

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

- Ash Seal Pond
- Main Ash Pond
- Economizer Pond
- Upper Ash Pond

Burlington Generating Station  
4282 Sullivan Slough Road  
Burlington, Iowa 52601

Prepared for:

Interstate Power and Light Company  
4282 Sullivan Slough Road  
Burlington, Iowa 52601

**SCS ENGINEERS**

25219168.00 | November 12, 2020

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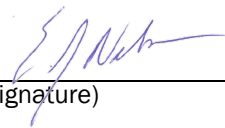
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## PE CERTIFICATION

 <p>11/12/20</p>	<p>I, Eric J. Nelson, hereby certify the following:</p> <ul style="list-style-type: none"> <li>This Closure Plan meets the requirements of 40 CFR 257.102(b)(1)</li> <li>The final cover system described in this Closure Plan meets the design requirements in 40 CFR 257.102(d)(3)</li> </ul> <p>The Closure Plan 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;">               (signature)         </div> <div style="text-align: center;">             11/12/2020              (date)         </div> </div>
	<p style="text-align: center;">Eric J. Nelson (printed or typed name)</p>
	<p>License number 23136</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; margin-top: 10px;">All pages</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 this updated Closure Plan for the coal combustion residual (CCR) units at the Burlington Generating Station (BGS) as required by 40 CFR 257.102(b).

**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.”*

The BGS facility includes four active, unlined CCR units that are subject to the requirements of 40 CFR 257.102 and included in this closure plan. The CCR units include:

- Ash Seal Pond
- Main Ash Pond
- Economizer Ash Pond
- Upper Ash Pond

**Figure 1** shows the site location. **Figure 2** shows the site layout and location of the four CCR surface impoundments. IPL is currently evaluating closure of the CCR surface impoundments using a hybrid approach that includes a combination of CCR removal, consolidation within the CCR surface impoundment limits, and in-place closure with a cap. CCR will be capped with a final cover system that meets the requirements of 40 CFR 257.102. IPL is currently in the process of finalizing studies to support their remedy selection per 40 CFR 257.97. Once a final remedy is selected, IPL will develop design plans and obtain permits/approvals from the State of Iowa to close the CCR surface impoundments. Additional information on each CCR surface impoundment is provided in the sections that follow.

### 1.1 ASH SEAL POND

The Ash Seal Pond is located south of the plant and adjacent to the Main Ash Pond (**Figure 2**). The Ash Seal Pond was constructed as the original primary ash settling pond at BGS. Under certain operational circumstances, water containing CCR can be temporarily redirected from the Main Ash Pond into the Ash Seal Pond. The surface impoundment is approximately 6.5 acres in size.

### 1.2 MAIN ASH POND

The Main Ash Pond is located west of the Ash Seal Pond and southwest of the plant. The impoundment is dredged regularly and bottom ash is stockpiled within the footprint of the surface impoundment to dewater. The bottom ash is periodically shipped off site for beneficial reuse as a feedstock in the production of cement. A hydrated fly ash stockpile is also located within the limits of the Main Ash Pond. The hydrated fly ash aggregate is managed under the tradename “Pozzostone” and is removed from the stockpile and the Main Ash Pond on occasion for beneficial use projects, as appropriate, under approvals obtained from the Iowa Department of Natural Resources (IDNR). Currently the pond receives the following waste streams:

- Sluiced bottom ash
- Ash seal system water
- Low-volume waste water from the plant

The Main Ash Pond outfall discharges to the Upper Ash Pond. The Main Ash Pond is approximately 20 acres in size.

### 1.3 ECONOMIZER ASH POND

The Economizer Ash Pond is located within the original footprint of the Upper Ash Pond and located north of the Main Ash Pond and northwest of the plant. The surface impoundment was constructed on top of the existing CCR in the Upper Ash Pond to receive the following waste streams:

- Sluiced economizer ash
- Low-volume flows from:
  - Water treatment sumps
  - Storm water vault
  - Oil-water separator effluent (via the storm water vault)
  - Various storm drains throughout the plant (via the storm water vault)

The Economizer Ash Pond also drains to the Upper Ash Pond. The surface impoundment is approximately 13 acres in total area but only has a small area of impounded water (approximately 0.4 acre).

