



Submitted to
Southern Indiana
Gas & Electric Company
dba Vectren Power
Supply, Inc. (SIGECO)
One Vectren Square
Evansville, IN 47708

Submitted by
AECOM
9400 Amberglen Boulevard
Austin, Texas 78729

January 13, 2017

CCR Annual Inspection

§257.83 (b)

for the

East Ash Pond

at the

F. B. Culley Generating Station

Revision 0

January 13, 2017

Ms. Lisa Messinger
Vectren Corporation
One Vectren Square
Evansville, IN 47708**RE: CCR Annual Inspection Report for Vectren F.B. Culley Generating Station: East Ash Pond CCR Unit**

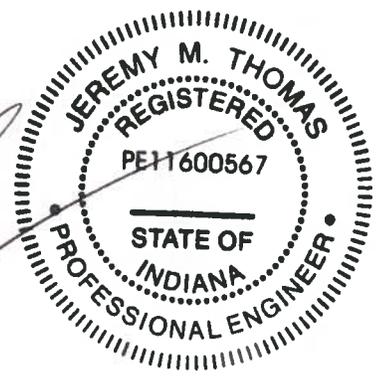
Dear Ms. Lisa Messinger:

AECOM is pleased to provide this CCR Annual Inspection Report for the East Ash Pond of the Vectren Coal Combustion Residuals (CCR) units at the F.B. Culley Generating Station located near Newburgh, Indiana.

The CCR Annual Inspection Report has been prepared in accordance with the requirements specified in the USEPA CCR Rule under 40 Code of Federal Regulations §257.83 (b) by a professional engineer licensed in the state of Indiana. These regulations require that the specified documentation and assessments for an existing CCR surface impoundment be prepared based on the timeframe of the initial annual inspection. The previous annual inspection was submitted on January 14, 2016, therefore, this annual inspection should be placed in the plant operating record within one year of that date.

AECOM looks forward to providing continued support to Vectren and working together on this important program. Please do not hesitate to call Terry Entwistle at 314-503-128 (cell) or Jeremy Thomas at 920-236-6724 (work), if you have any questions or comments on this CCR Annual Inspection Report.

Sincerely,

AECOMTeresa L Entwistle, PE, CFM
Senior Project Manager
terry.entwistle@aecom.com
Jeremy Thomas, PE
Project Manager
jeremy.thomas@aecom.com

1-13-17

cc: Julie Harkin
Mark Rokoff

Table of Contents

Executive Summary..... 1

1 Introduction..... 1-1

 1.1 Purpose of this Report 1-1

 1.2 Brief Description of Impoundment..... 1-1

2 Annual Inspection Description..... 2-1

 2.1 Annual Inspection 2-1

 2.1.1 Review of Available Information 2-1

 2.1.2 Visual Inspection 2-1

 2.2 Content of the Inspection Report 2-2

 2.3 Frequency of Inspections 2-3

 2.4 Deficiency Identified..... 2-4

 2.4.1 Previous Inspection 2-4

 2.4.2 Current Inspection 2-5

3 Limitations..... 3-1

Tables

Table ES-1 Summary

Table 1-1 CCR Rule Cross Reference Table

Table 2-1 Depth and Elevation of Impounded Water

Table 2-2 Areas of Concern (Inspected: December 3, 2015)

Table 2-3 Areas of Concern (Inspected: December 8, 2016)

Appendices

Appendix A Figures

 Figure 1 – Location Map

 Figure 2 – Site Map

 Figure 3 – Inspection Site Plan

Executive Summary

This Coal Combustion Residuals (CCR) Annual Inspection for the East Ash Pond at the Southern Indiana Gas & Electric Company dba Vectren Power Supply, Inc., F. B. Culley Generating Station has been prepared in accordance with the requirements specified in the USEPA CCR Rule under 40 Code of Federal Regulations §257.83 (b). These regulations require that the specified documentation and assessments for an existing CCR surface impoundment be prepared by January 13, 2017.

This Inspection for the East Ash Pond meets the regulatory requirements as summarized in **Table ES-1**.

