Indianapolis Power & Light Company
Harding Street 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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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) Harding Street Generating Station. Based on the applicability criteria presented in 40 CFR 257.73(b), the following existing CCR surface impoundments are addressed herein:

- Pond 1,
- Pond 2A/2B, and
- Pond 3.

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 Harding Street Generating Station have been reviewed. This document compiles this information into a single history of construction document for Ponds 1, 2A/2B, and 3. Several of the historical documents that were reviewed report elevations with respect to either the Station's datum or the National Geodetic Vertical Datum of 1929 ("NGVD29"). At this location, the latter datum is approximately 0.45 feet higher than the present-day standard, the North American Vertical Datum of 1988 ("NAVD88"). The Station's datum is approximately 1.67 feet lower than 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 Harding Street Generating Station, which is located within the southwestern portion of Indianapolis, Indiana, in Marion County. The Station's address is 3700 South Harding Street, Indianapolis, IN 46217 (Latitude: 39.709°N, Longitude: 86.197°W). The Station's property is contained within Sections 27, 28, 33, and 34 of Township 15N, Range 3E 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 Maywood, 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 1,
- Pond 2A/2B, and
- Pond 3.

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 1, 2A/2B, and 3 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 1, 2A/2B, and 3 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 2, 4, 4A, and 4B are depicted in several of this document's attachments, they are not discussed herein. Prior to October 2015, CCR was also treated in these former CCR surface impoundments. By October 16, 2015, IPL had implemented operational changes to prevent future deposits of CCR into former Ponds 2, 4, 4A, and 4B and had completed construction tasks to prevent liquid impoundment in these former CCR surface impoundments. Going forward, IPL will not place CCR into these former CCR surface impoundments and will prevent the future impoundment of liquids. Therefore, former Ponds 2, 4, 4A, and 4B 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 2, 4, 4A, and 4B are exempt from the requirements stipulated in 40 CFR 257.73(c)(1).

Based on the available boring and CPT logs, the Harding Street Generating Station ash ponds are, in general, founded at an approximate elevation of 667 feet, where a natural lean clay is often encountered. When present, the thickness of this clay layer varies between 4 to 15 feet under the ash ponds. In general, this layer is comprised of clays that have consistencies varying between medium stiff to stiff. The secondary foundation layer underlying the clay layer is typically comprised of a well-graded, medium dense to dense granular material (i.e., gravel or sand), which is sometimes interbedded with silt.

In 1958, the Harding Street Generating Station commissioned a CCR surface impoundment south of Lick Creek. This initial ash pond's footprint encompassed the area currently occupied by Ponds 1, 2A/2B, and 3. Borings drilled through the materials of the 1958 ash pond's dikes show that they were built using primarily ash fill. The ash in these dikes was found to be stratified into two layers: an upper, medium dense to loose moist ash layer and a lower, very loose wet ash layer. In general, the latter extended from the native foundation soils up to an approximate elevation of 679 feet. The denser ash layer typically extended from the looser ash layer up to an approximate elevation of 684 feet. The 1958 dikes were, in general, constructed to an approximate minimum crest elevation of 684 feet, which is in agreement with the top-of-ash elevation shown in the SCS borings. The northern and western dikes were, however, built several feet higher – approximate elevations of 687 feet and 691 feet, respectively – within the pool areas of present-day Ponds 1 and 3. These crests were typically 15-feet wide to allow for access roads to be constructed along the ash pond's perimeter. The exterior and interior faces of the ash fill were graded to approximately 3-Horizontal:1-Vertical ("3H:1V") side slopes from grade to their specified crest elevations.

In 1969, the City of Indianapolis installed an 84-inch-diameter interceptor sewer approximately parallel to and approximately 30 feet southeast of the 1958 ash pond's eastern dike, as shown on the drawings provided in Attachment F herein. Per these drawings, the invert elevation of this pipe, which is currently owned by Citizens Energy Group, is approximately 654 feet.

Prior to the mid-1970s, ash material was excavated along the 1958 ash pond's northern and western dikes, and the corresponding crests and abutting access roads were reconfigured into shapes similar to their present-day routes. The widths of these dikes' crests were maintained at approximately 15 feet. The exterior faces of the pond's dikes were unaffected by this work. As such, the typical crest elevation across the pond's perimeter became approximately 685 feet. In addition, the reconfigured dikes' interior faces were, in general, graded to the same slopes as their exterior counterparts (i.e., 3H:1V).

In the mid-1970s, subsequent to the work discussed in the preceding paragraph, a partition dike was constructed within the limits of the 1958 ash pond, effectively bisecting it into a "middle ash pond" and an "east ash pond." The northern branch of this dike was built within the footprint of the present-day partition dike between Ponds 1 and 3, and it was built to an approximate crest elevation of 685 feet.

Between 1982 and 1985, a dike was constructed within the footprint of the present-day partition dike between Ponds 1 and 2A. The dike was constructed to an approximately 15-foot-wide crest with an approximate minimum crest elevation of 689 feet, which is the present-day minimum crest elevation for this dike. Based on a boring that was drilled through this dike, this dike was constructed using primarily ash fill. Similar to the dikes of the 1958 ash pond, the ash within this partition dike was stratified into a medium dense to loose, moist ash layer and a very loose, wet ash layer. The aforementioned boring showed the partition dike's surficial soil is comprised of a silt material interbedded with sand and gravel. Similar to the perimeter dikes of the middle and east ash ponds, this dike's side slopes were graded to approximately 3H:1V.

Around the time that the partition dike south of the middle ash pond was constructed, this ash pond's western-most dike was removed, thereby merging it with an ash pond immediately west of it. By 1996, however, this dike was re-built in its original location. The dike was constructed to an approximate minimum crest elevation of 685 feet, which matched the elevation of the original dike. The reconstruction of this dike effectively created the present-day footprint of Pond 1.

The present-day footprints of Ponds 2A/2B and 3 were established by the early 1990s following the construction of a dike within the area presently occupied by Pond 2A/2B's eastern-most boundary. A boring drilled through this partition dike suggests that it was constructed using primarily ash fill. Similar to the perimeter and partition dikes comprising the Station's Ash Pond System, the boring log showed ash extending from the native soil underlying the dike up to approximately 684 feet. Ash closer to this top-of-ash elevation was denser than the ash found near the dike's foundation. This dike was built up to its present-day minimum crest elevation – approximately 689 feet – with approximately 3H:1V side slopes.

Modifications to the area presently occupied by Pond 2A/2B began in the early 1990s when the southern segment of the dike that bisected the 1958 ash pond was partially removed; only the portion supporting three electrical transmission poles was kept intact. Thus, the area functioned as a single ash pond until the mid-1990s when it was divided into three separate ash ponds. This was accomplished through the construction of two partition dikes, one of which was built in the vicinity of the partial partition dike presently residing within Pond 2A/2B. These dikes were constructed to an approximate minimum crest elevation of 683 feet, although they were several feet taller at the interface points with Ponds 1 and 3. The new partition dikes were built up from the existing ash elevation using approximately 3H:1V side slopes to 15-foot-wide crests. The access roads atop these dikes occupied the middle 10 feet of their crests, and they were comprised of 6-inch-thick layers of #53 crushed stone, as specified by the Indiana Department of Transportation (INDOT).

By 1996, the perimeter dikes for Ponds 1 and 3 were raised to their present-day crest elevations, which feature approximate minimum crest elevations of 688 feet and 685 feet, respectively. SCS borings drilled through these dikes show that a dense, silty fill interbedded with sand and/or gravel was used to raise the dikes.

The present-day layout of the dikes for the Station's Ash Pond System was established between 1997 and 1998. At this time, the access roads circumnavigating the Ash Pond System were widened to provide adequate space for trucks to traverse the area. This was typically accomplished by widening some of the dikes' crests from 15 feet to approximately 40-foot widths. The fill material used to widen the dikes was placed from the existing ash surface up to the existing crest elevation and was graded to approximately 3H:1V side slopes. During this expansion, the road atop Pond 3's southeastern dike was widened over the easement for the aforementioned 84-inch-diameter interceptor sewer.

An interior dike separating the west area of present-day Pond 2A/2B into two ponds was removed between July 2007 and June 2008. Between October 2013 and September 2014, a portion of the partition dike southwest of the electrical transmission poles was removed, effectively creating the present-day Pond 2A/2B.

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. The Station ceased producing CCR when its fuel source was converted to natural gas in early 2016. Since then, the Station only conveys non-CCR, low volume wastewater from cooling tower blowdown, Unit 7's waste sump, and various other sumps to the Ash Pond System for sedimentation. Sedimentation of the constituents therein subsequently occurs within Ponds 1, 2A/2B, and 3, which are interconnected with a network of discharge pipes. Pond 1 serves as the Station's initial settling pond and directs residual wastewater to Pond 2A/2B through a 30-inch-diameter corrugated metal pipe, which has an invert elevation of approximately 681.5 feet. After undergoing secondary sedimentation in Pond 2A/2B, the wastewater subsequently flows through a 24-inch-diameter culvert into Pond 3. Following the final sedimentation of the finer waste constituents, the treated water discharges through three 12-inch-diameter welded steel pipes, which have invert levels at an approximate elevation of 678.5 feet, to a drop outlet structure (National Pollutant Discharge Elimination System-permitted Outfall 006). An 18-inch-diameter reinforced concrete pipe then conveys the treated wastewater into Lick Creek.

These perched ash ponds do not have any spillways.

Table 2 provides a list of key features for each existing CCR surface impoundment at Harding Street 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 1, 2A/2B, and 3, 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 1	Initial Settling	688	7.0	101.8
Pond 2A/2B	Secondary Settling	686	3.8	39.5
Pond 3	Final Settling	685	9.3	120.0

[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.

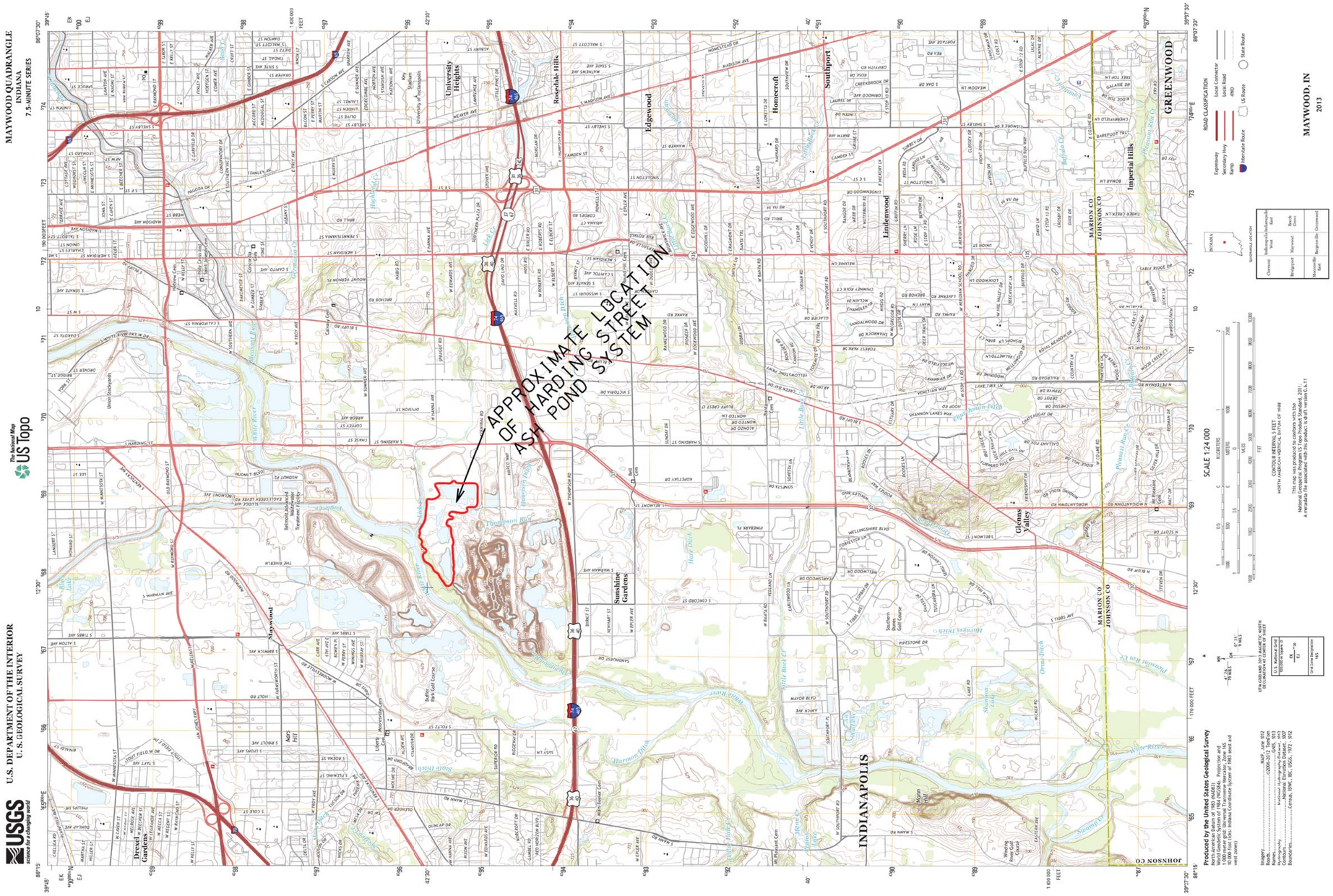
IPL performs routine inspections of the Ash Pond System and employs a separate entity to perform annual independent maintenance inspections.

As shown on Figure 2 of Attachment E, several piezometers and staff gauges are distributed around and within the Station's Ash Pond System. The 14 piezometers installed around the ash ponds' perimeters are used to monitor the groundwater levels within the dikes and foundation materials. The eight 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 and a weekly basis, respectively.

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 1, 2A/2B, and 3) at Harding Street Generating Station.

EXHIBITS



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: HS HOC - EXHIBIT 1.DGN

PREPARED BY: ---

REVIEWED BY: ---

APPROVED BY: ---

Sargent & Lundy LLC
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55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

ipl an AES company

PROJECT

HARDING STREET
GENERATING STATION
INDIANAPOLIS POWER & LIGHT

DRAWING TITLE

ASH POND SYSTEM LOCATION

DRAWING NUMBER	REVISION
EXHIBIT 1	0
SHEET OF	

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: HS HOC - EXHIBIT 2.DGN
PREPARED BY: ---
REVIEWED BY: ---
APPROVED BY: ---

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PROJECT

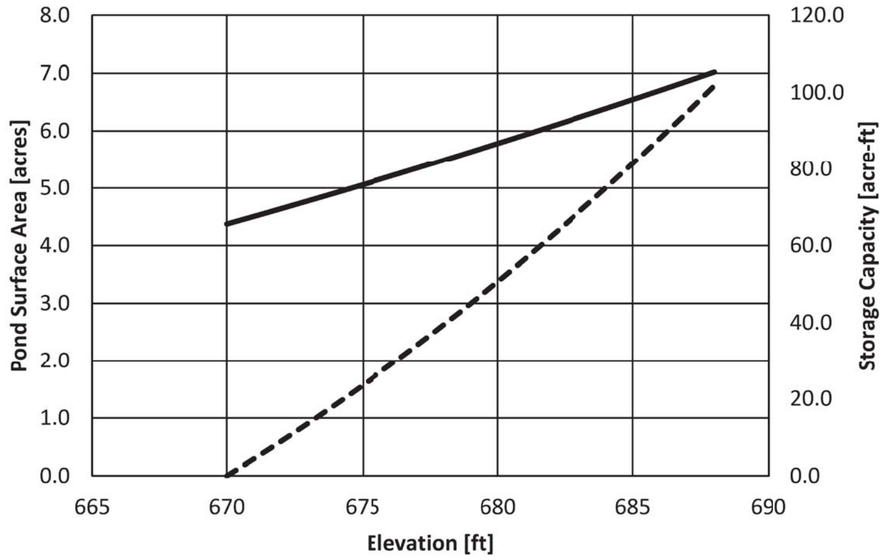
HARDING STREET
GENERATING STATION
INDIANAPOLIS POWER & LIGHT

DRAWING TITLE

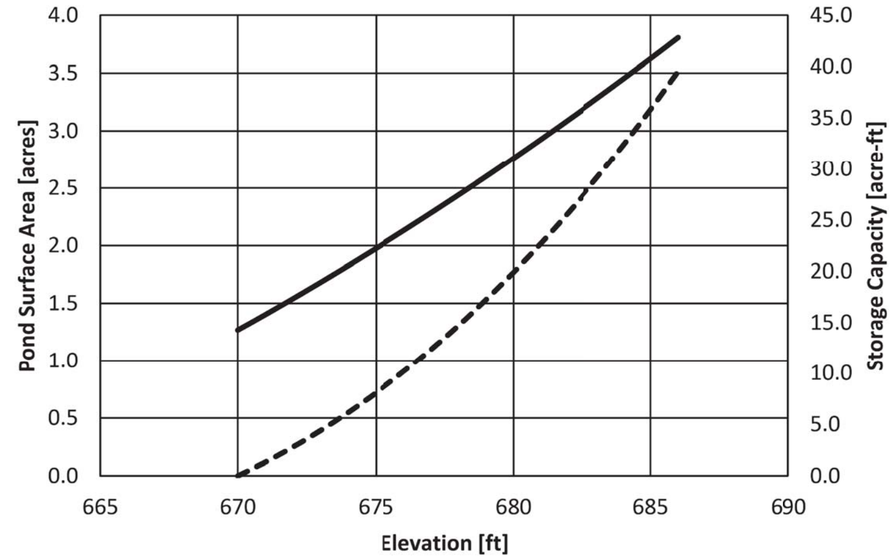
AERIAL VIEW OF HARDING STREET GENERATING STATION & ANCILLARY FEATURES

DRAWING NUMBER	REVISION
EXHIBIT 2	0
SHEET OF	

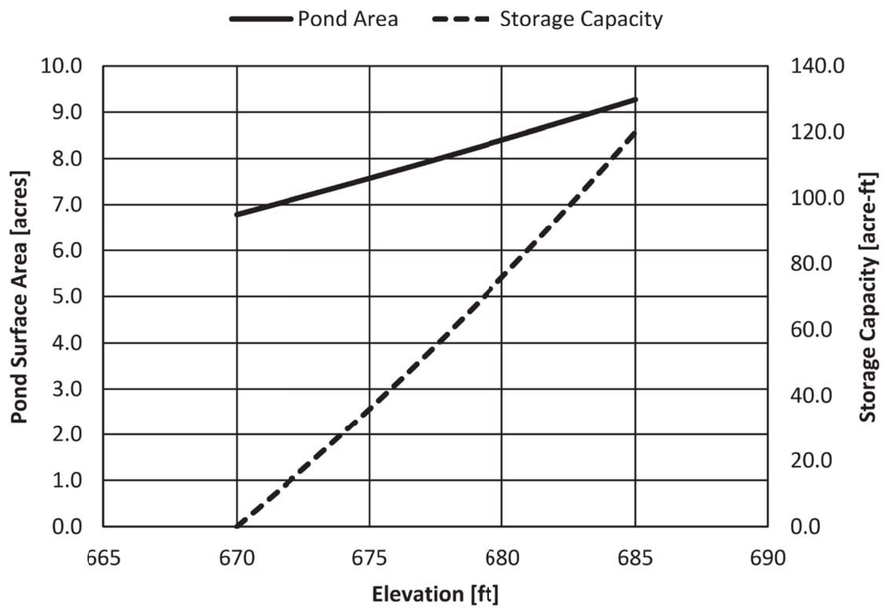
Pond 1 Area-Capacity Curve



Pond 2A/2B Area-Capacity Curve



Pond 3 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: HS HOC - EXHIBIT 3.DGN
PREPARED BY: ---
REVIEWED BY: ---
APPROVED BY: ---

