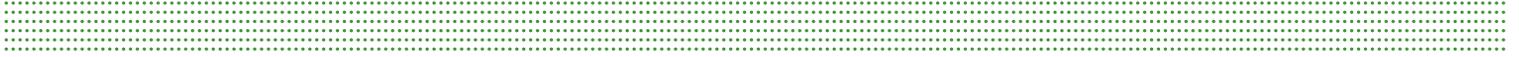


Sioux Energy Center  
Initial Closure Plan for  
CCR Surface Impoundment SCPC



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## 1.0 INTRODUCTION

SCPC (Cell 1) at the Sioux Energy Center is a 37.5 acre active surface impoundment used for managing CCR. SCPC is one cell in the planned Sioux Energy Center utility waste landfill (UWL) which is permitted by the Missouri Solid Waste Disposal Area Construction Permit No. 0918301 (“MDNR Construction Permit”) issued by the Missouri Department of Natural Resources (MDNR) Solid Waste Management Program (SWMP). The UWL will be constructed in 3 phases, and Phase I includes 3 surface impoundments denoted as Cell 1 (SCPC), Cell 2, and Cell 3. To date, only SCPC has been constructed.

## 2.0 CLOSURE PLAN

Pursuant to 40 CFR 257.102, a CCR surface impoundment can be closed by either leaving the CCR material in place and installing a final cover system, or through removal of the CCR (i.e. “closure by removal”). SCPC at the Sioux Energy Center will be closed by capping and leaving the CCR materials in place as contemplated and authorized by the regulations. Set forth herein is the process by which Ameren Missouri will close SCPC at Sioux at the end of its useful life. In accordance with 257.102(b)(3), this initial written closure plan will be amended as required to meet the CCR Rules in effect at the time of closure.

SCPC was constructed with a composite bottom liner system in accordance with the MDNR Construction Permit, which complies with the liner design criteria in the CCR Rule. Closure of SCPC will be accomplished by leaving CCR in place and constructing a final cover system in accordance with §257.102(d), *Closure performance standard when leaving CCR in place*. CCR material will be dewatered and graded to create acceptable slope stability and positive drainage in accordance with the MDNR Construction Permit. The final cover system will then be installed in direct contact with the CCR. Stormwater drains, side slope benches and let downs will be graded and constructed in accordance with the MDNR Construction Permit. The surface of the final cover system will be stabilized to control erosion of the final cover system throughout the post-closure period.

## 3.0 PROPOSED FINAL COVER SYSTEM

The final design of the final cover system will comply with the MDNR Construction Permit, and with 10 CSR 80-11.010(14) and 40 CFR 257.102(d)(3). The final cover system will have a permeability less than or equal to the permeability of the bottom liner system, or a permeability no greater than  $1 \times 10^{-5}$  cm/sec,

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whichever is less. Disruption of the final cover system will be minimized through a design that accommodates settling and subsidence.

The existing Sioux UWL closure approved in the MDNR Construction Permit includes an alternative final cover as defined by 257.102(d)(3). The current final cover system includes composite sections consisting of earthen fill and geomembrane liner on top, and other sections consisting of earthen fill only on the side slopes. The final cover will have a minimum 18-inch thick infiltration layer made of earthen fill, which will underlie a 6-inch thick layer of earthen material capable of sustaining plant growth or an alternative cover system. Ameren Missouri owns the property that contains the required quantity of soil suitable for construction of the final cover system. The final cover will be sloped a minimum of 1% to 2% on the uppermost “flat” area of the completed UWL, and between 25% and 33% on the exterior side slopes in accordance with the MDNR Construction Permit. A plan showing the final grading at closure of SCPC is attached.

The CCR Rule authorizes the use of an alternative final cover system for closure, provided such system meets equivalent performance requirements. If an alternative final cover system is implemented, the final engineering design will include a demonstration of the equivalency of the proposed final cover system.

### **3.1 Stormwater and Erosion Controls**

Stormwater that falls on SCPC after closure will be controlled by a system of perimeter berms, letdown channels, side slope bench drainage ways and a perimeter ditch, all ultimately directing stormwater runoff to the Recycle Pond in accordance with the MDNR Construction Permit. Side slope benches and letdown structures will carry stormwater from the upper portion of the slopes of the CCR unit to the perimeter ditch and Recycle Pond.

