



Liner Design Criteria Report Jeffrey Energy Center Inactive Bottom Ash Pond

Prepared for:
Westar Energy
Jeffrey Energy Center
St. Marys, Kansas

Prepared by:
APTIM Environmental & Infrastructure, Inc.

April 2018



TABLE OF CONTENTS

1.0 INTRODUCTION.....	1
2.0 POND OVERVIEW	2
3.0 LINER DESIGN CRITERIA.....	3
3.1 DETERMINATION OF CCR UNIT LINER SYSTEM(S) (§257.71(A)(1)).....	3
3.2 INFORMATION SOURCES REVIEWED	3
3.3 POND LINER INFORMATION (§257.71(A)(2))	3
3.4 LINER DESIGN CONCLUSIONS (§257.71(A)(3))	3
3.5 EXISTING UNLINED CCR SURFACE IMPOUNDMENT REQUIREMENTS (§257.71(A)(4))	4
4.0 RECORDS RETENTION AND MAINTENANCE (§257.71(C)).....	5
4.1 INCORPORATION OF REPORT INTO OPERATING RECORD.....	5
4.2 NOTIFICATION REQUIREMENTS	5
5.0 PROFESSIONAL ENGINEER CERTIFICATION (§257.71(B)).....	6

LIST OF FIGURES

FIGURES

Figure 1 – Inactive Bottom Ash Pond, Site Location Plan

Figure 2 – Inactive Bottom Ash Pond, Site Topography Prior to Closure

CCR Regulatory Requirements

USEPA CCR Rule Criteria 40 CFR §257.71	Jeffrey Energy Center (JEC) Liner Design Criteria Report – Inactive Bottom Ash Pond
<p>§257.71(a)(1) stipulates:</p> <p><i>“(a)(1) No later than October 17, 2016*, the owner or operator of an existing CCR surface impoundment must document whether or not such unit was constructed with any one of the following:</i></p> <p><i>(i) A liner consisting of a minimum of two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec;</i></p> <p><i>(ii) A composite liner that meets the requirements of §257.70(b); or</i></p> <p><i>(iii) An alternative composite liner that meets the requirements of §257.70(c).”</i></p> <p>*Note: §257.100(e)(3)(i) stipulates:</p> <p><i>“No later than April 17, 2018, complete the documentation of liner type as set forth by §257.71(a) and (b).”</i></p>	<p>Section 3.1</p>
<p>§257.71(a)(2) stipulates:</p> <p><i>“(2) The hydraulic conductivity of the compacted soil must be determined using recognized and generally accepted methods.”</i></p>	<p>Section 3.3</p>

USEPA CCR Rule Criteria 40 CFR §257.71	Jeffrey Energy Center (JEC) Liner Design Criteria Report – Inactive Bottom Ash Pond
<p>§257.71(a)(3) stipulates:</p> <p><i>“(3) An existing CCR surface impoundment is considered to be an existing unlined CCR surface impoundment if either:</i></p> <p><i>(i) The owner or operator of the CCR unit determines that the CCR unit is not constructed with a liner that meets the requirements of paragraphs (a)(1)(i), (ii), or (iii) of this section; or</i></p> <p><i>(ii) The owner or operator of the CCR unit fails to document whether the CCR unit was constructed with a liner that meets the requirements of paragraphs (a)(1)(i), (ii), or (iii) of this section.”</i></p>	Section 3.4
<p>§257.71(a)(4) stipulates:</p> <p><i>“(4) All existing unlined CCR surface impoundments are subject to the requirements of § 257.101(a).”</i></p>	Section 3.5
<p>§257.71(b) stipulates:</p> <p><i>“(b) The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer attesting that the documentation as to whether a CCR unit meets the requirements of paragraph (a) of this section is accurate.”</i></p>	Section 5.0
<p>§257.71(c) stipulates:</p> <p><i>“(c) The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in §257.105(f), the notification requirements specified in §257.106(f), and the Internet requirements specified in §257.107(f).”</i></p>	Section 4.0

1.0 INTRODUCTION

APTIM Environmental and Infrastructure, Inc. (APTIM, f/k/a CB&I Environmental & Infrastructure, Inc., CB&I) has prepared this Liner Design Criteria Report (Report) at the request of Westar Energy (Westar) for the inactive Bottom Ash Pond (Pond) located at Jeffrey Energy Center (JEC) in St. Marys, Kansas. JEC is a coal-fired power plant that has been in operation since 1980.

