## **Closure Plan**

# **Closed CCR Surface Impoundment**

40 CFR 257.102(b) Revision 5

# **Asbury Power Plant**

21133 Uphill Road Asbury, Missouri 64832

October 17, 2016 Revised June 13, 2023

# **Prepared For:**

The Empire District Electric Company, A Liberty Utilities Company 602 S. Joplin Avenue Joplin, Missouri 64801





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#### 1.0 INTRODUCTION

257.102 Criteria for conducting the closure or retrofit of CCR units. (a) Closure of a CCR landfill, CCR surface impoundment, or any lateral expansion of a CCR unit must be completed either by leaving the CCR in place and installing a final cover system or through removal of the CCR and decontamination of the CCR unit, as described in paragraphs (b) through (j) of this section. Retrofit of a CCR surface impoundment must be completed in accordance with the requirements in paragraph (k) of this section.

40 CFR 257.102(b) of the Final Rule on Disposal of Coal Combustion Residuals from Electric Utilities (CCR Rule) requires the development of written closure plan for CCR surface impoundment. The Empire District Electric Company's Asbury Power Plant (Asbury) has one CCR Surface Impoundment. The site occupies the north half of Section 17, Township 30 North, and Range 33 West on the Asbury 7.5-Minute Quadrangle Map as seen in **Figure 1**. The impoundment was closed by leaving CCR in place.

The closure plan has been amended to reflect final closure of the facility and the use of ClosureTurf as the final cover system. Final Closure of the CCR Surface Impoundment was completed January 23, 2023.

#### 2.0 PLAN CERTIFICATION 257.102(b)(4)

The undersigned Professional Engineer (P.E.) is familiar with the requirements of 40 CFR Part 257. The attached CCR closure plan for the existing CCR Surface Impoundment at the Asbury Power Plant has been prepared in accordance with the requirements of 257.102(b).

OF MIS

Signature:

Name:

indsey R. Henry

Date:

June 13, 2023

Registration Number: E-21592

State: Missouri



#### 3.0 WRITTEN CLOSURE PLAN

257.102(b) Written closure plan (1) Content of the plan. The owner or operator of a CCR unit must prepare a written closure plan that describes the steps necessary to close the CCR unit at any point during the active life of the CCR unit consistent with recognized and generally accepted good engineering practices. The written closure plan must include, at a minimum, the information specified in paragraphs (b)(1)(i) through (vi) of this section.

This closure plan is being prepared in accordance with 257.102(b) to outline the steps necessary to close the CCR Surface Impoundment at the Asbury Power Plant. This plan has been prepared in accordance with generally accepted good engineering practices.

#### 3.1 Narrative

257.102(b)(1)(i) A narrative description of how the CCR unit will be closed in accordance with this section.

The CCR Surface Impoundment that served the Asbury Power Plant is approximately 107.55 acres. The CCR Impoundment was subdivided into three (3) operational Ponds, identified as the Lower Pond, Upper Pond, and South Pond. The Lower Pond, Upper Pond, and South Pond were separated by interior earthen berms, and could be hydraulically separated from one another for operational purposes. The CCR Surface Impoundment was closed by leaving the CCR in place. The date of final closure was January 23, 2023.

Free liquids were removed to the extent possible, and the existing CCR materials were sufficiently stabilized to support the placement of the final fill and final cover system. Any discharge was discharged through a NPDES permitted outfall. This discharge was in compliance with the current NPDES permit. The CCR materials were graded to provide positive drainage of stormwater. A final cover system was installed to minimize infiltration and erosion. Additional information is presented in Section 3.3 below.

#### 3.2 CCR Left in Place

257.102(b)(1)(iii) If closure of the CCR unit will be accomplished by leaving CCR in place, a description of the final cover system, designed in accordance with paragraph (d) of this section, and the methods and procedures to be used to install the final cover. The closure plan must also discuss how the final cover system will achieve the performance standards specified in paragraph (d) of this section.