To manage erosion of the final cover, the side slope benches, stormwater letdown structures, and perimeter ditches will be stabilized with vegetation, erosion control mats, limestone riprap, and/or an articulated concrete blanket in accordance with the MDNR Construction Permit.

### **3.2 Stability and Settlement**

The CCR contained in SCPC is gypsum. Gypsum’s unique physical properties allow it to dewater and stabilize rapidly. Liquid from the impoundment will be removed by gravity drainage or by actively pumping from existing sumps and drains. The final grades and stability of SCPC after closure, including both the CCR fill and final cover system, were designed to accommodate potential settlement, and were

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evaluated as a condition of the MDNR Construction Permit approval and have acceptable factors of safety for stability.

#### **4.0 CCR UNIT INVENTORY AND AREA ESTIMATE**

Set forth in Table 1 is Ameren Missouri’s estimate of CCR material that will be deposited in SCPC at the time of closure.

**Table 1 - Estimated maximum CCR inventory and largest areas area of SCPC.**

<b>CCR Unit</b>	<b>Maximum Estimated CCR Inventory (CY)</b>	<b>Estimated Final Cover Area (acres)</b>
<b>SCPC</b>	2,800,000	37.5 acres

#### **5.0 CLOSURE SCHEDULE**

SCPC is an active unit that will continue to receive CCR until closure. Closure activities will not begin until the CCR in SCPC has reached the grades approved by the MDNR Construction Permit. Ameren has developed preliminary work schedules based on project milestones and estimated completion dates that are reflected in Table 2.

**Table 2 - Preliminary work schedules based on project milestones and estimated completion dates.**

<b>Closure Activity</b>	<b>Estimated Timeframe</b>
<b>Initial Written Closure Plan</b>	October 17, 2016
<b>Closure Activities Commence</b>	2023
<b>Agency Coordination and Permit Acquisition</b>	
• <b>Coordinate with state agencies for compliance</b>	2023
• <b>Acquiring state permits</b>	2023
• <b>Demonstration of alternative final cover</b>	2023
<b>Dewatering and Stabilization</b>	2023
<b>Installation of Final Cover System</b>	
• <b>Grading final cover subgrade</b>	2025
• <b>Installation of final cover</b>	2026
<b>Closure Activities Complete</b>	2028

## **6.0 POST-CLOSURE PLAN**

For CCR units closed by capping the CCR material in place, post-closure care is required for a minimum of thirty years. The final cover systems will serve to minimize infiltration of rainfall into the landfill during the post-closure period and provide aesthetic value. Post-closure care will include performance of the following activities and those activities required by the MDNR Construction Permit:

- Maintenance of cover integrity, vegetative growth to protect the cover material, and the surface water control system
- Maintenance, sampling, testing and statistical analysis of the groundwater monitoring wells

### **6.1 Post-Closure Contact Information**

**Contact Name:** Ameren Missouri  
**Contact Address:** 1901 Chouteau Avenue  
 St. Louis, MO 63103  
**Contact Phone Number:** (800) 552-7583  
**Contact Email Address:** [CCR@ameren.com](mailto:CCR@ameren.com)

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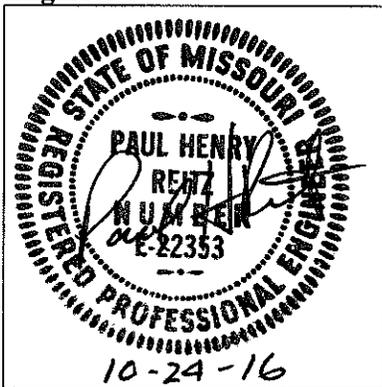
## 6.2 Post-Closure Land Use

The closure of SCPC will include turf or native grasses, or an alternative erosion layer. Ameren Missouri's current intent is to maintain the closed the SCPC as a passive, open space.

