Indianapolis Power & Light Company
Eagle Valley Generating Station

History of Construction of CCR Surface Impoundments

Prepared by

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S&L Project No. 10572-085

Rev. 0
Issue Date: October 14, 2016
Issue Purpose: Use

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<u>EXHIBITS:</u>

1. Ash Pond System Location
2. Aerial View of Eagle Valley Generating Station & Ancillary Features
3. Ash Pond System Area & Capacity Curves

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B. Soil Boring Logs (39 pages)
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D. Topographic & Bathymetric Surveys of Ash Pond System (3 pages)
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1 PURPOSE

Pursuant to 40 CFR 257.73(c)(1), this document provides a history of construction of the coal combustion residual (CCR) surface impoundments at Indianapolis Power & Light Company's (IPL) Eagle Valley Generating Station. Based on the applicability criteria presented in 40 CFR 257.73(b), the following existing CCR surface impoundments are addressed herein:

- Pond A,
- Pond B, and
- Pond C.

2 HISTORY OF CONSTRUCTION REQUIREMENTS PER 40 CFR 257

This document provides, to the extent feasible, the information to be included in a history of construction pursuant to 40 CFR 257.73(c)(1). Per 40 CFR 257.73(c)(1), "…the owner or operator of the CCR unit must compile a history of construction, which shall contain, to the extent feasible, the information specified in paragraphs (c)(1)(i) through (xi) of [40 CFR 257.73]." The preamble to 40 CFR 257 clarifies the Environmental Protection Agency's (EPA) intent for including the clause "to the extent feasible." The preamble states, "EPA acknowledges that much of the construction history of the surface impoundment maybe *[sic]* unknown or lost." Elsewhere, the preamble continues:

> EPA is using the phrase "to the extent available" and clarifying that the term requires the owner or operator to provide information on the history of construction only to the extent that such information is reasonably and readily available. EPA intends facilities to provide relevant design and construction information only if factual documentation exists. EPA does not expect owners or operators to generate new information or provide anecdotal or speculative information regarding the CCR surface impoundment's design and construction history.

Table 1 lists the information requested by 40 CFR 257.73(c)(1)(i) through (xi).

Readily available and applicable historical information (e.g., drawings, reports, historical aerial photographs, etc.) relevant to the existing CCR surface impoundments at Eagle Valley Generating Station have been reviewed. This document compiles this information into a single history of construction document for Ponds A, B, and C. Several of the historical documents that were reviewed report elevations with respect to the National Geodetic Vertical Datum of 1929 ("NGVD29"). This datum is approximately 0.42 feet higher than the present-day standard, the North American Vertical Datum of 1988 ("NAVD88"). All elevations referenced in this history of construction are with respect to NAVD88.

Table 1: Requested Information for History of Construction

40 CFR Reference	Requested Information	Location in History of Construction
257.73(c)(1)(i)	The name and address of the person(s) owning or operating the CCR unit.	Section 3
257.73(c)(1)(i)	The name associated with the CCR unit.	Section 3
257.73(c)(1)(i)	The identification number of the CCR unit if one has been assigned by the state.	N/A
257.73(c)(1)(ii)	The location of the CCR unit identified on the most recent U.S. Geological Survey (USGS) 7½ minute or 15 minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available.	Section 3 Exhibit 1
257.73(c)(1)(iii)	A statement of the purpose for which the CCR unit is used.	Section 5
257.73(c)(1)(iv)	The name and size in acres of the watershed within which the CCR unit is located.	Section 3
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.	Section 4
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.	Section 4
257.73(c)(1)(vi)	The method of site preparation and construction of each zone of the CCR unit.	Section 4
257.73(c)(1)(vi)	The approximate dates of construction of each successive stage of construction of the CCR unit.	Section 4
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.	Section 4 Section 5 Attachment A Attachment D
257.73(c)(1)(viii)	A description of the type, purpose, and location of existing instrumentation.	Section 6 Attachment E
257.73(c)(1)(ix)	Area-capacity curves for the CCR unit.	Section 5 Exhibit 3
257.73(c)(1)(x)	A description of each spillway and diversion design features and capacities and calculations used in their determination.	N/A
257.73(c)(1)(xi)	The construction specifications and provisions for surveillance, maintenance, and repair of the CCR unit.	Section 6

3 SITE DESCRIPTION & LOCATION

IPL owns and operates Eagle Valley Generating Station, which is located approximately four miles north of downtown Martinsville, Indiana, in Morgan County. The Station's address is 4040 Blue Bluff Road, Martinsville, IN 46151 (Latitude: 39.486°N, Longitude: 86.418°W). The Station's property is contained within Section 16 of Township 12N, Range 1E of the Second Principal Meridian. Exhibit 1 shows the approximate location of the Station's Ash Pond System on a reproduction of the USGS 7.5-minute topographic map of the Martinsville, Indiana, Quadrangle.

The Station's Ash Pond System, which is shown in Exhibit 2, includes the following existing CCR surface impoundments as defined by 40 CFR 257.53:

- Pond A,
- Pond B, and
- Pond C.

These existing CCR surface impoundments are contained within the Upper White River watershed (Hydrologic Unit Code 05120201), which extends over approximately 1,453,440 acres of central Indiana. Ponds A, B, and C have not been assigned identification numbers by the State of Indiana.

4 HISTORICAL INFORMATION & STAGES OF CONSTRUCTION

The following construction histories were developed for Ponds A, B, and C through the review of historical design drawings, which are included herein as Attachment A, and reports. Boring logs prepared by SCS BT Squared ("SCS") and boring logs and cone penetrometer test (CPT) data prepared by Terracon Consultants, Inc. ("Terracon") were also reviewed and are included herein as Attachments B and C, respectively. In accordance with 40 CFR 257.73(c)(1), this construction history only includes information that was readily available at the time this document was written.

Although former Ponds D and E are depicted in several of this document's attachments, they are not discussed herein. Prior to October 2015, CCR was also treated in former Pond D; former Pond E had been filled with compacted ash since August 2010. By October 16, 2015, IPL had implemented operational changes to prevent future deposits of CCR into former Pond D and had completed construction tasks to prevent liquid impoundment in these former CCR surface impoundments. Going forward, IPL will not place CCR into former Ponds D and E will prevent the future impoundment of liquids. Therefore, former Ponds D and E do not satisfy either of the definitions for existing CCR surface impoundments or inactive CCR surface impoundments given in 40 CFR 257.53. Consequently, former Ponds D and E are exempt from the requirements stipulated in 40 CFR 257.73(c)(1).

Based on several boring and CPT logs, the Eagle Valley Generating Station ash ponds are generally founded at an approximate elevation of 602 feet, where a natural lean clay is often encountered. When present, the thickness of this clay layer varies between 2 to 10 feet underneath the ash ponds. Near the historical locations of dikes constructed in the 1950s, this clay tends to exhibit a medium stiff to stiff consistency. Conversely, softer clays are more common further from the surface and at borings drilled near the Discharge Canal.

The secondary natural foundation layer underlying the clay layer is typically a medium dense, poorly graded sand, which is sometimes interbedded with silt and/or gravel. This granular soil layer generally extends deep into the subsurface, often beyond the elevations at which the boring and CPTs were terminated.

Eagle Valley Generating Station commissioned its first ash pond in 1949. This initial ash pond occupied an area west of and adjacent to the Indiana Southern Railroad (ISRR) rail line, encompassing most of Pond C and the northern areas of Ponds A and B. The construction of the Discharge Canal in the 1950s required this ash pond to be modified. Consequently, a new dike was constructed south of and adjacent to the new Discharge Canal, which is the area currently occupied by the northern perimeter dike abutting the pool areas for Ponds A and C. Using soils obtained from the Discharge Canal excavation, this new perimeter dike was constructed with approximately 1.5-Horizontal:1-Vertical (“1.5H:1V”) interior and exterior side slopes extending from natural grade up to an approximately 10-foot-wide crest at an approximate elevation of 608 feet.

In 1956, the ash disposal area was expanded by constructing perimeter dikes in the area currently occupied by Pond A’s southern and eastern perimeter dikes. A narrow excavation in this new ash disposal area provided the native soils used for constructing these new dikes. Similar to the previously-constructed dikes, the new dikes were constructed with approximately 1.5H:1V side slopes extending from grade – an approximate elevation of 604 feet – up to approximately 6-foot-wide crests established at an approximate elevation of 606 feet.

The ash disposal area was reconfigured into its present-day footprint in the early 1980s. According to six borings drilled in their vicinity, these new dikes were primarily constructed with ash obtained throughout the reconfiguration process. The ash fill was compacted and graded to approximately 3H:1V and 2H:1V exterior and interior side slopes, respectively. The dikes’ crests were established at an approximate elevation of 619 feet and were approximately 10-feet wide. Unlike the dikes constructed in the 1950s, these new dikes were constructed with clay cores that were, at a minimum, 6-feet wide.

In the early 1980s, subsequent to the reconfiguration of the perimeter dikes, a diversion dike was constructed to a crest elevation of approximately 617 feet in the vicinity of the present-day partition dike between Ponds A and C.

The present-day configurations for Ponds A, B, and C were established in 1991 following a two-phase construction process. Vertical expansions for the dikes along the neck of Pond A were completed in the first phase of construction. Pond A’s remaining perimeter dikes were expanded vertically during the second phase, which also provided the partition dike separating Ponds A and B. Prior to any of this work, a partition dike between Ponds B and C was constructed.

Although they were built during different phases of construction, the partition dikes separating Pond A from Ponds B and C had similar design specifications. Both dikes were formed by placing compacted ash fill atop an existing dike and/or stored ash. This ash fill was excavated from an abandoned ash pond east of the ISRR rail line. The ash was to be placed and compacted to within 85% of its maximum density until the specified crest elevation, approximately 629 feet, was reached. The method for calculating the ash fill's maximum density was not specified. Boring and CPT logs for the partition dike between Ponds A and B typically show a compacted ash layer extending from the dike's crest down to an approximate elevation of 610 feet, where a deposit of very loose ash exists. In addition, these new partition dikes were constructed with approximately 8-foot-wide crests with adjoining interior and exterior side slopes graded at approximately 3H:1V.

Similar to the composition of the partition dikes, the vertical expansions for Pond A's perimeter dikes were constructed with ash material excavated from an abandoned ash pond east of the ISRR rail line. This ash fill was placed up to an elevation that is approximately 1 foot below the dikes' present-day crest elevations. The expanded perimeter dikes were constructed with approximately 10-foot-wide crests and 2H:1V interior side slopes. In order to create a uniform outer face for the perimeter dikes, the exterior slopes were graded at approximately 3H:1V. Finally, an approximately 1-foot-thick top soil layer was placed over the outer face and crest of each perimeter dike, thereby bringing the final crest elevation of each perimeter dike to its present-day elevation. Access roads to traverse the dike's crests were constructed using a 6-inch-thick layer of compacted bottom ash.

Unlike the partition dikes, a clay core was placed within Pond A's modified perimeter dikes. This core occupies, at a minimum, a 6-foot-thick zone of the perimeter dikes. In general, the boring and CPT logs located near the centers of Pond A's perimeter dikes show a lean clay core extending down from the crest elevation to an approximate elevation of 615 feet. The consistency of the clay core varies within Pond A's perimeter dikes, ranging from soft to very stiff. Underlying the clay core is typically a loose to medium dense ash fill that extends to an approximate elevation of 612 feet. However, denser ash deposits are observed in borings drilled through the original dike that was constructed in the 1980s. Below an approximate elevation of 612 feet is typically a very loose to loose ash deposit that extends down to the dikes' base elevations.

5 CURRENT CCR SURFACE IMPOUNDMENT CONFIGURATIONS

As previously mentioned, Exhibit 2 provides an aerial view of the current configuration of the Station's Ash Pond System. Because the Station ceased power-generating operations in April 2016, it only conveys non-CCR, low volume wastewater to the Ash Pond System for sedimentation. Sedimentation of the constituents therein subsequently occurs within Ponds A, B, and C, which are interconnected with a network of discharge pipes. Pond A serves as the Station's initial settling pond and directs residual wastewater to Pond B through two 24-inch-diameter corrugated metal pipes, which have invert levels at an approximate elevation of 624 feet. After undergoing secondary sedimentation in Pond B, the wastewater subsequently flows through two more 24-inch-diameter corrugated metal pipes, which have invert levels at an approximate elevation of 616 feet. Following the final sedimentation of the finer waste constituents, the treated water discharges through a concrete outlet structure (National Pollutant Discharge Elimination System-permitted Outfall 103) into the Discharge Canal.

Table 2 provides a list of key features for each existing CCR surface impoundment at Eagle Valley Generating Station. Existing minimum crest elevations, storage areas, and storage capacities were obtained from site-specific topographic and bathymetric surveys conducted in 2015. These surveys are included herein as Attachment D. Corresponding area-capacity curves for Ponds A, B, and C, which were developed from these surveys, are provided in Exhibit 3.

Table 2: Attributes of Existing CCR Surface Impoundments

Pond Designation	Purpose	Existing Minimum Crest Elevation[1] (ft)	Estimated Existing Storage Area (acres)	Estimated Existing Storage Capacity (acre-ft)
Pond A	Primary Settling	626	19.9	405.9
Pond B	Secondary Settling	618	11.1	158.1
Pond C	Final Settling	617	7.1	95.4

[1] Elevations are with respect to NAVD88.

6 ACTIVE MAINTENANCE & SURVEILLANCE PROGRAMS

Specifications and provisions for surveillance, maintenance, and repair of the Station's existing CCR surface impoundments are contained within the Station's active Ash Pond Operations and Maintenance Plan ("O&M Plan"). The O&M Plan is included herein as Attachment E. This document:

- Discusses the existing instrumentation installed to monitor the water level in each CCR surface impoundment,
- Describes the active inspection program,
- Provides provisions for maintaining the vegetation, riprap, and access roads along the CCR surface impoundments' dikes,
- Discusses remedial actions for damages caused by erosion and seepage,
- Provides provisions for maintaining the outlets within the Ash Pond System, and
- Provides example forms used to document each repair/maintenance activity.

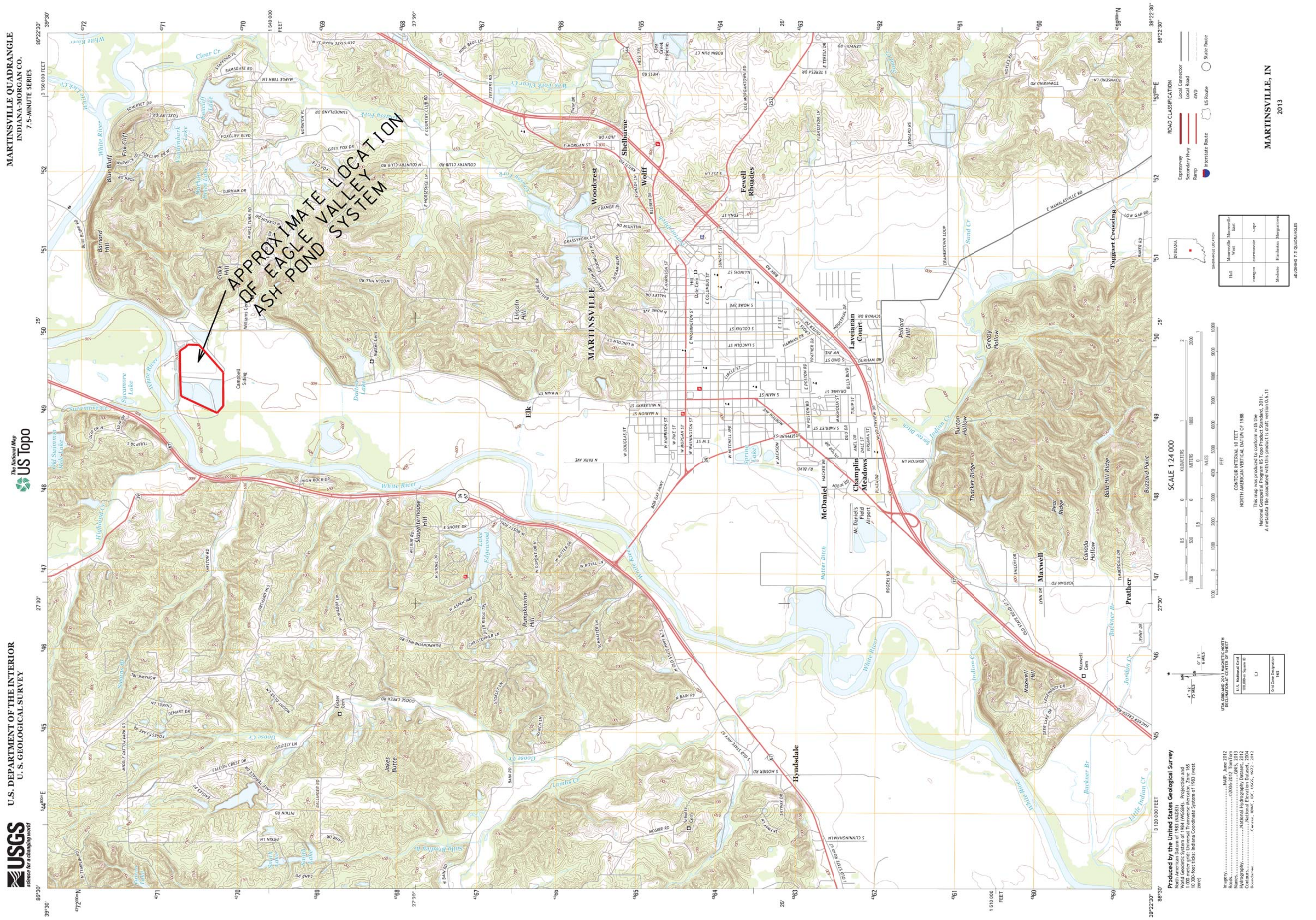
IPL performs routine inspections of the Ash Pond System and employs a separate entity to perform annual independent maintenance inspections.

As shown on Figure 1 of Attachment E, several piezometers and staff gauges are distributed around and within the Station's Ash Pond System. The seven piezometers installed around the ash ponds' perimeters are used to monitor the groundwater levels within the dikes and foundation materials. The four staff gauges, which are installed within the ash ponds, monitor the elevation of the impounded water in each ash pond. Readings from these piezometers and staff gauges are recorded, at a minimum, on a monthly basis.

7 CONCLUSION

In compliance with 40 CFR 257.73(c)(1), this history of construction has compiled, to the extent feasible, the relevant historical and current information regarding the existing CCR surface impoundments (i.e., Ponds A, B, and C) at Eagle Valley Generating Station.

EXHIBITS



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RELEASE INFORMATION		
REV.	DATE	DESCRIPTION
0	10/14/2016	FOR USE

ISSUE PURPOSE: USE

SPECIFICATION: ---

PROJECT NO.: 10572-085

CAD FILE NAME: EV HOC - EXHIBIT 1.DGN

PREPARED BY: ---

REVIEWED BY: ---

APPROVED BY: ---

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PROJECT

EAGLE VALLEY
GENERATING STATION
INDIANAPOLIS POWER & LIGHT

DRAWING TITLE

ASH POND SYSTEM LOCATION

DRAWING NUMBER	REVISION
EXHIBIT 1	0

SHEET OF

ZD8911/0+5089/✱✱Sn12‹
Form GDG-0401-01-08. ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision --. Revision Date: XX-XX-XXXX

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...✱EV HOC - Exhibit 1.dgn

NOT TO SCALE

NORTH

NOTES

1. AERIAL IMAGE, DATED 10/17/2015, SHOWN ON THIS DRAWING WAS OBTAINED USING GOOGLE EARTH PRO v6.2.

HOLD INFORMATION

NO.	DESCRIPTION

RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	10/14/2016	FOR USE

ISSUE PURPOSE: USE
SPECIFICATION: ---
PROJECT NO.: 10572-085

CAD FILE NAME: EV HOC - EXHIBIT 2.DGN
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PROJECT

EAGLE VALLEY
GENERATING STATION
INDIANAPOLIS POWER & LIGHT

DRAWING TITLE

AERIAL VIEW OF EAGLE
VALLEY GENERATING STATION &
ANCILLARY FEATURES

DRAWING NUMBER	REVISION
EXHIBIT 2	0

SHEET OF

ZD8911/0+5089/**Sn12(
Form GDG-0401-01-08. ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision --. Revision Date: XX-XX-XXXX

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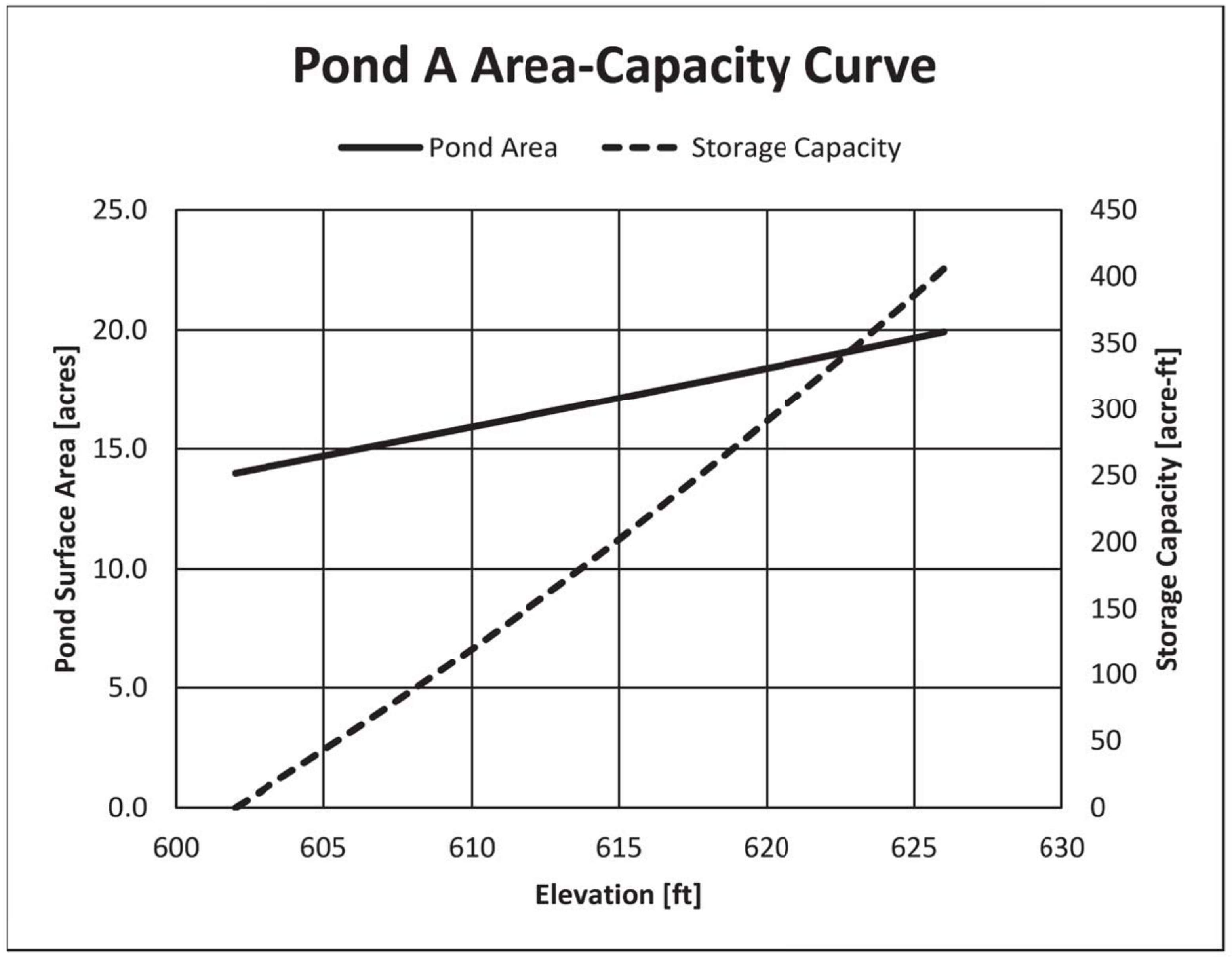
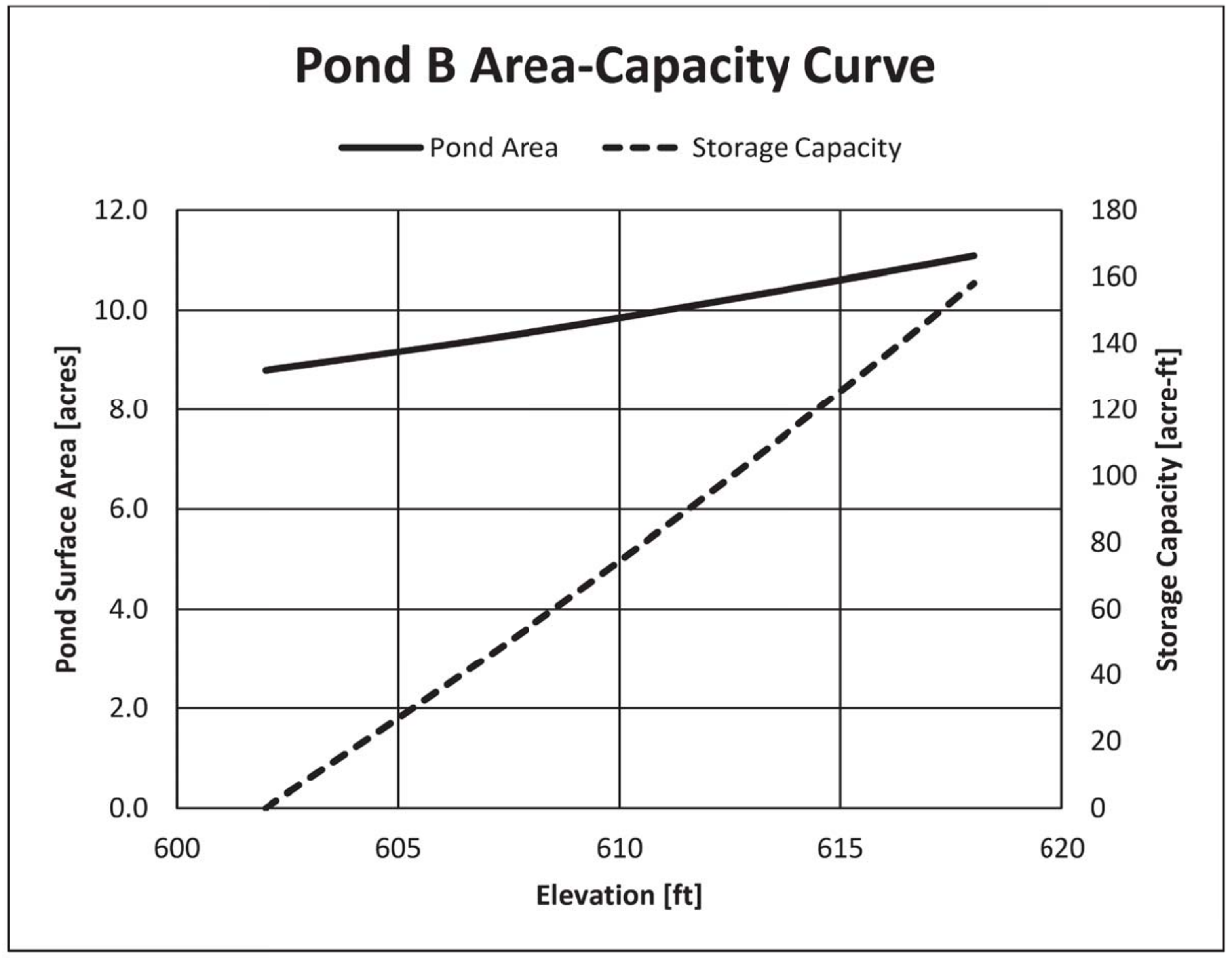
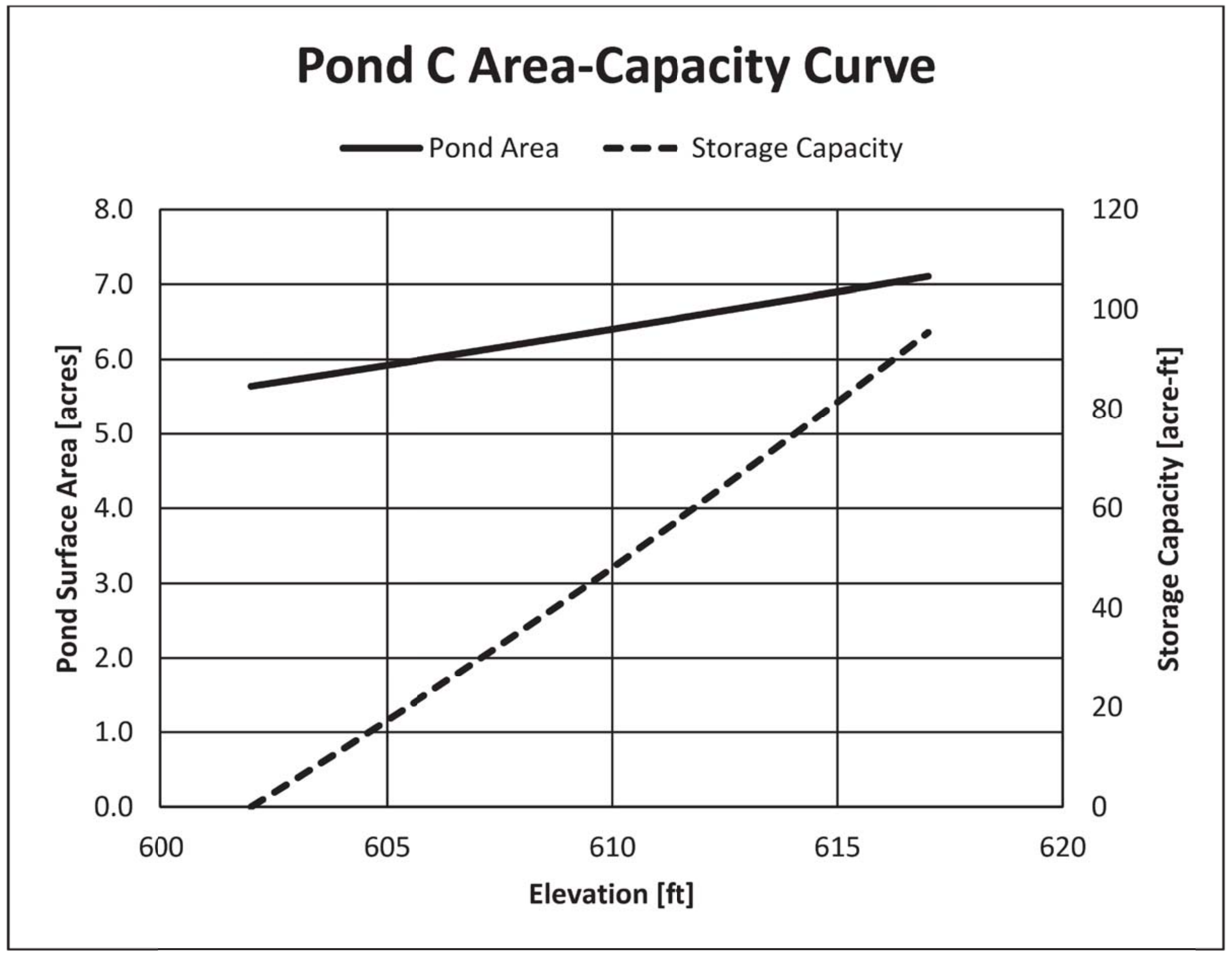


Pond A Area-Capacity Curve



Pond B Area-Capacity Curve



Pond C Area-Capacity Curve

NOTES

1. ALL ELEVATIONS ARE WITH RESPECT TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

HOLD INFORMATION

NO.	DESCRIPTION

RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	10/14/2016	FOR USE

ISSUE PURPOSE: USE

SPECIFICATION: ---

PROJECT NO.: 10572-085

CAD FILE NAME: EV HOC - EXHIBIT 3.DGN

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PROJECT

EAGLE VALLEY
GENERATING STATION
INDIANAPOLIS POWER & LIGHT

DRAWING TITLE

ASH POND SYSTEM
AREA & CAPACITY CURVES

DRAWING NUMBER	REVISION
EXHIBIT 3	0
SHEET OF	

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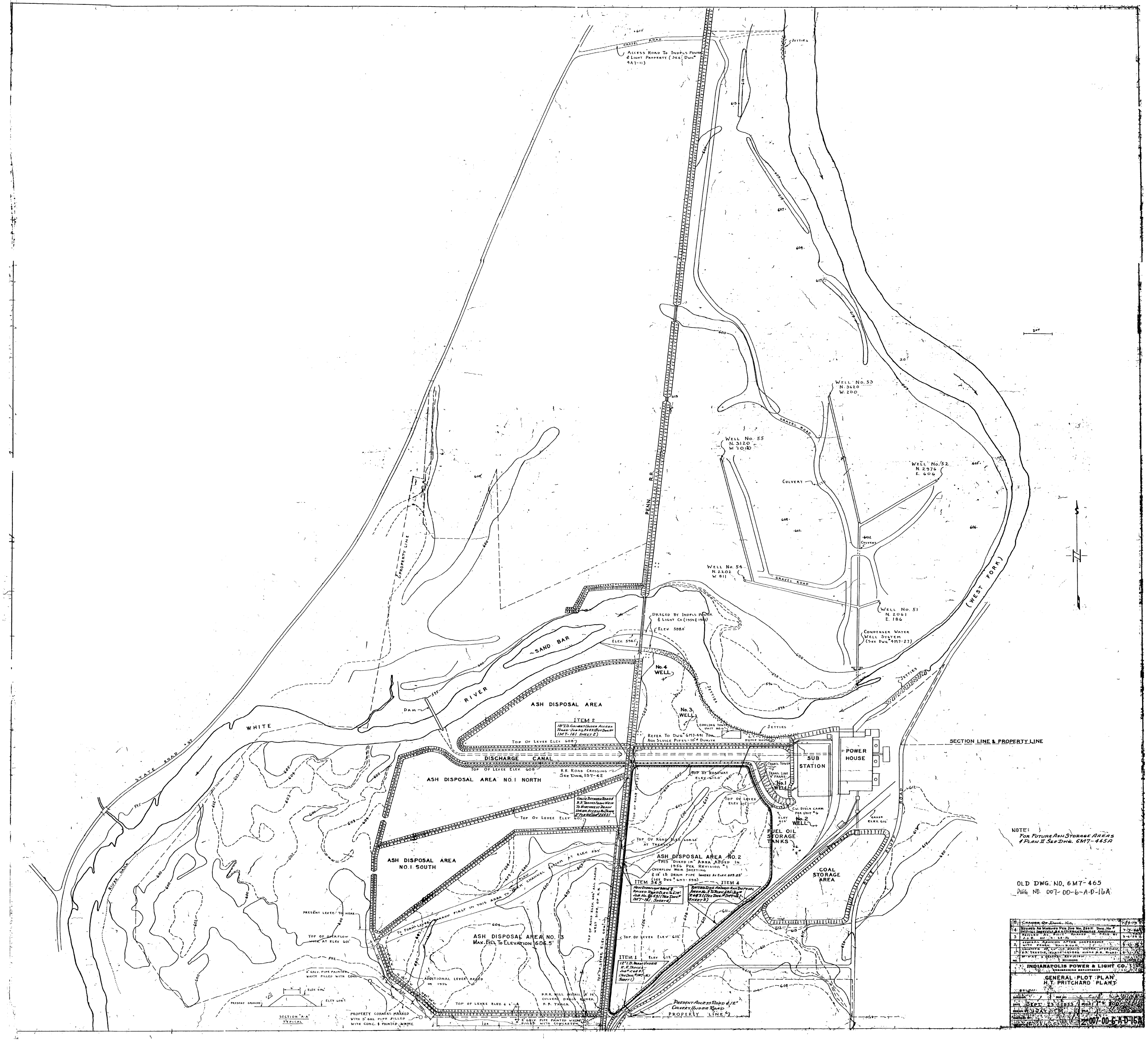
...*EV HOC - Exhibit 3.dgn

