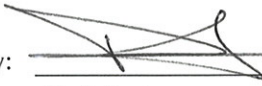
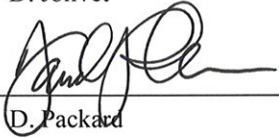





Closure Plan for Existing CCR Surface Impoundments

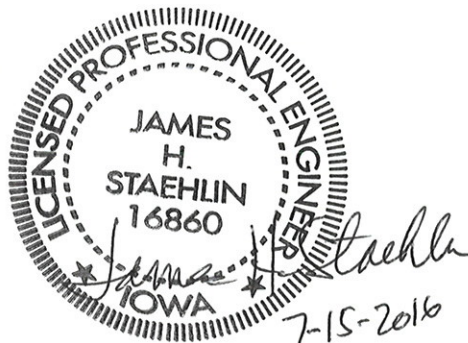
Prepared for Interstate Power and Light Company
Burlington Generating Station
Burlington, IA

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FINAL



TABLE OF CONTENTS

1. INTRODUCTION	1
2. PROPOSED CCR IMPOUNDMENT CLOSURE PROCEDURE	3
3. PROPOSED COVER SYSTEM.....	4
4. ESTIMATED MAXIMUM INVENTORY OF CCR.....	4
5. ESTIMATED MAXIMUM AREA OF COVER.....	5
6. SCHEDULE.....	5
7. COMPLETION OF CLOSURE ACTIVITIES.....	6
8. CERTIFICATIONS	7
9. REFERENCES	7

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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 Power and Light Company (IPL) – a wholly owned subsidiary of Alliant Energy – operates the single-unit Burlington Generating Station (BGS), located 4 miles south of Burlington, Iowa. This coal-burning facility operates a system of interconnected surface impoundments that form its Coal Combustion Residual (CCR) disposal facility. These ponds are currently in use, but will cease receiving CCR once the generating unit refuels or retires at the end of 2021. To comply with the requirements of the USEPA Final CCR Rule (40 CFR 257.50-107) published on April 17, 2015 and amended on July 2, 2015, Alliant Energy, on behalf of its subsidiary IPL, submits the following Closure Plan detailing the steps to be undertaken to close the existing CCR surface impoundments by leaving the CCR in place, 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 and,
- Schedule for completing all closure activities.

BGS currently operates six surface impoundments at the site, of which four are managed as existing CCR impoundments under the provisions of the CCR Rule – Ash Seal Pond, Bottom Ash Pond, Economizer Ash Pond, and Upper Ash Pond. This Closure Plan applies to these four existing CCR impoundments. The Lower Pond and Coal Pile Runoff Pond do not meet the definition of a CCR surface impoundment per the CCR Rule, and as such are not discussed herein. Additionally, a bottom ash storage pile and a hydrated fly ash stockpile are located on-site within the confines of the Bottom Ash Pond. Further details on each of these impoundments are included in the following sections. The overall layout of the facility is shown in Figure 1.

ASH SEAL POND

The Ash Seal Pond was originally designed as the Station's primary ash settling pond. A pump connection exists between this surface impoundment and the Bottom Ash pond, and under certain circumstances, ash seal water – containing CCR – may be temporarily pumped into the Ash Seal Pond. Thus this surface impoundment is regulated as an existing CCR impoundment under the CCR Rule. The overall area of the impoundment is approximately six acres and it is only partially filled with CCR.