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ipl an AES company

PROJECT

HARDING STREET
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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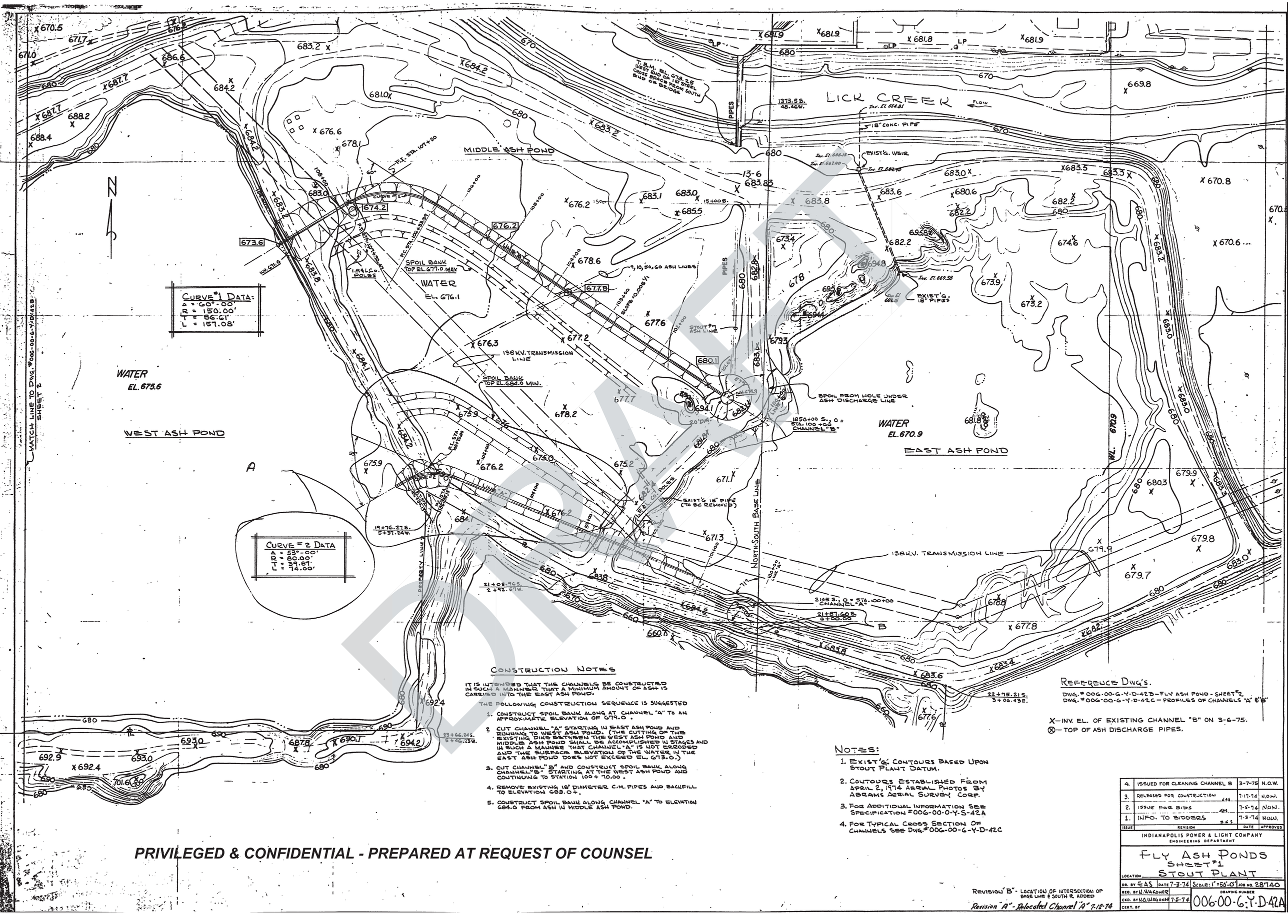
Form 000-0401-01-08. ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision --, Revision Date: XX-XX-XXXX

ATTACHMENT A

HISTORICAL DESIGN DRAWINGS

Item	Drawing Number	Title
1	006-00-6-Y-D-42A	Fly Ash Ponds, Sheet #1
2	006-00-6-Y-D-42M	Ash Disposal System, Site Plan
3	006-00-6-Y-D-42N	Ash Disposal System, Area Plan and Retaining Wall Detail
4	006-00-6-Y-D-42P	Ash Pond System, Site Plan
5	006-00-6-Y-D-42Q	Ash Pond System, Elevations and Details
6	006-00-6-Y-D-42T	Ash Pond Access Road Improvements
7	006-00-6-Y-M-40A	Stout Plant Property, Sheet #1
8	006-00-6-Y-M-40B	Stout Plant Property, Sheet #2
9	6-1-1-4-1	Aerial Survey, Topographic Map

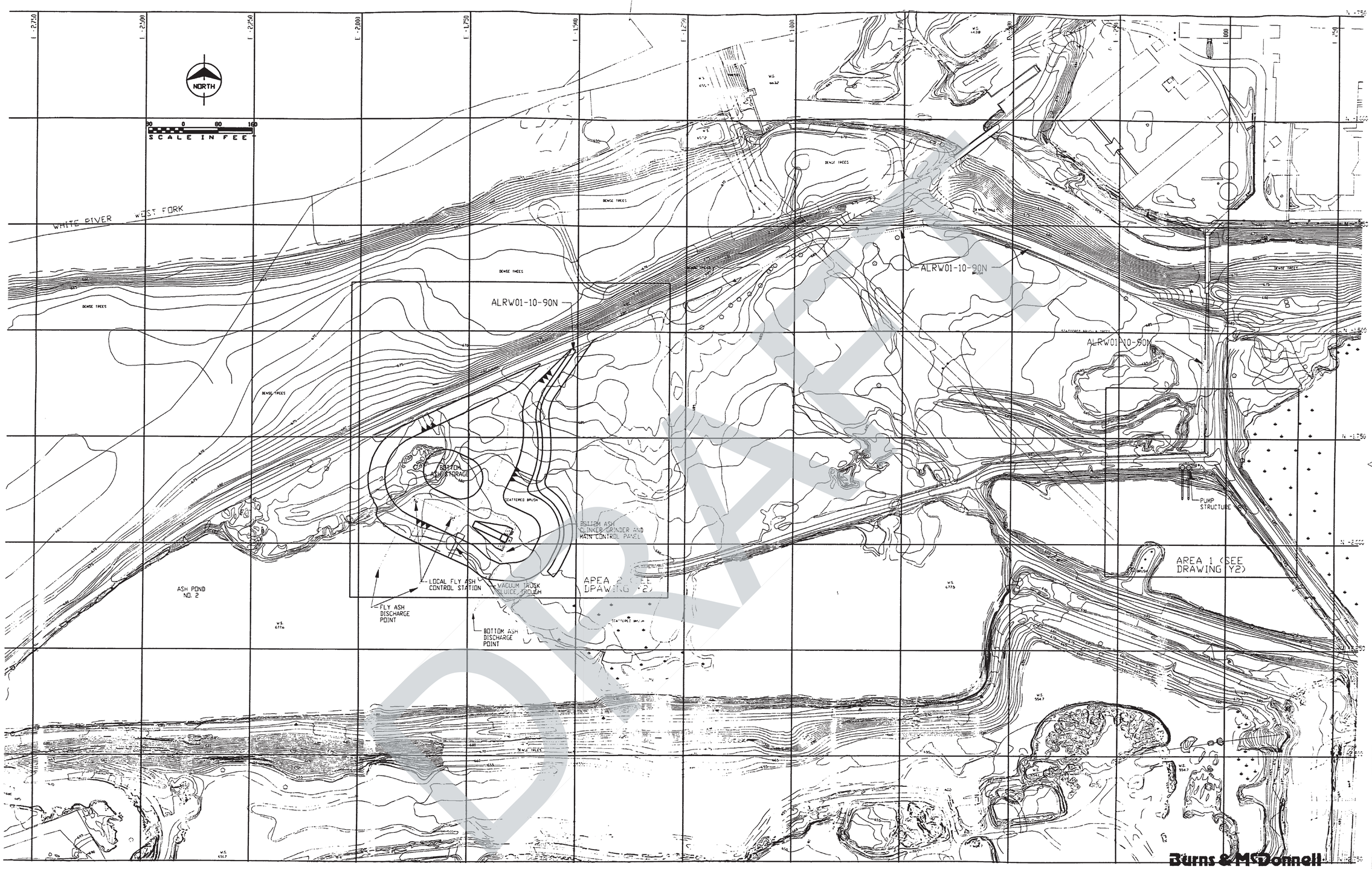


ISSUE	REVISION	DATE	APPROVED
4.	ISSUED FOR CLEANING CHANNEL B	3-7-75	N.O.W.
3.	RELEASED FOR CONSTRUCTION	7-17-74	N.O.W.
2.	ISSUE FOR BIDS	7-5-74	NOW.
1.	INFO. TO BIDDERS	7-3-74	NOW.

INDIANAPOLIS POWER & LIGHT COMPANY
ENGINEERING DEPARTMENT

LOCATION: FLY ASH PONDS SHEET #1 STOUT PLANT

DR. BY EAS	DATE 7-3-74	SCALE: 1"=50'-0"	JOB NO. 28740
REQ. BY N. WAGONER		DRAWING NUMBER	
CKD. BY N.O. WAGONER	7-5-74	006-00-G-Y-D-42A	
CERT. BY			



Scale For Microfilming Millimeters Inches

no.	date	by	revision
A	9-25-92	RDV	ISSUED FOR BID
B	10-22-92	RDV	CHANGED ELEV. TO 695 - ISSUED WITH REVISION 1
C	2-14-94	RDV	ISSUED FOR PROJECT CLOSE-OUT

Burns & McDonnell
ENGINEERS - ARCHITECTS - CONSULTANTS
Kansas City, Missouri

date	detailed
7-28-92	LANGHAMMER
designed	checked
VERING	BUGNI

INDIANAPOLIS POWER & LIGHT COMPANY
E.W. STOUT GENERATING STATION
COMPOSITE

ASH DISPOSAL SYSTEM
SITE PLAN
project 92-178-1 contract
drawing Y 01 rev C

Burns & McDonnell

PRIVILEGED & CONFIDENTIAL - PREPARED AT REQUEST OF COUNSEL

REFERENCE DPAWING ... 6A24-373

IPL

DRAWN BY	M.F.G.
M.O. BY	M.F.G.
APPROVED BY	M.F.G.
CADD ID	M.F.G.
PLOT INFORMATION	
02/08/95	08:47:15
PLOT SCALE	1 = 1
PAPER SIZE	142 X 90

DRAFTING AND RECORDS SERVICES
ASH DISPOSAL SYSTEM
SITE PLAN
SITE NAME E.W. STOUT GENERATING STATION
ADDRESS 3700 HARDING STREET
DATE DRAWN 7-28-92 DRAWING SCALE AS NOTED PROJECT No. 90356296
IPL DRAWING No. 006-00-6-Y-D-42M

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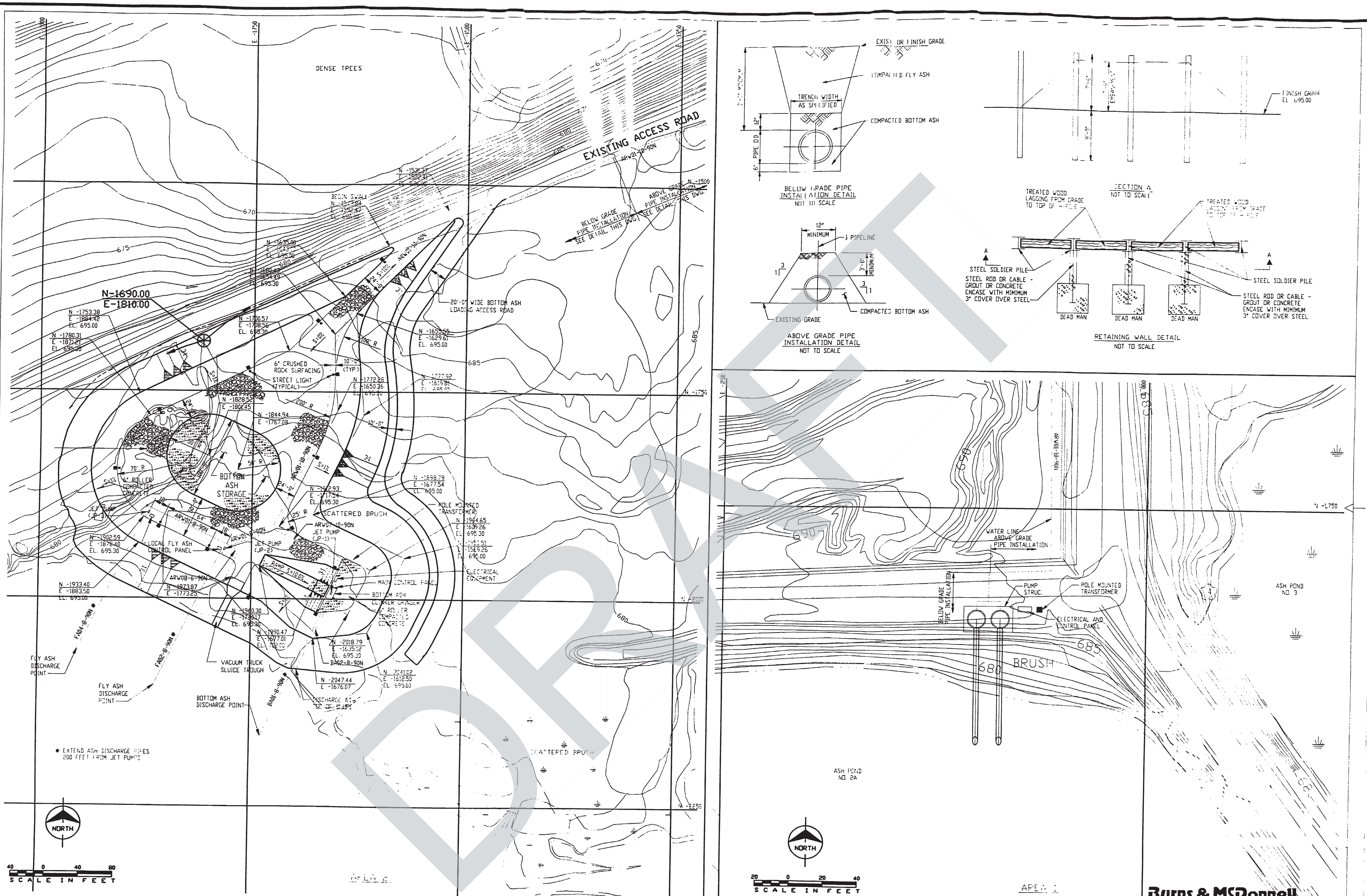

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A	9-25-92	RDV	ISSUED FOR BID
B	10-22-92	RDV	CHANGED ELEV. TO 695 - ISSUED WITH REVISION 1
C	2-14-94	RDV	REVISED FLY ASH DISCHARGE LINE SIZE ISSUED FOR PROJECT CLOSE-OUT

Burns & McDonnell
ENGINEERS ARCHITECTS CONSULTANTS
Kansas City, Missouri

date	detailed
7-28-92	LANGHAMMER
designed	checked
VERING	BUGNI

INDIANAPOLIS POWER & LIGHT COMPANY
E.W. STOUT GENERATING STATION

ASH DISPOSAL SYSTEM
AREA PLANS AND RETAINING WALL DETAIL
rev. C

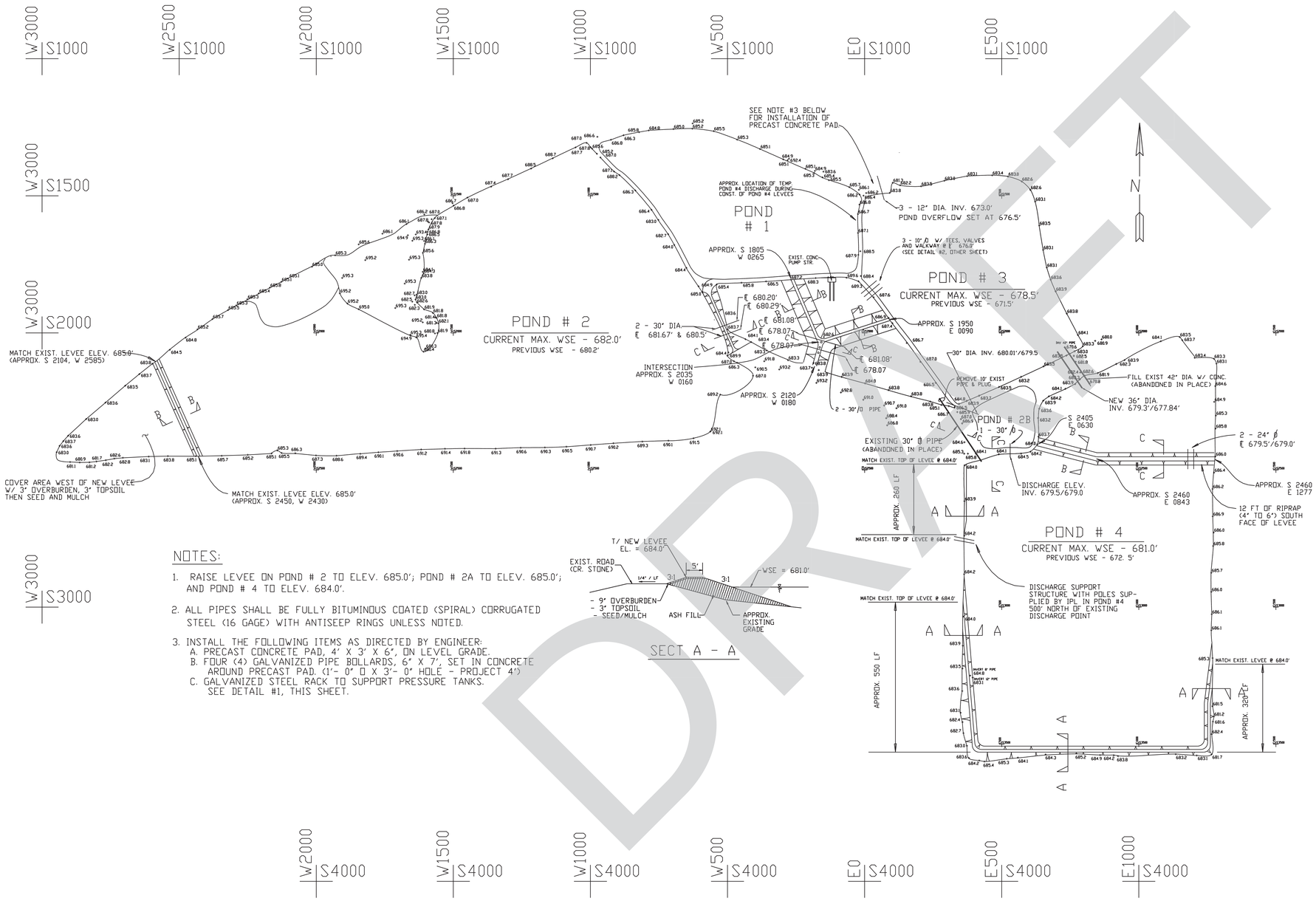
PRIVILEGED & CONFIDENTIAL - PREPARED AT REQUEST OF COUNSEL

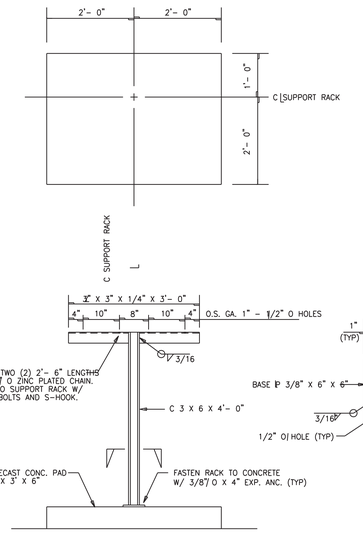
REFERENCE DRAWING ... 6A24 3/4

IPL
ENGINEERING AND RECORDS SERVICES
ASH DISPOSAL SYSTEM
AREA PLAN AND
RETAINING WALL DETAIL
E.W. STOUT GENERATING STATION
ADDRESS 3700 S. HARDING STREET
DATE DRAWN 7-28-92
DRAWING SCALE AS NOTED

IPL DRAWING No. 006-00-6-Y-D-42N

DESCRIPTION	PROJECT No.	DATE	REV	DESCRIPTION	PROJECT No.	DATE	REV	DESCRIPTION	PROJECT No.	DATE	REV	DESCRIPTION	PROJECT No.	DATE	REV	DESCRIPTION	PROJECT No.	DATE
			8				6				4				2			
			7				5				3				1			





DETAIL #1
NO SCALE

NOTES:

1. RAISE LEVEE ON POND # 2 TO ELEV. 685.0'; POND # 2A TO ELEV. 685.0'; AND POND # 4 TO ELEV. 684.0'.
2. ALL PIPES SHALL BE FULLY BITUMINOUS COATED (SPIRAL) CORRUGATED STEEL (16 GAGE) WITH ANTISEEP RINGS UNLESS NOTED.
3. INSTALL THE FOLLOWING ITEMS AS DIRECTED BY ENGINEER:
   A. PRECAST CONCRETE PAD, 4' X 3' X 6', ON LEVEL GRADE.
   B. FOUR (4) GALVANIZED PIPE BOLLARDS, 6" X 7', SET IN CONCRETE ARDUND PRECAST PAD. (1'- 0" Ø X 3'- 0" HOLE - PROJECT 4')
   C. GALVANIZED STEEL RACK TO SUPPORT PRESSURE TANKS. SEE DETAIL #1, THIS SHEET.

