

# Closure Plan for Inactive CCR Surface Impoundments – Amendment No. 1

Interstate Power and Light Company  
Sutherland Generating Station – Main Ash Settling Area  
3001 E. Main Street Road  
Marshalltown, Iowa 50158

Prepared for:

Interstate Power and Light Company  
Sutherland Generating Station  
3001 E. Main Street Road  
Marshalltown, Iowa 50158

**SCS ENGINEERS**

25218136.00 | July 29, 2019

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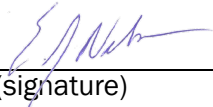
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A – February 15, 2018 Sargent & Lundy Closure Plan

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## PE CERTIFICATION

|   |   |
|---|---|
|  | <p>I, Eric J. Nelson, hereby certify the following:</p> <ul style="list-style-type: none"> <li>This Closure Plan amendment meets the requirements of 40 CFR 257.102(b)</li> <li>The final cover system described in this Closure Plan amendment meets the design requirements in 40 CFR 257.102(d)(3)</li> </ul> <p>The Closure Plan amendment was prepared by me or under my direct supervision, and I am a duly licensed Professional Engineer under the laws of the State of Iowa.</p> |
|   | <div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> <br/>             (signature)         </div> <div style="text-align: right;">             7/29/2109<br/>             (date)         </div> </div>   |
|   | <p style="text-align: center;">Eric J. Nelson<br/>(printed or typed name)</p>   |
|   | <p>License number <u>23136</u></p> <p>My license renewal date is December 31, 2020.</p>   |
|   | <p>Pages or sheets covered by this seal:</p> <p style="text-align: center;">Closure Plan for Inactive CCR Surface Impoundments –</p>  |
|   | <p style="text-align: center;">Amendment No. 1</p>  |

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## 1.0 INTRODUCTION AND PROJECT SUMMARY

On behalf of Interstate Power and Light Company (IPL), SCS Engineers (SCS) has prepared Amendment Number 1 (No. 1) to the Closure Plan for the Main Ash Settling Area at the Sutherland Generating Station (SGS) as allowed by 40 CFR 257.102(b)(3)(i).

The initial closure plan was issued in February 2018 by Sargent & Lundy in accordance with 40 CFR 257.100(e)(6) and 257.102(b). SCS prepared Amendment No. 1 at the request of IPL to reconcile the February 2018 closure plan with the plans developed to obtain a closure permit (Sanitary Disposal Project Closure Permit No. 64-SDP-11-19C) from the Iowa Department of Natural Resources (IDNR).

**40 CFR 257.102(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.”*

**40 CFR 257.102(b)(3)** *“Amendment of a written closure plan. (i) The owner or operator may amend the initial or any subsequent written closure plan developed pursuant to paragraph (b)(1) of this section at any time.”*

SGS site background information, project summary, and site layout is described in Section 1 of the February 15, 2018 closure plan developed by Sargent & Lundy. The February 2018 closure plan document is provided in **Appendix A**.

## 2.0 PROPOSED CCR IMPOUNDMENT CLOSURE PROCEDURE

**40 CFR 257.102(b)(1)(i)** *“A narrative description of how the CCR unit will be closed in accordance with this section.”*

The proposed CCR impoundment closure procedure was initially described in Section 2 of the February 15, 2018 closure plan developed by Sargent & Lundy. The amended closure procedure is provided below.

The proposed Main Ash Settling Area closure will meet the requirements of the Federal CCR Rule and State Regulations. The closure will include the following tasks:

- Dewatering of all ponds in the Main Ash Settling Area.
- Demolition of above and below grade conveyance features.
- Stabilizing impoundment bottoms to receive fill.
- Consolidation of the Main Ash Settling Area, to final cover subgrades. Material consolidation includes the following:
  - CCR currently located within the Main Ash Settling Area
  - Residual coal and soil from the former coal yard area
  - Demolition materials including concrete, brick, stone, and other inert materials from the plant demolition that are free of hazardous materials.

