Closure Plan
Tecumseh Energy Center
Bottom Ash Settling Area

Prepared for:

Evergy Kansas Central, Inc.

Tecumseh Energy Center

Tecumseh, Kansas

Prepared by:

APTIM Environmental & Infrastructure, LLC

Revision 0 - October 2016

Revision 1 - July 20, 2020

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Plan Review/Amendment Log §257.102(b)(3)

Date of Review	Reviewer Name	Amendment Required (YES/NO)	Sections Amended and Reason
July 20, 2020	APTIM Environmental & Infrastructure, LLC	YES	Revised company name, corrected CCR unit name, revised closure plan to be closer in alignment with other Evergy closure plans. Note that no triggering event has necessitated this revision.

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1.0 INTRODUCTION

APTIM Environmental and Infrastructure, Inc. (APTIM) has revised the following Closure Plan (Plan) at the request of Evergy Kansas Central, Inc. (Evergy) for the Bottom Ash Settling Area (BASA) located at the Tecumseh Energy Center (TEC) in Tecumseh, Kansas. TEC is a closed coal-fired generating station that consisted of two operational coal-fired electric generating units owned and operated by Evergy. The BASA is comprised of two sub-units within a single embanked area: the North Pond and the South Pond. Both the North and South Ponds have been deemed to be regulated coal combustion residual units under the United States Environmental Protection Agency (USEPA) Disposal of Coal Combustion Residuals from Electric utilities Final Rule (CCR Rule) 40 CFR §257 and §261.

This Plan details the closure requirements outlined in §257.102 for CCR units closed by removal of CCR. The criteria for conducting the closure or retrofit of CCR units for the BASA are detailed in Section 2.0. Additionally, the following Plan details the necessary steps to close the BASA at any point in during the active life, based on recognized and good engineering practices.

2.0 REGULATORY OVERVIEW OF CCR CLOSURE PLAN REQUIREMENTS

On April 17, 2015, USEPA published the CCR Rule under Subtitle D of the Resource Conservation and Recovery Act (RCRA) as 40 CFR Part §257 and §261. The purpose of the CCR Rule is to regulate the management of CCR in regulated CCR units for landfill and surface impoundments. The BASA has been deemed to be a regulated CCR unit at TEC.

Section 257.102(b) of the CCR Rule requires owners or operators of CCR landfills and surface impoundments to prepare a Plan describing the closure of the unit and schedule for implementation of the Plan. The following citations from the CCR Rule are applicable for the BASA as discussed in this Plan:

§257.102(b)(1) stipulates:

(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

- *(i) A narrative description that discusses how the CCR unit will be closed in accordance with this section.* (See Section 4.1)
- *(ii) If closure of the CCR unit will be accomplished through removal of CCR from the CCR unit, a description of the procedures to remove the CCR and decontaminate the CCR unit in accordance with paragraph (c) of this section.* (See Section 4.1)
- *(iii) If closure of the CCR unit will be accomplished by leaving CCR in place, a description of the final cover system, designed and methods and procedures to be used to install the final cover will achieve performance standards specified in 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 achieves the performance standards specified in paragraph (d) of this section.* (N/A)
- *(iv) An estimate of the maximum inventory of CCR ever on-site over the active life of the CCR unit.* (See Section 3.4)
- *(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.* (N/A)
- *(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.* (See Section 5.0)

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An outline of the closure performance standards for closure of units where CCR will be removed is described in §257.102(c), which stipulates:

"An owner or operator may elect to close a CCR unit by removing and decontaminating all areas affected by releases from the CCR unit. CCR removal and decontamination of the CCR unit are complete when constituent concentrations throughout the CCR unit and any areas affected by releases from the CCR unit have be removed and groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to §257.95(h) for constituents listed in appendix IV to this part."

In addition to the above, the Plan must ensure compliance with the closure recordkeeping requirements specified in §257.105(i), the closure notification requirements specified in §257.106(i), and the closure intent requirements specified in §257.107(i). A written certification is provided in Section 7.0 from a qualified professional engineer in the State of Kansas, to certify that this Plan meets the requirements of the CCR Rule.

