Rush Island Energy Center
Closure Plan
Post-Closure Plan
for
CCR Surface Impoundment

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1.0 INTRODUCTION

Pursuant to 40 CFR 257 (CCR Rule), specifically §257.102(b), the owner or operator of a Coal Combustion Residual (CCR) unit must prepare a written closure plan identifying the manner and timing of closure and, with respect to the installation method for the final cover system, describe the procedures to remove and decontaminate the unit or place a final cover system depending on closure method to meet the designated performance criteria set forth in the CCR Rule. In a related activity under §257.104(d) of the CCR Rule, the owner or operator must prepare an initial written post-closure plan describing monitoring and maintenance activities during the post-closure care period. This document contains both of these written plans and their associated certification statements.

There is one active CCR surface impoundment at the Rush Island Energy Center, referred to as the RCPA. The impoundment receives direct sluice bottom ash, wetted fly ash, and other plant process water and discharges through an NPDES permitted outfall. Appended hereto as Appendix A, is a locus map showing the location of the impoundment. Set forth below is a table identifying the impoundment, operational status and anticipated closure date. Such schedule is preliminary and subject to revision based upon operational needs, regulatory compliance, construction progress and/or budgetary constraints.

Table 1 – Rush Island Energy Center CCR Units

CCR Unit	CCR Type	Operational Status	Estimated Closure Start Date	Estimated Closure Completion Date
RCPA (Ash Pond)	Bottom Ash, Fly Ash	Active	2018	2023

Set forth below in Table 2 is Ameren Missouri's estimate of CCR materials within the unit along with the currently expected final cover area. Note that final cover area and volume is subject to change due to current operational activities and method of closure.

Table 2. Estimated CCR Inventory and Cover Area

CCR Unit	Estimated Inventory (CY)	Estimated Final Cover Area (Acres)
RCPA (Ash Pond)	12,725,000	111

Note: Estimated inventory based on Annual CCR Inspection dated January 7, 2016 which states total water and CCR volume as listed above. The maximum inventory assumes that all wet space of the impoundment is filled with CCR.

2.0 CLOSURE PLAN

Ameren intends to close the RCPA (Ash Pond) at the Rush Island Energy Center 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 use to close the CCR impoundment at Rush Island.

This Closure Plan requires drainage (dewatering of free liquids) and general stabilization of the existing CCR material, placement of general fill, and the installation of a final cover system over the CCR material to minimize erosion and infiltration. The final cover grades will promote drainage and minimize cuts and fills (and associated construction costs). Stormwater on the final cover system will be conveyed to NPDES approved outfalls. A conceptual site plan and schematic grading plan for RCPA (Ash Pond) closure is presented in Appendix B for reference. Primary activities associated with closure of the impoundment are described below with the understanding that a more detailed engineering design has yet to be evaluated and completed.

2.1 Reroute Process Water/Piping Modifications and Equipment Removal

Once ash handling systems have been installed to cease placement of CCR in the RCPA (Ash Pond), and to preclude the probability of future impoundment of water, water systems and piping will be rerouted from this unit to other areas to prevent future discharge of plant service water systems or other drainage to the closed impoundment. In addition, any equipment previously used to manage CCR within the impoundment footprint will be removed as it is no longer needed for closure purposes.

2.2 Dewater Surface Water

Liquid from impoundments is removed either passively (e.g. gravity drainage) or actively (e.g. extraction wells, pumps or trenches). To dewater the unit, material can be moved and stockpiled to allow water to drain to sump areas where pumps will be utilized to discharge decant water through approved NDPES outfalls or to other water management systems at the facility. Recognized and generally accepted good engineering practices will be utilized in regards to determining when dewatering has been completed and stabilization of the remaining CCR and grading will commence.

2.3 Stabilization and Grading

The CCR Rule requires final cover systems for CCR units preclude the probability of future impoundment of water, sediment or slurry and the stabilization of wastes within an impoundment. The underlying CCR is considered stabilized when it is structurally suitable for use as a base layer and can accommodate construction activities. Stabilization techniques could include, but not be limited to, compaction via tracking by earth moving equipment or installation of a bridging layer.

