



# Hazard Potential Classification Assessment Lawrence Energy Center Inactive Units - Ash Pond Area 2, Ash Pond Area 3, and Ash Pond 4

Prepared for:  
Westar Energy  
Lawrence Energy Center  
Lawrence, Kansas

Prepared by:  
APTIM Environmental & Infrastructure, Inc.

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## Plan Review/Amendment Log §257.73(a)(2)

Date of Review	Reviewer Name	Sections Amended and Reason	Version

## CCR Regulatory Requirements

<b>USEPA CCR Rule Criteria 40 CFR §257.73</b>	<b>Lawrence Energy Center (LEC) Hazard Potential Classification Assessment – Inactive Units 2,3 &amp; 4</b>
<p>§257.73(a)(2)(i) stipulates:</p> <p><i>(2) Periodic hazard potential classification assessments.</i></p> <p><i>(i) The owner or operator of the CCR unit must conduct initial and periodic hazard potential classification assessments of the CCR unit according to the timeframes specified in paragraph (f) of this section. The owner or operator must document the hazard potential classification of each CCR unit as either a high hazard potential CCR surface impoundment, a significant hazard potential CCR surface impoundment, or a low hazard potential CCR surface impoundment. The owner or operator must also document the basis for each hazard potential classification.</i></p>	<p>Section 3.3</p>
<p>§257.73(a)(2)(ii) stipulates:</p> <p><i>(ii) The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer stating that the initial hazard potential classification and each subsequent periodic classification specified in paragraph (a)(2)(i) of this section was conducted in accordance with the requirements of this section.</i></p>	<p>Section 5.0</p>

USEPA CCR Rule Criteria 40 CFR §257.73	Lawrence Energy Center (LEC) Hazard Potential Classification Assessment – Inactive Units 2,3 & 4
<p>§257.73(f)(1) stipulates:</p> <p><i>(f) Timeframes for periodic assessments –</i></p> <p><i>(1) Initial Assessments. Except as provided by paragraph (f)(2) of this section, the owner or operator of the CCR unit must complete the initial assessments required by paragraphs (a)(2), (d), and (e) of this section no later than October 17, 2016*. The owner or operator has completed an initial assessment when the owner or operator has placed the assessment required by paragraphs (a)(2), (d), and (e) of this section in the facility's operating record as required by §257.105(f)(5), (10), (12).</i></p> <p><i>*However due to the Bottom Ash Pond meets the requirements of 257.100(e)(1) and therefore the timeframe in §257.100(e)(3)(v) is applied, which states:</i></p> <p><i>(v) No later than April 17, 2018, complete the initial hazard potential classification, structural stability, and safety factor assessments as set forth by §257.73(a)(2), (b), (d), (e), and (f).</i></p>	<p>Section 3.1</p>

USEPA CCR Rule Criteria 40 CFR §257.73	Lawrence Energy Center (LEC) Hazard Potential Classification Assessment – Inactive Units 2,3 & 4
<p>§257.73(f)(2) stipulates:</p> <p><i>(2) Use of a previously completed assessment(s) in lieu of the initial assessment(s). The owner or operator of the CCR unit may elect to use a previously completed assessment to serve as the initial assessment required by paragraphs (a)(2), (d), and (e) of this section provided that the previously completed assessments(s):</i></p> <p><i>(i) Was completed no earlier than 42 months prior to October 17, 2016; and</i></p> <p><i>(ii) Meets the applicable requirements of paragraphs (a)(2), (d) and (e) of this section.</i></p>	<p>Not Applicable</p>