The CCR was placed and graded to provide positive drainage of stormwater. The final cover system was designed and constructed to meet the criteria in paragraphs 257.102(d)(3)(i). The integrity of the final cover system was designed to accommodate settling and subsidence. The final cover system for the CCR Surface Impoundment was in compliance with 40 CFR 257.102(d)(3).

#### 3.3 Final Cover System

40 CFR 257.102(d)(3)(i) The final cover system must be designed and constructed to meet the criteria in paragraphs (d)(3)(i)(A) through (D) of this section. The design of the final cover system must be included in the written closure plan required by paragraph (b) of this section.



- (A) The permeability of the final cover system must be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than  $1 \times 10^{-5}$  cm/sec, whichever is less.
- (B) The infiltration of liquids through the closed CCR unit must be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material.
- (C) The erosion of the final cover system must be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth.
- (D) The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence.

40 CFR 257.102(d)(3)(ii) outlines the requirements should the facility choose to utilize an alternative final cover system. This regulation states:

The owner or operator may select an alternative final cover system design, provided the alternative final cover system is designed and constructed to meet the criteria in paragraphs (d)(3)(ii)(A) through (C) of this section. The design of the final cover system must be included in the written closure plan required by paragraph (b) of this section.

- (A) The design of the final cover system must include an infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in paragraphs (d)(3)(i)(A) and (B) of this section.
- (B) The design of the final cover system must include an erosion layer that provides equivalent protection from wind or water erosion as the erosion layer specified in paragraph (d)(3)(i)(C) of this section.
- (C) The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence.

In addition, 40 CFR 257.102(d)(3)(iii) requires an alternative cover system design to be certified by a professional engineer. This regulation states:

The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer that the design of the final cover system meets the requirements of this section.

Asbury chose to utilize an alternative final cover system. An Alternative Final Cover System Demonstration was completed December 21, 2021 for the Empire District Electric Company's CCR Surface Impoundment at the Asbury Power Plant. The Alternative Final Cover System Demonstration was completed in compliance with 40 CFR 257.102(d)(3)(ii) and certified by a professional engineer in compliance with 40 CFR 257.102(d)(3)(iii) of the EPA CCR Rule. This Demonstration was placed in the facility's operating record.

The chosen final cover system was the ClosureTurf system. ClosureTurf is a patented, three component system that is EPA Subtitle D compliant landfill that is specifically designed to address and solve soil erosion, slope integrity, installation and maintenance cost control, EPA regulation compliance, and longevity of structure and appearance. The anticipated design life of ClosureTurf is 100 years. ClosureTurf consists of the following components, top to bottom.



- Specialized sand infill
- Engineered artificial turf
- Flexible geomembrane liner (FML)
- Prepared CCR subgrade

#### 3.4 Maximum CCR Inventory

257.102(b)(1)(iv) An estimate of the maximum inventory of CCR ever on-site over the active life of the CCR unit.

The total amount of CCR that could be on site is estimated to be 2,523,500 cubic yards. This estimate is thought to be very conservative. Over the life of the power plant CCR has been sold to other contractors for beneficial use.

#### 3.5 Maximum CCR Area

257.102(b)(1)(v) An estimate of the largest area of the CCR unit ever requiring a final cover as required by paragraph (d) of this section at any time during the CCR unit's active life.

The total area of the CCR Surface Impoundment that serves the Asbury Power Plant is approximately 106.4 acres. The CCR Surface Impoundment required the placement of a final cover system since this area will be closed by leaving the CCR in place.

#### 3.6 Schedule

257.102(b)(1)(vi) A schedule for completing all activities necessary to satisfy the closure criteria in this section, including an estimate of the year in which all closure activities for the CCR unit will be completed. The schedule should provide sufficient information to describe the sequential steps that will be taken to close the CCR unit, including identification of major milestones such as coordinating with and obtaining necessary approvals and permits from other agencies, the dewatering and stabilization phases of CCR surface impoundment closure, or installation of the final cover system, and the estimated timeframes to complete each step or phase of CCR unit closure. When preparing the written closure plan, if the owner or operator of a CCR unit estimates that the time required to complete closure will exceed the timeframes specified in paragraph (f)(1) of this section, the written closure plan must include the site-specific information, factors and considerations that would support any time extension sought under paragraph (f)(2) of this section.