Minimum design slopes are not established within the CCR Rule. However, in its Utility Waste Landfill Regulations, the Missouri Department of Natural Resources requires a minimum slope of one percent (1%) which Ameren Missouri will use as practicable for final slopes of the surface impoundments. Ameren Missouri will optimize the use of existing onsite CCR materials to achieve final grade and to enhance drainage. Additional import materials may be required to develop the necessary subgrade.

Any subgrade development, including use of CCR, will consist of placement in loose lifts of uniform thickness and then compacted. Final grades will then be cut and achieved prior to installation of the final cover system. The subgrade will be proofrolled to confirm suitable subgrade conditions exists. A conceptual grading plan schematic is provided in Appendix B.

2.4 Installation of Drainage and Stormwater Management

Stormwater management systems will be designed and constructed to adequately manage flow during peak discharge of the design flood event and collect and control runoff during the same design storm. Collection channels will include appropriate width, depth, sideslopes, and erosion controls as deemed appropriate during design.

2.5 Design and Install Cover System

Ameren will meet the final cover system minimum standards which include an 18-inch infiltration layer and 6 inches of topsoil to support the growth of vegetation. The final cover is also required to have permeability less than or equal to that of the bottom layer or no greater than 1×10^{-5} cm/sec, whichever is less. Alternative cover systems may be authorized provided that such design meets or exceeds the CCR Rule performance standards. Applicable geotechnical design will support the use of a particular final cover system. More details of the proposed options for the final cover system are provided in Section 3.0.

2.6 Closure Documentation

A construction quality assurance plan, engineering drawings, bid specifications and "as built" construction drawings will be developed to demonstrate that appropriate closure activities were successfully implemented. Additional closure documentation will include the following:

- The annual progress reports summarizing closure progress and projected closure activities:
- Notification of completion of closure will be completed within 60 days of the actual closure completion date.

The closure notices and progress reports will be placed in Rush Island's Operating Record; will be sent to the Director of Missouri Department of Natural Resources (MDNR) before close of business on the respective compliance dates; and will be placed on Ameren's CCR public website within 30 days of placing said information in the Operating Record.

Within 30 days following completion of closure of the CCR unit, Ameren shall record a notation on the deed to the RCPA property stating that the property has been used as a CCR unit and its use is restricted under the Post-Closure Care Plan and the post-closure care requirements.

3.0 FINAL COVER SYSTEM

A typical final cover system used for closure is comprised of earthen materials designed to a performance standard of no less than $1x10^{-5}$ cm/s permeability, and sufficient soil cover to support vegetative growth to minimize erosion. Synthetic materials may also be used to achieve the permeability standard.

A typical cross section of the final cover system is shown in Exhibit 2 below.