ATTACHMENT A

HISTORICAL DESIGN DRAWINGS

Item	Drawing Number	Title
1	007-00-6-A-D-16A	General Plot Plan, H.T. Pritchard Plant
2	007-00-6-A-D-16B	General Plan, Sheet No. 1, Units No. 1 & 2
3	007-00-6-C-D-42B	Discharge Structure for New Ash Pond
4	007-00-6-Y-D-42A	Revised Ash Disposal Plan Area
5	007-00-6-Y-D-42B	New Ash Disposal Area Cross Sections – Sheet 1
6	007-00-6-Y-D-42C	New Ash Disposal Area Cross Sections – Sheet 2
7	007-00-6-Y-D-42D	New Ash Disposal Area Cross Sections – Sheet 3
8	007-00-6-Y-D-42E	New Ash Disposal Area Cross Sections – Sheet 4
9	007-00-6-Y-D-42F	New Ash Disposal Area Cross Sections – Sheet 5
10	007-00-6-Y-D-42G	New Ash Disposal Area, Miscellaneous Details
11	007-00-6-Y-D-42J	Abandon Ash Pond & New Decant Structure, Area Plan
12	007-00-6-Y-D-42N	New Ash Disposal Area Plan



NOTE:
FOR FUTURE ASH STORAGE AREAS & PLAN II SEE DWG. 6M7-465A

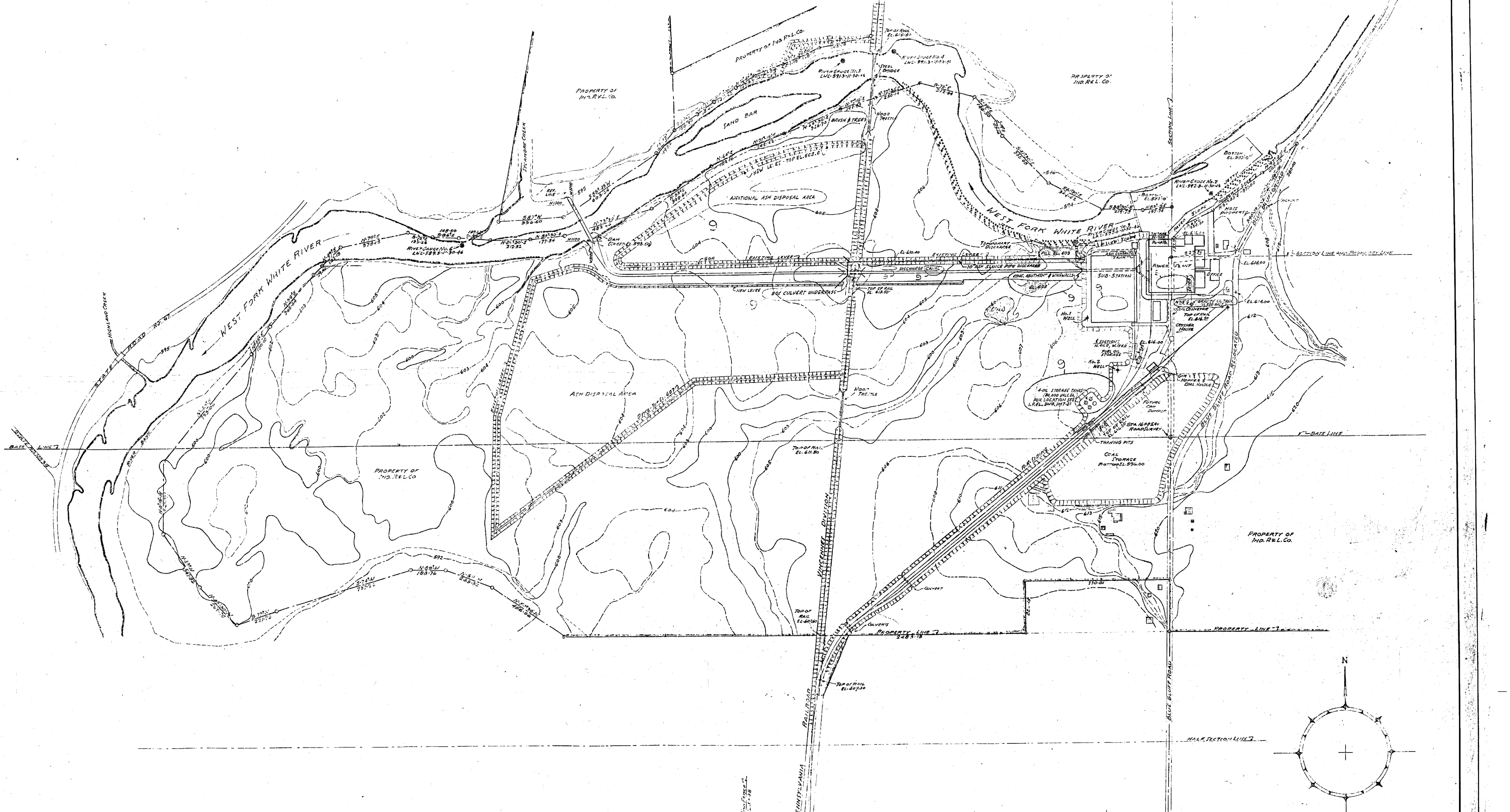
OLD DWG. NO. 6M7-465
DWG NO. 007-00-6-A-D-16A

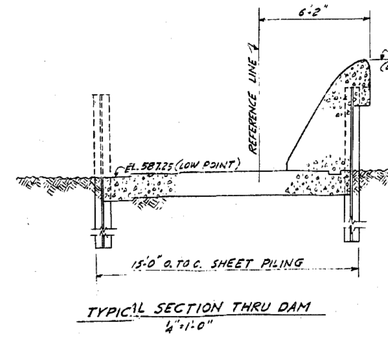
NO.	REVISIONS	DATE
5	CHANGE OF DWG. NO.	7-29-79
4	REVISED AS MARKED PER JOB No. 26431 DWG. No. # 1M7-161 SHEETS 1, 2, 3 & 4 (DIKING & DRAINAGE ADDITIONS	7-7-60
3	REVISED "AS BUILT" MARKED IN FIELD BY J.J.R. ON 4-28-56	3-6-59
2	GENERAL REVISION AFTER CONFERENCE WITH PENNA. RAILROAD	[illegible]
1	LOCATION OF 24" I.D. DRAIN UNDER OVERFLOW R.R. TRESTLE, EARTH LEVEES ALONG R.R. RIGHT-OF-WAY & GENERAL REVISION	6-21-56

INDIANAPOLIS POWER & LIGHT CO.
ENGINEERING DEPARTMENT

GENERAL PLOT PLAN
H.T. PRITCHARD PLANT

DIVISION
JOB NO.
DATE SEPT. 23, 1953
SCALE 1" = 300'
DRAWN BY J DAY
FILE
CHECKED BY
CERTIFIED BY
NO. 007-00-6-A-D-16A





TYPICAL SECTION THRU DAM
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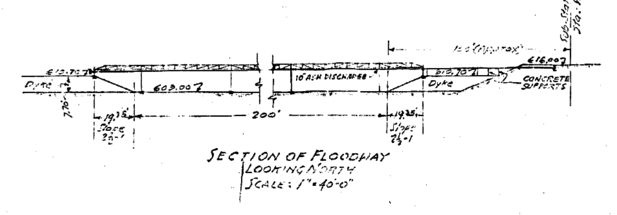

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LOOKING NORTH
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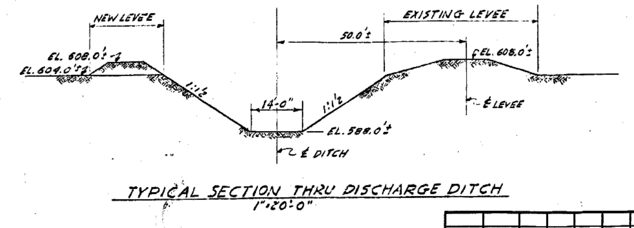

TYPICAL SECTION THRU DISCHARGE DITCH
1"=20'-0"

OLD DWG #6A7-3

5-5-47

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10	3-30-81								CHANGED DRAWING NUMBER
9	3-13-51	RP	H.H.B.		JmK	TDC		MJX	ADDED OIL STORAGE TANKS & EXTENDED LEVEE
8	1-3-51	RP				TDC		WUK	REVISED AS NOTED
7	2-14-49	EB	AD		DTS				AS BUILT
6	5-3-48	E.B.			DTS	SK			ASH SLUICE PIPE LINE ADDED.
5	11-14-47	E.B.							COAL STORAGE AREA AND ROADS REVISED.
4	10-20-47	E.B.							RELOCATION OF SUB-STATION.
3	4-21-47								
2	4-5-47								
1	3-7-47								

WHITE RIVER GENERATING STATION
INDIANAPOLIS POWER & LIGHT CO.
INDIANAPOLIS, INDIANA
JOB NO.

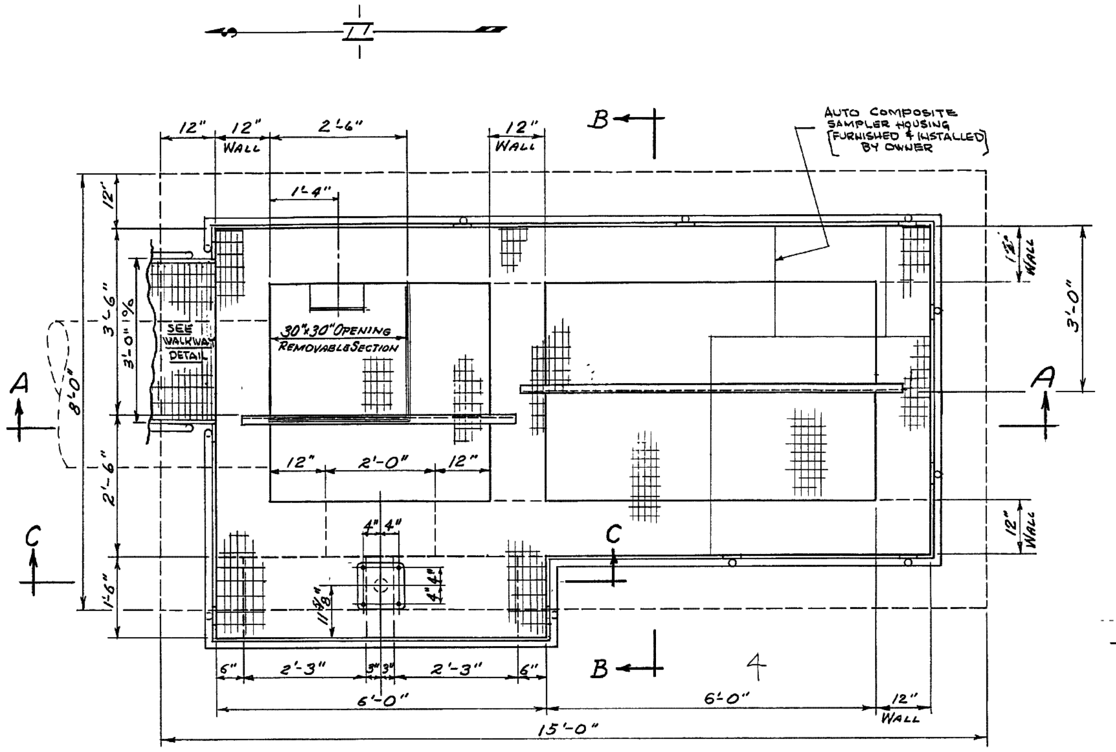
GENERAL PLAN
SHEET NO. 1
UNITS NO. 1 & 2

GIBBS & HILL, INC.
ENGINEERS-CONSTRUCTORS
NEW YORK
JOB NO. 641

SCALE: 1"-200'-0"

007-00-6-A-D-16B

IPL NO. 007-00-6-A-D-16B



PLAN

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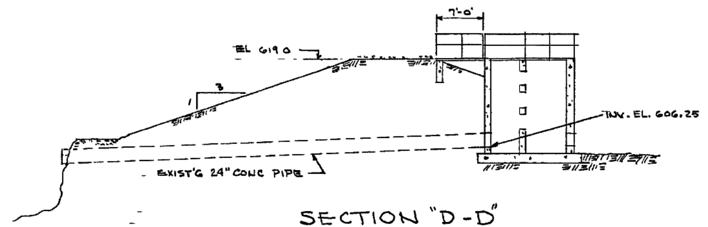

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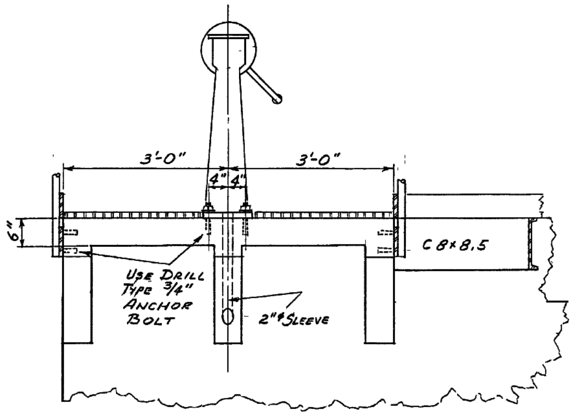

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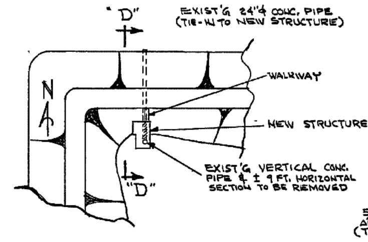
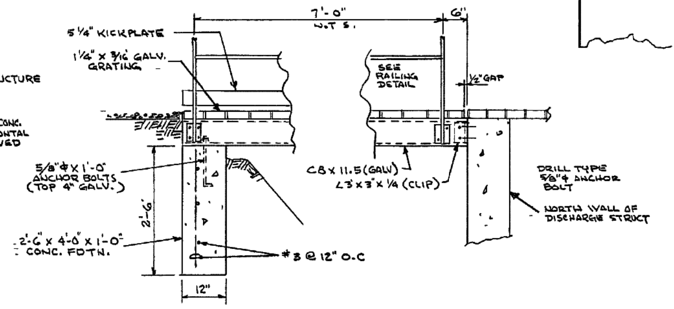


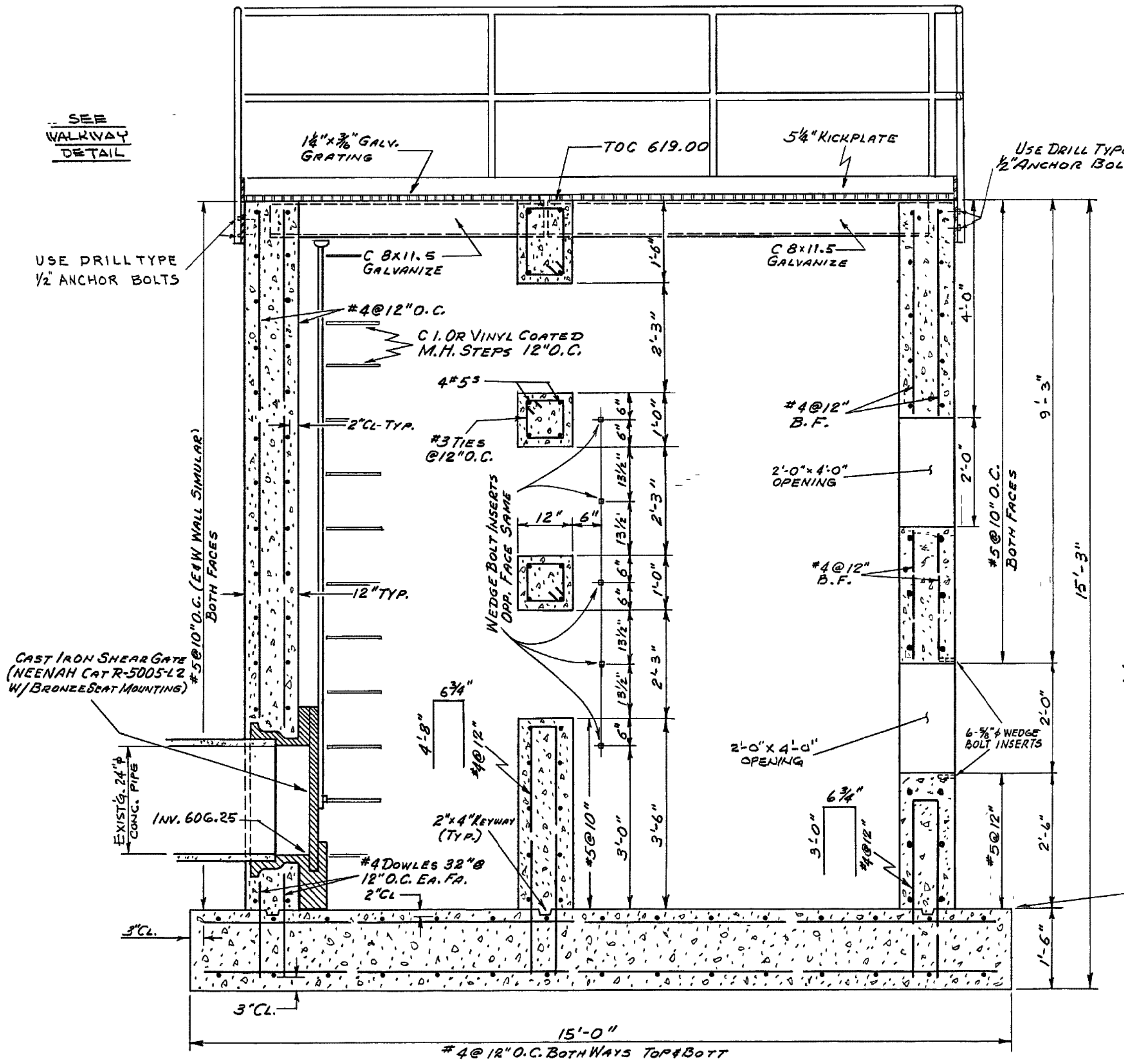
LOCATION PLAN

SCALE: 1" = 40'-0"



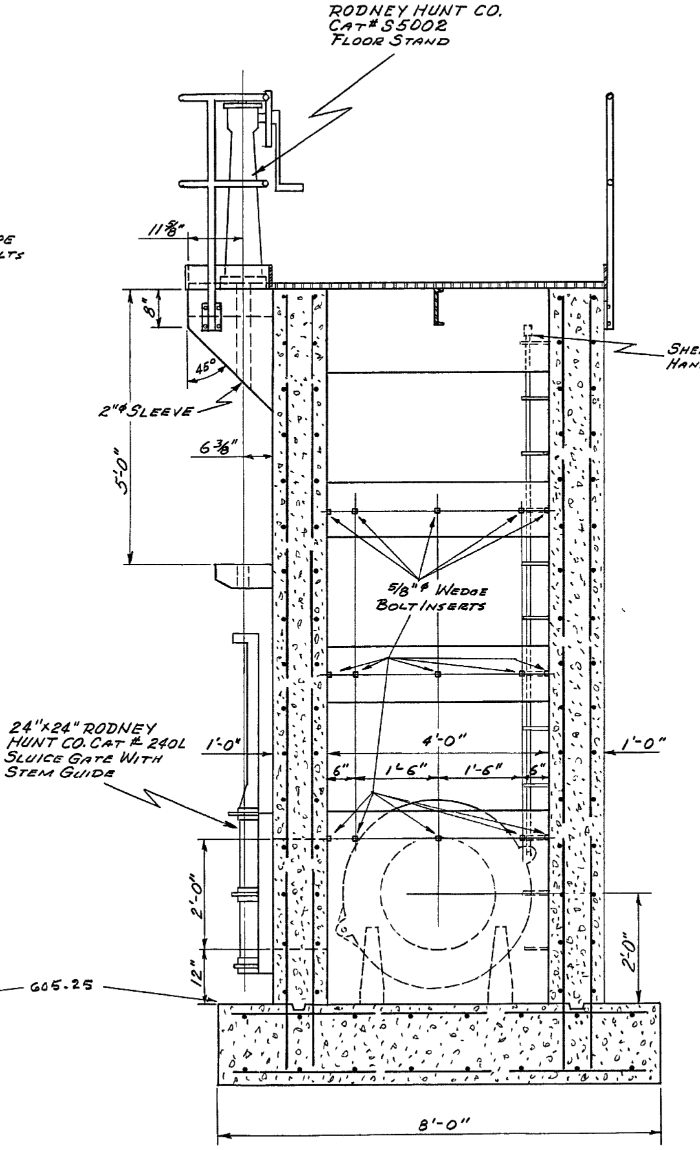
WALKWAY DETAIL

N.T.S.



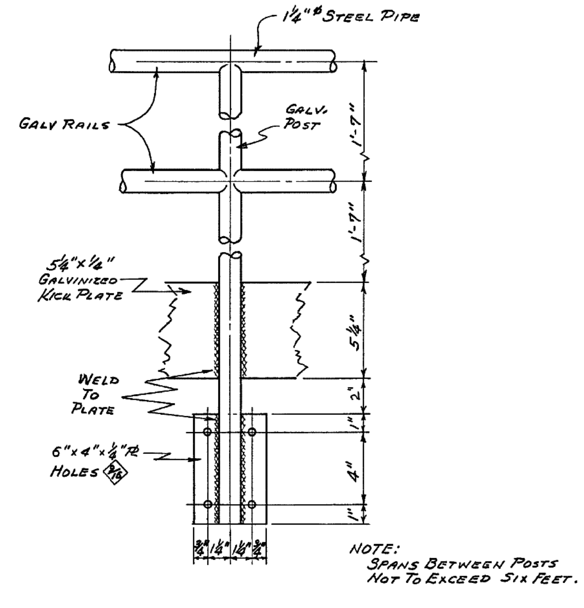
SECTION "A-A"

Scale: 3/4"=1'-0"



SECTION "B-B"

Scale: 3/4"=1'-0"



NOTE:
SPANS BETWEEN POSTS NOT TO EXCEED SIX FEET.

RAILING DETAIL

Scale: 3"=1'-0"

NOTES:

1. ALL CONC. TO BE 3500 PSI STRENGTH IN 28 DAYS WITH AN ENTRAINMENT OF 4 - 6%.
2. MAX. CONC. SLUMP TO BE 5 INCH.
3. CONC. SHALL NOT BE DROPPED MORE THAN 5 FEET WHEN POURING.
4. REINF. BARS TO BE GRADE 40 DEFORMED BILLET STEEL.
5. STRUCTURAL STEEL TO BE ASTM A36.
6. ALL STRUCTURAL STEEL, GRATING, BOLTS & HANDRAILS TO BE HOT DIPPED GALVANIZED.
7. WORK DRAWING WITH IPL SPECIFICATION 007-00-0-Y-S-42F.

REFERANCE DWG'S.
007-00-6-E-G-23A WIRING LAYOUT

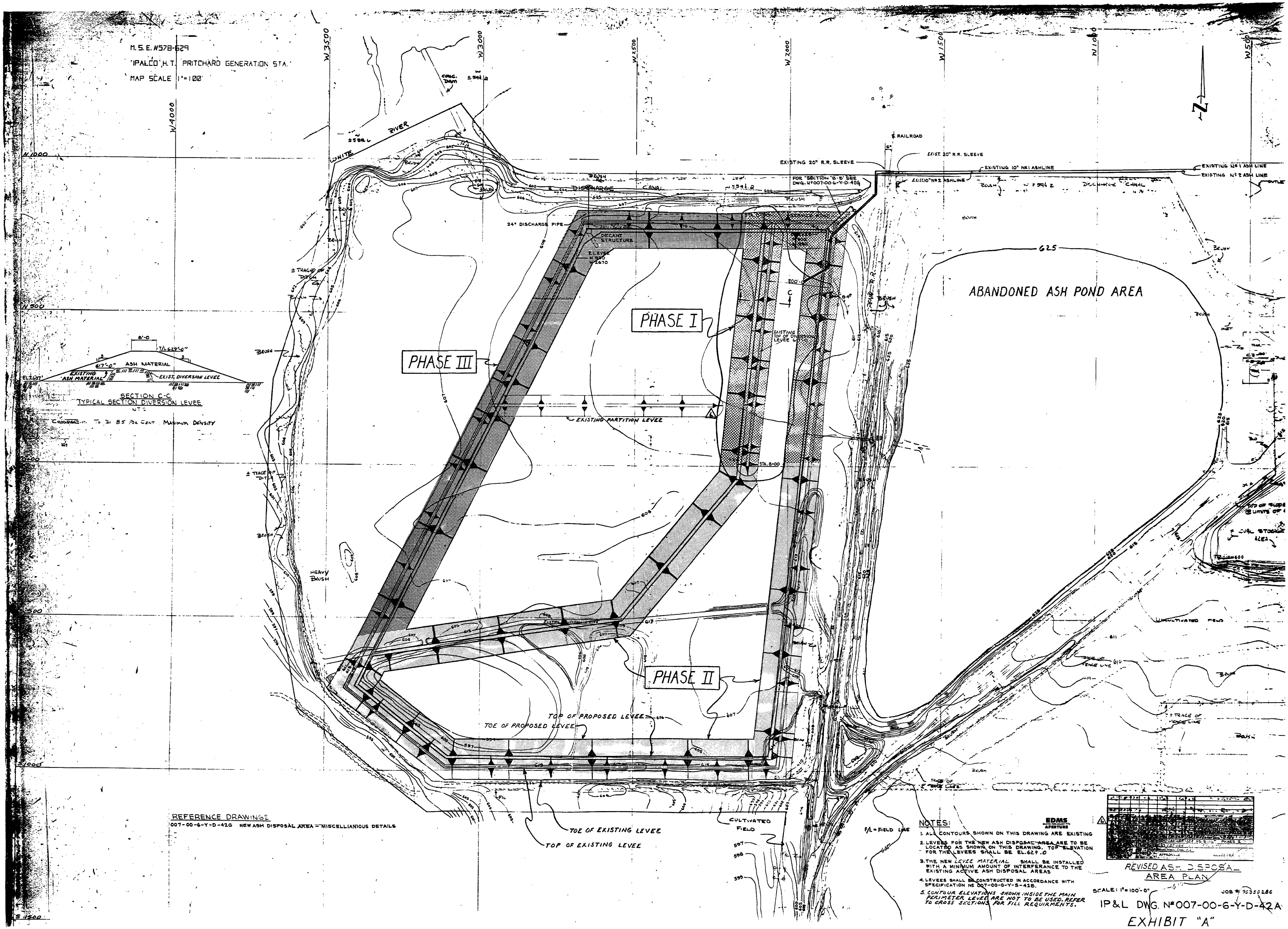
ISSUE NO	DATE	DWN	CHK'D	Arch	Struct	Mech.	Elec	P E	ISSUED FOR
4	9 82	DJ	ELE	ELE	ELE				ADD GRATING
3	5 5 82	NBS	ELE	ELE	ELE				ADDITIONAL INLET OPENING
2	3 30 82	EAS	ELE	ELE	ELE				BIDS
1	6/30/79		LEG	LEG	LEC	LAR	LAR	LAR	PERMITS

INDIANAPOLIS POWER & LIGHT COMPANY
ENGINEERING DEPARTMENT

DISCHARGE STRUCTURE FOR
NEW ASH POND AT
LOCATION H.T. PRITCHARD GENERATING STA.

DR BY Sudduth DATE 6-27-79
JOB NO 32044
REQ BY G.R.S. 6-7-79
CKD BY
CERT BY
DRAWING NUMBER
007-00-6-C-D-42B

M. S. E. #578-629
IPALCO H. T. PRITCHARD GENERATION STA.
MAP SCALE 1"=100'



REFERENCE DRAWINGS
007-00-6-Y-D-42G NEW ASH DISPOSAL AREA – MISCELLIANIOUS DETAILS

EDMS
APERTURE

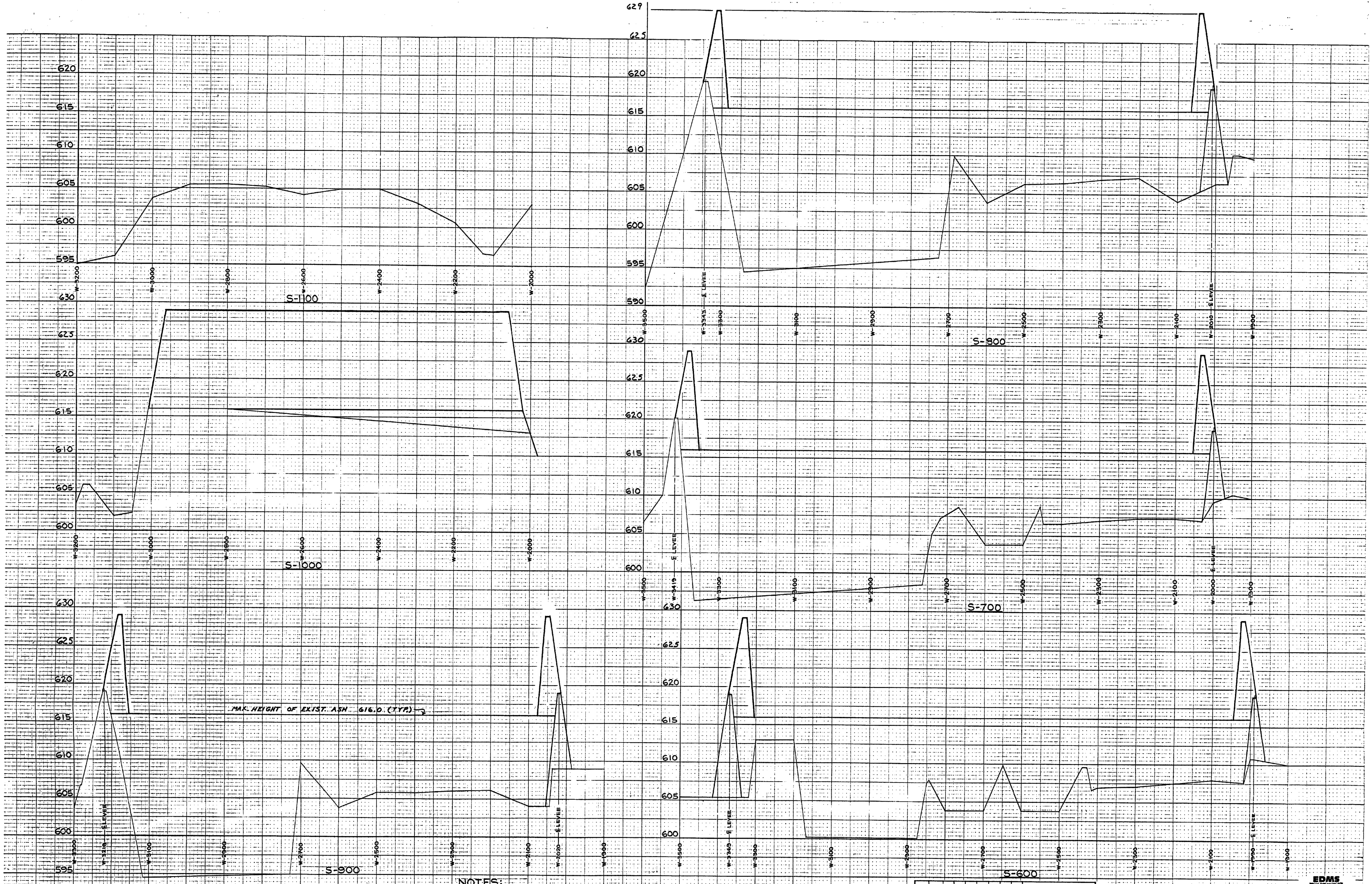
NOTES:
1. ALL CONTOURS SHOWN ON THIS DRAWING ARE EXISTING
2. LEVEES FOR THE NEW ASH DISPOSAL AREA ARE TO BE LOCATED AS SHOWN ON THIS DRAWING. TOP ELEVATION FOR THE LEVEES SHALL BE EL.629.0
3. THE NEW LEVEE MATERIAL SHALL BE INSTALLED WITH A MINIMUM AMOUNT OF INTERFERANCE TO THE EXISTING ACTIVE ASH DISPOSAL AREAS
4. LEVEES SHALL BE CONSTRUCTED IN ACCORDANCE WITH SPECIFICATION Nº 007-00-0-Y-S-42B.
5. CONTOUR ELEVATIONS SHOWN INSIDE THE MAIN PERIMETER LEVEE ARE NOT TO BE USED. REFER TO CROSS SECTIONS FOR FILL REQUIRMENTS.