Below is a discussion of the milestones of the closure of the CCR Surface Impoundment.

Milestones Required For the Closure of the CCR Surface Impoundment			
Milestone	Date		
Written Closure Plan placed on webpage	October 17, 2016		
Meet with MDNR to Discuss Specific Closure Requirements	December 2016		
Obtain Topographic Mapping for Site	April 11, 2017		
	October 17, 2018		
Complete Location Restriction Demonstration	Amended January 27, 2021		
Retirement of Asbury Power Plant	March 1, 2020		



Obtain Updated Topographic Mapping for Site	May 20, 2020
Cease Placing CCR in Surface Impoundment	April 11,2021
Notification of Intent to Close CCR Surface Impoundment	April 1, 2021
Commence Closure Activities	May 11, 2021
Pre-Bid Conference	April 13, 2022
Pre-Construction Conference	June 3, 2022
Construction Mobilization	June 6, 2023
Complete Final Cover Placement January 23, 2023	
Begin Post-Closure Care	January 24, 2023

#### **4.0 NOTIFICATIONS**

257.102(b)(2)(iii) The owner or operator has completed the written closure plan when the plan, including the certification required by paragraph (b)(4) of this section, has been placed in the facility's operating record as required by  $\S$  257.105(i)(4).

Asbury posted the initial written closure plan to their website within 30 days of October 17, 2016. The final closure plan was most recently amended on June 13, 2023. The State Director was notified each time of the revision of this plan and subsequent placement on the website.

Asbury will post the amended written closure plan to their website within 30 days. In addition, the State Director will be notified of the completion of this amended plan and subsequent placement on the website.

257.102(g) No later than the date the owner or operator initiates closure of a CCR unit, the owner or operator must prepare a notification of intent to close a CCR unit. The notification must include the certification by a qualified professional engineer or the approval from the Participating State Director or the approval from EPA where EPA is the permitting authority for the design of the final cover system as required by § 257.102(d)(3)(iii), if applicable. The owner or operator has completed the notification when it has been placed in the facility's operating record as required by § 257.105(i)(7).

Asbury prepared a Notification of Intent to Close the CCR Surface Impoundments on April 1, 2021. A Notification of Closure of the CCR Surface Impoundment was completed on February 21, 2023. These certifications were prepared by a qualified professional engineer and placed in the facility's operating record as required by § 257.105(i)(7).

Asbury will prepare a Deed Notation to indicate that the CCR Surface Impoundment property has been used as a CCR Unit and its use is restricted under Post-Closure care requirements. A notification will be prepared stating that a Deed Notation has been recorded.

257.102(i)(3)

Within 30 days of recording a notation on the deed to the property, the owner or operator must prepare a notification stating that the notation has been recorded. The owner or operator has completed the notification when it has been placed in the facility's operating record as required by  $\S 257.105(i)(9)$ . by  $\S 257.102(f)(3)$ . The owner or operator has



completed the notification when it has been placed in the facility's operating record as required by § 257.105(i)(8).

#### **5.0 CLOSURE PLAN AMENDMENT**

257.102(b)(3) Amendment of a written closure plan.

- (i) The owner or operator may amend the initial or any subsequent written closure plan developed pursuant to paragraph (b)(1) of this section at any time.
- (ii) The owner or operator must amend the written closure plan whenever: (A) There is a change in the operation of the CCR unit that would substantially affect the written closure plan in effect; or (B) Before or after closure activities have commenced, unanticipated events necessitate a revision of the written closure plan.
- (iii) The owner or operator must amend the closure plan at least 60 days prior to a planned change in the operation of the facility or CCR unit, or no later than 60 days after an unanticipated event requires the need to revise an existing written closure plan. If a written closure plan is revised after closure activities have commenced for a CCR unit, the owner or operator must amend the current closure plan no later than 30 days following the triggering event.