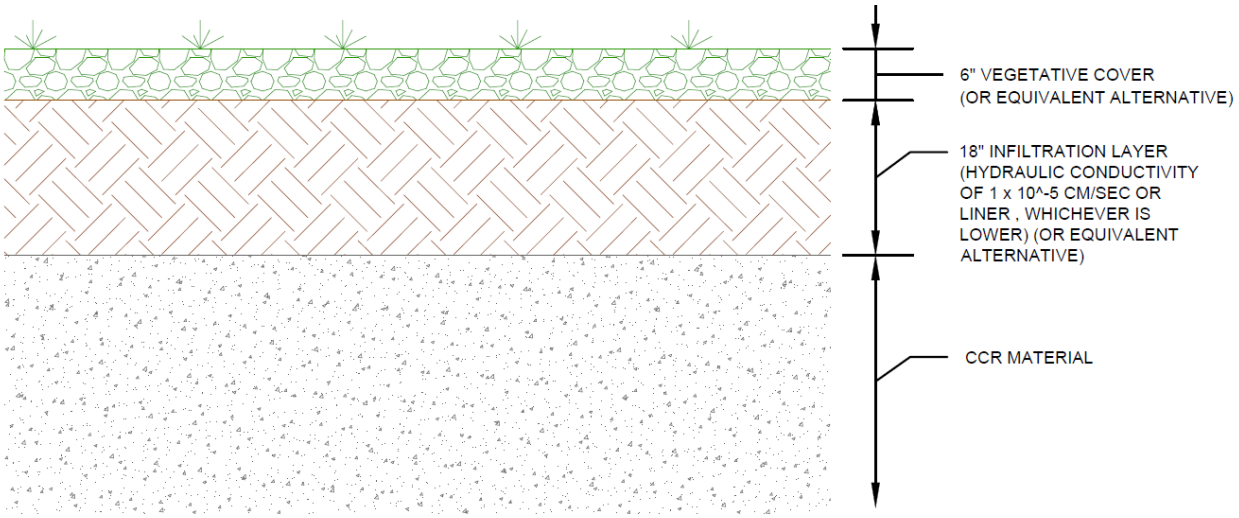


Exhibit 1 – Typical CCR Rule Compliant Final Cover System

3.1 Alternative Cover System

The CCR Rule authorizes the use of an alternative final cover system for closure, provided such system meets equivalent performance requirements. Alternative final systems comprised of synthetic turf material have demonstrated equivalence with the prescriptive final cover requirements in solid waste applications, and have been approved for use as final cover (primarily in landfill applications). MDNR has approved synthetic turf systems for use as interim covers for use at municipal solid waste landfills and we are evaluating their use for final cover. Benefits of an alternative cover system application include reduced cover system costs when soils would otherwise be required to be imported, reduced environmental impact from haul trucks, a potential reduced construction timeframe, improvements to stormwater discharge quality, ability to accommodate settling / subsidence, and reductions in post-closure care maintenance.

Consideration of an alternative cover system will be based on interviews with manufacturers, site visits and a field demonstration assessment. Each of the technologies considered by Ameren Missouri prevent contact of CCR materials with percolating rainwater, promote controlled runoff to stormwater detention systems, reduce borrow volume requirements and minimize maintenance. Performance considerations used to evaluate various synthetic products include the following: permeability, constructability, cost, installation time, thickness, puncture strength, wind resistance, flood resistance, CCR compatibility, vehicle traffic, storm flow velocity restrictions, maintenance, erosion control, and UV protection.

A typical cross section of an alternative cover system is set forth below. The particular example provided below is one option and other alternative scenarios and manufacturers or equals will be considered as deemed appropriate by Ameren.