USEPA CCR Rule Criteria 40 CFR §257.73	Lawrence Energy Center (LEC) Hazard Potential Classification Assessment – Inactive Units 2,3 & 4
<p>§257.73(f)(3) stipulates:</p> <p><i>(3) Frequency for conducting periodic assessments. The owner or operator of the CCR unit must conduct and complete the assessments required by paragraphs (a)(2), (d), (e) of this section every five years. The date of completing the initial assessment is the basis for establishing the deadline to complete the first subsequent assessment. If the owner or operator elects to use a previously completed assessment(s) in lieu of the initial assessment as provided by paragraph (f)(2) of this section, the date of the report for the previously completed assessment is the basis for establishing the deadline to complete the first subsequent assessment. The owner or operator may complete any required assessment prior to the deadline provided the owner or operator places the completed assessment(s) into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing subsequent assessments is based on the date of completing the previous assessment. For purposes of this paragraph (f)(3), the owner or operator has completed an assessment when the relevant assessment(s) required by paragraphs (a)(2), (d), and (e) of this section has been placed in the facility's operating record as required by §257.105(f)(5), (10), and (12).</i></p>	<p>Section 4.3</p>
<p>§257.73 (g) stipulates:</p> <p><i>(g) 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>	<p>Section 4.1 and 4.2</p>





## 1.0 INTRODUCTION

APTIM Environmental and Infrastructure, Inc. (APTIM, f/k/a CB&I Environmental & Infrastructure Inc., CB&I) has prepared this Hazard Potential Classification Assessment (Assessment) at the request of Westar Energy (Westar) for the inactive Ash Pond Area 2 (Area 2 Ponds), Ash Pond Area 3 (Area 3 Ponds), and the Scrubber Supply Pond (Area 4 Pond) located at Lawrence Energy Center (LEC) in Lawrence, Kansas.

The Area 2, 3, and 4 Ponds have been deemed to be regulated, inactive CCR units by the United States Environmental Protection Agency (USEPA), through the Disposal of Coal Combustion Residuals from Electric Utilities Final Rule (CCR Rule) 40 CFR §257 and §261. On July 26, 2016 the USEPA extended the CCR Rule requirements for certain inactive CCR surface impoundments. Westar is currently in the process of conducting closure by removal of CCR (per §257.100(b)) within the inactive Area 2, 3, and 4 Ponds to prepare for construction of a Kansas National Pollutant Discharge Elimination System (NPDES) regulated pond system. All facility water containing CCR material is managed in settling tanks. CCR material from the Area 2, 3, and 4 Ponds is being disposed of in Industrial Landfill No. 847. Westar intends to complete closure of the Area 2, 3, and 4 Ponds in 2018.

In support of compliance with the CCR Rule, APTIM has reviewed the most recent annual inspection, relevant portions of the facility's operating record, permit application, and construction reports in updates in relation to this Assessment. This Assessment evaluates the hazard potential classification of the Area 2, 3, and 4 Ponds and meets the requirements set forth within 40 CFR §257.73(a)(2).

## 2.0 POND OVERVIEW

Westar owns and operates a series of clarifying ponds for process water at LEC in Douglas County, Kansas. LEC is located approximately 3 miles northwest of Lawrence, Kansas, is bounded by the Kansas River and resides in Sections 13 and 14, Township 12 South, Range 19 East. The locations of the Area 2, Area 3, and Area 4 Ponds are depicted in **Figure 1**.

The ponds are separated into three “areas”, termed Areas 2, 3, and 4, as noted below:

### □ Area 2 Ponds

- Pond 501 (CCR removed and operating)
- Pond 502 (CCR removed and operating)
- Pond 503 (CCR removed and operating)
- Clear Pond (a.k.a. West Pond, CCR removed and operating)
- Laydown Area (in the process of being dewatered, CCR removed, and incorporated into the Storm Water Settling Pond)
- Storm Water Settling Pond (in the process of being dewatered and CCR removed)

### □ Area 3 Ponds

- Pond 401 (CCR removed and operating)
- Pond 402 (CCR removed and incorporated into Pond 404)
- Pond 403 (CCR removed and incorporated into Pond 404)
- Pond 404 (CCR removed and operating)