3.0 TEC BASA OVERVIEW

3.1 Location, Topography, and Description

Bottom ash slurry was historically deposited within TEC's BASA. The closure of the BASA will be accomplished by the removal of the CCR from the unit. The following Plan was developed to satisfy the CCR Rule requirements for removal of CCR per §257.102(b)(1)(ii).

The location of the BASA is shown on **Figure 1**. The BASA was constructed in two phases, in 1968 and in 1980. The BASA was further excavated and an internal berm was constructed to separate the BASA into two approximately equal sized ponds (North and South Pond), which can be seen in **Figure 2**. The total surface area of the combined ponds in the BASA is approximately 1.8 acres, with the North and South Pond each having a surface area of approximately 0.8 acres and 1 acre, respectively.

There are no available drawings, construction records, or written operational records of the original construction. However, it appears that in the original construction on the east end of the BASA was incised into the sloping topography. The above-grade berms were constructed around the north, south, and west side slopes, using silty clay.

The interior slope of the North and South ponds is generally 1H:1V and a perimeter berm surrounds the North and South Ponds. The top elevation of the BASA varies between approximate 884 to 886 feet mean sea level (ft MSL). The north and west berms slope towards Tecumseh Creek. The perimeter berm prevents overland flow of stormwater into the North and South Pond of the BASA. Existing site topography is depicted in **Figure 2.**

3.2 Existing Solid Waste Regulatory Permits and Consents

Westar was granted an Industrial Landfill Permit (Number 322) at TEC by the Kansas Department of Health and Environment – Bureau of Waste Management (KDHE-BWM), in accordance with Kansas Statutes Annotated (KSA) 65-3407. KDHE modified the solid waste permit, per K.A.R. 28-29-6a, in response to the CCR Rule to include all on-site CCR waste materials management units as disposal areas under the existing solid waste permit for TEC. The current Industrial Landfill Permit modification was approved on October 15, 2015.

3.3 Bottom Ash Generation, Recycling, and Disposal

Bottom ash and process water was sent to either the north or south sub-unit until one or both were filled, then the CCR material was dewatered. The dewatered ash material was then either sold for beneficial reuse or landfilled at the TEC 322 Landfill. Generation and recycling rates at TEC varied over time.

3.4 Maximum Volume Estimate (§257.102(b)(1)(iv))

The maximum volume ever on site is unknown, however, APTIM expects the maximum amount of CCR ever in the unit would not have exceeded the unit capacity, which was estimated to be approximately 51,000 cubic yards (cy) based on a 2016 survey by Professional Engineering Consultants.

4.0 CLOSURE PLAN (§257.102(b)(1))

This Plan has been prepared in accordance with requirements of the CCR Rule and includes a written certification in Section 7.0 from a qualified Professional Engineer for the State of Kansas.

4.1 Narrative Description (§257.102(b)(1)(i) and (ii))

Closure will be accomplished through removal of CCR. The CCR material contained in the unit will be dewatered as necessary, removed, and either beneficially used or disposed in the on-site CCR landfill. CCR will be removed primarily by mechanical excavation using earth-moving equipment. CCR will be allowed to dewater by gravity drainage and evaporation. The impoundment will be decontaminated by removal of CCR and will be considered complete when constituent concentrations throughout the CCR unit, if detected, have been removed and/or groundwater monitoring concentrations do not exceed the groundwater protection standard for constituents listed in Appendix IV to 40 CFR 257. Following CCR removal, the BASA will be regraded for surface water drainage and the area will be vegetated.

5.0 CLOSURE ACTIVITY SCHEDULE (§257.102(b)(1)(vi))

The size of area and time of year closure construction takes place will vary, therefore closure construction schedules will vary. The schedule provided in this section is therefore a general estimation.

5.1 Commencement of Closure

Commencement of final closure has occurred if placement of waste in the BASA has ceased and any of the following actions or activities has been completed (40 CFR 257.102(e)(3)):

(i) Steps necessary to implement this Plan;

(ii) Submittal of a completed application for any required state or agency permit or permit modification; or

(iii) Steps necessary to comply with any state or other agency standards that are a prerequisite, or are otherwise applicable, to initiating or completing the closure.