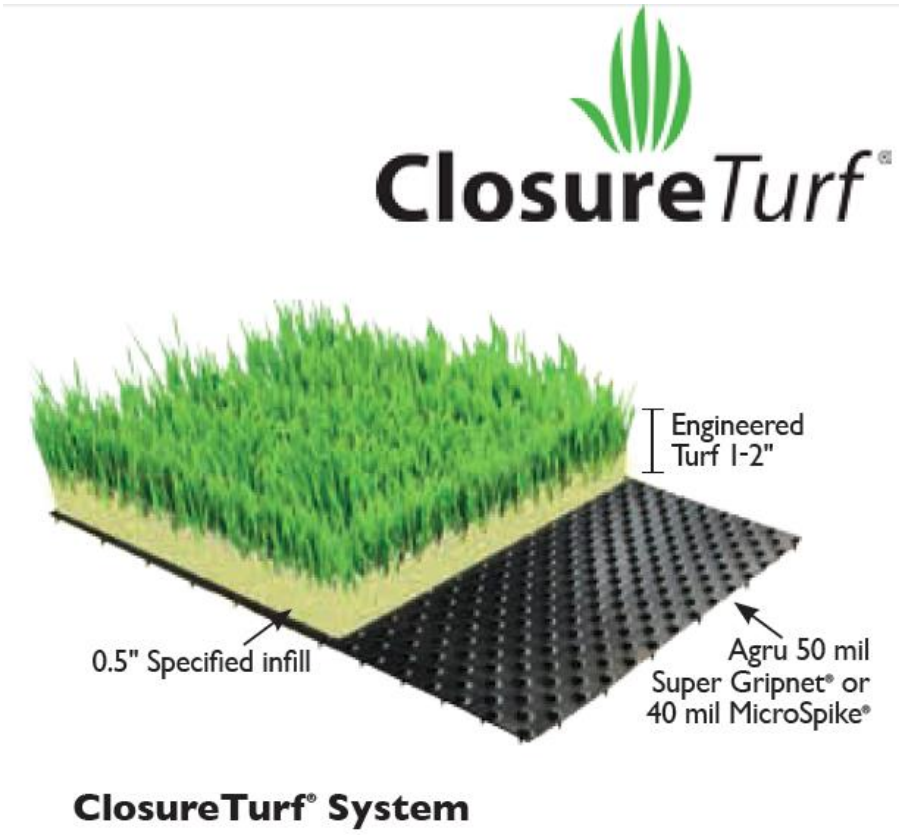


Exhibit 2 – Example Alternative Synthetic Alternative Final Cover System (From Agru America Closure Solutions Brochure)

3.2 Settlement and Subsidence of Cover System

Settling and subsidence of the final cover system is considered to be minimal. Settlement on the impoundment occurs during consolidation of the CCR material, general fill material, or underlying natural subsoils under new loads from grading activities. A portion of the CCR material within the impoundments contains cemented material that will have minimal settlement. The saturated, un-cemented CCR material encountered will settle under the additional loading. This settlement, however, will occur for the duration of grading activities and is expected to be minimal after the final cover system is installed. General fill will be installed in a controlled manner to minimize post-cover system installation settlement.

Slope stability and mass stability of the covered-in-place material will be analyzed after completion of the final design, which will occur in the future as directed by Ameren. The stable cover system design concept will minimize the need for extensive future maintenance.

3.3 Method of Installation

In general, closure construction will consist of erosion and sediment control installation, clearing and grubbing, dewatering, grading and compaction of CCR, constructing a compacted clay layer and erosion layer or alternative cover system, installing stormwater controls, and performing final seeding and restoration.

4.0 PRELIMINARY WORK SCHEDULE

Ameren has developed a generic preliminary closure work schedule based on project milestones and estimated completion dates reflected in Table 1. Since this unit has not yet submitted an intent to initiate closure, the timing is generic as shown in Exhibit 3 below.

Ameren - Rush Island Ash Pond
Closure Schedule

Item #	Task Item	Completion Timeframe (months)														
		-8	-7	-6	-5	-4	-3	-2	-1		12	24	36	48	60	62
1	Prepare Construction Plans															
2	PE Design Certification															
3	Notice of Intent to Close															
4	MDNR Closure Approval															
5	Cease placing CCR															
6	Commence Closure															
7	Dewater Impoundment															
8	Final Cover Installation															
9	PE Closure Certification															
10	Notice of Closure															
11	Record Deed Notation															
12	Notice of Deed Recordation															

Exhibit 3 - Generic Closure Timeline

5.0 REGULATORY APPROVAL

To the extent closure activities impact stormwater conditions set forth in the current NPDES permit, Ameren will consult with the Agency as appropriate.

6.0 AMENDMENT TO CLOSURE PLAN

Ameren will assess the Closure Plan and amend the Plan whenever there is a change in operation of the CCR impoundment that would substantially affect the Plan or when unanticipated events necessitate a revision of the Plan either before or after closure activities have commenced.

The Closure Plan will be amended at least 60 days prior to a planned change in the operation of the facility or the CCR impoundment, or no later than 60 days after an unanticipated event requires the need to revise the Plan. If the closure plan needs to be revised after closure activities have commenced, the Plan will be revised no later than 30 days following the triggering event.

The amended Closure Plan will be placed in the facility operating record as required by the CCR Rule.