NOTES:

1. DISPOSE OF TREES & BRUSH OFF-SITE.
2. WHERE FILL IS LESS THAN 12', USE #53 CRUSHED STONE AT CONTRACTOR'S OPTION.
3. ALL PIPES TO HAVE ANTI-SEEP COLLARS (2 @ EACH END).
4. ALL PIPES TO HAVE TEE SECTIONS (VERIFY DETAILS W/ OWNER).

PRIVILEGED & CONFIDENTIAL - PREPARED AT REQUEST OF COUNSEL

REV	DESCRIPTION	PROJECT No.	DATE
10			
9			
8			
7			
6			
5			
4			
3			
2			
1	AS BUILTS	9435026C	3/20/96

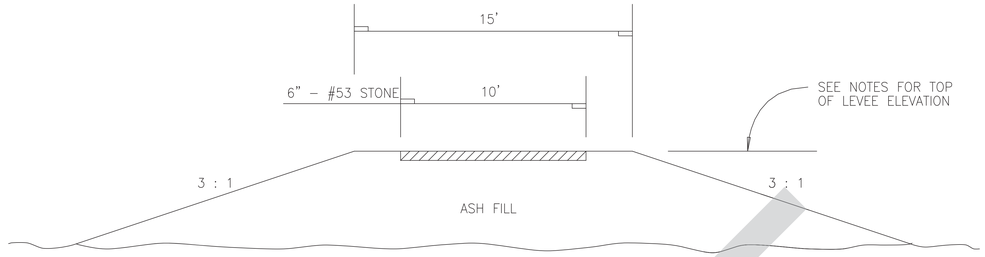
IPL

DRAWN BY
REQ. BY JKM
APPROVED BY
CHECKED BY

PLOT INFORMATION
-
PLOT SCALE
PAPER SIZE

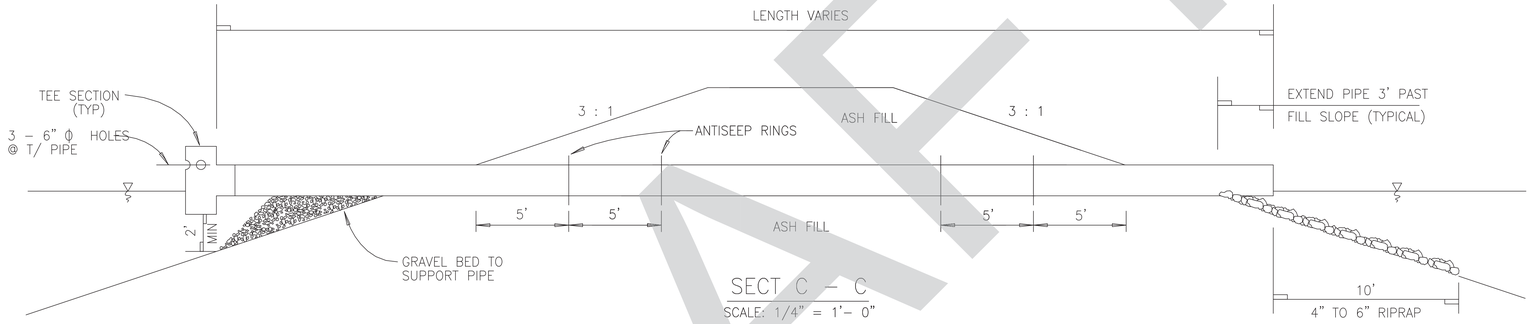
POWER STATION PROJECTS
ASH POND SYSTEM
SITE PLAN

SITE NAME E. W. STOUT GENERATING STATION
ADDRESS 3700 S. HARDING STREET
DATE DRAWN 3/20/96 DRAWING SCALE 1" = 200' PROJECT No. 9435026C
IPL SKETCH No. 006-00-6-Y-D-42P



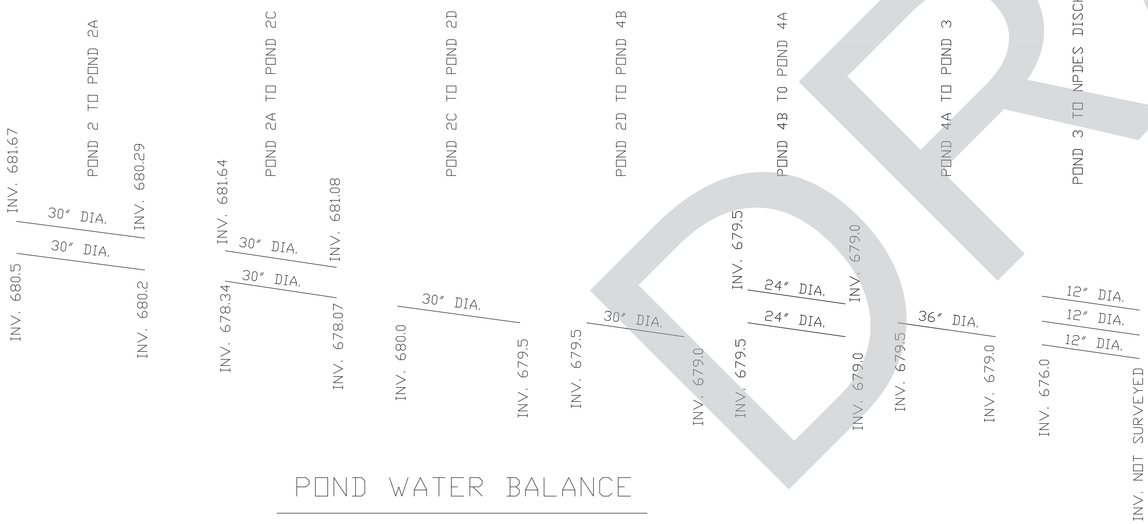
SECT B – B

SCALE: 1/4" = 1'– 0"

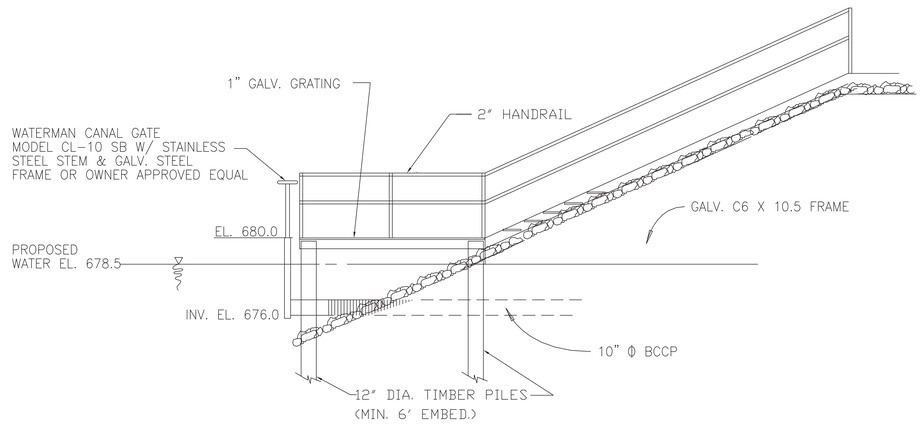


SECT C – C

SCALE: 1/4" = 1'– 0"



POND WATER BALANCE



DETAIL # 2

PRIVILEGED & CONFIDENTIAL - PREPARED AT REQUEST OF COUNSEL

REV	DESCRIPTION	PROJECT No.	DATE
10			
9			
8			
7			
6			
5			
4			
3			
2			
1	AS BUILTS	9435026C	3/20/96

IPL

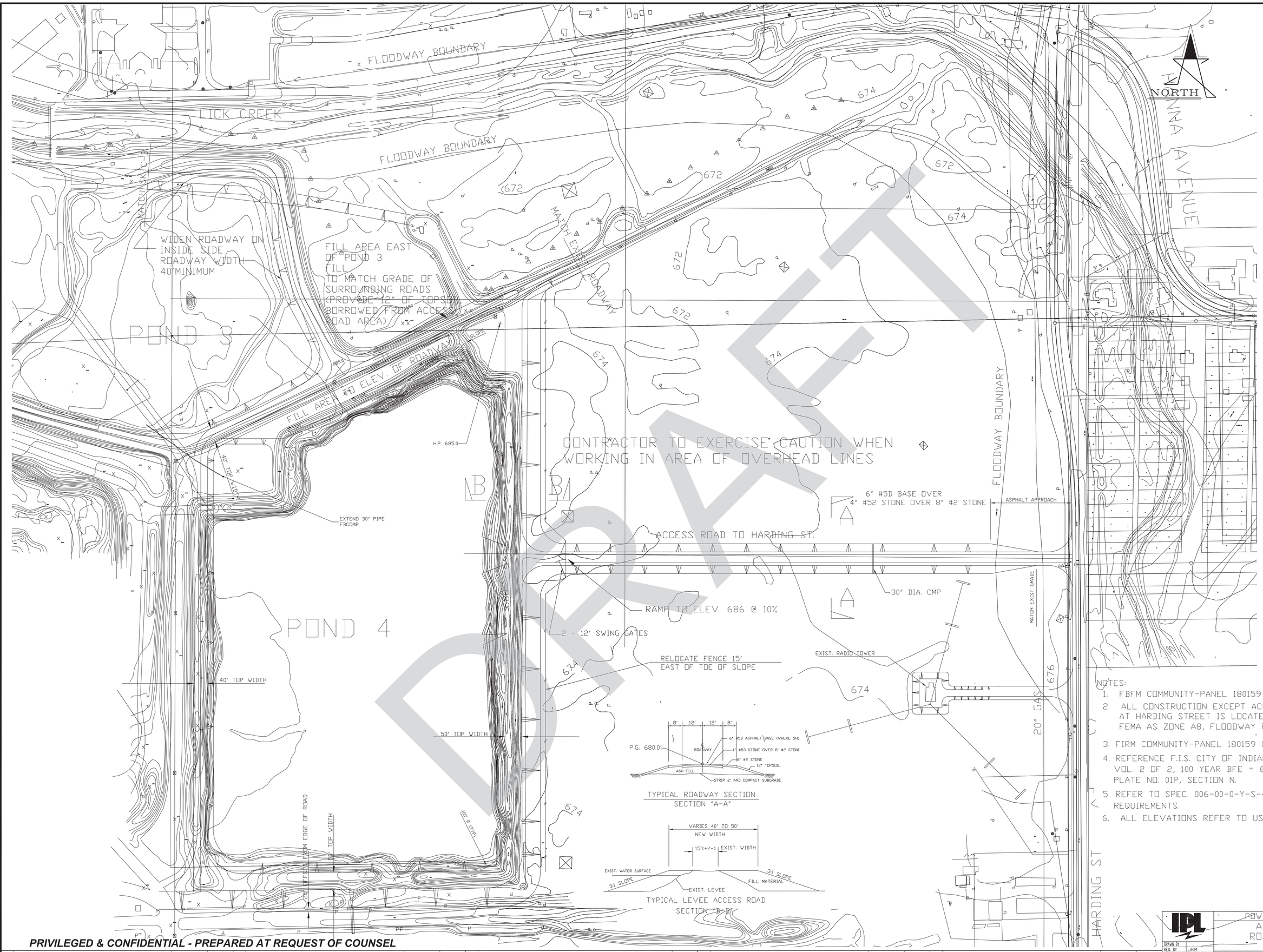
DRAWN BY
REQ. BY JKM
APPROVED BY
CHECKED BY

PLOT INFORMATION
–
PLOT SCALE
PAPER SIZE

POWER STATION PROJECTS
ASH POND SYSTEM
ELEVATIONS AND DETAILS

SITE NAME E. W. STOUT GENERATING STATION
ADDRESS 3700 S. HARDING
DATE DRAWN 3/20/96 | DRAWING SCALE AS SHOWN | PROJECT No. 9435026C

IPL
SKETCH No. 006-00-6-Y-D-42Q



NOTES:

1. FBFM COMMUNITY-PANEL 180159 0070 REV. 6/3/88
2. ALL CONSTRUCTION EXCEPT ACCESS ROAD INTERSECTION AT HARDING STREET IS LOCATED IN AREA DESIGNATED BY FEMA AS ZONE A8, FLOODWAY FRINGE
3. FIRM COMMUNITY-PANEL 180159 0070 D REV. 6/3/88
4. REFERENCE F.I.S. CITY OF INDIANAPOLIS, IN & MARION CO. VOL. 2 OF 2, 100 YEAR BFE = 680, BASE FLOOD PROFILE PLATE NO. 01P, SECTION N.
5. REFER TO SPEC. 006-00-0-Y-S-42H FOR FILL PLACEMENT REQUIREMENTS.
6. ALL ELEVATIONS REFER TO USGS DATUM UNLESS NOTED.

PRIVILEGED & CONFIDENTIAL - PREPARED AT REQUEST OF COUNSEL

REV	DESCRIPTION	PROJECT No.	DATE
10			
9			
8			
7			
6			
5			
4			
3			
2			
1			

IPL

DRAWN BY	
REQ. BY	JKM
APPROVED BY	
CHECKED BY	
PLOT INFORMATION	
-	
PLOT SCALE	
PAPER SIZE	

POWER STATION PROJECTS
ASH POND ACCESS ROAD IMPROVEMENTS

SITE NAME E. W. STOUT GEN. STATION
ADDRESS 3700 S. HARDING
DATE DRAWN 9/15/97 | DRAWING SCALE 1" = 100' | PROJECT No. 184.610

