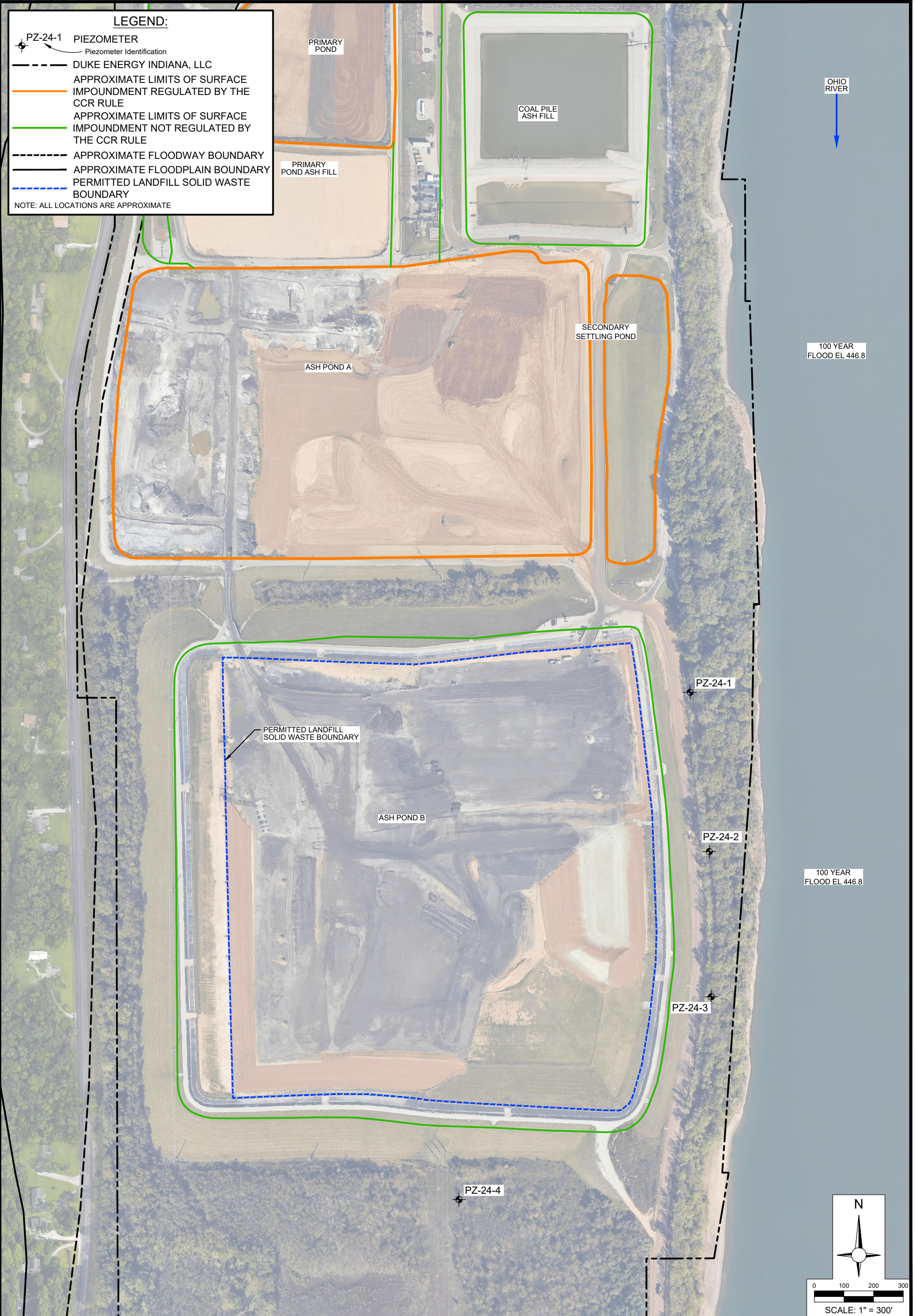
Figures

Figure 1: Piezometer Locations Map

LEGEND:

-  PZ-24-1 PIEZOMETER
Piezometer Identification
-  DUKE ENERGY INDIANA, LLC
APPROXIMATE LIMITS OF SURFACE
IMPOUNDMENT REGULATED BY THE
CCR RULE
-  APPROXIMATE LIMITS OF SURFACE
IMPOUNDMENT NOT REGULATED BY
THE CCR RULE
-  APPROXIMATE FLOODWAY BOUNDARY
-  APPROXIMATE FLOODPLAIN BOUNDARY
-  PERMITTED LANDFILL SOLID WASTE
BOUNDARY

NOTE: ALL LOCATIONS ARE APPROXIMATE



1	Scale:	AS SHOWN
	Dwn. By:	JG
	Chk. By:	SL
	Date:	05/21/2024
Project Number:	170DUK0016	

PIEZOMETER LOCATION MAP
DUKE ENERGY INDIANA, LLC
GALLAGHER GENERATING STATION
FLOYD COUNTY, INDIANA



Appendix A: Soil Boring Logs



CLIENT Duke Energy Indiana, LLC BORING # PZ-24-1
 PROJECT NAME Piezometer Installation JOB # 170DUK0016
 PROJECT LOCATION Gallagher Generating Station NORTHING 1094878.79
New Albany, Indiana EASTING 278699.59

DRILLING and SAMPLING INFORMATION

TEST DATA

Date Started 4/23/24 Hammer Wt. 140 lbs.
 Date Completed 4/23/24 Hammer Drop 30 in.
 Drill Foreman J. Mitchner Spoon Sampler OD 2.0 in.
 Inspector M. Bazlamit Rock Core Dia. -- in.
 Boring Method HSA Shelby Tube OD -- in.

SOIL CLASSIFICATION		Stratum Depth, ft	Depth Scale, ft	Sample No.	Sample Type	Sampler Graphics	Recovery Graphics	Groundwater	Standard Penetration Test, Blows per 6 in. Increments	Moisture Content, %	Pocket Penetrometer PP-1sf	Remarks
SURFACE ELEVATION 435.9												
Brown, dry, low plasticity, non-sticky, SILTY CLAY LOAM with trace gravel		1		1	SS				17-10-12-15			
		2		2	SS				24-18-18-15			
		5		3	SS				4-7-5-9			
		4		4	SS				7-7-7-8			
		5		5	SS				2-3-3-4			
Brown, moist, medium plasticity, SANDY CLAY LOAM		10		6	SS				4-5-4-5			
		7		7	SS				2-2-3-4			
		8		8	SS				2-2-2-3			
		9		9	SS				2-3-2-4			
		10		10	SS				1-2-2-3			
		11		11	SS				2-2-2-2			
		12		12	SS				0-1-1-1			
		13		13	SS				1-1-1-1			
Gray, moist, low plasticity, non-sticky, SANDY LOAM		14		14	SS				1-1-2-2			
		15		15	SS				1-1-1-2			Note: Well screen set from 22.6 to 32.3 ft.
		16		16	SS				0-2-2-2			
	17		17	SS				4-5-6-50/0.3				
Black, SHALE		33.9										
Bottom of Test Boring at 34.5 ft.		34.5										

Sample Type

Depth to Groundwater

Boring Method

- SS - Driven Split Spoon
- ST - Pressed Shelby Tube
- CA - Continuous Flight Auger
- RC - Rock Core
- CU - Cuttings
- CT - Continuous Tube

- Noted on Drilling Tools -- ft.
- ∇ At Completion -- ft.
- ▼ After -- hours -- ft.
- ⊠ Cave Depth -- ft.

- HSA - Hollow Stem Augers
- CFA - Continuous Flight Augers
- DC - Driving Casing
- MD - Mud Drilling
- HA - Hand Auger



CLIENT Duke Energy Indiana, LLC BORING # PZ-24-2
 PROJECT NAME Piezometer Installation JOB # 170DUK0016
 PROJECT LOCATION Gallagher Generating Station NORTHING 1094341.55
New Albany, Indiana EASTING 278764.17

DRILLING and SAMPLING INFORMATION

TEST DATA

Date Started 4/23/24 Hammer Wt. 140 lbs.
 Date Completed 4/23/24 Hammer Drop 30 in.
 Drill Foreman J. Mitchner Spoon Sampler OD 2.0 in.
 Inspector M. Bazlamit Rock Core Dia. -- in.
 Boring Method HSA Shelby Tube OD -- in.

SOIL CLASSIFICATION	Stratum Depth, ft	Depth Scale, ft	Sample No.	Sample Type	Sampler Graphics	Recovery Graphics	Groundwater	Standard Penetration Test, Blows per 6 in. Increments	Moisture Content, %	Pocket Penetrometer PP-1sf	Remarks
SURFACE ELEVATION 435.8											
6 in. Asphalt	0.5										
Brown, slightly moist, medium plasticity, non-sticky, SANDY CLAY LOAM											
		5	3	SS				4-6-4-7			
			4	SS				6-8-7-10			
			5	SS				3-4-4-6			
	10		6	SS				6-6-6-6			
- moist between 12 ft. and 19 ft.			7	SS				3-5-5-4			
		15	8	SS				3-3-2-3			
			9	SS				3-2-2-1			
			10	SS				1-2-1-1			
- wet below 19 ft.		20	11	SS				0-2-0-2			
			12	SS				0-0-0-0			
		25	13	SS				0-2-0-3			
			14	SS				2-2-2-2			
	27.8		15	SS				0-2-2-1			Note: Well screen set from 23.7 to 33.4 ft.
Gray, wet to moist, low plasticity, non-sticky, SANDY CLAY			16	SS				2-2-2-2			
		30	17	SS				0-3-0-5			
Gray, wet, poorly graded, medium grained, LOAMY SAND			18	SS				50/0.3			
Black, SHALE. Bottom of Test Boring at 34.3 ft.	34.3										

Sample Type

Depth to Groundwater

Boring Method

- SS - Driven Split Spoon
- ST - Pressed Shelby Tube
- CA - Continuous Flight Auger
- RC - Rock Core
- CU - Cuttings
- CT - Continuous Tube

- Noted on Drilling Tools 19.0 ft.
- ∇ At Completion -- ft.
- ▼ After -- hours -- ft.
- ⊠ Cave Depth -- ft.

- HSA - Hollow Stem Augers
- CFA - Continuous Flight Augers
- DC - Driving Casing
- MD - Mud Drilling
- HA - Hand Auger



CLIENT Duke Energy Indiana, LLC
 PROJECT NAME Piezometer Installation
 PROJECT LOCATION Gallagher Generating Station
New Albany, Indiana

BORING # PZ-24-3
 JOB # 170DUK0016
 NORTHING 1093851.71
 EASTING 278770.76

DRILLING and SAMPLING INFORMATION

TEST DATA

Date Started 4/24/24 Hammer Wt. 140 lbs.
 Date Completed 4/24/24 Hammer Drop 30 in.
 Drill Foreman J. Mitchner Spoon Sampler OD 2.0 in.
 Inspector M. Bazlamit Rock Core Dia. -- in.
 Boring Method HSA Shelby Tube OD -- in.

SOIL CLASSIFICATION	Stratum Depth, ft	Depth Scale, ft	Sample No.	Sample Type	Sampler Graphics	Recovery Graphics	Groundwater	Standard Penetration Test, Blows per 6 in. Increments	Moisture Content, %	Pocket Penetrometer PP-1sf	Remarks
SURFACE ELEVATION 434.8											
Brown, slightly moist, medium plasticity, non-sticky, SILTY CLAY LOAM											
		5	3	SS				5-6-5-7			
			4	SS				7-10-8-12			
			5	SS				4-7-5-8			
		10	6	SS				10-8-10-8			
			7	SS				3-2-3-2			
		15	8	SS				3-2-2-3			
		16.2	9	SS				3-3-2-3			
Brown, moist, medium plasticity, non-sticky, SANDY CLAY LOAM			10	SS				1-2-2-1			
		20	11	SS				2-3-2-3			
			12	SS				0-2-0-1			
		25	13	SS				0-2-0-1			
Gray, moist to wet, low plasticity, sticky, SANDY LOAM			14	SS				1-2-1-3			
		26.7	15	SS				2-1-1-2			
			16	SS				0-3-2-10			
		30	17	SS				50/0.3			
Black, SHALE. Bottom of Test Boring at 32.3 ft.	32.3										

Note: Well screen set from 22.0 to 31.7 ft.

Sample Type

- SS - Driven Split Spoon
- ST - Pressed Shelby Tube
- CA - Continuous Flight Auger
- RC - Rock Core
- CU - Cuttings
- CT - Continuous Tube

Depth to Groundwater

- Noted on Drilling Tools 30.0 ft.
- ▽ At Completion -- ft.
- ▼ After -- hours -- ft.
- ⊠ Cave Depth -- ft.

Boring Method

- HSA - Hollow Stem Augers
- CFA - Continuous Flight Augers
- DC - Driving Casing
- MD - Mud Drilling
- HA - Hand Auger



CLIENT Duke Energy Indiana, LLC BORING # PZ-24-4
 PROJECT NAME Piezometer Installation JOB # 170DUK0016
 PROJECT LOCATION Gallagher Generating Station NORTHING 1093167.65
New Albany, Indiana EASTING 277919.56

DRILLING and SAMPLING INFORMATION

TEST DATA

Date Started 4/18/24 Hammer Wt. 140 lbs.
 Date Completed 4/18/24 Hammer Drop 30 in.
 Drill Foreman J. Mitchner Spoon Sampler OD 2.0 in.
 Inspector M. Bazlamit Rock Core Dia. -- in.
 Boring Method HSA Shelby Tube OD -- in.

SOIL CLASSIFICATION		Stratum Depth, ft	Depth Scale, ft	Sample No.	Sample Type	Sampler Graphics	Recovery Graphics	Groundwater	Standard Penetration Test, Blows per 6 in. Increments	Moisture Content, %	Pocket Penetrometer PP-1sf	Remarks
SURFACE ELEVATION 425.5												
6 in. Topsoil		0.5		1	SS				1-4-2-8			
Brown, slightly moist, low to medium plasticity, SILTY CLAY				2	SS				9-11-10-11			
			5	3	SS				4-4-4-5			
				4	SS				7-5-6-6			
	- moist between 8 ft. and 13.5 ft.			5	SS				2-3-2-2			
			10	6	SS				4-2-2-3			
	- very soft below 12 ft.			7	SS				1-1-2-2			
	- wet below 13.5 ft.		15	8	SS				1-1-0-0			
		17.2		9	SS				1-1-1-1			
Gray, moist, low plasticity, non-sticky, SANDY LOAM				10	SS				1-1-0-4			
			20	11	SS				2-2-1-1			
				12	SS				0-2-2-3			
			25	13	SS				2-9-4-11			
		26.1		14	SS				10-14-13-29			
Black, SHALE		28.0										
Bottom of Test Boring at 28.0 ft.												

Note: Well screen set from 15.6 to 25.3 ft.