A record of amendments to the Closure Plan will be tracked below.

Version	Date	Description of Changes Made
1	10/13/2016	Initial Submittal
2	11/08/2016	Revised Closure Date in Table I/Revised Exhibit 3

7.0 CLOSURE PLAN CERTIFICATION

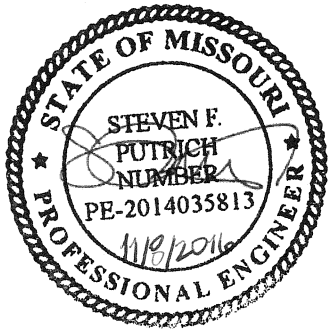
I certify that this Written Closure Plan for Ameren's RCPA (Ash Pond) CCR surface impoundment at the Rush Island Energy Center meets the USEPA's CCR Rule requirements of §257.102(b).

Signed: _____

Certifying Engineer

Print Name: Steven F. Putrich, P.E.
Missouri License No.: 2014035813
Title: Project Principal
Company: Haley & Aldrich, Inc.

Professional Engineer's Seal:



7.1 Final Cover System Certification

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

I certify that this final cover system for Ameren's RCPA (Ash Pond) CCR surface impoundment at the Rush Island Energy Center meets the USEPA's CCR Rule requirements. of §257.102.

Signed: _____

Certifying Engineer

Print Name: Steven F. Putrich, P.E.
Missouri License No.: 2014035813
Title: Project Principal
Company: Haley & Aldrich, Inc.

Professional Engineer's Seal:

8.0 POST-CLOSURE PLAN

For CCR units closed by capping the CCR material in place, post-closure care is required in accordance with §257.104 for a minimum of thirty years per the CCR Rule. Ameren will also need to meet any additional post-closure care requirements set forth under MDNR regulations.

8.1 Activities

In accordance with §257.104(c) of the CCR Rule, Ameren will conduct post-closure care activities for 30 years following completion of closure activities of the RCPA (Ash Pond). This assumes that the site is not under groundwater monitoring assessment monitoring.

The final cover system including stormwater controls will be inspected on a yearly basis by appropriate personnel for settlement, seepage, erosion, scarps, sloughs, stormwater ponding on the final cover system, wind erosion, storm water erosion, animal burrows, and overall integrity of the final cover system. In addition, run-on and run-off controls will be inspected for signs of erosion and seepage. As determined necessary to maintain the structural integrity of the final cover system and storm water controls, the final cover system and its components will be repaired for any noted deficiencies.

No leachate collection system exists at the unit; therefore, there are no related post-closure requirements for that type of system.

During the post-closure care period, Ameren will maintain the integrity of the monitoring wells, bollards, well surface completion, and sampling equipment in secure and proper working condition for the required sampling intervals. The monitoring wells and sampling equipment will be inspected at each sampling event. Any identified damage or deficiency in the integrity of the monitoring wells or components will be repaired to maintain the integrity of the system. The monitoring wells will then be re-surveyed if surface completions are modified. Ameren will be developing the monitoring wells and certifying the system in documents under separate cover as required by the CCR Rule. Those documents should be reviewed for applicability and additional information during the post-closure care period.

8.2 Post-Closure Care Contact Information

The name, address, telephone number, and email address of the person or office to contact about the facility during the post-closure care period is as follows:

Name:	Ameren Missouri
Address:	1901 Chouteau Avenue St. Louis, Missouri 63103
Telephone Number:	(800) 552-7583
Email Address:	CCR@ameren.com

8.3 Planned Uses

Ameren currently has no planned uses for the CCR surface impoundment after closure has been completed. Ameren reserves the right to alter that planned use and will update this Closure Plan at that time.

8.4 Amendment to Post-Closure Plan

This initial Plan or any subsequent version of the Post-Closure Plan will be assessed and amended whenever there is a change in operation of the RCPA (Ash Pond) Pond that would substantially affect the Plan or when unanticipated events necessitate a revision of the Plan either before or after closure activities have commenced and been completed in accordance with §257.104(d)(3). Revisions to the Plan will be made in accordance with §257.104(d)(3)(iii).