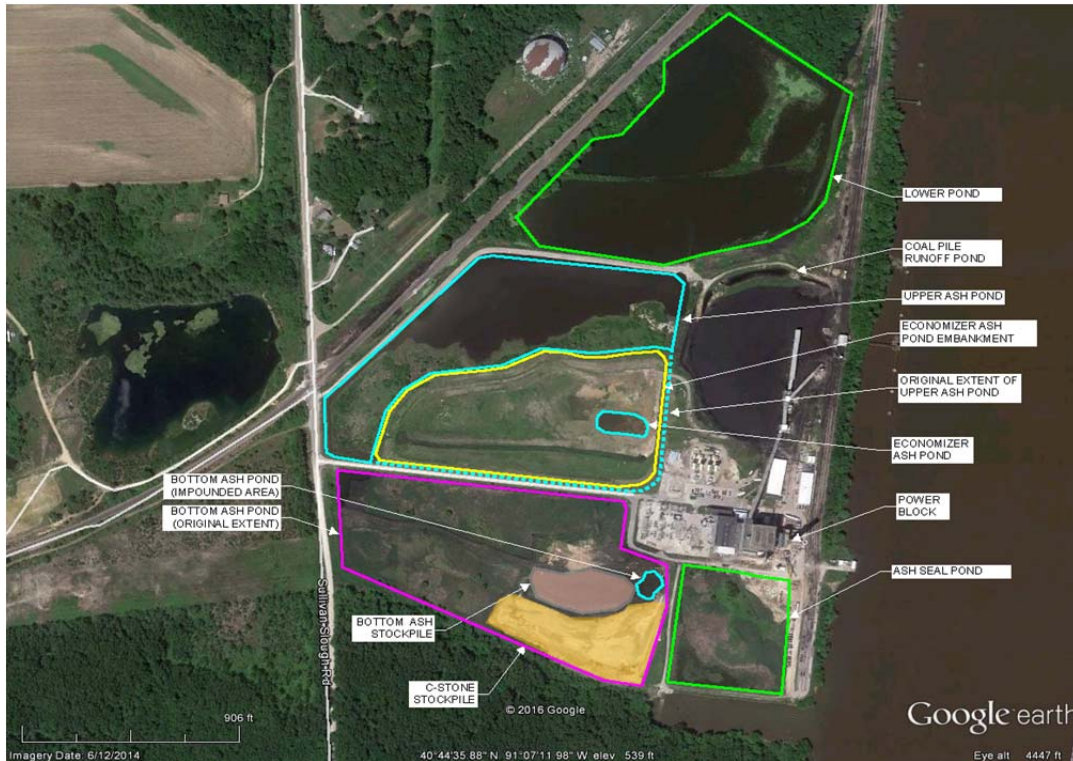


Figure 1: Overall Layout of Impoundments at Burlington Generating Station

BOTTOM ASH POND

The Bottom Ash Pond receives sluiced bottom ash and low-volume waste flows from the plant as well as emergency discharge from the Ash Seal Pond. Bottom ash that settles in this surface impoundment is regularly dredged out and stockpiled temporarily in a dewatering area within the overall footprint of the surface impoundment. The dewatered bottom ash is periodically shipped offsite for beneficial reuse. As such, this pond is regulated as an existing CCR impoundment under the CCR Rule. Water from the Bottom Ash Pond drains via a treatment channel to the Upper Ash Pond. The overall area of the impoundment (outermost limits) is approximately 20 acres.

ECONOMIZER ASH POND

The Economizer Ash Pond receives sluiced economizer ash along with other low-volume flows from the water treatment sump pit, the storm water vault, the oil-water separator effluent, and from various storm drains throughout the plant. As such, this surface impoundment is regulated as an existing CCR impoundment under the CCR Rule. This surface impoundment is located atop an accumulation of CCR that is contained within the confines of the larger Upper Ash Pond. Water from this pond also drains into the Upper Ash Pond. The area of impounded water is approximately 0.4 acres; however, the overall area of the CCR surface impoundment is approximately 13 acres when considering the accumulated CCR that impounds the water.

UPPER ASH POND

The Upper Ash Pond receives the combined runoff and discharge flows from the Bottom Ash and Economizer Ash Ponds, and as such is regulated as an existing CCR impoundment under the Rule. This surface impoundment drains via a precast concrete parshall flume into the Lower Pond. The overall area of impounded water is approximately 11 acres.