### 1.4 UPPER ASH POND

The Upper Ash Pond is located west of the plant and north of the Main Ash Pond. The Upper Ash Pond receives water from the Main Ash Pond and the Economizer Pond. The Upper Ash Pond originally spanned approximately 28 acres, but with the Economizer Ash Pond constructed within the limits, it reduced the Upper Ash Pond area to approximately 15 acres. The Upper Ash Pond discharges to the Lower Pond, a non-CCR surface impoundment, which then discharges to the Mississippi River in accordance with conditions and limits defined in a National Pollutant Discharge Elimination System (NPDES) Individual Permit 2900101 issued by the IDNR

## 2.0 PROPOSED CLOSURE PLAN NARRATIVE

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

The CCR surface impoundments at BGS will be closed by a combination of CCR removal, consolidation within the CCR surface impoundment limits, and in-place closure with a cap. Clean closure and final cover areas will be determined during final design.

The four CCR surface impoundment closures will meet the requirement of the Federal CCR Rule and State Regulations. The closure will include the following tasks:

- Dewatering of ponds, where required to meet 40 CFR 257.102(d)(2)(i).
- Potential clean excavation of some surface impoundments or portions of surface impoundments.
- Export of stockpiled material into beneficial uses, when economic conditions and opportunities are favorable.
- Consolidation of CCR from clean closure areas into select impoundment areas to establish final cover subgrade elevations.
- Stabilization of CCR to meet the requirements of 40 CFR 257.102(d)(2)(ii).
- Capping of CCR material with a final covers system per 40 CFR 257.102(d)(3).

- Establishing final grades to preclude ponding storm water on the cap.
- Direct non-contact storm water drainage off the cap.
- Restoration of all areas disturbed during construction.

Slopes and 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 will be designed to provide flexibility to accommodate these changes. Side slopes will be able to 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).

CCR and accumulated sediment will be consolidated within the boundary of all or portions of some surface impoundments, and the area will be closed by covering the CCR within the final cover system described in **Section 3.0**.

### **3.0 FINAL COVER SYSTEM AND PERFORMANCE**

**40 CFR 257.102(b)(1)(ii).** *“If closure of the CCR unit will be accomplished through removal of CCR from the CRR unit, a description of the procedures to remove the CCR and decontaminate the CCR unit in accordance with paragraph (c) of this section.”*

*“(c) Closure by removal of CCR. 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 been 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.”*

Portions of the CCR surface impoundments to be closed by removal of CCR will either be dewatered with CCR removed mechanically (e.g., with an excavator) or dredged hydraulically while the water in the impoundment remains. All dewatering discharges, whether from pumping or hydraulic dredging, will be treated to meet the discharge limits established in the individual NPDES permit for BGS. Treated water will be discharged via existing Outfall 001, which is located where the Lower Pond discharges to the Mississippi River.

**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.”*

*“(d) Closure performance standard when leaving CCR in place.*

*(1) The owner or operator of a CCR unit must ensure that, at a minimum, the CCR unit is closed in a manner that will:*

- (i) Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere;”*

The final cover system design will minimize or eliminate infiltration, as further described below.



- (ii) *Preclude the probability of future impoundment of water, sediment, or slurry;*

The final cover system will meet these criteria, as further described below.

- (iii) *Include measures that provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care period;*

The final cover system will be designed to provide slope stability and to prevent sloughing or movement during the closure and post-closure care period. Stability of the final cover system will be assessed as part of the final cover design for state approvals once state requirements for the final cover system are determined.

- (iv) *Minimize the need for further maintenance of the CCR unit; and*

Maintenance of the final cover will be minimized by the establishment of vegetative cover and the erosion control systems, which are further described below.

- (v) *Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices.”*

All closure activities for the CCR units at BGS must be completed by October 17, 2023, per 40 CFR 257.103(f)(2)(iv)(A), pending the USEPA’s approval of the CCR surface impoundment operating extension beyond April 11, 2021, as requested by IPL according to 40 CFR 257.103(f)(3).

*“(2) Drainage and stabilization of CCR surface impoundments. The owner or operator of a CCR surface impoundment or any lateral expansion of a CCR surface impoundment must meet the requirements of paragraphs (d)(2)(i) and (ii) of this section prior to installing the final cover system required under paragraph (d)(3) of this section.”*

- (i) *Free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues.*

Free liquids will be dewatered from the pond and remaining waste will be mixed with dry CCR or otherwise adequately stabilized prior to final cover system placement.

- (ii) *Remaining wastes must be stabilized sufficiently to support the final cover system.*

The remaining wastes will be stabilized prior to final cover system placement.