Any amendments to the Plan will include written certification from a qualified professional engineer that the amendments to the Plan meet the requirements of the CCR Rule.

A record of amendments to the plan will be tracked below. The latest version of the Plan will be noted on the first page of the Plan.

Version	Date	Description of Changes Made
1	10/13/2016	Initial Issuance

8.5 Certification

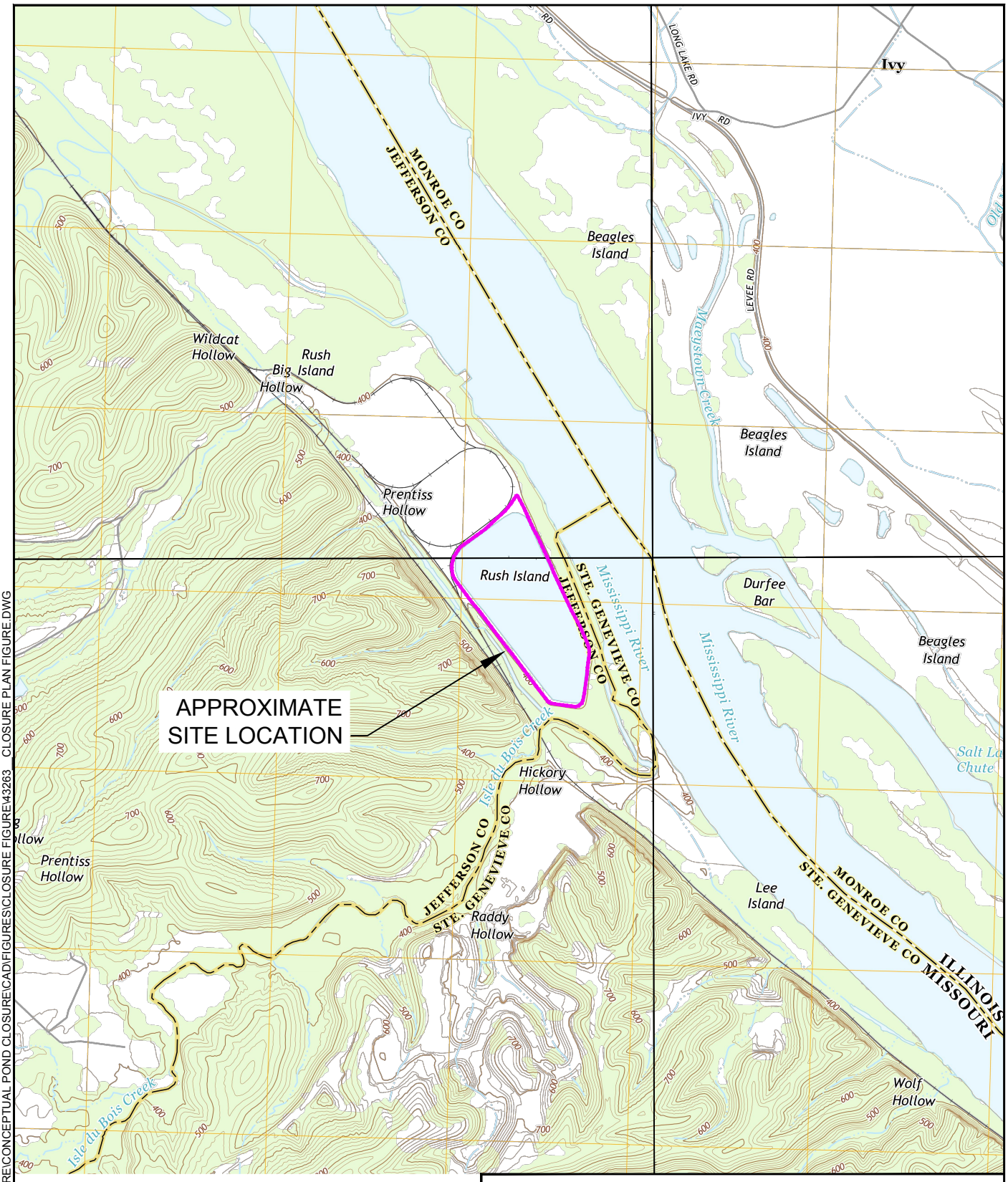
I certify that this initial Written Post-Closure Plan for Ameren's RCPA (Ash Pond) CCR surface impoundment at the Rush Island Energy Center meets the USEPA's Final CCR Rule requirements of §257.104(d).