2. PROPOSED CCR IMPOUNDMENT CLOSURE PROCEDURE

IPL has chosen closure-in-place for the CCR surface impoundments at BGS. This involves dewatering and consolidation of the CCR material and placement of a protective cover that meets the requirements of the CCR Rule.

The closures will be done sequentially according to the following steps:

Ash Seal Pond:

- Dewatering (if water present),
- Consolidation of CCR material from the south half into north half of surface impoundment,
- Grading of CCR material to final slopes for drainage,
- Maintain *cleaned-out* south half of surface impoundment for storm water runoff detention,
- Installation of cover system materials over consolidated CCR material and,
- Installation of drainage control features.

Bottom Ash Pond:

- Prior re-route of water flows as required,
- Dewatering (if water present),
- Consolidation of CCR material from north half into south half of overall surface impoundment,
- Maintain *cleaned-out* north half of surface impoundment for storm water detention,
- Grading of CCR material to final slopes for drainage (including material from hydrated fly ash stockpile),
- Installation of cover system materials over consolidated CCR and,
- Installation of drainage control features.

Economizer Ash / Upper Ash Ponds:

- Prior re-route of water flows as required,
- Dewatering (if water present),
- Consolidation of CCR material from Upper Ash Pond onto accumulated CCR around Economizer Ash Pond and as fill in this impoundment,
- Maintain cleaned-out former Upper Ash Pond for storm water detention,
- Grading of CCR material to final slopes for drainage,
- Installation of cover system materials over consolidated CCR and,

- Installation of drainage control features.

Proposed final grades for the capped area over the former CCR impoundments will range from a minimum 3% to a maximum of 4H:1V, which will allow for adequate drainage of rainwater off the cover system described in Section 3.

The final objective of the closure procedure is to create, in each former impoundment area, a consolidated area of CCR capped by a cover system adjacent to an open area that will serve as a storm water detention area. The two areas will be separated by an earthen isolation berm with a gravel access road along its crest.

Storm water runoff from the cover system will be directed via ditches and culverts, as required, toward the newly-created water detention basins. These ditches and outlets will be designed per the requirements of the Iowa Erosion Control Manual published by the Iowa Department of Natural Resources, latest edition. The basins will naturally drain to the Mississippi River via Outfall 001.

3. PROPOSED COVER SYSTEM

The final cover shall meet the minimum requirements of 40 CFR 257.102(b)(3)(i)(A) thru (D). It shall consist, from bottom to top, of a compacted 18" thick "infiltration layer" of appropriate low-permeability material having a hydraulic conductivity of no more than 10^{-5} cm/s, followed by a 6" thick "erosion layer" of uncompacted soil capable of sustaining a vegetative cover, with a suitable seed mixture.

The underlying CCR material will be graded, stabilized and compacted as required to be able to support the overlying materials of the cover system. The overlying materials will be placed and compacted so as to minimize infiltration, limit erosion and future maintenance, and maintain positive drainage. Soil properties, compaction, permeability, and thickness testing will be performed during installation 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 limit 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 an aggregate surface.

4. ESTIMATED MAXIMUM INVENTORY OF CCR

Based on existing information provided to S&L in the preparation of this Plan, including original plant construction drawings and recent topographic survey data, it is estimated that approximately 1,024,000 cubic yards of CCR are currently present on-site. This quantity includes the hydrated fly ash stockpile located within the confines of the Bottom Ash Pond. A breakdown of this total quantity is given in Table 1.



TABLE 1: ESTIMATED QUANTITIES OF CCR

Impoundment / Area	Estimated CCR Quantity
Ash Seal Pond	92,000 cy
Bottom Ash Pond (excl. hydrated fly ash stockpile)	270,000 cy
Hydrated fly ash stockpile (as of Jan. 2016)	65,000 cy
Upper Ash Pond	257,000 cy
Economizer Ash Pond	340,000 cy
TOTAL	1,024,000 cy

5. ESTIMATED MAXIMUM AREA OF COVER

It is estimated that the total area of the surface impoundments requiring a cover system after grading and consolidation is approximately 28 acres. The Ash Seal, Bottom Ash, and Economizer Ash / Upper Ash Ponds will require approximately 4, 10, and 14 acres of cover system, respectively.