5.2 Closure Schedule

The milestones and the associated timeframes in this section are initial estimates. Some of the activities associated with the milestones will overlap.

Table 1: Estimated Closure Schedule

Written Closure Plan	October 17,2016
Notification of Intent to Close Placed in Operating Record	October 19, 2018 [1]
Initiation of Closure / Coordinating with and obtaining necessary approvals and permits from other agencies	Year 1-2
Mobilization	Year 1
Dewater and remove CCR	Year 1 - 3
Year all closure activities for the CCR unit will be completed	Year 1-5 [2]

Notes:
1. Initiation of Closure may be extended for multiple two-year periods in accordance with 40 CFR 257.102(e)(2)(ii) and (iii).
2. Final closure of Surface Impoundments must be completed within five years of commencing closure unless a demonstration is placed in the operating record document (40 CFR 257.102(f)(2)).

6.0 AMENDMENT OF CCR CLOSURE PLAN (§257.102(b)(1))

The owner or operator may amend the initial or any subsequent written Plan developed pursuant to 40 CFR 257.102(b)(1) at any time.

The written closure must be amended 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 Plan. If a written Plan is revised after closure activities have commenced for a CCR unit, the current written Plan must be amended no later than 30 days following the triggering event.

A written certification from a qualified professional engineer that the initial and any amendment of the written Plan meets the requirements of §257.102(b) must be obtained.

Plan changes will be documented using the Revision History which prefaces this Plan. Substantial changes to this Plan will be certified by a Qualified Professional Engineer.

7.0 PROFESSIONAL ENGINEER CERTIFICATION (§257.102(b)(4))

The undersigned registered professional engineer is familiar with the requirements of CCR Rule requirements of §257.102 of the CCR Rule and has visited and examined TEC or has supervised examination of TEC by appropriately qualified personnel. The undersigned registered professional engineer attests that this CCR Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and meets the requirements of §257.102, and that this Plan is adequate for TEC's facility. This certification was prepared as required by §257.102(b)(4).

Name of Professional Engineer: Richard Southorn

Company: APTIM

Professional Engineer Seal:

July 20, 2020

Richard Southorn

Digitally signed by Richard Southorn
Date: 2020.07.20 18:26:07 -05'00'