Signed:_____
Certifying Engineer

Print Name:	Steven F. Putrich, P.E.
Missouri License No.:	2014035813
Title:	Project Principal
Company:	Haley & Aldrich, Inc.

Professional Engineer's Seal:

APPENDIX A – LOCATION MAP



BLEVINS, BRETT Printed: 10/4/2016 10:47 AM Layout: HA-FIG-A-P
G:\43263 AMEREN RI POND CLOSURE\CONCEPTUAL POND CLOSURE\CAD\FIGURES\CLOSURE FIGURE\43263 CLOSURE PLAN FIGURE.DWG

NOTES

1. BACKGROUND MAPS ARE 7.5 MINUTE QUADRANGLE MAPS, DATED 2015.

0 2500 5000
SCALE IN FEET

HALEY ALDRICH

AMEREN MISSOURI
RUSH ISLAND ENERGY CENTER
RUSH ISLAND, MISSOURI

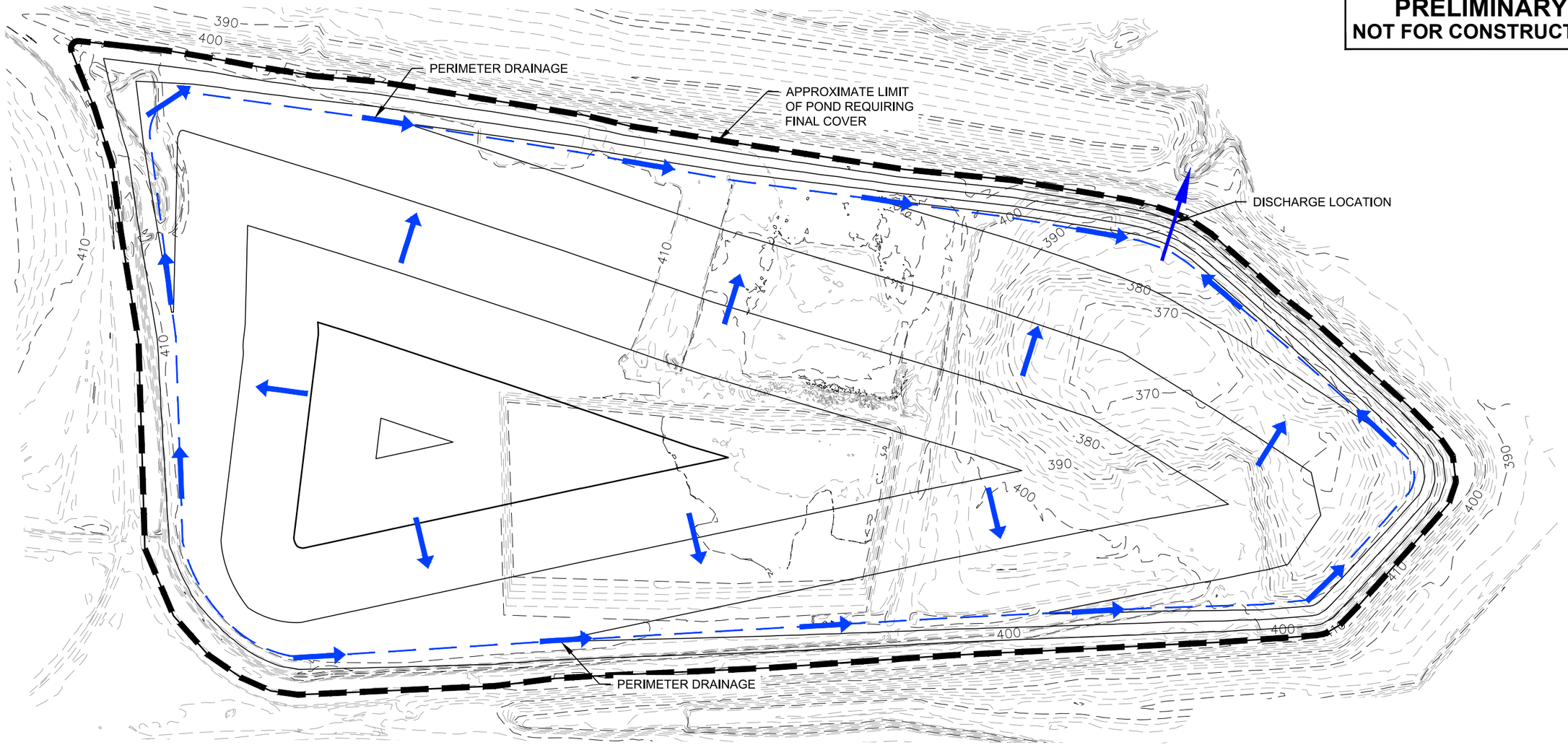
SITE LOCATION

SCALE: AS SHOWN
OCTOBER 2016

FIGURE 1

APPENDIX B – CONCEPTUAL CLOSURE PLAN SCHEMATIC

PRELIMINARY
NOT FOR CONSTRUCTION



THE LAYOUT AS SHOWN IS UNDER CONSIDERATION BY AMEREN AS A PRELIMINARY CLOSURE OPTION. THIS LAYOUT HAS NOT BEEN CHOSEN AS THE PREFERRED ASH POND CLOSURE OPTION, AND MORE DETAILED OPTIONS ANALYSIS AND DETAILED DESIGN WILL occur BEFORE A CLOSURE OPTION IS CHOSEN.

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- APPROXIMATE LIMITS REQUIRING FINAL COVER

NOTES

1. EXISTING TOPOGRAPHY OF THE RUSH ISLAND ASH POND IS BASED ON A COMPOSITE OF THE FOLLOWING SURVEY INFORMATION AND APPROXIMATED ASH STOCKPILING INFORMATION: AN AERIAL SURVEY CONDUCTED BY KUCERA INTERNATIONAL, INC. ON OCTOBER 8TH, 2013 AND PROCESSED BY HENDERSON AERIAL SURVEY; SUPPLEMENTAL STOCKPILE TOPOGRAPHIC INFORMATION AS SURVEYED BY ZAHNER & ASSOCIATES, INC., FROM JANUARY 31, 2014 AND MARCH 26, 2014; AND APPROXIMATED ASH STOCKPILE INFORMATION BETWEEN THE DATE OF MOST RECENT TOPOGRAPHY THROUGH THE END OF JULY 2015. ADDITIONALLY, BASED ON PLANT KNOWLEDGE, THE NORTHEAST INTERIOR PORTION OF THE ASH POND WAS ASSUMED TO BE AND DEPICTED AS A RELATIVELY FLAT AREA AT AN ELEVATION OF 410 AMSL.

0 300 600
SCALE IN FEET

HALEY ALDRICH

AMEREN MISSOURI
RUSH ISLAND ENERGY CENTER
RUSH ISLAND, MISSOURI

CONCEPTUAL ASH POND CLOSURE SCHEMATIC

SCALE: AS SHOWN
OCTOBER 2016

FIGURE 2

BLEVINS, BRETT Printed: 10/4/2016 10:48 AM Layout: PLAN
G:\43263_AMEREN RI POND CLOSURE\CONCEPTUAL POND CLOSURE\CAD\FIGURES\CLOSURE FIGURE43263_CLOSURE PLAN FIGURE2.DWG