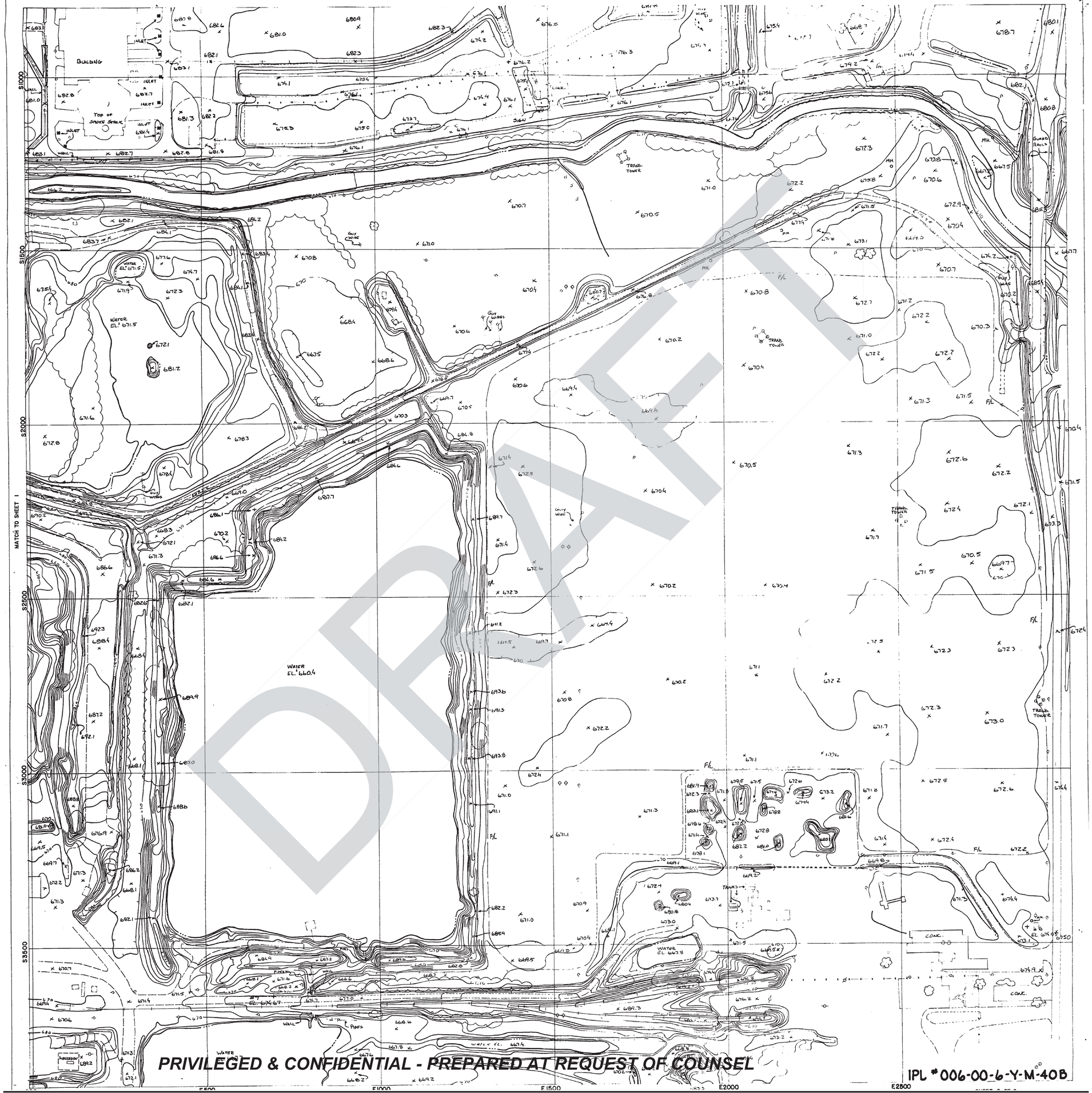
IPL SKETCH No. 006-00-6-Y-D-42T

S1000
S1500
S2000
S3000
S3500
W3000
W2500
W2000
W1500
W1000
W500
000

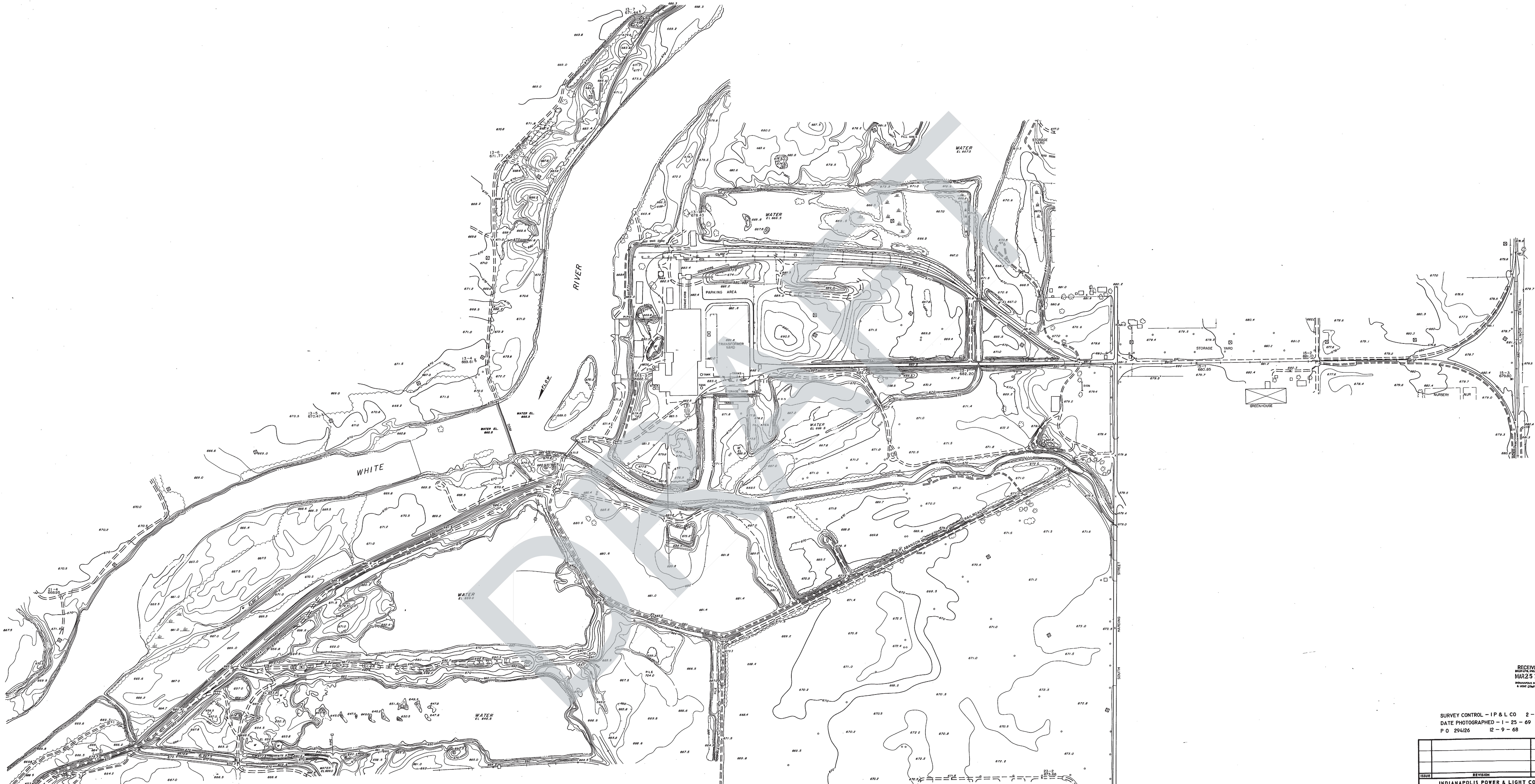
SPILLWAY
SMOKE OBSCURED
ASH POND 2-1
WATER EL. 678.8
WATER EL. 678.8
WATER EL. 645.3
WATER EL. 641.7
10" POLYPROPYLENE LINED (FLANGED)
10" SCH.60 CARBON STEEL (FLANGED)
S 1262'-5"
W 45°-2"
S 1381'-8"
W 45°-2"
S 1812'-6"
W 548'-4"
S 1787'-6"
W 45°-2"
S 1990'-8"
W 733'-9"
S 1937'-6"
W 771'-11"
S 1846'-11"
W 612'-6"
MATCH TO SHEET 2

MSE NO. 582-044
INDIANAPOLIS POWER & LIGHT COMPANY
STOUT PLANT PROPERTY
DATE OF PHOTOGRAPHY: 12/7/82
MAP SCALE: 1"=100', 2' C.I.
REVISED 11-4-85

IPL #006-00-6-Y-M-40A
SHEET 1 OF 2



IPL # 006-00-6-Y-M-40B



ELEVATIONS BASED ON STOUT PLANT DATUM
FOR USGS DATUM (MEAN SEA LEVEL) ADD 2.1 FEET

PRIVILEGED & CONFIDENTIAL - PREPARED AT REQUEST OF COUNSEL

SURVEY CONTROL – I P & L CO 2 – 10 – 69
DATE PHOTOGRAPHED – 1 – 25 – 69 HR. 11:00
P O 294126 12 – 9 – 68

ISSUE	REVISION	DATE	APPROVED

INDIANAPOLIS POWER & LIGHT COMPANY
ENGINEERING DEPARTMENT

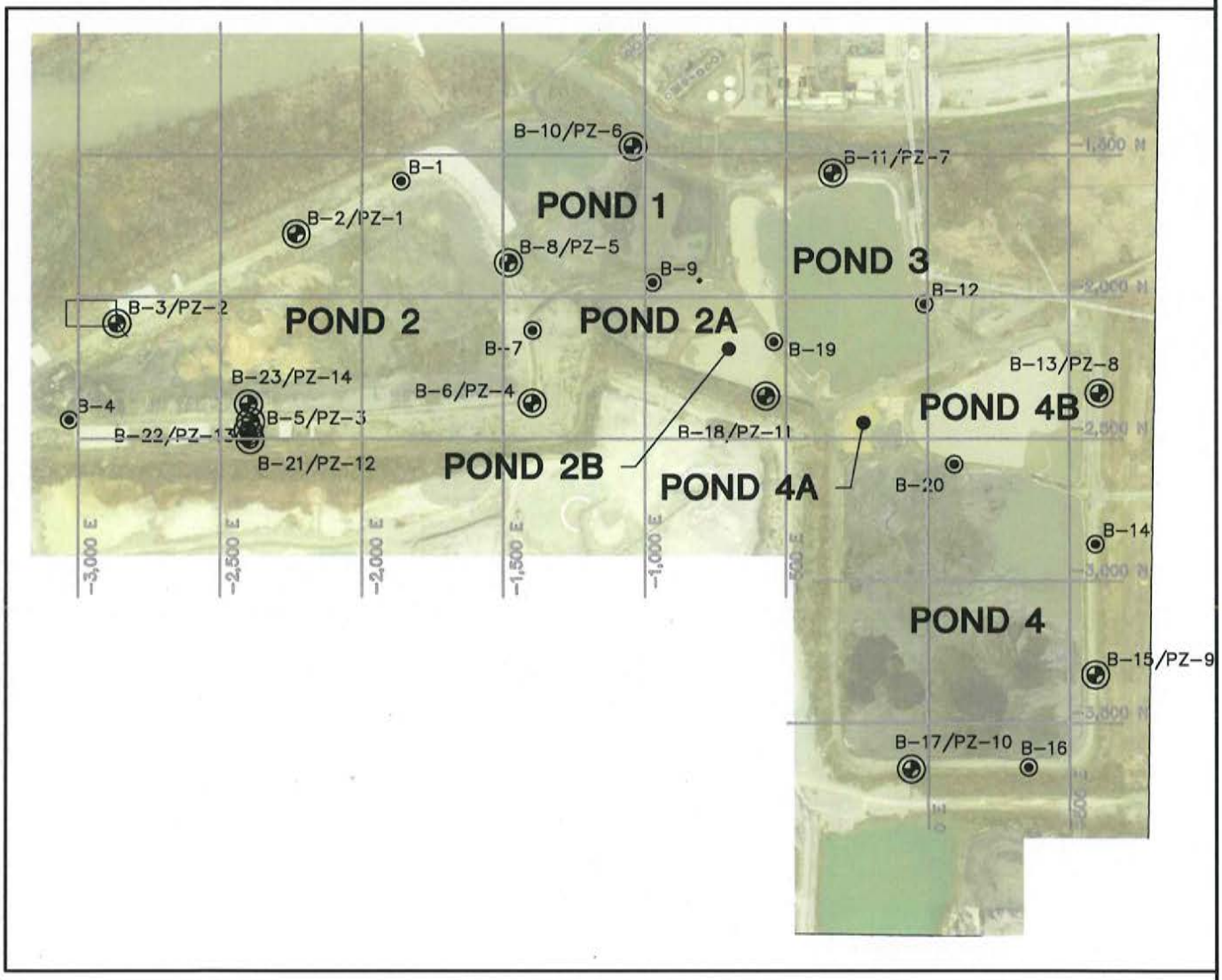
AERIAL SURVEY
TOPOGRAPHIC MAP
LOCATION E. W. STOUT GENERATING STATION

DR. BY ABRAMS	DATE 3 – 69	SCALE 1" = 200'	JOB NO. 28740
REQ. BY		DRAWING NUMBER	
CKD. BY		6–1–1–4–1	
CERT. BY			

ATTACHMENT B

SOIL BORING LOGS[1]

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



LEGEND

- SOIL BORING
- PIEZOMETER

600 0 600

SCALE: 1" = 600'

NOTES:

1. BORING LOCATIONS ARE BASED ON DRAWINGS PROVIDED BY IPL.
2. ON-SITE COORDINATE SYSTEM DEVELOPED FROM IPL DRAWING "HARDING STREET ASH PONDS – PIEZOMETER_TEST BORE LOCATIONS" DATED DEC. 6, 2011.

N

CLIENT: ipl an AES company	INDIANAPOLIS POWER & LIGHT COMPANY	SITE	HARDING STREET GENERATING STATION 3700 SOUTH HARDING STREET INDIANAPOLIS, INDIANA	BORING AND PIEZOMETER LOCATION PLAN	
PROJECT NO. 25211429.52	DRAWN BY: KG/KP	ENGINEER	SCS BT SQUARED 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE 2	
DRAWN: 02/07/11	CHECKED BY: KG				
REVISED: 09/23/11	APPROVED BY: DH 04/09/12				

I:\4295\4295B\Drawings-General\BORINGS AND PIEZOMETERS.dwg, 4/9/2012 9:24:11 AM

SOIL BORING LOGS

SCS BT Squared
Civil & Environmental Engineering

SOIL BORING LOG INFORMATION
10-92

Facility/Project Name		License/Permit/Monitoring Number	Boring Number
IPL - Harding Street SCS # 25211429.52			B-9
Boring Drilled By (Firm name and name of crew chief)		Drilling Started	Drilling Completed / Drilling Method
American Drilling Services Bernie Byers		08/04/2011	08/05/2011 / HSA 3¼"
Facility Well No. / Unique Well No. / Common Well Name		Static Water Level Feet	Surface Elevation 686.30 Feet / Borehole Diam. 6.5 Inches
Boring Location State Plane N, E SE 1/4 of SE 1/4 of Section 28, T. 15 N., R. 3 E.		Lat. Long.	Local Grid Location (If applicable) -1938 N -974 E Feet
County Marion County, Indiana	Location Code	Civil Town/City/or Village Indianapolis	

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	21	13-23 14-10		SILT with SAND and GRAVEL, 2.5Y 3/2, sand is fine to coarse, gravel is fine, angular to subangular, mixed lithology.					0	D		
				SILT with SAND, 2.5Y 3/2, sand is fine to coarse, angular, coal fragments (ash).					0	M		
S2	16	04-05 06-05		SILTY SAND, motled, 7.5Y 3/1, 2.5Y 5/6, sand is fine to coarse, trace fine gravel, angular coal fragments (ash).					-	M		
				SILTY SAND, 10YR 3/6, massive, sand is fine to coarse, mostly coal fragments (ash).								
S3	19	06-03 06-05	5						-	M		
				SILTY SAND, 10YR 3/2, massive, sand is fine to coarse, coal fragments, trace fine gravel (ash).								
S4	21	1/12 05-03		SILT, 2.5Y 3.5/2, massive, little very fine sand.					0	W		
				SILTY SAND, 10YR 3/1, sand is very fine to coarse, coal fragments (ash).					-	M W		
S5	19	1/12 01/01		SILT, 2.5Y 3/2, 2.5Y 2.5/1, 1mm to 5mm varves (ash). Same as above with trace fine gravel (coal fragments) (ash).					0	W		
			10									
S6	16	01-01 1/12		Same as above, silty sand seam at 10.5' to 10.75'.					0	W		
				SILT with SAND, 2.5YR 4/1, 2.5YR 4/2, 2.5YR 2.5/1, 2mm to 10mm varves throughout, sand is fine to medium coal fragments, concentrated in darker varves (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

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
S7	24	1/12 WOH/ 12		SILT, 2.5YR 3/2, massive.								
				SILT, 2.5YR 4/1, 2.5YR 3/1, 2.5YR 5/1, 2mm to 10mm varves throughout, little very fine sand, trace organic matter (sticks) (ash).					0	W		
S8	24	WOR/ 18-06							2.5	W		
			20	SILT, mottled, 2.5YR 2.5/1, 2.5YR 3/2, little clay.								
S9	22	01-01 02-02		FAT CLAY, mottled, 5Y 4/3, 5Y 2.5/1, trace shells and shell fragments (native).					1.0	W		
			25									
S10	20	WOH- 02 01-02		FAT CLAY, mottled, 5Y 4/2, 5Y 4/4.					1.0	W		
				CLAY with SAND, 2.5Y 3/2, sand is fine, trace organic matter (sticks).								
			30	Same as above.								
S11	18	02-02 05-08		SILTY SAND, 2.5Y 4/2, sand is fine to medium, mixed lithology.					-	W		
				SILTY GRAVEL with SAND, gravel is fine, sand is fine to coarse, subrounded to rounded, mixed lithology.					-	W		
				SILTY SAND with GRAVEL, 2.5Y 4/2, sand is fine to coarse, gravel is coarse								

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10-92

Boring Number B-9

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
S12	10	16-14 11-10		and angular, trace shell fragments.					-	W		
S13	12	10-15 14-11		SILTY SAND, 2.5Y 4/3, sand is fine to coarse, little gravel, angular to well rounded, mixed lithology, fine gravel, subrounded to rounded.					-	W		
			40									
S14	24	06-12 19-24		Same as above.					-	W		7' of heave with augers @ 46' - mix drilling gel to flush out augers and hold down sand
			45									
S15	10	09-14 18-23		Same as above.					-	W		
			50									
S16	18	25-36 46- 50/5		CLAY with SAND and GRAVEL, 2.5Y 4/2, sand is fine to coarse, angular to rounded, mixed lithology, gravel is fine to coarse, angular to subrounded, mixed lithology.					>4.5	W/M		
				FAT CLAY, 2.5Y 4/2, little fine to coarse sand and fine gravel, sand and gravel are angular to rounded, mixed lithology.								

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10-92

Boring Number B-9

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
S17	24	25-35 43- 50/5		FAT CLAY, 2.5Y 4/2, little fine to coarse sand and fine gravel, sand and gravel are angular to rounded, mixed lithology.					>4.5	W/M		
S18	0	56- 50/4		No recovery - drove a cobble in clay? Bedrock?					-	-		
			60	SHALE, 5Y 2.5/1, 1mm to 2mm laminae, friable.								
S19	2	50/3		End of boring @ 62.25'; Abandoned with bentonite grout.					-	D		moist around edges, dry at center
			65									
			70									

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SOIL BORING LOG INFORMATION
10-92

Facility/Project Name		License/Permit/Monitoring Number	Boring Number
IPL - Harding Street SCS # 25211429.52			B-10 / PZ-6
Boring Drilled By (Firm name and name of crew chief)	Drilling Started	Drilling Completed	Drilling Method
American Drilling Services Bernie Byers	08/08/2011	08/08/2011	3¼" HSA
Facility Well No. / Unique Well No. / Common Well Name	Static Water Level Feet	Surface Elevation 685.31 Feet	Borehole Diam. 6.5 Inches
Boring Location State Plane N, E SE 1/4 of SE 1/4 of Section 28, T. 15 N., R. 3 E.	Lat. Long.	Local Grid Location (If applicable) -1457 N -1040 E Feet	
County: Marion County, Indiana	Location Code	Civil Town/City/or Village: Indianapolis	

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	16	19-20 25-31		SILTY SAND with GRAVEL, 2.5Y 2.5/1, with 1/2" seams of 2.5Y 5/6.					0	M		
S2	18	19-14 08-07		SANDY SILT with GRAVEL, 2.5Y 2.5/1, gravel is coal chunks, angular, sand well graded (ash).					0	M		
S3	20	03-03 03-02	5						0	M/W		wet at 5.5'
				SILT, 2.5Y 2.5/1, trace sand, fine grained, 1mm varves throughout (ash).								
S4	24	WOH							0	W		very soft
S5	14	WOH							0	W		very soft
		WOH- WOH	10									
S6	17	WOH- 01							0	W		very soft

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

Signature Tyler Munson Firm SCS BT Squared Tyler Munson

SCS BT Squared

10-92

Boring Number B-10 / PZ-6

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
S7	20	01-02 02-01							0	W		
				CLAY, mottled, 2.5Y 2.5/1 and 2.5Y 4/4, high plasticity (native).								
S8	18	03-04 05-05	20						1.75	W		
									2.25			
				WELL GRADED SAND, 2.5Y 4/2, few silt, trace gravel up to 1/2" diameter, shell fragments (native).								
S9	14	04-05 05-08	25							W		
				WELL GRADED GRAVEL with SAND, 2.5Y 4/2, few silt, gravel is subrounded.								
S10	14	05-11 13-11								W		
			30	WELL GRADED SAND with GRAVEL, 2.5Y 4/3, gravel is subrounded.								used ~20 gallons of water to keep head on sand to prevent heaving
S11	22	02-03 08-13								W		
				POORLY GRADED SAND, 2.5Y 5/4, fine to medium grained.								