REVISED ASH DISPOSAL AREA PLAN

SCALE: 1"=100'-0"
JOB # 70350286

IP&L DWG. Nº007-00-6-Y-D-42A

EXHIBIT "A"



NOTES:

1. LEVEES ARE SHOWN ON EXISTING GRADE. CONTRACTOR SHALL USE *THE ABANDONED ASH POND* AS THE BORROW AREA FOR BUILDING LEVEES

2. FOR REFERENCE DRAWINGS SEE DRAWING Nº 007-00-6-Y-D-42A

KEY

— EXISTING GRADE (1979)
— *LEVEE (1979)*
— *PROPOSED LEVEE (1990)*

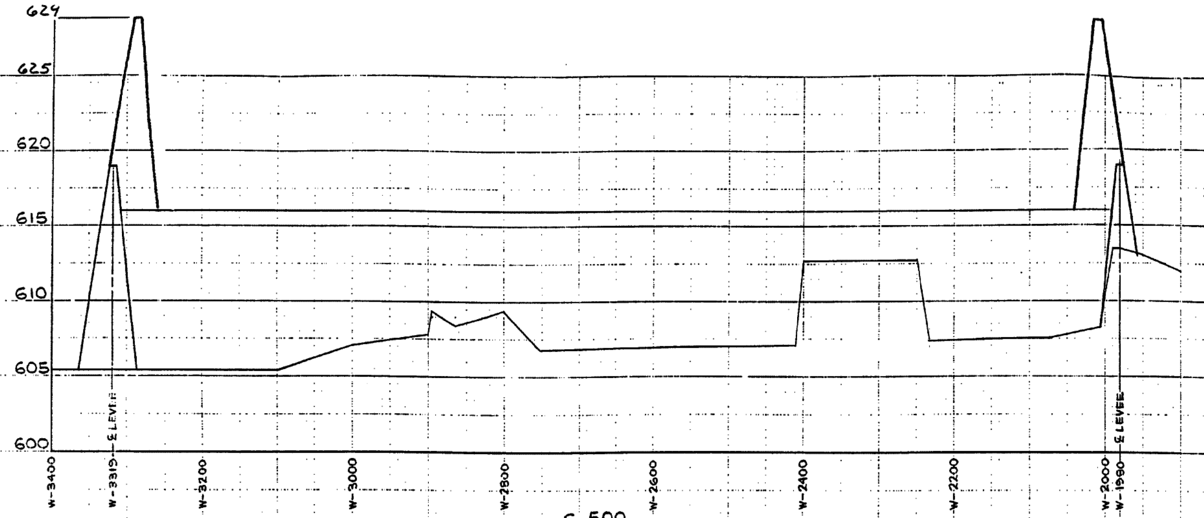
ISSUE NO.	DATE	DWN	CHK'D	Arch	Struct	Mech.	Elec.	P.E.	ISSUED FOR
				APPROVALS					
3	5-90	PB			JKM			GEW	PERMIT REVISION
2	1-8-79	LWC	LBR	CRS	CRS	LBR	LBR	LBR	AS BUILT
1	6-15-79	LWC	LBR	CRS	CRS	LBR	LBR	LBR	PERMITS

EDMS
APERTURE

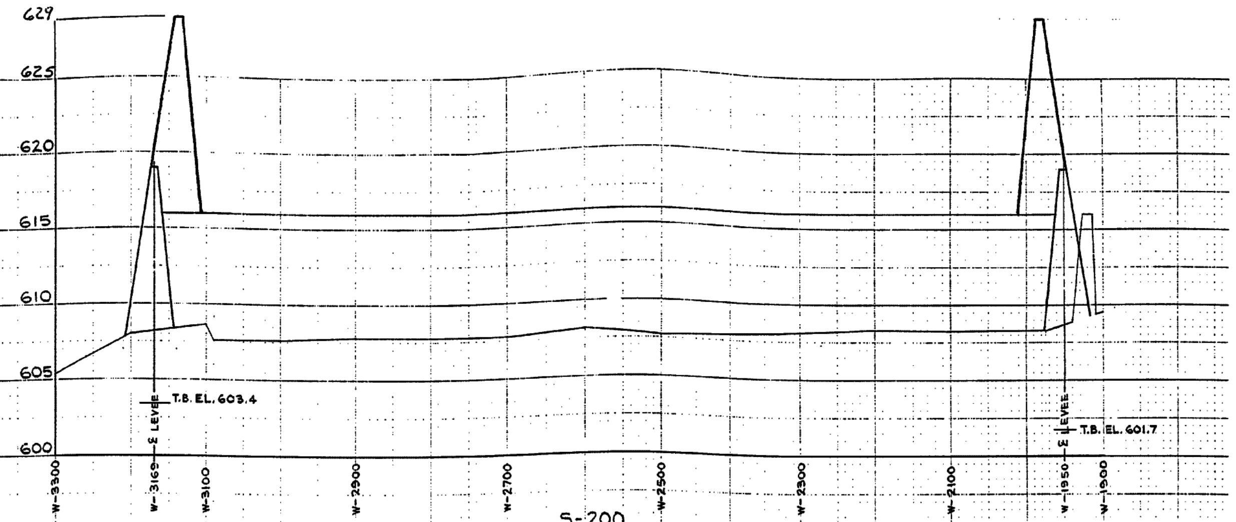
NEW ASH DISPOSAL AREA
CROSS SECTIONS - SHEET 1

JOB Nº 9033028C DATE: 5-23-90

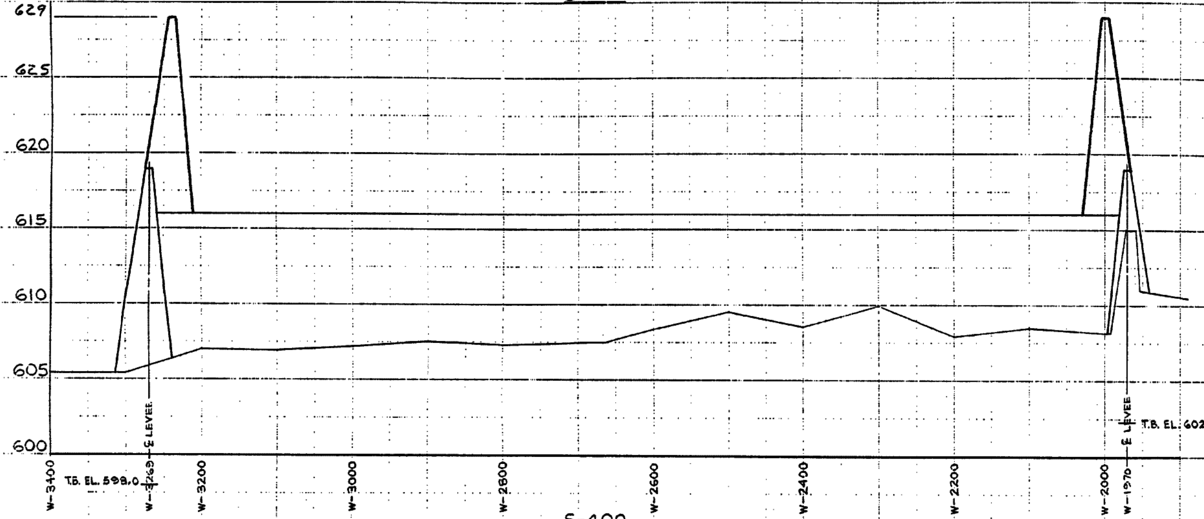
IP&L DWG. Nº 007-00-6-Y-D-42B



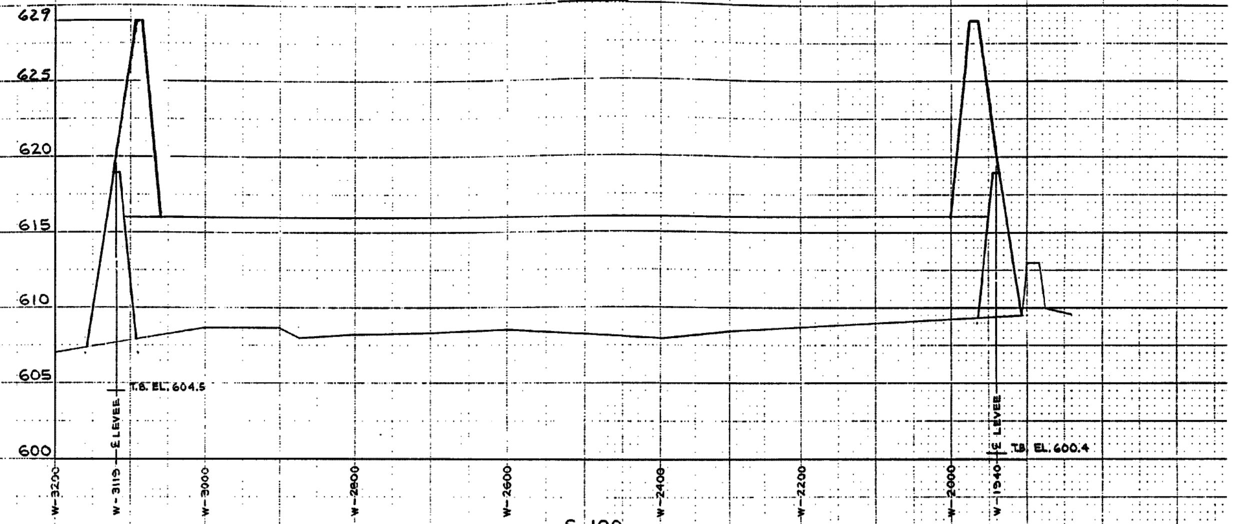
S-500



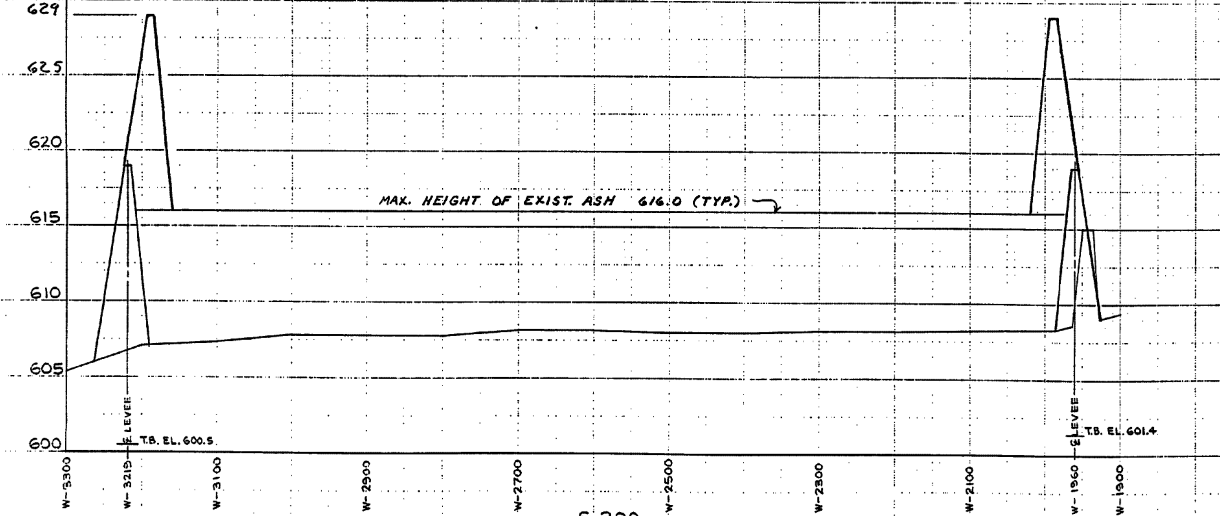
S-200



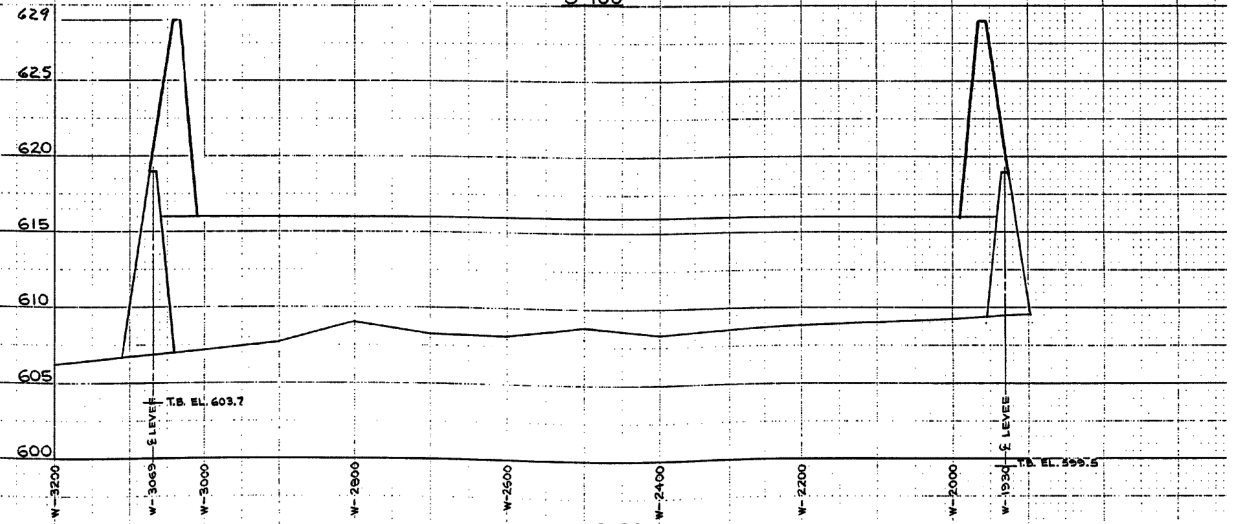
S-400



S-100



S-300



0+00

REFERENCE DRAWINGS

1. NOTES SEE DWG.#007-00-6-Y-D-42B
2. REFERENCE DWGS. SEE DWG.#007-00-6-Y-D-42A

KEY

▬ PROPOSED LEVEE (1990)
— EXISTING GRADE
— LEVEE (1979)
T.B. — TEST BORING-EL OF VIRGIN EARTH TO WHICH LEVEE CORE MUST BE INSTALLED.

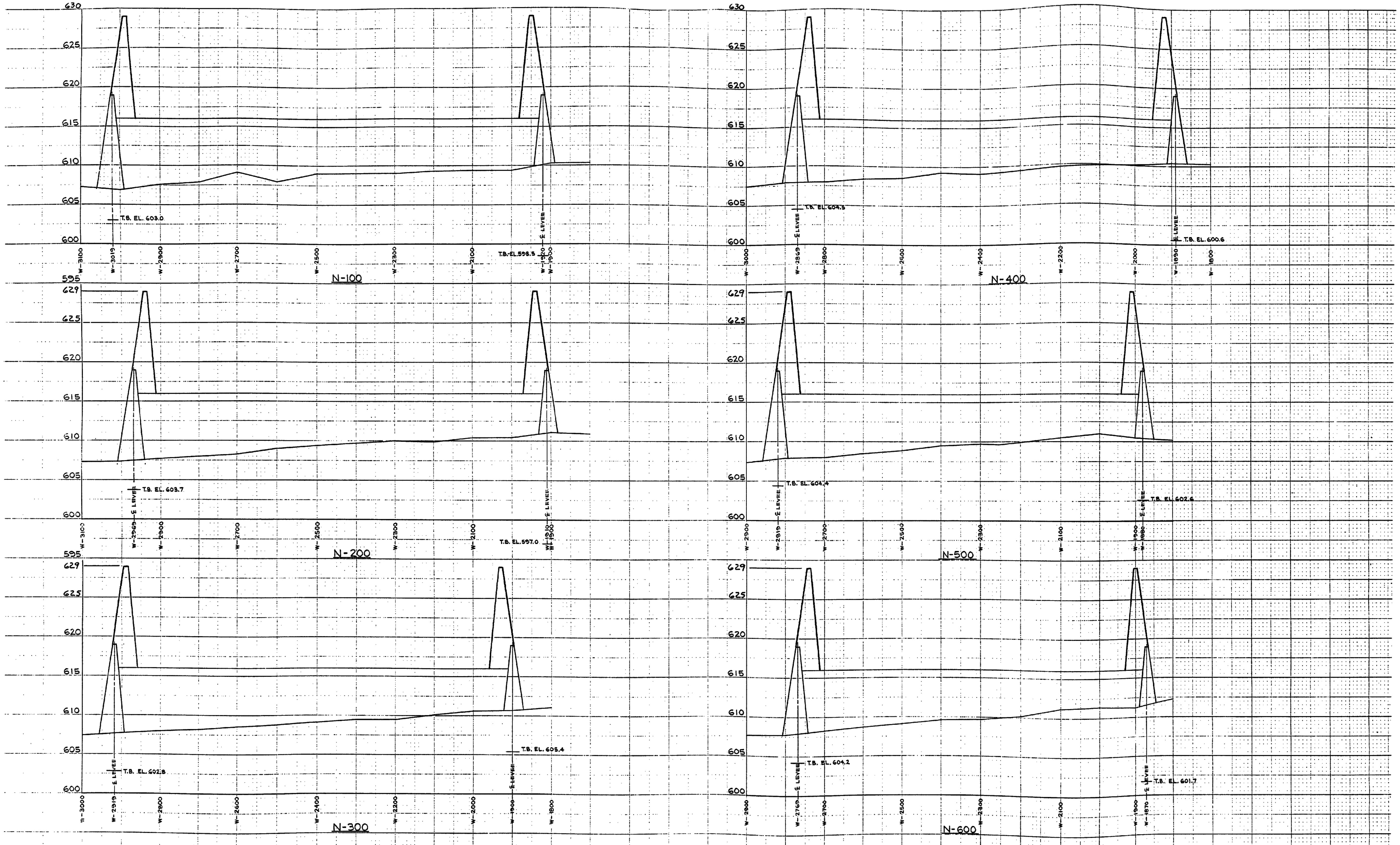
ISSUE NO.	DATE	DWN	CHK'D	Arch	Struct	Mech.	Elec.	P.E.	ISSUED FOR
3	5-90	TB			JKM			GEN	PERMIT REVISION
2	1-8-80	LWC	LBR	GRS	GRS	LBR	LBR	LBR	AS BUILT
1	6-15-79	LWC	LBR	GRS	GRS	LBR	LBR	LBR	PERMITS

APPROVALS

NEW ASH DISPOSAL AREA
CROSS SECTIONS-SHEET 2

JOB. Nº 9035028C DATE: 5-23-90

IP&L DWG. Nº007-00-6-Y-D-42C



REFERENCE DRAWINGS

1. NOTES SEE DWG. #007-00-6-Y-D-42B

2. REFERENCE DWGS. SEE DWG. #007-00-6-Y-D-42A

KEY

- *PROPOSED LEVEE (1990)*
- EXISTING GRADE (1979)
- *LEVEE (1979)*
- T.B. TEST BORING TO VIRGIN EARTH TO WHICH LEVEE CORE MUST BE INSTALLED.

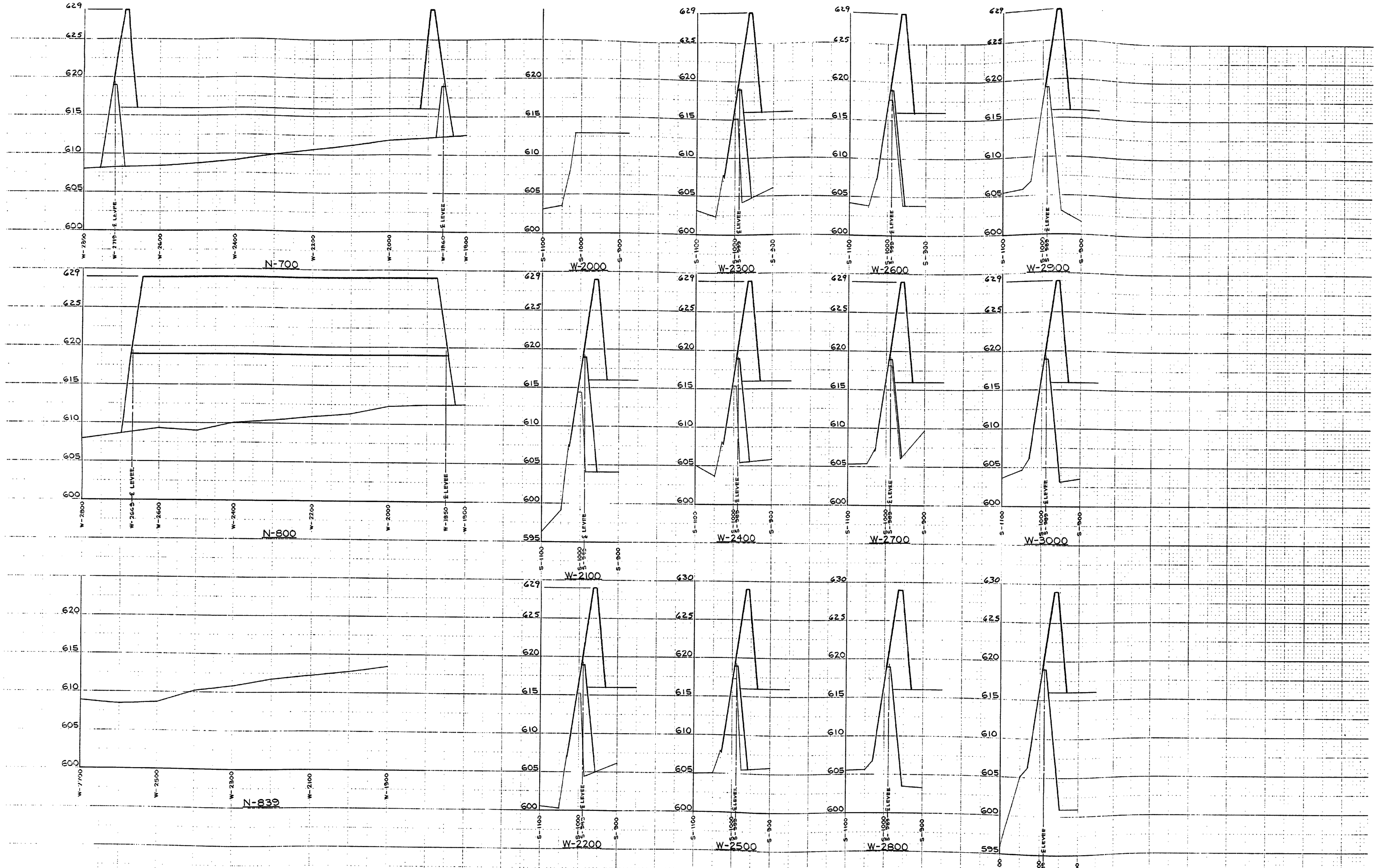
ISSUE NO.	DATE	DWN	CHKD	Arch	Struct	Mech.	Elec.	P.E.	ISSUED FOR
3	5-90	TB			JKM			GEW	PERMIT REVISION
2	1-8-80	LWC	LGR	CRS	CRS	LGR	LGR	LGR	AS BUILT
1	6-15-79	LWC	LGR	CRS	CRS	LGR	LGR	LGR	Permits

APPROVALS

NEW ASH DISPOSAL AREA
CROSS SECTIONS - SHEET 3

JOB Nº 9035028C. DATE: 5-23-90

IP&L DWG. Nº 007-00-6-Y-D-42D



REFERENCE DRAWINGS

1. NOTES SEE DWG. #007-00-6-Y-D-42B
2. REFERENCE DWGS. SEE DWG. #007-00-6-Y-D-42A

KEY
— EXISTING GRADE (1979)
═ LEVEE (1979)
▬ PROPOSED LEVEE (1990)

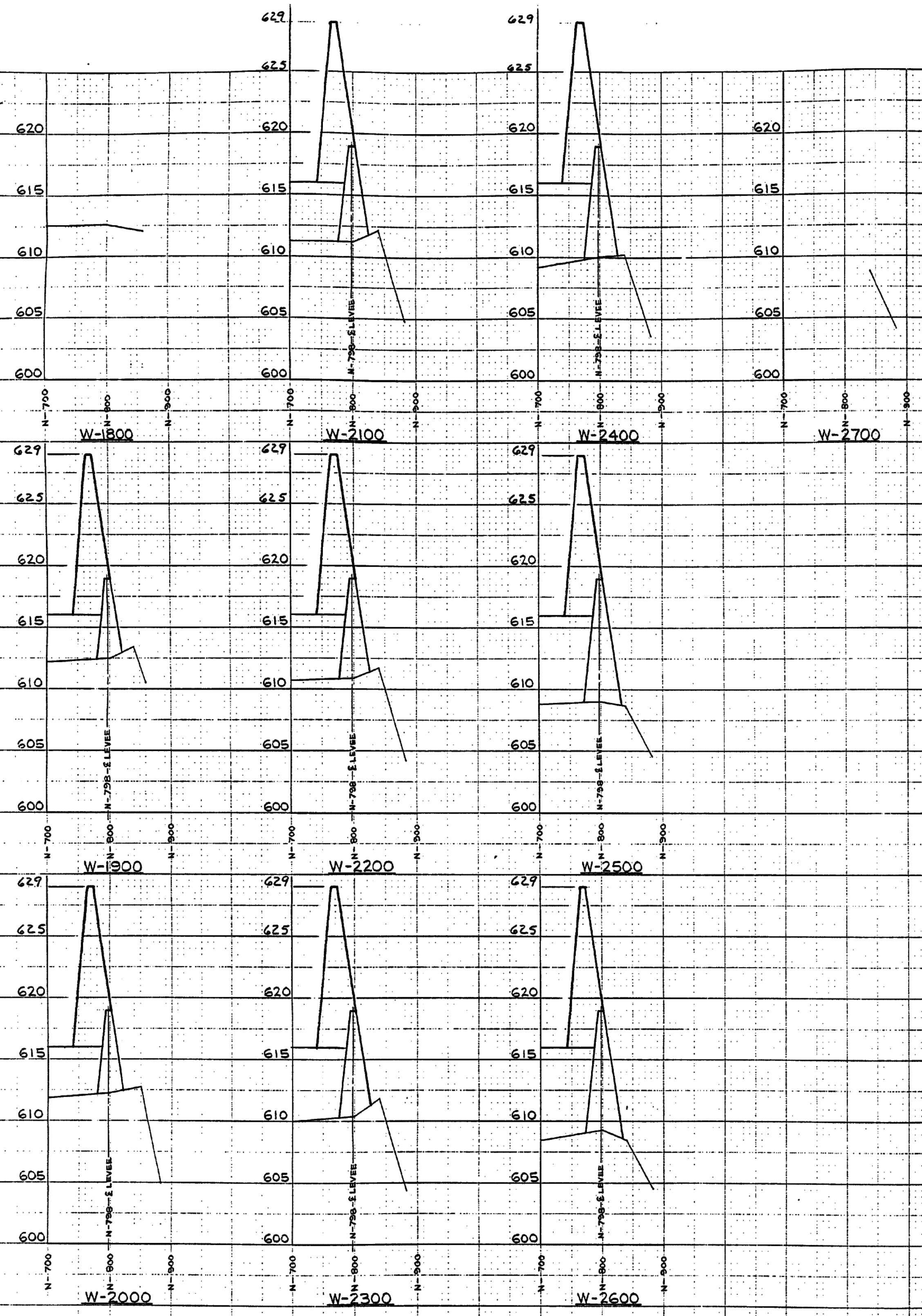
ISSUE NO.	DATE	DWN	CHK'D	Arch	Struct	Mech.	Elec.	P.E.	ISSUED FOR
3		PB			JKM			GEN	PERMIT REVISION
2	1-9-80	LWC	LAR	CRS	CRS	LBR	LBR	LBR	AS BUILT
1	6-15-79	LWC	LBR	CRS	CRS	LBR	LBR	LBR	PERMITS

APPROVALS

NEW ASH DISPOSAL AREA
CROSS SECTIONS - SHEET 4

JOB. Nº 9035028C DATE: 5-23-90

IP&L DWG. Nº 007-00-6-Y-D-42E



REFERENCE DRAWINGS

1. NOTES SEE DWG.#007-00-6-Y-D-42B
2. REFERENCE DWGS. SEE DWG.#007-00-6-Y-D-42A

KEY
- EXISTING GRADE (1979)
- LEVEE (1979)
- PROPOSED LEVEE (1990)

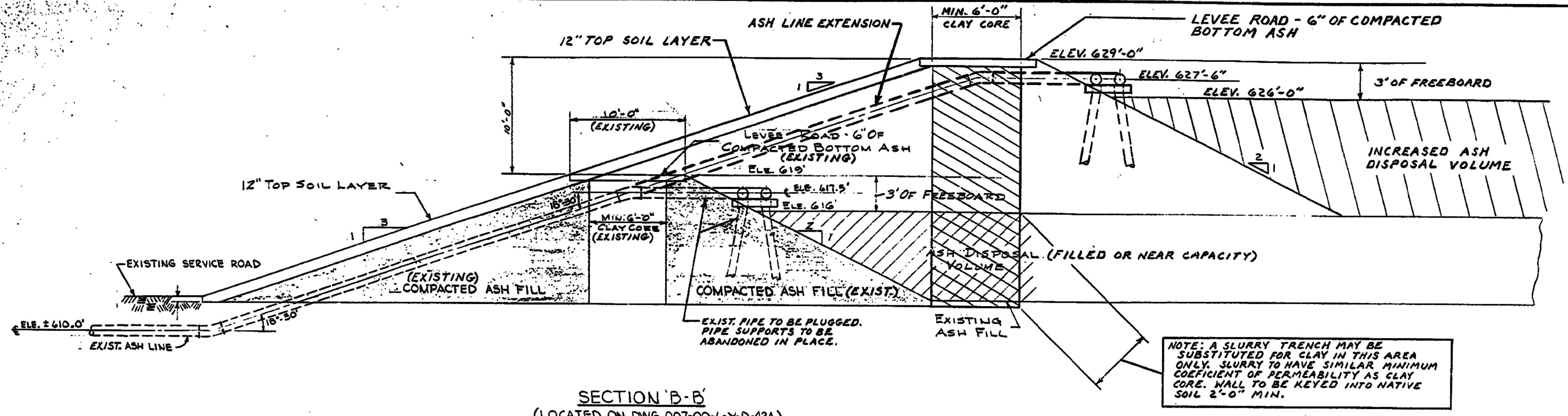
ISSUE NO.	DATE	DWN	CHKD	Arch	Struct	Mech.	Elec.	P.E.	ISSUED FOR
2	5-90	TB			JKM			GEW	PERMIT REVISION
1	6-15-79	LWC	LBR	CRS	CRS	LBR	LBR	LBR	PERMITS

APPROVALS

NEW ASH DISPOSAL AREA
CROSS SECTIONS - SHEET 5

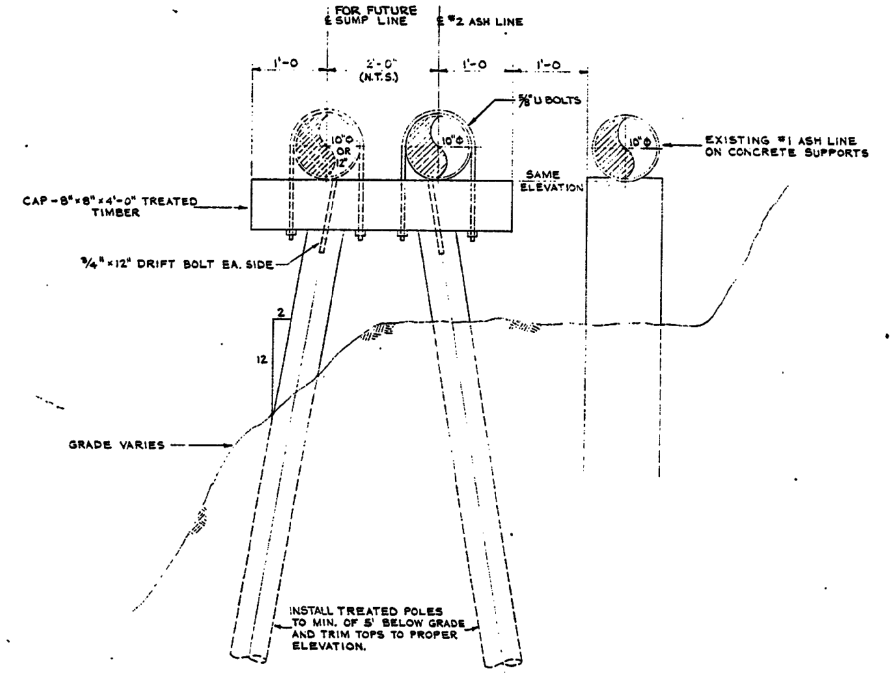
JOB Nº 9035029C DATE: 5-23-90

IP&L DWG. Nº 007-00-6-Y-D-42F

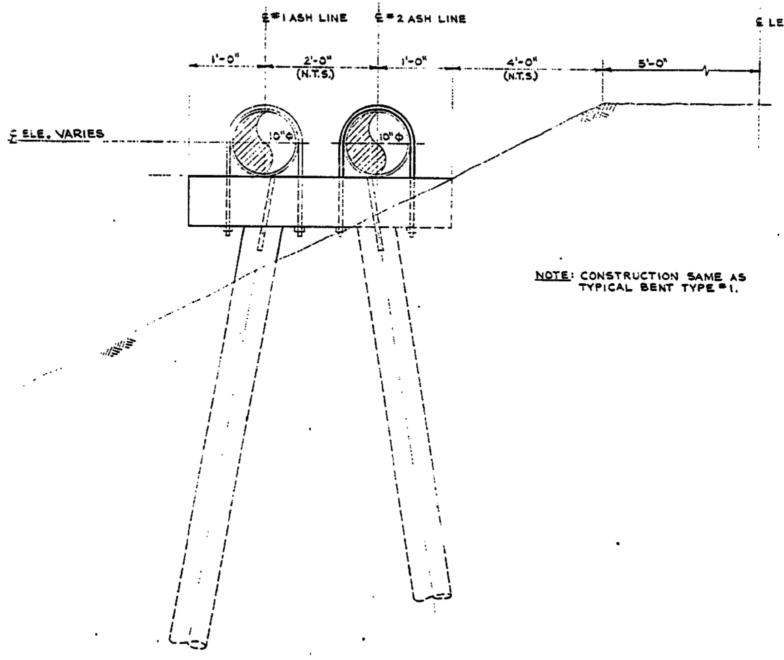


NOTE: A SLURRY TRENCH MAY BE SUBSTITUTED FOR CLAY IN THIS AREA ONLY. SLURRY TO HAVE SIMILAR MINIMUM COEFICIENT OF PERMEABILITY AS CLAY CORE. WALL TO BE KEYED INTO NATIVE SOIL 2'-0" MIN.

SECTION 'B-B'
(LOCATED ON DWG. 007-00-6-Y-D-42A)
SCALE: 3/16" = 1'-0"

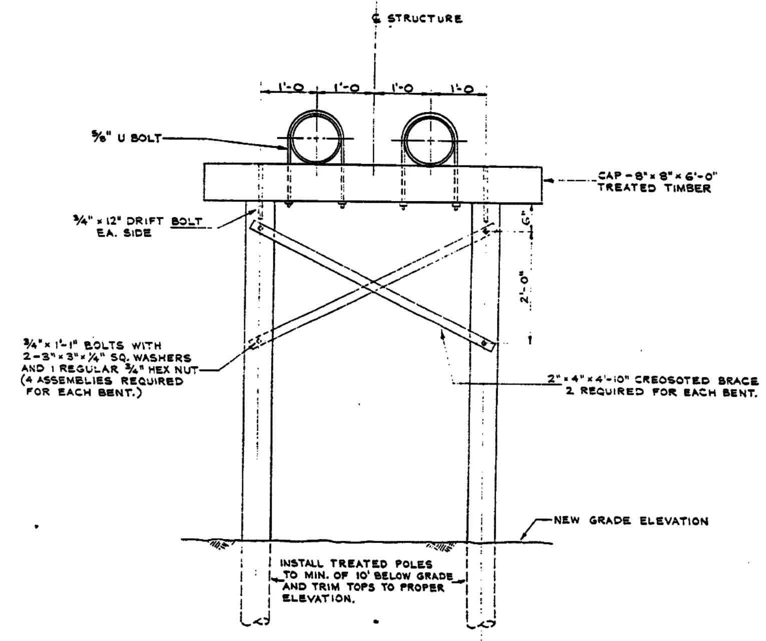


TYPICAL BENT TYPE #1
(LOOKING WEST)
45 REQUIRED



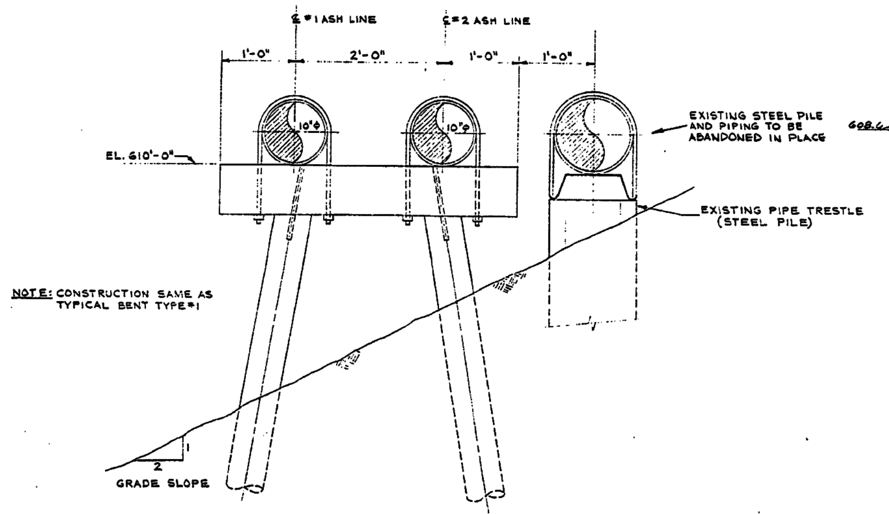
NOTE: CONSTRUCTION SAME AS TYPICAL BENT TYPE #1.