6. SCHEDULE

A schedule detailing the proposed closure activities is included in Table 2. Closure of the existing CCR surface impoundments is anticipated to require approximately 4 years. The schedule provided in Table 2 estimates a closure initiation date of March, 2021 with a completion of closure by December, 2024. Alliant Energy will obtain certification from an Iowa-licensed professional engineer that the site was 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-IN-PLACE OF ASH POND

Task Description	Anticipated Start Date	Anticipated Completion Date
Pre-Design Activities		
Complete <i>Closure Plan</i> per Federal CCR rule requirements.	04/16/2016	10/16/2016
Post <i>Closure Plan</i> in the Station's Operating Record	10/16/2016	10/16/2016
Send a Notification of the availability of the Closure plan to the Relevant State Director and publish Closure Plan to the Station's Internet Website	10/16/2016	11/15/2016
Place <i>Post-Closure Plan</i> in the Station's Operating Record	10/16/2016	10/16/2016
Send a Notification of the availability of the Post-Closure plan to the Relevant State Director and place Post-Closure Plan to the Station's Internet Website	10/16/2016	11/15/2016
Design / Bidding / Permitting		
Complete Site Survey & Bathymetric Survey of Existing Surface Impoundment	08/2016	09/2016



Task Description	Anticipated Start Date	Anticipated Completion Date
Detailed Engineering / Closure Permit Application Development	01/2020	07/2020
Preparation of Bid Documents	07/2020	08/2020
Issue Bids	09/2020	09/2020
Bids Due	10/2020	10/2020
Bid Evaluation Period	11/2020	12/2020
Issue Award and Notice to Proceed	12/31/2020	12/31/2020
Construction		
Initiation of Close-In-Place Operation	03/2021	03/2021
Place a <i>Notification of Intent to Close</i> the Surface Impoundment in the Station's Operating Record	03/2021	03/2021
Send a <i>Notification of Intent to Close</i> to the Relevant State Director and post Notification to the Station's Internet Website	03/2021	03/2021
Contractor Mobilization	03/01/2021	03/01/2021
Closure activities for Ash Seal/ Bottom Ash Pond	03/2021	11/2022
Closure activities for Econ Ash / Upper Ash Pond	03/2023	09/2024
Post-Construction Administration		
Certification verifying the completion of closure in accordance with the closure plan	10/2024	10/2024
Place a <i>Notification of Pond Closure Completion</i> in the Station's Operating Record	12/2024	12/2024
Send a <i>Notification of the availability of the Closure Completion</i> to the Relevant State Director/place Closure Completion to the Station's Internet Website	12/2024	12/2024
Record a Notation of the CCR Impoundment Closure on the Deed of the Property	12/2024	12/2024
Place a Notification of the Deed Notation in the Station's Operating Record	12/2024	12/2024
Send a Notification of the availability of the Deed Notation to the Relevant State Director/ place Deed Notation to the Station's Internet Website	12/2024	12/2024
Place a Notification of Completion of the Post-Closure Care in the Station's Operating Record	12/2054	12/2054
Send a Notification of the availability of the Post-Closure Care to the Relevant State Director / place Post-Closure Care to the Station's Internet Website	12/2054	12/2054

7. COMPLETION OF CLOSURE ACTIVITIES

To confirm completion of the close-in-place operation, IPL will retain a qualified professional engineer licensed in the State of Iowa to verify that the existing CCR surface impoundments have been closed in accordance with this closure plan and the requirements of 40 CFR 257.102(d). The qualified professional engineer will provide IPL with a written certification stating compliance as required in 40 CFR 257.102(f)(3). A 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

1. 40 CFR Part 257, Subpart D – Environmental Protection Agency Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, Federal Register, Vol. 80, No. 74, Friday April 17, 2015, as amended by the Technical Amendments published in the Federal Register on July 2, 2015.