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
S12	16	05-09 12-12							0	W		
				End of boring @ 36'; Abandoned with bentonite grout. Blind drill adjacent hole with 4 1/4" augers for piezometer (PZ-6) installation to 20'.								
			40									
			45									
			50									

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SOIL BORING LOG INFORMATION
10-92

Facility/Project Name		License/Permit/Monitoring Number	Boring Number
IPL - Harding Street SCS # 25211429.52			B-11 / PZ-7
Boring Drilled By (Firm name and name of crew chief)		Drilling Started	Drilling Completed / Drilling Method
American Drilling Services Bernie Byers		08/08/2011	08/08/2011 / 3¼" HSA
Facility Well No. / Unique Well No. / Common Well Name		Static Water Level 11 Feet	Surface Elevation 684.77 Feet / Borehole Diam. 6.5 Inches
Boring Location State Plane N, E SW 1/4 of SW 1/4 of Section 27, T. 15 N., R. 3 E.		Lat. Long.	Local Grid Location (If applicable) -1551 N -333 E
County Marion County, Indiana	Location Code	Civil Town/City/or Village Indianapolis	

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
				WELL GRADED GRAVEL with SAND, 2.5Y 8/3, angular.								
S1	20	16-09 08-08		SILT, 2.5Y 5/1, with clay, trace fine sand.					0	M		
S2	22	05-12 09-07		WELL GRADED SAND with GRAVEL, 2.5Y 5/6, gravel is rounded.					0	M		geofabric at ~4' bgs, sample place in 1.5' to 2' soil jar top
				SANDY SILT, 2.5Y 2.5/1, sand is fine grained (ash).								
S3	22	04-03 04-04	5						0.5	M/W		wet @ 5'
S4	24	01-02 02-01							0.25	W		
S5	14	01-02 02-01							0.25	W		
			10	SILTY SAND, 2.5Y 2.5/1, sand is fine grained (ash).								
S6	24	WOH/ 18 / 01							0.25	W		

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

Signature Tyler Munson Firm SCS BT Squared Tyler Munson

SCS BT Squared

10-92

Boring Number B-11 / PZ-7

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
S7	24	WOH/ 24		SILTY SAND, 2.5Y 2.5/1, sand is fine grained (ash).					0.25	W		
S8	6	WOH/ 12 03-02	20	CLAY, 2.5Y 3/1, high plasticity, trace fine grained sand.					0.5	W		
S9	23	WOH-WOH WOH-02	25						0.5	W		
S10	12	10-11 11-07		WELL GRADED GRAVEL with SAND, 2.5Y 4/1, gravel is well rounded to subrounded.						W		
S11	12	04-05 08-10	30									

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
S12	14	06-09 13-14		WELL GRADED GRAVEL with SAND, 2.5Y 4/1, gravel is well rounded to subrounded.						W		
				End of boring @ 36'; Abandoned with bentonite grout. Blind drill adjacent hole with 4 1/4" augers for piezometer (PZ-7) installation to 20'.								
			40									
			45									
			50									

SCS BT Squared
Civil & Environmental Engineering

SOIL BORING LOG INFORMATION
10-92

Facility/Project Name		License/Permit/Monitoring Number	Boring Number
IPL - Harding Street SCS # 25211429.52			B-12
Boring Drilled By (Firm name and name of crew chief)		Drilling Started	Drilling Completed / Drilling Method
American Drilling Services Bernie Byers		08/08/2011	08/08/2011 / 3¼" HSA
Facility Well No. / Unique Well No. / Common Well Name		Static Water Level Feet	Surface Elevation 684.07 Feet / Borehole Diam. 7.5 Inches
Boring Location State Plane N, E SW 1/4 of SW 1/4 of Section 27, T. 15 N., R. 3 E.		Lat. Long.	Local Grid Location (If applicable) -2014 N -10 E
County Marion County, Indiana	Location Code	Civil Town/City/or Village Indianapolis	

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
				WELL GRADED GRAVEL with SAND, 2.5Y 6/1, angular.								
S1	14	08-04 05-05		SILTY SAND, 2.5Y 4/1, sand is fine grained (ash).					0	M		geomembrane like HAP-11 at 6"
S2	14	04-03 02-03							0	M		
S3	16	01-1/18	5	SILT, 2.5Y 2.5/1, trace to few fine to coarse sand (ash).					0	M/W		wet at 5.5'
S4	22	01-02 1/12							0	W		
S5	22	WOH-WOH-WOH-WOH		From 8' to 10', with mottling, 2.5Y 3/2.					0	W		root sticks at 8.5'
S6	20	WOH/24	10	SILT, 2.5Y 3/1, trace angular gravel, few sand (ash).					0	W		

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

Signature Tyler Munson Firm SCS BT Squared Tyler Munson

SCS BT Squared

10-92

Boring Number B-12

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
S7	10	01-01-1/12		SILT, 2.5Y 3/1, trace angular gravel, few sand.					0	W		1/2" root stick at 15'
S8	16	WOH/18-02	20	CLAY, mottled, 2.5Y 2.5/1 and 2.5Y 3/2, high plasticity, few sand, trace shell fragments (native).					0.75	W		
S9	14	03-03 03-03	25	WELL GRADED SAND, 10YR 4/2, trace shell fragments.						W		
S10	12	06-10 17-15		WELL GRADED SAND with GRAVEL, 10YR 4/2, gravel is subrounded.						W		
S11	15	07-08 08-09	30	WELL GRADED SAND with GRAVEL, 2.5Y 4/4, gravel is well rounded.						W		
				End of boring @ 32'; Abandoned with bentonite grout.								

SCS BT Squared
Civil & Environmental Engineering

SOIL BORING LOG INFORMATION
10-92

Facility/Project Name		License/Permit/Monitoring Number	Boring Number
IPL - Harding Street SCS # 25211429.52			B-18 / PZ-11
Boring Drilled By (Firm name and name of crew chief)		Drilling Started	Drilling Completed	Drilling Method
American Drilling Services Bernie Byers		08/10/2011	08/10/2011	4¼" HSA
Facility Well No.	Unique Well No.	Common Well Name	Static Water Level	Surface Elevation	Borehole Diam.
			22 Feet	684.73 Feet	8.5 Inches
Boring Location			Lat.	Local Grid Location (If applicable)	
State Plane N, E			Long.	-2340 N	-572 E
NE 1/4 of NE 1/4 of Section 33, T. 15 N., R. 3 E.					
County		Location Code	Civil Town/City/or Village	
Marion County, Indiana			Indianapolis	

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
				WELL GRADED GRAVEL, 10YR 5/1, limestone, angular.								
S1	10	02-03 06-04		WELL GRADED SAND with SILT and GRAVEL, 2.5Y 2.5/1, trace to few angular coal gravel, up to 1/2" diameter (ash).						M		felt-like geofabric at ~6" under gravel
S2	22	06-12 12-11								M		
S3	20	06-07 07-08	5	SILT with SAND, 2.5Y 2.5/1, sand is well graded, trace angular coal gravel, up to 1/2" diameter (ash).					0.25	W		wet at 5'
S4	22	03-03 06-09		WELL GRADED SAND with SILT, 2.5Y 2.5/1, trace coal gravel (ash).						W		
				SILT, 2.5Y 3/1, trace fine sand (ash).								
				SILTY SAND, 2.5Y 2.5/1, sand is well graded.								
S5	14	04-04 03-02		WELL GRADED SAND with GRAVEL, 10YR 4/4, gravel is subrounded to well rounded and up to 1" diameter.						M/W		very moist but not saturated
			10	SANDY CLAY, 10YR 3/4, medium plasticity, sand is fine to medium grained.								
S6	14	02-02 03-04							1.5	W		
S7	24											Shelby Tube from 12' to 14'
				CLAY with SILT, 10YR 3/4, medium to high plasticity (native).								

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

Signature Tyler Munson Firm SCS BT Squared Tyler Munson

SCS BT Squared

10-92

Boring Number B-18 / PZ-11

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
S8	12	02-02 04-06		CLAY with SILT, 10YR 3/4, medium to high plasticity (native).					0.5	W		
S9	14	03-08 07-06	20	POORLY GRADED SAND with GRAVEL, 10YR 5/4, sand is coarse grained, gravel is well rounded and up to 1/2" diameter.						M/W		very moist but not saturated
S10	14	06-09 10-09	25	WELL GRADED SAND with GRAVEL, 10YR.						W		wet at 22.5' pump in 15 gallons to minimize heave heave sand to 26.5'
			30	End of boring @ 28'; Set 5' screen at 26.8'.								

SCS BT Squared
Civil & Environmental Engineering

SOIL BORING LOG INFORMATION
10-92

Facility/Project Name		License/Permit/Monitoring Number	Boring Number
IPL - Harding Street SCS # 25211429.52			B-19
Boring Drilled By (Firm name and name of crew chief)		Drilling Started	Drilling Completed / Drilling Method
American Drilling Services Bernie Byers		08/10/2011	08/11/2011 / 3¼" HSA
Facility Well No. / Unique Well No. / Common Well Name		Static Water Level Feet	Surface Elevation 686.30 Feet / Borehole Diam. 6.5 Inches
Boring Location State Plane N, E NW 1/4 of NW 1/4 of Section 34, T. 15 N., R. 3 E.		Lat. Long.	Local Grid Location (If applicable) -2148 N -542 E
County Marion County, Indiana	Location Code	Civil Town/City/or Village Indianapolis	

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	19	15-20 15-15		WELL GRADED GRAVEL with SILT and SAND, gravel is angular limestone, silt and sand are coal/ash.						M		
				GRAVELLY SILT with SAND, 2.5Y 3/2, gravel is angular coal, sand is well graded (ash/mix dirt?).								
S2	20	09-11 14-14		SILT with SAND, 2.5Y 3/2, sand is well graded, gravel is angular coal and up to 1/2" diameter (ash).					0.25	M		
				SILT with SAND, 2.5Y 2.5/1, sand is fine grained (ash).								wet from 4.5' to 5'
S3	20	08-14 18-17	5	WELL GRADED SAND with SILT and GRAVEL, 2.5Y 3/3 and 2.5Y 3/1, gravel is coal, angular and up to 1/2" diameter (ash).					0	M/W		
S4	22	06-08 08-06							0.5	W		wet at 7'
				SILT with SAND, 2.5Y 2.5/1, sand is well graded, trace angular coal gravel, up to 3/4" diameter (ash).								
S5	18	04-06 07-07	10						0.5	W		
S6	20	02-04 09-11		SILT with SAND, 2.5Y 2.5/1, sand is well graded, trace angular coal, gravel up to 3/4" diameter (ash).					0.5	W		

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

Signature Tyler Munson Firm SCS BT Squared Tyler Munson

SCS BT Squared

10-92

Boring Number B-19

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
S7	24	1/24"		SILT with SAND, 2.5Y 2.5/1, sand is well graded, trace angular coal, gravel up to 3/4" diameter (ash).					0	W		
S8	0	40 psi		Osterburg Sample.					-	W		
S9	0	100 psi		SILT with SAND, 2.5Y 3/1, sand is fine grained (ash). Osterburg Sample.					-	W		
			20									
S10	24	1/12" 1/12"							0	W		
S11	24	1/12" 01-01	25	SILT with CLAY, 2.5Y 3/2, very "sticky" and soft (hard to open S/S tube), trace few fine sand (ash).					0	W		
S12	0			Shelby Tube.					-	W		
S13		01-01 01-01							0.25	W		
			30									
				SILT with CLAY, 2.5Y 3/2, very soft, trace fine sand.								
S14	24	1/12" 01-01							0	W		
				WELL GRADED SAND, 2.5Y 3/1 (native).								

SCS BT Squared

10-92

Boring Number B-19

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
				WELL GRADED SAND, 2.5Y 3/1 (native).								pump ~30 gallons in, ~12' of heave when pulled center bit from 38', mix drilling mud to control heave and allow continuted drilling, drill mud won't pump out heave with weight of tricone bit, set up to use hydraulic to drive, use 150 gallons of drilling mud to clear hole to 38', sand and gravel cuttings up with mud
S15	14	07-11 16-17	40	WELL GRADED SAND, 10YR 4/2, few gravel (well rounded), up to 3/4" diameter (native).						W		
S16	24	14-24 23-23								W		
			45	End of boring @ 44'; Abandoned with bentonite grout.								
			50									

ATTACHMENT C

GEOTECHNICAL DATA REPORT[2]

[2] CPT data for existing CCR surface impoundments were extracted from *Geotechnical Data Report, Harding Street Generating Station, Indianapolis, Indiana*, by Terracon Consultants, Inc., dated October 20, 2015.

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

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

Project Manager:	AJM
Drawn by:	NCD
Checked by:	AJM
Approved by:	AJM

Project No.	N1155176
Scale:	AS SHOWN
File Name:	N1155176
Date:	9-16-2015

Terracon
611 Lunken Park Dr.
Cincinnati, OH 45226

EXPLORATION PLAN

Harding Street Generating Station
3700 South Harding Street
Indianapolis, IN

Exhibit

A-2

Field Exploration Description

Locations for the two (2) SPT soil borings (HS-B-30 and HS-B-31) and fifteen (15) CPT soundings (HS-C-1 to HS-C-15) 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 an unlined split-barrel sampler and thin-walled tubes in accordance with ASTM D1586 and D1587. Bedrock was not encountered within the exploration depth at the SPT soil borings.

In the split barrel sampling procedure, the number of blows required to advance a standard 2-inch O.D. split barrel 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 borings, an automatic 140-lb SPT hammer was used to advance the split-barrel 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.

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 boring logs are not necessarily consistent with soil classifications and descriptions determined in accordance with ASTM Methods D2487 and D2488 since the CPT description is based on 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, including the road base material (where applicable). 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.

CPT LOG NO. HS-C-6

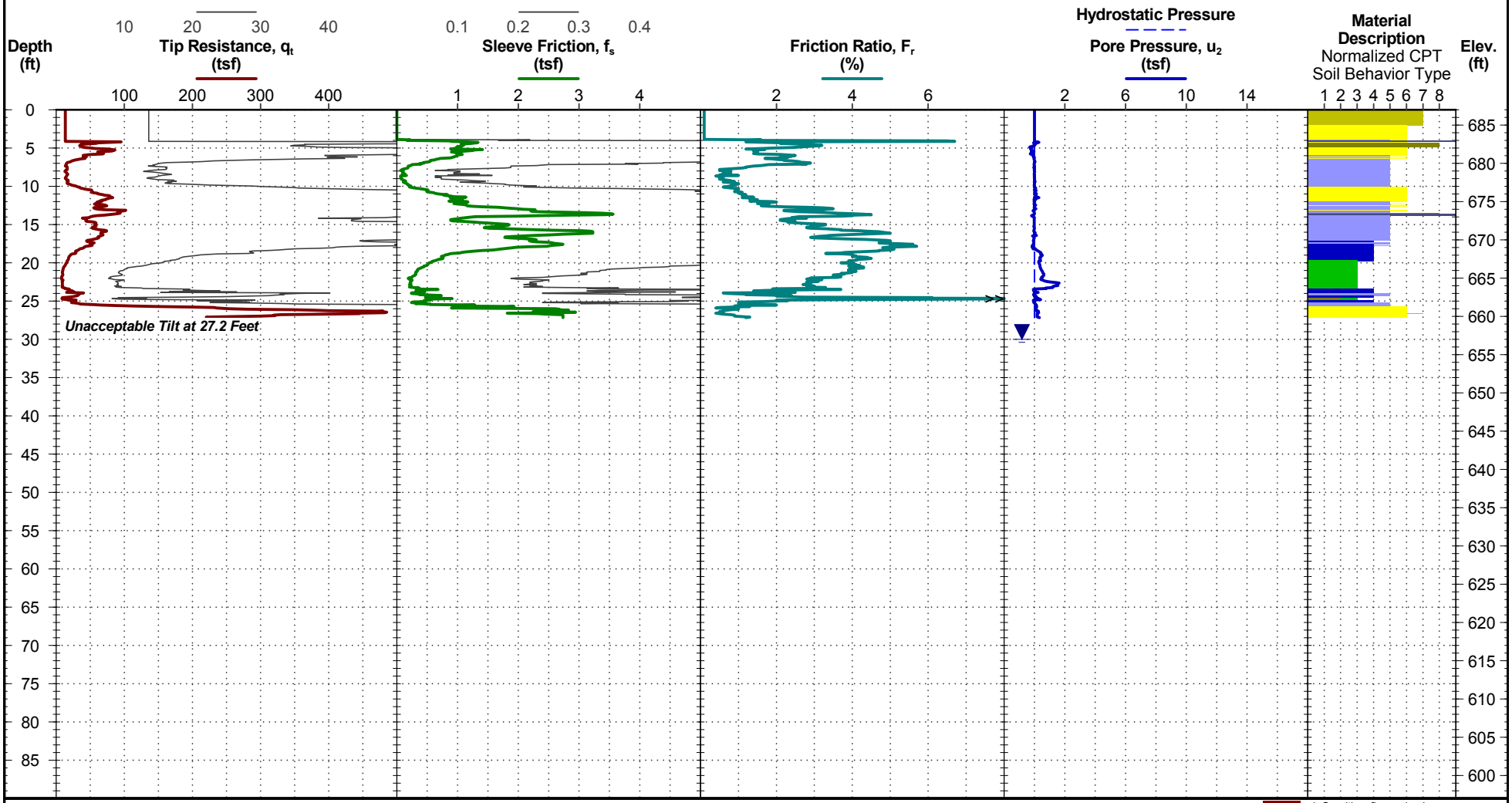
PROJECT: Harding Street Generating Station

CLIENT: Sargent & Lundy
Chicago, IL

TEST LOCATION: See Exhibit A-2

Surface Elev.: 687.0 ft
Latitude: 39.70656°
Longitude: 86.19831°

SITE: 3700 South Harding Street
Indianapolis, Indiana



Hole caved, grout to 15 ft

See Exhibit A-3 for description of field procedures.

See Appendix C for explanation of symbols and abbreviations.

Elevation Reference: 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

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

Probe no. 4399 with net area ratio of 0.82
U2 pore pressure transducer location
Manufactured by Geotech A.B.; calibrated 10/21/2014
Tip and sleeve areas of 10 cm^2 and 150 cm^2
Ring friction reducer with O.D. of 1.875 in

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

CPT Started: 8/27/2015
CPT Completed: 8/27/2015
Rig: Geoprobe
Operator: Buchanan/Pattison
Project No.: N1155176
Exhibit: A-15

CPT LOG NO. HS-C-7

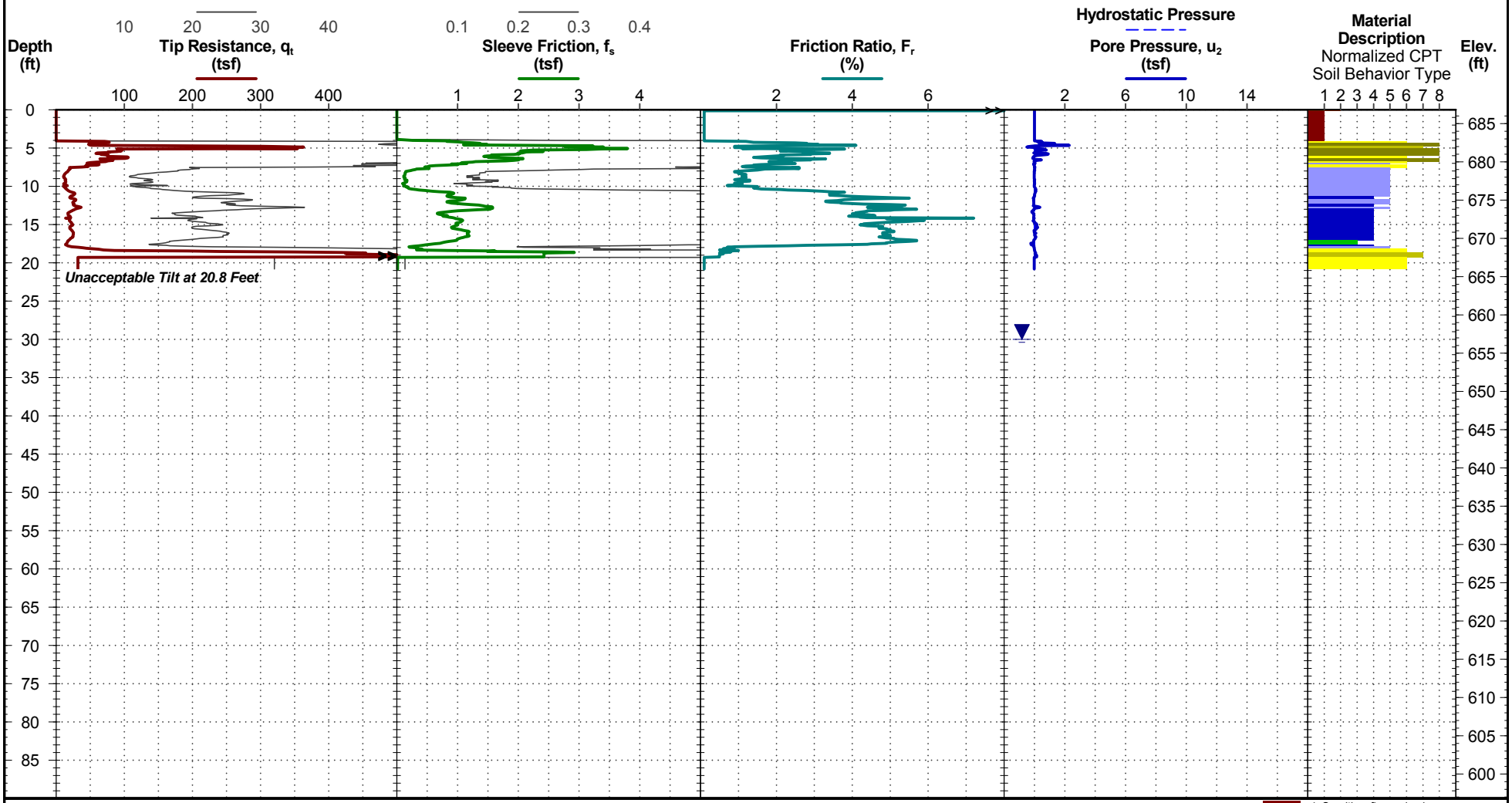
PROJECT: Harding Street Generating Station

CLIENT: Sargent & Lundy
Chicago, IL

TEST LOCATION: See Exhibit A-2

Surface Elev.: 686.8 ft
Latitude: 39.70624°
Longitude: 86.19677°

SITE: 3700 South Harding Street
Indianapolis, Indiana



Hole caved, grout to 10 ft

See Exhibit A-3 for description of field procedures.