- Capping of consolidated and graded CCR material.
- Establishing final grades to preclude ponding storm water on the cap.
- Direct non-contact storm water drainage off the cap:”
  - The cover will shed storm water off the cover in all directions to perimeter swale.
  - Runoff is collected in perimeter vegetated swale that channel the flow to be discharged via culverts along the south and the northwest perimeter of the closure area under the gravel perimeter access road.
- Restoration of all areas disturbed during construction.

Slopes will range from a minimum of approximately 2.5% to a maximum of 5H:1V. The final grades may vary if settlement occurs in the fill material during material placement and grading, or the estimated fill material volumes are different than what is estimated. Final grades are designed to provide flexibility to accommodate these changes. Side slopes can be flattened or steepened, but will not be steepened in excess of 4H:1V or flattened to less than 2 percent (outside the drainage swales).

A 20-foot-wide perimeter road will be established around the final cover system limits. The road will consist of a geotextile separation fabric and 12 inches of aggregate material. A portion of the perimeter road will be constructed on top of the final cover. In these areas, the 6-inch topsoil layer will be replaced with the 12-inch aggregate layer.

### 3.0 PROPOSED COVER SYSTEM

**40 CFR 257.102(b)(1)(iii).** *“If closure of the CCR unit will be accomplished by leaving CCR in place, a description of the final cover system, designed in accordance with 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 will achieve the performance standards specified in paragraph (d) of this section.”*

The proposed cover system is described in Section 3 of the February 15, 2018 closure plan developed by Sargent & Lundy. No alternate cover system was permitted with the IDNR, so Section 3 is amended to remove the following text from the February 15, 2018 closure plan developed by Sargent & Lundy (**Appendix A**).

*“As an alternate cover system, a geosynthetic clay liner (GCL) /HDPE composite overlain with 18” of soil capable of sustaining vegetative growth may be used. A GCL is a manufactured clay liner consisting of bentonite (sodium montmorillonite) clay encapsulated between two layers of woven geotextile. It is placed directly atop the CCR subgrade and is activated by the moisture provided in the protective soil cover. If used, the GCL will provide a hydraulic conductivity which is less than the 1x10<sup>-5</sup>cm/s requirement in the CCR Rule. It will also accommodate settling and subsidence.”*

### 4.0 ESTIMATED MAXIMUM INVENTORY OF CCR

**40 CFR 257.102(b)(1)(iv).** *“An estimate of the maximum inventory of CCR ever on-site over the active life of the CCR unit.”*

The estimated maximum inventory of the CCR at SGS has not changed and is described in Section 4 of the February 15, 2018 closure plan developed by Sargent & Lundy.

## 5.0 ESTIMATED MAXIMUM AREA OF COVER

**40 CFR 257.102(b)(1)(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.”

The description of the estimated maximum area of cover from Section 5 of the February 15, 2018 closure plan developed by Sargent & Lundy is amended, as follows:

The estimated maximum extent of final cover provided in the initial closure plan was 14.7 acres. As designed, the proposed cover system will occupy an area of approximately 14.2 acres.

## 6.0 SCHEDULE OF SEQUENTIAL CLOSURE ACTIVITIES

**40 CFR 257.102(b)(1)(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 of closure activities from Section 6 of the February 15, 2018 closure plan developed by Sargent & Lundy is amended, as follows:

Closure of the existing CCR surface impoundments is anticipated to require one construction season to complete as shown in the schedule below.

| Task Description  | Anticipated Start Date | Anticipated Completion Date |
|---|------------------------|-----------------------------|
| Award Contract for Closure Work   | 6/2019                 | 6/2019 (Actual)             |
| Construction of CCR Surface Impoundment Closure   | 7/2019                 | 12/2019                     |
| Place a Notification of CCR Surface Impoundment Closure Completion in the Station’s Operating Record  | 12/2019                | 12/2019                     |
| Send Notification of availability of Closure Completion to Relevant State Director / Place Closure Completion to the Station’s Internet Website | 12/2019                | 12/2019                     |
| Record a Notation of the CCR Impoundment Closure on the Deed of the Property  | 12/2019                | 12/2019                     |
| Place a Notification of the Deed Notation in the Station’s Operating Record   | 12/2019                | 12/2019                     |
| Send Notification of Availability of Deed Notation to Relevant State Director / Place Deed Notation to the Station’s Internet Website           | 12/2019                | 12/2019                     |