TYPICAL BENT TYPE #2
(LOOKING NORTH)
6 REQUIRED



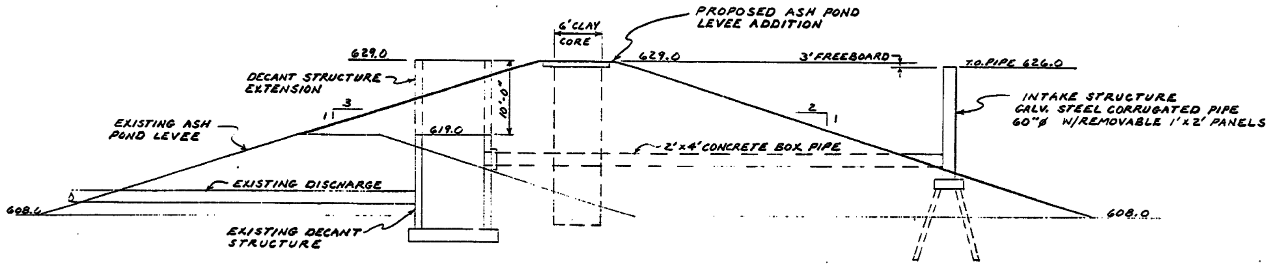
TYPICAL BENT TYPE #3
2-REQUIRED

NOTES:
CONTRACTOR TO FURNISH ALL MATERIAL FOR BENTS EXCEPT TREATED POLES



NOTE: CONSTRUCTION SAME AS TYPICAL BENT TYPE #1

TYPICAL BENT TYPE #4
(LOOKING NORTH)
2 REQUIRED



CROSS SECTION AT DECANT STRUCTURES

2	3-90	7B		JKM			SEN	PERMIT REVISON
1	5-5-81	BS	[illegible]	[illegible]	[illegible]	-	-	DIDS
ISSUE NO.	DATE	DWN	CHKD	Arch Struct	Mech	Elec	P.E.	ISSUED FOR

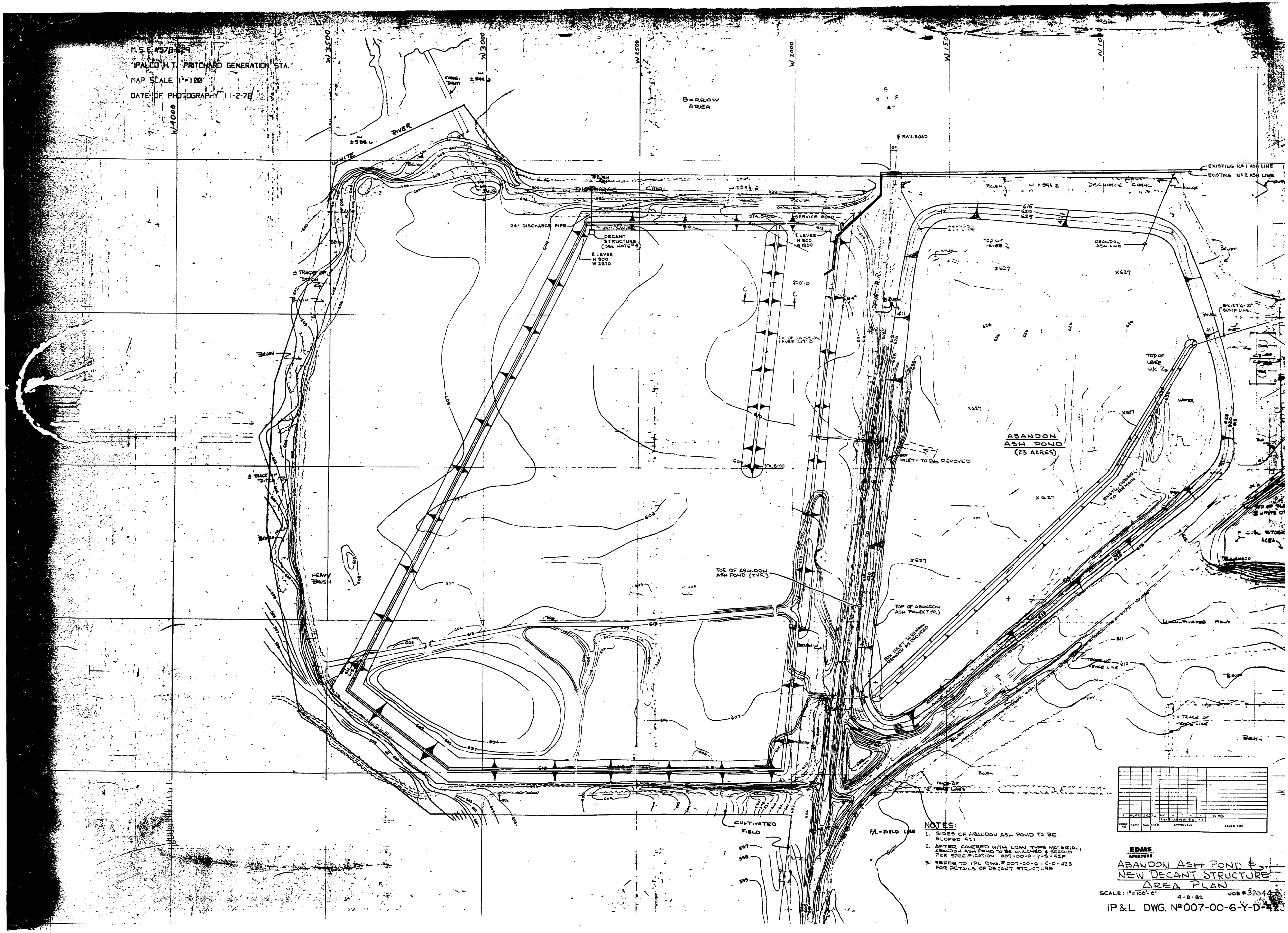
INDIANAPOLIS POWER & LIGHT COMPANY
ENGINEERING DEPARTMENT

NEW ASH DISPOSAL AREA
MISCELLANEOUS DETAILS

LOCATION H.T. PRITCHARD PLANT

DR. BY LWC DWBS DATE 5-5-81 JOB NO. 9035028C
REQ. BY
CKD. BY
CERT. BY
DRAWING NUMBER 007-00-6-Y-D-42G

M.S.E. #578-629
IPALCO H.T. PRITCHARD GENERATION STA.
MAP SCALE 1"=100'
DATE OF PHOTOGRAPHY 11-2-78



NOTES:

1. SIDES OF ABANDON ASH POND TO BE SLOPED 4:1
2. AFTER COVERED WITH LOAN TYPE MATERIAL, ABANDON ASH POND TO BE MULCHED & SEEDED PER SPECIFICATION 007-00-0-Y-S-42F
3. REFER TO IPL DWG.# 007-00-6-C-D-42B FOR DETAILS OF DECANT STRUCTURE

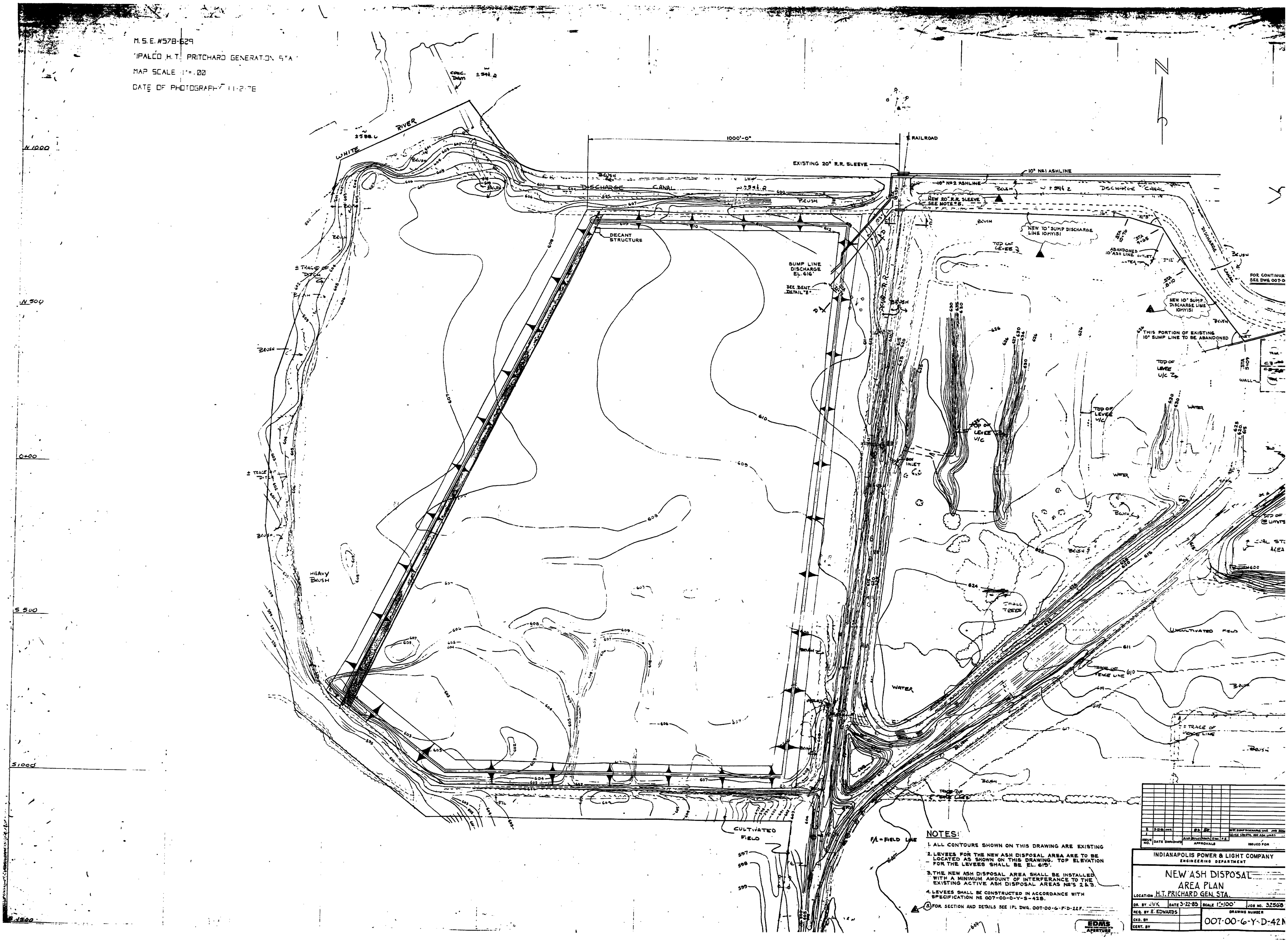
ISSUE NO	DATE	DWN	CHK'D	Arch	Struct	Mech	Elec	P.E.	ISSUED FOR
1	[illegible]	[illegible]	[illegible]	-	-	-	-		B.DS

EDMS APERTURE

ABANDON ASH POND &
NEW DECANT STRUCTURE
AREA PLAN

SCALE: 1"=100'-0"
4-8-82
JCB #32044

IP&L DWG. Nº 007-00-6-Y-D-42J



NOTES:

1. ALL CONTOURS SHOWN ON THIS DRAWING ARE EXISTING
2. LEVEES FOR THE NEW ASH DISPOSAL AREA ARE TO BE LOCATED AS SHOWN ON THIS DRAWING. TOP ELEVATION FOR THE LEVEES SHALL BE EL. 619'.
3. THE NEW ASH DISPOSAL AREA SHALL BE INSTALLED WITH A MINIMUM AMOUNT OF INTERFERANCE TO THE EXISTING ACTIVE ASH DISPOSAL AREAS No'S 2 & 3.
4. LEVEES SHALL BE CONSTRUCTED IN ACCORDANCE WITH SPECIFICATION No 007-00-0-Y-S-42B.
5. FOR SECTION AND DETAILS SEE IPL DWG. 007-00-6-P-D-22F.

ISSUE NO.	DATE	DWN	CHKD	Arch	Struct	Mech.	Elec.	P.E.	ISSUED FOR
2	3-22-85	JWK			EB	EB			INST. SUMP DISCHARGE LINE JOB 325
1									LEVEE CONSTR. ADD ASH LINES

INDIANAPOLIS POWER & LIGHT COMPANY
ENGINEERING DEPARTMENT

NEW ASH DISPOSAL
AREA PLAN

LOCATION H.T. PRICHARD GEN. STA.

DR. BY JWK	DATE 3-22-85	SCALE 1"=100'	JOB NO. 32568
REQ. BY E. EDWARDS		DRAWING NUMBER	
CKD. BY		007-00-6-Y-D-42N	
CERT. BY			

EDMS APERTURE

ATTACHMENT B

SOIL BORING LOGS[1]

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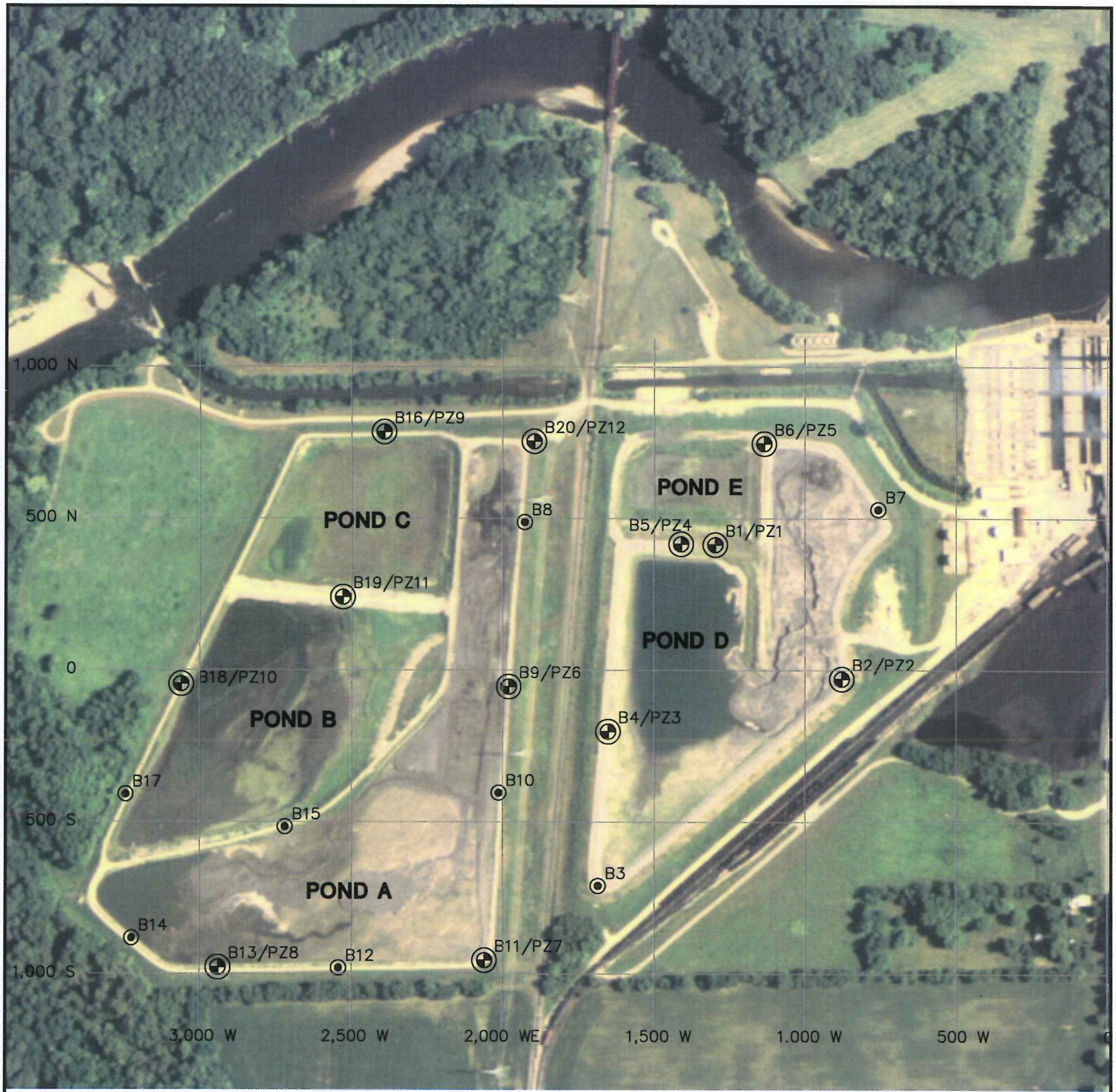
[1] Boring logs for existing CCR surface impoundments were extracted from *Hydraulic and Stability Analysis Report: Indianapolis Power & Light Company, Eagle Valley Generating Station, Martinsville, Indiana*, by SCS BT Squared, dated April 9, 2012.



LEGEND

⊕	SOIL BORING / PIEZOMETER
⊙	SOIL BORING

500 0 500

SCALE: 1" = 500'

N

NOTES:

1. AERIAL PHOTOGRAPH FROM INDIANA SPATIAL DATA PORTAL, DATED JULY 07, 2007.
2. BORING LOCATIONS ARE APPROXIMATE AND ARE BASED ON DRAWINGS PROVIDED BY INDIANAPOLIS POWER AND LIGHT COMPANY.
3. ON-SITE COORDINATE SYSTEM DEVELOPED FROM IPL DRAWING "EAGLE VALLEY MONITORING WELLS ASH PONDS A; B; C" DATED SEP. 13, 2011.

CLIENT	ipl an AES company INDIANAPOLIS POWER & LIGHT COMPANY	SITE	EAGLE VALLEY GENERATING STATION 4040 BLUE BLUFF ROAD MARTINSVILLE, INDIANA
			BORING AND PIEZOMETER LOCATION MAP

PROJECT NO.	25211429.51	DRAWN BY:	KG	ENGINEER	SCS BT SQUARED 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE
DRAWN:	02/03/11	CHECKED BY:	KG			2
REVISED:	1/18/12	APPROVED BY:	DH 04/04/12			

I:\4295\4295A\Drawings-General\Boring Loc.dwg, 4/4/2012 10:24:15 AM

B1 – 2011 Boring Logs, Abandonment, and Well Construction Forms

SCS BT Squared
Civil & Environmental Engineering

SOIL BORING LOG INFORMATION

10-92

Facility/Project Name IPL - Eagle Valley SCS # 25211429.51	License/Permit/Monitoring Number		Boring Number B8
Boring Drilled By (Firm name and name of crew chief) American Drilling Services Jeremy Wallace	Drilling Started 08/15/2011	Drilling Completed 08/15/2011	Drilling Method HSA 3¼"
Facility Well No. / Unique Well No. / Common Well Name	Static Water Level Feet	Surface Elevation 628.36 Feet	Borehole Diam. 6.5 Inches
Boring Location State Plane N, E NW 1/4 of NE 1/4 of Section 16, T. 12 N., R. 1 E.	Lat. Long.	Local Grid Location (If applicable) 468 N -1908 E	
County Morgan County, Indiana	Location Code	Civil Town/City/or Village Martinsville, IN	

Sample Number	Sample Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: P200	RQD/ Comments
S1	12	25-27 40-18		SILT with SAND and GRAVEL, mottled, 2.5Y 3/2, 2.5Y 5/6, gravel is fine and angular, sand is fine to coarse, includes coal fragments (fill) (ash).					2.0- 4.0	M		
				CLAY, mottled, 5Y 5/1, 5Y 5/4, trace fine to coarse sand, trace organics (plant material) (fill).								
S2	16	05-07 08-06	5						4.0	M		
				Same as above.								
S3	17	02-03 06-06		At 9', 1cm layer of ASH (silt, 2.5Y 2.5/1).					3.5 >4.5	M M		
			10	CLAY, 2.5Y 4/4, some 5Y 5/1 mottling, trace organics (wood pieces) (fill).								
S4	19	04-11 12-13		SILTY CLAY, mottled, 5Y 5/4, 5Y 2.5/1, little fine to medium sand. SILT, 5Y 2.5/1, some fine to coarse sand, sand is angular coal fragments (ash).					1.5 <0.5	M M		

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Meghan D

Firm SCS BT Squared Meghan Dickoff

Boring Number B8

Sample									Soil Properties			
Number	Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Standard Penetration	Moisture Content	P200	RQD/ Comments
				SILT, mottled, 5Y 2.5/1, 5Y 5/1, 5Y 4/3, 1mm to 5mm varves throughout, little fine sand is coal fragments, concentrated in darkest varves, trace clay concentrated in brown varves, trace coarse sand - coal fragments (ash) (fill).					0.5	M		
S5	18	02-03 03-04							0	W		wet at 17'
				SILT, 5Y 2.5/1, massive with mottles of 5Y 5/2 (ash).								
			20	SILT, 5Y 2.5/1, 5Y 3/1, 5Y 4/2, 1mm to 5mm varves throughout, some very fine to fine sand, includes coal fragments, trace clay in brown varves (ash).								
S6	21	03-03 03-02		At 22', 1" SAND, 5Y 2.5/1, fine to medium coal fragments.					0	W		
									-	M/W		
S7	19	04-04 07-04	25	CLAY, 5Y 3/2, massive, trace fine sand (native?).					2.5	M/W		top of clay at 24' 1"
S8	16	WOH- 02- 05-08		CLAY, 5Y 4/2, massive.					1.0- 1.5	M		
			30	SILTY SAND, 2.5Y 4/4, massive, fine to medium, trace shell fragments (native?).								
											M	
S9	15	WOH- 07- 06-05		SILTY SAND, 2.5Y 4/4, massive, fine to coarse, angular to well rounded, mixed lithology.					-			
											W	

Boring Number B8

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties			RQD/ Comments
Number	Length Recovered								Standard Penetration	Moisture Content	P200	
				SILTY SAND, 2.5Y 4/4, massive, fine to coarse, angular to well rounded, mixed lithology.								
S10	18	08-16 20-23							-	w		
				At 38', few coarse gravel, broken cobbles.								
			40									
S11	24	10-12 14-17		Same as above.					-	w		
				End of boring @ 42'; Abandoned with bentonite grout.								
			45									
			50									

SCS BT Squared
Civil & Environmental Engineering

SOIL BORING LOG INFORMATION
10-92

Facility/Project Name IPL - Eagle Valley SCS # 25211429.51		License/Permit/Monitoring Number	Boring Number B9 / PZ6
Boring Drilled By (Firm name and name of crew chief) American Drilling Services Jeremy Wallace	Drilling Started 08/15/2011	Drilling Completed 08/15/2011	Drilling Method HSA 4¼"

Facility Well No.	Unique Well No.	Common Well Name	Static Water Level Feet	Surface Elevation 629.04 Feet	Borehole Diam. 8.5 Inches

Boring Location State Plane N, E NW 1/4 of NE 1/4 of Section 16, T. 12 N., R. 1 E.	Lat. Long.	Local Grid Location (If applicable) -71 N -1959 E
County Morgan County, Indiana	Location Code	Civil Town/City/or Village Martinsville

Sample									Soil Properties			
Number	Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Standard Penetration	Moisture Content	P200	RQD/ Comments
S1	11	30-22 11-09		SILT with GRAVEL, 2.5Y 6/2, gravel is fine, angular (fill).					-	D		
				CLAY, mottled, 2.5Y 5/4, 2.5Y 5/1, little fine to coarse sand and fine gravel, sand and gravel are angular to subrounded (fill).					4.0-4.5	M		
S2	18	04-04 03-05	5	CLAY, mottled, 2.5Y 5/5, 2.5Y 5/3, 2.5Y 6/1, trace fine to coarse sand. ASH layers (1") at 4.75' and 6'.					3.5	M		
S3	17	03-02 03-05	10	SILT, 2.5Y 2.5/1, massive, trace 0.5cm to 1cm pieces of sandy clay (2.5Y 5/5), little very fine to fine sand - coal fragments (ash) (fill).					3.5 0	M W		
S4	22	04-07 08-09		CLAY, mottled, 10YR 4/4 (main color), 10YR 4/1, trace plant matter, trace fine sand (fill).					3.0	M		
				At 14', 2" SILT, 2.5Y 2.5/1 (ash).								

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Meghan Dickoff	Firm SCS BT Squared Meghan Dickoff

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10-92

Boring Number B9 / PZ6

Sample									Soil Properties			
Number	Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Standard Penetration	Moisture Content	P200	RQD/ Comments
				Same as above.								
S5	24	03-02 02-02		SILT, 2.5Y 2.5/1, 2.5Y 4/2, 2.5Y 5/1, 1mm to 3mm varves throughout, trace plant matter, little very fine to fine sand - coal fragments, concentrated in darkest varves, trace clay concentrated in brown varves (ash).					<0.5	M		
			20						<0.5	W		
S6	22	06-10 15-13		SILT, 2.5Y 2.5/1, 2.5Y 5/1, massive 20' to 20.5', varved (1mm to 8mm) below, little very fine to fine sand, trace coarse sand, well rounded, trace plant matter, clayey layer (2") at 21' (ash).						M		wet at 20' to 20.5'
									3.0	M		
S7	19	04-06 08-09	25	CLAY, 5Y 3/1, little fine sand.					4.0	M		
				CLAY, 5Y 4/4, little fine sand (native)					3.5	M		
S8	22	02-05 04-06		Same as above.					2.5 1.5	M		
			30	SAND with CLAY, 2.5Y 4/4, sand is fine to medium.						M		
S9	16	01-02 02-03		SILTY SAND, 10YR 5.5/4, fine to medium, trace coarse sand (native).					-	M		

Boring Number B9 / PZ6

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties			RQD/ Comments
Number	Length Recovered								Standard Penetration	Moisture Content	P200	
S10	12	WOH- 03- 10-12		SILTY SAND, 10YR 5/4, fine to coarse, subangular to well rounded, mixed lithology, trace fine gravel.					-	W		spoon and rods fell from 15' and drove first 8"
				End of boring @ 38'; Will set PZ with screen just above clay.								
			40									
			45									
			50									

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SOIL BORING LOG INFORMATION
10-92

Facility/Project Name IPL - Eagle Valley SCS # 25211429.51	License/Permit/Monitoring Number		Boring Number B10
Boring Drilled By (Firm name and name of crew chief) American Drilling Services Jeremy Wallace	Drilling Started 08/16/2011	Drilling Completed 08/16/2011	Drilling Method HSA 3¼"
Facility Well No. / Unique Well No. / Common Well Name	Static Water Level Feet	Surface Elevation 629.19 Feet	Borehole Diam. 6.5 Inches
Boring Location State Plane N, E SW 1/4 of NE 1/4 of Section 16, T. 12 N., R. 1 E.	Lat. Long.	Local Grid Location (If applicable) -419 N -1993 E	
County Morgan County, Indiana	Location Code	Civil Town/City/or Village Martinsville	

Sample									Soil Properties			
Number	Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Standard Penetration	Moisture Content	P200	RQD/ Comments
S1	11	32-33 14-08		SILT with GRAVEL, 2.5Y 7/2, 2.5Y 5/1, gravel is fine and coarse, angular, limestone, some fine to coarse sand, angular (fill).					-	D		
				CLAY, 2.5Y 4/3, mottled, with fine to coarse sand, rounded (fill).								
S2	8	02-01 01-02	5	CLAY, 5Y 5/2, some coarse sand and gravel, trace plant material (fill).					1.0	M		
				CLAY, mottled, 5Y 5/1, 5Y 5/4, trace fine gravel, trace organic/plant matter (fill).					0.5	M		
S3	14	WOH- WOH		SILT with SAND, 5Y 2.5/1, sand is fine coal fragments, some clay, clay is pieces of material above and below.					-	W		
		WOH- 02	10	CLAY, 5Y 5/1, mottled.						M		
S4	21	WOH- 03- 07-08		CLAY, 10YR 4/3.5, with fine to coarse sand and fine gravel, sand and gravel are subangular to well rounded, mixed lithology.					1.0	M		
									3.5	M		

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Meghan D	Firm SCS BT Squared Meghan Dickoff

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10-92

Boring Number B10

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties			RQD/ Comments
Number	Length Recovered								Standard Penetration	Moisture Content	P200	
S5	22	WOH- 01 01-02		SILT, mottled, 2.5Y 2.5/1, 2.5Y 4/2, 2.5Y 5/1, 1mm to 10mm varves throughout, trace plant matter, trace very fine sand (coal fragments) (ash) (fill).					0	W		
S6	20	WOH- 05- 09-09	20	SILT, 2.5Y 2.5/1, mottled with 2.5Y 5/6, little fine to medium sand, mixed lithology, including coal fragments (ash) (fill).					0	M		
				SILT, 2.5Y 2.5/1, massive, trace plant matter (ash) (fill).					0	M		
S7	14	WOH- 02 02-03	25	SILT, 2.5Y 2.5/1, 2.5Y 4/2, 2.5Y 5/1, 1mm to 10mm varves throughout, trace plant matter, trace very fine sand (coal fragments) (ash).					0	W		
				CLAY, 10YR 4/4, massive, little fine sand, mixed lithology.					0.5	M/W		
S8	16	05-10 11-14		SILTY SAND with GRAVEL, 10YR 5/4, massive, sand is fine to coarse, gravel is fine, angular to well rounded.					-	M		
			30									
S9	14	13-18 17-16		Same as above.					-	M		
				End of boring @ 34'; Abandoned with bentonite grout.								

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SOIL BORING LOG INFORMATION
10-92

Facility/Project Name IPL - Eagle Valley SCS # 25211429.51			License/Permit/Monitoring Number		Boring Number B11 / PZ7
Boring Drilled By (Firm name and name of crew chief) American Drilling Services Jeremy Wallace			Drilling Started 08/16/2011	Drilling Completed 08/16/2011	Drilling Method HSA 4¼"
Facility Well No.	Unique Well No.	Common Well Name PZ-7	Static Water Level Feet	Surface Elevation 628.17 Feet	Borehole Diam. 8.5 Inches
Boring Location State Plane N, E SW 1/4 of NE 1/4 of Section 16, T. 12 N., R. 1 E.			Lat. Long.	Local Grid Location (If applicable) -950 N -2064 E	
County Morgan County, Indiana		Location Code	Civil Town/City/or Village Martinsville		

Sample Number	Sample Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Standard Penetration	Moisture Content	P200	RQD/ Comments
				SILTY GRAVEL, 5Y 5/1, gravel is fine to coarse, angular, limestone (fill).					-	D		
S1	15	12-08 07-08		SILT, 2.5Y 2.5/1, massive, little fine to coarse sand and fine gravel, mostly coal fragments (ash) (fill).					0.5	M		
				Same as above.					0	M		
S2	19	13-11 11-12	5	SILT, mottled, 2.5Y 2.5/1, 2.5Y 5/1, trace coal fragments, angular, coarse sand size (ash) (fill).					0	W		wet @ 5.5'
S3	22	03-03 10-14		SILT, 2.5Y 2.5/1, massive, trace organic matter (roots), 2" clay layer (5Y 6/1, 5Y 5/6) at 9.5', trace fine to coarse sand (coal fragments) and clay throughout.					0	W		
			10									
S4	23	03-03 02-03		SILT, 2.5Y 2.5/1, massive, trace organic (roots), fine and coarse gravel-sized pieces in to 3" (10R 4/8), 3mm fine sand seam at 13', 1cm to 2cm clay zones at 13.5' to 14' (5Y 5/2) (ash) (fill).					0	W		

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Meghan Dickoff	Firm SCS BT Squared Meghan Dickoff

Boring Number B11 / PZ7

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties			RQD/ Comments
Number	Length Recovered								Standard Penetration	Moisture Content	P200	
S5	22	01-02 02-02		SILT, 5Y 3/1, 2" layer of silty medium to coarse sand (coal) at 16.5', another 6" layer at 17', trace plant matter and plastic (ash) (fill).					<0.5	W		
S6	24	WOH/ 24	20	SILT, 5Y 2.5/1, 5Y 5/2, varves 1mm to 2cm thick throughout, little very fine sand (coal fragments) in dark varves (ash) (fill).					0	W		
S7	24	WOH- WOH WOH- 01	25	Same as above, but more and thicker dark/sandy varves.					0	W		
S8	22	03-03 03-04		CLAY, 2.5Y 3/2, massive, trace fine sand.					1.5	M/W		
			30	CLAY, 10YR 3/4, massive, trace fine sand.					1.25	M/W		
S9	24	WOH- 03- 03-03		CLAY, 10YR 3/4, massive, trace fine sand.					0.5	W		

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Boring Number B11 / PZ7

Sample									Soil Properties			
Number	Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Standard Penetration	Moisture Content	P200	RQD/ Comments
				CLAY with SAND, 2.5Y 5/1 and 2.5Y 5/4, sand is fine.					0	w		
S10	24	03-10 11-10		SILTY SAND, 2.5Y 4.5/2, sand is fine to coarse, angular to well rounded, mixed lithology, little fine gravel, angular to subrounded, mixed lithology.					-	w		
			40	Same as above.								
S11	12	08-10 16-11										
				End of boring @ 42'.								
			45									
			50									

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SOIL BORING LOG INFORMATION
10-92

Facility/Project Name IPL - Eagle Valley	SCS # 25211429.51		License/Permit/Monitoring Number		Boring Number B12
Boring Drilled By (Firm name and name of crew chief) American Drilling Services	Jeremy Wallace		Drilling Started 08/17/2011	Drilling Completed 08/17/2011	Drilling Method HSA 3¼"
Facility Well No.	Unique Well No.	Common Well Name	Static Water Level Feet	Surface Elevation 629.10 Feet	Borehole Diam. 6.5 Inches
Boring Location State Plane N, E SW 1/4 of NE 1/4 of Section 16, T. 12 N., R. 1 E.			Lat. Long.	Local Grid Location (If applicable) -975 N	-2544 E
County Morgan County, Indiana		Location Code	Civil Town/City/or Village Martinsville		

Sample									Soil Properties			
Number	Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Standard Penetration	Moisture Content	P200	RQD/ Comments
S1	18	25-10 09-08		2" SILT with SAND and GRAVEL, 2.5Y 6/2, sand and gravel are angular, sand is fine to coarse, gravel is fine, limestone. LEAN CLAY, 5Y 5/3, massive (fill).					3.5-4.0	D/M		
S2	18	05-06 08-07	5	LEAN CLAY, mottled, 2.5Y 5/4, 5Y 5/1, trace plant matter (roots, sticks) (fill).					3.5	M		
S3	20	02-02 03-03	10	Same as above, with trace coarse sand and fine gravel - coal fragments, brick/ceramic fragments (fill).					1.0-1.5	M/W		
S4	16	WOH-02-05-07		LEAN CLAY, 10YR 4.5/6, massive, trace fine to medium sand - coal fragments (fill).					1.0 2.0	W		
				At 14', 1 cm of SILT, 2.5Y 3/1.								

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Meghan D	Firm SCS BT Squared Meghan Dickoff

Boring Number B12

Sample									Soil Properties			
Number	Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Standard Penetration	Moisture Content	P200	RQD/ Comments
S5	23	09-08 04-07		SILT, 2.5Y 3/1, massive, little fine to coarse sand, sand is well rounded, mixed lithology, angular coal fragments, trace clay (5Y 4/4) in clasts (ash) (fill).					<0.5	M W		
S6	20	WOH-03-05-11	20	SILT, 2.5Y 2.5/1, massive, some fine to coarse sand and fine gravel, subrounded to well rounded, mixed lithology, 1" to 3" clay (5Y 4/4) layers at 20.25' and 21', 1" silty sand and gravel seam at 21.75', trace roots/sticks throughout (ash) (fill).					<0.5	M		standard penetration is 2.5 in clay seams
S7	21	02-01 02-02	25	SILT, 2.5Y 3/1, 2.5Y 2.5/1, 2.5Y 5/1, 1mm to 10 mm varves throughout, some very fine to fine sand (coal fragments) concentrated in darker varves (ash) (fill).					<0.5	W/M		
S8	24	WOR/ 24	30	SILT, 2.5Y 4/1, 2.5Y 2.5/1, 1mm to 1.5mm varves throughout, trace very fine to fine sand (coal fragments) (ash) (fill).					0	W		
S9	11	01-12 13-08		SILTY SAND, 10YR 5/4, sand is fine to medium, little coarse sand and fine gravel, subangular to well rounded, mixed lithology.					-	M		driller says it did not feel like he drilled through any clay above sand

Boring Number B12

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties			RQD/ Comments
Number	Length Recovered								Standard Penetration	Moisture Content	P200	
S10	16	10-11 13-10		SILTY SAND, 10YR 5/4, sand is fine to medium, some coarse sand and fine gravel, subangular to well rounded, mixed lithology.					-	W		
				End of boring @ 38'; Abandoned with bentonite grout.								
			40									
			45									
			50									

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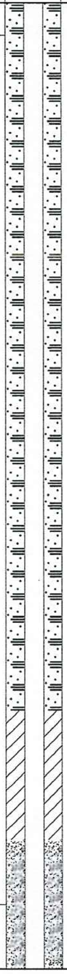
SOIL BORING LOG INFORMATION
10-92

Facility/Project Name IPL - Eagle Valley SCS # 25211429.51		License/Permit/Monitoring Number		Boring Number B13 / PZ8
Boring Drilled By (Firm name and name of crew chief) American Drilling Services Jeremy Wallace		Drilling Started 08/17/2011	Drilling Completed 08/18/2011	Drilling Method HSA 4¼"
Facility Well No.	Unique Well No. / Common Well Name	Static Water Level Feet	Surface Elevation 629.56 Feet	Borehole Diam. 8.5 Inches
Boring Location State Plane N, E SE 1/4 of NW 1/4 of Section 16, T. 12 N., R. 1 E.		Lat. Long.	Local Grid Location (If applicable) -974 N -2938 E	
County Morgan County, Indiana	Location Code	Civil Town/City/or Village Martinsville		

Sample Number	Sample Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties Standard Penetration	Soil Properties Moisture Content	Soil Properties P200	RQD/ Comments
				5" SILT with GRAVEL, 2.5Y 5/2, massive, gravel is fine, subangular to angular, limestone (fill).					-	D		
S1	17	20-10 07-08		LEAN CLAY, mottled, 5Y 4/2, 5Y 5/3, 10YR 4/6, some silt, some fine to coarse sand and fine gravel-sized coal fragments (fill).					2.5- 3.0	M		
S2	18	02-03 06-06	5	LEAN CLAY, mottled, 5Y 5/2, 10YR 6/8, 10YR 4/4.					1.5 4.0	M		
S3	18	02-03 04-04	10	LEAN CLAY, same as above.					4.5 1.0	M		
S4	18	02-05 05-09		LEAN CLAY, 10YR 4/4, massive, trace fine sand, including coal fragments.					2.0	M		
				SILT, 2.5Y 2.5/1, massive, trace coarse sand-sized coal (ash).								