See Appendix C for explanation of symbols and abbreviations.

Elevation Reference: 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

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

Probe no. 4399 with net area ratio of 0.82
U2 pore pressure transducer location
Manufactured by Geotech A.B.; calibrated 10/21/2014
Tip and sleeve areas of 10 cm^2 and 150 cm^2
Ring friction reducer with O.D. of 1.875 in

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

CPT Started: 8/27/2015
CPT Completed: 8/27/2015
Rig: Geoprobe
Operator: Buchanan/Pattison
Project No.: N1155176
Exhibit: A-16

CPT LOG NO. HS-C-12

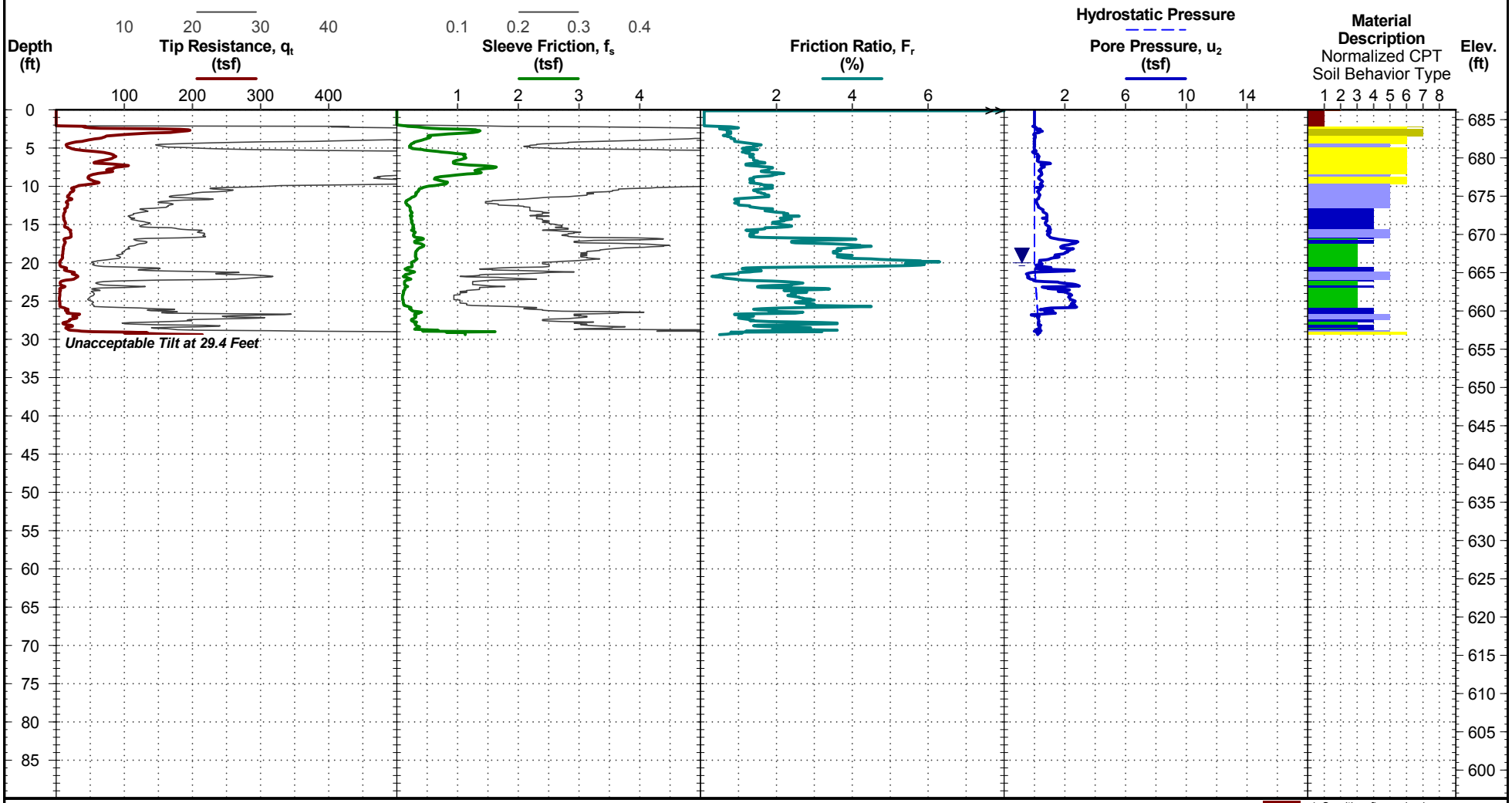
PROJECT: Harding Street Generating Station

CLIENT: Sargent & Lundy
Chicago, IL

TEST LOCATION: See Exhibit A-2

Surface Elev.: 686.3 ft
Latitude: 39.7078°
Longitude: 86.19528°

SITE: 3700 South Harding Street
Indianapolis, Indiana



Hole caved, grout to 8 ft

See Exhibit A-3 for description of field procedures.

See Appendix C for explanation of symbols and abbreviations.

Elevation Reference: 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

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

Probe no. 4399 with net area ratio of 0.82
U2 pore pressure transducer location
Manufactured by Geotech A.B.; calibrated 10/21/2014
Tip and sleeve areas of 10 cm^2 and 150 cm^2
Ring friction reducer with O.D. of 1.875 in

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

CPT Started: 8/24/2015
CPT Completed: 8/24/2015
Rig: Geoprobe
Operator: Buchanan/Pattison
Project No.: N1155176
Exhibit: A-21

CPT LOG NO. HS-C-13

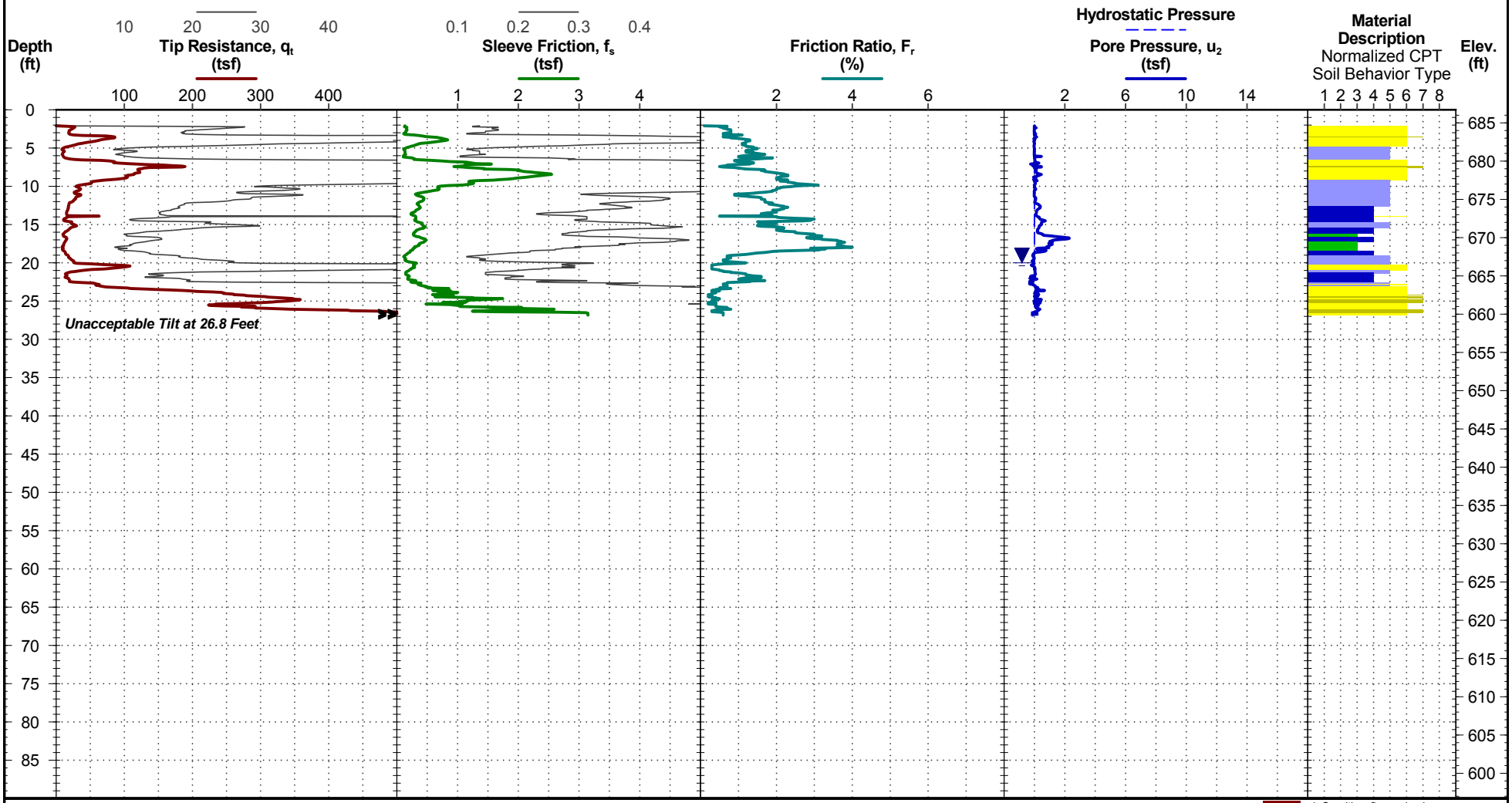
PROJECT: Harding Street Generating Station

CLIENT: Sargent & Lundy
Chicago, IL

TEST LOCATION: See Exhibit A-2

Surface Elev.: 686.7 ft
Latitude: 39.70846°
Longitude: 86.19598°

SITE: 3700 South Harding Street
Indianapolis, Indiana



Hole caved, grout to 15 ft

See Exhibit A-3 for description of field procedures.

See Appendix C for explanation of symbols and abbreviations.

Elevation Reference: 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

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

Probe no. 4399 with net area ratio of 0.82
U2 pore pressure transducer location
Manufactured by Geotech A.B.; calibrated 10/21/2014
Tip and sleeve areas of 10 cm^2 and 150 cm^2
Ring friction reducer with O.D. of 1.875 in

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

CPT Started: 8/24/2015
CPT Completed: 8/24/2015
Rig: Geoprobe
Operator: Buchanan/Pattison
Project No.: N1155176
Exhibit: A-22

CPT LOG NO. HS-C-14

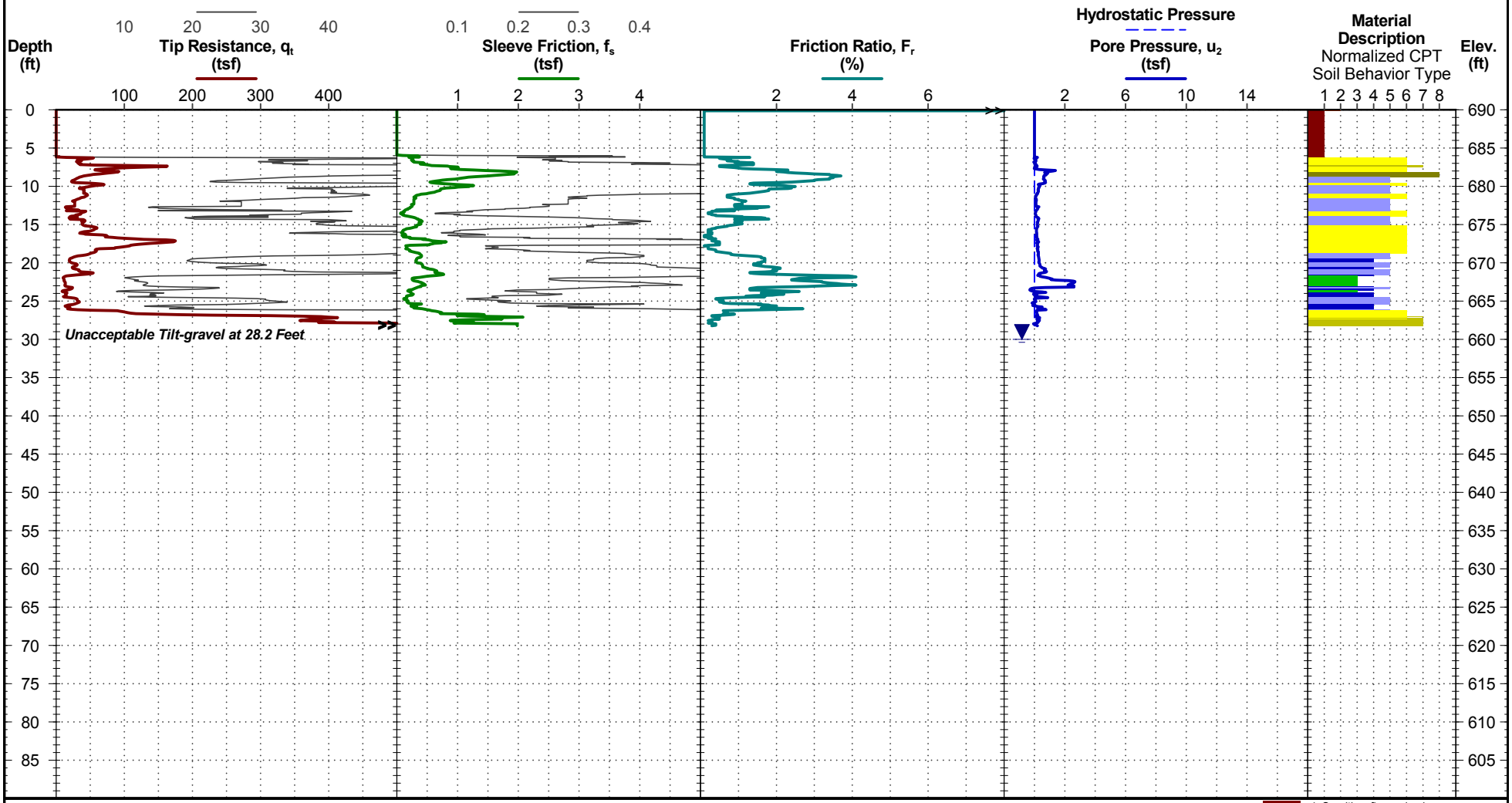
PROJECT: Harding Street Generating Station

CLIENT: Sargent & Lundy
Chicago, IL

TEST LOCATION: See Exhibit A-2

Surface Elev.: 690.0 ft
Latitude: 39.70859°
Longitude: 86.19837°

SITE: 3700 South Harding Street
Indianapolis, Indiana



Hole caved, grout to 8 ft

See Exhibit A-3 for description of field procedures.

See Appendix C for explanation of symbols and abbreviations.

Elevation Reference: 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

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

Probe no. 4342

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

CPT Started: 8/28/2015
CPT Completed: 8/28/2015
Rig: Geoprobe
Operator: Buchanan/Pattison
Project No.: N1155176
Exhibit: A-23

CPT LOG NO. HS-C-15

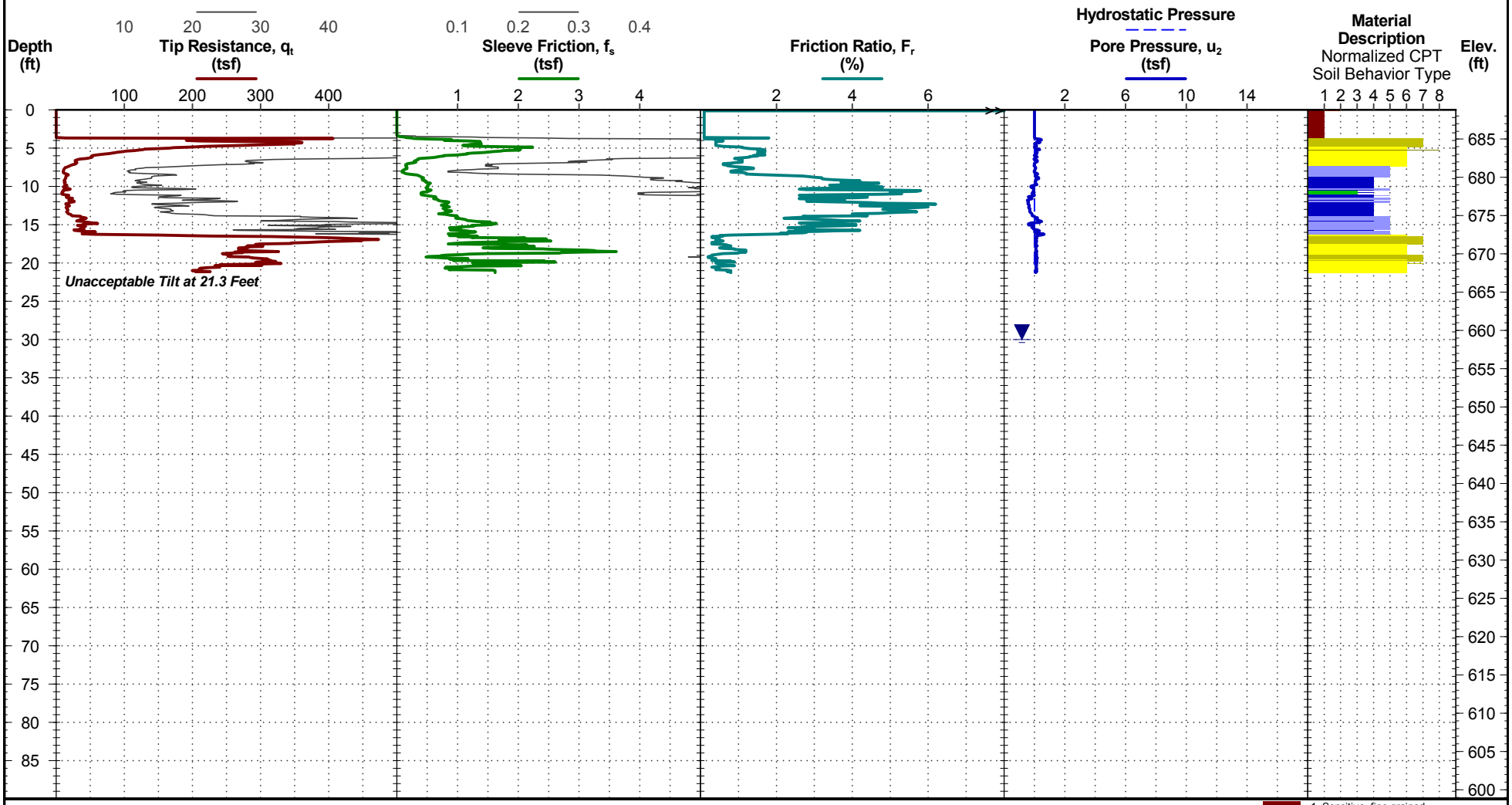
PROJECT: Harding Street Generating Station

CLIENT: Sargent & Lundy
Chicago, IL

TEST LOCATION: See Exhibit A-2

Surface Elev.: 688.8 ft
Latitude: 39.70891°
Longitude: 86.20019°

SITE: 3700 South Harding Street
Indianapolis, Indiana



Hole caved, grout to 13 ft

See Exhibit A-3 for description of field procedures.