Table ES-1 – Summary				
Report Section	CCR Rule Reference	Requirement Summary	Requirement Met?	Comments
2.1	§257.83 (b)(1)	<i>Annual Inspection</i>	Yes	The CCR Unit has met the annual inspection requirements
2.2	§257.83 (b)(2)	<i>Inspection Report</i>	Yes	The CCR Unit has met the inspection report requirements
2.3	§257.83 (b)(4)	<i>Frequency of Inspections</i>	Yes	The CCR Unit has met the required frequency of inspections
2.4	§257.83 (b)(5)	<i>Deficiency Identified</i>	Yes	Remedial actions and measures have been identified for all noted deficiencies

The Culley East Ash Pond is currently an active surface impoundment. All inspection requirements were evaluated and the surface impoundment was found to meet all requirements as required within each individual assessment in §257.83 (b).

1 Introduction

1.1 Purpose of this Report

The purpose of the Annual Inspection presented in this report is to document that the requirements specified in 40 Code of Federal Regulations (CFR) §257.83 (b) have been met to support the requirement under each of the applicable regulatory provisions for the F. B. Culley Generating Station (Culley) East Ash Pond. The Culley East Ash Pond is an existing coal combustion residual (CCR) surface impoundment as defined by 40 CFR §257.53. The CCR Rule requires that the inspection for an existing CCR surface impoundment be prepared by January 13, 2017.

The following table summarizes the documentation required within the CCR Rule and the sections that specifically respond to those requirements of this assessment.

Report Section	Title	CCR Rule Reference
2.1	Annual Inspection	§257.83 (b)(1)
2.2	Inspection Report	§257.83 (b)(2)
2.3	Frequency of Inspections	§257.83 (b)(4)
2.4	Deficiency Identified	§257.83 (b)(5)

1.2 Brief Description of Impoundment

The Culley station is located in Warrick County, Indiana, southeast of Newburgh, Indiana, and is owned and operated by Southern Indiana Gas and Electric Company, dba Vectren Power Supply Inc. (SIGECO). The Culley station is located along the north bank of the Ohio River and the west bank of the Little Pigeon Creek along the southeast portion of the site. Culley has two CCR surface impoundments, identified as the West Ash Pond and the East Ash Pond. Only the East Ash Pond is actively receiving CCR materials. The East Ash Pond is located directly east of the station and is approximately 10 acres in size.

The East Ash Pond was commissioned in or around 1971. Earthen embankments were constructed along the south and east sides of the impoundment. Structural fill used for the original construction of the Culley station in the 1950's borders the impoundment to the west side, and west end of the north side. The east embankment intersects a natural hillside on the east end of the north side of the impoundment. The embankment is approximately 1,200 feet long, 30 feet high, and has 2.4 to 1 (horizontal to vertical) exterior side slopes covered with trees and other undergrowth vegetation. Interior side slopes varied from 2.5 to 1 (horizontal to vertical) to 2 to 1 (horizontal to vertical) for the upper and lower portion of the embankment, respectively. The embankment crest elevation varies from 392.67 feet¹ to 396.42 feet and has a crest width of approximately 15 feet. The surface

¹ Unless otherwise noted, all elevations in this report are in the NAVD88 datum.

area of the impoundment is approximately 9.8 acres. Within the pond, there are several small pools that are being utilized for treatment and separation of CCR material. The ponding water has a surface area of approximately 7 acres and has normal operating level of 386 feet.

A site Location Map showing the area surrounding the station is included as **Figure 1 of Appendix A. Figure 2 in Appendix A** presents the Culley Site Map.

2 Annual Inspection Description

Regulatory Citation: 40 CFR §257.83 Inspection requirements for CCR surface impoundments

The Annual Inspection for the East Ash Pond is described in this section. Information about operational and maintenance procedures was provided by Culley plant personnel. The Culley station follows an established maintenance program that quickly identifies and resolves issues of concern.

2.1 Annual Inspection

Regulatory Citation: 40 CFR §257.83 (b) Annual inspections by a qualified professional engineer;

- *(1) If the existing or new CCR surface impoundment or any lateral expansion of the CCR surface impoundment is subject to the periodic structural stability assessment requirements under §257.73 (d) or §257.74 (d), the CCR unit must additionally be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards.*

The East Ash Pond is subject to the periodic structural stability assessment requirements as mentioned. Thus, the following items were performed to comply with the CCR Rule.

2.1.1 Review of Available Information

Regulatory Citation: 40 CFR §257.83 (b)(1);

- *(i) A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., CCR unit design and construction information required by §257.73 (c)(1) and §257.74 (c)(1), previous periodic structural stability assessments required under §257.73 (d) and §257.74 (d), the results of inspections by a qualified person, and results of previous annual inspections).*

The available information was reviewed for the East Ash Pond, including the weekly inspections by plant personnel and the initial CCR Rule annual inspection performed by ATC Group Services LLC on December 3, 2015.