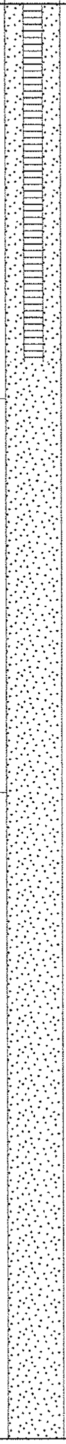
I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Meghan D

Firm SCS BT Squared Meghan Dickoff

Boring Number B13 / PZ8

Sample									Soil Properties			
Number	Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Standard Penetration	Moisture Content	P200	RQD/ Comments
S5	19	07-16 24-25		SILT, 2.5Y 2.5/1, massive, little fine to coarse sand-sized coal fragments, trace fine to coarse sand and fine gravel, mixed lithology, well rounded (ash) (fill).					<0.5	M		wet in top 6"
												water in borehole 8/18 am, bottom at 18'
			20	SILT, 2.5Y 2.5/1, 1mm to 2mm thick varves, little clay (ash).								
S6	24	02-05 05-07		LEAN CLAY, 5Y 3/1, silty, some fine to coarse sand, angular to rounded, some fine gravel, rounded, massive, mixed lithology.					1.0	M/W		
				At 21', 1cm fine black sand layer (coal fragments?).								
S7	24	01-02 05-06	25	SILTY LEAN CLAY, mottled with silt, 2.5Y 3.5/3, 2.5Y 2.5/1, 2.5Y 3/1, 1" layers of silt (2.5Y 5/1, 2.5Y 3/1) at 25' and 25.75', trace fine to coarse sand and fine gravel, subangular to rounded, mixed lithology (fill clay with ash).					1.0-1.5	M/W		sand in tip
				POORLY GRADED SAND with SILT, massive, sand is fine to medium, mixed lithology, trace coarse sand and fine gravel, subrounded to rounded, mixed lithology.								
S8	16	12-10 09-07							-	M		
			30									
				Same as above, 1" sandy clay layer at 33' (2.5Y 5/6 and 2.5Y 4/1).								
S9	12	01-07 05-04							-	M		rods slipped, fell ~8' to drive first 4"



Boring Number B13 / PZ8

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties			RQD/ Comments
Number	Length Recovered								Standard Penetration	Moisture Content	P200	
S10	17	05-10 15-13		SILTY SAND, 2.5Y 5/4, fine to coarse, subangular to rounded, mixed lithology, little fine gravel, subrounded, mixed lithology.					-	M W		wet in last 6"
			40 45 50	End of borign @ 38'; PZ screen set at 15' to 20'.								

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SOIL BORING LOG INFORMATION
10-92

Facility/Project Name IPL - Eagle Valley	SCS # 25211429.51		License/Permit/Monitoring Number		Boring Number B13A
Boring Drilled By (Firm name and name of crew chief) American Drilling Services Jeremy Wallace			Drilling Started 08/24/2011	Drilling Completed 08/24/2011	Drilling Method 3¼" HSA
Facility Well No.	Unique Well No.	Common Well Name	Static Water Level Feet	Surface Elevation 629.33 Feet	Borehole Diam. 6.5 Inches
Boring Location State Plane N, E SE 1/4 of NW 1/4 of Section 16, T. 12 N., R. 1 E.			Lat. Long.	Local Grid Location (If applicable) -974 N -2944 E	
County Morgan		Location Code	Civil Town/City/or Village Martinsville, Indiana		

Sample Number	Sample Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: P200	RQD/ Comments
				Blind drill to 19' to top of Shelby Tube sample intervals. See B13/PZ8 for soil sample descriptions.								
			5									
			10									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature John Mason	Firm SCS BT Squared John Mason

Boring Number B13A

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties			RQD/ Comments
Number	Length Recovered								Standard Penetration	Moisture Content	P200	
				Blind drilled. to top of Shelby Tube sample intervals.								
			20									3" Shelby Tube sample
												3" Shelby Tube sample, no recovery
			25	End of boring @ 25'.								
			30									

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SOIL BORING LOG INFORMATION
10-92

Facility/Project Name IPL - Eagle Valley	SCS # 25211429.51	License/Permit/Monitoring Number		Boring Number B14
Boring Drilled By (Firm name and name of crew chief) American Drilling Services	Jeremy Wallace	Drilling Started 08/18/2011	Drilling Completed 08/18/2011	Drilling Method HSA 3¼"
Facility Well No.	Unique Well No.	Common Well Name	Static Water Level Feet	Surface Elevation 628.14 Feet	Borehole Diam. 6.5 Inches
Boring Location State Plane N, E SE 1/4 of NW 1/4 of Section 16, T. 12 N., R. 1 E.		Lat. Long.	Local Grid Location (If applicable) -877 N	-3220 E
County Morgan County, Indiana		Location Code	Civil Town/City/or Village Martinsville	

Sample									Soil Properties			
Number	Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Standard Penetration	Moisture Content	P200	RQD/ Comments
				3" SILT with GRAVEL, 2.5Y 6/2, gravel is fine and angular, limestone (fill).								
S1	14	13-09 05-04		LEAN CLAY, mottled, 2.5Y 5/3, 2.5Y 5/6, 2.5Y 4/1, trace fine to coarse sand, mixed lithology, angular to rounded, little silt (2.5Y 3/1 - ash) (fill).					2.0-3.0	M		
S2	17	04-04 10-12	5	Same as above.					2.0-3.0	M		
				SILT with SAND, 2.5Y 3/2, massive, sand is fine to coarse, coal fragments, little fine to coarse gravel, also coal fragments (ash) (fill).					0	M		
S3	12	WOH-WOH 01-02	10	LEAN CLAY, mottled, 2.5Y 5/4, 2.5Y 5/6, 5Y 6/2, trace plant matter.					0.5 1.0	M/W		
S4	19	07-12 09-06		SILT, mottled, 2.5Y 3/1, 2.5Y 5/1, 2.5Y 3/3, little very fine to fine sand (coal particles) is darkest areas (ash) (fill).					1.5	M		

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Meghan Dickoff	Firm SCS BT Squared Meghan Dickoff

SCS BT Squared

Boring Number B14

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties			RQD/ Comments
Number	Length Recovered								Standard Penetration	Moisture Content	P200	
				SILT, 2.5Y 2.5/1, massive, some medium to coarse sand (coal fragments) (ash) (fill).						W		
S5	17	07-14 09-06		SILT, mottled, 2.5Y 3/1, 2.5Y 5/1, 2.5Y 5/6, 5Y 6/2, little fine to coarse sand (mixed lithology and coal) (ash) (fill).					<0.5	M		
			20									
S6	24	04-05 06-06		LEAN CLAY with SAND, 2.5Y 4/4, sand is fine to medium, trace coarse sand, subangular to well rounded, 1cm silty fine to medium sand layer at 20.75'.					3.0	W		
				Same as above, 1" silty sand and gravel layer at 24.75'.								
S7	19	05-05 08-09	25	FAT CLAY, mottled, 2.5Y 2.5/1, 2.5Y 3/2.					2.0	W		
									1.25			
S8	23	02-02 02-03		FAT CLAY, 10YR 4/4, massive, trace very fine sand.						W		
			30						0.75			
S9	14	02-08 08-07		SILTY SAND, 10YR 4.5/4, trace clay, sand is fine to medium, little coarse sand and fine gravel, subangular to well rounded, mixed lithology.					-	M		

Boring Number B14

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties			RQD/ Comments
Number	Length Recovered								Standard Penetration	Moisture Content	P200	
S10	14	05-10 11-10		SILTY SAND with GRAVEL, 10YR 5.5/6, sand is fine to coarse, gravel is fine, subangular to well rounded, mixed lithology.					-	W		
				End of boring @ 38'; Abandoned with bentonite grout.								
			40									
			45									
			50									

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SOIL BORING LOG INFORMATION
10-92

Page 1

Facility/Project Name IPL - Eagle Valley	SCS # 25211429.51	License/Permit/Monitoring Number		Boring Number B15
Boring Drilled By (Firm name and name of crew chief) American Drilling Services Jeremy Wallace		Drilling Started 08/19/2011	Drilling Completed 08/19/2011	Drilling Method HSA 3¼"
Facility Well No.	Unique Well No.	Common Well Name	Static Water Level Feet	Surface Elevation 628.35 Feet
				Borehole Diam. 6.5 Inches
Boring Location State Plane N, E SW 1/4 of NE 1/4 of Section 16, T. 12 N., R. 1 E.		Lat. Long.	Local Grid Location (If applicable) -514 N -2719 E	
County Morgan County, Indiana		Location Code	Civil Town/City/or Village Martinsville	

Sample Number	Sample Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: P200	RQD/ Comments
				1" SILT with GRAVEL, 2.5Y 6/2, gravel is angular (fill).					-	D		
S1	20	12-13 16-20		SILT, 5Y 3/2, massive, trace fine to coarse sand-sized angular coal fragments (ash) (fill).					<0.5	M/D		
S2	22	20-18 18-12	5	Same as above.					<0.5	M/D		
				SILT, 2.5Y 4/2, 5Y 3/2, 3" to 6" layers alternating between colors, trace fine to coarse sand (coal fragments) in both, trace plant roots at 6' (ash) (fill).								
S3	20	05-06 16-15	10	SILT, 5Y 3/2, massive, little fine to coarse sand and fine gravel from 8' to 9', well rounded, mixed lithology, trace coal fragments in same interval.					<1.0	M		includes a few roots/sticks
S4	22	07-16 18-19		SILT, mottled, 5Y 3.5/1, 2.5Y 3/2, 5Y 4/1, little very fine to fine sand, trace coarse sand-sized coal fragments at 13' to 14'.					<0.5	M		

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Meghan D	Firm SCS BT Squared Meghan Dickoff

Boring Number B15

Sample									Soil Properties			
Number	Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Standard Penetration	Moisture Content	P200	RQD/ Comments
S5	24	01-WOH/ 18		SILT, 2.5Y 3/2, 2.5Y 2.5/1, 1mm to 10mm varves throughout except in 6" zone at 16.75 to 17.25', this zone is silt with very fine sand, extremely loose material (ash) (fill).					0	w		trace plant roots throughout
S6	18	WOR/ 24	20	SILT, 2.5Y 2.5/1, 10YR 3.5/3, 1mm to 2cm varves throughout (ash) (fill).					0	w		
S7	24	01-WOH/ 18	25	3" SILTY SAND, 2.5Y 2.5/1, sand is fine to coarse coal (ash) (fill). SILT, 2.5Y 5/2, 2.5Y 2.5/1, 2mm to 10mm varves throughout, little very fine sand throughout (ash) (fill).					0	w		M in last 3"
S8	20	WOH-01-01-02		FAT CLAY, 2.5Y 4.5/3.5, massive.					0	w		
			30	FAT CLAY with SAND, 2.5Y 4.5/3.5, massive, sand is fine to very fine, mixed lithology.					0	w		
S9	24	WOH-WOH 02-03		FAT CLAY, mottled, 2.5Y 5/2, 10YR 4/6, trace shell fragments.					0 0.5	w w		

Boring Number B15

Sample Number	Sample Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties Standard Penetration	Soil Properties Moisture Content	Soil Properties P200	RQD/ Comments
				FAT CLAY, mottled, 2.5Y 5/2, 10YR 4/6, trace shell fragments.					1.25	W		
S10	19	WOH- 08 07-08		SILTY SAND, 10YR 5/2, sand is fine to medium, trace coarse sand and fine gravel, massive.					-	W		
			40									
S11	24	05-11 13-18		SILTY SAND with GRAVEL, 10YR 5/2, sand is fine to coarse, gravel is fine, subrounded to well rounded, mixed lithology.					-	W		
				End of boring @ 42'; Abandoned with bentonite grout.								
			45									
			50									

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SOIL BORING LOG INFORMATION

10-92

Facility/Project Name IPL - Eagle Valley SCS # 25211429.51			License/Permit/Monitoring Number		Boring Number B16 / PZ9
Boring Drilled By (Firm name and name of crew chief) American Drilling Services Jeremy Wallace			Drilling Started 08/22/2011	Drilling Completed 08/22/2011	Drilling Method 4¼" HSA
Facility Well No.	Unique Well No.	Common Well Name	Static Water Level Feet	Surface Elevation 618.46 Feet	Borehole Diam. 8.5 Inches
Boring Location State Plane N, E NW 1/4 of NE 1/4 of Section 16, T. 12 N., R. 1 E.			Lat. Long.	Local Grid Location (If applicable) 779 N 2394 E	
County Morgan County, Indiana		Location Code	Civil Town/City/or Village Martinsville		

Sample Number	Sample Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Standard Penetration	Moisture Content	P200	RQD/ Comments
S1	20	24-16 12- 09		SILTY SAND with GRAVEL, 5YR 4/3, sand is fine, gravel is fine (fill).						M		
				At 1.9', SILT with CLAY (ash).								
S2	22	05-09 10-13	5	SILT, 2.5Y 3/2, with some fine pieces of coal, intermixed with brown clay (ash).						M		
S3	23	05-06 10-10		CLAY with SAND, 2.5Y 4/3, sand is fine (fill).					2.5	M		
				SILT, 2.5Y 3/1 (ash).								
			10									
S4	24	01-01 WOH- WOH		SILT, 2.5Y 2.5/1, some horizontal bedding structure (ash).					0.0	W		

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature John Mason	Firm SCS BT Squared John Mason

Boring Number B16 / PZ9

Sample Number	Sample Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties Standard Penetration	Soil Properties Moisture Content	Soil Properties P200	RQD/ Comments
				CLAY, 2.5Y 4/4, plastic, massive.								
S5	22	03-05 05- 05							1.7	M		
			20									
S6	23	01-01 02-02		Same as above, but soft and wet.					0.7	W		
				CLAYEY SAND, 7.5YR 4/4, fine.								
20	S7	03-07 07-06	25	POORLY GRADED SAND with SILT, 7.5YR 4/4, fine to medium.						W		
				Same as above, with 2" fine sand.								
S8	24	03-05 07-10								W		
			30	End of boring @ 30'.								

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SOIL BORING LOG INFORMATION
10-92

Facility/Project Name IPL - Eagle Valley SCS # 25211429.51		License/Permit/Monitoring Number		Boring Number B17
Boring Drilled By (Firm name and name of crew chief) American Drilling Services Jeremy Wallace		Drilling Started 08/22/2011	Drilling Completed 08/22/2011	Drilling Method 3¼" HSA
Facility Well No.	Unique Well No.	Common Well Name	Static Water Level Feet	Surface Elevation 618.22 Feet	Borehole Diam. 6.5 Inches
Boring Location State Plane N, E SE 1/4 of NW 1/4 of Section 16, T. 12 N., R. 1 E.		Lat. Long.	Local Grid Location (If applicable) -406 N -3241 E	
County Morgan County, Indiana		Location Code	Civil Town/City/or Village Martinsville	

Sample Number	Sample Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties Standard Penetration	Soil Properties Moisture Content	Soil Properties P200	RQD/ Comments
				Crushed gravel.	.							
				SILTY SAND, light brown, fine.	.							
S1	20	12-08 09-10		SILT, 2.5Y 2.5/1, massive, non-cohesive (ash).						M		
S2	23	05-08 09-09	5	Same as above.						M		
S3	24	08-09 13-11		Same as above, some root hairs, trace fine grains of coal.						M		
			10									
S4	22	04-04 02-02		SILT, mottled, 5GY 4/1 and 5YR 2.5/1 (ash).						W		

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature John Mason

Firm SCS BT Squared John Mason

Boring Number B17

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties			RQD/ Comments
Number	Length Recovered								Standard Penetration	Moisture Content	P200	
S5	18	WOH-02 04-03		CLAY, 10YR 4/4, massive, low plasticity.						W		
S6	21	01-01 02-03	20	CLAY, 10YR 4/4, massive, plastic.					1.2	W		
S7	23	WOH-01 02-02	25	CLAY, 10YR 4/3, massive, trace coarse sand, subrounded, plastic.					1.2	W		
S8	20	10-12 16-11		POORY GRADED GRAVEL with SILT and SAND, 10YR 5/3, fine to coarse, subrounded, mixed lithology.						W		
			30	SILTY SAND with GRAVEL, 10YR 5/3, sand is fine to coarse, gravel is fine, subrounded grains with mixed lithology.								
S9	17	03-12 14-17								W		
				End of boring @ 34'.								

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SOIL BORING LOG INFORMATION
10-92

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Facility/Project Name IPL - Eagle Valley SCS # 25211429.51			License/Permit/Monitoring Number		Boring Number B18 / PZ10
Boring Drilled By (Firm name and name of crew chief) American Drilling Services Jeremy Wallace			Drilling Started 08/23/2011	Drilling Completed 08/23/2011	Drilling Method 4¼" HSA
Facility Well No.	Unique Well No.	Common Well Name	Static Water Level Feet	Surface Elevation 618.72 Feet	Borehole Diam. 8.5 Inches
Boring Location State Plane N, E NE 1/4 of NW 1/4 of Section 16, T. 12 N., R. 1 E.			Lat. Long.	Local Grid Location (If applicable) -45 N -3059 E	
County Morgan County, Indiana	Location Code		Civil Town/City/or Village Martinsville, IN		

Sample									Soil Properties			
Number	Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Standard Penetration	Moisture Content	P200	RQD/ Comments
				SILTY GRAVEL, crushed dolomite.								
S1	18	20-16 12-09		SILTY SAND, 10YR 5/4, fine, with fine gravel (fill).						M		
				SANDY CLAY (fill).								
S2	20	05-08 10-10	5	SILT, 10YR 2/1, massive, non-plastic, trace root hairs (ash).						M		
S3	19	05-08 12-13	10	As above, piece of wood at 9.9' (ash) (fill).						M		
S4	22	02-04 04- 05		SILT, 10YR 2/1, horizontal layering, trace root hairs, non plastic (ash).						W		wet at 13.5'

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature John Mason	Firm SCS BT Squared John Mason

Boring Number B18 / PZ10

Sample									Soil Properties			
Number	Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Standard Penetration	Moisture Content	P200	RQD/ Comments
S5	1	04-04 08- 08		CLAY, 10YR 5/4, plastic.						M		poor recovery
S6	22	03-03 03- 04	20	SILTY SAND, 10YR 4/4, fine to medium, massive.						M		
S7	19	04-06 10-13	25	POORLY GRADED SAND with SILT, 10YR 5/3, fine to medium, with some coarse sand at 25.8'.						M		
S8	16	09-10 13-09		POORLY GRADED SAND with SILT and GRAVEL, gravel is fine, sand is coarse and subrounded grains.						W		
			30	End of boring @ 30'.								

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SOIL BORING LOG INFORMATION
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Facility/Project Name IPL - Eagle Valley SCS # 25211429.51			License/Permit/Monitoring Number		Boring Number B19 / PZ11
Boring Drilled By (Firm name and name of crew chief) American Drilling Services Jeremy Wallace			Drilling Started 08/23/2011	Drilling Completed 08/23/2011	Drilling Method 4¼" HSA
Facility Well No.	Unique Well No.	Common Well Name	Static Water Level Feet	Surface Elevation 619.34 Feet	Borehole Diam. 8.5 Inches
Boring Location State Plane N, E NW 1/4 of NE 1/4 of Section 16, T. 12 N., R. 1 E.			Lat. Long.	Local Grid Location (If applicable) 239 N -2529 E	
County Morgan County, Indiana		Location Code	Civil Town/City/or Village Martinsville		

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties			RQD/ Comments
Number	Length Recovered								Standard Penetration	Moisture Content	P200	
				SILTY GRAVEL, 10YR 5/3, angular (fill).								
S1	22	08-08 10-10		SILT, 10YR 2/1, some pieces of wood, non-plastic (ash).						M		
S2	24	08-10 09-08	5	As above.						M		
S3		01-02 02-03	10	As above, but wet and trace pieces of coal and root hairs (ash).						W		
S4	24	03-03 03-04		SILT, 10YR 2/2, horizontal layers, non-plastic (ash).						W		

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature John Mason	Firm SCS BT Squared John Mason

Boring Number B19 / PZ11

Sample Number	Sample Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties Standard Penetration	Soil Properties Moisture Content	Soil Properties P200	RQD/ Comments
S5	24	01- WOH WOH- 02		As above, but very soft (ash).					0.7	W		
				CLAY, 7.5YR 3/2, plastic.								
S6	20	05-08 09-08	20	SILTY SAND with GRAVEL, 10YR 4/3, sand is fine to coarse, gravel is subrounded, massive.						M		
S7	17	08-08 05-06	25	POORLY GRADED SAND with SILT and GRAVEL, 10YR 5/3, sand is medium to coarse, gravel is fine and subrounded with mixed lithology.						M		
S8	3	02-07 11-09		SILTY SAND, 10YR 5/3, fine to coarse, subrounded grains.						W		
			30	End of boring @ 30'.								

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SOIL BORING LOG INFORMATION
10-92

Page 1

Facility/Project Name IPL - Eagle Valley SCS # 25211429.51			License/Permit/Monitoring Number		Boring Number B20 / PZ12
Boring Drilled By (Firm name and name of crew chief) American Drilling Services Jeremy Wallace			Drilling Started 08/24/2011	Drilling Completed 08/24/2011	Drilling Method 4¼" HSA
Facility Well No.	Unique Well No.	Common Well Name	Static Water Level Feet	Surface Elevation 628.66 Feet	Borehole Diam. 8.5 Inches
Boring Location State Plane N, E NW 1/4 of NE 1/4 of Section 16, T. 12 N., R. 1 E.			Lat. Long.	Local Grid Location (If applicable) 750 N -1899 E	
County Morgan County, Indiana		Location Code	Civil Town/City/or Village Martinsville		

Sample Number	Sample Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties Standard Penetration	Soil Properties Moisture Content	Soil Properties P200	RQD/ Comments
				SILTY GRAVEL, angular (fill).								
S1	13	10-10 11-12		SILT, 5Y 2.5/2, some pieces of coal, non-plastic (ash).						M		
S2	18	12-06 03-04	5	As above (ash).						M		
				CLAY, 10YR 5/3, with pieces of plant material and gray to black ash (fill).								
S3	21	12-10 07-08		SILT, 10YR 2/2, mixed with pieces of coal and brown clay.						M		
			10	CLAY, 10YR 5/4, slightly plastic, trace pieces of wood (fill).					3.2			
S4	17	05-05 07-10		GRAVELLY SILT, 10YR 2/2, gravel is coal, fine to coarse, interlayerd with silt and brown clay (ash).						M		

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature John Mason	Firm SCS BT Squared John Mason

Boring Number B20 / PZ12

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties			RQD/ Comments
Number	Length Recovered								Standard Penetration	Moisture Content	P200	
S5	9	27 50/4"		SILTY SAND, 5YR 4/4, sand is coarse ash, coal and slag-like material (ash).						M		
			20									
S6	5	50/5"		As above, but 5YR 2.5/2 (ash).						M		
				SILT, wet, horizontal layers (ash).								
S7	22	08-04 03-04	25							W		
				CLAY, 7.5YR 3/2, some black plant material, low plasticity.					1.5			
S8	22	03-04 04-05		CLAY, 10YR 4/3, massive, some broken white snail shells, plastic.					1.5	M		
			30									
S9	24	WOH- WOH 02-02		CLAY, 10YR 5/3, plastic, massive, trace white shell fragments.					0.5-1.0	W		

Boring Number B20 / PZ12

Sample Number	Sample Length Recovered	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	Max. PID/FID	Soil Properties Standard Penetration	Soil Properties Moisture Content	Soil Properties P200	RQD/ Comments
S10	20	02-02 07-11		SILTY SAND, 7.5YR 4/1, fine, some horizontal layering, trace plant materials.						w		
				SILTY GRAVEL, 10YR 5/4, coarse.								
S11	19	05-09 15-17	40	SILTY SAND with GRAVEL, 10YR 4/3, massive, sand is medium to coarse, gravel is fine to coarse, mixed lithology.						w		
				End of boring @ 42'.								
			45									
			50									

ATTACHMENT C

GEOTECHNICAL DATA REPORT[2]

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[2] Boring logs and CPT data for existing CCR surface impoundments were extracted from *Geotechnical Data Report, Eagle Valley Generating Station, Martinsville*, *Indiana*, by Terracon Consultants, Inc., dated October 21, 2015.

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager:	AJM	Project No.	N1155177
Drawn by:	NCD	Scale:	NTS
Checked by:	AJM	File Name:	N1155177
Approved by:	AJM	Date:	10-15-2015

Terracon
611 Lunken Park Dr.
Cincinnati, OH 45226

EXPLORATION PLAN

Eagle Valley Generating Station
4040 Blue Bluff Road
Martinsville, IN

Exhibit
A-2

Field Exploration Description

Locations for twelve (12) SPT borings and ten (10) CPT soundings were laid out on the site by Terracon personnel based on the exploration program provided by S&L and in consultation with on-site S&L personnel. Ground surface elevations and coordinates of the as-drilled boring/sounding locations were determined using a Leica Viva NetRover survey grade GPS with the following references: WGS84 latitude and longitude with WGS84 ellipsoid height. Based on satellite availability and data collection interval, the horizontal survey data accuracy was reported as ±0.1 foot. The horizontal and vertical references are NAD83 and NAVD88, respectively.

SPT Field Exploration

The SPT borings were drilled with a track rotary drill rig using continuous flight hollow-stem augers to advance the boreholes. Samples of the soil encountered in the borings were obtained using 3-inch thin-walled tube samples in accordance with ASTM D1587, 2-inch unlined samplers in accordance with ASTM D1586, and 3-inch lined split spoon samplers in accordance with ASTM D1587. The 3-inch split spoon material was sealed and stored in 3-inch diameter brass containers. Bedrock was not encountered within exploration depth at SPT test borings.

In the split spoon sampling procedure, the number of blows required to advance a standard 2-inch O.D. split spoon sampler the last 12 inches of the typical total 18-inch penetration by means of a rope and cathead manual 140-lb safety hammer with a free fall of 30 inches, is the standard penetration resistance value (SPT-N). This value is used to estimate the in-situ relative density of cohesionless soils and consistency of cohesive soils.

At SPT test borings, an automatic 140-lb SPT hammer was used to advance the split spoon sampler in the borings performed on this site. A greater efficiency is typically achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. Published correlations between the SPT values and soil properties are based on the lower efficiency cathead and rope method. This higher efficiency affects the standard penetration resistance blow count (N) value by increasing the penetration per hammer blow over what would be obtained using the cathead and rope method. The efficiency ratio of the automatic hammer system used for this project was 87.2 percent and was last calibrated on September 14, 2014. SPT N-values reported on the boring logs are field values. N-values reported on the logs for the 3-inch split spoon samples are not equivalent to SPT N-values for 2-inch split spoon samples.

The samples were tagged for identification, sealed to reduce moisture loss, and taken to our laboratory for further examination, testing, and classification. Information provided on the boring logs attached to this report includes soil descriptions, consistency evaluations, boring depths, sampling intervals, and groundwater conditions. Before leaving the site, the drill crew backfilled each of the borings with a cement/bentonite grout mixture.

A field log of each boring was prepared by the drill crew. These logs included visual classifications of the materials encountered during drilling as well as the driller's interpretation of the subsurface conditions between samples. Final boring logs included with this report represent the engineer's review of obtained soil samples, driller's field logs and include modifications based on laboratory tests of the samples.

CPT Field Exploration

Cone Penetration Test (CPT) soundings were performed in general accordance with industry-standard procedures (ASTM Method D5778) with continuous data collection. CPT soundings were performed with a Geotech AB Nova cone penetrometer consisting of a cone-shaped sounding tip attached to 1.25-inch-diameter steel rods with flush-joint couplings. The cone tip contains load cells to measure cone tip penetration resistance, sleeve friction resistance and pore-pressure transducers to measure pore water pressure. The tilt angle of the penetrometer is also measured by an inclinometer located within the sounding tip. The CPT soundings were logged electronically in the field. Requested information on the cone is shown in the following table and on the attached calibration sheet.

Cone Parameter	Specifications
Serial No.	4342 and 4399
Tip Area	10-cm^2
Cone Diameter	35.6 mm
Sleeve Area	150-cm^2
Sleeve Diameter	35.9 mm

The data collected from the CPT was processed and is presented graphically in the attached logs, including the tip resistance, sleeve resistance, a ratio of sleeve to tip resistance, pore pressure and interpreted material descriptions (based upon published correlations) with depth. Material descriptions (Soil Behavior Types) provided on the logs are not necessarily consistent with soil classifications and determined in accordance with ASTM Method D2487 since the CPT description is based on normalized correlations. The Excel files of the CPT data have been transmitted with this report to the client.

When feasible, layers of dense gravel, dense rubble, and cemented fly ash were removed when encountered to allow CPT soundings to advance. The CPT cone was extracted and the remaining open hole was backfilled with cement bentonite grout. The results of our field program and the final CPT sounding logs included with this report were evaluated by a professional geotechnical engineer licensed in the State of Indiana.

BORING LOG NO. EV-B-201

PROJECT: Eagle Valley Generating Station

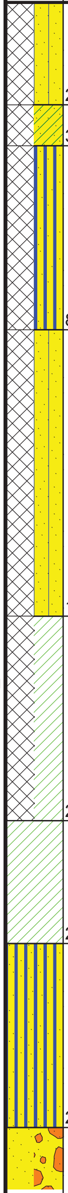
CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE: **4040 Blue Bluff Road**
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48487° Longitude: -86.42722°

Surface Elev.: 617.6 (Ft.)



DEPTH		ELEVATION (Ft.)
	FILL - SILTY SAND, with gravel, trace clay, trace plant material, brown and gray	
2.5		615
	FILL - SANDY LEAN CLAY, trace gravel, brown	
3.5		614
	FILL - SANDY SILT, mostly ash, trace sand, trace clay, very dark gray 3-inch split spoon sample @ 5'-7'	
8.0		609.5
	FILL - SILTY SAND, mostly ash, very dark grayish brown -grades very dark gray to black @ 10'-11.5	
15.0		602.5
	FILL - LEAN CLAY, mostly ash, trace sand, grayish brown	
20.0		597.5
	LEAN CLAY (CL), trace shells, brown, stiff	
23.0		594.5
	SANDY SILT (ML), some sand, mostly silt, little clay, gray with reddish-brown, very soft	
27.5		590

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
		☒	39	5-7-10 N=17						
		☒	100	4-13-16 N=29						
5		☒	88	9-13-12-14 N=25	73.6					NP
		✋☒	100	7-10-11 N=21						
10		☒	72	7-7-9 N=16	29.3			20		
		■	0							
15		☒	100	1-4-5 N=9						
		■	89				1.23	30	92	42-23-19
20	▽	☒	100	1-3-2 N=5		2.0 (HP)				
		☒	100	2-1-2 N=3	73.0	0.25 (HP)				
25	▽	☒	100	0-0-2 N=2		0.25 (HP)				
		☒	33	2-1-1 N=2						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
thin-wall tube, 2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 25' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 27' while drilling.*

▽ *Water was observed @ 21' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/19/2015	Boring Completed: 8/19/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-4

BORING LOG NO. EV-B-201

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE: 4040 Blue Bluff Road
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48487° Longitude: -86.42722°

Surface Elev.: 617.6 (Ft.)

GRAPHIC LOG	DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
	POORLY GRADED SAND WITH GRAVEL (SP), mostly medium to coarse sand, little fine gravel, few silt, brown, very loose to medium dense *(continued)*	30		☒	56	4-8-11 N=19				14		
	32.5 585											
	WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM), mostly fine to coarse sand, some coarse to fine gravel, few silt, brown, medium dense			☒	72	8-9-12 N=21						
		35		☒	61	7-10-15 N=25						
	36.5 581											
	Boring Terminated at 36.5 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
thin-wall tube, 2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 25' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 27' while drilling.*
▽ *Water was observed @ 21' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/19/2015	Boring Completed: 8/19/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-4

BORING LOG NO. EV-B-201-A

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE:
4040 Blue Bluff Road
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48497° Longitude: -86.42684°

Surface Elev.: 611.6 (Ft.)

DEPTH	Description	ELEVATION (Ft.)
	FILL - SILT, mostly ash, mostly silt, little sand, little clay, very dark gray	
7.0		604.5
	FILL - LEAN CLAY, mostly ash, trace sand, trace organics, trace cinders, dark grayish brown, medium stiff	
12.5		599
	LEAN CLAY (CL), trace shells, trace fine sand, brown, medium stiff to stiff	
20.0		591.5
	SILTY SAND (SM), brown, loose	
22.5		589
	POORLY GRADED SAND (SP), fine to medium sand, with gravel, trace shells, brown, medium dense	
26.0		585.5
	POORLY GRADED SAND (SP), fine to coarse sand, brown, medium dense to very dense	

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
		☒	100	2-2-6 N=8						
5		☒	100	3-6-5 N=11	88.0					
		☒	100	3-2-7 N=9		1.0 (HP)				
		☒	100	1-2-2 N=4		0.5 (HP)				
10	▽	■	71							38-23-15
		☒	100	2-2-3 N=5		1.25 (HP)				
15		☒	100	0-2-2 N=4		0.75 (HP)		29		33-20-13
	▽	☒	33	0-0-2 N=2	62.3	0.5 (HP)				
20		☒	61	3-4-5 N=9	32.0					
		☒	61	7-14-13 N=27						
25		☒	61	7-7-9 N=16				21		
		☒	0	24-31-31 N=62						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
thin-wall tube, 2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 20' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

Elevation Ref: NAVD88

Notes:

Water was used during drillng at 25 feet.

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 19.5' while drilling.*

▽ *Water was observed @ 12' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/18/2015	Boring Completed: 8/18/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-5

BORING LOG NO. EV-B-201-A

PROJECT: **Eagle Valley Generating Station**

CLIENT: **Sargent & Lundy, L.L.C.**
Chicago, IL

SITE: **4040 Blue Bluff Road**
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48497° Longitude: -86.42684°

Surface Elev.: 611.6 (Ft.)

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
	30.0		581.5	30										
	31.0	**SILTY SAND (SM)**, trace gravel, brown, medium dense	580.5			☒	56	7-14-14 N=28						
	31.5	**POORLY GRADED SAND (SP)**, mostly fine sand, trace gravel, brown, medium dense	580											
		Boring Terminated at 31.5 Feet												

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
thin-wall tube, 2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 20' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 19.5' while drilling.*

▽ *Water was observed @ 12' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/18/2015	Boring Completed: 8/18/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-5

BORING LOG NO. EV-B-202

Page 1 of 2

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE: 4040 Blue Bluff Road
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48302° Longitude: -86.42539°

Surface Elev.: 628.7 (Ft.)

DEPTH	DESCRIPTION	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
	FILL - SANDY LEAN CLAY, with gravel, light olive gray				☒	83	12-11-10 N=21						
2.5		626											
	FILL - LEAN CLAY, olive gray with trace bluish gray				☒	100	5-6-7 N=13				17		36-21-15
			5		☒	100	4-4-5 N=9						
					☒	100	2-3-4 N=7						
			10		■	67					17	114	36-19-17
12.5		616											
	FILL - SANDY LEAN CLAY, trace gravel, reddish-brown				☒	100	5-8-11 N=19						
			15		☒	100	8-9-12 N=21						
16.0		612.5											
	FILL - SILT, mostly ash, very dark gray				☒	100	3-3-12 N=15	70.2			25		
			20		☒	100	13-17-22 N=39						
22.5		606											
	FILL - SANDY LEAN CLAY, brown 3-inch split spoon sample @ 22.5'-24.5'				☒	83	6-5-8-10 N=13	84.6			28		
			25		☒	100	5-8-8 N=16						
27.5		601											
	POORLY GRADED SAND (SP), mostly fine sand, light brown, medium dense				☒	100	10-12-12 N=24						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
thin-wall tube, 2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 46.5' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 34' while drilling.*

▽ *Water was observed @ 40' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/21/2015	Boring Completed: 8/21/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-6

BORING LOG NO. EV-B-202

PROJECT: **Eagle Valley Generating Station**

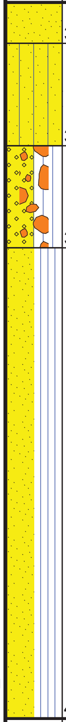
CLIENT: **Sargent & Lundy, L.L.C.**
Chicago, IL

SITE: **4040 Blue Bluff Road**
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48302° Longitude: -86.42539°

Surface Elev.: 628.7 (Ft.)



DEPTH		ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
30.0		598.5	30										
	SILTY SAND (SM), trace coarse sand, trace gravel, light brown, very dense				☒	100	15-23-23 N=46						
32.5	**WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM)**, mostly sand, some gravel, few silt, brown, medium dense	596		▽	☒	100	9-10-6 N=16						
35.0	**POORLY GRADED SAND WITH SILT (SP-SM)**, few fine gravel, brown, medium dense to dense	593.5	35		☒	100	9-8-6 N=14						
			40	▽	☒	100	9-12-19 N=31	11.2					
			45		☒	100	15-11-9 N=20						
46.5	***Boring Terminated at 46.5 Feet***	582											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
thin-wall tube, 2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 46.5' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 34' while drilling.*

▽ *Water was observed @ 40' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/21/2015	Boring Completed: 8/21/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-6

BORING LOG NO. EV-B-202A

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE: 4040 Blue Bluff Road
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48301° Longitude: -86.42529°

Surface Elev.: 619.4 (Ft.)

DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
FILL - SILT, mostly ash, very dark gray			☒	100	3-6-9 N=15						
			☒	100	6-7-7 N=14						
5.0 614.5 **FILL - LEAN CLAY**, mostly ash, very dark gray	5		☒	100	4-5-6 N=11	86.7	3.5 (HP)		18		32-10-22
7.5 612 **FILL - SILT**, mostly ash, very dark gray			☒	100	4-7-7 N=14						
10.0 609.5 **FILL - SANDY SILT**, mostly ash, very dark gray	10		☒	100	5-5-8 N=13						
		▽	☒	100	2-1-2 N=3						
3-inch split spoon sample @ 15'-17'	15		☒	96	3-4-7-8 N=11	54.5					
17.5 602 **POORLY GRADED SAND (SP)**, mostly fine sand, little gravel, light brown, medium dense			☒	100	4-5-10 N=15						
	20		☒	100	10-12-13 N=25						
			☒	100	10-12-7 N=19						
25.0 594.5 **WELL GRADED SAND WITH SILT WITH GRAVEL, MASONRY SAND AND LIMESTONE (SW-SM)**, mostly sand, little gravel, little silt, light brown, loose	25		☒	94	6-3-5 N=8						
		▽	☒	78	12-7-11 N=18						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 36.5' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 13.5' while drilling.*

▽ *Water was observed @ 29' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/21/2015	Boring Completed: 8/21/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-7

BORING LOG NO. EV-B-202A

Page 2 of 2

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE: 4040 Blue Bluff Road
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48301° Longitude: -86.42529°

Surface Elev.: 619.4 (Ft.)

GRAPHIC LOG	DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
	WELL GRADED SAND WITH SILT WITH GRAVEL, MASONRY SAND AND LIMESTONE (SW-SM), mostly sand, little gravel, little silt, light brown, loose *(continued)*	30		☒	100	8-17-12 N=29	11.5					
				☒	100	11-12-18 N=30						
	36.5 583	35		☒	100	10-11-14 N=25						
	Boring Terminated at 36.5 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 36.5' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 13.5' while drilling.*

▽ *Water was observed @ 29' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/21/2015	Boring Completed: 8/21/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-7

BORING LOG NO. EV-B-203

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE:
4040 Blue Bluff Road
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48009° Longitude: -86.42619°

Surface Elev.: 628.4 (Ft.)

DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
FILL - LEAN CLAY, little sand, trace gravel, olive brown			⊠	50	11-8-7 N=15		4.5 (HP)				
			⊠	39	4-5-4 N=9		4.0 (HP)				
	5		⊠	94	5-5-5 N=10		4.0 (HP)		19		
7.5 621 **FILL - LEAN CLAY**, olive brown			⊠	100	2-2-3 N=5		1.5 (HP)				
	10		■	83							35-19-16
-grades reddish-brown at 14'			⊠	100	4-5-4 N=9		1.5 (HP)				
15.0 613.5 **FILL - SILT**, mostly ash, mostly silt, few sand, little clay, dark brownish gray to very dark gray	15		⊠	100	11-17-24 N=41						
			⊠	100	3-3-6 N=9						
3-inch split spoon sample @ 20'-22'	20	▽	⊠	83	8-13-15-11 N=28				29		NP
22.5 606 **FILL - SILT**, mostly ash, little sand, very dark gray			⊠	100	0-1-1 N=2						
	25		⊠	100	0-1-1 N=2						
			⊠	100	0-0-1 N=1						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
thin-wall tube, 2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 51.5' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 22' while drilling.*

▽ *Water was observed @ 38' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/20/2015	Boring Completed: 8/20/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-8

BORING LOG NO. EV-B-203

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE: 4040 Blue Bluff Road
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48009° Longitude: -86.42619°

Surface Elev.: 628.4 (Ft.)

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
FILL - SILT, mostly ash, little sand, very dark gray *(continued)* 3-inch split spoon sample @ 30'-32'		30		☒	92	1-1-4-5 N=5	72.6					
32.5	596											
SILTY SAND (SM), mostly fine to medium sand, some silt, trace fine sub-angular gravel, brownish gray, loose				☒	100	2-3-2 N=5				20		
		35		☒	100	0-2-2 N=4						
			▽									
40.0	588.5											
POORLY GRADED SAND WITH GRAVEL (SP), mostly medium to coarse sand, little fine gravel, few silt, brown, very loose to loose		40		☒	72	5-3-4 N=7						
		45		☒	61	2-1-2 N=3						
50.0	578.5											
POORLY GRADED SAND (SP), brown, medium dense		50		☒	100	8-11-17 N=28						
51.5	577											
Boring Terminated at 51.5 Feet												

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
thin-wall tube, 2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 51.5' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 22' while drilling.*

▽ *Water was observed @ 38' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/20/2015	Boring Completed: 8/20/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-8

BORING LOG NO. EV-B-203A

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE: 4040 Blue Bluff Road
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48006° Longitude: -86.42556°

Surface Elev.: 618.5 (Ft.)

DEPTH	DESCRIPTION	ELEVATION (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
	FILL - SILTY SAND, trace gravel, trace root hairs, dark grayish brown			☒	100	5-5-5 N=10						
2.5		616										
	FILL - LEAN CLAY, mostly ash, dark brown to dark grayish brown			☒	100	5-6-10 N=16		2.5 (HP)		17		
				☒	100	8-9-12 N=21		3.5 (HP)				
				☒	100	3-6-9 N=15		4.0 (HP)				
				☒	100	5-6-8 N=14		3.5 (HP)				
				☒	89	3-4-4 N=8	54.0	2.5 (HP)		25		40-23-17
15.0		603.5										
	FILL - SILTY SAND, mostly ash, very dark gray			☒	100	0-2-6 N=8						
				☒	100	3-3-5 N=8						
20.0		598.5										
	POORLY GRADED SAND WITH SILT (SP-SM), few gravel, brown, medium dense			☒	100	5-7-6 N=13	10.6					
				☒	39	6-9-9 N=18						
			▽									
				☒	100	7-7-10 N=17						
27.5		591										
			▼	☒	100	8-11-7 N=18						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 36.5' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 24.5' while drilling.*
▽ *Water was observed @ 30' after drilling.*
▼ *Water was observed 24 hours after drilling at 28'*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/20/2015	Boring Completed: 8/20/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-9

BORING LOG NO. EV-B-203A

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE: 4040 Blue Bluff Road
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48006° Longitude: -86.42556°

Surface Elev.: 618.5 (Ft.)

GRAPHIC LOG	DEPTH / DESCRIPTION / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), mostly medium to coarse sand, some gravel, few silt, brown, medium dense *(continued)* 32.5 586	30	▽	☒	100	5-8-9 N=17						
	POORLY GRADED SAND (SP), poorly graded, fine to medium, trace gravel, gray, medium dense 35.0 583.5			☒	100	3-6-10 N=16						
	SILTY SAND (SM), brown, loose 36.5 582	35		☒	100	2-4-5 N=9						

Boring Terminated at 36.5 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 36.5' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 24.5' while drilling.*

▽ *Water was observed @ 30' after drilling.*

▼ *Water was observed 24 hours after drilling at 28'*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/20/2015	Boring Completed: 8/20/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-9

BORING LOG NO. EV-B-204

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE: 4040 Blue Bluff Road
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48301° Longitude: -86.42907°

Surface Elev.: 618.3 (Ft.)

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
FILL - POORLY GRADED SAND, with gravel, brown and gray				☒	39	12-5-4 N=9						
2.5	616											
FILL - SILT WITH SAND, mostly ash, mostly silt, little fine to medium sand, little clay, very dark gray				☒	17	3-4-6 N=10				25		NP
		5		☒	100	7-5-8 N=13						
				☒	100	6-6-7 N=13						
3-inch split spoon sample @ 10'-12'		10		☒	100	8-10-15-15 N=25				22		
				☒	100	6-6-7 N=13						
15.0	603.5											
LEAN CLAY, little fine sand, brown, medium stiff		15		☒	100	3-3-3 N=6		0.75 (HP)		46		
17.5	601											
POORLY GRADED SAND (SP), mostly sand, trace gravel, trace silt, light brown to brown, loose to medium dense				☒	94	5-7-8 N=15	11.7			4		NP
-lean clay noted @ 17.5'-18.5'		20		☒	100	6-5-7 N=12						
				☒	100	4-7-8 N=15						
		25	∇	☒	100	7-10-11 N=21				4		
			∇	☒	94	3-4-6 N=10	5.5					
29.0	589.5											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 36.5' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

Notes:
No water was used during drillng.

WATER LEVEL OBSERVATIONS

∇ *Water was observed at 27' while drilling.*
∇ *Water was observed @ 25' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/19/2015	Boring Completed: 8/19/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-10

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1155177_BORING LOGS - COPY.GPJ TERRACON2015.GDT 10/21/15

BORING LOG NO. EV-B-204

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE: 4040 Blue Bluff Road
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48301° Longitude: -86.42907°

Surface Elev.: 618.3 (Ft.)

GRAPHIC LOG	DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
	POORLY GRADED SAND WITH SILT (SP-SM), light brown to brown, medium dense to dense	30										
				☒	83	6-9-7 N=16				10		
				☒	56	11-9-11 N=20	9.7					
		35		☒	61	20-20-19 N=39						
	36.5 / 582											
	Boring Terminated at 36.5 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 36.5' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 27' while drilling.*

▽ *Water was observed @ 25' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/19/2015	Boring Completed: 8/19/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-10

BORING LOG NO. EV-B-204A

Page 1 of 2

PROJECT: Eagle Valley Generating Station	**CLIENT: Sargent & Lundy, L.L.C. Chicago, IL**
SITE: 4040 Blue Bluff Road Martinsville, Indiana	

LOCATION See Exhibit A-2

Latitude: 39.48328° Longitude: -86.42901°

Surface Elev.: 609.8 (Ft.)

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
FILL - SILT WITH SAND , mostly ash, little sand, very dark gray				☒	56	2-2-2 N=4						
				☒	100	6-7-8 N=15						
3-inch split spoon sample @ 5'-7'		5		☒	100	7-9-9-8 N=18	85.0			36		NP
7.5	602.5											
LEAN CLAY (CL), brown, stiff				☒	56	1-2-3 N=5		1.5 (HP)				
		10	▽	☒	56	2-4-5 N=9		1.5 (HP)		12		36-20-16
11.5	598.5											
POORLY GRADED SAND (SP), mostly medium sand, light brown, loose				☒	61	4-6-6 N=12						
		15		☒	67	4-5-6 N=11						
17.5	592.5											
POORLY GRADED SAND (SP), fine to coarse, trace sub-angular fine gravel, brown, medium dense				☒	56	7-8-9 N=17				8		
		20	▽	☒	44	6-8-9 N=17						
				☒	50	11-10-10 N=20						
25.0	585	25										
SILTY SAND WITH GRAVEL (SM), mostly sand, some gravel, little silt, brown, dense				☒	78	11-17-13 N=30						
27.5	582.5											
				☒	61	9-12-14 N=26						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 31.5' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 11' while drilling.*

▽ *Water was observed @ 22' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/20/2015	Boring Completed: 8/20/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-11

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N1155177_BORING LOGS - COPY.GPJ TERRACON2015.GDT 10/21/15

BORING LOG NO. EV-B-204A

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE: 4040 Blue Bluff Road
Martinsville, Indiana

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 39.48328° Longitude: -86.42901° Surface Elev.: 609.8 (Ft.) DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
▨	**POORLY GRADED SAND (SP)**, mostly fine to medium sand, few silt, brown to grayish brown, medium dense *(continued)*	30		☒	61	5-10-12 N=22	6.3					
	31.5 / 578.5											
	Boring Terminated at 31.5 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 31.5' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 11' while drilling.*

▽ *Water was observed @ 22' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/20/2015	Boring Completed: 8/20/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-11

BORING LOG NO. EV-B-205

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE: 4040 Blue Bluff Road
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48346° Longitude: -86.42785°

Surface Elev.: 618.2 (Ft.)

DEPTH	Description	ELEVATION (Ft.)
0.0–2.5	**FILL - SAND**, with gravel, light brown to gray	615.5
2.5–15.0	**FILL - SILT WITH SAND**, mostly ash, mostly silt, little sand, little clay, trace gravel, very dark gray 3-inch split spoon sample @ 10'-12'	603
15.0–17.5	**FILL - LEAN CLAY**, gray	600.5
17.5–21.0	**POORLY GRADED SAND (SP)**, mostly fine sand, trace clay, trace shells, brown, loose to medium dense	597
21.0–27.5	**POORLY GRADED SAND WITH SILT (SP-SM)**, mostly medium to fine sand, few silt, brown, medium dense	590.5
27.5–		

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
0–1.5		☒	67	13-32-23 N=55						
2.5–4		☒	100	9-17-20 N=37						
5–6.5		☒	100	9-12-14 N=26				20		NP
7.5–9		☒	100	2-2-2 N=4						
10–12		☒	100	6-10-12-15 N=22				17		
12.5–14		☒	100	1-2-1 N=3						
15–17		■	79							29-17-12
17.5–19		☒	100	2-2-2 N=4						
20–21.5		☒	100	8-10-10 N=20						
22.5–24		☒	72	8-11-14 N=25						
25–26.5		☒	89	9-12-14 N=26	9.3			4		
27	▽									
27.5–29		☒	78	6-8-9 N=17				11		

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
thin-wall tube, 2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 25' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

Elevation Ref: NAVD88

Notes:

Water was used during drillng @ 30 feet.

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 27' while drilling.*

▽ *Water was observed @ 38' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/19/2015	Boring Completed: 8/19/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-12

BORING LOG NO. EV-B-205

PROJECT: **Eagle Valley Generating Station**

CLIENT: **Sargent & Lundy, L.L.C.**
Chicago, IL

SITE: **4040 Blue Bluff Road**
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48346° Longitude: -86.42785°

Surface Elev.: 618.2 (Ft.)

DEPTH	DESCRIPTION	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
	POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), some fine gravel, some sand, few silt, brown, medium dense *(continued)*		30		☒	100	13-12-11 N=23						
					☒	39	5-5-7 N=12						
			35		☒	50	9-5-7 N=12	8.4					
				▽									
41.5		576.5	40		☒	44	16-11-11 N=22						

Boring Terminated at 41.5 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
thin-wall tube, 2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 25' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 27' while drilling.*

▽ *Water was observed @ 38' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/19/2015	Boring Completed: 8/19/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-12

BORING LOG NO. EV-B-206

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE: 4040 Blue Bluff Road
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48114° Longitude: -86.42924°

Surface Elev.: 628.6 (Ft.)

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
FILL - SANDY SILT, mostly ash, some sand, very dark gray				╳	56	4-8-9 N=17						
				╳	94	3-16-15 N=31						
		5		╳	100	9-15-24 N=39				15		
				╳	100	7-6-9 N=15						
-grades very dark gray to black with trace cinders @ 10'-11.5'		10		╳	100	7-8-9 N=17						
3-inch split spoon sample @ 12.5'-14.5'				╳	92	8-17-23-30 N=40	53.4			29	93	
		15		╳	100	3-13-15 N=28						
18.5	610		▽	╳	100	4-3-1 N=4						
FILL - SILT, mostly ash, very dark gray		20		╳	100	1-0-0 N=0				40		
Specific Gravity = 2.526 @ 22.5'-24'				╳	100	0-0-0 N=0						
25.0	603.5	25										
FILL - LEAN CLAY, mostly ash, little sand, very dark gray				╳	96	0-0-0-2 N=0	81.8					32-21-11
3-inch split spoon sample @ 25'-27'; Specific Gravity = 2.534				╳	100	0-2-2 N=4		0.75 (HP)				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 61.5' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

Notes:

Water was used during drillng @ 40 feet.

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 18.5' while drilling.*

▽ *Water was observed @ 39' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/20/2015	Boring Completed: 8/20/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-13

BORING LOG NO. EV-B-206

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy, L.L.C.
Chicago, IL

SITE: 4040 Blue Bluff Road
Martinsville, Indiana

LOCATION See Exhibit A-2

Latitude: 39.48114° Longitude: -86.42924°

Surface Elev.: 628.6 (Ft.)

DEPTH	DESCRIPTION	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
	FILL - LEAN CLAY, mostly ash, little sand, very dark gray *(continued)*		30		☒	100	0-4-4 N=8		0.75 (HP)				
31.0		597.5											
	SILTY SAND (SM), dark greenish gray to brown, medium dense												
32.5		596											
	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), mostly medium to coarse sand, little fine gravel, few silt, brown, medium dense				☒	100	4-4-11 N=15						
			35		☒	100	10-11-12 N=23				4		
				▽									
			40		☒	83	4-8-11 N=19				13		
45.0		583.5											
	POORLY GRADED SAND WITH SILT (SP-SM), few gravel, grayish brown to brown, medium dense to dense		45		☒	100	9-10-10 N=20	10.2					
			50		☒	89	12-10-10 N=20						
			55		☒	100	19-12-16 N=28	8.0					

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 61.5' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water was observed at 18.5' while drilling.*

▽ *Water was observed @ 39' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/20/2015	Boring Completed: 8/20/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-13

BORING LOG NO. EV-B-206

PROJECT: **Eagle Valley Generating Station**

CLIENT: **Sargent & Lundy, L.L.C.**
Chicago, IL

SITE: **4040 Blue Bluff Road**
Martinsville, Indiana

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 39.48114° Longitude: -86.42924° Surface Elev.: 628.6 (Ft.) DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	P-200 (%)	LABORATORY TORVANE/HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
	POORLY GRADED SAND WITH SILT (SP-SM), few gravel, grayish brown to brown, medium dense to dense *(continued)*	60		☒	94	7-12-20 N=32						
	61.5 / 567											
	Boring Terminated at 61.5 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger
2" and 3" split-spoon sampling

Abandonment Method:
Boring backfilled to 61.5' with cement-bentonite grout upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

Notes:

WATER LEVEL OBSERVATIONS
▽ *Water was observed at 18.5' while drilling.*
▽ *Water was observed @ 39' after drilling.*

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

Boring Started: 8/20/2015	Boring Completed: 8/20/2015
Drill Rig: D 90 Track (Unit 022)	Driller: Moore
Project No.: N1155177	Exhibit: A-13

CPT LOG NO. EV-C-201

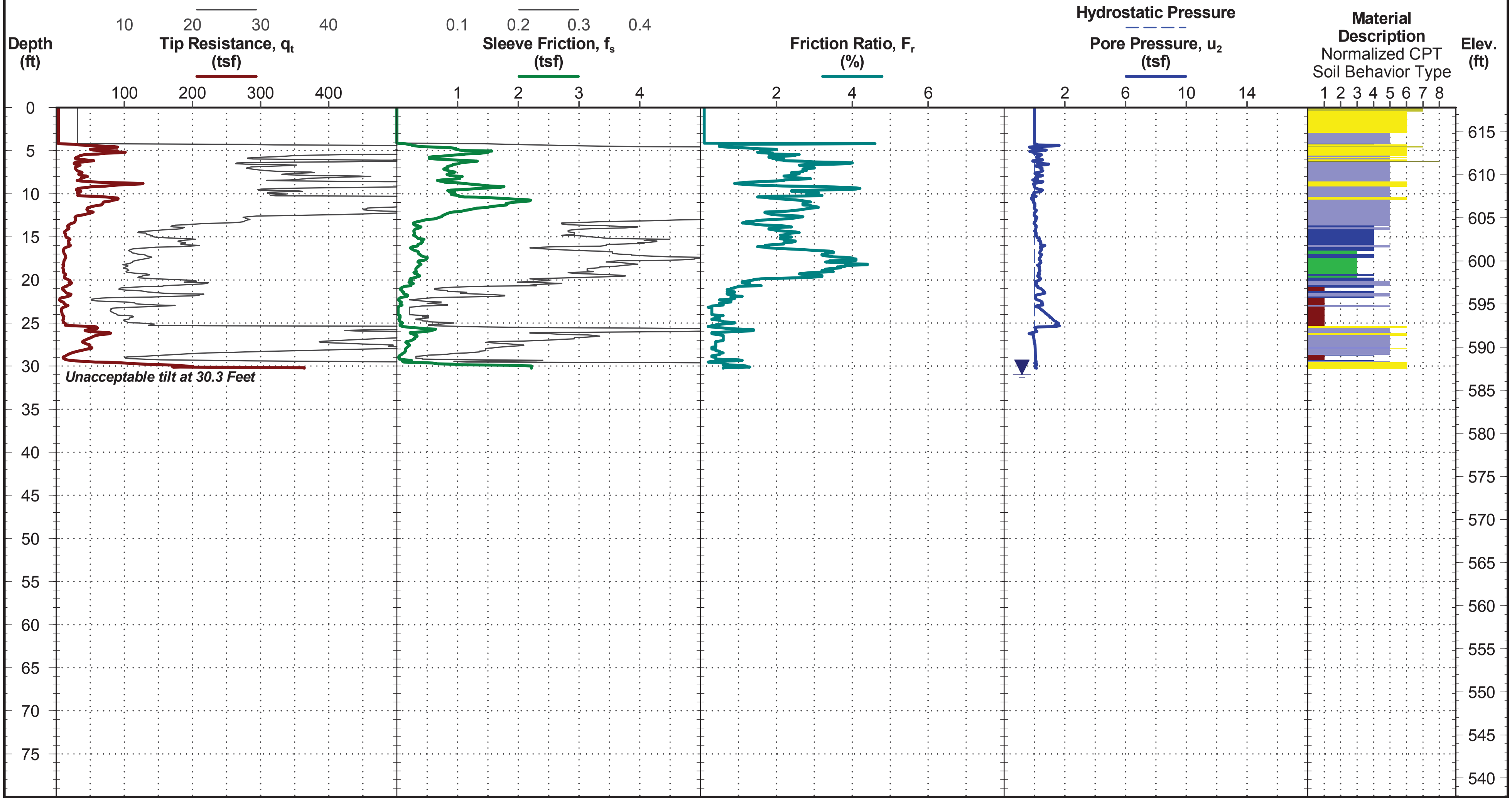
Page 1 of 1

PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy
Chicago, IL

SITE: Eagle Valley
Martinsville, Indiana

TEST LOCATION: See Exhibit A-2
Surface Elev.: 617.8 ft
Latitude: 39.48495°
Longitude: -86.42723°



Hole caved, grout to 3.5 feet

See Exhibit A-3 for description of field procedures.

See Appendix C for explanation of symbols and abbreviations.

Elevation Ref: NAVD88

CPT sensor calibration reports available upon request.

- 🟥 1 Sensitive, fine grained
- 🟧 2 Organic soils - clay
- 🟩 3 Clay - silty clay to clay
- 🟦 4 Silt mixtures - clayey silt to silty clay
- 🟪 5 Sand mixtures - silty sand to sandy silt
- 🟨 6 Sands - clean sand to silty sand
- 🟨 7 Gravelly sand to dense sand
- 🟫 8 Very stiff sand to clayey sand
- ⬛ 9 Very stiff fine grained

WATER LEVEL OBSERVATION

▼ 31 ft estimated water depth
(used in normalizations and correlations; see Appendix C)

Probe no. 4342

611 Lunken Park Drive
Cincinnati, Ohio

CPT Started: 9/1/2015	CPT Completed: 9/1/2015
Rig: Geoprobe	Operator: Buchanan/Pattison
Project No.: N1155177	Exhibit: A-16

CPT LOG NO. EV-C-202

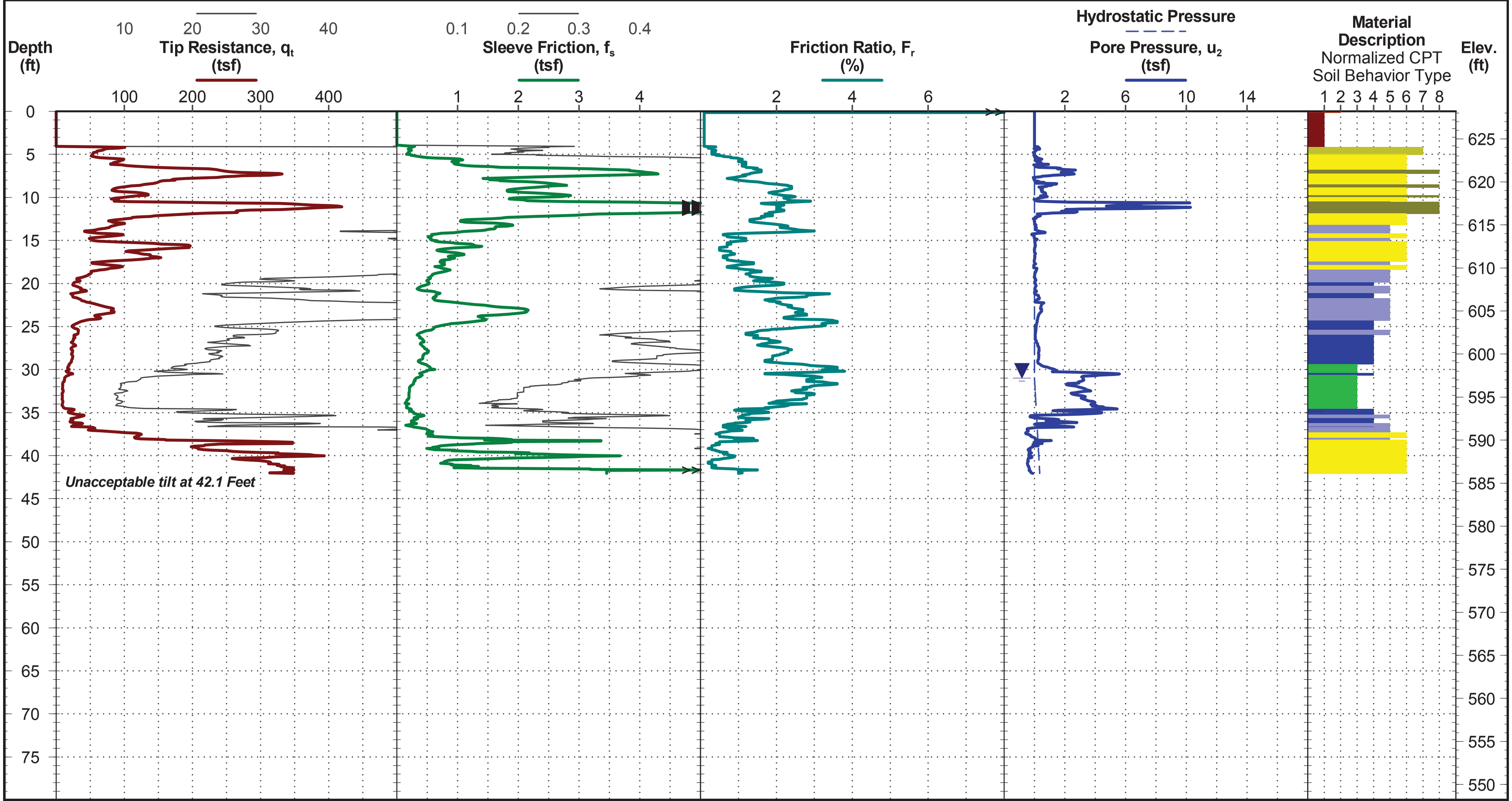
PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy
Chicago, IL

SITE: Eagle Valley
Martinsville, Indiana

TEST LOCATION: See Exhibit A-2

Surface Elev.: 628.2 ft
Latitude: 39.48345°
Longitude: -86.42542°



Hole caved, grout to 3 feet
See Exhibit A-3 for description of field procedures.
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

CPT sensor calibration reports available upon request.

- 🟥 1 Sensitive, fine grained
- 🟧 2 Organic soils - clay
- 🟩 3 Clay - silty clay to clay
- 🟦 4 Silt mixtures - clayey silt to silty clay
- 🟪 5 Sand mixtures - silty sand to sandy silt
- 🟨 6 Sands - clean sand to silty sand
- 🟨 7 Gravelly sand to dense sand
- 🟫 8 Very stiff sand to clayey sand
- ⬛ 9 Very stiff fine grained

WATER LEVEL OBSERVATION

▼ 31 ft estimated water depth
(used in normalizations and correlations; see Appendix C)

Probe no. 4342

611 Lunken Park Drive
Cincinnati, Ohio

CPT Started: 8/31/2015	CPT Completed: 8/31/2015
Rig: Geoprobe	Operator: Buchanan/Pattison
Project No.: N1155177	Exhibit: A-17

CPT LOG NO. EV-C-203

Page 1 of 1

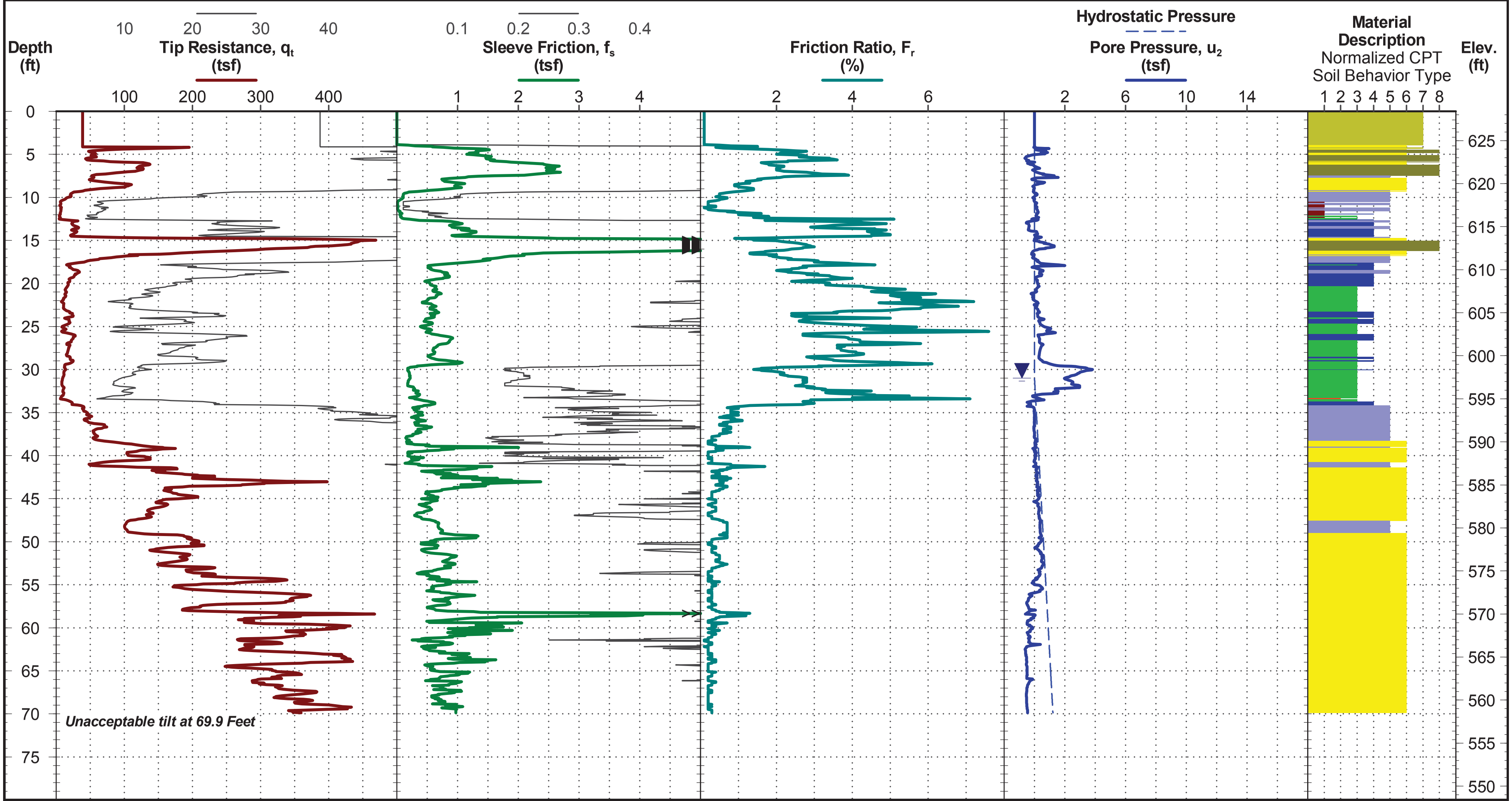
PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy
Chicago, IL

TEST LOCATION: See Exhibit A-2

Surface Elev.: 628.4 ft
Latitude: 39.48005°
Longitude: -86.42621°

SITE: Eagle Valley
Martinsville, Indiana



Hole caved, grout to 3 feet

See Exhibit A-3 for description of field procedures.

See Appendix C for explanation of symbols and abbreviations.

Elevation Ref: NAVD88

CPT sensor calibration reports available upon request.

- 1 Sensitive, fine grained
- 2 Organic soils - clay
- 3 Clay - silty clay to clay
- 4 Silt mixtures - clayey silt to silty clay
- 5 Sand mixtures - silty sand to sandy silt
- 6 Sands - clean sand to silty sand
- 7 Gravelly sand to dense sand
- 8 Very stiff sand to clayey sand
- 9 Very stiff fine grained

WATER LEVEL OBSERVATION

▼ 31 ft estimated water depth
(used in normalizations and correlations; see Appendix C)

Probe no. 4342

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

CPT Started: 8/31/2015	CPT Completed: 8/31/2015
Rig: Geoprobe	Operator: Buchanan/Pattison
Project No.: N1155177	Exhibit: A-18

CPT LOG NO. EV-C-204

Page 1 of 1

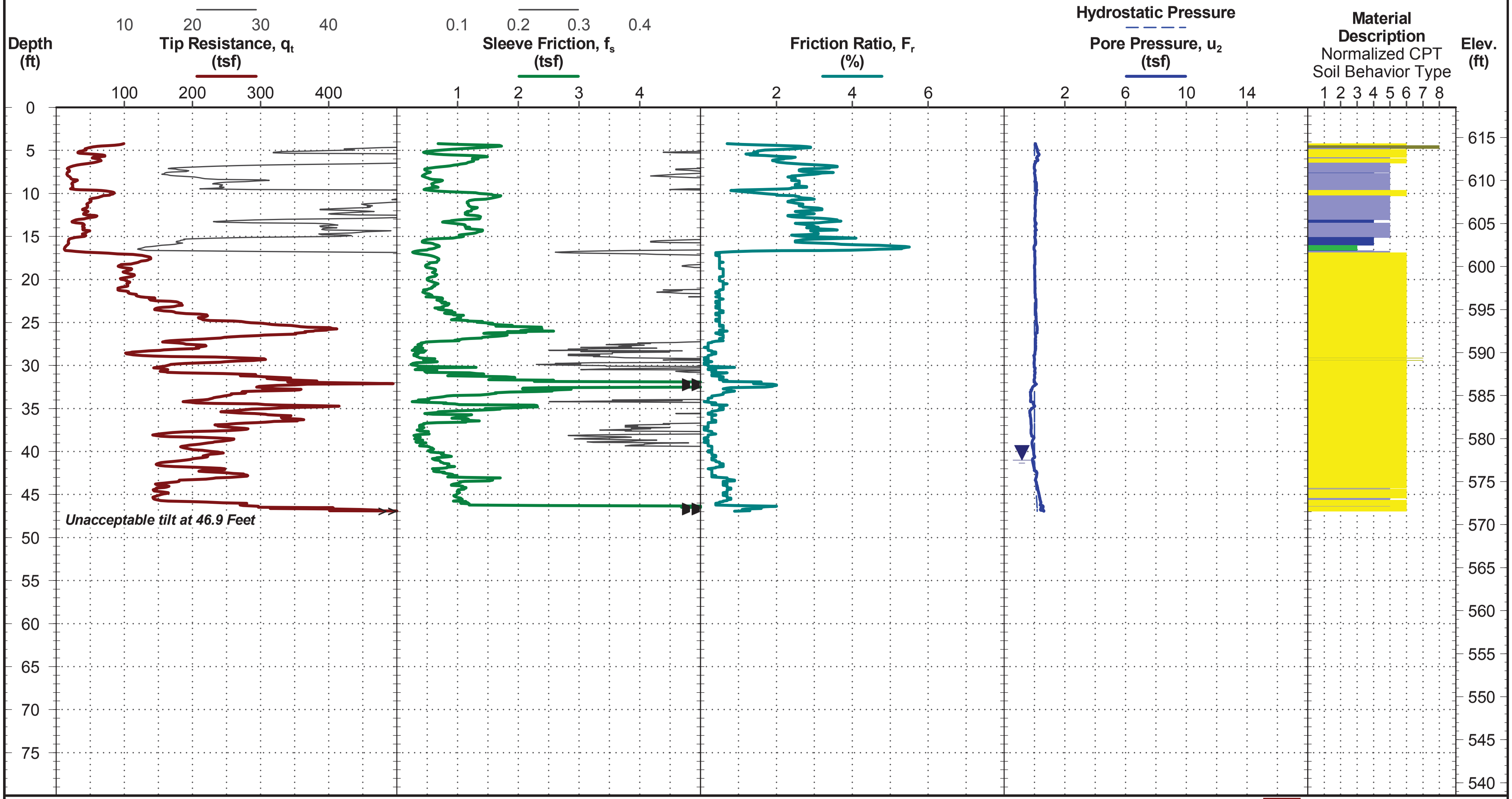
PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy
Chicago, IL

SITE: Eagle Valley
Martinsville, Indiana

TEST LOCATION: See Exhibit A-2

Surface Elev.: 618.5 ft
Latitude: 39.48303°
Longitude: -86.42896°



Hole caved, grout to 4 feet
See Exhibit A-3 for description of field procedures.
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

CPT sensor calibration reports available upon request.