See Appendix C for explanation of symbols and abbreviations.

Elevation Reference: 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

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

Probe no. 4399 with net area ratio of 0.82
U2 pore pressure transducer location
Manufactured by Geotech A.B.; calibrated 10/21/2014
Tip and sleeve areas of 10 cm^2 and 150 cm^2
Ring friction reducer with O.D. of 1.875 in

Terracon
611 Lunken Park Drive
Cincinnati, Ohio

CPT Started: 8/24/2015
CPT Completed: 8/24/2015
Rig: Geoprobe
Operator: Buchanan/Pattison
Project No.: N1155176
Exhibit: A-24

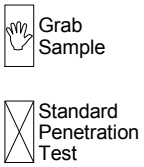
APPENDIX C

SUPPORTING DOCUMENTS

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING



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 and data collection interval, the horizontal survey data accuracy was reported as ±01 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] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[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 ≥ 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.

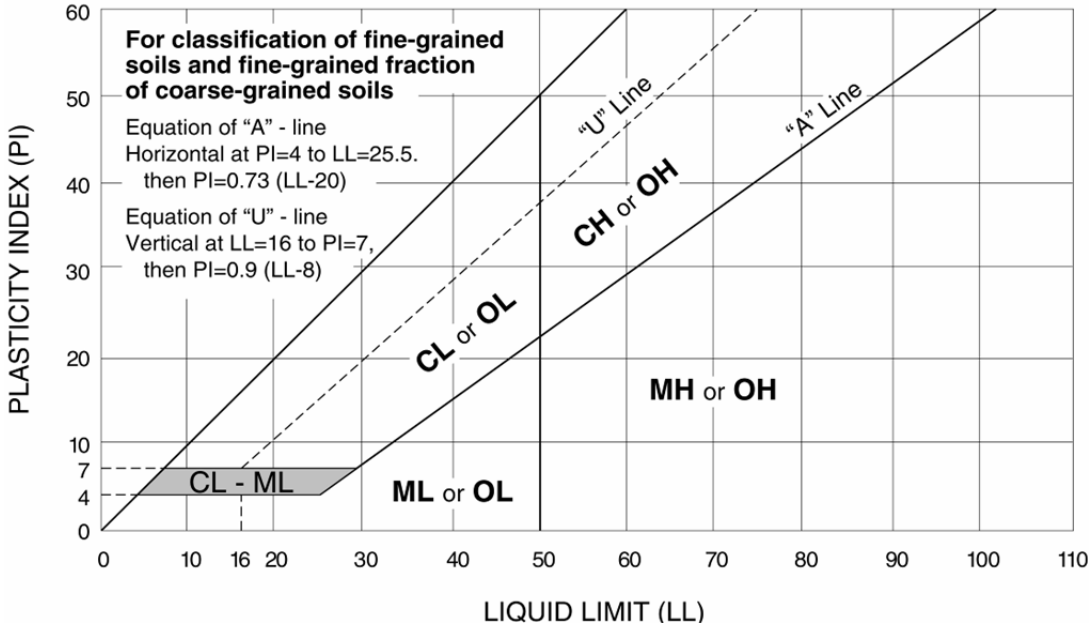


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Exhibit C-2

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'
ϕ' (1) = $\tan^{-1}(0.373[\log(q_t/\sigma'_{v0}) + 0.29])$
ϕ' (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) = ρV_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)
$\alpha_M = 0.0188 \times 10^{(0.55Ic + 1.68)}$

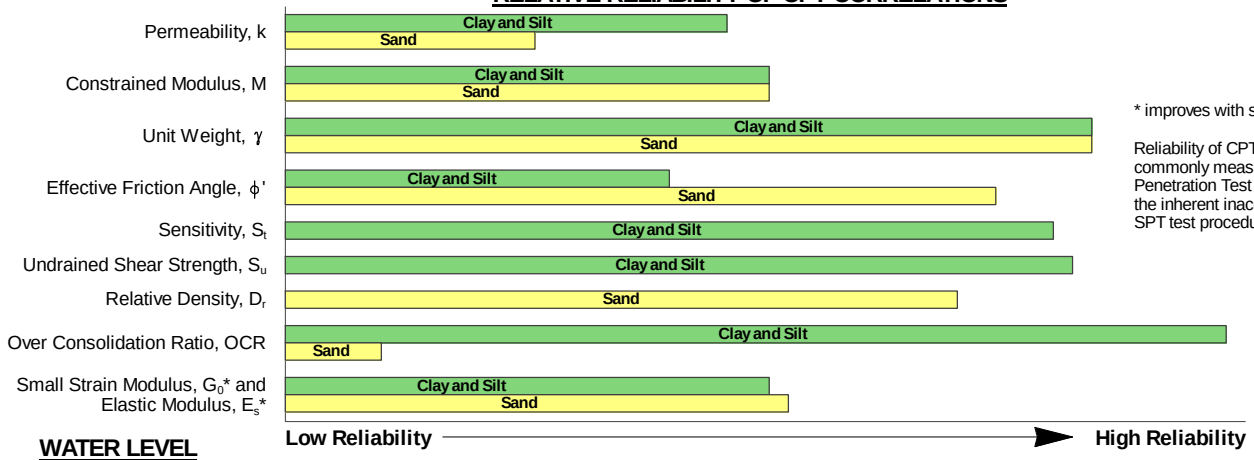
Hydraulic Conductivity, k
For $1.0 < I_c < 3.27$ $k = 10^{(0.952 - 3.04Ic)}$
For $3.27 < I_c < 4.0$ $k = 10^{(-4.52 - 1.37Ic)}$

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

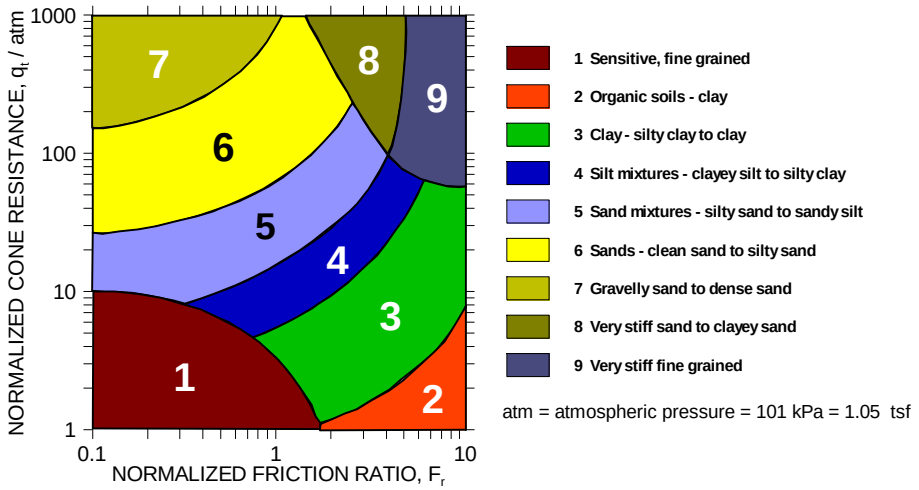
Estimated - Depth to water interpolated by the practitioner using pore pressure measurements in coarse grained soils and known site conditions

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

ATTACHMENT D

TOPOGRAPHIC & BATHYMETRIC SURVEYS OF ASH POND SYSTEM

Item	Drawing Number	Title
1	8113HARD SHT 1	Harding Street Generating Station, Overall Ash Pond Survey
2	8113HARD SHT 3	Harding Street Generating Station, Survey of Ash Pond No. 1, 2A, 2B & 3

Location Map Not to Scale

200 0 200 400
SCALE: 1" = 200'

Indiana State Plane
East Zone Grid North

Notes:

1. The horizontal coordinate system is based upon the Indiana East State Plane Coordinate System, NAD 83 (2011), Epoch 2010.00, based on control point no. 3 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 14, 17–18, 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 dry conditions at the time of the hydrographic survey. Some portions of Ponds No. 2 & No. 4 had areas that were not surveyed. At the time of the aerial survey water was present, but no at the time of the hydrographic survey was performed.
9. A portion of Pond No. 4B was not surveyed. At the time of the aerial survey no ash was present, but when the hydrographic survey was performed ash obstructed the survey area.
10. 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.
11. The aerial photos shown herein were taken from the United States Geological Survey (USGS) Earth Explorer and are dated February 2013. They are intended for reference only and were not used for mapping.

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.

9-22-2015

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

CHRISTOPHER DAVID CARMIEN REGISTERED LAND SURVEYOR No. LS21100003 STATE OF INDIANA

Legend:

- Intermediate Contour Line
- Index Contour Line
- Survey Control
- 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
- Existing Building
- Area Excluded from Hydrographic Survey (See Note 8 Sheet 1 of 4)
- No Water Present (See Note 9 Sheet 1 of 4)

Survey Control Information

Point ID	Northing	Easting	Elevation	Description
3	1,624,422.04	178,812.39	690.14	5/8" Rebar Set
5000	1,624,506.77	181,701.24	674.00	Monument Found
5001	1,622,919.96	181,571.32	675.98	Mag Nail Found
5002	1,624,110.74	179,050.85	687.66	1/2" Rebard Found
5003	1,626,429.81	179,169.29	684.22	Mag Nail Found
5004	1,625,961.82	180,117.16	683.84	Mag Nail Found
5008	1,625,491.50	178,288.03	675.21	IPL Benchmark Found (Corner of Sheeting)
5010	1,625,104.97	177,888.05	688.13	Gin Spike Set
5011	1,624,819.89	177,980.29	686.32	Gin Spike Set
5012	1,624,749.78	177,885.74	716.85	Gin Spike Set
5013	1,625,082.04	178,220.14	688.78	Gin Spike Set
5014	1,623,956.35	179,177.18	685.21	Gin Spike Set
5016	1,624,264.57	179,482.52	685.82	Gin Spike Set
5017	1,624,107.03	179,383.87	684.57	Gin Spike Set
5030	1,625,969.24	180,617.00	683.65	IPL Mag Nail Panel Point "D" Found
5032	1,625,953.01	179,516.93	683.83	IPL Mag Nail Panel Point "B" Found
10022	1,624,360.14	180,048.40	686.55	5/8" Rebar Found
10025	1,625,859.41	178,457.89	684.29	Mag Nail Found (SCHEIDER)
10026	1,626,870.04	179,287.72	682.94	5/8" Rebar Found (SCHEIDER)
10029	1,623,176.16	181,412.38	674.77	5/8" Rebar 'Bent' Found

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

S&L Project No. : 1057084

BY	DATE
KJM	10.02.15

NO.	REVISION
1	Added Grid Lines and Notes

DRAWN: KJM CHK'D: CDC
DESIGNED:- APPR'D: DRW
DATE: September 22, 2015
1" = 200'

PROJECT NUMBER 1550-8113-90

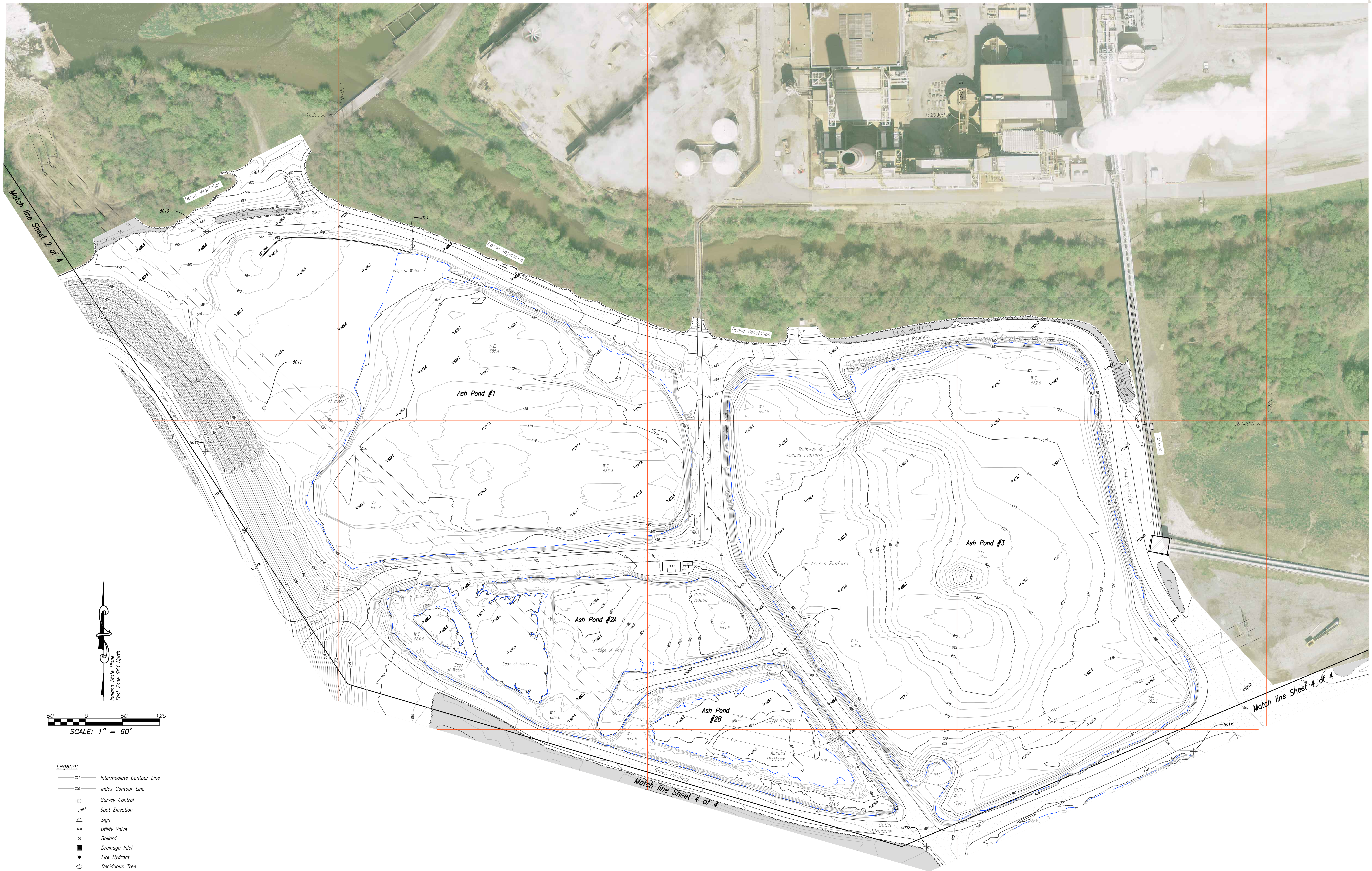
Indianapolis
Sargent & Lundy, LLC
Indianapolis Power & Light (IPL)
Indiana

Harding Street Generating Station
Overall Ash Pond Survey

SHEET 1 OF 4

DRAWING NUMBER 8113HARD

M:\PROJ\1550\8113\TOPOGRAPHIC\8113TP-HARDING-COMBINED.DWG



60 0 60 120

SCALE: 1" = 60'

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
	Existing Building
	Area Excluded from Hydrographic Survey (See Note 8 Sheet 1 of 4)
	No Water Present (See Note 9 Sheet 1 of 4)

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

CHRISTOPHER DAVID CARMIEN REGISTERED No. LS21100003 STATE OF INDIANA LAND SURVEYOR

S&L Project No.: 1057084

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

DRAWN: KJM CHK'D. CDC
DESIGNED: – APPRV'D: DRW
DATE: September 22,2015
1" = 60'
PROJECT NUMBER 1550-8113-90

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

Harding Street Generating Station
Survey of Ash Pond No. 1, 2A, 2B & 3

SHEET 3 OF 4
DRAWING NUMBER 8113HARD

M:\PROJ\1550\8113\TOPOGRAPHIC\8113TP-HARDING-COMBINED.DWG

ATTACHMENT E

OPERATIONS & MAINTENANCE PLAN

SCS BT SQUARED







Ash Pond Operations and Maintenance Plan

Indianapolis Power & Light Company
Harding Street Generating Station
Indianapolis, Indiana

Prepared for:

Indianapolis Power & Light Company

3700 South Harding Street
Indianapolis, Indiana

Prepared by:

SCS BT SQUARED
2830 Dairy Drive
Madison, Wisconsin 53718-6751
(608) 224-2830

April 2012
File No. 25211429.52

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1.0 INTRODUCTION

SCS BT Squared (SCS) has prepared this Operations and Maintenance Plan (O&M Plan) for the ash ponds located at the Harding Street Generating Station in Indianapolis, Indiana. The ash ponds are owned and operated by Indianapolis Power and Light Company (IP&L). This O&M Plan was prepared to fulfill Tasks 3a and 3b of the Action Plan prepared in response to the U.S. Environmental Protection Agency (USEPA) report prepared by CDM following their inspection of ash ponds at the Harding Street (HS) Station in April 2010.

This 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, for general guidance.

This O&M Plan is for the eight ash ponds (Ponds 1, 2, 2A, 2B, 3,. 4, 4A, and 4B) located south of the generating station. Ash generated by burning coal at the generating station is mixed with water and may be pumped to either Pond 1 or Pond 4 where initial sedimentation occurs. The supernatant fluid from Pond 1 then flows to Ponds 2A, 2B, 4A, 4B and finally to Pond 3 for final sedimentation, or the supernatant fluid from Pond 4 flows to 4B and finally to Pond 3 for final sedimentation. After sedimentation in Pond 3 is complete, the fluid is discharged via a National Pollutant Discharge Elimination System (NPDES) permitted outfall to the Lick Creek that flows to the White River. The ponds were created by berms constructed of native site soils including clay and sand 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**.

This O&M Plan has been prepared to assist IP&L in assuring the safety of the ash ponds and berms and allow continuous operation of the ponds, minimize the need for costly repairs, and extend the useful life of each pond.