Sample Type

Depth to Groundwater

Boring Method

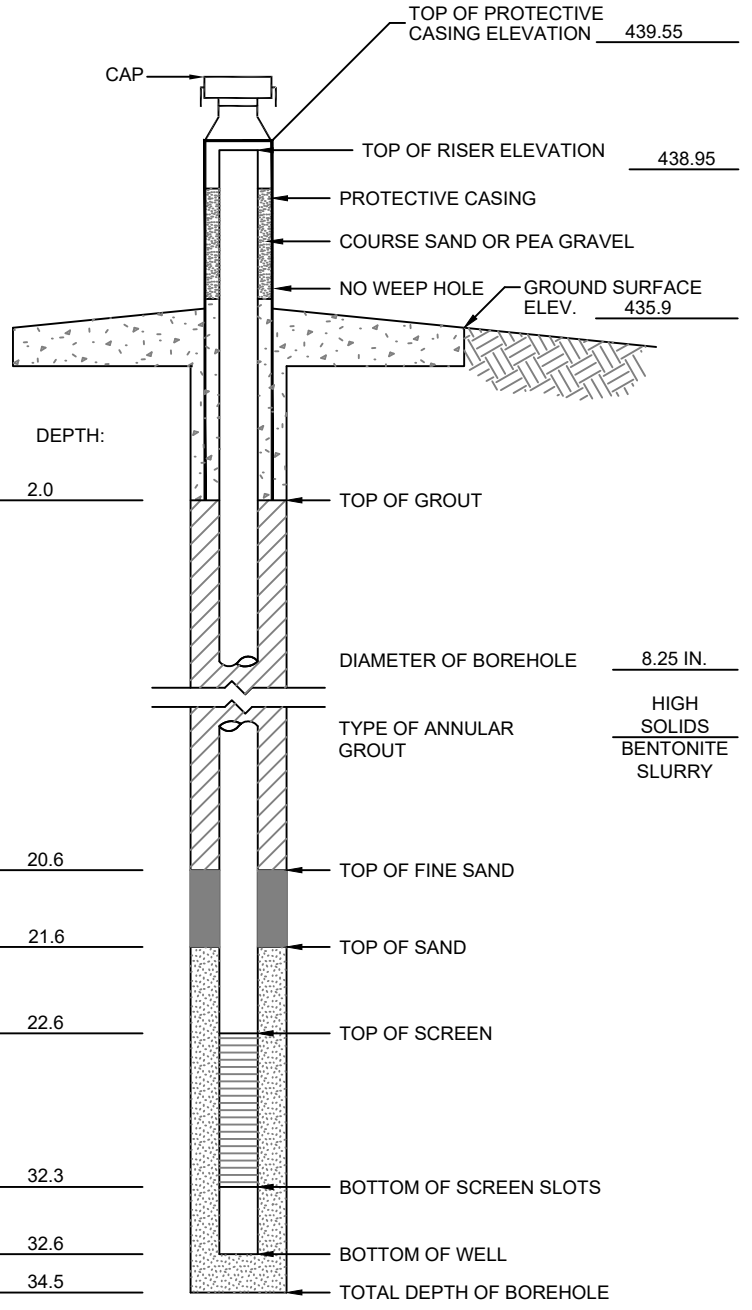
- SS - Driven Split Spoon
- ST - Pressed Shelby Tube
- CA - Continuous Flight Auger
- RC - Rock Core
- CU - Cuttings
- CT - Continuous Tube

- Noted on Drilling Tools 13.5 ft.
- ∇ At Completion -- ft.
- ▼ After -- hours -- ft.
- ⊠ Cave Depth -- ft.

- HSA - Hollow Stem Augers
- CFA - Continuous Flight Augers
- DC - Driving Casing
- MD - Mud Drilling
- HA - Hand Auger

Appendix B: Piezometer Construction Diagrams

TYPE OF RISER PIPE: PVC
 RISER PIPE SIZE: 2 IN.
 PRO-COVER MATERIAL: STEEL
 PRO-COVER SIZE: 6 IN.
 PRO-COVER CAP: CAM LOCK
 SCREEN MFG. BY: JOHNSON
 SCREEN SLOT SIZE: 0.010 IN.
 SIZE OF SAND PACK: #4, #7
 DEVELOPMENT METHOD: SUBMERSIBLE PUMP
 DEVELOPMENT DATE: 05/29/2024
 DEVELOPMENT DURATION: 105 MIN.
 GALLONS PURGED: 20 GAL
 WATER LEVEL BEFORE DEVELOPMENT: 24.09

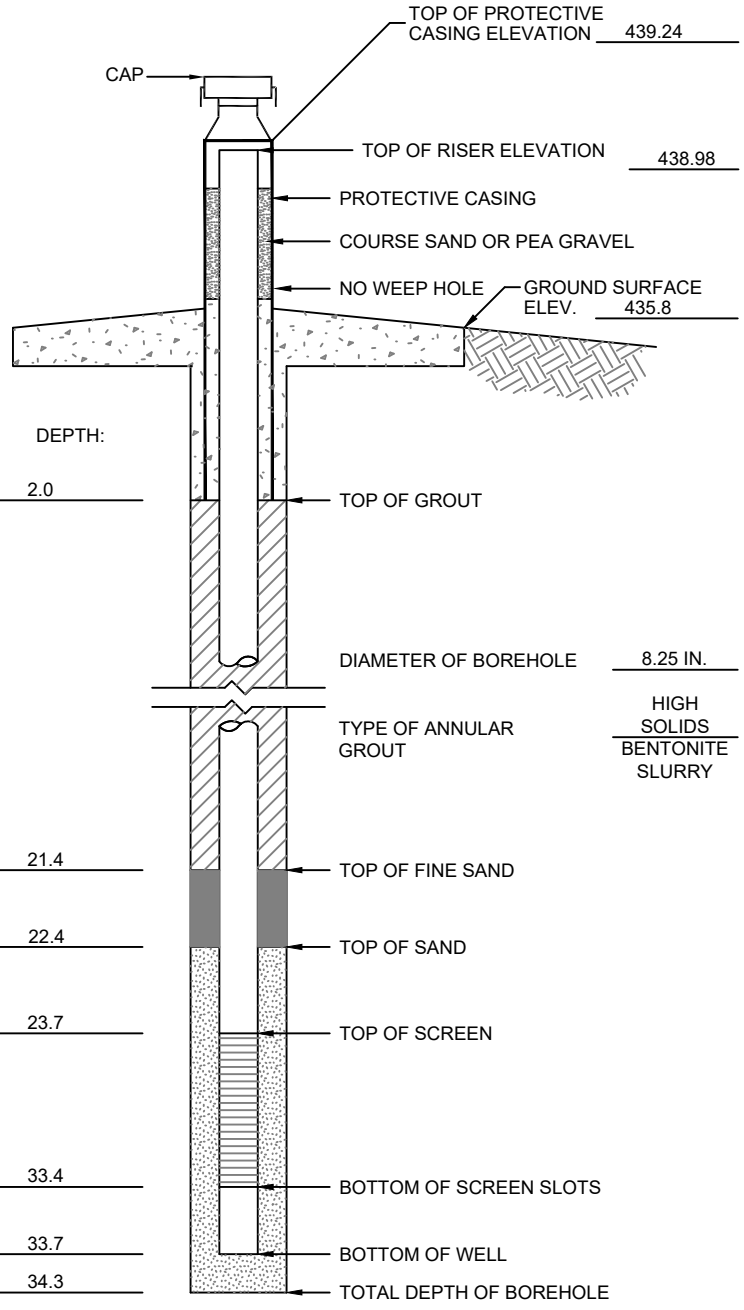


ELEVATION (MSL)	DEPTH:
433.9	2.0
415.3	20.6
414.3	21.6
413.3	22.6
403.6	32.3
403.3	32.6
401.4	34.5

NOTE:
 -ALL DEPTHS ARE MEASURED FROM GROUND SURFACE
 -ALL COORDINATES ARE INDIANA STATE PLANE EAST (NAD83)

Northing: 1094878.79	Inspector: M. BAZLAMIT	Drilling Method: HSA	
Easting: 278699.59	Driller: J. MITCHNER	Completion Date: 4/23/2024	
PIEZOMETER CONSTRUCTION DIAGRAM PZ-24-1		Project Number: 170DUK0016	Drn. By: BH
		Date: 5/23/2024	Scale: NOT TO SCALE
DUKE ENERGY INDIANA, LLC GALLAGHER GENERATING STATION FLOYD COUNTY, INDIANA			

TYPE OF RISER PIPE: PVC
 RISER PIPE SIZE: 2 IN.
 PRO-COVER MATERIAL: STEEL
 PRO-COVER SIZE: 6 IN.
 PRO-COVER CAP: CAM LOCK
 SCREEN MFG. BY: JOHNSON
 SCREEN SLOT SIZE: 0.010 IN.
 SIZE OF SAND PACK: #4, #7
 DEVELOPMENT METHOD: SUBMERSIBLE PUMP
 DEVELOPMENT DATE: 05/29/2024
 DEVELOPMENT DURATION: 60 MIN
 GALLONS PURGED: 25 GAL
 WATER LEVEL BEFORE DEVELOPMENT: 21.74'

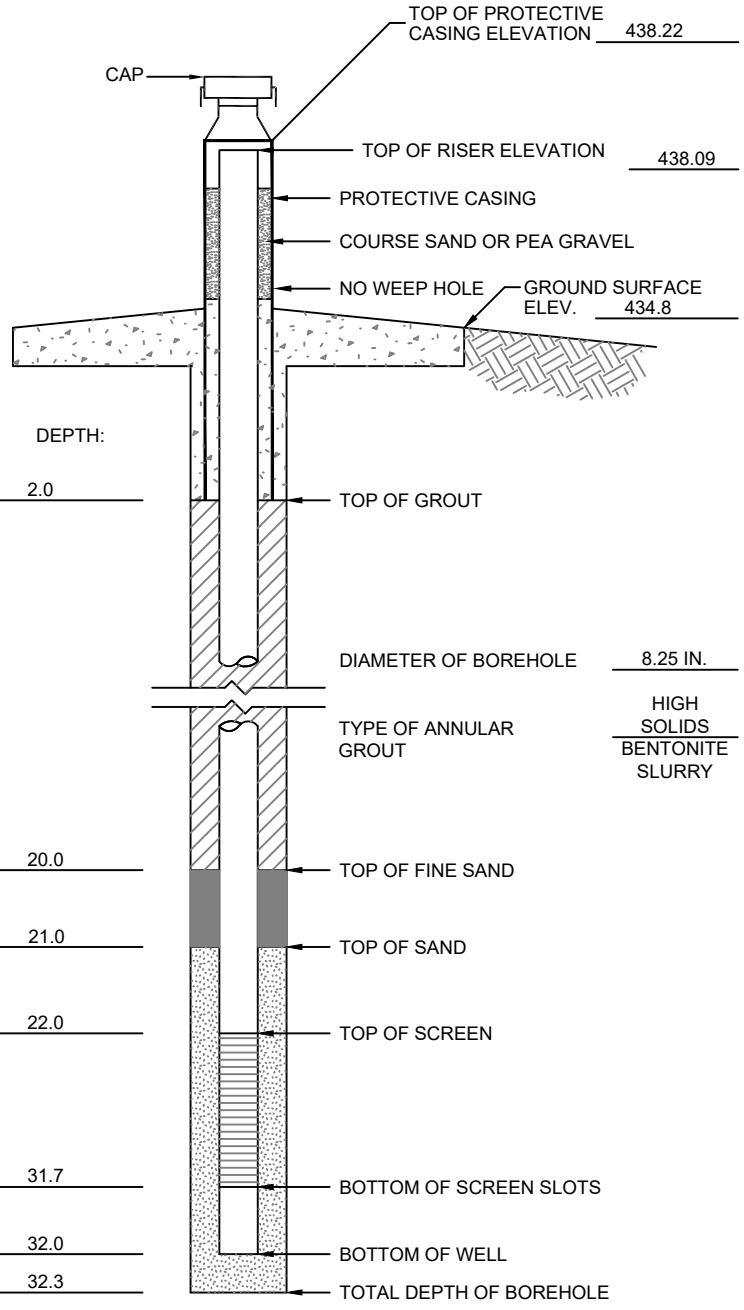


ELEVATION (MSL)	DEPTH:
<u>433.8</u>	<u>2.0</u>
<u>414.4</u>	<u>21.4</u>
<u>413.4</u>	<u>22.4</u>
<u>412.1</u>	<u>23.7</u>
<u>402.3</u>	<u>33.4</u>
<u>402.1</u>	<u>33.7</u>
<u>401.5</u>	<u>34.3</u>

NOTE:
 -ALL DEPTHS ARE MEASURED FROM GROUND SURFACE
 -ALL COORDINATES ARE INDIANA STATE PLANE EAST (NAD83)

Northing: <u>1094341.55</u>	Inspector: <u>M. BAZLAMIT</u>	Drilling Method: <u>HSA</u>	
Easting: <u>278764.17</u>	Driller: <u>J. MITCHNER</u>	Completion Date: <u>4/24/2024</u>	
PIEZOMETER CONSTRUCTION DIAGRAM PZ-24-2		Project Number: <u>170DUK0016</u>	Drn. By: <u>BH</u>
		Date: <u>5/23/2024</u>	Scale: <u>NOT TO SCALE</u>
DUKE ENERGY INDIANA, LLC GALLAGHER GENERATING STATION FLOYD COUNTY, INDIANA			

TYPE OF RISER PIPE: PVC
 RISER PIPE SIZE: 2 IN.
 PRO-COVER MATERIAL: STEEL
 PRO-COVER SIZE: 6 IN.
 PRO-COVER CAP: CAM LOCK
 SCREEN MFG. BY: JOHNSON
 SCREEN SLOT SIZE: 0.010 IN.
 SIZE OF SAND PACK: #4, #7
 DEVELOPMENT METHOD: SUBMERSIBLE PUMP
 DEVELOPMENT DATE: 05/29/2024
 DEVELOPMENT DURATION: 105 MIN.
 GALLONS PURGED: 32 GAL
 WATER LEVEL BEFORE DEVELOPMENT: 22.19'