- 🟥 1 Sensitive, fine grained
- 🟧 2 Organic soils - clay
- 🟩 3 Clay - silty clay to clay
- 🟦 4 Silt mixtures - clayey silt to silty clay
- 🟪 5 Sand mixtures - silty sand to sandy silt
- 🟨 6 Sands - clean sand to silty sand
- 🟨 7 Gravelly sand to dense sand
- 🟫 8 Very stiff sand to clayey sand
- ⬛ 9 Very stiff fine grained

WATER LEVEL OBSERVATION

▼ 41 ft estimated water depth
(used in normalizations and correlations; see Appendix C)

Probe no. 4342

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

CPT Started: 9/1/2015	CPT Completed: 9/1/2015
Rig: Geoprobe	Operator: Buchanan/Pattison
Project No.: N1155177	Exhibit: A-19

CPT LOG NO. EV-C-205

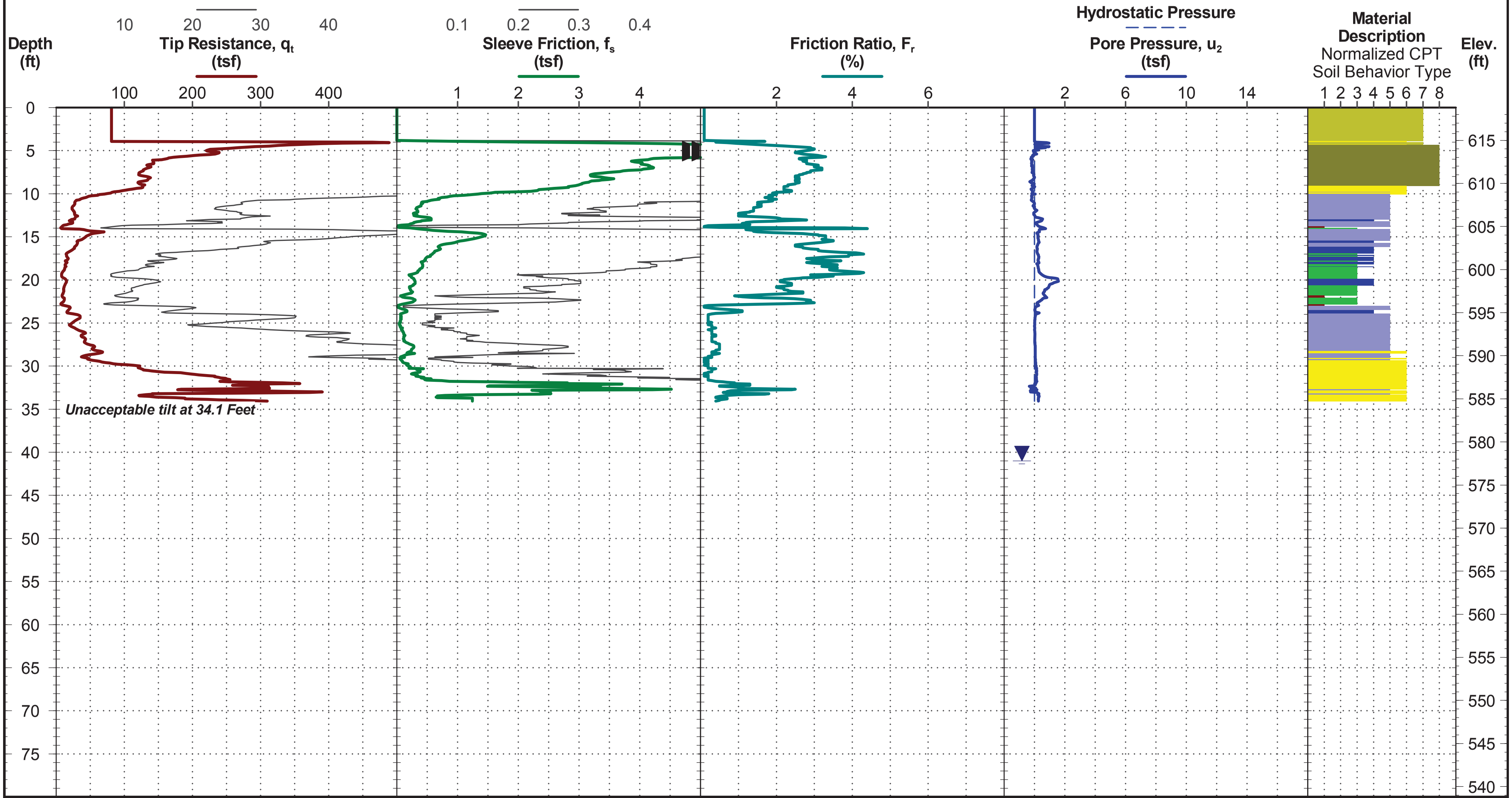
PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy
Chicago, IL

SITE: Eagle Valley
Martinsville, Indiana

TEST LOCATION: See Exhibit A-2

Surface Elev.: 618.8 ft
Latitude: 39.48344°
Longitude: -86.42734°



Hole caved, grout to 3.5 feet
See Exhibit A-3 for description of field procedures.
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

CPT sensor calibration reports available upon request.

- 🟥 1 Sensitive, fine grained
- 🟧 2 Organic soils - clay
- 🟩 3 Clay - silty clay to clay
- 🟦 4 Silt mixtures - clayey silt to silty clay
- 🟪 5 Sand mixtures - silty sand to sandy silt
- 🟨 6 Sands - clean sand to silty sand
- 🟩 7 Gravelly sand to dense sand
- 🟫 8 Very stiff sand to clayey sand
- ⬛ 9 Very stiff fine grained

WATER LEVEL OBSERVATION

▼ 41 ft estimated water depth
(used in normalizations and correlations; see Appendix C)

Probe no. 4342

611 Lunken Park Drive
Cincinnati, Ohio

CPT Started: 9/1/2015	CPT Completed: 9/1/2015
Rig: Geoprobe	Operator: Buchanan/Pattison
Project No.: N1155177	Exhibit: A-20

CPT LOG NO. EV-C-206

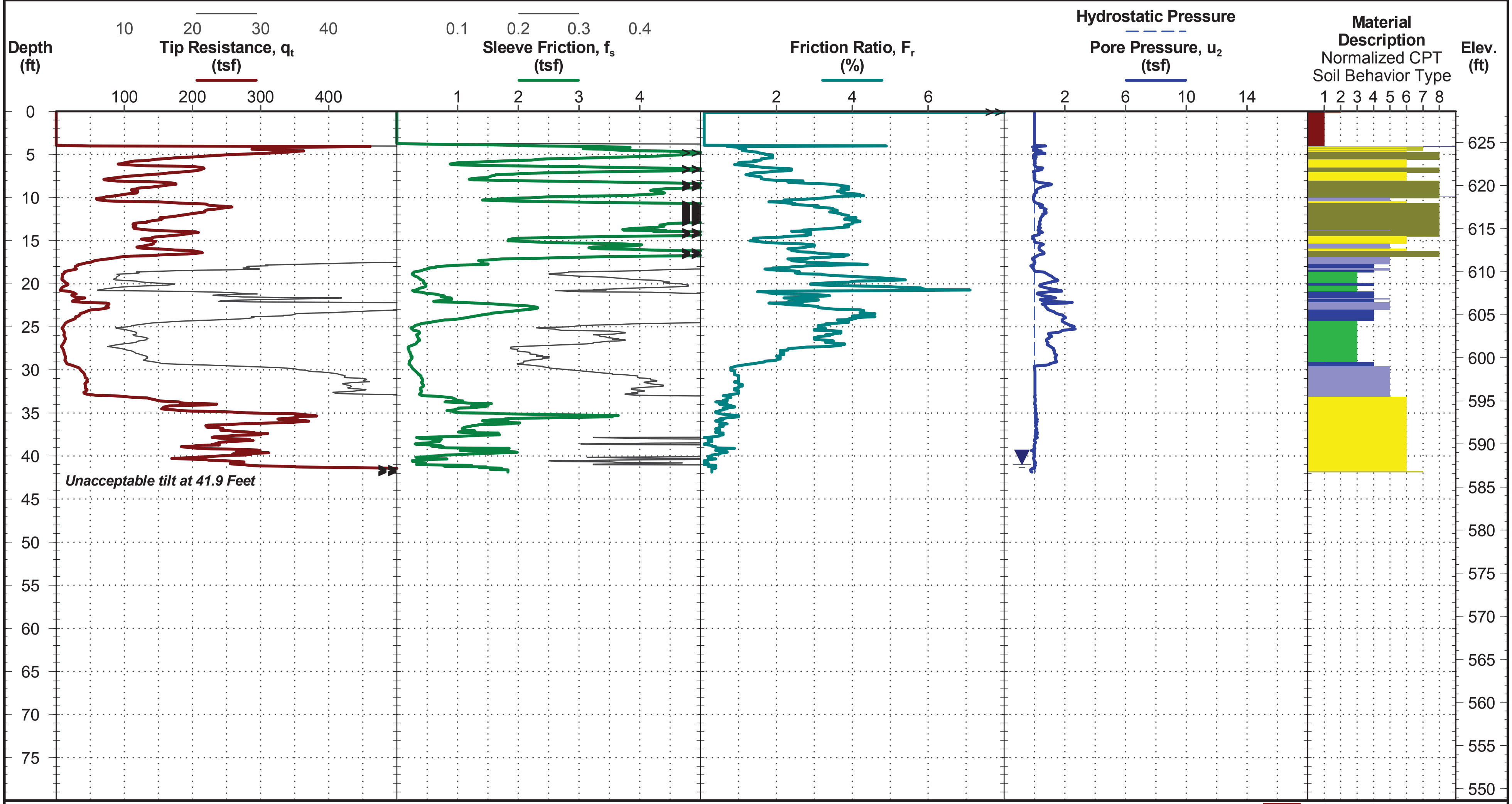
PROJECT: Eagle Valley Generating Station

CLIENT: Sargent & Lundy
Chicago, IL

SITE: Eagle Valley
Martinsville, Indiana

TEST LOCATION: See Exhibit A-2

Surface Elev.: 628.6 ft
Latitude: 39.48117°
Longitude: -86.42913°



Hole caved, grout to 3 feet
See Exhibit A-3 for description of field procedures.
See Appendix C for explanation of symbols and abbreviations.
Elevation Ref: NAVD88

CPT sensor calibration reports available upon request.

1 Sensitive, fine grained
2 Organic soils - clay
3 Clay - silty clay to clay
4 Silt mixtures - clayey silt to silty clay
5 Sand mixtures - silty sand to sandy silt
6 Sands - clean sand to silty sand
7 Gravelly sand to dense sand
8 Very stiff sand to clayey sand
9 Very stiff fine grained

WATER LEVEL OBSERVATION

▼ 41 ft estimated water depth
(used in normalizations and correlations; see Appendix C)

Probe no. 4342

611 Lunken Park Drive
Cincinnati, Ohio

CPT Started: 9/1/2015	CPT Completed: 9/1/2015
Rig: Geoprobe	Operator: Buchanan/Pattison
Project No.: N1155177	Exhibit: A-21

APPENDIX C

SUPPORTING DOCUMENTS

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING

- ☐ Grab Sample
- ☐ Shelby Tube
- ☐ Standard Penetration Test

WATER LEVEL

- ▽ **Water Initially Encountered**
- ▽ **Water Level After a Specified Period of Time**
- ▼ **Water Level After a Specified Period of Time**

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

N	**Standard Penetration Test Resistance (Blows/Ft.)**
(HP)	**Hand Penetrometer**
(T)	**Torvane**
(DCP)	**Dynamic Cone Penetrometer**
(PID)	**Photo-Ionization Detector**
(OVA)	**Organic Vapor Analyzer**

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Ground surface elevations and coordinates of the as-drilled boring/sounding locations were determined using a Leica Viva NetRover survey grade GPS with the following references: WGS84 latitude and longitude with WGS84 ellipsoid height. Based on satellite availability, the horizontal survey data accuracy was reported as ±0.1 foot. The horizontal and vertical references are NAD83 and NAVD88 respectively.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		**CONSISTENCY OF FINE-GRAINED SOILS** (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (tsf)**	**Standard Penetration or N-Value Blows/Ft.**
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

RELATIVE PROPORTIONS (ASTM D2488)

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
Few	5 - 10
Little	15 - 25
Some	30 - 45
Mostly	50 - 100

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

Terracon

Exhibit: C-1

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	**Group Name** [B]
Coarse Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc > 3$ [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	$PI > 7$ and plots on or above "A" line [J]		CL	Lean clay [K,L,M]
			$PI < 4$ or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K,L,M,N]
			Liquid limit - not dried			Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K,L,M,P]
			Liquid limit - not dried			Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10} \qquad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

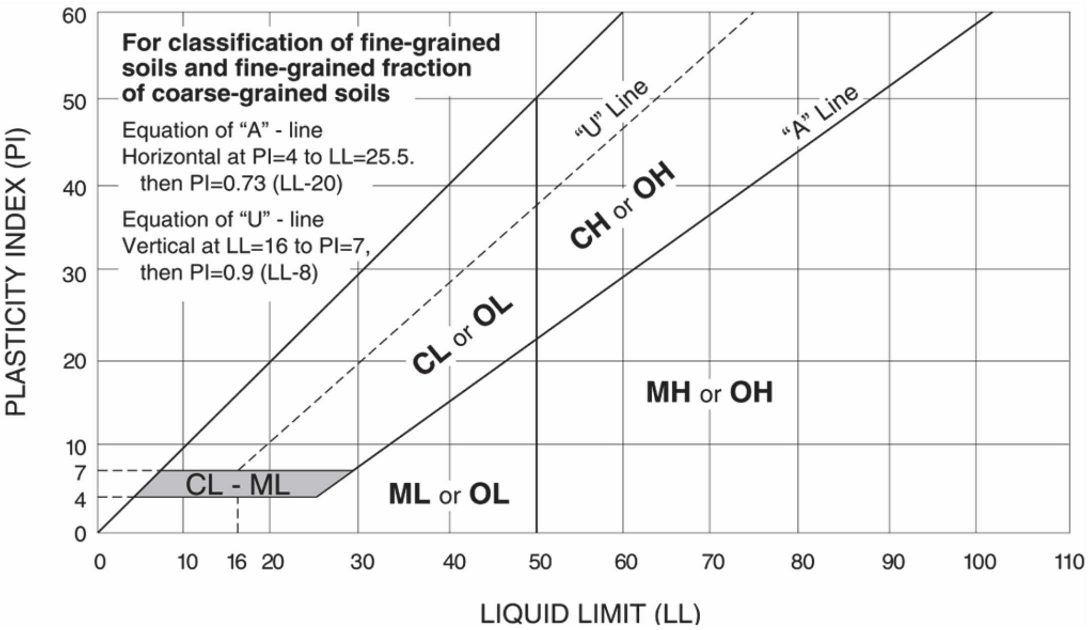
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] $PI \geq 4$ and plots on or above "A" line.

[O] $PI < 4$ or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



Terracon

Exhibit C-2

Geoprobe Systems®
THE WORLD LEADER IN DIRECT PUSH TECHNOLOGY

CERTIFICATE FOR CPT PROBE 4342

PROBE NUMBER	4342 (Terracon)
DATE OF CALIBRATION	June 25, 2015
CALIBRATED BY	Sean Bigler Geoprobe® Systems

POINT RESISTANCE

Sensor Range	100.00 MPa
Scaling Factor	858
Net Area Factor	0.85

LOCAL FRICTION

Sensor Range	1.00 MPa
Scaling Factor	3752
Net Area Factor	0.000

PORE PRESSURE

Sensor Range	2.00 MPa
Scaling Factor	3833

TILT ANGLE

Range	0-40 deg.

CALIBRATION EQUIPMENT

Sensotec® Precision Load Cell Model 73/2537-11-02 Calibrated June 11, 2009
Serial No. 804409
Calibration at 0.0, 3000, 6000, 9000, 12000, 15000, 18000, 21000, 24000, 27000, 30000, 27000, 24000, 21000, 18000, 15000, 12000, 9000, 6000, 3000, 0.0 lbs

Sensotec® Pressure Transducer Model A-10/6076-08 Calibrated June 11, 2009
Serial No. 544931
Calibration at 0.0, 30, 60, 90, 120, 150, 180, 210, 240, 270, 300, 270, 240, 210, 180, 150, 120, 90, 60, 30, 0.0 psi

Documentation of NIST Traceability available upon request.

Cone penetration test probe calibration results are accurate at the time of calibration. Geoprobe® Systems does not guarantee probe accuracy at the time of field testing. ISSMFE international reference test procedure for cone penetration testing recommends probe calibration at least every 3 months.

EXHIBIT C-3A

Geoprobe Systems
THE WORLD LEADER IN DIRECT PUSH TECHNOLOGY

CERTIFICATE FOR CPT PROBE 4399

PROBE NUMBER	4399 (Terracon-OH)
DATE OF CALIBRATION	October 21, 2014
CALIBRATED BY	Troy Schmidt Geoprobe® Systems

POINT RESISTANCE

Sensor Range	100.00 MPa
Scaling Factor	862
Net Area Factor	0.82

LOCAL FRICTION

Sensor Range	1.00 MPa
Scaling Factor	3806
Net Area Factor	0.000

PORE PRESSURE

Sensor Range	2.00 MPa
Scaling Factor	3750

TILT ANGLE

Range	0-40 deg.

CALIBRATION EQUIPMENT

Sensotec® Precision Load Cell Model 73/2537-11-02 Calibrated August 01, 2014
Serial No. 804409
Calibration at 0.0, 3000, 6000, 9000, 12000, 15000, 18000, 21000, 24000, 27000, 30000, 27000, 24000, 21000, 18000, 15000, 12000, 9000, 6000, 3000, 0.0 lbs

Sensotec® Pressure Transducer Model A-10/6076-08 Calibrated August 01, 2014
Serial No. 544931
Calibration at 0.0, 30, 60, 90, 120, 150, 180, 210, 240, 270, 300, 270, 240, 210, 180, 150, 120, 90, 60, 30, 0.0 psi

Documentation of NIST Traceability available upon request.

Cone penetration test probe calibration results are accurate at the time of calibration. Geoprobe® Systems does not guarantee probe accuracy at the time of field testing. ISSMFE international reference test procedure for cone penetration testing recommends probe calibration at least every 3 months.

EXHIBIT C-3B

CPT GENERAL NOTES

DESCRIPTION OF MEASUREMENTS AND CALIBRATIONS

To be reported per ASTM D5778:

Uncorrected Tip Resistance, q_c
Measured force acting on the cone divided by the cone's projected area

Corrected Tip Resistance, q_t
Cone resistance corrected for porewater and net area ratio effects
$q_t = q_c + u_2(1 - a)$
Where a is the net area ratio, a lab calibration of the cone typically between 0.70 and 0.85

Pore Pressure, u
Pore pressure measured during penetration
u_1 - sensor on the face of the cone
u_2 - sensor on the shoulder (more common)

Sleeve Friction, f_s
Frictional force acting on the sleeve divided by its surface area

Normalized Friction Ratio, F_r
The ratio as a percentage of f_s to q_t, accounting for overburden pressure

To be reported per ASTM D7400, if collected:

Shear Wave Velocity, V_s
Measured in a Seismic CPT and provides direct measure of soil stiffness

DESCRIPTION OF GEOTECHNICAL CORRELATIONS

Normalized Tip Resistance, Q_t
$Q_t = (q_t - \sigma_{V0})/\sigma'_{V0}$

Over Consolidation Ratio, OCR
$OCR\ (1) = 0.25(Q_t)^{1.25}$
$OCR\ (2) = 0.33(Q_t)$

Undrained Shear Strength, S_u
$S_u = Q_t \times \sigma'_{V0}/N_{kt}$
N_{kt} is a soil-specific factor (shown on S_u plot)

Sensitivity, S_t
$S_t = (q_t - \sigma_{V0}/N_{kt}) \times (1/f_s)$

Effective Friction Angle, ϕ'
$\phi'\ (1) = \tan^{-1}(0.373[\log(q_t/\sigma'_{V0}) + 0.29])$
$\phi'\ (2) = 17.6 + 11[\log(Q_t)]$

Unit Weight, γ
$\gamma = (0.27[\log(F_r)]+0.36[\log(q_t/atm)]+1.236) \times \gamma_{water}$
σ_{V0} is taken as the incremental sum of the unit weights

Small Strain Shear Modulus, G_0
$G_0\ (1) = \rho V_s^2$
$G_0\ (2) = 0.015 \times 10^{(0.55Ic + 1.68)}(q_t - \sigma_{V0})$

Soil Behavior Type Index, I_c
$I_c = [(3.47 - \log(Q_t)^2 + (\log(F_r) + 1.22)^2]^{0.5}$

SPT N_{60}
$N_{60} = (q_t/atm) / 10^{(1.1268 - 0.2817Ic)}$

Elastic Modulus, E_s (assumes $q/q_{ultimate} \sim 0.3$, i.e. FS = 3)
$E_s\ (1) = 2.6\psi G_0$ where $\psi = 0.56 - 0.33\log Q_{t,clean\ sand}$
$E_s\ (2) = G_0$
$E_s\ (3) = 0.015 \times 10^{(0.55Ic + 1.68)}(q_t - \sigma_{V0})$
$E_s\ (4) = 2.5q_t$

Constrained Modulus, M
$M = \alpha_M(q_t - \sigma_{V0})$
For $I_c > 2.2$ (fine-grained soils)
$\alpha_M = Q_t$ with maximum of 14
For $I_c < 2.2$ (coarse-grained soils)
$\alpha_M = 0.0188 \times 10^{(0.55Ic + 1.68)}$

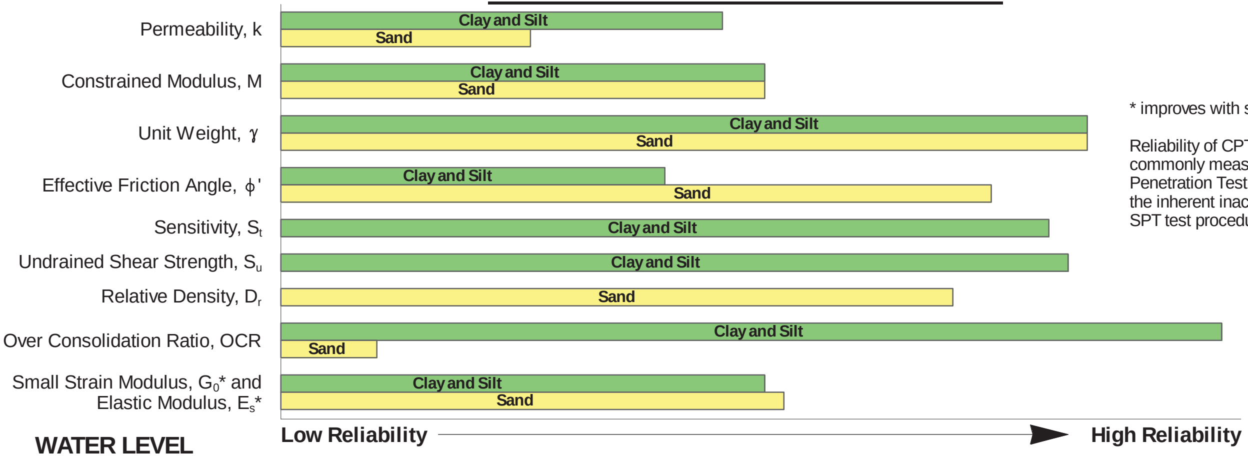
Hydraulic Conductivity, k
For $1.0 < I_c < 3.27$ $k = 10^{(0.952 - 3.04Ic)}$
For $3.27 < I_c < 4.0$ $k = 10^{(-4.52 - 1.37Ic)}$

Relative Density, D_r
$D_r = (Q_t / 350)^{0.5} \times 100$

REPORTED PARAMETERS

CPT logs as provided, at a minimum, report the data as required by ASTM D5778 and ASTM D7400 (if applicable). This minimum data include q_t, f_s, and u. Other correlated parameters may also be provided. These other correlated parameters are interpretations of the measured data based upon published and reliable references, but they do not necessarily represent the actual values that would be derived from direct testing to determine the various parameters. To this end, more than one correlation to a given parameter may be provided. The following chart illustrates estimates of reliability associated with correlated parameters based upon the literature referenced below.

RELATIVE RELIABILITY OF CPT CORRELATIONS



* improves with seismic V_s measurements

Reliability of CPT-predicted N_{60} values as commonly measured by the Standard Penetration Test (SPT) is not provided due to the inherent inaccuracy associated with the SPT test procedure.

WATER LEVEL

The groundwater level at the CPT location is used to normalize the measurements for vertical overburden pressures and as a result influences the normalized soil behavior type classification and correlated soil parameters. The water level may either be "measured" or "estimated:"

Measured - Depth to water directly measured in the field

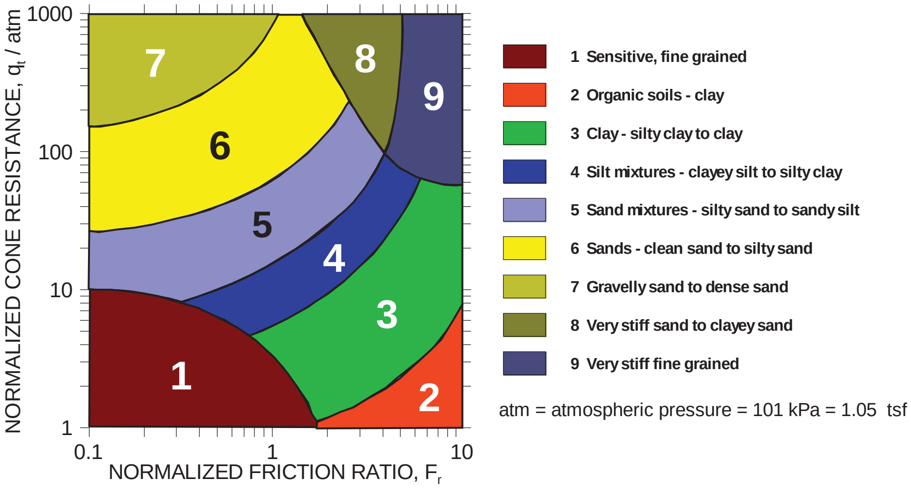
Estimated - Depth to water interpolated by the practitioner using pore pressure measurements in coarse grained soils and known site conditions

While groundwater levels displayed as "measured" more accurately represent site conditions at the time of testing than those "estimated," in either case the groundwater should be further defined prior to construction as groundwater level variations will occur over time.

CONE PENETRATION SOIL BEHAVIOR TYPE

The estimated stratigraphic profiles included in the CPT logs are based on relationships between corrected tip resistance (q_t), friction resistance (f_s), and porewater pressure (u_2). The normalized friction ratio (F_r) is used to classify the soil behavior type.

Typically, silts and clays have high F_r values and generate large excess penetration porewater pressures; sands have lower F_r's and do not generate excess penetration porewater pressures. The adjacent graph (Robertson *et al.*) presents the soil behavior type correlation used for the logs. This normalized SBT chart, generally considered the most reliable, does not use pore pressure to determine SBT due to its lack of repeatability in onshore CPTs.



atm = atmospheric pressure = 101 kPa = 1.05 tsf

REFERENCES

Kulhawy, F.H., Mayne, P.W., (1997). "Manual on Estimating Soil Properties for Foundation Design," Electric Power Research Institute, Palo Alto, CA.
Mayne, P.W., (2013). "Geotechnical Site Exploration in the Year 2013," Georgia Institue of Technology, Atlanta, GA.
Robertson, P.K., Cabal, K.L. (2012). "Guide to Cone Penetration Testing for Geotechnical Engineering," Signal Hill, CA.
Schmertmann, J.H., (1970). "Static Cone to Compute Static Settlement over Sand," *Journal of the Soil Mechanics and Foundations Division*, 96(SM3), 1011-1043.

Terracon

Exhibit C-3C

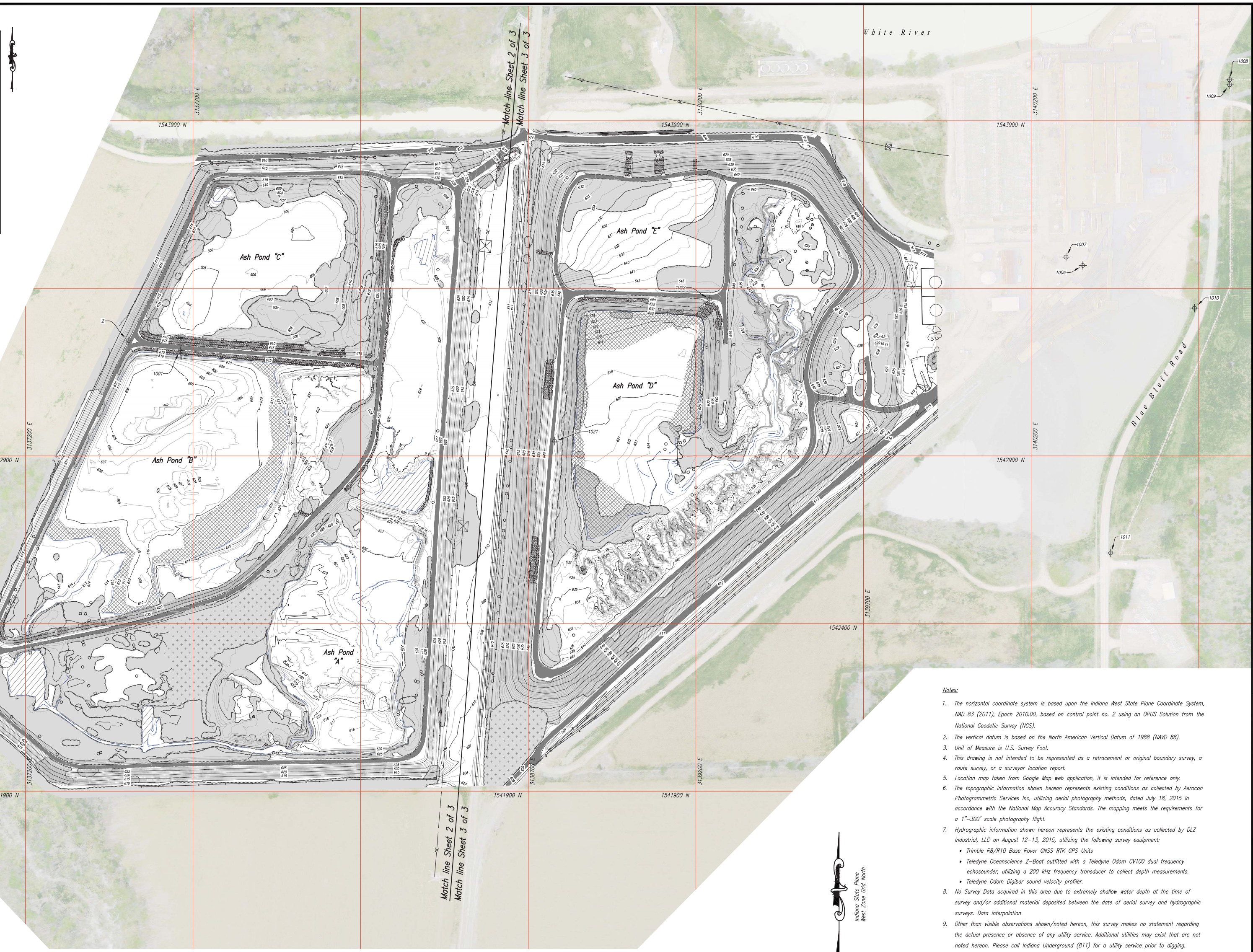
ATTACHMENT D

TOPOGRAPHIC & BATHYMETRIC SURVEYS OF ASH POND SYSTEM

Item	Drawing Number	Title
1	8113EAGL SHT 1	Eagle Valley Generating Station, Overall Ash Pond Survey
2	8113EAGL SHT 2	Eagle Valley Generating Station, Survey of Ash Ponds A, B, & C

Location Map

Not to Scale



Indiana State Plane
West Zone Grid North

120 0 120 240
SCALE: 1" = 120'

Legend:

701	Intermediate Contour Line
700	Index Contour Line
⌖	Survey Control
× XXX.X	Spot Elevation
	Sign
	Utility Valve
⊙	Bollard
▤	Drainage Inlet
	Fire Hydrant
	Deciduous Tree
	Utility Pole (Typ.)
—×—×—	Fence Line
	Guard Rail
	Vegetation Line
	Brush
	Edge of Water
	Railroad Track
— — —	Gravel Drive
—— OE ——	Overhead Electric Line
W.E. XXX.X	Water Elevation at Time of Aerial Flight
▨	Area Excluded from Hydrographic Survey (See Note 8 Sheet 1 of 3)
	No Survey Data acquired in this area survey. Data interpolation (See Note 11 Sheet 1 of 3)
+ + +	No Survey Data acquired due to Dense Vegetation
	Rip–Rap

Survey Control Information

Point ID	Northing	Easting	Elevation	Description
2	1,543,243.21	3,137,506.71	618.12	5/8" Rebar Set w/ DLZ Cap
1001	1,543,213.50	3,137,662.07	618.61	IPL Benchmark "TBM-1"
1006	1,543,468.21	3,140,354.22	615.77	IPL -PK Nail CP#13
1007	1,543,493.14	3,140,304.17	616.98	IPL - PK Nail CP#7
1008	1,544,022.34	3,140,792.14	609.94	IPL - Rebar CP#25
1009	1,544,007.28	3,140,792.15	609.73	3/4" Iron Rod CP#24
1010	1,543,340.98	3,140,687.26	613.75	IPL - Rebar w/ Red IPL Cap CP#28
1011	1,542,610.78	3,140,437.38	616.96	IPL - Rebar w/ Red IPL Cap CP#1

Notes:

1. The horizontal coordinate system is based upon the Indiana West State Plane Coordinate System, NAD 83 (2011), Epoch 2010.00, based on control point no. 2 using an OPUS Solution from the National Geodetic Survey (NGS).
2. The vertical datum is based on the North American Vertical Datum of 1988 (NAVD 88).
3. Unit of Measure is U.S. Survey Foot.
4. This drawing is not intended to be represented as a retracement or original boundary survey, a route survey, or a surveyor location report.
5. Location map taken from Google Map web application, it is intended for reference only.
6. The topographic information shown hereon represents existing conditions as collected by Aerocon Photogrammetric Services Inc, utilizing aerial photography methods, dated July 18, 2015 in accordance with the National Map Accuracy Standards. The mapping meets the requirements for a 1"–300' scale photography flight.
7. Hydrographic information shown hereon represents the existing conditions as collected by DLZ Industrial, LLC on August 12–13, 2015, utilizing the following survey equipment:
    - Trimble R8/R10 Base Rover GNSS RTK GPS Units
    - Teledyne Oceanscience Z–Boat outfitted with a Teledyne Odom CV100 dual frequency echosounder, utilizing a 200 kHz frequency transducer to collect depth measurements.
    - Teledyne Odom Digibar sound velocity profiler.
8. No Survey Data acquired in this area due to extremely shallow water depth at the time of survey and/or additional material deposited between the date of aerial survey and hydrographic surveys. Data interpolation
9. Other than visible observations shown/noted hereon, this survey makes no statement regarding the actual presence or absence of any utility service. Additional utilities may exist that are not noted hereon. Please call Indiana Underground (811) for a utility service prior to digging.
10. The aerial photos shown herein were taken from the United States Geological Survey (USGS) Earth Explorer and are dated February 2011. They are intended for reference only and were not used for mapping.
11. Between the aerial flight and hydrographic portions of the survey, the water levels on some fly ash ponds receded. At the time of the hydrographic survey, Ponds B & D had less water. Data was interpolated in between as noted heron.