On July 26, 2016 the United States Environmental Protection Agency (USEPA) extended the requirements of the Disposal of Coal Combustion Residuals from Electric Utilities Final Rule (CCR Rule) 40 CFR §257 and §261, for certain inactive CCR surface impoundments. The Pond has been determined to be inactive by 40 CFR §257.53 and therefore has been deemed to be a regulated, inactive CCR unit by the USEPA through the CCR Rule. Westar is currently in the process of closing the Pond in-place in accordance with §257.100(d) of the CCR Rule and intends to complete closure of the Pond in 2018.

APTIM has reviewed the relevant portions of the facility's operating record, permit application, and design documents for completion of this Report. This Report meets the requirements set forth within 40 CFR §257.71 based on the review of available information and visual observation from previous annual inspections.

2.0 POND OVERVIEW

Westar owns and operates all waste management units at JEC in St. Marys, Pottawatomie County, Kansas. JEC is located approximately 4.5 miles north of Belvue, Kansas and approximately 4.3 miles west of Highway 63 and resides in Sections 1, 2, 11, and 12, Township 9 South, Range 11 East and Sections 6 and 7, Township 9 South, Range 12 East. The location of the Pond is depicted in **Figure 1**.

At JEC the Pond is located southeast of Fly Ash Area 1, north of the FGD Landfill, west of Bottom Ash Area 1, and east of the Tower Hill Lake. The Pond has a surface area of 72.1 acres and a normal operating pool of 1,164 feet mean seal level (ft MSL). Existing site topography is depicted in **Figure 2**.

A Type C fly ash berm and overflow was constructed in the 1990's to separate the Pond and Tower Hill Lake. In 2000 the berm was expanded by raising the embankment and adding an auxiliary spillway, and it was permitted (DPT-0160) as a dam (Pond Dam).

The Pond Dam is approximately 25-feet high, 1,050-feet long, with a 30-foot wide crest, approximate 3H:1V side slopes, and a crest elevation of 1,170 ft MSL. The open flow spillway serves as the outlet from the Pond to Tower Hill Lake and is approximately 450-feet long, 40-feet wide, with 3H:1V side slopes. It has a rock control crest at 1,165 ft MSL. The upstream side of the spillway is lined with a minimum of 1.5-foot thick layer of limestone riprap.

The Pond is currently dewatered and in the process of in-place closure in accordance with §257.100(d) of the CCR Rule with closure intended to be completed in 2018. The Pond has not received CCR material prior to October 2015. Historically the Pond received CCR material from the plant, stormwater runoff, decant water from Bottom Ash Area 1, and miscellaneous process water streams.

3.0 LINER DESIGN CRITERIA

In accordance with §257.71, the liner design criteria for the inactive Pond has been compiled from available information sources, evaluated for compliance, and is presented in the following subsections.

3.1 Determination of CCR Unit Liner System(s) (§257.71(a)(1))

The Pond has been determined to be an inactive CCR unit. For inactive CCR units, the type of liner must be documented by April 17, 2018, based on §257.100(e)(3)(i). It has been determined that the Pond has no engineered or constructed liner system in-place.

3.2 Information Sources Reviewed

APTIM performed a review of the following documentation sources relative to the Pond liner design/construction:

- Memorandum – Notification of Intent to Initiate Closure of an Inactive CCR Surface Impoundment, Bottom Ash Pond, Jeffrey Energy Center, Haley Aldrich, 2015.
- Annual Inspection Report, Jeffrey Energy Center, Inactive Unit – Bottom Ash Pond, CB&I Environmental & Infrastructure Inc., June 2017.
- History of Construction Report, Jeffrey Energy Center, Inactive Unit – Bottom Ash Pond, APTIM, 2017.