## 7.0 COMPLETION OF CLOSURE ACTIVITIES

To confirm completion of the CCR surface impoundment closures, IPL has retained SCS, a qualified engineer licensed in the State of Iowa, to verify that the CCR surface impoundments have been closed in accordance with this closure plan and the requirements of 40 CFR 257.102(d). SCS will provide IPL with a written certification stating compliance as required in 40 CFR 257.102(f)(3). The Post-Closure Plan is presented in a separate document.



## 8.0 CERTIFICATIONS

**40 CFR 257.102(b)(4)** *“The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer that the initial and any amendment of the written closure plan meets the requirement of this section.”*

Eric J. Nelson, PE, a licensed professional engineer in the State of Iowa, has overseen the preparation of this Closure Plan Amendment. A certification statement is provided on **page iii** of the amendment.

## 9.0 RECORDKEEPING AND REPORTING

**40 CFR 257.102(b)(vi)(2)(iii)**. *“The owner or operator has completed the written closure plan when the plan including the certification required by paragraph (b)(4) of this section, has been placed in the facility’s operating record as required by Section 257.105(i)(4).”*

The closure plan amendment will be placed in the facility’s operating record and on Alliant Energy’s CCR Rule Compliance Data and Information website.

Additional amendments to the written closure plan will be done when there is a change in the operation of the CCR unit that affects the plan or when unanticipated events warrant revision to the written closure plan, as required by 40 CFR 102(b)(3)(ii).

IPL will provide notification as follows:

- Intent to initiate closure (notification submitted December 14, 2015)
- Closure completion
- Availability of the written Closure Plan and any amendments

All notifications will be placed in the facility’s operating record and on the website (40 CFR 257.105(i), 257.106(i), 257.107 (i)).

## 10.0 REFERENCES

40 CFR Part 257, Subtitle D – Environmental Protection Agency Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities.

Sargent & Lundy, 2018, Closure Plan for Inactive CCR Surface Impoundments, Sutherland Generating Station, Interstate Power and Light, February 15, 2018.

## Appendix A

### February 15, 2018 Sargent & Lundy Closure Plan



# Closure Plan for Inactive CCR Surface Impoundments

Prepared for Interstate Power and Light Company  
Sutherland Generating Station  
Marshalltown, IA

Issue Date: February 15, 2018  
Issue Purpose: For Use

|              |  |            |
|--------------|--|------------|
| Prepared by: |    | 02/15/2018 |
|              | M. Turner  | Date       |
| Reviewed by: |  | 02/15/2018 |
|              | D. Packard   | Date       |
| Approved by: |  | 02/15/2018 |
|              | K. Mixer   | Date       |

Certification and Seal:

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa:



Kenneth Mixer  
My license renewal date is December 31, 2018  
Pages covered by this seal: All

55 East Monroe Street  
Chicago, IL 60603-5780 USA  
Project No. 13391-055

Report Number: SL-014297  
Revision: 0

**FINAL**



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## **LEGAL NOTICE**

*This report ("Deliverable") was prepared by Sargent & Lundy, L.L.C. ("S&L"), expressly for the sole use of Alliant Energy ("Client") in accordance with the agreement between S&L and Client. This Deliverable was prepared using the degree of skill and care ordinarily exercised by engineers practicing under similar circumstances. Client acknowledges: (1) S&L prepared this Deliverable subject to the particular scope limitations, budgetary and time constraints, and business objectives of the Client; (2) information and data provided by others may not have been independently verified by S&L; and (3) the information and data contained in this Deliverable are time sensitive and changes in the data, applicable codes, standards, and acceptable engineering practices may invalidate the findings of this Deliverable. Any use or reliance upon this Deliverable by third parties shall be at their sole risk.*