- **Area 4 Pond** – Scrubber Supply Pond (certified CCR removed in May 2017 and removed from service)

The Area 2, 3, and 4 Ponds are regulated impoundments under the CCR Rule and stopped receiving CCR prior to October 2015. Historically the Area 2, 3, and 4 Ponds received CCR material from the plant. The CCR material was deposited in the Area 2, 3, and 4 Ponds while overflow water was discharged to the Kansas River via Outfall 001BV, in line with Kansas NPDES Permit No. I-KS-31-PO09. As each pond was progressively filled, the ponds were dewatered and the CCR material was excavated and placed in Industrial Landfill No. 847. CCR material was distributed to different ponds within each area depending on the availability of capacity.

A perimeter impoundment dike was constructed to surround the LEC ponds and ties into the natural grades near the southern portion of the Area 2 Pond and the eastern portion of the Area 4 Pond. The crest of the perimeter dike is at approximately 839 feet Mean Sea Level (ft MSL) with side slopes at 3H:1V, providing a maximum height of 15 feet located in the northwest section. The crest width is approximately 30 feet. The perimeter dike was originally constructed of silty clay, which was obtained by excavation of existing grades in the area.

Currently a reconfiguration of the Area 2, 3, and 4 Ponds is being undertaken. With the Area 4 Pond closed, plant process water flows from the Area 2 Ponds (with the exception of Ponds 502 and 503) to the Area 3 Ponds prior to discharge to the Kansas River through Outfall 001BV. Site topography prior to closure of the Area 2, 3, and 4 Ponds is depicted in **Figure 2**.

## **2.1 Existing Conditions and Operations**

The original design of the LEC ponds included four areas through which stormwater and contact water moved before being discharged to the Kansas River. Following the adoption and establishment of the CCR Rule, the LEC ponds have been renamed and reconfigured. Currently, closure by removal of CCR at the LEC ponds is ongoing and is anticipated to be completed in 2018, in accordance with §257.102(c). Most of the configurations and flow patterns of the Area 2, Area 3, and Area 4 Ponds will be maintained. The Laydown Area will be reconfigured into the northern portion of the Storm Water Settling Pond. Pond 402 and Pond 403 will be reconfigured into the eastern portion of Pond 404. Closure consists of the removal of CCR material and existing clay liner, with the installation of an 18-in. clay liner, rip-rap, and aggregate base at the top of each berm. Contact water and process water is currently managed within the LEC Pond network, allowing for proper management of water during the ongoing construction process. As each pond is progressively dewatered, CCR material will be excavated and placed in the Industrial Landfill No. 847.

Following the completion of the closure activities, stormwater will continue to be directed to the Storm Water Settling Pond where it is discharged to Baldwin Creek. Contact water and process water will be directed to Pond 501, 502, and 503. From Pond 502, contact water and process water is discharged to the West Pond (Clear Pond), then Pond 404 and 401. From Pond 401, water is discharged through conveyance pipes to the Kansas River through Outfall 001BV or recycled into the plant.

## **2.2 Current Dimensions and Capacities**

The Area 2, 3, and 4 Ponds incorporate a total area of approximately 47.4 acres with a storage capacity of approximately 683.5 acre-ft. The maximum and minimum depths of impounded water varied depending on plant operations, stormwater conditions and the closure schedule. Historically, CCR material has been distributed to different cells within each area depending on the availability of space. This made the amount of CCR material in each pond vary from minimal to almost at capacity. Due to current closure construction operations there is no CCR material volume within the Area 4 Pond and portions of the Area 2 and 3 Ponds. All ponds are being constructed during closure to have 3H:1V sideslopes.

## **2.3 Instrumentation**

There are no instrumentation devices associated with the hydraulic structures, impoundment embankments, perimeter dike, or slope performance has been installed at or near the Area 2, 3, and 4 Ponds.