The proposed closure plan may be amended as required to provide a revised closure plan or a revised closure schedule. This amended closure plan should be posted to the website and the State Director shall be notified of the placement of the amended closure plan on the website. The closure plan has been amended to reflect the rule changes included in the following amendments to the CCR Rule: Amendments to the National Minimum Criteria (Phase One, Part One) to the CCR Rule; A Holistic Approach to Closure Part A: Deadline to Initiate Closure and Enhancing Public Access to Information; and A Holistic Approach to Closure Part B: Alternate Liner Demonstration.

#### **6.0 CERTIFICATION**

257.102(b)(4) The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer that the initial and any amendment of the written closure plan meets the requirements of this section.

The original closure plan was certified in Section 2.0 of that report. As required, any amendments to the original closure plan must also be certified by a qualified professional engineer. The amended closure plan has been certified in Section 2.0 of this report. Any further amendments to this amended closure plan must also be certified by a qualified professional engineer.

#### 7.0 AMENDMENTS

257.102(b)(3)(i) The owner or operator may amend the initial and any subsequent written closure plan developed pursuant to paragraph (b)(1) of this section at any time.



Asbury may amend the Closure Plan in the future as provided by 257.102(b)(3)(i). A record of all amendments to the plan will be tracked below:

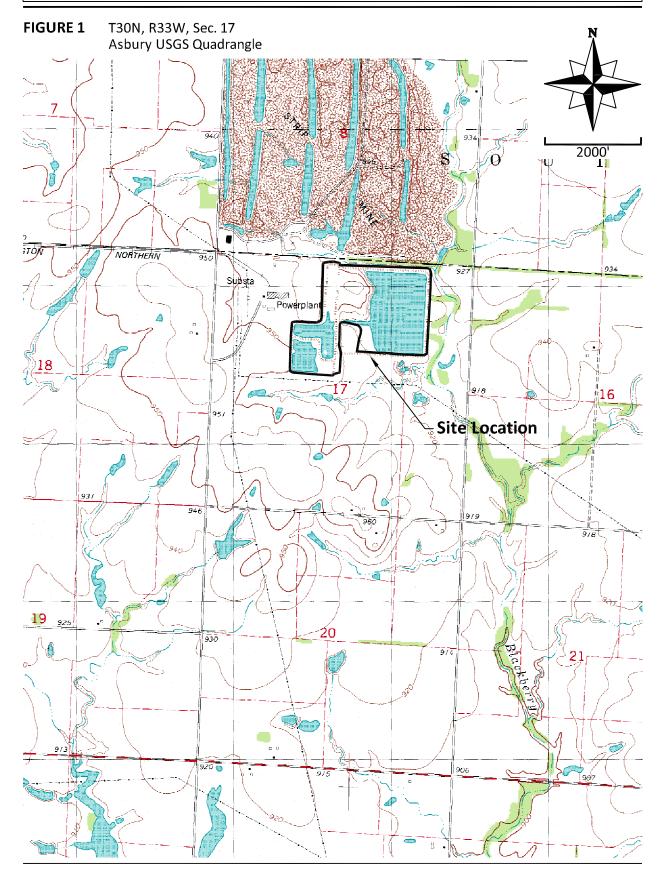
Closure Plan Amendments				
Revision Number	Date	Revisions	By whom	
0	10/17/2016	Initial Issuance	Midwest Environmental Consultants	
1	11/16/2018	Update Plan to reflect revisions of Phase One, Part One and the Location Restrictions Issued 10/17/2018	Midwest Environmental Consultants	
2	1/15/2021	Retirement of Asbury Power Plant and update to reflect revisions of A Holistic Approach to Closure Part A: Deadline to Initiate Closure and Enhancing Public Access to Information Issued 9/28/2020	Midwest Environmental Consultants	
3	3/22/2022	Updated Closure Schedule and the chosen final cover system	Midwest Environmental Consultants	
4	2/28/2023	Updated Closure Plan to reflect Completion of Final Cover Placement	Midwest Environmental Consultants	
5	6/13/2023	Updated Closure Plan to reflect as-built closure area	Midwest Environmental Consultants	