*“(3) Final cover system”*

The final cover system (**Figure 2**) for the four CCR surface impoundments will include the following, at a minimum, from the bottom up:

- Eighteen-inch-thick soil infiltration layer (compacted low-permeability soil)
- Six-inch-thick vegetative soil layer

This final cover will meet the minimum requirements of 40 CFR 257.102(d)(3)(i)(A) through (D) as follows:

- Per 257.102(d)(3)(i)(A), the final cover system will include an 18-inch soil layer with a permeability of  $1 \times 10^{-5}$  centimeters per second (cm/sec) or less. The permeability of the proposed final cover system is less than the permeability of the natural subsoils under the pond identified during facility design, as documented in the March 2018 “CCR Surface Impoundment History of Construction” prepared by Hard Hat Services, for the BGS facility. There is no liner system present in any of the surface impoundments.
- Per 257.102(d)(3)(i)(B), the cover system will provide at least 18 inches of earthen material to minimize infiltration.
- Per 257.102(d)(3)(i)(C), erosion of the final cover system will be minimized with a vegetative soil layer with a minimum of 6 inches of un-compacted rooting zone material.
- Per 257.102(d)(3)(i)(D), the design of the final cover system will minimize disruptions to the final cover system and is expected to be stable, based on currently available information about the site and the materials that will be consolidated under the final cover system. The stability of the final cover system will be re-assessed and confirmed during final design once state requirements are determined.
- The design of the final cover will accommodate settling and subsidence of the CCR fill below the cover. The CCR will be placed and compacted prior to final cover placement. The final cover system will be designed with minimum and maximum slopes that will accommodate settlement and minimize disruptions to the cover.

All final cover materials will be tested to confirm they meet the required specifications, and construction will be overseen and documented by a licensed professional engineer. Final cover soil layers will be checked for thickness. All areas will be restored after final cover is placed. Vegetation will be monitored and maintained.

## 4.0 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 CCR ever on-site in the impoundments, over the active life of the impoundments, is approximately 1,319,065 cubic yards (cy). This is the estimate volume of CCR currently present in the surface impoundments. The following are the estimated CCR volumes for each impoundment:

- Ash Seal Pond – approximately 108,800 cy
- Main Ash Pond – approximately 487,100 cy
- Economizer Ash Pond – approximately 535,400 cy
- Upper Ash Pond – approximately 187,800 cy

These estimates are based on in-place survey, borings, and material test data obtained during geotechnical investigations of the CCR surface impoundments conducted in 2019 and 2020.

## 5.0 LARGEST AREA OF CCR UNIT REQUIRING FINAL 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.”*

If no clean closure areas are determined during final design, the estimated largest area of final cover would be approximately 55 acres. This number is expected to decrease with portions of the CCR surface impoundments being closed by removal, or if any one surface impoundment is capped independently of the others. Each pond has the following surface areas based on their geometry:

- Ash Seal Pond – approximately 6.5 acres
- Main Ash Pond – approximately 20 acres
- Economizer Ash Pond – approximately 13 acres
- Upper Ash Pond – approximately 15 acres

The surface impoundments are delineated by the berms and access roads.

## 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 preliminary schedule for closure of the four surface impoundments is provided in **Appendix A**.

## 7.0 COMPLETION OF CLOSURE ACTIVITIES

**40 CFR 257.102(f)(1).** *“Except as provided for in paragraph (f)(2) of this section, the owner or operator must complete closure of the CCR unit:*

- (i) *For existing and new CCR landfills and any lateral expansion of a CCR landfill, within six months of commencing closure activities.”*

This does not apply to any of the four surface impoundments.

- (ii) *“For existing and new CCR impoundments and any lateral expansion of a CCR surface impoundment, within five years of commencing closure activities.”*

Closure of the four units will be completed by October 17, 2023.

**40 CFR 257.102(f)(3).** *“Upon completion, the owner or operator of the CCR unit must obtain a certification from a qualified professional engineer verifying that closure has been completed in accordance with the closure plan specified in paragraph (b) of this section and the requirements of this section.”*

A qualified professional engineer will oversee CCR removal and final cover construction. The engineer will verify CCR removal, verify final cover materials and methods, and oversee material testing. At the end of construction, the engineer will provide a report summarizing and documenting construction and will certify compliance with the requirements.