## 1. INTRODUCTION

Interstate Light and Power Company (IPL) – a wholly owned subsidiary of Alliant Energy – operates the Sutherland Generating Station (SGS), located east of Marshalltown, IA, in Marshall County. SGS has four inactive coal combustion residual (CCR) surface impoundments, collectively known as the Main Ash Settling Area. The Main Ash Settling Area was commissioned in the late 1950s and was used as a bottom ash settling impoundment until the station’s conversion to natural gas in April of 2012. As a result of accumulated CCR, the impoundment was reconfigured into a four pond system with an area on the north side of the impoundment area for stockpiling bottom ash. The four inactive CCR surface impoundments are known as the Primary (North) Pond, the Primary (South) Pond, the Secondary (Main) Pond, and the Polishing Pond. There is an additional pond at the northeast corner of this area, the Discharge Pond. This pond was not designed to hold, treat, or dispose of CCR and therefore is not subject to the CCR Rule. The Station is currently planning to decommission the four inactive CCR surface impoundments within the Main Ash Settling Area.

A hydrated fly ash pile is located approximately 300 feet south of the southern edge of the Main Ash Settling Area. This ash stockpile was generated by dry fly ash captured in the electrostatic precipitators which was then hydrated for stabilization. The pile has not received CCR on or after October 19, 2015, and is not subject to the closure or post-closure requirements identified in the CCR Rule. Thus, the hydrated fly ash pile is not discussed further herein.

To comply with the requirements of the USEPA Final CCR Rule (40 CFR 257.50 thru 257.107), IPL submits the following Closure Plan detailing the steps to be undertaken to close the existing CCR unit, in accordance with §257.102(b) of the CCR Rule.

This document provides the following required information:

- Facility information
- Estimate of the maximum inventory of CCR on-site
- Proposed CCR surface impoundment closure procedure
- Description of the proposed final cover system over the CCR material
- Schedule for completing all closure activities

This closure plan applies to the closure of the Primary (North) Pond, the Primary (South) Pond, the Secondary (Main) Pond, and the Polishing Pond.

The overall layout of the Main Ash Settling Area is shown in Figure 1.



**Figure 1 – Current Layout of Sutherland Generating Station**

The Main Ash Settling Area is located approximately 800 feet east of the power block. It is made up of five smaller interconnected impoundments separated by internal berms. The ponds include:

- Primary (North) Pond (approx. 0.37 acres)
- Primary (South) Pond (approx. 0.17 acres)
- Secondary (Main) Pond (approx. 5.3 acres)
- Polishing Pond (approx. 1.1 acres)
- Discharge Pond (approx. 0.1 acres)

The Primary (North) Pond received sluiced bottom ash, primarily from the Units 1 & 2 pulverized coal units, via a discharge pipe directly from the Station.

The Primary (South) Pond historically received slag from Unit 3 cyclone boiler.

Typical Station operations called for the bottom ash/slag to be dredged out of both primary ponds and stockpiled in an area immediately north of the ponds within the original containment dike.

Water from both primary ponds is discharged via a culvert into the northwest portion of the Secondary (Main) Pond. Water from the Secondary (Main) Pond flows into the Polishing Pond via a concrete lined mixing channel, then into the Discharge Pond via a metering flume. Lastly, the water

enters a discharge riser structure and exits the diked impoundment area. Water then flows through a wide naturally vegetated swale located between sets of railroad tracks to the NPDES-permitted outfall.

Overall, the Main Ash Settling Area is approximately 720 feet in the east-west direction and 890 feet in the north-south direction (14.7 acres) measured to the outside top of the original containment berms.

The Station retired in 2017 and no longer sends low-volume waste water or cooling tower blowdown to the Ash Ponds. The Ash Ponds continue to receive coal yard sump pit discharge, which is primarily storm water runoff that contacts the coal yard.