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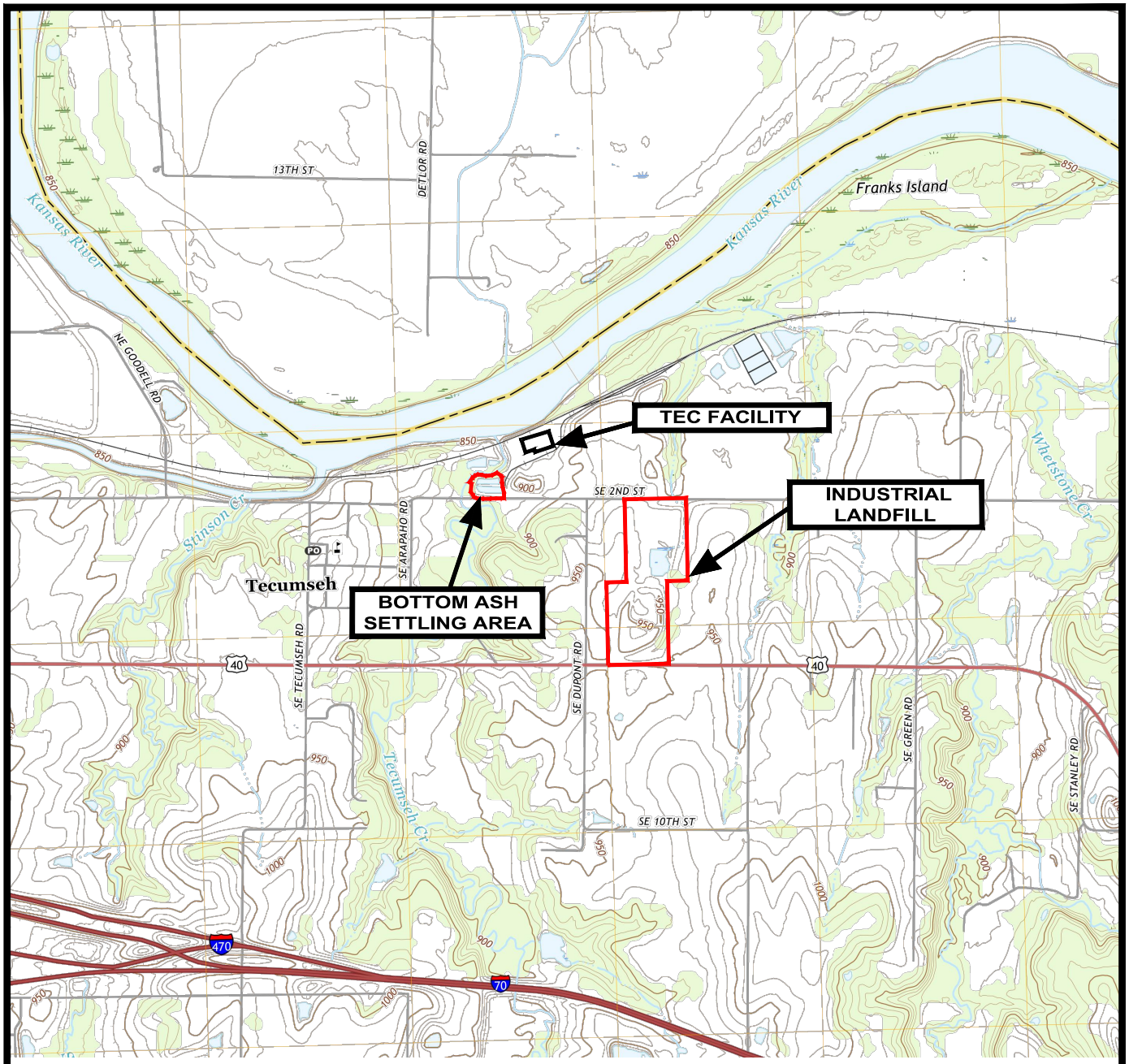
FIGURES



LEGEND

APPROXIMATE CCR UNIT BOUNDARY

N

0 2500'

GRAPHIC SCALE

NOTES

1. AERIAL TOPO OBTAINED FROM USGS 7.5-MINUTE SERIES, GRANTVILLE QUADRANGLE, KANSAS, 2018.
2. ALL BOUNDARIES ARE APPROXIMATE