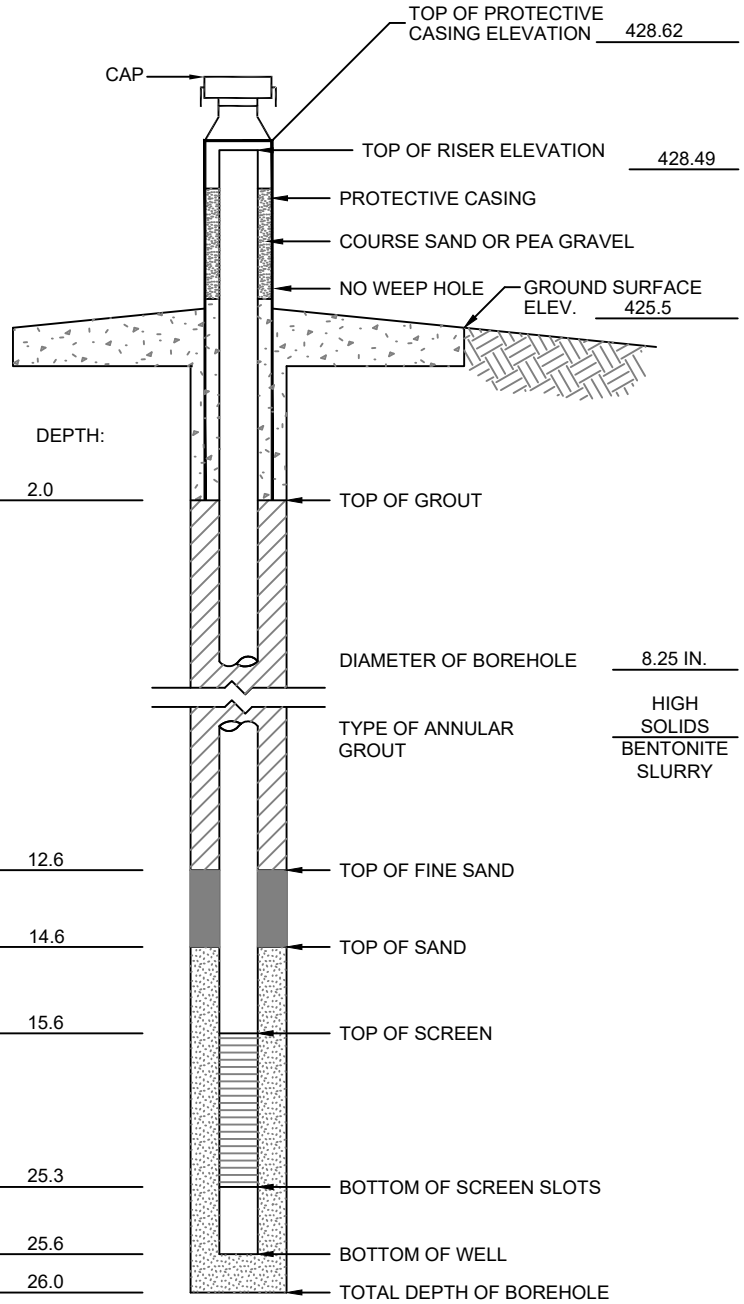


ELEVATION (MSL)	DEPTH:
432.8	2.0
414.8	20.0
413.8	21.0
412.8	22.0
403.1	31.7
402.8	32.0
402.5	32.3

NOTE:
 -ALL DEPTHS ARE MEASURED FROM GROUND SURFACE
 -ALL COORDINATES ARE INDIANA STATE PLANE EAST (NAD83)

Northing: 1093851.71	Inspector: M. BAZLAMIT	Drilling Method: HSA	
Easting: 278770.76	Driller: J. MITCHNER	Completion Date: 4/25/2024	
PIEZOMETER CONSTRUCTION DIAGRAM PZ-24-3 DUKE ENERGY INDIANA, LLC GALLAGHER GENERATING STATION FLOYD COUNTY, INDIANA		Project Number: 170DUK0016	Drn. By: BH
		Date: 5/23/2024	Scale: NOT TO SCALE

TYPE OF RISER PIPE: PVC
 RISER PIPE SIZE: 2 IN.
 PRO-COVER MATERIAL: STEEL
 PRO-COVER SIZE: 6 IN.
 PRO-COVER CAP: CAM LOCK
 SCREEN MFG. BY: JOHNSON
 SCREEN SLOT SIZE: 0.010 IN.
 SIZE OF SAND PACK: #4, #7
 DEVELOPMENT METHOD: SUBMERSIBLE PUMP
 DEVELOPMENT DATE: 05/30/2024
 DEVELOPMENT DURATION: 120 MIN.
 GALLONS PURGED: 40 GAL
 WATER LEVEL BEFORE DEVELOPMENT: 7.74'



ELEVATION (MSL)	DEPTH:
423.5	2.0
412.9	12.6
410.9	14.6
409.9	15.6
400.2	25.3
399.9	25.6
399.5	26.0

NOTE:
 -ALL DEPTHS ARE MEASURED FROM GROUND SURFACE
 -ALL COORDINATES ARE INDIANA STATE PLANE EAST (NAD83)

Northing: 1093167.65	Inspector: M. BAZLAMIT	Drilling Method: HSA
Easting: 277919.56	Driller: J. MITCHNER	Completion Date: 4/18/2024

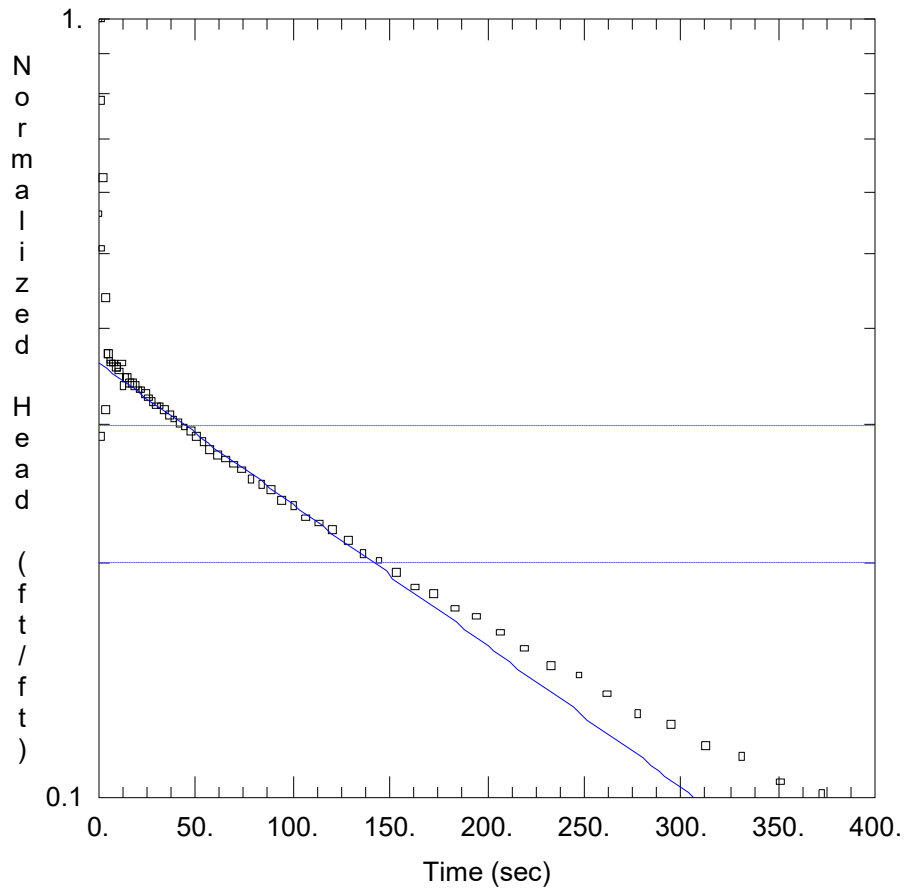
PIEZOMETER CONSTRUCTION DIAGRAM PZ-24-4

DUKE ENERGY INDIANA, LLC
 GALLAGHER GENERATING STATION
 FLOYD COUNTY, INDIANA

Project Number: 170DUK0016	Date: 5/23/2024	Scale: NOT TO SCALE	Drn. By: BH
			Ckd. By: SL



Appendix C: Hydraulic Conductivity Test Results



PZ-24-1 IN

Data Set: G:\...\PZ-24-1IN.aqt

Date: 06/14/24

Time: 11:41:23

PROJECT INFORMATION

Company: Atlas Technical Consultants

Client: Duke Energy Indiana LLC

Project: 170DUK0016

Location: Gallagher Station

Test Well: PZ-24-1

Test Date: 05/30/2024

AQUIFER DATA

Saturated Thickness: 6. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (PZ-24-1)

Initial Displacement: 2.58 ft

Static Water Column Height: 11.3 ft

Total Well Penetration Depth: 10. ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.33 ft

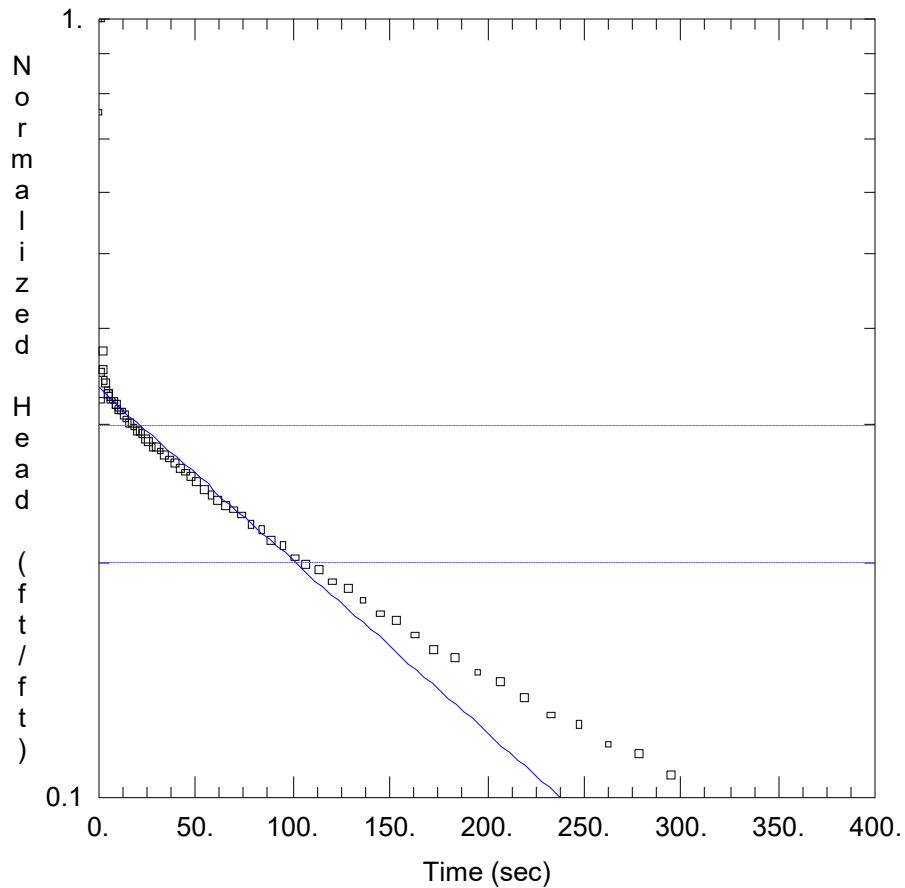
SOLUTION

Aquifer Model: Confined

Solution Method: Bower-Rice

K = 0.0001784 cm/sec

y0 = 0.9321 ft



PZ-24-1 OUT

Data Set: G:\...\PZ-24-1OUT.aqt

Date: 06/14/24

Time: 11:47:35

PROJECT INFORMATION

Company: Atlas Technical Consultants

Client: Duke Energy Indiana LLC

Project: 170DUK0016

Location: Gallagher Station

Test Well: PZ-24-1

Test Date: 05/30/2024

AQUIFER DATA

Saturated Thickness: 6. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (PZ-24-1)

Initial Displacement: 2.91 ft

Static Water Column Height: 11.3 ft

Total Well Penetration Depth: 10. ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.33 ft

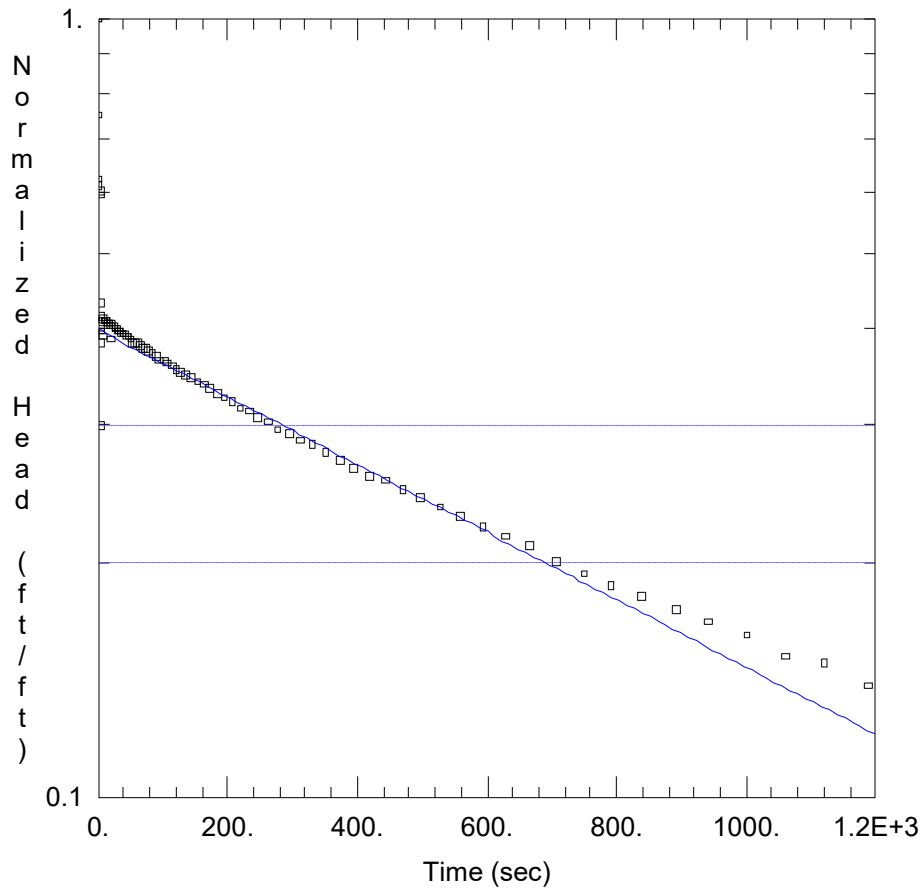
SOLUTION

Aquifer Model: Confined

Solution Method: Bouwer-Rice

K = 0.0002174 cm/sec

y0 = 0.9764 ft



PZ-24-2 IN

Data Set: G:\...\PZ-24-2 IN.aqt

Date: 06/14/24

Time: 11:45:25

PROJECT INFORMATION

Company: Atlas Technical Consultants

Client: Duke Energy Indiana LLC

Project: 170DUK0016

Location: Gallagher Station

Test Well: PZ-24-1

Test Date: 05/30/2024

AQUIFER DATA

Saturated Thickness: 2.1 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (PZ-24-2)

Initial Displacement: 3.1 ft

Static Water Column Height: 15.3 ft

Total Well Penetration Depth: 10. ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.33 ft