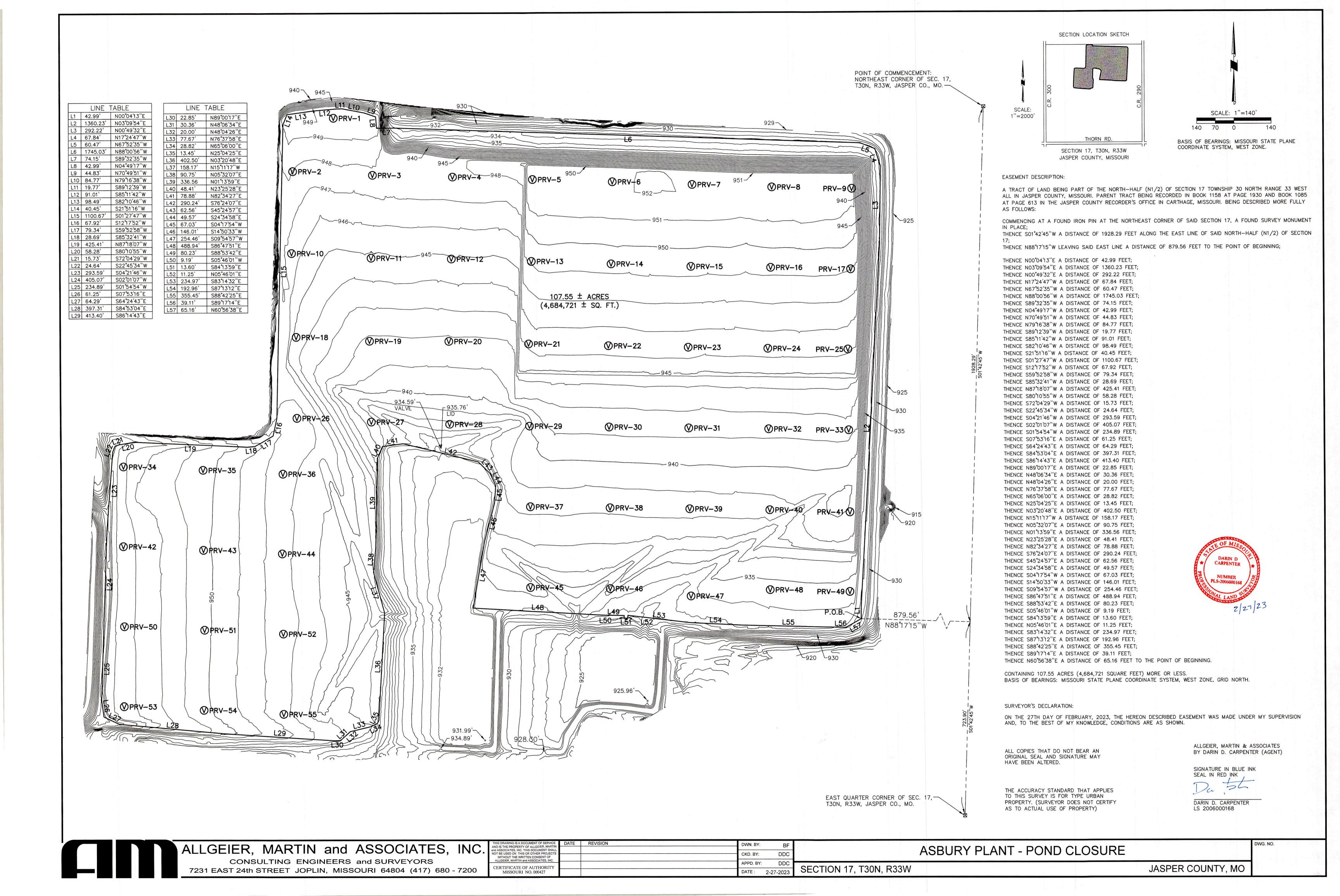


### **FIGURES**



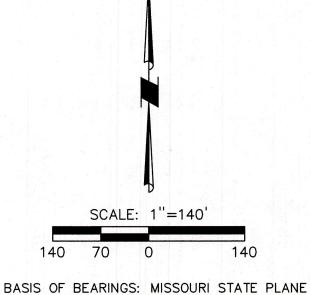
**Asbury Power Plant**Closure Plan - Closed CCR Surface Impoundment
Site Location Map







SECTION LOCATION SKETCH SCALE: 1"=2000



COORDINATE SYSTEM, WEST ZONE.

SECTION 17, T30N, R33W JASPER COUNTY, MISSOURI

# EASEMENT DESCRIPTION:

A TRACT OF LAND BEING PART OF THE NORTH-HALF (N1/2) OF SECTION 17 TOWNSHIP 30 NORTH RANGE 33 WEST ALL IN JASPER COUNTY, MISSOURI. PARENT TRACT BEING RECORDED IN BOOK 1158 AT PAGE 1930 AND BOOK 1085 AT PAGE 613 IN THE JASPER COUNTY RECORDER'S OFFICE IN CARTHAGE, MISSOURI. BEING DESCRIBED MORE FULLY

COMMENCING AT A FOUND IRON PIN AT THE NORTHEAST CORNER OF SAID SECTION 17, A FOUND SURVEY MONUMENT THENCE SO1°42'45"W A DISTANCE OF 1928.29 FEET ALONG THE EAST LINE OF SAID NORTH-HALF (N1/2) OF SECTION

THENCE N88°17'15"W LEAVING SAID EAST LINE A DISTANCE OF 879.56 FEET TO THE POINT OF BEGINNING;

THENCE NOO°04'13"E A DISTANCE OF 42.99 FEET; THENCE NO3°09'54"E A DISTANCE OF 1360.23 FEET; THENCE NO0°49'32"E A DISTANCE OF 292.22 FEET; THENCE N17°24'47"W A DISTANCE OF 67.84 FEET; THENCE N67°52'35"W A DISTANCE OF 60.47 FEET; THENCE N88°00'56"W A DISTANCE OF 1745.03 FEET; THENCE S89°32'35"W A DISTANCE OF 74.15 FEET; THENCE NO4°49'17"W A DISTANCE OF 42.99 FEET; THENCE N70°49'51"W A DISTANCE OF 44.83 FEET; THENCE N79°16'38"W A DISTANCE OF 84.77 FEET; THENCE S89°12'39"W A DISTANCE OF 19.77 FEET; THENCE S85°11'42"W A DISTANCE OF 91.01 FEET; THENCE S82°10'46"W A DISTANCE OF 98.49 FEET; THENCE S21°51'16"W A DISTANCE OF 40.45 FEET; THENCE SO1°27'47"W A DISTANCE OF 1100.67 FEET; THENCE S12°17'52"W A DISTANCE OF 67.92 FEET; THENCE S59°52'58"W A DISTANCE OF 79.34 FEET; THENCE S85°32'41"W A DISTANCE OF 28.69 FEET; THENCE N87°18'07"W A DISTANCE OF 425.41 FEET; THENCE S80°10'55"W A DISTANCE OF 58.28 FEET; THENCE S72°04'29"W A DISTANCE OF 15.73 FEET; THENCE S22°45'34"W A DISTANCE OF 24.64 FEET; THENCE SO4°21'46"W A DISTANCE OF 293.59 FEET; THENCE SO2°01'07"W A DISTANCE OF 405.07 FEET; THENCE SO1°54'54"W A DISTANCE OF 234.89 FEET; THENCE SO7°53'16"E A DISTANCE OF 61.25 FEET; THENCE S64°24'43"E A DISTANCE OF 64.29 FEET; THENCE S84°53'04"E A DISTANCE OF 397.31 FEET; THENCE S86°14'43"E A DISTANCE OF 413.40 FEET; THENCE N89°00'17"E A DISTANCE OF 22.85 FEET; THENCE N48°06'34"E A DISTANCE OF 30.36 FEET; THENCE N48°04'26"E A DISTANCE OF 20.00 FEET; THENCE N76°37'58"E A DISTANCE OF 77.67 FEET; THENCE N65°06'00"E A DISTANCE OF 28.82 FEET; THENCE N25°04'25"E A DISTANCE OF 13.45 FEET; THENCE NO3°20'48"E A DISTANCE OF 402.50 FEET; THENCE N15°11'17"W A DISTANCE OF 158.17 FEET; THENCE NO5°32'07"E A DISTANCE OF 90.75 FEET; THENCE NO1°13'59"E A DISTANCE OF 336.56 FEET; THENCE N23°25'28"E A DISTANCE OF 48.41 FEET; THENCE N82°34'27"E A DISTANCE OF 78.88 FEET; THENCE S76°24'07"E A DISTANCE OF 290.24 FEET; THENCE S45°24'57"E A DISTANCE OF 62.56 FEET; THENCE S24°34'58"E A DISTANCE OF 49.57 FEET; THENCE SO4°17'54"W A DISTANCE OF 67.03 FEET; THENCE S14°50'33"W A DISTANCE OF 146.01 FEET; THENCE S09°54'57"W A DISTANCE OF 254.46 FEET; THENCE S86°47'51"E A DISTANCE OF 488.94 FEET; THENCE S88°53'42"E A DISTANCE OF 80.23 FEET; THENCE S05°46'01"W A DISTANCE OF 9.19 FEET; THENCE S84°13'59"E A DISTANCE OF 13.60 FEET; THENCE NO5°46'01"E A DISTANCE OF 11.25 FEET; THENCE S83°14'32"E A DISTANCE OF 234.97 FEET; THENCE S87°13'12"E A DISTANCE OF 192.96 FEET;