2.1.2 Visual Inspection

Regulatory Citation: 40 CFR §257.83 (b)(1);

- *(ii) A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit and appurtenant structures.*

The East Ash Pond was visually inspected by AECOM on December 8, 2016. No major signs of distress or malfunction of the CCR unit and appurtenant structures were identified. A few minor maintenance issues are listed under section 2.4.2.

Regulatory Citation: 40 CFR §257.83 (b)(1);

- *(iii) A visual inspection of any hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit for structural integrity and continued safe and reliable operation.*

There are no active hydraulic structures underlying the base or passing through the dike of the CCR unit of the East Ash Pond. A riser spillway was present in the southeast portion of the East Ash Pond which had discharged to Little Pigeon Creek but was previously plugged with concrete and abandoned. There was no seepage observed on the outer slope of the embankment in the area opposite the previous spillway. Therefore, no signs of structural deficiencies were identified during the visual inspection on December 8, 2016.

2.2 Content of the Inspection Report

Regulatory Citation: 40 CFR §257.83 (b)(2) Inspection report. The qualified professional engineer must prepare a report following each inspection that addresses the following:

- *(i) Any changes in geometry of the impounding structure since the previous annual inspection.*

The geometry of the impounding structure has not changed since the previous annual inspection.

- *(ii) The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection.*

There is no automated instrumentation at this impoundment. Readings were observed via a staff gage located within the surface impoundment.

- *(iii) The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection.*

The required information is presented in Table 2.2 below. The minimum and maximum water depths were calculated based on the yearly minimum and maximum water elevation readings provided by Culley plant personnel. The depth was calculated by subtracting elevation of the base of the impoundment (obtained from the original bathymetric survey) from the water surface elevation.

Table 2-1 – Depth and Elevation of Impounded Water

	Minimum		Maximum		Present	
	Depth (ft)	Elev (ft)	Depth (ft)	Elev (ft)	Depth (ft)	Elev (ft)
Impounded Water	2.4	378.4	10.2	386.2	4.7	380.7

CCR depths range from 0 feet to approximately 60 feet. The minimum CCR depth occurs along the perimeter of the impoundment. The maximum CCR depth occurs at the center of the splitter dike within the impoundment..

- *(iv) The storage capacity of the impounding structure at the time of the inspection.*

The storage capacity of the impounding structure is approximately 543,000 CY.

- (v) *The approximate volume of the impounded water and CCR at the time of the inspection.*

The approximate volume of impounded water and CCR material for the East Ash Pond are 30,000 CY and 365,000 CY respectively.

- (vi) *Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit and appurtenant structures.*

The visual inspection performed on December 8, 2016 did not reveal any actual or potential structural weaknesses. However, a minor maintenance issue is listed under section 2.4.2.

- (vii) *Any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection.*

There were no changes which might have affected the stability or operation of the impounding structure since the previous annual inspection.

2.3 Frequency of Inspections

Regulatory Citation: 40 CFR §257.83 (b)(4);

- (i) *Except as provided for in paragraph (b)(4)(ii) of this section, the owner or operator of the CCR unit must conduct the inspection required by paragraphs (b)(1) and (2) of this section on an annual basis. The date of completing the initial inspection report is the basis for establishing the deadline to complete the first subsequent inspection. Any required inspection may be conducted prior to the required deadline provided the owner or operator places the completed inspection report into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing subsequent inspection reports is based on the date of completing the previous inspection report. For purposes of this section, the owner or operator has completed an inspection when the inspection report has been placed in the facility's operating record as required by §257.105 (g)(6).*

The annual inspection report was submitted to SIGECO on January 13, 2017.

- (ii) *In any calendar year in which both the periodic inspection by a qualified professional engineer and the quinquennial (occurring every five years) structural stability assessment by a qualified professional engineer required by §257.73 (d) and §257.74 (d) are required to be completed, the annual inspection is not required, provided the structural stability assessment is completed during the calendar year. If the annual inspection is not conducted in a year as provided by this paragraph (b)(4)(ii), the deadline for completing the next annual inspection is one year from the date of completing the quinquennial structural stability assessment.*

The quinquennial structural stability assessment is not required for this year as it was completed October 2016. Thus, an annual inspection report was submitted to SIGECO as stipulated in §257.83 (b)(4)(i).