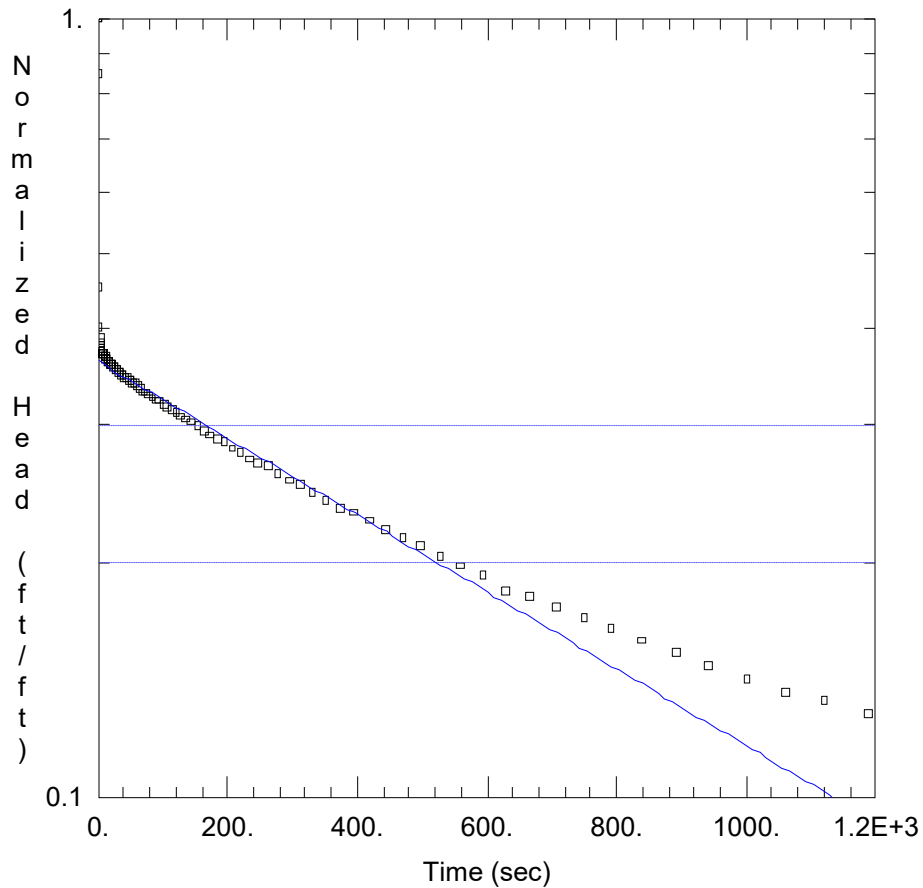
SOLUTION

Aquifer Model: Confined

Solution Method: Bower-Rice

K = 0.0001037 cm/sec

y0 = 1.236 ft



PZ-24-2 OUT

Data Set: G:\...\PZ-24-2 OUT.aqt

Date: 06/14/24

Time: 11:49:35

PROJECT INFORMATION

Company: Atlas Technical Consultants

Client: Duke Energy Indiana LLC

Project: 170DUK0016

Location: Gallagher Station

Test Well: PZ-24-1

Test Date: 05/30/2024

AQUIFER DATA

Saturated Thickness: 2.1 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (PZ-24-2)

Initial Displacement: 3.53 ft

Static Water Column Height: 15.3 ft

Total Well Penetration Depth: 10. ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.33 ft

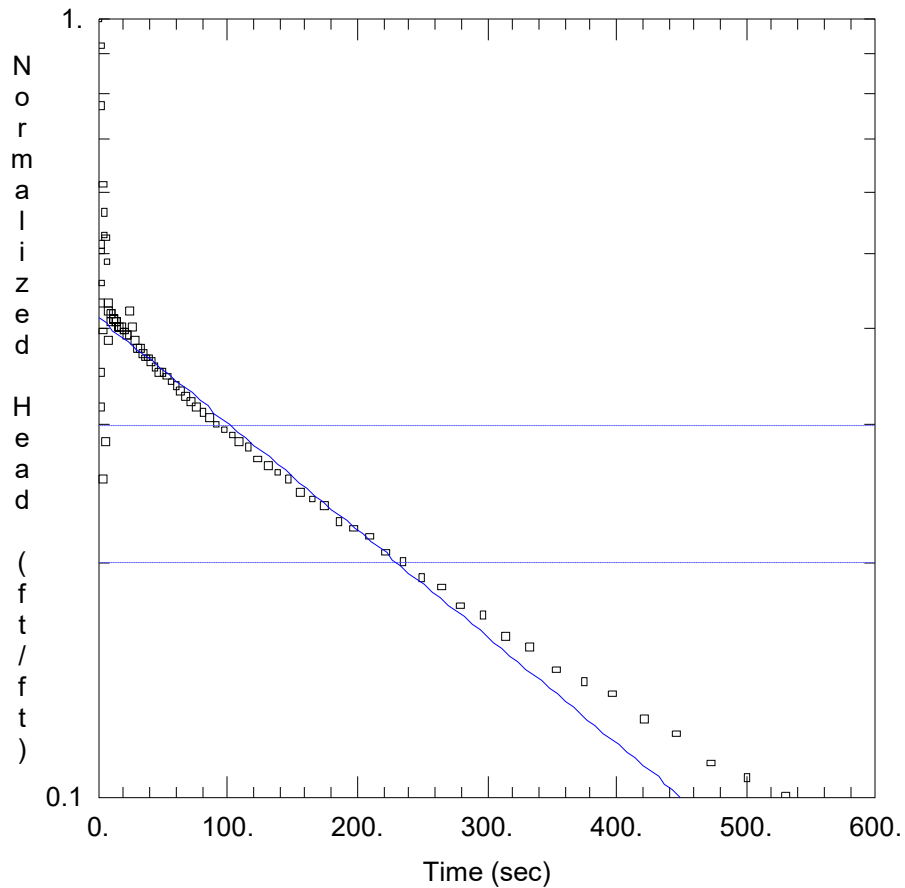
SOLUTION

Aquifer Model: Confined

Solution Method: Bower-Rice

K = 0.000118 cm/sec

y0 = 1.281 ft



PZ-24-3 IN

Data Set: G:\...\PZ-24-3 IN.aqt

Date: 06/14/24

Time: 11:51:40

PROJECT INFORMATION

Company: Atlas Technical Consultants

Client: Duke Energy Indiana LLC

Project: 170DUK0016

Location: Gallagher Station

Test Well: PZ-24-3

Test Date: 05/30/2024

AQUIFER DATA

Saturated Thickness: 5.5 ft

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA (PZ-24-3)

Initial Displacement: 1.99 ft

Static Water Column Height: 12.6 ft

Total Well Penetration Depth: 10. ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.33 ft

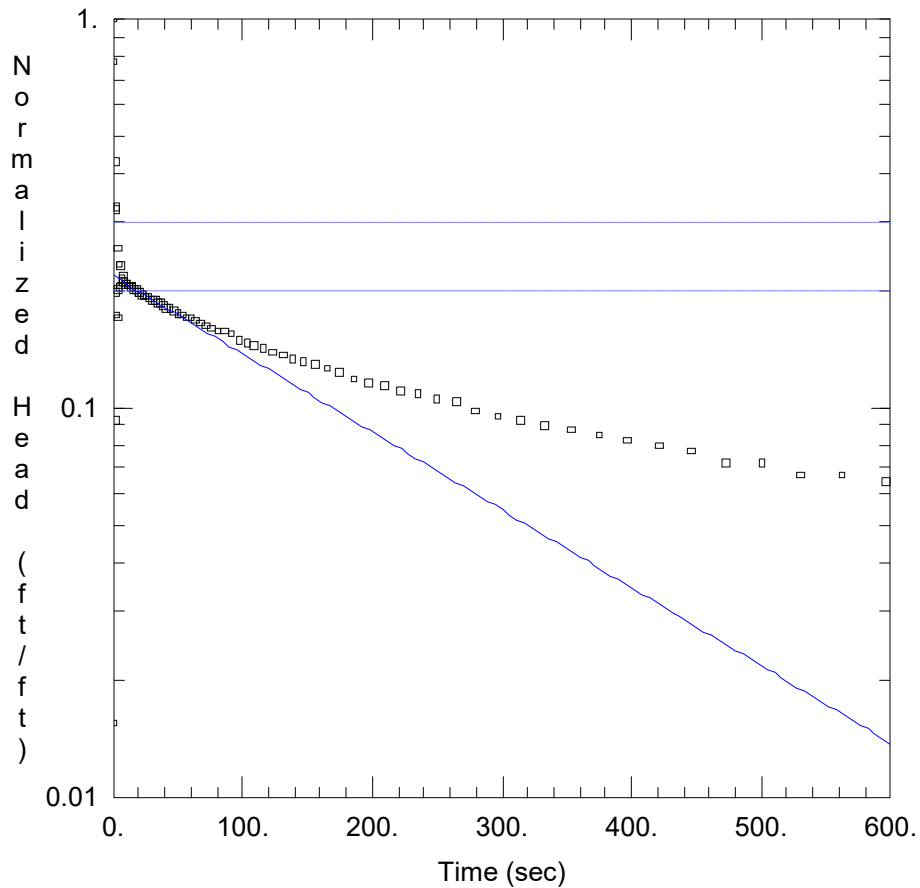
SOLUTION

Aquifer Model: Confined

Solution Method: Bouwer-Rice

$K = 0.0001448$ cm/sec

$y_0 = 0.8235$ ft



PZ-24-3 OUT

Data Set: G:\...\PZ-24-3 OUT.aqt

Date: 06/14/24

Time: 11:54:04

PROJECT INFORMATION

Company: Atlas Technical Consultants

Client: Duke Energy Indiana LLC

Project: 170DUK0016

Location: Gallagher Station

Test Well: PZ-24-1

Test Date: 05/30/2024

AQUIFER DATA

Saturated Thickness: 5.5 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (PZ-24-3)

Initial Displacement: 3.88 ft

Static Water Column Height: 5.5 ft

Total Well Penetration Depth: 12.5 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.33 ft

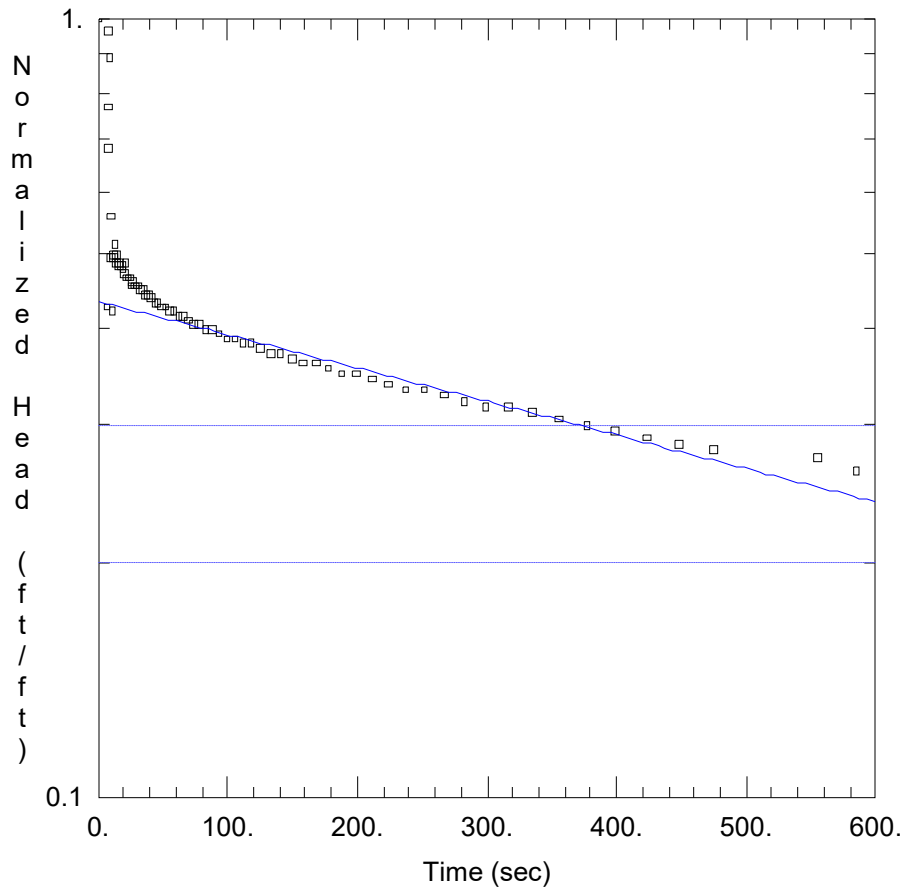
SOLUTION

Aquifer Model: Confined

Solution Method: Bower-Rice

K = 0.0002223 cm/sec

y0 = 0.8455 ft



PZ-24-4 IN

Data Set: G:\...\PZ-24-4 IN.aqt

Date: 06/14/24

Time: 12:27:31

PROJECT INFORMATION

Company: Atlas Technical Consultants

Client: Duke Energy Indiana LLC

Project: 170DUK0016

Location: Gallagher Station

Test Well: PZ-24-4

Test Date: 05/31/2024

AQUIFER DATA

Saturated Thickness: 20.9 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (PZ-24-4)

Initial Displacement: 1.83 ft

Static Water Column Height: 7.9 ft

Total Well Penetration Depth: 20.9 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.33 ft

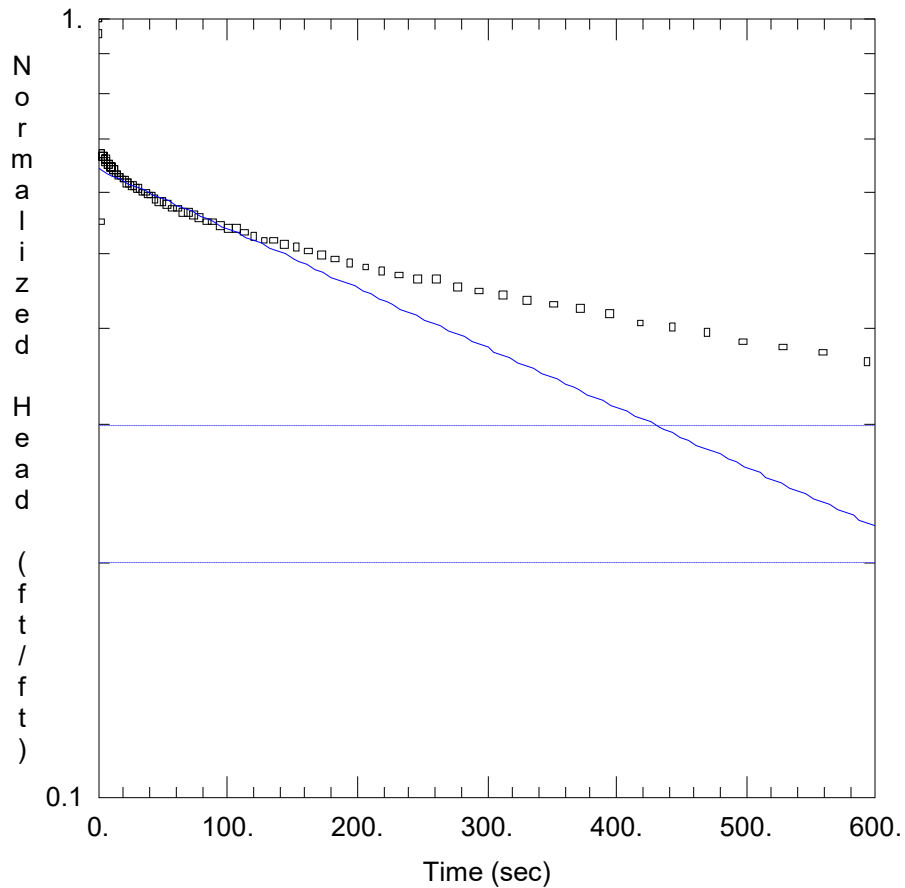
SOLUTION

Aquifer Model: Confined

Solution Method: Bouwer-Rice

K = 3.145E-5 cm/sec

y0 = 0.7932 ft



PZ-24-4 OUT

Data Set: G:\...\PZ-24-4 OUT.aqt

Date: 06/14/24

Time: 12:29:58

PROJECT INFORMATION

Company: Atlas Technical Consultants

Client: Duke Energy Indiana LLC

Project: 170DUK0016

Location: Gallagher Station

Test Well: PZ-24-4

Test Date: 05/31/2024

AQUIFER DATA

Saturated Thickness: 20.9 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (PZ-24-4)

Initial Displacement: 1.77 ft

Static Water Column Height: 7.9 ft

Total Well Penetration Depth: 20.9 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Confined