### 3.0 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

The available information for the Area 2, 3, and 4 Ponds was provided to and reviewed by APTIM for this Assessment:

- Annual Inspection Report Lawrence Energy Center Inactive Units – Ash Pond Area 2, Ash Pond Area 3, Ash Pond 4, CB&I, June 2017.
- Coal Combustion Waste Impoundment Round 7 – Dike Assessment Report, Dewberry & Davis, LLC, March 2011.
- LEC Survey, Professional Engineering Consultants (PEC), June 2016.
- NPDES Permit No. I-KS-31-PO09.

Based on the available information and the site visit conducted May 15, 2017 by Richard Southorn, a professional engineer with APTIM, the following Assessment has been conducted to determine the hazard potential classification of the Area 2, 3, and 4 Ponds.

#### 3.1 Hazard Potential Classification Standards

Per §257.53, a hazard potential classification is defined based on the possible adverse incremental consequences that result from the release of water or stored contents due to failure of the diked CCR surface impoundment or mis-operation of the diked CCR surface impoundment or its appurtenances. It is required by §257.73(a)(2) that the owner or operator of a CCR surface impoundment determine which of the following three hazard potential classifications characterizes their CCR unit:

- High Hazard Potential – A diked surface impoundment where failure or mis-operation will probably cause loss of human life;
- Significant Hazard Potential – A diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns; or
- Low Hazard Potential – A dikes surface impoundment where failure mis-operation results in no probable loss of life, and low economic and/or environmental losses. Losses are principally limited to the surface impoundment owner’s property.

Therefore the initial Assessment will be submitted prior to April 17, 2018, per 257.100(e)(3)(v).

#### 3.2 Perimeter Dike Hazard Potential Classification

Kansas regulates Dams through the Kansas Department of Agriculture – Division of Water Resources (KSDWR). In an assessment report created by Dewberry & Davis, LLC in March 2011, it was determined that the perimeter dike should be classified as a significant hazard potential. This was due to the potential for economic and environmental impact, should the perimeter dike fail. It was determined that the loss of human life was found not probable in the event of a failure.

### **3.3 CCR Rule Initial Hazard Potential Classification (§257.73(a)(2)(i))**

Based on the hazard potential classification standards within §257.73(a)(2), it has been determined that the Area 2, 3, and 4 Ponds meets the standards of a Low Hazard Potential Classification. The low hazard potential classification is deemed appropriate for the Area 2, 3, and 4 Ponds due to there being little to no potential of failure as they are inactive, in the process of being/have been dewatered, and are undergoing closure.

## **4.0 RECORDS RETENTION AND MAINTENANCE**

### **4.1 Incorporation of Assessment into Operating Record (§257.73(f)(1) & (g))**

§257.105(f)(1) and (g) of 40 CFR Part 257 provides record keeping requirements to ensure that the Assessment must be placed in the Facility's Operating Record. Specifically, §257.105(f) stipulates:

*§257.105(f) stipulates: "(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: (5)The initial and periodic hazard potential classification assessments as required by §§257.73(a)(2) and 257.74(a)(2)."*

This Assessment 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 Assessment. Specifically, §257.106(f) stipulates:

*§257.106(f) stipulates: "(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: (4) Provide notification of the availability of the initial and periodic hazard potential classification assessments specified under §257.05(f)(5)"*

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

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

*§257.107(f) stipulates: "(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: (4) The initial and periodic hazard potential classification assessments specified under §257.105(f)(5)."*

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

### **4.3 Periodic Assessment Frequency (§257.73(f)(3))**

A periodic Assessment will be conducted every five years in accordance with 40 CFR 257.73(f)(3). The deadline for completing the assessment is based on the date of the previously completed Assessment. Each periodic Assessment will be placed in the Facility's Operating Record as required by §257.105(f)(5).