## 2. PROPOSED CCR IMPOUNDMENT CLOSURE PROCEDURE

The proposed Main Ash Settling Area closure includes the following tasks:

- a. Dewatering of all ponds in the Main Ash Settling Area,
- b. Consolidation of the Main Ash Settling Area,
- c. Regrading of Secondary (Main) Pond into four (4) "mounds",
- d. Capping of consolidated and graded CCR material,
- e. Establishing final grades to preclude ponding storm water on the cap,
- f. Direct non-contact storm water drainage off the cap:
  - o Natural sheet flow along the southern-facing slopes of each mound
  - o Runoff is collected in E-W vegetated ditches that channel the flow to the perimeter berm to be discharged via culverts evenly spaced along the perimeter of the site.
- g. Restoration of all areas disturbed during construction.

Based on the schedule included in this Plan, it is technically feasible to complete closure of the CCR disposal facilities within the designated time frame and in compliance with the CCR Rule. The proposed cover system will meet the requirements of both the Federal CCR Rule and State regulations. Its integrity will be maintained by way of precautionary measures as described in the Post-Closure Plan.

The proposed grading for the final cap over the existing surface impoundment is designed to allow for adequate drainage of rainwater off the cover system. The grading will also allow for a potential solar photovoltaic development following closure of the ash disposal area. Slopes will range from a minimum of approximately 2.5% to a maximum of 3H:1V.

The existing perimeter berm will be refurbished to provide a minimum 15 feet wide aggregate roadway for vehicular access around the full perimeter of the site. Additionally, intermediate crushed aggregate paths may be provided along some or all of the mound ridges. No modifications other than the placement of the aggregate roadway are expected along the northernmost existing perimeter berm.

### 3. PROPOSED COVER SYSTEM

The final cover will meet the minimum requirements of 40 CFR 257.102(d)(3)(i)(A) thru (D). The baseline cover system will consist of a compacted 18" thick "infiltration layer" of appropriate low-permeability material having a hydraulic conductivity of no more than  $10^{-5}$  cm/s, under a 6" thick "erosion layer" of soil capable of sustaining a vegetative cover, with a suitable seed mixture.

As an alternate cover system, a geosynthetic clay liner (GCL) /HDPE composite overlain with 18" of soil capable of sustaining vegetative growth may be used. A GCL is a manufactured clay liner consisting of bentonite (sodium montmorillonite) clay encapsulated between two layers of woven geotextile. It is placed directly atop the CCR subgrade and is activated by the moisture provided in the protective soil cover. If used, the GCL will provide a hydraulic conductivity which is less than the  $1 \times 10^{-5}$  cm/s requirement in the CCR Rule. It will also accommodate settling and subsidence.

The materials of the cover system will be placed and compacted as required to minimize infiltration, limit erosion and future maintenance, and maintain positive drainage. Soil properties, compaction, permeability, and thickness testing will be performed to confirm compliance with the CCR Rule. Regular maintenance of the seeding will take place until the vegetative cover is established and self-sustaining, in order to prevent premature erosion of the topmost layer.

All other areas that are disturbed during the surface impoundment closure activities will be restored, either by providing a vegetative cover or aggregate surfacing.

### 4. ESTIMATED MAXIMUM INVENTORY OF CCR

Since the original Ash Pond functioned as a single rectangular impoundment prior to being reconfigured into its current layout, it is reasonable to assume that internal berms are primarily constructed out of previously deposited CCR, along with relatively small quantities of rip rap.

The estimated total amount of CCR material that will be consolidated into the Main Ash Settling Area is 246,000 cy.

### 5. ESTIMATED MAXIMUM AREA OF COVER

It is estimated that the proposed cover system will occupy an area equal to the area of the existing Main Ash Settling Area which is 14.7 acres.

### 6. SCHEDULE

Closure of the existing CCR surface impoundments is anticipated to require one year to complete. Alliant Energy will obtain certification from an Iowa licensed professional engineer that the CCR surface impoundments were closed in compliance with the Closure Plan. The certification will be placed in the Station's operating record within 60 days of completing closure.