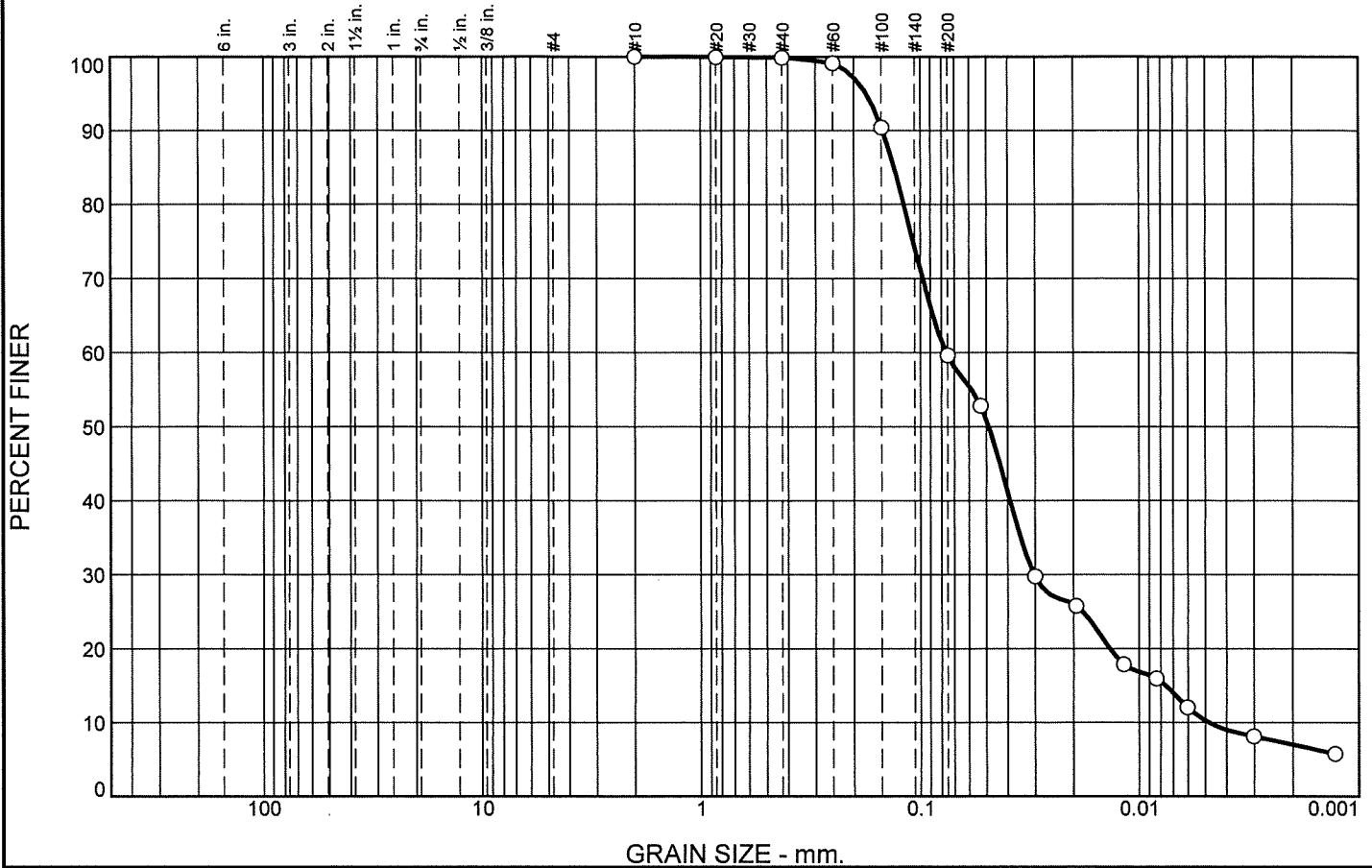
Solution Method: Bower-Rice

K = 5.606E-5 cm/sec

y0 = 1.135 ft

Appendix D: Soils Lab Results

Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	27.9	18.4	26.8	19.0	7.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	100.0		
#40	99.9		
#60	99.1		
#100	90.4		
#200	59.6		
#270	52.8		

Material Description

PZ-24-01

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.1484 D₈₅= 0.1317 D₆₀= 0.0760
D₅₀= 0.0488 D₃₀= 0.0303 D₁₅= 0.0076
D₁₀= 0.0048 C_u= 15.73 C_c= 2.50

Classification

USCS= AASHTO=

Remarks

Finer than 0.062mm = 56.0%

* (no specification provided)

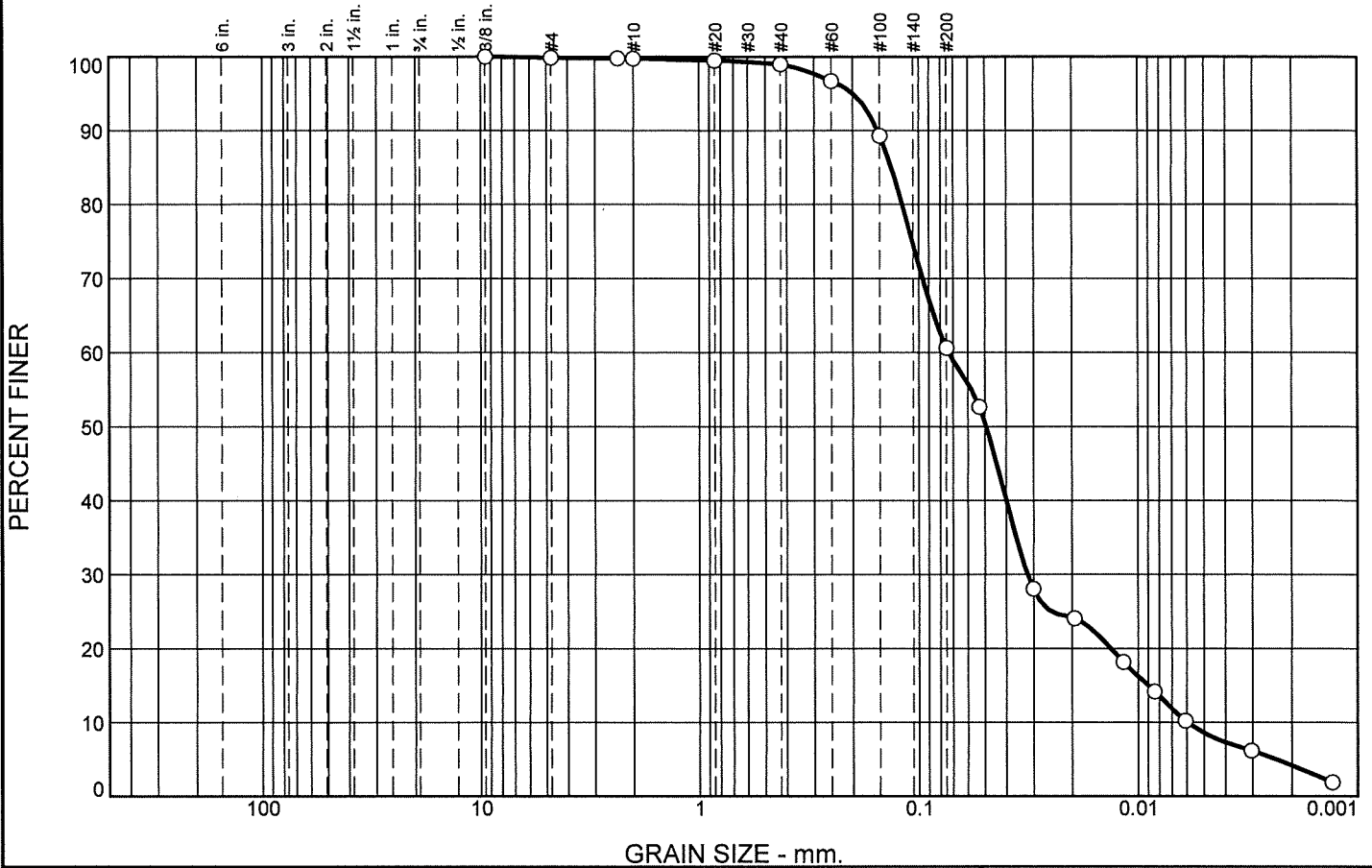
Source of Sample: 15857
Sample Number: 15857-7

Depth: 28.0'-30.0'

Date:

Atlas	Client: Duke Energy Project: PZ Installation
Indianapolis, Indiana	Project No: 170DUK0016 Figure

Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	0.0	0.1	0.2	0.2	0.4	2.4	24.8	19.3	28.4	20.0	4.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.9		
#8	99.8		
#10	99.7		
#20	99.5		
#40	99.0		
#60	96.7		
#100	89.3		
#200	60.6		
#270	52.6		

Material Description

PZ-24-01

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.1535 D₈₅= 0.1333 D₆₀= 0.0733
 D₅₀= 0.0493 D₃₀= 0.0320 D₁₅= 0.0090
 D₁₀= 0.0060 C_u= 12.30 C_c= 2.35

Classification
 USCS= AASHTO=

Remarks
 Finer than 0.062mm = 56.5%

* (no specification provided)

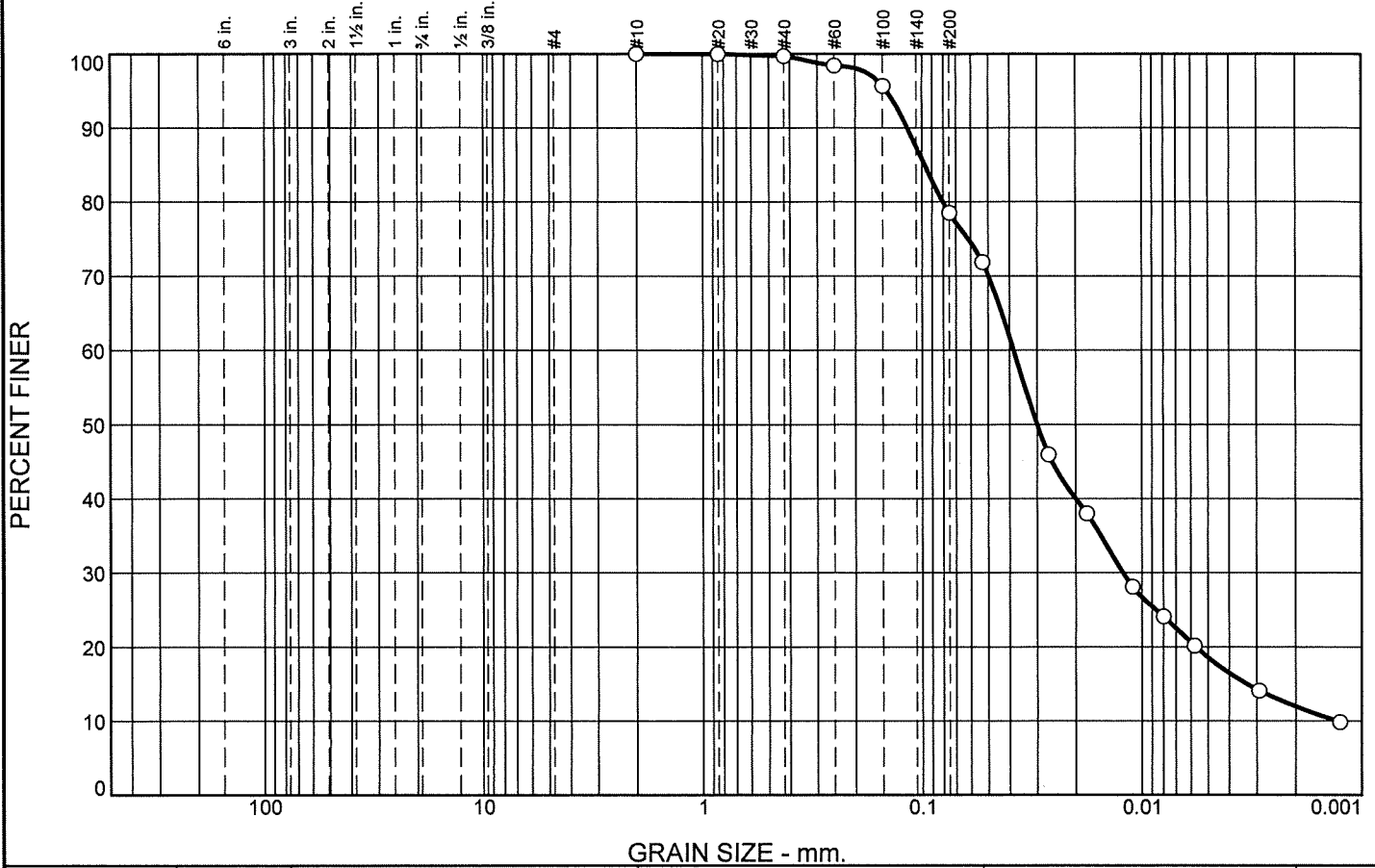
Source of Sample: 15857
 Sample Number: 15857-8

Depth: 30.0'-32.0'

Date:

Atlas Indianapolis, Indiana	Client: Duke Energy Project: PZ Installation Project No: 170DUK0016
Figure	

Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4	12.6	14.0	31.8	28.1	11.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	100.0		
#40	99.7		
#60	98.4		
#100	95.6		
#200	78.5		
#270	71.8		

Material Description

PZ-24-02

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.1163 D₈₅= 0.0972 D₆₀= 0.0384
 D₅₀= 0.0301 D₃₀= 0.0122 D₁₅= 0.0033
 D₁₀= 0.0013 C_u= 29.54 C_c= 3.00

Classification
 USCS= AASHTO=

Remarks
 Finer than 0.062mm = 75.2%

* (no specification provided)