3.3 Pond Liner Information (§257.71(a)(2))

The Pond is characterized as a “cross-valley” impoundment. The Pond foundation and abutment materials primarily consists of the native underlying geologic materials, in ascending order, including: Roca Shale; Grenola Limestone; Eskridge Shale; and Beattie Limestone. The Pond construction does not include any engineered pond liner system. The Pond Dam, which separates the Pond from Tower Hill Lake, is constructed of a Type C fly ash material that separates the Pond and Tower Hill Lake.

Based on the review of the available construction history documentation for the inactive CCR Unit, the Pond was not constructed with an engineered liner system and therefore is considered to be an unlined pond. No information on the hydraulic conductivity was available for review, and therefore could not be verified for the Pond.

3.4 Liner Design Conclusions (§257.71(a)(3))

Based on a review of the Pond liner information, it can be concluded that the Pond does not meet the requirements of 40 CFR Part §257.71. The Rule states that existing CCR surface impoundments are considered unlined if *“the owner or operator of the CCR unit fails to document whether the CCR unit was constructed with a liner that meets the requirements of paragraphs (a)(1)(i), (ii) or (iii) of this section.”* The Pond is considered to be unlined.

3.5 Existing Unlined CCR Surface Impoundment Requirements (§257.71(a)(4))

According to §257.71(a)(4) of the Rule, existing unlined CCR surface impoundments are subject to the requirements in §257.101(a). This requires that if the concentrations of constituents in Appendix IV of the CCR Rule are detected at levels greater than the groundwater protection standard established under §257.95(h), the surface impoundment must cease accepting CCR and non-CCR wastestreams and either be retrofitted or closed in accordance with §257.102. However, the Pond has not received CCR material since October 2015 and is currently dewatered and undergoing closure in-place, which is anticipated to be completed in 2018.

4.0 RECORDS RETENTION AND MAINTENANCE (§257.71(c))

4.1 Incorporation of Report into Operating Record

§257.105(f) of 40 CFR Part §257 provides record keeping requirements to ensure that this Report will be placed in the Facility Operating Record. Specifically, §257.105(f) stipulates:

§257.105(f): “(f) Design criteria. The owner or operator of a CCR unit subject to this subpart must place the following information, as it becomes available, in the facility's operating record: (2) The documentation of liner type as required by §257.71(a).”

This Report will be placed within the Facility Operating Record upon Westar's review and approval.

4.2 Notification Requirements

§257.106(f) of 40 CFR Part §257 provides guidelines for the notification of the availability of the Report. Specifically, §257.106(f) stipulates:

§257.106(f): “(f) Design criteria. The owner or operator of a CCR unit subject to this subpart must notify the State Director and/or appropriate Tribal authority when information has been placed in the operating record and on the owner or operator's publicly accessible internet site. The owner or operator must: (3) Provide notification of the availability of the documentation of liner type specified under §257.105(f)(2).”

The State Director and appropriate Tribal Authority will be notified upon placement of this Report in the Facility Operating Record.

§257.107(f) of 40 CFR Part §257 provides publicly accessible Internet site requirements to ensure that this Report is accessible through the Westar webpage. Specifically, §257.107(f) stipulates:

§257.107(f): “(f) Design criteria. The owner or operator of a CCR unit subject to this subpart must place the following information on the owner or operator's CCR Web site: (3) The documentation of liner type specified under §257.105(f)(2).”

This Report will be uploaded to Westar's CCR Compliance Reporting Website upon Westar's review and approval.

5.0 PROFESSIONAL ENGINEER CERTIFICATION (§257.71(b))

The undersigned registered professional engineer is familiar with the requirements of the CCR Rule and examined JEC or has supervised examination of the JEC by appropriately qualified personnel. I hereby certify based on a review of available information within the facility's operating records, that the Pond does not meet the Liner Design Criteria. This certification was prepared as required by 40 CFR Part §257.71(b).