2.4 Deficiency Identified

Regulatory Citation: 40 CFR §257.83 (b)(5);

- *If a deficiency or release is identified during an inspection, the owner or operator must remedy the deficiency or release as soon as feasible and prepare documentation detailing the corrective measures taken.*

Areas of concern from previous inspections were reviewed and described below in section 2.4.1. Areas of concern from this year's inspection are described in section 2.4.2.

2.4.1 Previous Inspection

Six areas of concern were noted during the initial annual inspection performed on December 3, 2015. Corrective measures were completed to meet the requirements of §257.83 (b)(5) for each deficiency or observation identified as shown in the table below.

Table 2-2 – Areas of Concern (Inspected: December 3, 2015)	
Deficiency/Observation	Corrective Measure Used
Minor erosion at crest's edge and pipe discharge outlet into the pond along the west berm. Possible rodent activity on downstream slope of south embankment.	Eroded areas were filled and rodent control methods were established.
Trees and concrete debris on downstream slope of south embankment.	<p>The concrete debris was removed from the downstream slope.</p> <p>The vegetation height requirement was remanded by the U.S. Court of Appeals on June 14, 2016. The downstream slope will be addressed once the replacement rule is issued by EPA and revised requirements are established. Concrete debris has been removed.</p> <p>During the period from the initial annual inspection, an analysis was performed to determine the best management practice in regards to the referenced vegetation. The majority of the trees on the downstream slope of the embankment are at the toe and no seepage was observed in this area. No visual evidence was observed of stability concerns (ie., sloughing, depressions, erosion, etc.) Based on these observations and the size and extent of the trees, AECOM believes removing these trees at this time would result in significant disturbance to the unit, could destabilize the embankment and could promote excessive erosion during high rainfall events. It is our opinion that the trees are currently necessary for stabilization of the embankment and are better left in place.</p>

<p>Downstream slopes of south and east embankment appear to be steeper than original design.</p>	<p>The suitability of the slope steepness is documented in the 2016 Safety Factor Assessment.</p>
<p>Accumulated exposed ash, normal pool height, and condition of the west berm could affect ability to handle design storm event. The west embankment that separates the plant and the ash pond is made of a permeable gravel material. This could pose a risk if the peak water surface of the inflow design storm reaches the west berm elevation.</p>	<p>A portion of the accumulated ash was removed and the normal operating pool level was lowered to gain storm retention capacity as documented in the 2016 Inflow Design Report. The Inflow Design Report also confirms that an emergency spillway is not required due to the lowered operating level. The peak water surface elevation (+/-391 feet) of the inflow design storm is lower than the toe of the granular material of the west berm (varies from 392 to 393 feet). Therefore, the pervious condition of the upper portion of the berm does not pose the risk of potential seepage or erosion issues due to the inflow design storm.</p>
<p>Conveyor equipment on downstream slope of north embankment.</p>	<p>The conveyor equipment has been removed.</p>
<p>Area near abandoned and plugged spillway should be inspected. No controlled outlet for the pond if the pumping system fails during a storm event.</p>	<p>The 2016 Inflow Design Report confirms an emergency spillway is not required to meet the design storm event. Area is part of normal weekly inspection.</p>

2.4.2 Current Inspection

One area of concern was noted during the annual inspection performed on December 8, 2016. Corrective measures have been proposed to meet the requirements of §257.83 (b)(5) for each deficiency or observation identified as shown in the table below.

<p>Table 2-3 – Areas of Concern (Inspected: December 8, 2016)</p>	
<p>Deficiency/Observation</p>	<p>Proposed Corrective Measure</p>
<p>Currently, there is construction activity along the south embankment of the pond. The gravel access road on the embankment crest has been disturbed due to construction in this area and needs replacement.</p>	<p>Once construction activities are complete, install gravel access road along portion of the south embankment crest to complete road around perimeter of pond.</p>

3 Limitations

Background information, design basis, and other data which AECOM has used in preparation of this report have been furnished to AECOM by SIGECO. AECOM has relied on this information as furnished, and is not responsible for the accuracy of this information. Our recommendations are based on available information from previous and current investigations. These recommendations may be updated as future investigations are performed.

The conclusions presented in this report are intended only for the purpose, site location, and project indicated. The recommendations presented in this report should not be used for other projects or purposes. Conclusions or recommendations made from these data by others are their responsibility. The conclusions and recommendations are based on AECOM's understanding of current plant operations, maintenance, stormwater handling, and ash handling procedures at the station, as provided by SIGECO. Changes in any of these operations or procedures may invalidate the findings in this report until AECOM has had the opportunity to review the findings, and revise the report if necessary.

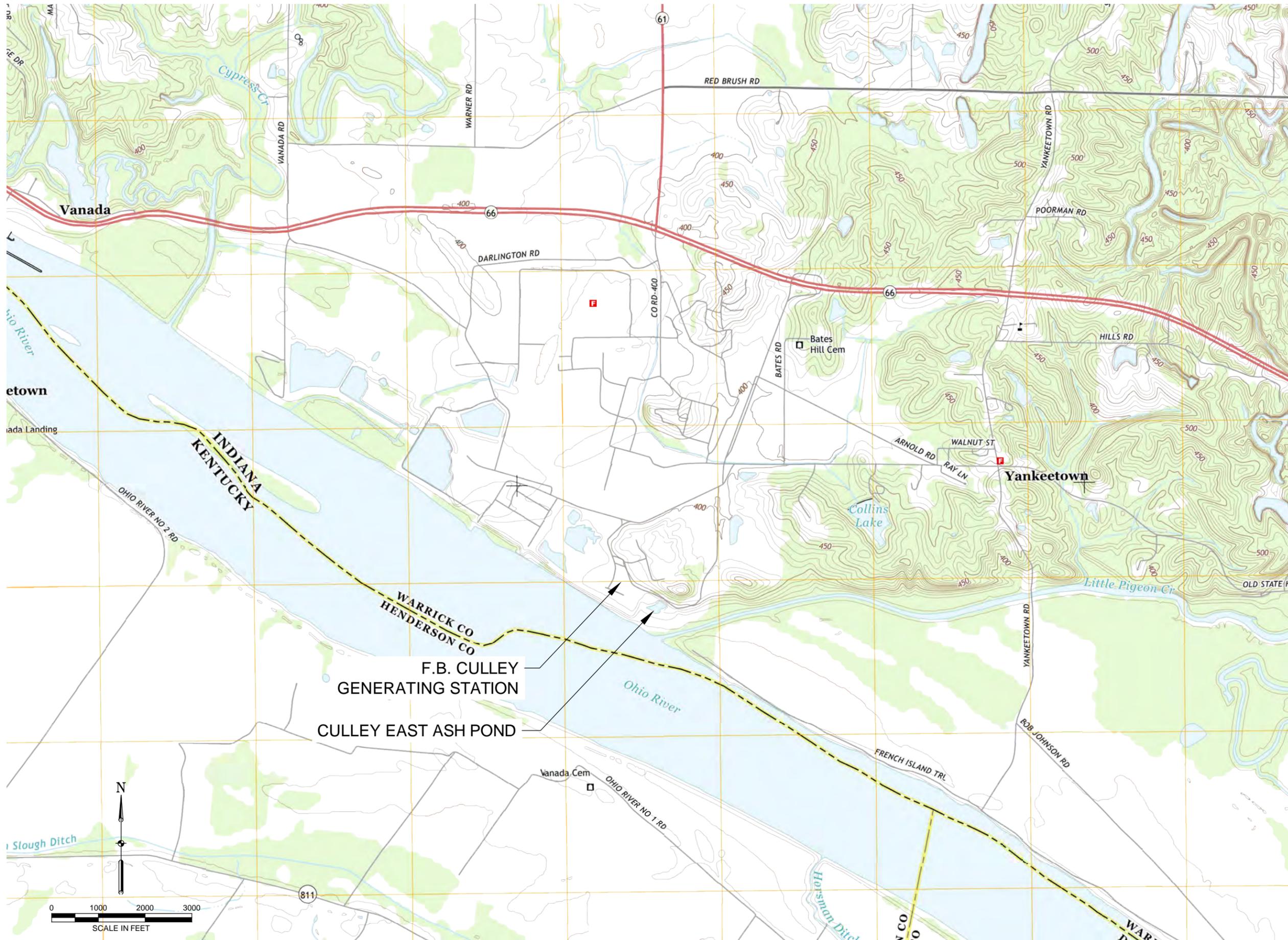
This development of the Annual Inspection was performed in accordance with the standard of care commonly used as state-of-practice in our profession. Specifically, our services have been performed in accordance with accepted principles and practices of the engineering profession. The conclusions presented in this report are professional opinions based on the indicated project criteria and data available at the time this report was prepared. Our services were provided in a manner consistent with the level of care and skill ordinarily exercised by other professional consultants under similar circumstances. No other representation is intended.

Appendix A Figures

Figure 1 – Location Map

Figure 2 – Site Map

Figure 3 – Inspection Site Plan



9400 Amberglenn Boulevard
 Austin, TX 78729-1100
 512-454-4797 (phone)
 512-454-8807 (fax)

**SOUTHERN INDIANA
 GAS AND ELECTRIC
 COMPANY**
 dba VECTREN POWER
 SUPPLY, INC.

One Vectren Square
 Evansville, IN 47708
 1-800-227-1376 (phone)

**F.B. CULLEY
 GENERATING STATION
 NEWBURGH, IN**

**CCR ANNUAL
 INSPECTION
 EAST ASH POND**

**PRELIMINARY
 NOT FOR
 CONSTRUCTION**

ISSUED FOR BIDDING _____ DATE BY _____

ISSUED FOR CONSTRUCTION _____ DATE BY _____

REVISIONS

NO.	DESCRIPTION	DATE
△		
△		
△		
△		
△		

AECOM PROJECT NO:	60442676
DRAWN BY:	MJC
DESIGNED BY:	MJC
CHECKED BY:	TLE
DATE CREATED:	01/10/2017
PLOT DATE:	1/12/2017
SCALE:	1" = 1000'
ACAD VER:	2014

SHEET TITLE

LOCATION MAP

FIGURE 1





9400 Amberglen Boulevard
Austin, TX 78729-1100
512-454-4797 (phone)
512-454-8807 (fax)

SOUTHERN INDIANA
GAS AND ELECTRIC
COMPANY
dba VECTREN POWER
SUPPLY, INC.

One Vectren Square
Evansville, IN 47708
1-800-227-1376 (phone)

F.B. CULLEY
GENERATING STATION
NEWBURGH, IN

CCR ANNUAL
INSPECTION
EAST ASH POND

PRELIMINARY
NOT FOR
CONSTRUCTION

ISSUED FOR BIDDING _____ DATE BY _____

ISSUED FOR CONSTRUCTION _____ DATE BY _____

REVISIONS

NO.	DESCRIPTION	DATE
△		
△		
△		
△		
△		

AECOM PROJECT NO:	60442676
DRAWN BY:	MJC
DESIGNED BY:	MJC
CHECKED BY:	TLE
DATE CREATED:	01/10/2017
PLOT DATE:	1/12/2017
SCALE:	1" = 200'
ACAD VER:	2014

SHEET TITLE

SITE MAP

FIGURE 2

CARUSO, MICHAEL, 1/12/2017 8:33 AM

P:\Projects\Environmental\60442676_VectrenCCR7.0_CAD_GIS\7.04_Plan_Sheets\CULLEY\ANNUAL INSPECTION PLAN.dwg
DRAWING PATH: AECOM



9400 Amberglen Boulevard
Austin, TX 78729-1100
512-454-4797 (phone)
512-454-8807 (fax)

**SOUTHERN INDIANA
GAS AND ELECTRIC
COMPANY**
dba VECTREN POWER
SUPPLY, INC.

One Vectren Square
Evansville, IN 47708
1-800-227-1376 (phone)