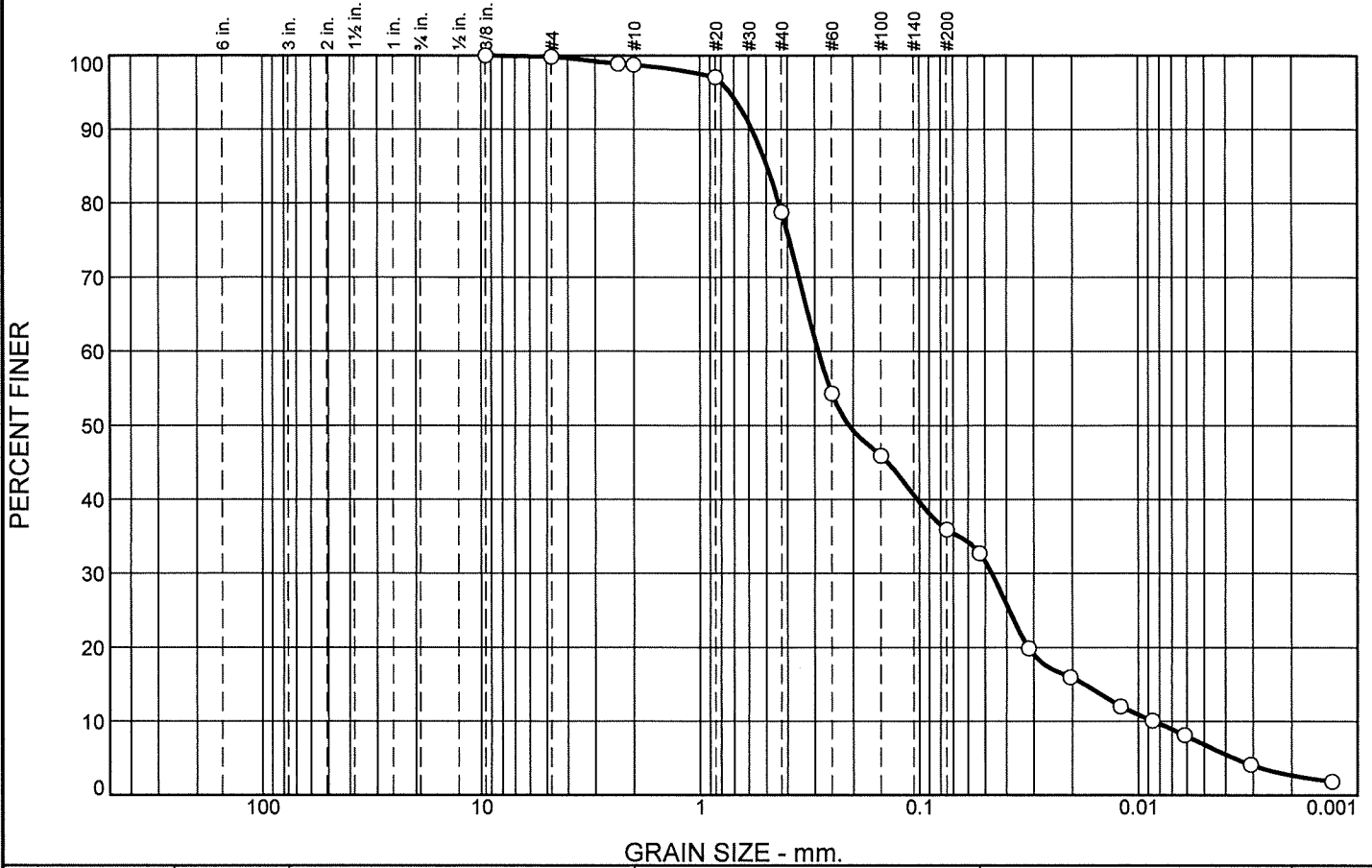
Source of Sample: 15857
 Sample Number: 15857-5

Depth: 28.0'-30.0'

Date:

Atlas Indianapolis, Indiana	Client: Duke Energy Project: PZ Installation Project No: 170DUK0016
Figure	

Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	0.0	0.2	1.1	1.2	12.2	31.0	14.6	7.0	16.8	13.2	2.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.8		
#8	98.9		
#10	98.7		
#20	97.1		
#40	78.8		
#60	54.3		
#100	45.9		
#200	35.9		
#270	32.7		

Material Description

PZ-24-02

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5807 D₈₅= 0.4955 D₆₀= 0.2891
D₅₀= 0.2093 D₃₀= 0.0467 D₁₅= 0.0176
D₁₀= 0.0085 C_u= 34.01 C_c= 0.89

Classification

USCS= AASHTO=

Remarks

Finer than 0.062mm = 34.5%

* (no specification provided)

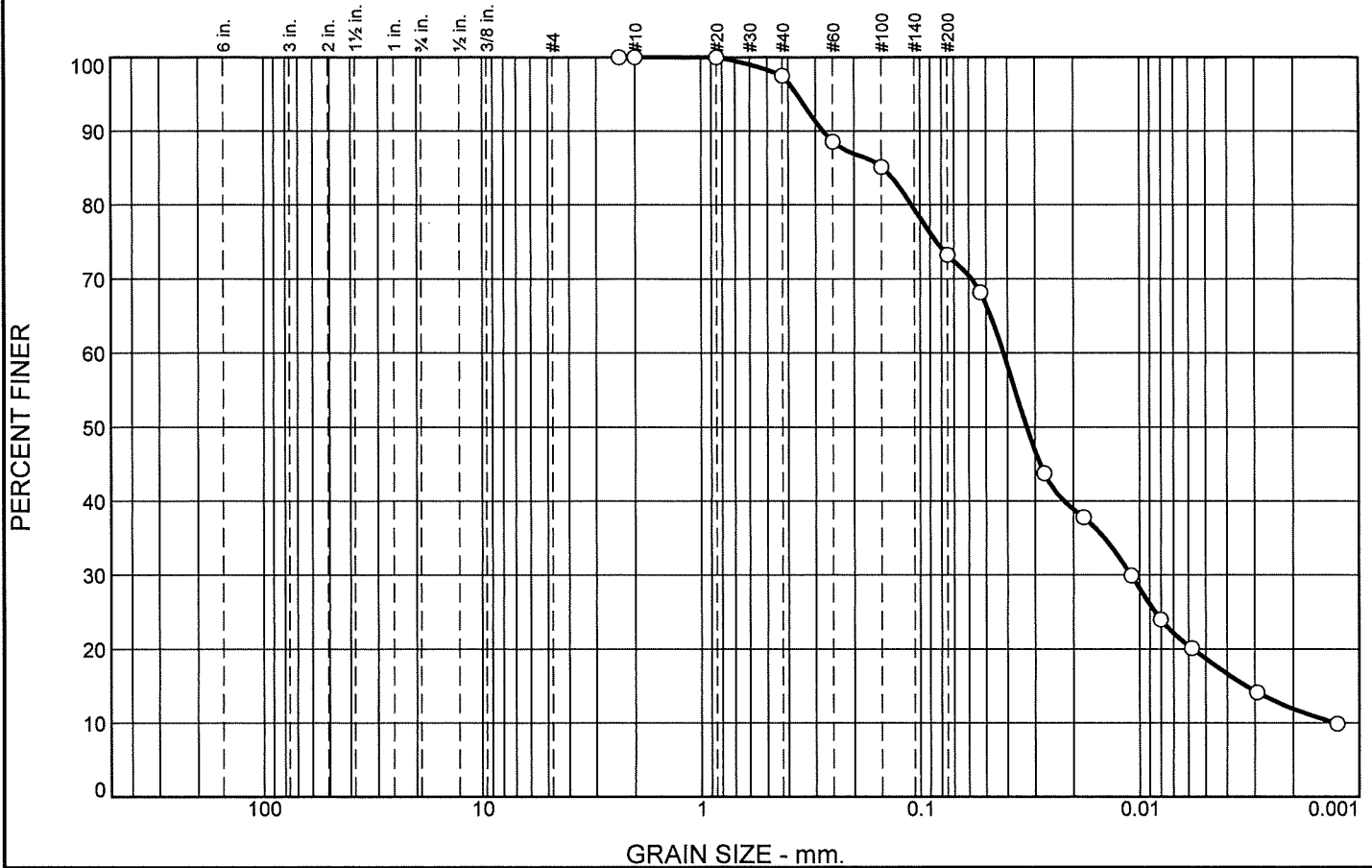
Source of Sample: 15857
Sample Number: 15857-6

Depth: 32.0'-34.0'

Date:

Atlas Indianapolis, Indiana	Client: Duke Energy Project: PZ Installation Project No: 170DUK0016
Figure	

Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	0.0	0.0	0.0	0.0	1.7	9.8	10.2	10.2	29.2	27.0	11.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#10	100.0		
#20	100.0		
#40	97.5		
#60	88.5		
#100	85.1		
#200	73.2		
#270	68.1		

* (no specification provided)

Material Description

PZ-24-03

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2778 D₈₅= 0.1481 D₆₀= 0.0417
D₅₀= 0.0328 D₃₀= 0.0110 D₁₅= 0.0033
D₁₀= 0.0013 C_u= 32.20 C_c= 2.23

Classification

USCS= AASHTO=

Remarks

Finer than 0.062mm = 70.9%

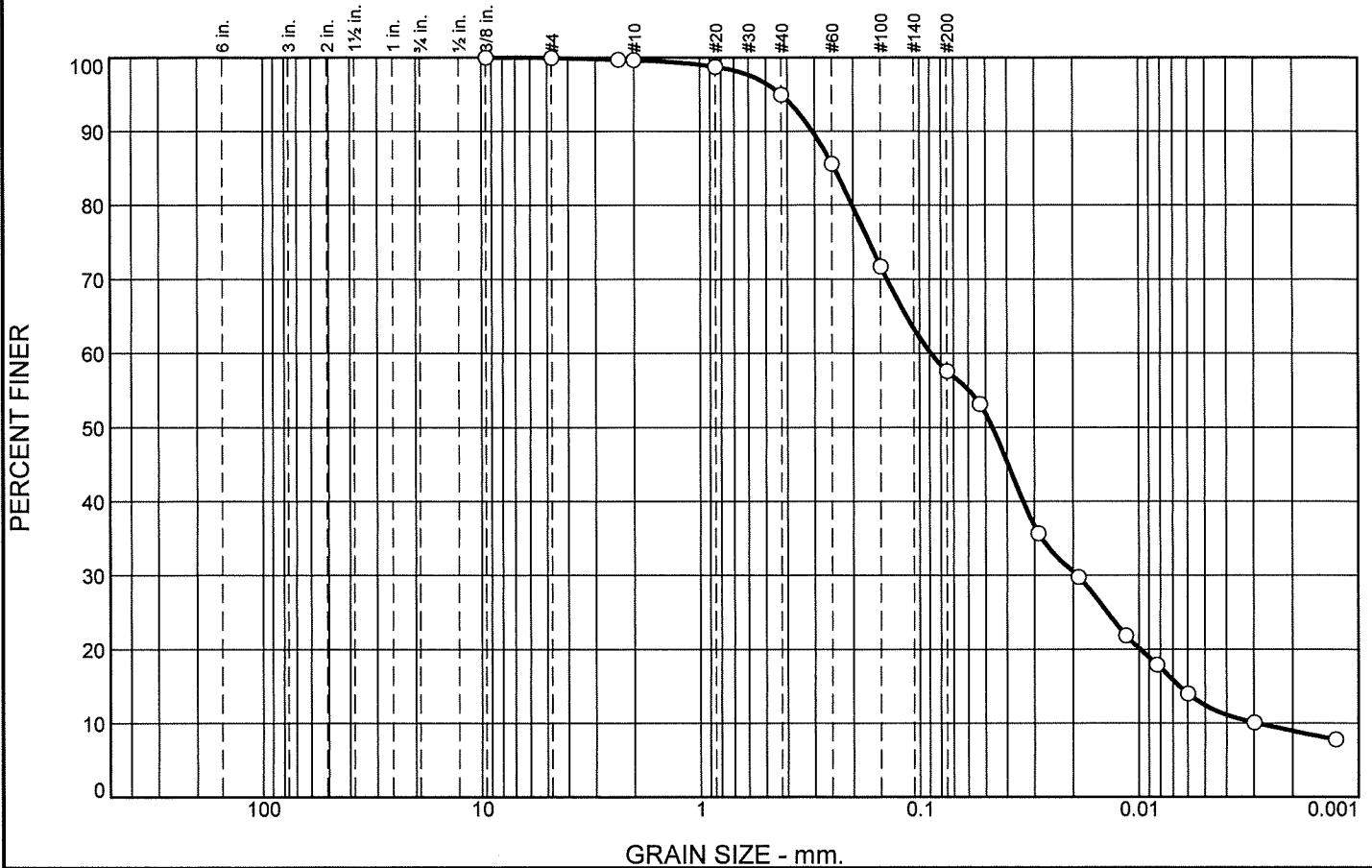
Source of Sample: 15857
Sample Number: 15857-3

Depth: 24.0'-26.0'

Date:

<p>Atlas</p> <p>Indianapolis, Indiana</p>	<p>Client: Duke Energy</p> <p>Project: PZ Installation</p> <p>Project No: 170DUK0016</p>	<p>Figure</p>
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Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	0.0	0.1	0.3	0.6	2.5	10.9	23.4	9.1	22.6	21.5	9.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.9		
#8	99.7		
#10	99.6		
#20	98.7		
#40	95.0		
#60	85.6		
#100	71.7		
#200	57.6		
#270	53.1		

Material Description

PZ-24-03

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3065 D₈₅= 0.2441 D₆₀= 0.0887
D₅₀= 0.0466 D₃₀= 0.0193 D₁₅= 0.0065
D₁₀= 0.0029 C_u= 30.50 C_c= 1.44

Classification

USCS= AASHTO=

Remarks

Finer than 0.062mm = 55.5%

* (no specification provided)

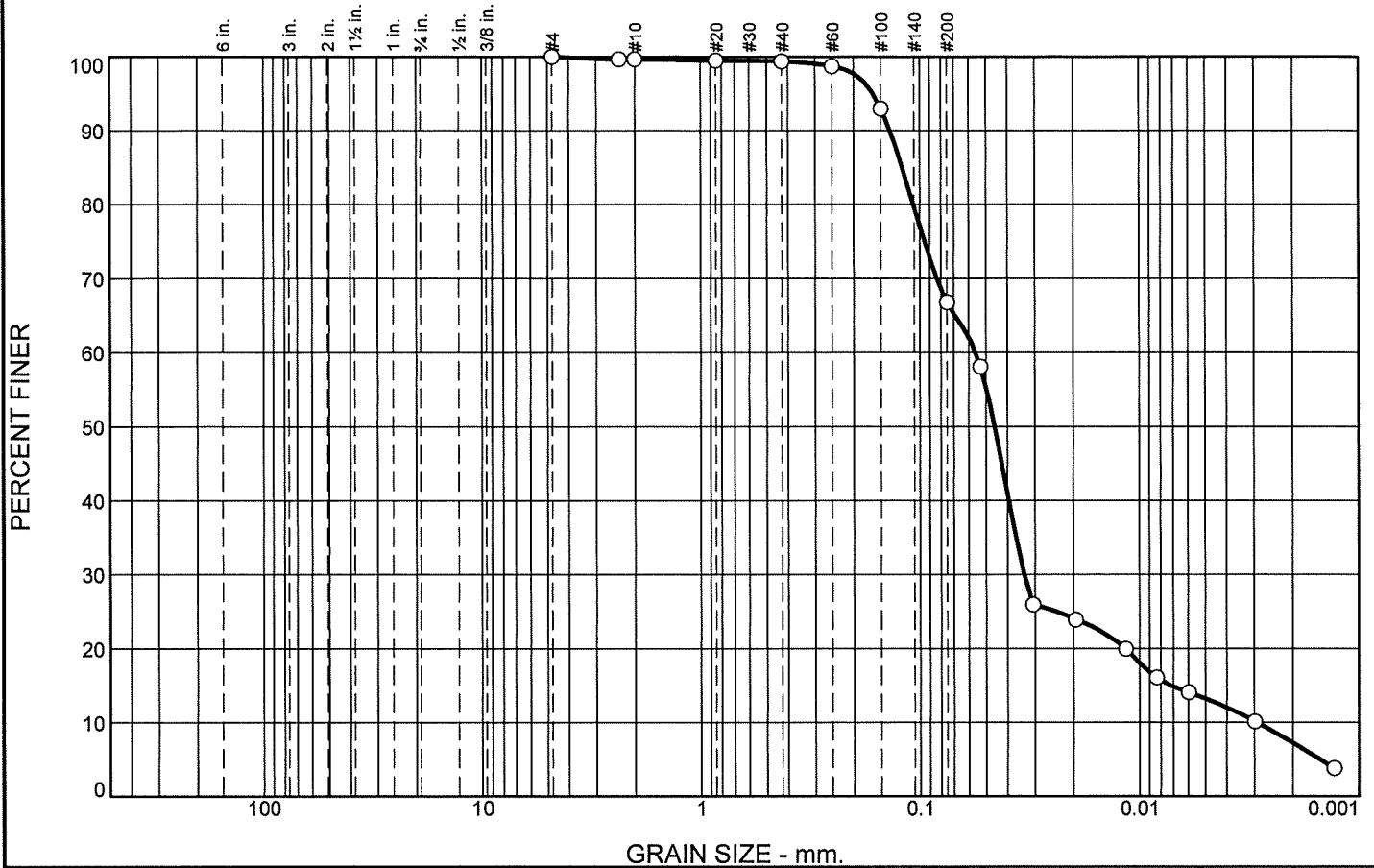
Source of Sample: 15857
Sample Number: 15857-4