**5.0 PROFESSIONAL ENGINEER CERTIFICATION (§257.73(a)(2)(ii))**

The undersigned registered professional engineer is familiar with the requirements of the CCR Rule and has visited and examined LEC or has supervised examination of LEC by appropriately qualified personnel. The undersigned registered professional engineer attests that this Assessment has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and meets the requirements of §257.73. This certification was prepared as required by §257.73(a)(2).

Name of Professional Engineer: Richard Southorn

Company: APTIM

Signature: 

Date: 04/16/18

PE Registration State: Kansas

PE Registration Number: PE25201

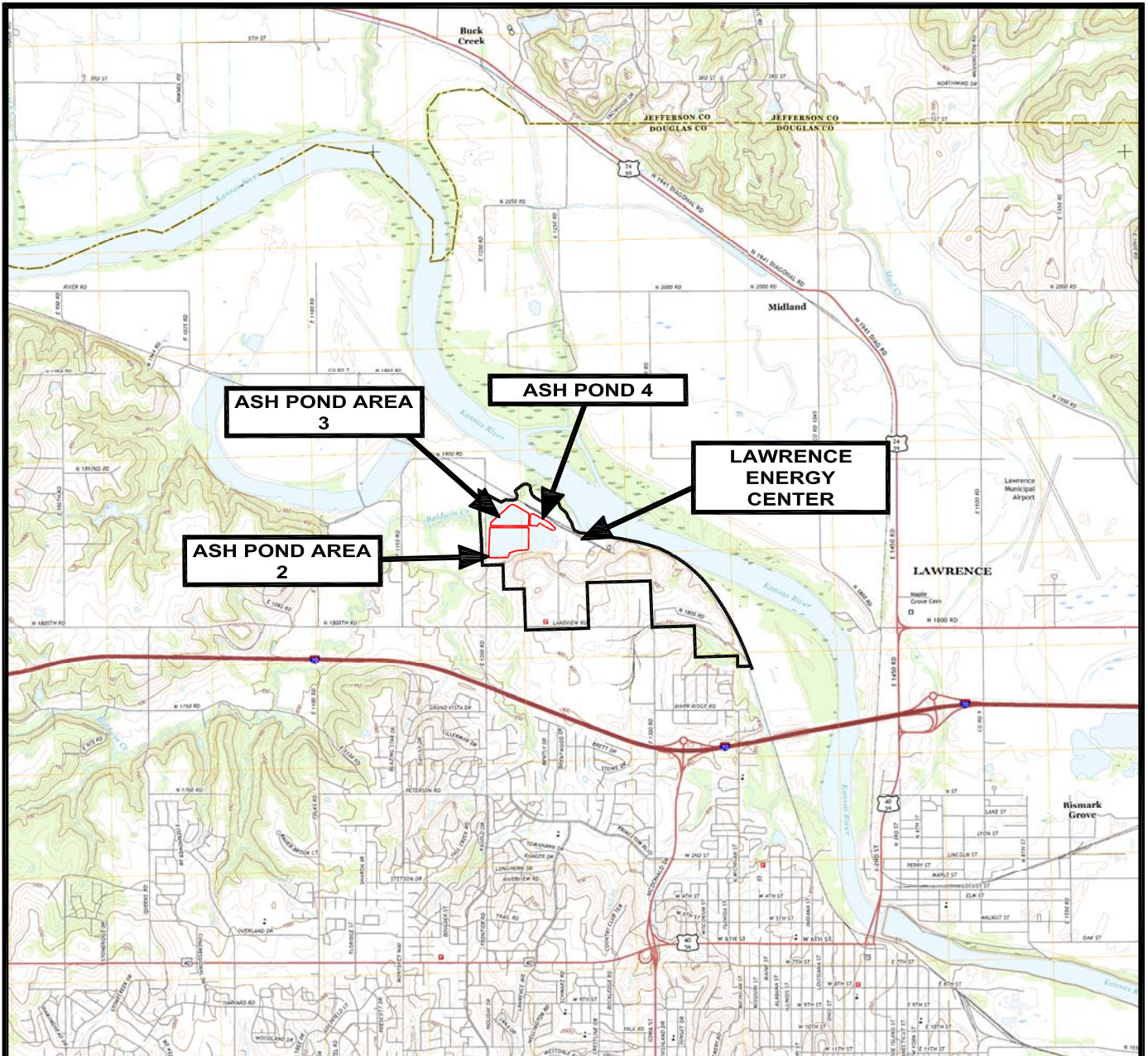
Professional Engineer Seal:



## FIGURES

- Figure 1 - Inactive Units – Ash Pond Area 2, Ash Pond Area 3, Ash Pond 4, Site Location Plan
- Figure 2 - Inactive Units – Ash Pond Area 2, Ash Pond Area 3, Ash Pond 4, Site Topography Prior to Closure





**LEGEND**

- LAWRENCE ENERGY CENTER FACILITY BOUNDARY
- CCR UNIT BOUNDARY

**NOTES**

1. AERIAL TOPO OBTAINED FROM USGS 7.5-MINUTE SERIES, LAWRENCE EAST, LAWRENCE WEST, MIDLAND AND WILLIAMSTOWN QUADRANGLE, KANSAS, 2014.
2. ALL BOUNDARIES ARE APPROXIMATE.



**APTIM Environmental & Infrastructure, Inc.**

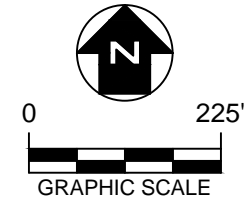
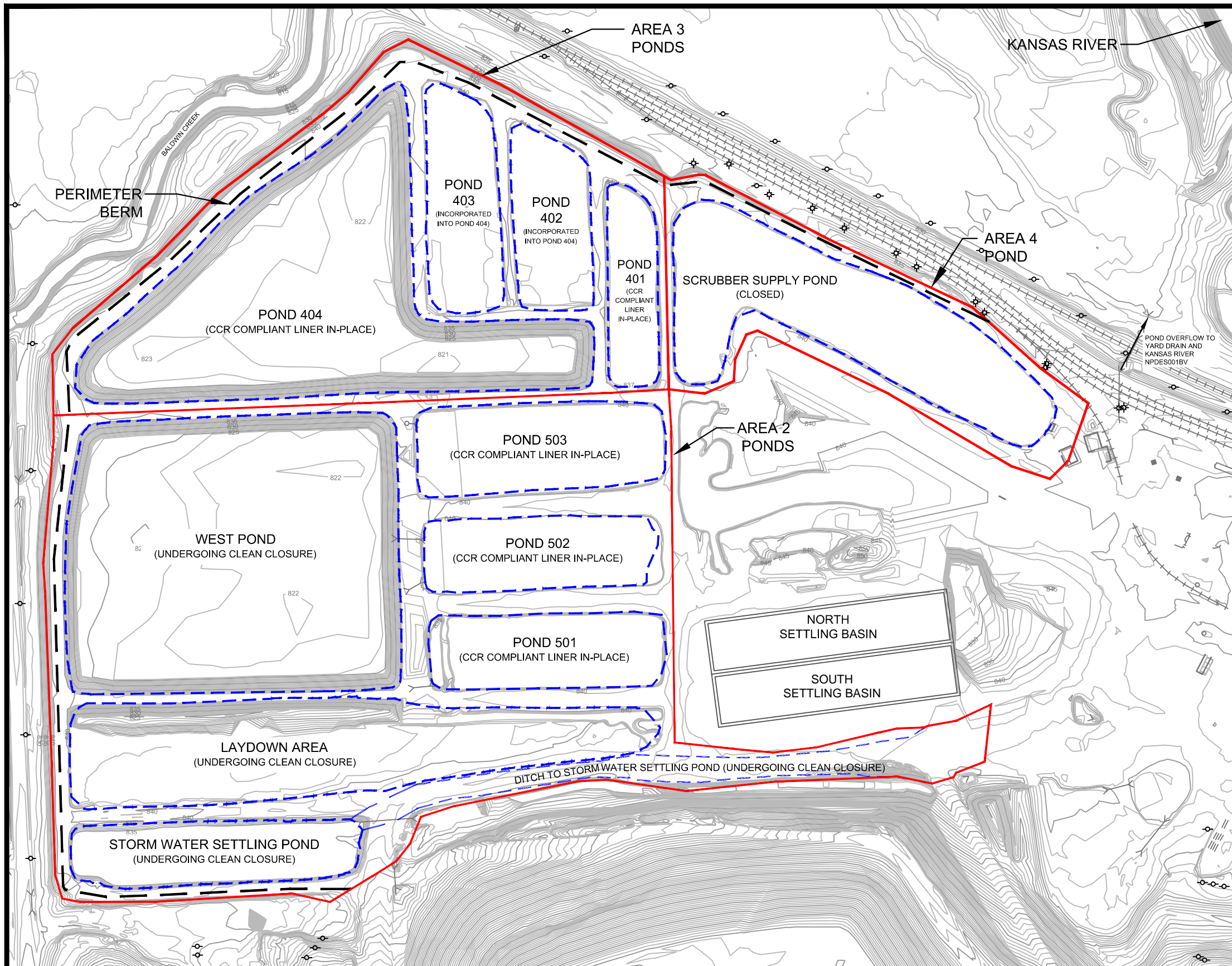
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**LAWRENCE ENERGY CENTER  
1250 N. 1800 RD., LAWRENCE, KS.**