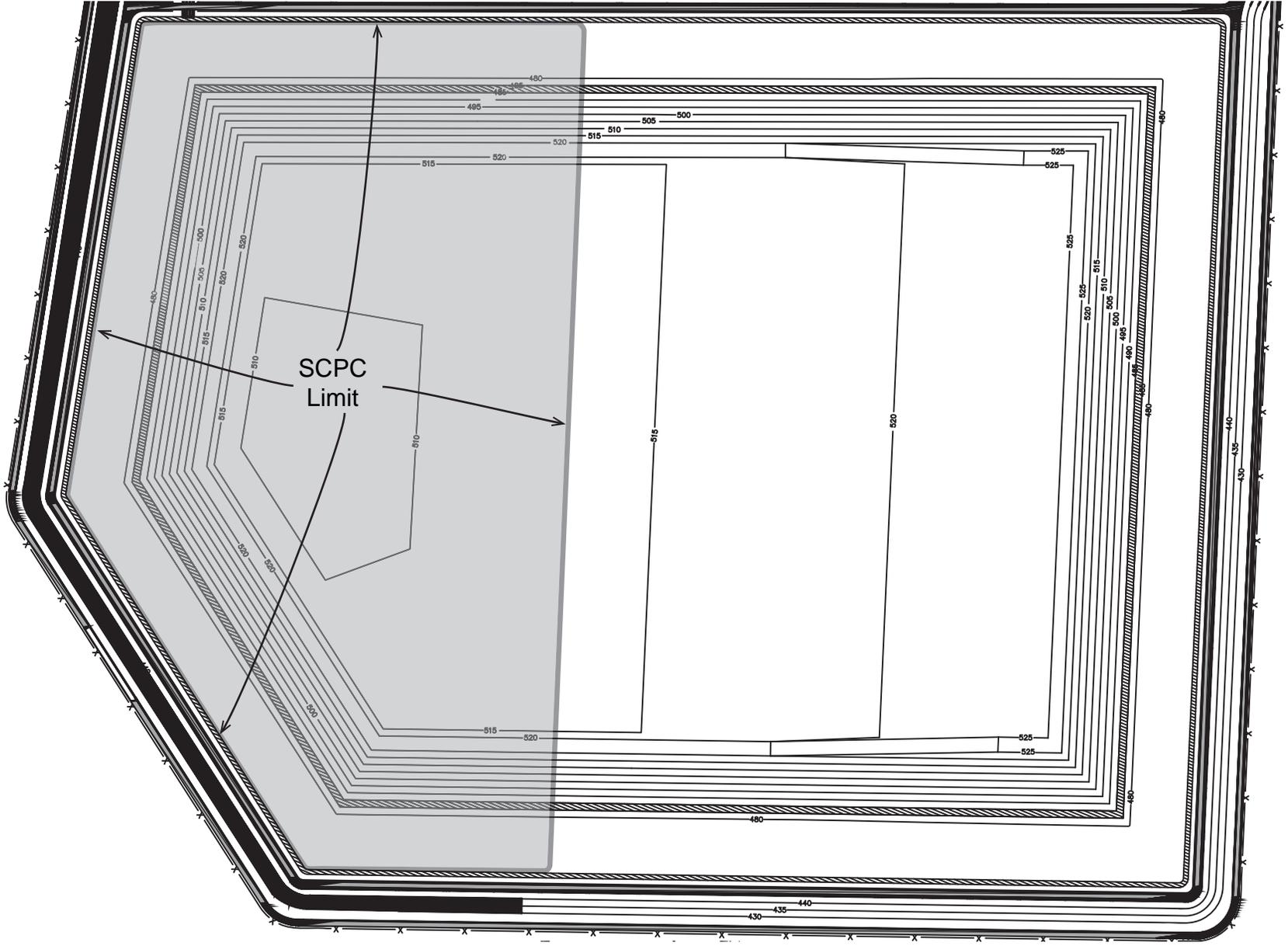
### Engineering Certification – Closure and Post-Closure Plan

The Closure and Post-Closure Plans for active CCR landfill SCPC at the Sioux Energy Center were prepared for MDNR SWMP Construction Permit No. 0918301, and will be amended to meet the requirements of 40 CFR 257.102(b) and 40 CFR 257.104(d) in effect at the time of closure. Engineering justification for this certification has been placed in the operating record.

#### Engineer's Seal



Paul Reitz, P.E.  
License: PE-22353, MO



Ameren Missouri  
Sioux Energy Center  
SCPC Closure Schematic