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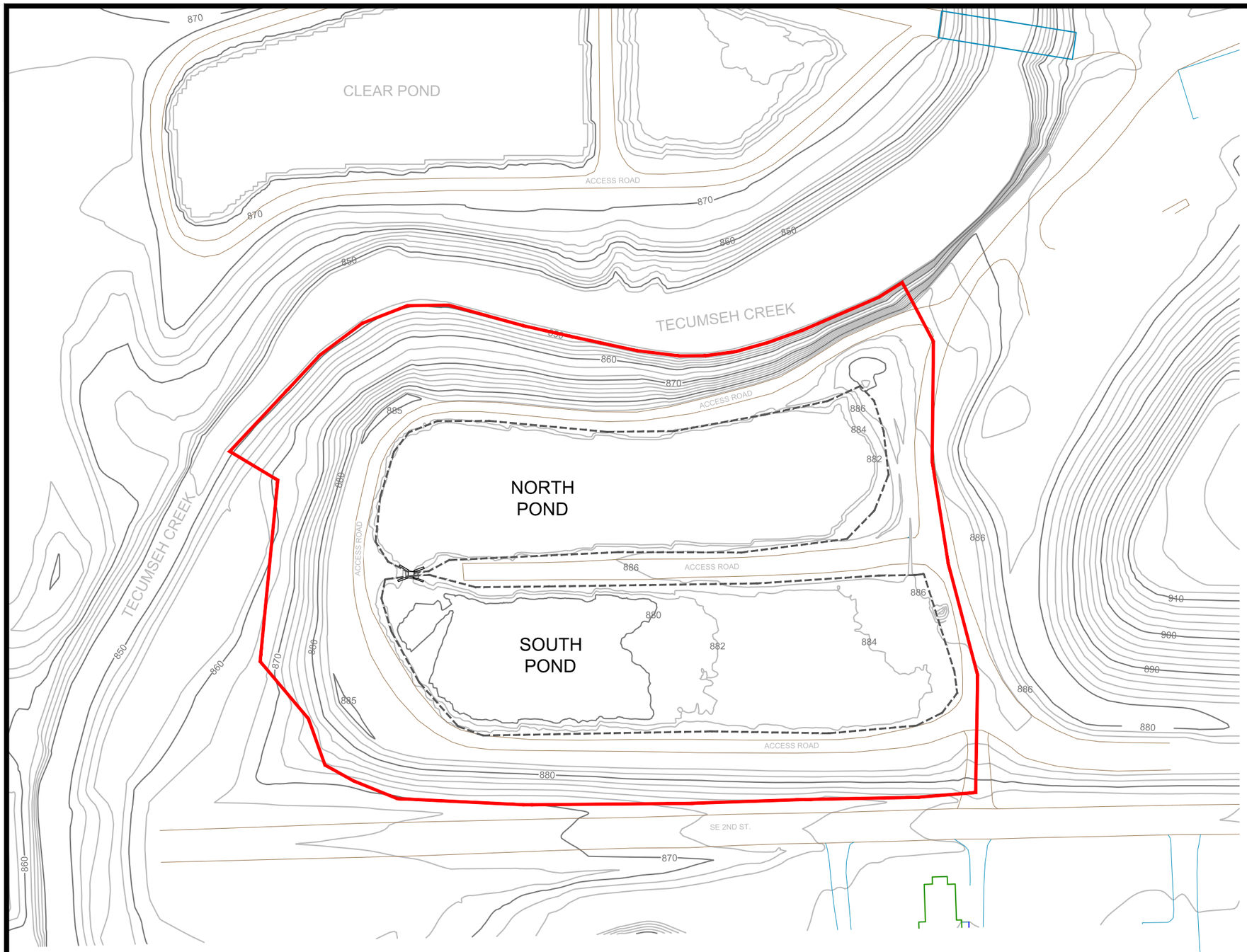
TECUMSEH ENERGY CENTER
5636 SE 2nd ST., TECUMSEH, KS

FIGURE 1
BOTTOM ASH SETTLING AREA
SITE LOCATION PLAN

APPROVED BY: RDS	PROJ. NO.: –	DATE: JULY 2020



N

0 80'

GRAPHIC SCALE

LEGEND

APPROXIMATE CCR UNIT BOUNDARY

APPROXIMATE POND BOUNDARY

NOTES

1. CONTOURS DEVELOPED BY PROFESSIONAL ENGINEERING CONSULTANTS IN JUNE 2016. SOME SURFACE CONTOURS MAY NOT BE SHOWN DUE TO THE PRESENCE OF WATER.
2. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
3. THE PRIMARY LOCATION OF CCR IS WITHIN THE APPROXIMATE POND BOUNDARY.

REV. NO.	DATE	DESCRIPTION

evergy

APTIM Environmental & Infrastructure, LLC

TECUMSEH ENERGY CENTER
5636 SE 2nd ST., TECUMSEH, KANSAS

FIGURE 2
BOTTOM ASH SETTLING AREA
SITE TOPOGRAPHY

DRAWN BY:	ORC	APPROVED BY:	RDS	PROJ. NO.:	–	DATE:	JULY 2020

T:\AutoCAD\Projects\Westar Energy\Tecumseh\Surface Impoundment\2020 Closure Plan\Figure 2 - Site Topography.dwg, 7/20/2020 6:04:27 PM, AutoCAD PDF (High Quality Print).pc3