**FIGURE 1  
INACTIVE UNITS - ASH POND AREA 2, ASH POND AREA 3, ASH POND 4  
SITE LOCATION PLAN**

APPROVED BY: RDS	PROJ. NO.: 631232565	DATE: APRIL 2018
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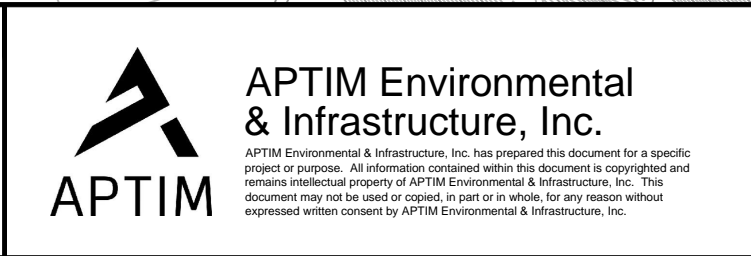
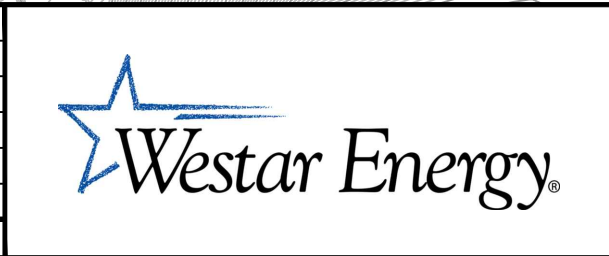
**LEGEND**

- APPROXIMATE POND AREA BOUNDARY
- - - APPROXIMATE POND BOUNDARY
- - - APPROXIMATE PERIMETER DIKE LOCATION

**NOTES**

1. EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY PEC IN JUNE 2016.
2. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
3. ALL BOUNDARIES AND FEATURE LOCATIONS ARE APPROXIMATE.

REV. NO.	DATE	DESCRIPTION



**LAWRENCE ENERGY CENTER  
1250 N 1800 RD. LAWRENCE, KANSAS**

**FIGURE 2  
INACTIVE UNITS - ASH POND AREA 2, ASH POND AREA 3, ASH POND 4  
SITE TOPOGRAPHY PRIOR TO CLOSURE**

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