**TABLE 2: PLANNING LEVEL SCHEDULE FOR CLOSURE OF CCR SURFACE IMPOUNDMENTS**

| Task Description   | Anticipated Start Date | Anticipated Completion Date |
|--|------------------------|-----------------------------|
| <b>Pre-Design Activities</b>   |                        |                             |
| Preparation of <i>Closure Plan</i> for compliance with Federal CCR Rule  | 02/2018                | 04/2018                     |
| Post initial <i>Closure Plan</i> in the Station's Operating Record   | 04/2018                | 04/2018                     |
| Send a Notification of the availability of the Closure plan to the Relevant State Director and publish <i>Closure Plan</i> to the Station's Internet Website | 04/2018                | 04/2018                     |
| Place initial <i>Post-Closure Plan</i> in the Station's Operating Record   | 04/2018                | 04/2018                     |
| Send Notification of availability of <i>Post-Closure Plan</i> to the State Director and place <i>Post-Closure Plan</i> to the Station's Internet Website     | 04/2018                | 04/2018                     |
| <b>Design / Bidding / Permitting</b>   |                        |                             |
| Engineering / Preparation of Bid documents   | 03/2018                | 06/2018                     |
| Issue Request for Bids   | 06/2018                | 07/2018                     |
| Bids due   | 08/2018                | 08/2018                     |
| Bid Evaluation Period  | 08/2018                | 01/2019                     |
| Issue Award and Notice to Proceed  | 02/2019                | 02/2019                     |
| <b>Construction</b>  |                        |                             |
| Initiation of Close-In-Place Activities  | 03/2019                | 03/2019                     |
| Contractor Mobilization  | 03/2019                | 04/2019                     |
| Dewater ponds  | 04/2019                | 04/2019                     |
| Consolidate CCR material and regrade Secondary (Main) Pond into four (4) "mounds"  | 04/2019                | 06/2019                     |
| Cap consolidated CCR material  | 06/2019                | 07/2019                     |
| Establish final grades   | 07/2019                | 08/2019                     |
| Reroute non-contact storm water to culverts for discharge  | 08/2019                | 09/2019                     |
| Restore all disturbed areas  | 09/2019                | 09/2019                     |
| <b>Post-Construction Administration</b>  |                        |                             |
| Certification verifying the completion of closure in accordance with the closure plan  | 10/2019                | 10/2019                     |



| <b>Task Description</b>   | <b>Anticipated Start Date</b> | <b>Anticipated Completion Date</b> |
|---|-------------------------------|------------------------------------|
| Place a Notification of CCR Surface Impoundment Closure Completion in the Station's Operating Record  | 11/2019                       | 11/2019                            |
| Send Notification of availability of Closure Completion to Relevant State Director / place Closure Completion to the Station's Internet Website               | 11/2019                       | 11/2019                            |
| Record a Notation of the CCR Impoundment Closure on the Deed of the Property  | 11/2019                       | 11/2019                            |
| Place a Notification of the Deed Notation in the Station's Operating Record   | 11/2019                       | 11/2019                            |
| Send Notification of availability of Deed Notation to Relevant State Director / place Deed Notation to the Station's Internet Website                         | 11/2019                       | 11/2019                            |
| Place a Notification of Completion of the Post-Closure Care in the Station's Operating Record   | 10/2050                       | 10/2050                            |
| Send a Notification of the availability of the Post-Closure Care to the Relevant State Director and place Post-Closure Care to the Station's Internet Website | 11/2050                       | 11/2050                            |

## 7. COMPLETION OF CLOSURE ACTIVITIES

To confirm completion of the CCR surface impoundment closures, IPL will retain a qualified engineer licensed in the State of Iowa to verify that the CCR surface impoundments have been closed in accordance with this closure plan and the requirements of 40 CFR 257.102(d). The qualified engineer will provide IPL with a written certification stating compliance as required in 40 CFR 257.102(f)(3). The Post-Closure Plan is presented in a separate document.

## 8. CERTIFICATIONS

It is S&L's opinion that this written closure plan meets the requirements of 40 CFR 257.102(b).

It is also S&L's opinion that the proposed final cover system as described herein meets the design requirements of 40 CFR 257.102(d)(3)(i).

## 9. REFERENCES

- 40 CFR Part 257, Subtitle D, – Environmental Protection Agency Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities