



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

Submitted by
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January 11, 2019

CCR Annual Inspection

§257.83 (b)

for the

Ash Pond

at the

A.B. Brown Generating Station

Revision 0

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Executive Summary

This Coal Combustion Residuals (CCR) Annual Inspection for the Ash Pond at the Southern Indiana Gas & Electric Company dba Vectren Power Supply, Inc., A.B. Brown 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 within one year of the placement of the previous inspection report in the facility's operating record. The previous inspection report was placed in the facility's operating record on January 11, 2018; accordingly, the deadline for completing this inspection report is January 11, 2019.

This Inspection for the 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 Brown 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 A.B. Brown Generating Station (Brown) Ash Pond. The Brown Ash Pond is an existing coal combustion residual (CCR) surface impoundment as defined by 40 CFR §257.53. As previously noted, the CCR Rule requires that the specified documentation and assessments for an existing CCR surface impoundment be prepared within one year of the placement of the previous inspection report in the facility's operating record. The previous inspection report was placed in the facility's operating record on January 11, 2018; accordingly, the deadline for completing this inspection report is January 11, 2019.

The Brown station has an interconnected existing CCR surface impoundment, the Ash Pond, which consists of a lower pool and an upper pool. The following table summarizes the documentation required within the CCR Rule and the sections that specifically respond to those requirements of this assessment.

Table 1-1 – CCR Rule Cross Reference Table

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 Brown station is a coal-fired power plant located approximately 10 miles east of Mount Vernon in Posey County, Indiana and is owned and operated by Southern Indiana Gas & Electric Company, dba Vectren Power Supply, Inc. (SIGECO). The Brown station is situated just west of the Vanderburgh-Posey County line and north of the Ohio River with the Ash Pond positioned on the east side of the generating station.

The Ash Pond was commissioned in 1978. An earthen dam was constructed across an existing valley to create the impoundment. In 2003, a second dam was constructed east of the original dam and further up the valley to increase the storage capacity. This temporarily created an upper pond and a lower pond. The upper and lower ponds were operated separately until 2016 when the upper dam was decommissioned. A 10-foot wide breach was installed in the upper embankment and the normal pool elevation was lowered. Currently, the upper pool and the lower pool act as one CCR unit referred to as the Ash Pond, which has a surface area of approximately 159 acres.

The lower pool dam embankment is approximately 1,540 feet long, 30 feet high, and has 3 to 1 (horizontal to vertical) side slopes covered with grassy vegetation. The embankment crest elevation is 450.9 feet¹ and has a crest width of 20 feet. An earthen buttress was constructed against the outboard slope of the dam. The buttress crest extends the length of the dam, is up to 200 feet wide and varies in elevation from 442 feet to 432 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 Brown Site Map.

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

2 Annual Inspection Description

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

The Annual Inspection for the Ash Pond is described in this section. Information about operational and maintenance procedures was provided by Brown plant personnel. The Brown 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 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 Ash Pond, including the weekly inspections by plant personnel and the previous CCR Rule annual inspection performed by AECOM on November 29, 2017.

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 Ash Pond was visually inspected by AECOM on December 5, 2018. 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.*

The exposed elements of the hydraulic structures underlying the base or passing through the dike of the CCR unit of the Ash Pond were visually inspected for structural integrity on December 5, 2018.

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.*

Plant personnel obtain water surface elevation data for the Ash Pond using an ultrasonic level indicator. Maximum recorded readings are provided in Table 2-1 below.

- *(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 2-1 below. The minimum and maximum water depths were calculated based on the yearly minimum and maximum water elevation readings provided by Brown plant personnel. The depth was calculated by subtracting the elevation of the base of the impoundment (Elev. 406 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	35.18	441.18	38.09	444.09	35.43	441.43

CCR depths range from 0 feet to approximately 62 feet. The minimum CCR depth occurs along the perimeter of the impoundment. The maximum CCR depth occurs at the center of the base of the impoundment embankment. The elevation at the top of CCR material at this location is approximately elevation 441.00 feet.

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

The storage capacity of the impounding structure is approximately 5,790,000 CY. The storage capacity of the lower pool is 2,640,000 CY. The storage capacity of the upper pool is 3,150,000 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 Ash Pond are 213,000 CY and 5,760,000 CY, respectively.²

- *(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 5, 2018 did not reveal any actual or potential structural weaknesses. However, a few minor maintenance issues are 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 other 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 11, 2019.

- *(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);

² The volume of impounded water was calculated by comparing the current elevation of impounded water to the bathymetrical contours, surveyed on August 17, 2015).

- *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

Five areas of minor concern were noted during the previous annual inspection performed on November 29, 2017. 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: November 29, 2017)

Deficiency/Observation	Corrective Measure Used
Animal burrows were present at the exterior edge of the buttress along the top of the outer slope. See attached plan for locations.	The animal burrows have been filled and regraded. Additional burrows have developed since the last inspection as noted in the current inspection table.
Silt was observed in the primary spillway's concrete flared end section at the toe of the embankment.	Silt was removed. Insignificant amounts of silt are again present.
Erosion was observed where the concrete mats tie into the embankment on the north end of the buttress.	Eroded areas have been covered with "concrete cloth" to protect against erosion.
Erosion was observed at the toe of the embankment adjacent to the coal pile area. The coal pile encroaches upon the swale causing erosion along the toe of the embankment. This erosion has also caused two non-operational drainage pipes to be exposed above ground surface in addition to minimal ponding water.	The Coal Pile has been moved away from the toe of embankment, and eroded areas have been mostly regraded and reseeded. Minor erosion remains as noted in the current inspection table.
Sparse vegetation and erosion rills were observed in areas of the buttress's exterior slope. See attached plan for locations.	Vectren installed a surface water diversion system at the top of the buttress slope to significantly reduce the extent of surface water running down the exterior slope of the buttress. This has resulted in a significant reduction in erosion problems. Eroded areas have been mostly regraded and reseeded. Some minor erosion rills have developed since the last inspection.

2.4.2 Current Inspection

Four minor areas of concern were noted during the annual inspection performed on December 5, 2018. 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.

Table 3-3 – Areas of Concern (Inspected: December 5, 2018)

Deficiency/Observation	Proposed Corrective Measure
Animal burrows were present at the exterior edge of the buttress along the middle of the outer slope. See attached plan for locations.	Fill with compacted soil and regrade as necessary. Regraded areas shall be seeded with vegetation.
Moderate erosion exists around the end of the surface water diversion outlet pipe at the northern toe of the buttress.	Fill with compacted soil and regrade as necessary.
Sparse vegetation and erosion rills were observed in areas of the buttress's exterior slope. See attached plan for locations.	Reseed and stabilize these areas.
Minor erosion was observed at the toe of the embankment adjacent to the coal pile area. The erosion has caused minor ponding of water between the toe of embankment and the coal pile.	Regrade and reseed eroded areas. Continue to maintain positive drainage along the swale towards the outfall.

3 Certification

This Certification Statement documents that the annual inspection has been completed for the Ash Pond at the A.B. Brown Generating Station and this inspection report meets the requirements specified in 40 CFR §257.83 (b). The Ash Pond is an active CCR surface impoundment as defined by 40 CFR §257.53.

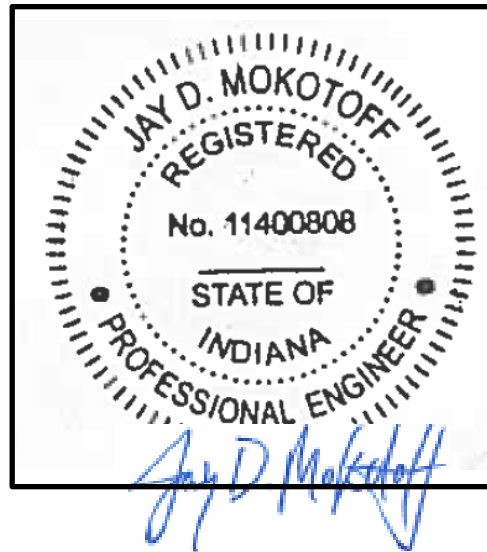
In accordance with the CCR rule, the deadline for completing the annual inspection for the active CCR surface impoundments and placing the report in the operating record is one year from the previous inspection report submittal date of January 11, 2018.

CCR Unit: Southern Indiana Gas & Electric Company; A.B. Brown Generating Station; Ash Pond

I, Jay Mokotoff, being a Registered Professional Engineer in good standing in the State of Indiana, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above referenced CCR Unit, that the annual inspection dated January 11, 2019 meets the requirements of 40 CFR §257.83 (b).

Jay D. Mokotoff
Printed Name

1-11-19
Date



4 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

AECOM DRAWING PATH: G:\Cleveland\DCS\Projects\Vectren Corporation\60442676_FB_Culley\400-Technical\470-Reports and Documents\Pond Inspections\Culley_East & ABBrown Annual Pond Inspection_2018\ABB_Pond Inspection\DWGs\BROWN-LOCATION MAP\BROWNING_DREW_12/20/2018 5:19 PM



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**A.B. BROWN
GENERATING STATION
MT. VERNON, IN**

**CCR ANNUAL
INSPECTION
ASH POND**

**ISSUED FOR
CERTIFICATION**

ISSUED FOR BIDDING _____ DATE BY _____

ISSUED FOR CONSTRUCTION _____ DATE BY _____

REVISIONS

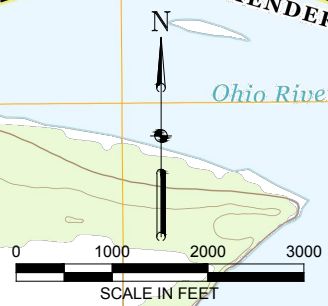
NO.	DESCRIPTION	DATE
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DRAWN BY:	AG
DESIGNED BY:	AG
CHECKED BY:	MJC
DATE CREATED:	12/07/2017
PLOT DATE:	12/20/2018
SCALE:	1" = 1000'
ACAD VER:	2014

SHEET TITLE

LOCATION MAP

FIGURE 1



AECOM DRAWING PATH: G:\Cleveland\DCS\Projects\Vectren Corporation\60442676_FB_Culley\400-Technical\470-Reports and Documents\Pond Inspections\Culley_East & ABrown Annual Pond Inspection_2018\ABB Pond Inspection\DWG's\BROWN-SITE MAP.dwg BROWNING, DREW, 12/20/2018 5:28 PM



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**A.B. BROWN
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 MT. VERNON, IN**

**CCR ANNUAL
 INSPECTION
 ASH POND**

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 CERTIFICATION**

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ISSUED FOR CONSTRUCTION _____ DATE BY _____

REVISIONS

NO.	DESCRIPTION	DATE
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△		
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AECOM PROJECT NO: 60442676

DRAWN BY: AG

DESIGNED BY: AG

CHECKED BY: MJC

DATE CREATED: 12/08/2017

PLOT DATE: 12/14/2018

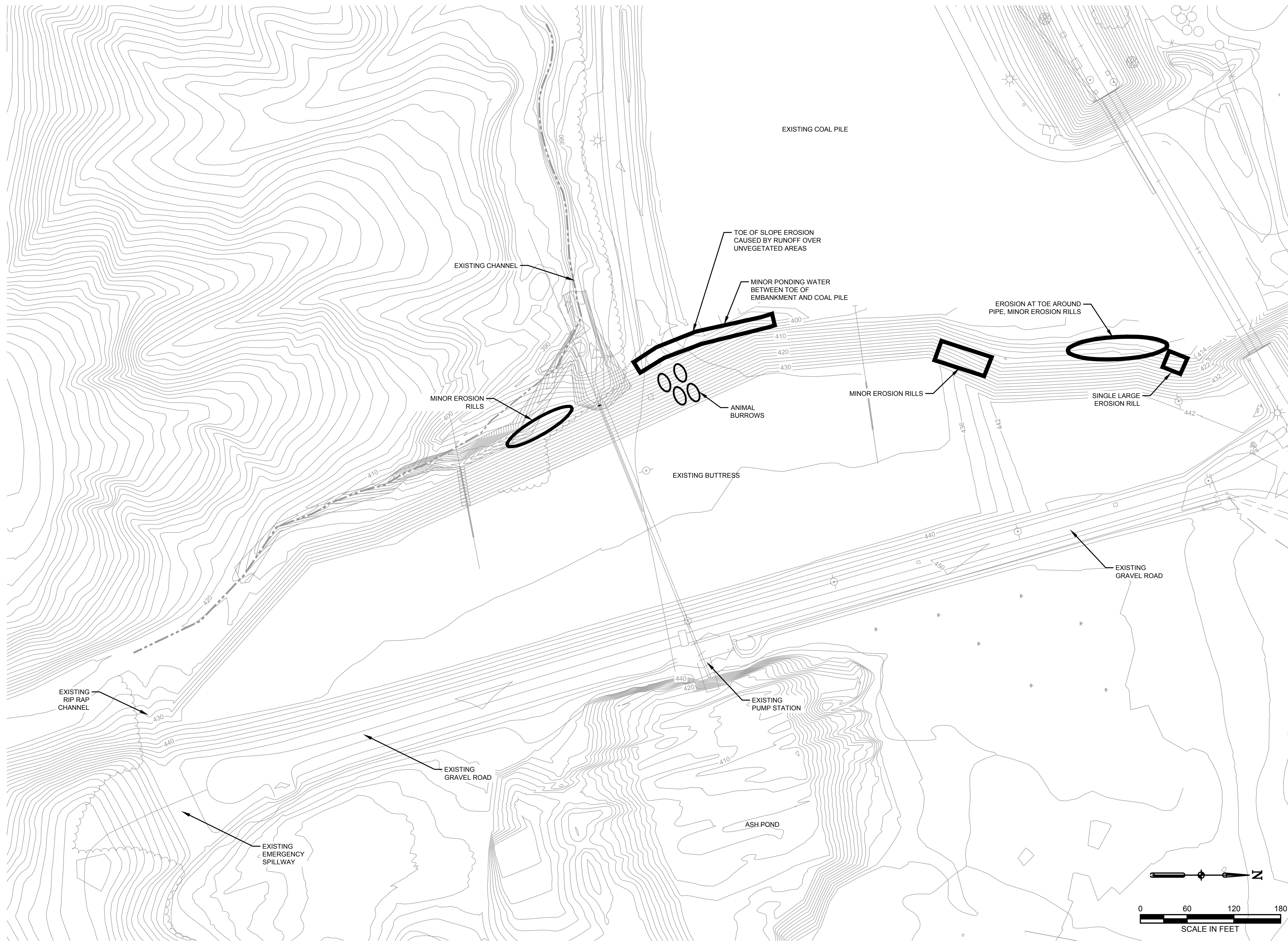
SCALE: AS SHOWN

ACAD VER: 2017

SHEET TITLE

SITE MAP

FIGURE 2



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ASH POND**

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ISSUED FOR CONSTRUCTION _____ DATE BY _____

REVISIONS

NO.	DESCRIPTION	DATE
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AECOM PROJECT NO: 60583533

DRAWN BY: DMB

DESIGNED BY: DMB

CHECKED BY: JDM

DATE CREATED: 12/14/2018

PLOT DATE: 12/14/2018

SCALE: 1" = 60'

ACAD VER: 2017

SHEET TITLE

INSPECTION SITE PLAN

FIGURE 3

9400 Amberglen Boulevard
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About AECOM

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