2.0 OPERATIONS

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

Pond 1	7 acres	Initial Sedimentation
Pond 2	20 acres	Secondary Sedimentation
Pond 2A	2 acres	Secondary Sedimentation
Pond 2B	2 acres	Secondary Sedimentation
Pond 3	9 acres	Final Sedimentation
Pond 4	20 acres	Initial/Secondary Sedimentation
Pond 4A	2 acres	Secondary Sedimentation
Pond 4B	5 acres	Secondary Sedimentation

2.1 NORMAL OPERATION

Pond 1 or Pond 4 can receive the water from the Station and act as the primary ash settling pond. Water from Pond 1 is discharged through a 36-inch-diameter corrugated metal pipe (CMP) to Pond 2A. Water leaves Pond 2A via a 30-inch-diameter CMP and flows to Pond 2B. The outlet of Pond 2B is a 30-inch-diameter CMP that drains to Pond 4A. Pond 4A drains to either Pond 4 via a 30-inch-diameter CMP or to Pond 4B via a 30-inch-diameter CMP. Pond 4 drains to Pond 4B via two 30-inch-diameter CMPs. Pond 4B drains to Pond 3 via a 30-inch-diameter CMP, and Pond 3 via three 12-inch-diameter steel pipes that lead to one 30-inch reinforced concrete pipe that leads to the Lick Creek, a tributary of the White River. Water and ash are pumped or trucked into Pond 2, and Pond 2 has a concrete outlet structure that has a 36-inch-diameter plastic pipe that leads to Pond 2A.

When Pond 1 fills with ash, the incoming water from the Station is diverted to Pond 4 (or vice versa) and the ash from Pond 1 is excavated and sent off site for beneficial reuse or to Pond 2.

During normal operation, the fluid level in the Ponds is approximately the same elevation as the invert elevation of the discharge structure. 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 14 piezometers (PZ-1 through PZ-14) located around the ash ponds at HS 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. Water levels shall be recorded on the example monitoring form included in **Appendix A**.

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

Pond	Piezometers	Water Level
1	PZ-6	680.0
2	PZ-1, PZ-2, PZ-3, PZ-4, PZ-5, PZ-12, PZ-13, and PZ-14	701.5
2A and 2B	PZ-11	678.5
3	PZ-7	675.0
4, 4A, and 4B	PZ-8, PZ-9,and PZ-10	675.5

If the level in any piezometer exceeds the elevation listed above, a Station supervisor must be notified.

3.2 POND WATER LEVEL MONITORING

There are eight staff gauges installed in the ash ponds at HS Station. Each ash pond has a staff gauge located at the outlet structure of the pond. 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 weekly. 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	Water Level
1	684.0
2	708.5
2A	683.6
2B	682.7
3	679.4
4	681.8
4A	681.4
4B	680.8

If the water level in any of the ponds is above the water elevations, a Station supervisor must be notified.

3.3 RECORD KEEPING

Completed monitoring forms shall be kept in **Appendix D** of this O&M Plan or at an alternative location as determined by the facility. Where necessary, these forms will direct users to additional records prepared in response to all actions discussed and taken in response to measurements in either the piezometers or staff gages that exceeded recommended values.

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.

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 or weather condition.

4.3 INSPECTION FORMS

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

4.4 RECORD KEEPING

Completed inspection forms shall be kept in **Appendix D** of this O&M Plan or at an alternative location as determined by the facility for a period of at least three years.

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 twice 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 promote stump decay. If necessary, the stump should be removed and the excavation filled with compacted structural fill.

Any vegetation issues shall be documented in the inspection sheet. Records of all repair / maintenance activities should be documented and either located in **Appendix D** or easily accessible.

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. Records of all repair / maintenance activities should be documented and either located in **Appendix D** or easily accessible.

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. Records of all repair / maintenance activities should be documented and either located in **Appendix D** or easily accessible.

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 break down 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 on the inspection sheet. Records of all repair / maintenance activities should be documented and either located in **Appendix D** or easily accessible.

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. Records of all repair / maintenance activities should be documented and either located in **Appendix D** or easily accessible.

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. Records of all repair / maintenance activities should be documented and either located in **Appendix D** or easily accessible.

5.7 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. Records of all repair / maintenance activities should be documented and either located in **Appendix D** or easily accessible.

5.8 RECORD KEEPING

An example maintenance form is included in **Appendix C**. Completed forms of any maintenance activities performed should be kept in **Appendix D** of this O&M Plan or an alternative location as determined by the facility.

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FIGURES

NOTES:

1. AERIAL PHOTOGRAPH FROM INDIANA SPATIAL DATA PORTAL, DATED 08/16/2010.

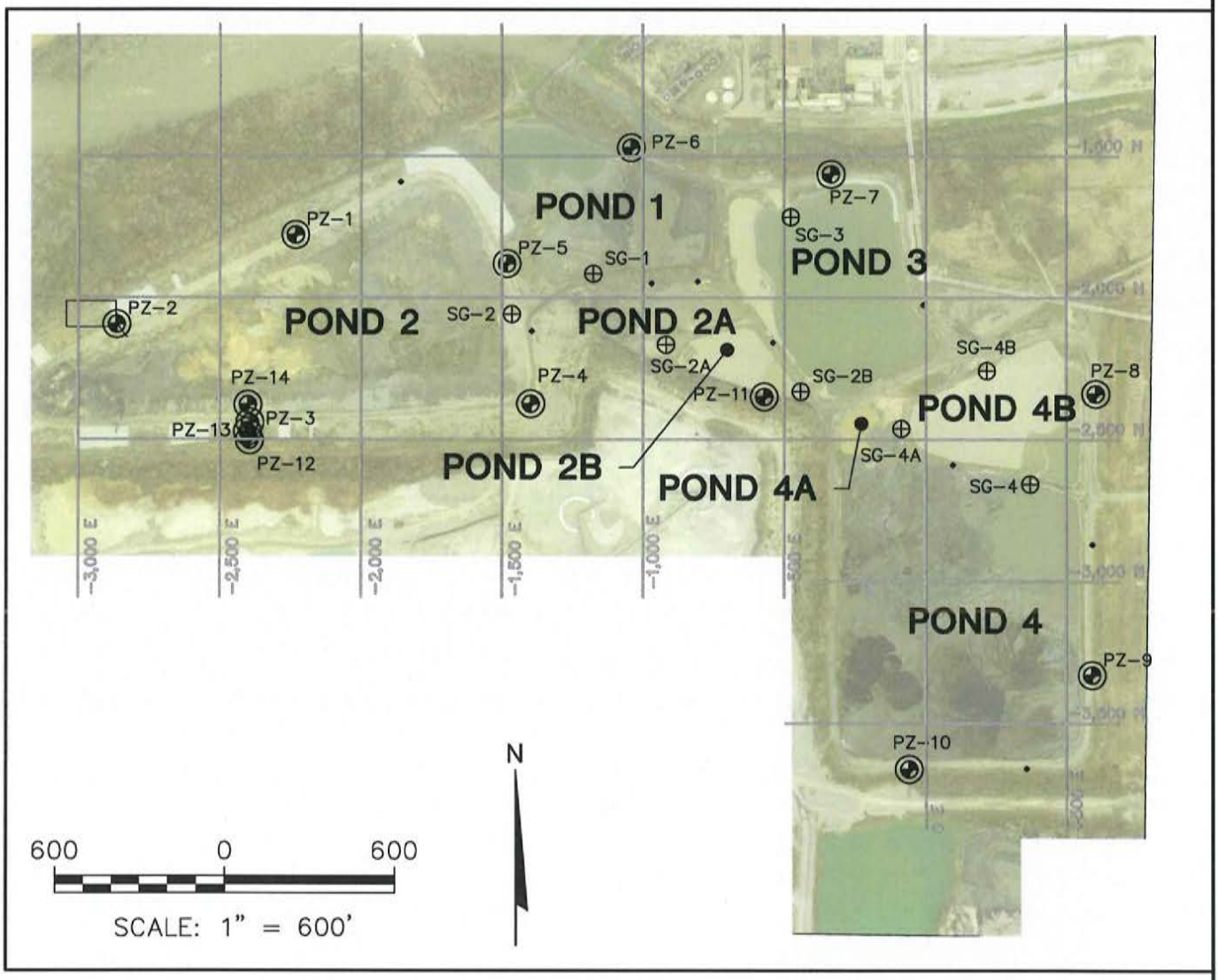
600 0 600

SCALE: 1" = 600'

N

CLIENT: ipl an AES company	INDIANAPOLIS POWER & LIGHT COMPANY	SITE	HARDING STREET GENERATING STATION 3700 SOUTH HARDING STREET INDIANAPOLIS, INDIANA	ASH POND LAYOUT PLAN	
PROJECT NO. 25211429.52	DRAWN BY: KG/KP	ENGINEER	SCS BT SQUARED	FIGURE	
DRAWN: 02/07/11	CHECKED BY: KG		2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	1	
REVISED: 09/23/11	APPROVED BY: DH 04/09/12				

I:\4295\4295B\Drawings-General\O&M-ASH POND LAYOUT.dwg, 4/9/2012 11:38:19 AM



LEGEND

PZ-3 ⊕ PIEZOMETER

SG-2 ⊕ STAFF GAUGE

NOTES:

1. PIEZOMETER LOCATIONS ARE BASED ON DRAWINGS PROVIDED BY IPL.
2. ON-SITE COORDINATE SYSTEM DEVELOPED FROM IPL DRAWING "HARDING STREET ASH PONDS – PIEZOMETER_TEST BORE LOCATIONS" DATED DEC. 6, 2011.

CLIENT	INDIANAPOLIS POWER & LIGHT COMPANY	SITE	HARDING STREET GENERATING STATION 3700 SOUTH HARDING STREET INDIANAPOLIS, INDIANA	PIEZOMETER AND STAFF GAUGE LOCATION PLAN	
PROJECT NO.	25211429.52	DRAWN BY:	KG/KP	ENGINEER	FIGURE
DRAWN:	02/07/11	CHECKED BY:	KG	SCS BT SQUARED	
REVISED:	09/23/11	APPROVED BY:	DH 04/09/12	2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	2

I:\4295\4295B\Drawings-General\O&M-PIEZOMETERS AND STAFF GAUGES.dwg, 4/9/2012 11:39:34 AM

APPENDIX A

Example Monitoring Forms

Ash Pond Monitoring Form
Harding Street Generating Station
Indianapolis Power & Light Company
Indianapolis, Indiana

Date: _____

Personnel: _____

Piezometer	Coordinates		Top of Casing Elevation	Depth to Water from Top of Casing	Water Elevation
	Northing	Easting			
PZ1	-1,766.83	-2,240.19	714.07		
PZ2	-2,083.48	-2,874.57	714.36		
PZ3	-2,432.90	-2,402.14	713.16		
PZ4	-2,364.90	-1,402.34	714.40		
PZ5	-1,868.62	-1,487.58	714.02		
PZ6	-1,457.29	-1,040.96	688.21		
PZ7	-1,551.16	-334.00	684.72		
PZ8	-2,332.20	607.09	683.33		
PZ9	-3,324.72	593.33	682.95		
PZ10	-3,659.20	-59.51	682.56		
PZ11	-2,340.13	-571.82	684.49		

Staff Gauge Reading

Pond 1	
Pond 2	
Pond 2A	
Pond 2B	
Pond 3	
Pond 4	
Pond 4A	
Pond 4B	

APPENDIX B

Example Inspection Forms

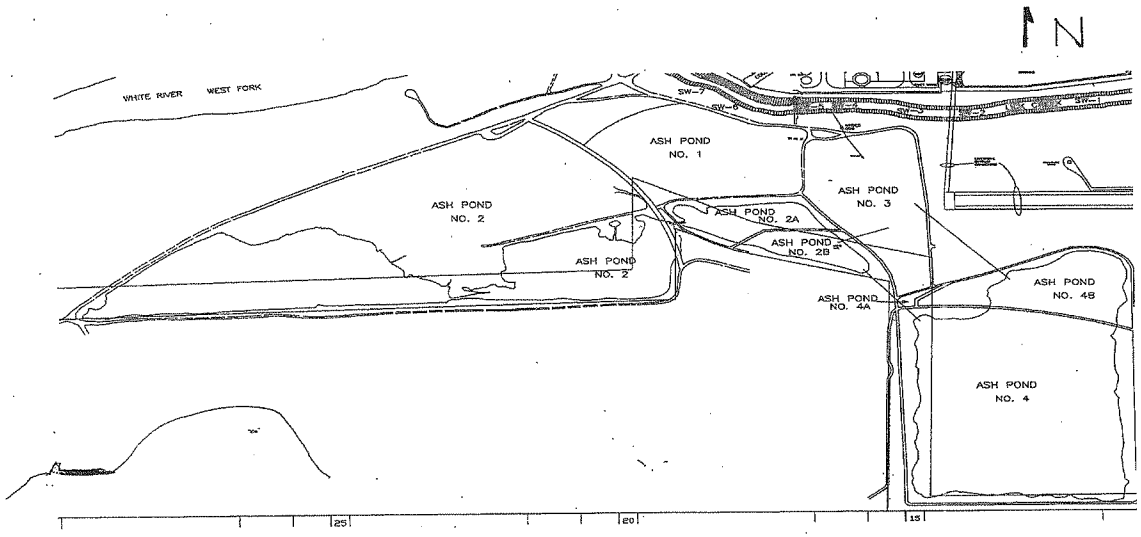
ASH POND(S) INSPECTION RECORD
HARDING STREET STATION

Date:_____ **Time:**_____

Ash Pond Description (Name/ID)	Erosion Along Crest or Embankment Slopes (Normal/ Abnormal)	Appearance of Sinkholes or Failure (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 (Normal/Abnormal)	Description of Current Operational Conditions (Normal/ Abnormal)	Initials Personnel
1								
2								
2A								
2B								
3								
4								
4A								
4B								

This record is completed following twice monthly ash pond inspections

NOTES:



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): **Indianapolis Power & Light Company**_____
Address: **4050 Blue Bluff Road**_____
City: **Martinsville**_____State **Indiana**____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

5) INSIDE SLOPE

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

None Monitor Maintenance Engineer

☐ **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

Required 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:_____

Required 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:_____

_____

{Inside Slope, Crest, **Outside Slope**, Outlet/Inlet Structures, Pond Drain}

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

Required 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:_____
_____

{Inside Slope, Crest, Outside Slope, Outlet/Inlet Structures, **Pond Drain**}

None Monitor Maintenance Engineer

Required Action

APPENDIX C

Example Maintenance Forms

Ash Pond Maintenance Form
Harding Street Generating Station
Indianapolis Power & Light Company
Indianapolis, Indiana

Date: _____

Personnel: _____

Maintenance Performed: _____

_____

_____

_____

_____

Reason for Maintenance: _____

_____

_____

_____

_____

Follow-up Inspection Required? _____

_____

_____

_____

_____

I:/4295/4295A/Reports/EV Maintenance Form.xls

APPENDIX D

Completed Forms

ATTACHMENT F

INTERCEPTOR SEWER DETAILS

Item	Title
1	Details of Southwest Interceptor Sewer in Vicinity of Harding Street Ash Ponds
2	Details of Southwest Interceptor Sewer in Vicinity of Harding Street Ash Ponds, Section B-B Looking Northeast

PRIVILEGED & CONFIDENTIAL - PREPARED AT REQUEST OF COUNSEL

N

One inch = 200 feet

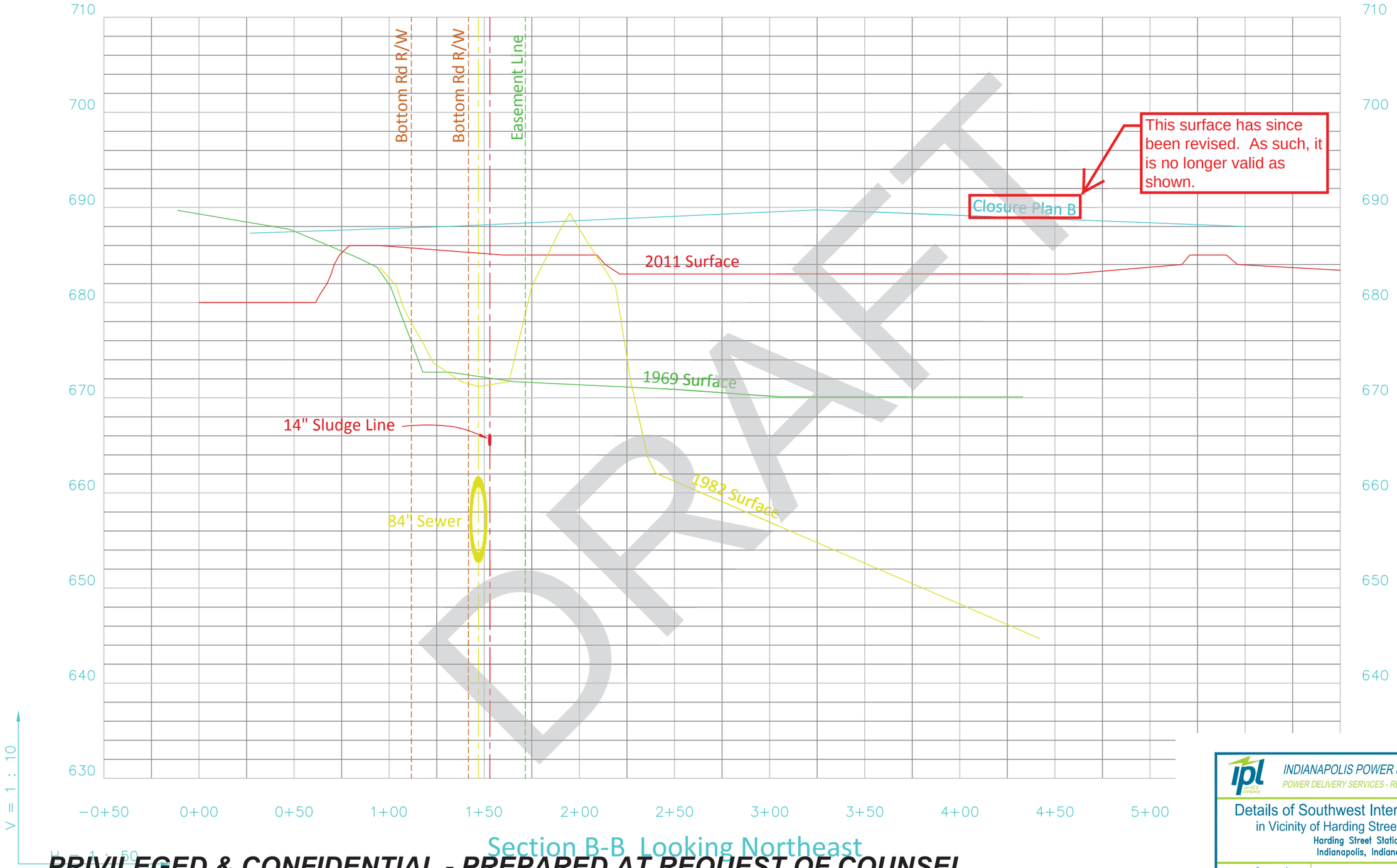
100 0 200 500

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

Details of Southwest Interceptor Sewer
in Vicinity of Harding Street Ash Ponds
Harding Street Station
Indianapolis, Indiana

SCALE: 1" = 200'	SHEET 1 OF 1	MAP:
BY: WAL	DATE: 12:39pm, May 09, 2016	

FILE: L:\DWG\WAL\Stout Interceptor Sewer Ease\Stout Interceptor Sewer Ease INCORS.dwg



Section B-B Looking Northeast

PRIVILEGED & CONFIDENTIAL - PREPARED AT REQUEST OF COUNSEL

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

Details of Southwest Interceptor Sewer
in Vicinity of Harding Street Ash Ponds
Harding Street Station
Indianapolis, Indiana

SCALE: 1" = 200'	SHEET 1 OF 1	MAP:
BY: WAL	DATE: 12:39pm, May 09, 2016	
FILE: L:\DWG\WAL\Stout Interceptor Sewer Ease\Stout Interceptor Sewer Ease INCORS.dwg		