Name of Professional Engineer: Richard Southorn

Company: APTIM

Signature: 

Date: 04/13/18

PE Registration State: Kansas

PE Registration Number: PE25201

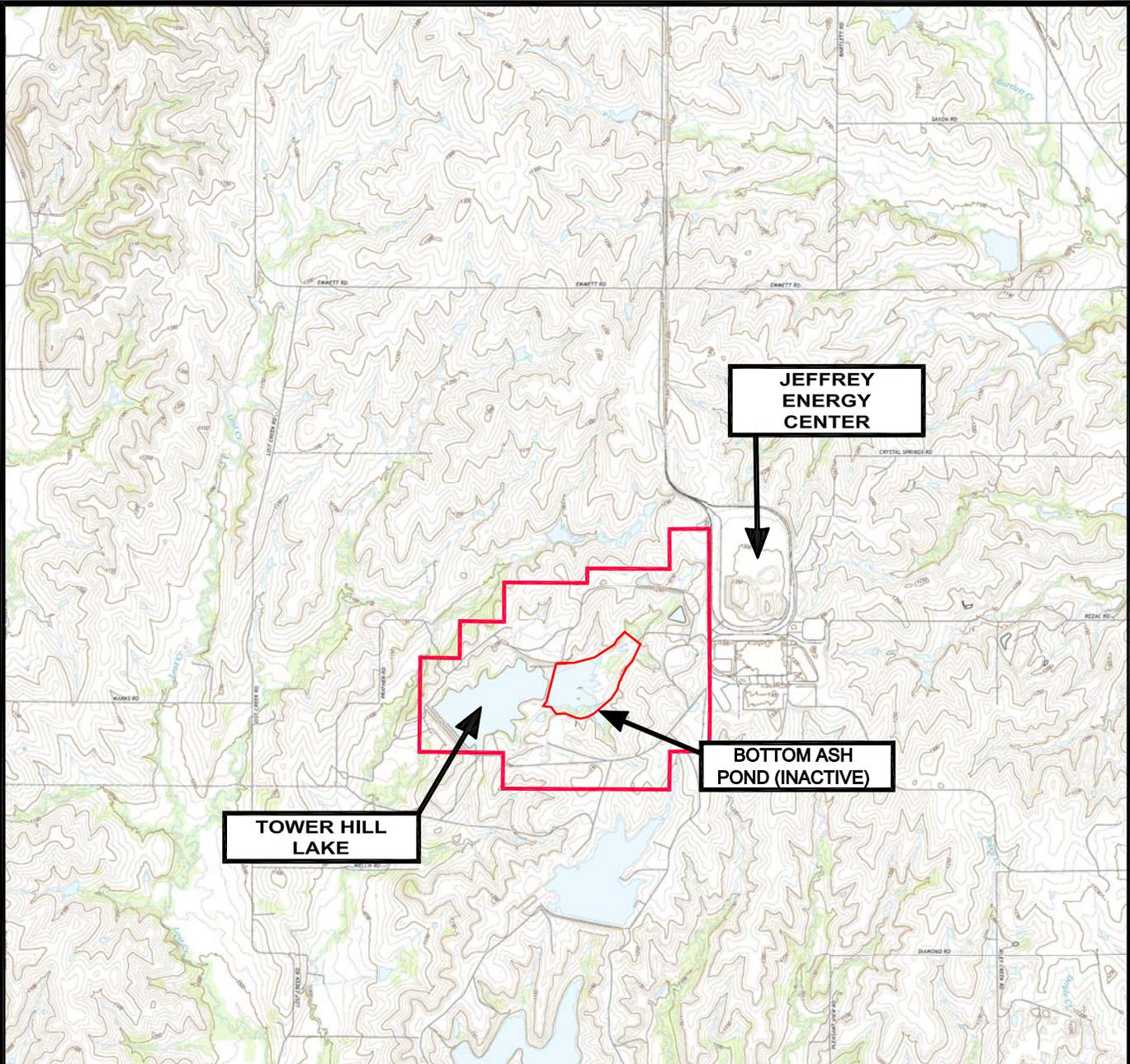
Professional Engineer Seal:



FIGURES

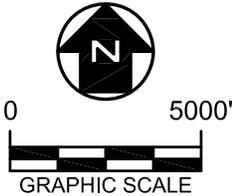
Figure 1 - Inactive Bottom Ash Pond, Site Location Plan

Figure 2 - Inactive Bottom Ash Pond, Site Topography Prior to Closure



LEGEND

 KDHE-BWM INDUSTRIAL LANDFILL PERMIT NO. 0359 BOUNDARY



NOTES

1. AERIAL TOPO OBTAINED FROM USGS 7.5-MINUTE SERIES, EMMETT AND LACLEDE QUADRANGLE, KANSAS, 2014.
2. ALL BOUNDARIES ARE APPROXIMATE.



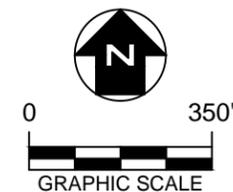
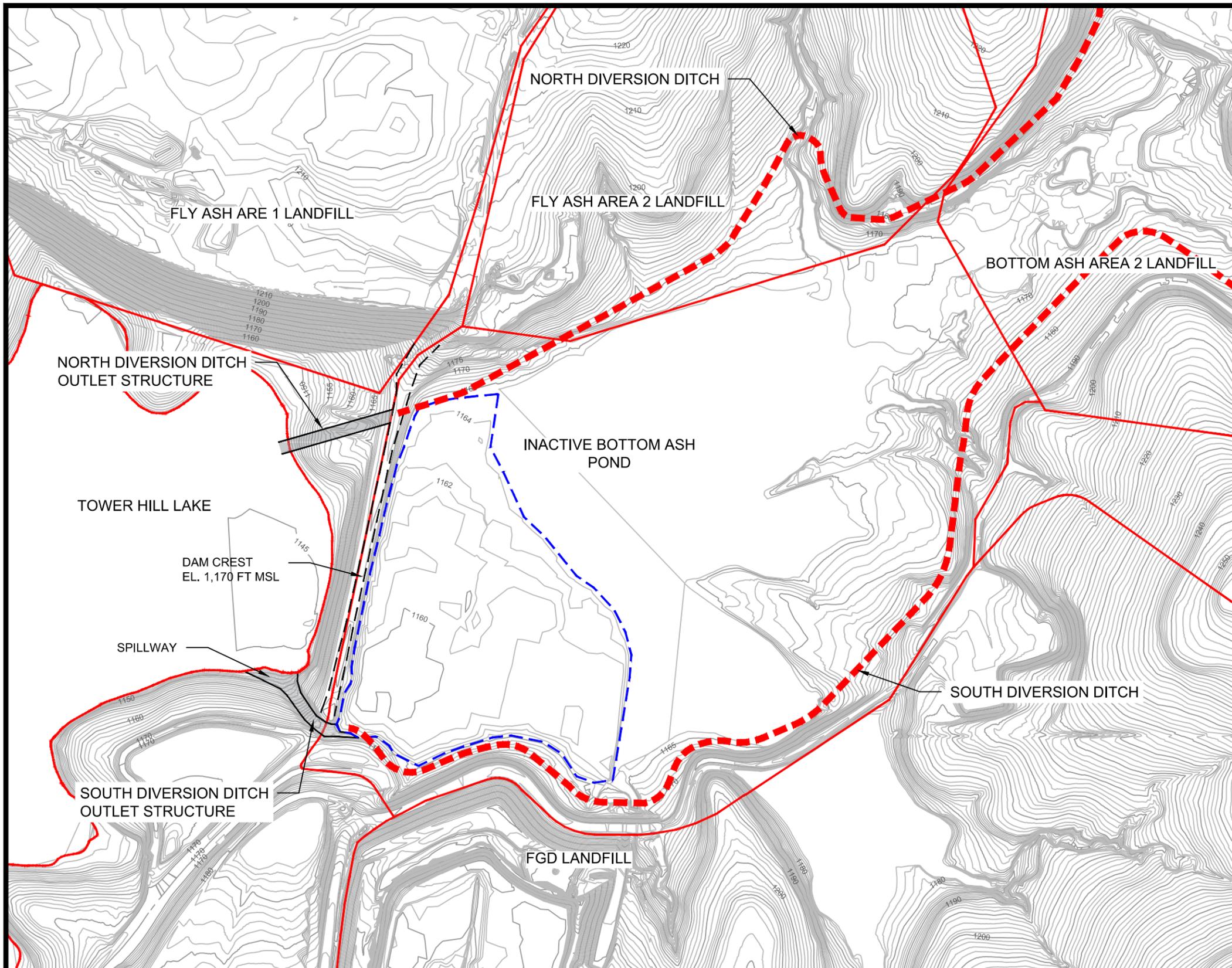
Aptim Environmental & Infrastructure, Inc.