Depth: 30.0'-32.0'

Date:

Atlas Indianapolis, Indiana	Client: Duke Energy Project: PZ Installation Project No: 170DUK0016
Figure	

Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	0.0	0.0	0.4	0.1	0.1	0.7	21.6	19.0	34.1	16.8	7.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	99.6		
#10	99.6		
#20	99.5		
#40	99.4		
#60	98.7		
#100	93.0		
#200	66.8		
#270	58.1		

Material Description

PZ-24-04

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.1366 D₈₅= 0.1202 D₆₀= 0.0557
D₅₀= 0.0457 D₃₀= 0.0335 D₁₅= 0.0072
D₁₀= 0.0029 C_u= 19.04 C_c= 6.89

Classification

USCS= AASHTO=

Remarks

Finer than 0.062mm = 62.9%

* (no specification provided)

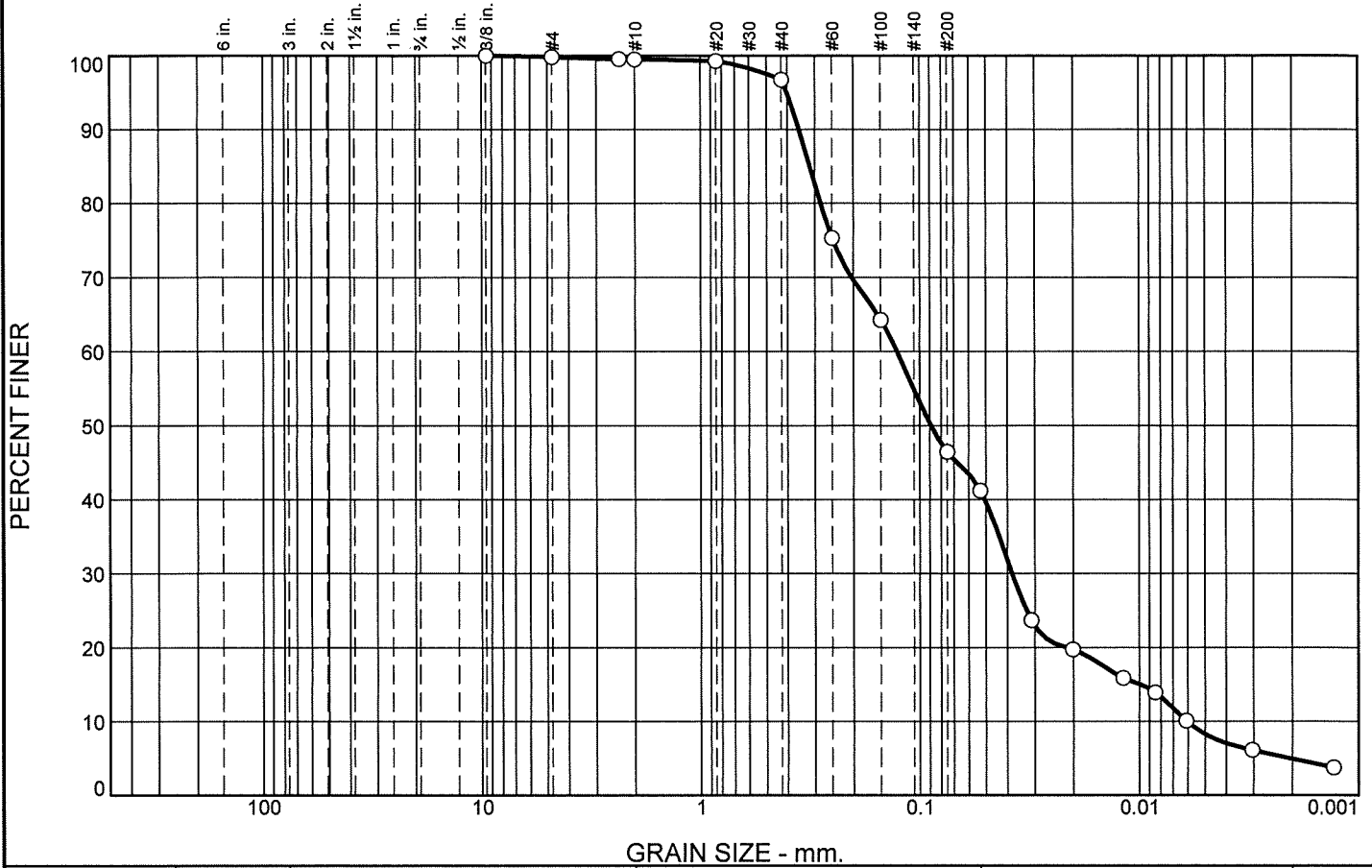
Source of Sample: 15857
Sample Number: 15857-1

Depth: 18.0'-20.0'

Date:

Atlas Indianapolis, Indiana	Client: Duke Energy Project: PZ Installation Project No: 170DUK0016
Figure	

Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	0.0	0.2	0.3	0.2	1.8	22.2	22.1	12.0	21.5	14.8	4.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.8		
#8	99.5		
#10	99.5		
#20	99.3		
#40	96.8		
#60	75.3		
#100	64.3		
#200	46.4		
#270	41.2		

Material Description

PZ-24-04

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3536 D₈₅= 0.3161 D₆₀= 0.1266
 D₅₀= 0.0888 D₃₀= 0.0381 D₁₅= 0.0100
 D₁₀= 0.0061 C_u= 20.89 C_c= 1.89

Classification
 USCS= AASHTO=

Remarks

Finer than 0.062mm = 43.9%

* (no specification provided)

Source of Sample: 15857
 Sample Number: 15857-2

Depth: 24.0'-26.0'

Date:

Atlas Indianapolis, Indiana	Client: Duke Energy Project: PZ Installation Project No: 170DUK0016
Figure	

Report Number
F24123-0346
Account Number
00060



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3505 Conestoga Dr.
Fort Wayne, IN 46808
260.483.4759
algreatlakes.com

To: ATC GROUP SERVICES LLC
STE 100
7988 CENTERPOINT DR
INDIANAPOLIS, IN 46256-3381

For: PZ INSTALLATION (SCREENS

PZ-24-4 18'-20'

PO Number: 170DUK0016

Date Received: 5/2/2024

Date Reported: 5/7/2024

Page: 1 of 8

Attn: SAMANTHA LAX

REPORT OF ANALYSIS

Analysis	Result	Method of Analysis
Sample: 15857-1	Lab Number: 76230	
Cation Exchange Capacity (NH4-Sat.)	5.23 meq/100g	MSA Part 3 (1996) pp 1220-1221

Report Number
F24123-0346
Account Number
00060



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To: ATC GROUP SERVICES LLC
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7988 CENTERPOINT DR
INDIANAPOLIS, IN 46256-3381

For: PZ INSTALLATION (SCREENS)

PZ-24-4 24'-26'

PO Number: 170DUK0016

Date Received: 5/2/2024

Date Reported: 5/7/2024

Page: 2 of 8

Attn: SAMANTHA LAX

REPORT OF ANALYSIS

Analysis	Result	Method of Analysis
Sample: 15857-2	Lab Number: 76231	
Cation Exchange Capacity (NH4-Sat.)	4.24 meq/100g	MSA Part 3 (1996) pp 1220-1221

Report Number
F24123-0346
Account Number
00060



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To: ATC GROUP SERVICES LLC
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For: PZ INSTALLATION (SCREENS)

PZ-24-3 24'-26'

PO Number: 170DUK0016

Date Received: 5/2/2024

Date Reported: 5/7/2024

Page: 3 of 8

Attn: SAMANTHA LAX

REPORT OF ANALYSIS

Analysis	Result	Method of Analysis
Sample: 15857-3	Lab Number: 76232	
Cation Exchange Capacity (NH4-Sat.)	6.62 meq/100g	MSA Part 3 (1996) pp 1220-1221

Report Number
F24123-0346
Account Number
00060



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To: ATC GROUP SERVICES LLC
STE 100
7988 CENTERPOINT DR
INDIANAPOLIS, IN 46256-3381

For: PZ INSTALLATION (SCREENS)

PZ-24-3 30'-32'

PO Number: 170DUK0016
Date Received: 5/2/2024
Date Reported: 5/7/2024
Page: 4 of 8

Attn: SAMANTHA LAX

REPORT OF ANALYSIS

Analysis	Result	Method of Analysis
Sample: 15857-4	Lab Number: 76233	
Cation Exchange Capacity (NH4-Sat.)	3.59 meq/100g	MSA Part 3 (1996) pp 1220-1221

Report Number
F24123-0346
Account Number
00060



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To: ATC GROUP SERVICES LLC
STE 100
7988 CENTERPOINT DR
INDIANAPOLIS, IN 46256-3381

For: PZ INSTALLATION (SCREENS)

PZ-24-2 28'-30'

PO Number: 170DUK0016

Date Received: 5/2/2024

Date Reported: 5/7/2024

Page: 5 of 8

Attn: SAMANTHA LAX

REPORT OF ANALYSIS

Analysis	Result	Method of Analysis
Sample: 15857-5	Lab Number: 76234	
Cation Exchange Capacity (NH4-Sat.)	6.27 meq/100g	MSA Part 3 (1996) pp 1220-1221

Report Number
F24123-0346
Account Number
00060



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To: ATC GROUP SERVICES LLC
STE 100
7988 CENTERPOINT DR
INDIANAPOLIS, IN 46256-3381

For: PZ INSTALLATION (SCREENS)

PZ-24-2 32'-34'

PO Number: 170DUK0016

Date Received: 5/2/2024

Date Reported: 5/7/2024

Page: 6 of 8

Attn: SAMANTHA LAX

REPORT OF ANALYSIS

Analysis	Result	Method of Analysis
Sample: 15857-6	Lab Number: 76235	
Cation Exchange Capacity (NH4-Sat.)	3.72 meq/100g	MSA Part 3 (1996) pp 1220-1221

Report Number
F24123-0346
Account Number
00060



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7988 CENTERPOINT DR
INDIANAPOLIS, IN 46256-3381

For: PZ INSTALLATION (SCREENS)

PZ-24-1 28'-30'

PO Number: 170DUK0016

Date Received: 5/2/2024

Date Reported: 5/7/2024

Page: 7 of 8

Attn: SAMANTHA LAX

REPORT OF ANALYSIS

Analysis	Result	Method of Analysis
Sample: 15857-7	Lab Number: 76236	
Cation Exchange Capacity (NH4-Sat.)	6.34 meq/100g	MSA Part 3 (1996) pp 1220-1221

Report Number
F24123-0346
Account Number
00060



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To: ATC GROUP SERVICES LLC
STE 100
7988 CENTERPOINT DR
INDIANAPOLIS, IN 46256-3381

For: PZ INSTALLATION (SCREENS)

PZ-24-1 30'-32'

PO Number: 170DUK0016

Date Received: 5/2/2024

Date Reported: 5/7/2024

Page: 8 of 8

Attn: SAMANTHA LAX

REPORT OF ANALYSIS

Analysis	Result	Method of Analysis
Sample: 15857-8	Lab Number: 76237	
Cation Exchange Capacity (NH4-Sat.)	8.26 meq/100g	MSA Part 3 (1996) pp 1220-1221

Appendix E: Survey Data Provided by Jacobi, Toombs & Lanz

Piezometer Cordinates and Elevations
Duke Energy Indiana, LLC
Gallagher Generating Station
Floyd County, IN
Data Provided by Jacobi, Toombs & Lanz, Inc.

Piezometer	Northing	Easting	Ground Elevation	Top Casing Elevation	Top PVC Elevation	Concrete Elevation
PZ-24-1	1094878.79	278699.59	435.90	439.55	438.95	436.35
PZ-24-2	1094341.55	278764.17	435.80	439.24	438.98	436.13
PZ-24-3	1093851.71	278770.76	434.80	438.22	438.09	435.50
PZ-24-4	1093167.65	277919.56	425.50	428.62	428.49	425.91

Coordinate System: Indiana State Plane, East Zone
Horizontal Datum: NAD '83
Vertical Datum: NAVD '88
All elevations in feet above mean sea level

Appendix F: Indiana Record of Water Well Forms

**RECORD OF WATER WELL**

State Form 35680 (R5 / 9-04)

Driller--Mail complete record in 30 days to:
 INDIANA DEPT. OF NATURAL RESOURCES
 Division of Water
 402 W. Washington St., Rm. W264
 Indianapolis, IN 46204-2641
 (877) 928-3755 toll-free or (317) 232-4160

County Permit Number DNR Variance Number

Include if applicable

Fill in completely

WELL LOCATION

County where drilled FLOYD	Civil township name NEW ALBANY	Township number (N-S) 3S	Range number (E-W) 6E	Section 15
Driving directions to the well location (include trip origin, street & road names, intersecting roads, and compass directions). Show well address below and subdivision in box at lower right. There is space for a map on the reverse side. From Indianapolis take I-65 South to I-265 West to I-64 East to Exit 123 / 5th St. Exit. Go South on 5th to Main St / SR111. Turn right on Main St/SR111 and go to Jackson St. Turn left onto Jackson St and go to Galiger Station Rd. Turn right on Galiger Station Rd and follow to facility's entrance gate.			UTM Northing 16S 601612mE	UTM Easting 16S 4234654mN
Well address: 30 Jackson St., New Albany			Datum <input type="checkbox"/> NAD83 <input checked="" type="checkbox"/>	GPS used
Subdivision name & lot number (if applicable)				

If drilled for water supply, this well is: First well on property Replacement well Additional well on property Dry hole**OWNER - CONTRACTOR**

Well owner--name DUKE ENERGY	Telephone number (317) 839-9611	
Address (number and street, city, state, ZIP code) 1000 E. MAIN St., PLAINFIELD, IN		
Environmental Consultant--name Atlas Technical Consultants LLC	Address (number and street, city, state, ZIP code) 7988 CENTERPOINT DR., INDIANAPOLIS, IN 46256	Telephone number (317) 849-4990
Drilling contractor--name Atlas Technical Consultants LLC	Address (number and street, city, state, ZIP code) 7988 CENTERPOINT DR., INDIANAPOLIS, IN 46256	Telephone number (317) 849-4990
Equipment operator--name J. Mitchner	License number of operator 4292	Date of well completion 4/23/24

CONSTRUCTION DETAILS**WELL LOG**

Use of well <input type="checkbox"/> Home <input type="checkbox"/> Public supply <input type="checkbox"/> Industrial / Commercial <input type="checkbox"/> Livestock <input type="checkbox"/> Irrigation <input checked="" type="checkbox"/> Monitoring / Environ. <input type="checkbox"/> Test Hole Other: _____	Drilling method <input type="checkbox"/> Rotary <input type="checkbox"/> Reverse Rotary <input type="checkbox"/> Cable Tool <input type="checkbox"/> Jet <input type="checkbox"/> Bucket / Bore <input checked="" type="checkbox"/> Auger (including HSA) <input type="checkbox"/> Direct Push Other: _____	Type of pump <input type="checkbox"/> Submersible <input type="checkbox"/> Shallow-well jet <input type="checkbox"/> Deep-well jet <input checked="" type="checkbox"/> No pump installed Other: _____	Pump depth setting (feet) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	FORMATIONS: Type of material PZ-24-01 Brown Silty Clay Brown Sandy Clay Loam Gray Sand Loam Black Shale	From (feet) 0.0 8.3 28.0 33.9	To (feet) 8.3 28.0 33.9 34.5				
Total depth of well (feet) 34	Borehole diameter (in.) 8	Gravel pack inserted <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Casing length (feet) 24	Casing diameter (in.) 2	Casing material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel	Screen length (feet) 10	Screen diameter (in.) 2	Screen material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel	Screen slot size 0.01	Water quality (clear, odor, etc.)