Surveyor's Certificate

I, Christopher David Carmien, being a Professional Surveyor in the State of Indiana, do hereby attest to the best of my knowledge and belief, that the topographic survey hereon shown was performed under my direct supervision, and is an accurate representation of said survey.

Christopher David Carmien 9-28-2015

Christopher David Carmien
Indiana Professional Surveyor No. LS21100003
My license expires July 31, 2016

No. LS21100003
STATE OF INDIANA

DLZ
DLZ INDUSTRIAL, LLC
316 TECH DRIVE, BURNS HARBOR, INDIANA 46304
TELEPHONE (219) 764–4700 FAX (219) 764–4156

S&L Project No. : 1057084

NO.	REVISION	BY	DATE
1	Added Grid Lines and Notes	KJM	10.02.15

DRAWN: KJM CHK'D. DRW
DESIGNED: – APPRV'D: CDC
DATE: September 28, 2015
1" = 120'
PROJECT NUMBER
1550–8113–90

Martinsville Indiana
Sargent & Lundy, LLC
Indianapolis Power & Light (IPL)

Eagle Valley Generating Station
Overall Ash Pond Survey

SHEET 1
OF 3
DRAWING NUMBER
8113EAGL

M:\PROJ\1550\8113\TOPOGRAPHIC\8113TO–EAGLEVALLEY–COMBINE.DWG

Legend:

701	Intermediate Contour Line
700	Index Contour Line
⌖	Survey Control
× XXX.X	Spot Elevation
	Sign
⧓	Utility Valve
⊙	Bollard
▤	Drainage Inlet
●	Fire Hydrant
	Deciduous Tree
	Utility Pole (Typ.)
—X—X—	Fence Line
	Guard Rail
	Vegetation Line
	Brush
	Edge of Water
	Railroad Track
— — —	Gravel Drive
OE	Overhead Electric Line
W.E. XXX.X	Water Elevation at Time of Aerial Flight
▨	Area Excluded from Hydrographic Survey (See Note 8 Sheet 1 of 3)
	No Survey Data acquired in this area survey. Data interpolation (See Note 11 Sheet 1 of 3)
+ + +	No Survey Data acquired due to Dense Vegetation
	Rip-Rap

DLZ
DLZ INDUSTRIAL, LLC
316 TECH DRIVE, BURNS HARBOR, INDIANA 46304
TELEPHONE (219) 764-4700 FAX (219) 764-4156

9-28-2015

CHRISTOPHER DAVID CARMIEN
No. LS21100003

S&L Project No. : 1057084

NO.	REVISION	BY	DATE
1	Added Grid Lines and Notes	KJM	10.02.15

DRAWN: KJM CHK'D. DRW
DESIGNED: – APPRV'D: CDC
DATE: September 28, 2015
1" = 60'
PROJECT NUMBER
1550-8113-90

Martinsville Indiana

Sargent & Lundy, LLC
Indianapolis Power & Light (IPL)

Eagle Valley Generating Station
Survey of Ash Ponds A, B, & C

SHEET 2
OF 3
DRAWING NUMBER
8113EAGL

M:\PROJ\1550\8113\TOPOGRAPHIC\8113TO-EAGLEVALLEY-COMBINE.DWG

ATTACHMENT E

OPERATIONS & MAINTENANCE PLAN

Eagle Valley Generating Station

Ash Pond

Operations & Maintenance Plan

Contents

Section **Page**

Figure

Appendices

1.0 INTRODUCTION

This Ash Pond Operations and Maintenance (O&M Plan) was prepared using the Indiana Dam Safety Inspection Manual, Part 1 - Overview of Dams and Ownership in Indiana, and Part 2 - Dam Management and Maintenance by the Indiana Department of Natural Resources (IDNR), Division of Water dated August 28, 2007.

This O&M Plan is for the five ash ponds (Ponds A, B, C, D, and E) located west and south of the generating station. Four of the ponds are in service (Ponds A, B, C, and D) while Pond E is filled with compacted ash and is out of service. Ash generated by burning coal at the generating station is mixed with water and pumped to the ponds where the ash settles out in the ponds and the water travels through the ponds and is finally discharged to the site discharge channel that flows to the White River. The ponds were created by berms constructed of clay and ash. There is an access road on the top of each berm, and the outside of each berm is vegetated. The layout of the ponds is shown on **Figure 1**.

2.0 OPERATIONS

There are five ash ponds at the Eagle Valley Generation Station. The layout of the ponds is shown on **Figure 1**. The approximate area of each of the ponds is as follows:

Pond A	19 acres
Pond B	12 acres
Pond C	6 acres
Pond D	16 acres
Pond E	Out of service

2.1 NORMAL OPERATION

Water is used to sluice ash from the generating units to the ash ponds. Wastewater from the Station is also pumped separately to the ash ponds. Water can be directed to either Pond A or D pond. When water is directed to Pond A, it acts as the initial settling pond. Water from Pond A is discharged through two 24” diameter pipes to Pond B. Water leaves Pond B via two 24” diameter pipes and flows to Pond C. When water is directed to Pond D, it acts as the initial settling pond. Water from Pond D is discharged through a section of 30” diameter polyethylene pipe and then a section of 24” diameter concrete pipe into Pond C.

The outlet of Pond C is a concrete structure with an overflow weir to control the water level within Pond C. Water entering this outlet structure flows to the discharge channel and then to the White River. During normal operation, the water level in each pond is approximately the same elevation as the discharge pipes in Ponds A, B, and D or the overflow weir in Pond C. Water is allowed to discharge freely from each pond and water is not backed up in the ponds.

3.0 INSTRUMENTATION AND MONITORING

3.1 PIEZOMETER MONITORING

There are ten piezometers located around the ash ponds at Eagle Valley Station. The location of the piezometers is shown on **Figure 2**. The piezometers are used to monitor the elevation of the water inside the berm of the ash ponds. The water level in the piezometers shall be recorded on a monthly basis. There is an example monitoring form included in **Appendix A**.

Liquid levels measured in the piezometers can be compared the following liquid levels.

Pond	Piezometers	Action Elevation
A	PZ6, PZ7, PZ8, and PZ12	622.0
B	PZ10 and PZ11	613.7
C	PZ9	613.7
D	PZ2, PZ3 and PZ5	616.6

If the level in any piezometer exceeds the action elevation listed above, an Event Level 2 emergency should be declared. See the EV Emergency Action Plan (EAP) for further details.

3.2 POND WATER LEVEL MONITORING

There are staff gauges installed in the ash ponds at Eagle Valley Station. The locations of the staff gauges are shown on **Figure 2**. The staff gauges are used to monitor the level of the water in each pond. The water level in each ash pond shall be recorded monthly. There is an example monitoring form included in **Appendix A**.

The water level in the ash ponds can be compared to the following table:

Pond	Action Elevation
A	627.2
B	617.3
C	614.3
D	627.4

If the water level in any of the ponds exceeds the action elevation listed above, an Event Level 2 emergency should be declared. See the EAP for further details.

3.3 RECORD KEEPING

Completed monitoring forms shall be kept in the EV environmental files.

4.0 INSPECTIONS

The ash pond inspection program includes two types of inspections:

- Maintenance inspections
- Informal inspections

Maintenance inspections shall be performed as a preventative measure to identify problems and develop solutions to prevent further degradation. Maintenance inspections shall be a complete inspection of all of the ash ponds and berms.

Informal inspections may be performed on only a portion of the ash pond berm where a problem is known to exist or provide an update on site conditions.

4.1 INSPECTION PERSONNEL

Maintenance inspection shall be performed by personnel familiar with dam design and construction, the causes of dam failures, and the visual signs which identify problems or potential concerns, preferably a qualified external professional.

Informal inspections may be performed by IPL personnel familiar with the ash ponds and berms who possess sufficient knowledge to make an accurate assessment of the ponds and berms conditions.

4.2 INSPECTION FREQUENCY

Maintenance inspections shall be performed on a semi-annual basis in the spring and fall of every year.

Informal inspections shall be performed on a bi-weekly basis or after a significant rain event/weather condition.

4.3 INSPECTION FORMS

Example inspection forms for the maintenance and informal inspections are included in **Appendix B**. These forms are to be completed for every maintenance inspection.

4.4 RECORD KEEPING

Completed inspection forms shall be kept in the EV environmental files.

5.0 MAINTENANCE

5.1 VEGETATION

A good, thick grass cover at an appropriate height is an important part of berm maintenance. A healthy stand of grass can serve the following purposes:

1. Protect the surface from extreme runoff events
2. Minimize animal penetrations
3. Minimize growth of woody vegetation
4. Allow for visual monitoring of the berm surface

A good grass cover requires mowing at least once per year, if acceptable safety conditions exist, to keep the grass at a reasonable height and discourage the establishment of woody vegetation. Any bare or thin spots should be reseeded as needed.

Any trees or brush should be cut flush with the ground and the stump treated with a waterproof sealant to prevent regrowth. If the stump is greater than 3 inches in diameter, the stump should be removed and the excavation filled with compacted structural fill.

Any vegetation issues shall be documented in the inspection sheet. All repair/maintenance activities should be documented and the records maintained in the EV environmental files.

5.2 EROSION

Erosion is a natural process and its continuous forces will eventually wear down almost any surface or structure. Erosion can be caused by improper drainage, settlement, vehicle traffic, inadequate vegetation, animal burrows, or other factors. Periodic and timely maintenance is essential in preventing continuous deterioration and possible failure.

A sturdy sod, free of weeds and brush, is one of the most effective means of erosion protection. Prompt repair of vegetated areas that develop erosion is required to prevent more serious damage to the berm. Rills and gullies should be filled with suitable soil (the upper 4 inches should be topsoil), lightly compacted, and seeded.

Erosion on the top of the berm on the access road should be addressed. Vehicle traffic can result in tire ruts, which can be areas where water collects and erosion occurs. The access road should be maintained using road gravel and compacted to allow vehicle access in all weather conditions.

Erosion on the inside of the berm can be caused by wave action within the pond. Rock riprap may be required on the interior slope of the berm to prevent erosion.

Any erosion issues shall be documented in the inspection sheet. All repair/maintenance activities should be documented and the records maintained in the EV environmental files.

5.3 SEEPAGE

Seepage may be through the foundation of the berm, through the embankment or along the foundation / embankment interface. Seepage can emerge anywhere on the downstream face of the berm, beyond the toe, or on the downstream abutments. Seepage may vary from a “soft” wet area to a flowing channel of water. It may show up first as an area where vegetation is lush and dark green. Cattails, reeds, moss, and other marsh vegetation often become established in a seepage area.

Areas with suspected seepage should be noted on the inspection forms with the exact location of the seepage and the approximate dimensions. Photographs to document the seepage are also helpful.

Continuous or cloudy seepage in an area of Pond A where an exception has been granted to the 50 foot protective berm requirement should be treated as an Event Level 2 emergency. See the EAP for further details.

All repair/maintenance activities should be documented and the records maintained in the EV environmental files.

5.4 OUTLETS

The outlet of each ash pond should be inspected during the semi-annual maintenance inspections. Several of the outlets are corrugated metal pipes, which can corrode and breakdown over time. The outlets should not be blocked with debris or ash and water should be able to freely enter and exit the outlets. Any debris blocking the flow into the pipe should be removed.

Any issues associated with the ash pond outlets shall be documented in the inspection sheet. All repair/maintenance activities should be documented and the records maintained in the EV environmental files.

5.5 RIPRAP

The riprap on the interior slope of the ash ponds should be inspected during the semi-annual maintenance inspections. Any areas of eroded or missing riprap should be noted and repaired. All repair/maintenance activities should be documented and the records maintained in the EV environmental files.

5.6 ACCESS ROADS

There are gravel access roads along the top of the ash pond berms. The access roads should be maintained to allow safe passage of vehicles. The road surface must be maintained to allow access to the ash ponds and berms. Any areas of erosion or degraded areas should be repaired. All repair/maintenance activities should be documented and the records maintained in the EV environmental files.

5.7 POND A PROTECTIVE BERM

A 50 foot protective berm of settled ash shall be maintained around the interior of the perimeter of the pond except for the areas around the overflow pipes, the southeast corner, and the narrow section of the pond in the northeast corner. Any eroded or degraded areas should be repaired. All repair/maintenance activities should be documented and the records maintained in the EV environmental files.

5.8 RODENT CONTROL

Rodents such as groundhogs, muskrats, and beaver can make burrows in the ash pond berms and compromise the structural integrity of the berms. Groundhogs typically burrow into the downstream slope of the berm, and muskrats and sometimes beavers burrow into the upstream slope below the water line. Collapse of a burrow can result in a hole in the berm, weakening the structure, and serving as a pathway for seepage.

Control methods should be implemented early in the spring, when burrows are easy to find. Groundhogs can be controlled using fumigants or removal. Muskrats and beaver can be controlled using traps. Information about the control of groundhogs and trapping of muskrats and beaver may be obtained from the IDNR.

Groundhog and muskrat burrows should be backfilled when they are discovered. Backfilling is accomplished using mud packing. A mixture of water and 90 percent earth and 10 percent cement is used and the mixture should be the thickness of thin concrete. A 4- to 6-inch-diameter pipe should be placed in the burrow and the mixture poured down the pipe until the burrow is full to within 6 inches of the surface. Dry earth should be used to fill the top 6 inches of the burrow and the area seeded.

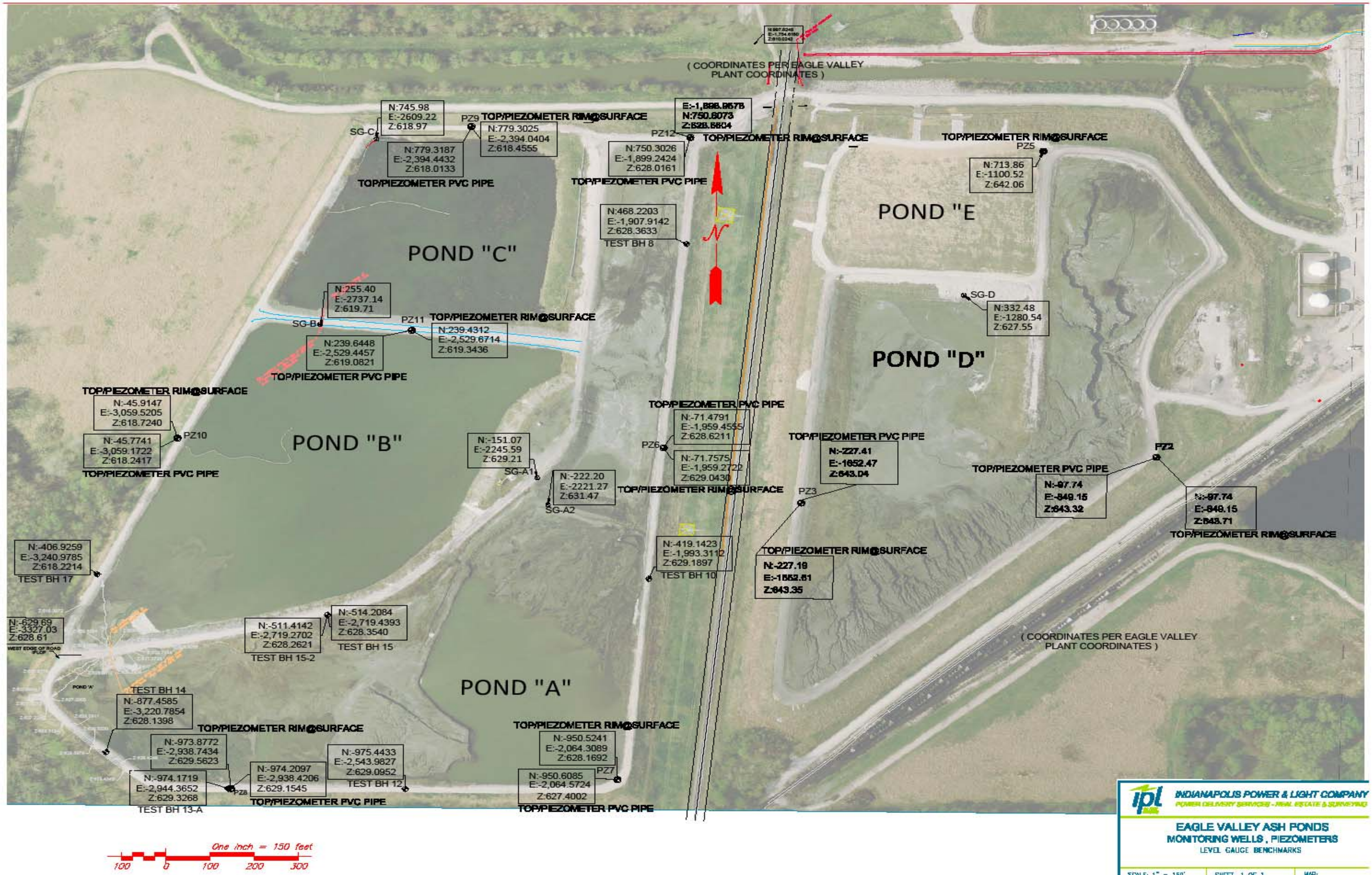
Any issues associated with rodents shall be documented in the inspection sheet. All repair /maintenance activities should be documented and the records maintained in the EV environmental files.

5.9 RECORD KEEPING

An example maintenance form is included in **Appendix C**. Completed forms of any maintenance activities performed should be kept in the EV environmental files.

FIGURE 1

Eagle Valley Ash Ponds Monitoring Wells, Piezometers, Level Gauge Benchmarks



INDIANAPOLIS POWER & LIGHT COMPANY
POWER DELIVERY SERVICES - REAL ESTATE & SURVEYING

EAGLE VALLEY ASH PONDS
MONITORING WELLS , PIEZOMETERS
LEVEL GAUGE BENCHMARKS

SCALE: 1" = 150'	SHEET 1 OF 1	MAP:
BY: JLE	DATE: 12:28pm, May 07, 2013	

FILE: L:\DWG\Gen\Eagle Valley Ash\TEST BORE HOLES AND MONITORING WE

APPENDIX A

Example Monitoring Form

EV Ash Pond Monitoring Form

Date: ____________________ Personnel: ____________________

Piezometer Readings

Piezometer	Top of Concrete Elevation	Reading	Water Elevation	Warning Level	Reading Okay?
PZ-2	643.71			616.6	
PZ-3	643.35			616.6	
PZ-5	642.06			616.6	
PZ-6	629.04			622.0	
PZ-7	628.17			622.0	
PZ-8	629.56			622.0	
PZ-9	618.46			613.7	
PZ-10	618.72			613.7	
PZ-11	619.34			613.7	
PZ-12	628.66			622.0	

Staff Gauge Readings

Pond	Reading	Warning Level	Reading Okay?
A		627.2	
B		617.3	
C		614.3	
D		627.4	

Comments

____

____

____

____

____

APPENDIX B

Example Inspection Forms

EAGLE VALLEY
BI-WEEKLY ASH POND(S) INSPECTION RECORD

This record is completed on a bi-weekly basis after inspection is completed. DATE:____________________

										Initials	
Ash Pond Description (Name/ID)	**Date**	**Erosion Along Crest or Embankment Slopes (Y/N)**	**Appearance of Sinkholes or Seepage (Y/N)***	**Tension Cracks Along Crest or Slope Faces (Y/N)**	**Presence of Vegetation Cover Along the Embankment Slopes (Y/N)**	**Changes in Dike Alignment (Y/N)**	**Appearance of Erosion/Deterioration Around Outlet Structures (Y/N)**	**Sloughing or Bulging On Slopes?**	**Description of Current Operational Conditions (Normal/ Abnormal)**	**Authorized Supervisor**	**Personnel**
A											
B											
C											
D											
E	Out of service										

*Seepage:
1. Location Description:____
2. Active Flow? (Y/N)
3. Color of Active Flow:____

Inspection Issue	Responsible Person	Corrective Action Taken	Date Issue Resolved

IPL Dike Field Review Checklist

1) Complete all Portions of this Section (Pre-review)
Date of Review:_______
Name of Dike:___________________________ Project Number__________

2) Review Inventory – Highlight missing information (Pre-review)
Owner(s) Name(s):___________________________________
Address:____
City:___________________________State___________Zip (+4)__________
Telephone (Home):_____________________Telephone (Work): __________
Contact Person:________________________________
Designed By:__________________________________
Constructed By:________________________________
Year Completed:______________Plans Available (Yes, No) (Location):__________
Purpose of Dike:_______________________________
Age of Dike:__________________________________

3) General Information
Mowing (times per year):________________________
Prior problems (wet areas, erosion, slides):_________
____
____
Repair or modification (what & when):____________
____
____
Failure/Incident/Breach (max. pool):______________
____
____
Downstream hazard status (recent changes):________
____
____
Dike Embankment Material:_____________________
____
____
Slope Erosion Control:__________________________
____
____

4) Field Information (while at site)
Pool Elevation (during review):____________________________________Time:___(a.m. p.m.)
Site Conditions (temp., weather, ground moisture):________________________________
____
Review Party:____

Required Action

None Monitor Maintenance Engineer

5) INSIDE SLOPE Gradient: Horizontal: Vertical: (est. meas.)

☐ **VEGETATION** [no problem]

☐ Trees: Quantity: (<5, sparse, dense)__________ ☐ ☐ ☐ ☐
Diameter: (<6”, 6-12”, >12”)_________
Location:_________ Notes:_______
____

☐ Brush: Quantity: (spare, dense)_____________
Location: _________ ☐ ☐ ☐ ☐
Notes:____________
____

☐ Ground Cover: Type: (grass, crown vetch) Other:___________
Quantity: (bare, sparse, adequate, dense) _____________ ☐ ☐ ☐ ☐
Appearance: (too tall, too short, good) __________
Notes:____________
____

☐ **SLOPE PROTECTION** [no problem, could not inspect thoroughly]
☐ None
☐ Riprap: Average Diameter:________
(adequate, sparse, displaced, weathered, vegetation) (bedding/fabric noted–yes, no) ☐ ☐ ☐ ☐
Notes:____________
____

☐ Wave Berm:________
Vegetation: (adequate, bare, sparse, improper vegetation)____________ ☐ ☐ ☐ ☐
Notes:____________
____

☐ Other:_______
Notes:____________ ☐ ☐ ☐ ☐
____

☐ **EROSION** [no problem, could not inspect thoroughly]
☐ Wave Erosion (beaching): Scarp: Length: ___________ Height:________
Location:_________ ☐ ☐ ☐ ☐
Notes:_____________
____

☐ Runoff Erosion (Gullies): Quantity:_______
Depth:________ Width: _________ Length:_________ ☐ ☐ ☐ ☐
Location:_________ Notes/Causes:_______
____

☐ **INSTABILITIES** [no problem, could not inspect thoroughly]
☐ Slides: Transverse Length: ___________ Longitudinal Length:__________
Scarp: Width:_________ Length:_________
Location: ____ ☐ ☐ ☐ ☐
Crack: Width:___________________ Depth:__________
Notes/Causes______________________________________

☐ Cracks: ☐ Transverse ☐ Longitudinal ☐ Other
Quantity:______ Length:________ Width:__________ Depth:________
Location:____
Notes:Causes:____
____

None Monitor Maintenance Engineer

Required Action

Action

None Monitor Maintenance Engineer

☐ Cracks: ☐ Transverse ☐ Longitudinal ☐ Other ☐ ☐ ☐ ☐
Quantity:________ Length:_________ Width:_________ Depth:_________
Location: ____
Notes/Causes:____
____

☐ Bulges ☐ Depressions ☐ Hummocky ☐ ☐ ☐ ☐
Size:_____ Height:________ Depth:__________
Location: ____
Notes/Causes:____
____

☐ Bulges ☐ Depressions ☐ Hummocky ☐ ☐ ☐ ☐
Size:_____ Height:________ Depth:__________
Location: ____
Notes/Causes:____
____

☐ **OTHER** [no problem, could not inspect thoroughly]
☐ Rodent Burrows: (few, numerous)____ ☐ ☐ ☐ ☐
Location: ____
Notes/Causes:____
____

☐ Other:____ ☐ ☐ ☐ ☐
Notes:____
____

6) CREST Length:________ Width:_________ (est. meas.)

☐ **VEGETATION** [no problem]
☐ Trees: Quantity: (<5, sparse, dense)__________ ☐ ☐ ☐ ☐
Diameter: (<6", 6-12", >12")_________
Location: _________
Notes:____________
____

☐ Brush: Quantity: (spare, dense)______________ ☐ ☐ ☐ ☐
Location: _________
Notes:____________
____

☐ Ground Cover: Type: (grass, crown vetch) Other:___________ ☐ ☐ ☐ ☐
Quantity: (bare, sparse, adequate, dense)_______
Appearance: (too tall, too short, good)___________
Notes:____________
____

☐ **EROSION** [no problem, could not inspect thoroughly]
☐ Runoff Erosion (Gullies): Quantity: _____ Depth:_____ Width:_____ Length:______ ☐ ☐ ☐ ☐
Location: _________
Notes:____

None Monitor Maintenance Engineer

Required
Action

Action

None Monitor Maintenance Engineer

☐ **WIDTH** [no problem]

☐ Too Narrow ☐ ☐ ☐ ☐
Location: _________
Notes/Causes:_______________________________
____

☐ **INSTABILITIES** [no problem, could not inspect thoroughly]

☐ Cracks: ☐ Transverse ☐ Longitudinal ☐ Other ☐ ☐ ☐ ☐
Quantity: ______ Length:_______ Width:________ Depth:_________
Location: _________
Notes/Causes:_______________________________
____

☐ Cracks: ☐ Transverse ☐ Longitudinal ☐ Other ☐ ☐ ☐ ☐
Quantity: ______ Length:_______ Width:________ Depth:_________
Location: _________
Notes/Causes:____
____

☐ Bulges: ☐ Depressions ☐ Hummocky ☐ ☐ ☐ ☐
Size:_______ Height:_______ Depth:________
Location: ____
Notes/Causes:____
____

☐ **OTHER** [no problem, could not inspect thoroughly]

☐ Rodent Burrows: (few, numerous)___________________________________ ☐ ☐ ☐ ☐
Location: ____
Notes:____
____

☐ Other:_______ ☐ ☐ ☐ ☐
Notes:____________
____

7) OUTSIDE SLOPE

Gradient: Horizontal: Vertical: (est. meas.)

☐ **VEGETATION** [no problem]

☐ Trees: Quantity: (<5, sparse, dense)__________ ☐ ☐ ☐ ☐
Diameter: (<6", 6-12", >12")_________
Location: _________
Notes:____________
____

☐ Brush: Quantity: (spare, dense)______________ ☐ ☐ ☐ ☐
Location: _________
Notes:____________
____

☐ Ground Cover: Type: (grass, crown vetch) Other:___________
Quantity: (bare, sparse, adequate, dense)_______
Appearance: (too tall, too short, good)___________
Notes:____________
____

None Monitor Maintenance Engineer

Required Action

Required Action

None Monitor Maintenance Engineer

☐ **EROSION** [no problem, could not inspect thoroughly]

☐ Runoff Erosion (Gullies): Quantity: _____ Depth:_____ Width:_____ Length:______ ☐ ☐ ☐ ☐
Location: _________
Notes/Causes:____________
____

☐ **INSTABILITIES** [no problem, could not inspect thoroughly] ☐ ☐ ☐ ☐

☐ Slides: Transverse Length:_________Longitudinal Length:__________
Scarp: Width:__________ Length:_________
Location: ____
Crack: Width: ________ Length:__
Notes/Causes:____
____

☐ Cracks: ☐ Transverse ☐ Longitudinal ☐ Other ☐ ☐ ☐ ☐
Quantity:________ Length:________ Width:________ Depth:________
Location: ____
Notes/Causes:____
____

☐ Cracks: ☐ Transverse ☐ Longitudinal ☐ Other ☐ ☐ ☐ ☐
Quantity:________________________ Length:______ Width:___ Depth:______
Location: _________
Notes/Causes:____
____

☐ Bulges: ☐ Depressions ☐ Hummocky ☐ ☐ ☐ ☐
Size: ______ Height:_______ Depth:________
Location: ____
Notes/Causes:____
____

☐ **OTHER** [no problem, could not inspect thoroughly] ☐ ☐ ☐ ☐

☐ Rodent Burrows: (few, numerous)____
Location: ____
Notes:____
____

☐ Other:_______ ☐ ☐ ☐ ☐
Notes:____________
____

☐ **SEEPAGE** [no problem, could not inspect thoroughly] ☐ ☐ ☐ ☐

☐ Wet Area ☐ Flow ☐ Boil ☐ Sinkhole
Flow Rate________________________ Size:________________________________
Location:____
☐ Aquatic Vegetation ☐ None
☐ Rust Colored Deposits ☐ None
☐ Sediment in Flow ☐ None
☐ Other:____
Notes/Causes:____
____

None Monitor Maintenance Engineer

Required Action

☐ Wet Area ☐ Flow ☐ Boil ☐ Sinkhole
Flow Rate______________________ Size:______________________________
Location:____
☐ Aquatic Vegetation ☐ None
☐ Rust Colored Deposits ☐ None
☐ Sediment in Flow ☐ None
☐ Other:____
Notes/Causes:____
____

8) OUTLET/INLET STRUCTURES

☐ **GENERAL INLET** [no problem, could not inspect thoroughly]
☐ Inlet Pipe Dimensions:____________ (adequate, too small)
Type: (steel, concrete, aluminum, stainless steel, corrugated metal wood, other):_______________
Location:____
Deterioration: (missing sections, rusted, collapsed)____________________________________
In Use: (Yes, No)____

☐ Pond Erosion at Inlet: (Describe)______________________________________
____
____
____

☐ Other____
____
____

☐ **OUTLET STRUCTURES** [no problem, could not inspect thoroughly]
☐ Number of Outlet Structures:____
☐ Description/Location of Outlet Structures:_________________________________
____
____

☐ Outlet Structure 1:
Type: (steel, concrete, aluminum, stainless steel, corrugated metal wood, other):_______________
____
Deterioration:(missing section, collapsed, rusted):________
____
Erosion at Outlet Structure: (soil piping, seep collar, etc.)________
____
Debris: (leaves, trash, logs, ice, etc.)_______
____
Notes:_______
____

☐ Outlet Structure 2

Type: (steel, concrete, aluminum, stainless steel, corrugated metal wood, other):_______________
____ ☐ ☐ ☐ ☐

Deterioration:(missing section, collapsed, rusted):________
____

Erosion at Outlet Structure: (soil piping, seep collar, etc.)________
____

Debris: (leaves, trash, logs, ice, etc.)_______
____

Notes:_______
____

☐ Outlet Structure 3 Dimensions:_________________

Type: (steel, concrete, aluminum, stainless steel, corrugated metal wood, other):_______________ ☐ ☐ ☐ ☐
____

Deterioration:(missing section, collapsed, rusted):______________________
____

Erosion at Outlet Structure: (soil piping, seep collar, etc.)________
____

Debris: (leaves, trash, logs, ice, etc.)_______
____

Notes:_______
____

9) POND DRAIN

☐ GENERAL

☐ None Found ☐ Does not have one ☐ ☐ ☐ ☐

☐ Type of Pond Drain ☐ ☐ ☐ ☐

(isolated control/intake tower, valve vault w/outlet conduit, valve in riser/drop inlet, siphon)

Notes:_______________________________________
____

☐ Operated During Inspection (yes, no)

Notes:_______________________________________ ☐ ☐ ☐ ☐
____

☐ ACCESS TO VALVE/SLUICE GATE [no problem, could not inspect thoroughly] ☐ ☐ ☐ ☐

☐ Type (not accessible, from shore, boat, walkway, other)______

Notes:_______________________________________
____

☐ Walkway/Platform:______________________________

☐ Concrete Deterioration ☐ Cracks (platform, piers, end supports, railing) ☐ ☐ ☐ ☐

Location:______________________

Notes:________________________
____

Required Action

None Monitor Maintenance Engineer

☐ Wood Deterioration ☐ ☐ ☐ ☐

Notes:________________________

____

☐ Metal Deterioration (minor, moderate, extensive, other) ☐ ☐ ☐ ☐

Notes:________________________

____

☐ **POND DRAIN COMPONENTS** [no problem, could not inspect thoroughly] ☐ ☐ ☐ ☐

☐ Concrete Structure

Locations:________________________

Description: (deterioration, misalignment, cracks):________

Notes/Causes:________________________

____

☐ Valve Control (Operating Device) ☐ ☐ ☐ ☐

☐ No Operating Device ☐ No Stem ☐ Bent/Broken Stem ☐ Other

Notes/Operability:________________________

____

☐ Metal Deterioration: (surface rust, minor, moderate, extensive, other) ☐ ☐ ☐ ☐

Location:________________________

Flow Rate:________________________

Notes/Causes:________________________

☐ Mis-alignment ☐ ☐ ☐ ☐

Notes/Causes:________________________

____

☐ Leakage – Flow Rate: ☐ ☐ ☐ ☐

Notes/Causes:________________________

____

☐ Outlet Conduit ☐ ☐ ☐ ☐

☐ Metal: (loss of coating/paint, surface rust, corrosion (pitting, scaling), rusted out)

Location:________________________

Notes/Causes:________________________

____

☐ Concrete (bug holes, hairline crack, efflorescence) ☐ ☐ ☐ ☐

(spalling, popouts, honeycombing, scaling, craze/map cracks)

(isolated crack, exposed rebar, disintegration, other)

Dimensions/Location:________________________

Notes/Causes:________________________

____

☐ Plastic: (deterioration, cracking)________________ ☐ ☐ ☐ ☐

Location:________________________

Notes/Causes:________________________

____

None Monitor Maintenance Engineer

Required Action

Action

None Monitor Maintenance Engineer

☐ Conduit Deformation ☐ Mis-Alignment:
Location:______________________ ☐ ☐ ☐ ☐
Notes/Causes:__________________
____

☐ Separated Joint ☐ Loss of Joint Material
Location/Description:_________________________ ☐ ☐ ☐ ☐
Notes/Causes:__________________
____

☐ Undermining ☐ ☐ ☐ ☐
Location/Description:_________________________
Notes/Causes:__________________
____

☐ Vegetation (trees, brush) ☐ ☐ ☐ ☐
Notes:_________________________
____

☐ Other ☐ ☐ ☐ ☐
Notes:_________________________
____

☐ Discharge Outlet
☐ Type (pipe outlet, concrete channel, rock-lined channel, none) ☐ ☐ ☐ ☐
Notes:_________________________
____

☐ Riprap: Average Diameter: ☐ ☐ ☐ ☐
(adequate, sparse, displaced, weathered, vegetation) bedding/fabric noted – yes, no))
Notes:_________________________
____

☐ Concrete (bug holes, hairline crack, efflorescence)
(spalling, popouts, honeycombing, scaling, craze/map cracks) ☐ ☐ ☐ ☐
(isolated crack, exposed rebar, disintegration, other)
Dimensions/Location:__________________
Notes/Causes:__________________
____

☐ Mis-alignment
Location/Description:_________________________ ☐ ☐ ☐ ☐
Notes/Causes:__________________
____

☐ Separated Joint ☐ Loss of Joint Material ☐ ☐ ☐ ☐
Location/Description:_________________________
Notes/Causes:__________________
____

☐ Undermining
Location/Description:_________________________
Notes/Causes:__________________
____

☐ Other
Notes:___________________________________
____

None Monitor Maintenance Engineer
Required Action

APPENDIX C

Example Maintenance Form

Ash Pond Maintenance Form
Eagle Valley Generating Station
Indianapolis Power & Light Company
Martinsville, Indiana

Date: ___________________

Personnel: ________________________

Maintenance Performed: ____

____

____

____

____

Reason for Maintenance: ____

____

____

____

____

Follow-up Inspection Required? ____

____

____

____

____