THENCE S89°17'14"E A DISTANCE OF 39.11 FEET; THENCE N60°56'38"E A DISTANCE OF 65.16 FEET TO THE POINT OF BEGINNING.

CONTAINING 107.55 ACRES (4,684,721 SQUARE FEET) MORE OR LESS. BASIS OF BEARINGS: MISSOURI STATE PLANE COORDINATE SYSTEM, WEST ZONE, GRID NORTH.

# SURVEYOR'S DECLARATION:

ON THE 27TH DAY OF FEBRUARY, 2023, THE HEREON DESCRIBED EASEMENT WAS MADE UNDER MY SUPERVISION AND, TO THE BEST OF MY KNOWLEDGE, CONDITIONS ARE AS SHOWN.

ALL COPIES THAT DO NOT BEAR AN ORIGINAL SEAL AND SIGNATURE MAY HAVE BEEN ALTERED.

THE ACCURACY STANDARD THAT APPLIES TO THIS SURVEY IS FOR TYPE URBAN PROPERTY. (SURVEYOR DOES NOT CERTIFY AS TO ACTUAL USE OF PROPERTY)

ALLGEIER, MARTIN & ASSOCIATES BY DARIN D. CARPENTER (AGENT)

SIGNATURE IN BLUE INK SEAL IN RED INK DARIN D. CARPENTER LS 2006000168

EAST QUARTER CORNER OF SEC. 17,-T30N, R33W, JASPER CO., MO.

SECTION 17, T30N, R33W

ALLGEIER, MARTIN and ASSOCIATES, INC.

CONSULTING ENGINEERS and SURVEYORS 7231 EAST 24th STREET JOPLIN, MISSOURI 64804 (417) 680 - 7200

CERTIFICATE OF AUTHORITY MISSOURI NO. 000427

DDC CKD. BY: APPD. BY:

ASBURY PLANT - POND CLOSURE

JASPER COUNTY, MO