WELL CAPACITY TEST

Test method <input type="checkbox"/> Air <input type="checkbox"/> Bailing <input type="checkbox"/> Pumping	Static level below surface feet	Gallons per min.	Hours tested	Drawdown (change in level) feet
---	------------------------------------	------------------	--------------	------------------------------------

GROUTING**WELL ABANDONMENT**

Grout material BENTONITE	Grout depth to 22.0 1	Sealing material	Depth filled from to
Installation method TREMIE & POUR	No. of bags used 1	Installation method	No. of bags used

Additional space for well log and comments on reverse side

I hereby swear or affirm, under the penalties for perjury, that the information submitted herewith is, to the best of my knowledge and belief, true, accurate, and complete.	Signature of drilling contractor or authorized representative <i>Zach Vaughan</i>	Date 5/1/24
--	--	-----------------------

**RECORD OF WATER WELL**

State Form 35680 (R5 / 9-04)

Driller--Mail complete record in 30 days to:
 INDIANA DEPT. OF NATURAL RESOURCES
 Division of Water
 402 W. Washington St., Rm. W264
 Indianapolis, IN 46204-2641
 (877) 928-3755 toll-free or (317) 232-4160

County Permit Number	
DNR Variance Number	

Include if applicable

Fill in completely

WELL LOCATION

County where drilled FLOYD	Civil township name NEW ALBANY	Township number (N-S) 3S	Range number (E-W) 6E	Section 15
Driving directions to the well location (include trip origin, street & road names, intersecting roads, and compass directions). Show well address below and subdivision in box at lower right. There is space for a map on the reverse side. From Indianapolis take I-65 South to I-265 West to I-64 East to Exit 123 / 5th St. Exit. Go South on 5th to Main St / SR111. Turn right on Main St/SR111 and go to Jackson St. Turn left onto Jackson St and go to Galiger Station Rd. Turn right on Galiger Station Rd and follow to facility's entrance gate.			UTM Northing 16S 601634mE	UTM Easting 16S 4234490mN
Well address: 30 Jackson St., New Albany			Datum <input type="checkbox"/> NAD83 <input checked="" type="checkbox"/>	GPS used
Subdivision name & lot number (if applicable)				

If drilled for water supply, this well is: First well on property Replacement well Additional well on property Dry hole

OWNER - CONTRACTOR

Well owner--name DUKE ENERGY	Telephone number (317) 839-9611	
Address (number and street, city, state, ZIP code) 1000 E. MAIN St., PLAINFIELD, IN		
Environmental Consultant--name Atlas Technical Consultants LLC	Address (number and street, city, state, ZIP code) 7988 CENTERPOINT DR., INDIANAPOLIS, IN 46256	Telephone number (317) 849-4990
Drilling contractor--name Atlas Technical Consultants LLC	Address (number and street, city, state, ZIP code) 7988 CENTERPOINT DR., INDIANAPOLIS, IN 46256	Telephone number (317) 849-4990
Equipment operator--name J. Mitchner	License number of operator 4292	Date of well completion 4/24/24

CONSTRUCTION DETAILS**WELL LOG**

Use of well <input type="checkbox"/> Home <input type="checkbox"/> Public supply <input type="checkbox"/> Industrial / Commercial <input type="checkbox"/> Livestock <input type="checkbox"/> Irrigation <input checked="" type="checkbox"/> Monitoring / Environ. <input type="checkbox"/> Test Hole Other: _____	Drilling method <input type="checkbox"/> Rotary <input type="checkbox"/> Reverse Rotary <input type="checkbox"/> Cable Tool <input type="checkbox"/> Jet <input type="checkbox"/> Bucket / Bore <input checked="" type="checkbox"/> Auger (including HSA) <input type="checkbox"/> Direct Push Other: _____	Type of pump <input type="checkbox"/> Submersible <input type="checkbox"/> Shallow-well jet <input type="checkbox"/> Deep-well jet <input checked="" type="checkbox"/> No pump installed Other: _____	FORMATIONS: Type of material		From (feet)	To (feet)
			PZ-24-02			
Total depth of well (feet) 34.3			Gravel pack inserted <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Asphalt	0.0	0.5
Casing length (feet) 24.3	Borehole diameter (in.) 8	Casing diameter (in.) 2	Casing material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel	Brown Sandy Clay Loam	0.5	27.8
Screen length (feet) 10	Screen diameter (in.) 2	Screen material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel	Other: _____	Gray Sandy Clay	27.8	32.3
Screen slot size 0.01	Water quality (clear, odor, etc.)			Gray Loamy Sand	32.3	34.3

WELL CAPACITY TEST

Test method <input type="checkbox"/> Air <input type="checkbox"/> Bailing <input type="checkbox"/> Pumping	Static level below surface 19 feet	Gallons per min.	Hours tested	Drawdown (change in level) feet
---	--	------------------	--------------	------------------------------------

GROUTING**WELL ABANDONMENT**

Grout material BENTONITE	Grout depth to 22.3 1	Sealing material	Depth filled from to
Installation method TREMIE & POUR	No. of bags used 1	Installation method	No. of bags used

Additional space for well log and comments on reverse side

I hereby swear or affirm, under the penalties for perjury, that the information submitted herewith is, to the best of my knowledge and belief, true, accurate, and complete.	Signature of drilling contractor or authorized representative <i>Zach Vaughan</i>	MUST BE SIGNED OR STAMPED	Date 5/1/24
--	--	---------------------------	-----------------------

**RECORD OF WATER WELL**

State Form 35680 (R5 / 9-04)

Driller--Mail complete record in 30 days to:
 INDIANA DEPT. OF NATURAL RESOURCES
 Division of Water
 402 W. Washington St., Rm. W264
 Indianapolis, IN 46204-2641
 (877) 928-3755 toll-free or (317) 232-4160

County Permit Number	
DNR Variance Number	

Include if applicable

Fill in completely

WELL LOCATION

County where drilled FLOYD	Civil township name NEW ALBANY	Township number (N-S) 3S	Range number (E-W) 6E	Section 15
Driving directions to the well location (include trip origin, street & road names, intersecting roads, and compass directions). Show well address below and subdivision in box at lower right. There is space for a map on the reverse side. From Indianapolis take I-65 South to I-265 West to I-64 East to Exit 123 / 5th St. Exit. Go South on 5th to Main St / SR111. Turn right on Main St/SR111 and go to Jackson St. Turn left onto Jackson St and go to Galiger Station Rd. Turn right on Galiger Station Rd and follow to facility's entrance gate.			UTM Northing 16S 601639mE	UTM Easting 16S 4234341mN
Well address: 30 Jackson St., New Albany			Datum <input type="checkbox"/> NAD83 <input checked="" type="checkbox"/>	GPS used
Subdivision name & lot number (if applicable)				

If drilled for water supply, this well is: First well on property Replacement well Additional well on property Dry hole

OWNER - CONTRACTOR

Well owner--name DUKE ENERGY	Telephone number (317) 839-9611	
Address (number and street, city, state, ZIP code) 1000 E. MAIN St., PLAINFIELD, IN		
Environmental Consultant--name Atlas Technical Consultants LLC	Address (number and street, city, state, ZIP code) 7988 CENTERPOINT DR., INDIANAPOLIS, IN 46256	Telephone number (317) 849-4990
Drilling contractor--name Atlas Technical Consultants LLC	Address (number and street, city, state, ZIP code) 7988 CENTERPOINT DR., INDIANAPOLIS, IN 46256	Telephone number (317) 849-4990
Equipment operator--name J. Mitchner	License number of operator 4292	Date of well completion 4/25/24

CONSTRUCTION DETAILS**WELL LOG**

Use of well <input type="checkbox"/> Home <input type="checkbox"/> Public supply <input type="checkbox"/> Industrial / Commercial <input type="checkbox"/> Livestock <input type="checkbox"/> Irrigation <input checked="" type="checkbox"/> Monitoring / Environ. <input type="checkbox"/> Test Hole Other: _____	Drilling method <input type="checkbox"/> Rotary <input type="checkbox"/> Reverse Rotary <input type="checkbox"/> Cable Tool <input type="checkbox"/> Jet <input type="checkbox"/> Bucket / Bore <input checked="" type="checkbox"/> Auger (including HSA) <input type="checkbox"/> Direct Push Other: _____	Type of pump <input type="checkbox"/> Submersible <input type="checkbox"/> Shallow-well jet <input type="checkbox"/> Deep-well jet <input checked="" type="checkbox"/> No pump installed Other: _____	Pump depth setting (feet) _____	FORMATIONS: Type of material PZ-24-03 Brown Silty Clay Loam Brown Sandy Clay Loam Gray Sandy Loam	From (feet) 0.0 16.2 26.7	To (feet) 16.2 26.7 32.3
Total depth of well (feet) 32.3	Borehole diameter (in.) 8	Gravel pack inserted <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Casing length (feet) 22.3	Casing diameter (in.) 2	Casing material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel				
Screen length (feet) 10	Screen diameter (in.) 2	Screen material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel				
Screen slot size 0.01	Water quality (clear, odor, etc.)					

WELL CAPACITY TEST

Test method <input type="checkbox"/> Air <input type="checkbox"/> Bailing <input type="checkbox"/> Pumping	Static level below surface 30 feet	Gallons per min.	Hours tested	Drawdown (change in level) feet
---	--	------------------	--------------	------------------------------------

GROUTING**WELL ABANDONMENT**

Grout material BENTONITE	Grout depth to 20.3 1	Sealing material	Depth filled from to
Installation method TREMIE & POUR	No. of bags used 1	Installation method	No. of bags used

Additional space for well log and comments on reverse side

I hereby swear or affirm, under the penalties for perjury, that the information submitted herewith is, to the best of my knowledge and belief, true, accurate, and complete.	Signature of drilling contractor or authorized representative <i>Zach Vaughan</i>	MUST BE SIGNED OR STAMPED	Date 5/1/24
--	--	---------------------------	-----------------------

**RECORD OF WATER WELL**

State Form 35680 (R5 / 9-04)

Driller--Mail complete record in 30 days to:
 INDIANA DEPT. OF NATURAL RESOURCES
 Division of Water
 402 W. Washington St., Rm. W264
 Indianapolis, IN 46204-2641
 (877) 928-3755 toll-free or (317) 232-4160

County Permit Number DNR Variance Number

Include if applicable

Fill in completely

WELL LOCATION

County where drilled FLOYD	Civil township name NEW ALBANY	Township number (N-S) 3S	Range number (E-W) 6E	Section 15
Driving directions to the well location (include trip origin, street & road names, intersecting roads, and compass directions). Show well address below and subdivision in box at lower right. There is space for a map on the reverse side. From Indianapolis take I-65 South to I-265 West to I-64 East to Exit 123 / 5th St. Exit. Go South on 5th to Main St / SR111. Turn right on Main St/SR111 and go to Jackson St. Turn left onto Jackson St and go to Galiger Station Rd. Turn right on Galiger Station Rd and follow to facility's entrance gate.			UTM Northing 16S 601382mE	UTM Easting 16S 4234129mN
Well address: 30 Jackson St., New Albany			Datum <input type="checkbox"/> NAD83 <input checked="" type="checkbox"/>	GPS used
Subdivision name & lot number (if applicable)				

 If drilled for water supply, this well is: First well on property Replacement well Additional well on property Dry hole
OWNER - CONTRACTOR

Well owner--name DUKE ENERGY	Telephone number (317) 839-9611	
Address (number and street, city, state, ZIP code) 1000 E. MAIN St., PLAINFIELD, IN		
Environmental Consultant--name Atlas Technical Consultants LLC	Address (number and street, city, state, ZIP code) 7988 CENTERPOINT DR., INDIANAPOLIS, IN 46256	Telephone number (317) 849-4990
Drilling contractor--name Atlas Technical Consultants LLC	Address (number and street, city, state, ZIP code) 7988 CENTERPOINT DR., INDIANAPOLIS, IN 46256	Telephone number (317) 849-4990
Equipment operator--name J. Mitchner	License number of operator 4292	Date of well completion 4/18/24

CONSTRUCTION DETAILS**WELL LOG**

Use of well <input type="checkbox"/> Home <input type="checkbox"/> Public supply <input type="checkbox"/> Industrial / Commercial <input type="checkbox"/> Livestock <input type="checkbox"/> Irrigation <input checked="" type="checkbox"/> Monitoring / Environ. <input type="checkbox"/> Test Hole Other: _____	Drilling method <input type="checkbox"/> Rotary <input type="checkbox"/> Reverse Rotary <input type="checkbox"/> Cable Tool <input type="checkbox"/> Jet <input type="checkbox"/> Bucket / Bore <input checked="" type="checkbox"/> Auger (including HSA) <input type="checkbox"/> Direct Push Other: _____	Type of pump <input type="checkbox"/> Submersible <input type="checkbox"/> Shallow-well jet <input type="checkbox"/> Deep-well jet <input checked="" type="checkbox"/> No pump installed Other: _____	Pump depth setting (feet) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	FORMATIONS: Type of material PZ-24-04 Brown Silty Clay Gray Sandy Loam Black Shale	From (feet) 0.0 17.2 26.1	To (feet) 17.2 26.1 28.0
Total depth of well (feet) 26	Borehole diameter (in.) 8	Gravel pack inserted <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Casing material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel			
Casing length (feet) 16	Casing diameter (in.) 2	Casing material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel	Screen material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel			
Screen length (feet) 10	Screen diameter (in.) 2	Screen material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel	Screen slot size 0.01	Water quality (clear, odor, etc.)		

WELL CAPACITY TEST

Test method <input type="checkbox"/> Air <input type="checkbox"/> Bailing <input type="checkbox"/> Pumping	Static level below surface 13.5 feet	Gallons per min.	Hours tested	Drawdown (change in level) feet
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GROUTING**WELL ABANDONMENT**

Grout material BENTONITE	Grout depth to 14.0	Sealing material	Depth filled from to
Installation method TREMIE & POUR	No. of bags used 1	Installation method	No. of bags used

Additional space for well log and comments on reverse side

I hereby swear or affirm, under the penalties for perjury, that the information submitted herewith is, to the best of my knowledge and belief, true, accurate, and complete.	Signature of drilling contractor or authorized representative <i>Zach Vaughan</i>	Date 5/1/24
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