**F.B. CULLEY
GENERATING STATION
NEWBURGH, IN**

**CCR ANNUAL
INSPECTION
EAST ASH POND**

**PRELIMINARY
NOT FOR
CONSTRUCTION**

ISSUED FOR BIDDING _____ DATE BY _____

ISSUED FOR CONSTRUCTION _____ DATE BY _____

REVISIONS

NO.	DESCRIPTION	DATE
△		
△		
△		
△		
△		

AECOM PROJECT NO: 60442676

DRAWN BY: MJC

DESIGNED BY: MJC

CHECKED BY: TLE

DATE CREATED: 01/10/2017

PLOT DATE: 1/12/2017

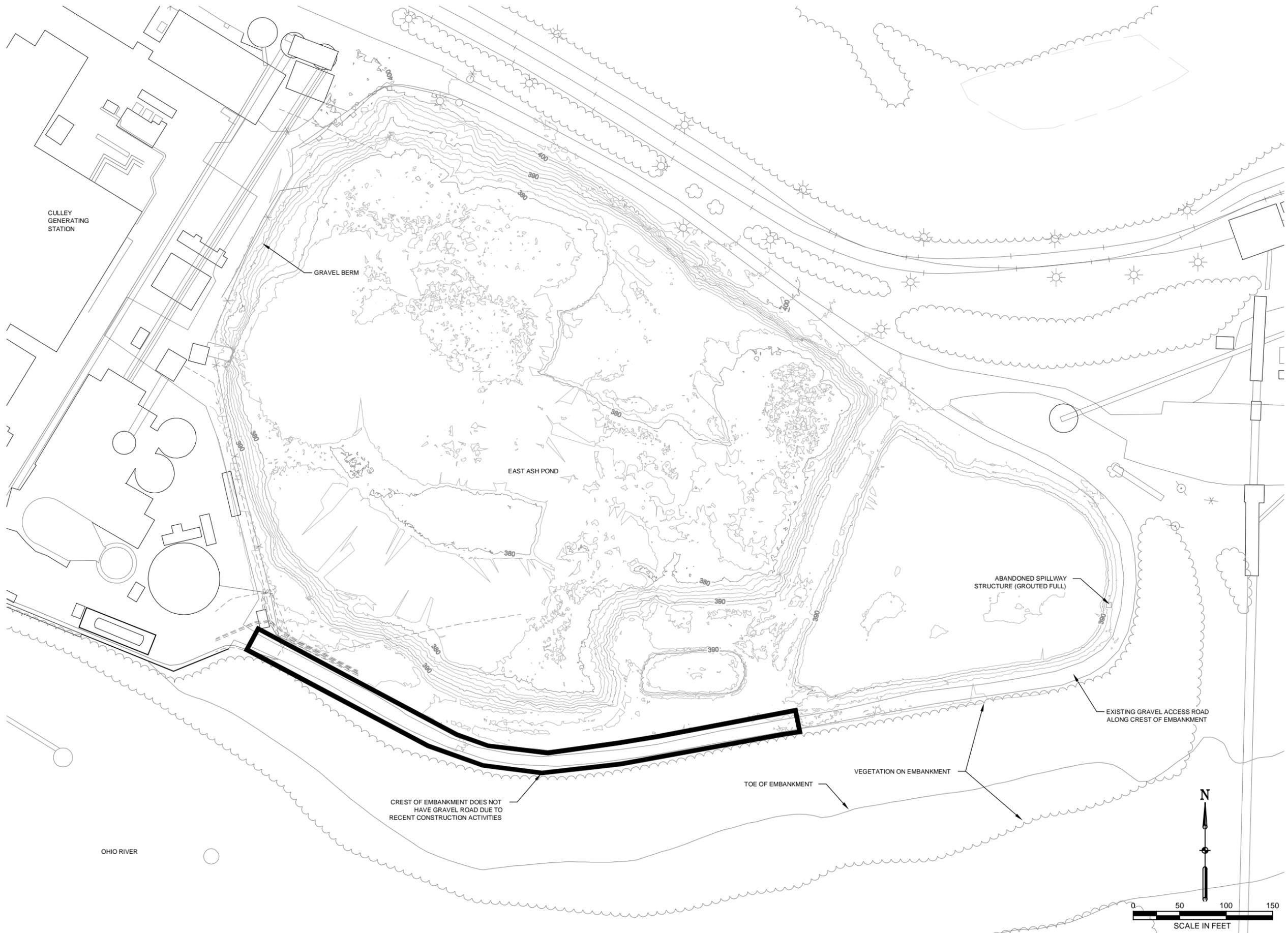
SCALE: 1" = 50'

ACAD VER: 2014

SHEET TITLE

INSPECTION SITE PLAN

FIGURE 3



9400 Amberglen Boulevard
Austin, Texas 78729
1-512-454-4797

About AECOM

AECOM (NYSE: ACM) is a global provider of professional technical and management support services to a broad range of markets, including transportation, facilities, environmental, energy, water and government. With approximately 45,000 employees around the world, AECOM is a leader in all of the key markets that it serves. AECOM provides a blend of global reach, local knowledge, innovation, and collaborative technical excellence in delivering solutions that enhance and sustain the world's built, natural, and social environments. A Fortune 500 company, AECOM serves clients in more than 100 countries and has annual revenue in excess of \$6 billion.