**WESTAR ENERGY
25905 JEFFREY RD., ST. MARYS, KS**

**FIGURE 1
INACTIVE BOTTOM ASH POND
SITE LOCATION PLAN**

Aptim Environmental & Infrastructure, Inc. has prepared this document for a specific project or purpose. All information contained within this document is copyrighted and remains intellectual property of Aptim Environmental & Infrastructure, Inc. This document may not be used or copied, in part or in whole, for any reason without expressed written consent by Aptim Environmental & Infrastructure, Inc.

APPROVED BY: RDS | PROJ. NO.: 631224603 | DATE: OCTOBER 2017



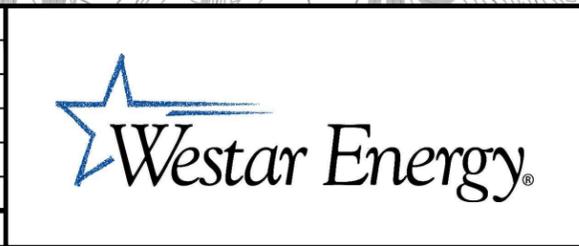
LEGEND

- APPROXIMATE CCR UNIT BOUNDARY
- - - APPROXIMATE WATER ELEVATION
- - - - - APPROXIMATE POND DAM BOUNDARY
- APPROXIMATE SPILLWAY BOUNDARY
- - - - - APPROXIMATE DIVERSION DITCH DELINEATION

NOTES

1. EXISTING CONTOURS DEVELOPED BY PROFESSIONAL ENGINEERING CONSULTANTS IN APRIL 2016.
2. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
3. ALL BOUNDARY AND FEATURE LOCATIONS ARE APPROXIMATE.

REV. NO.	DATE	DESCRIPTION




APTIM Environmental & Infrastructure, Inc.
APTIM Environmental & Infrastructure, Inc. has prepared this document for a specific project or purpose. All information contained within this document is copyrighted and remains intellectual property of APTIM Environmental & Infrastructure, Inc. This document may not be used or copied, in part or in whole, for any reason without expressed written consent by APTIM Environmental & Infrastructure, Inc.

WESTAR ENERGY
25905 JEFFREY RD., ST. MARYS, KS

FIGURE 2
INACTIVE BOTTOM ASH POND
SITE TOPOGRAPHY PRIOR TO CLOSURE

DRAWN BY:	ORC	APPROVED BY:	MMS	PROJ. NO.:	631232565	DATE:	APRIL 2018
-----------	-----	--------------	-----	------------	-----------	-------	------------

T:\AutoCAD\Projects\Westar Energy\Jeffrey\Compliance Reports\Inactive Bottom Ash Pond\Figures 2 and 3.dwg, DWG To PDF.pc3