## 8.0 REFERENCES

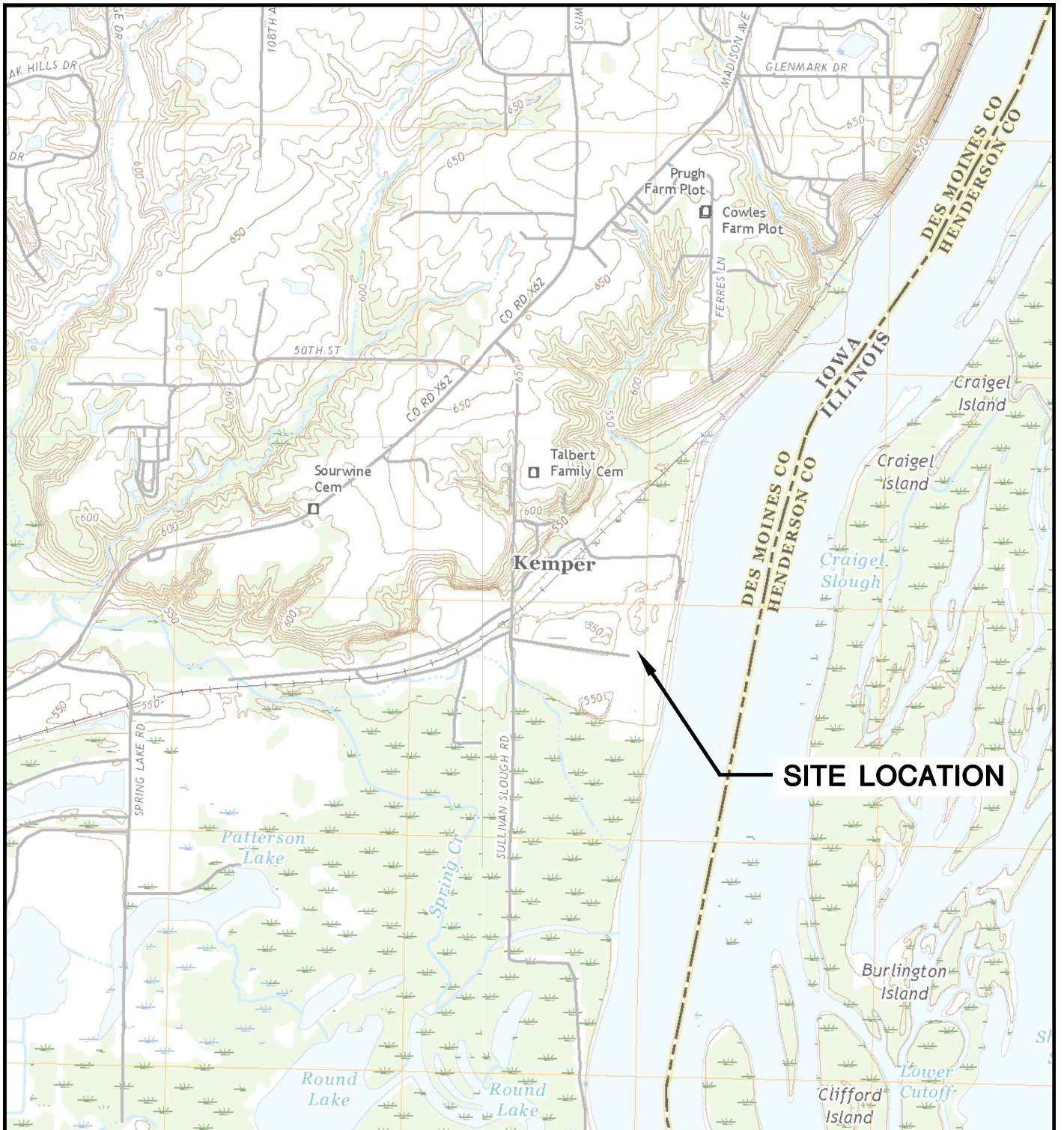
40 CFR Part 257, Subtitle D – Environmental Protection Agency Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities.

Hard Hat Services, 2018, CCR Surface Impoundment History of Construction, Burlington Generating Station, Interstate Power and Light Company, March 6, 2018, Revision 1.

Sargent & Lundy, 2016, Closure Plan for Existing CCR Surface Impoundments, Burlington Generating Station, Interstate Power and Light Company, July 18, 2016.

## Figures

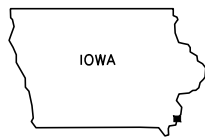
- 1 Site Location Map
- 2 Site Plan



**SITE LOCATION**



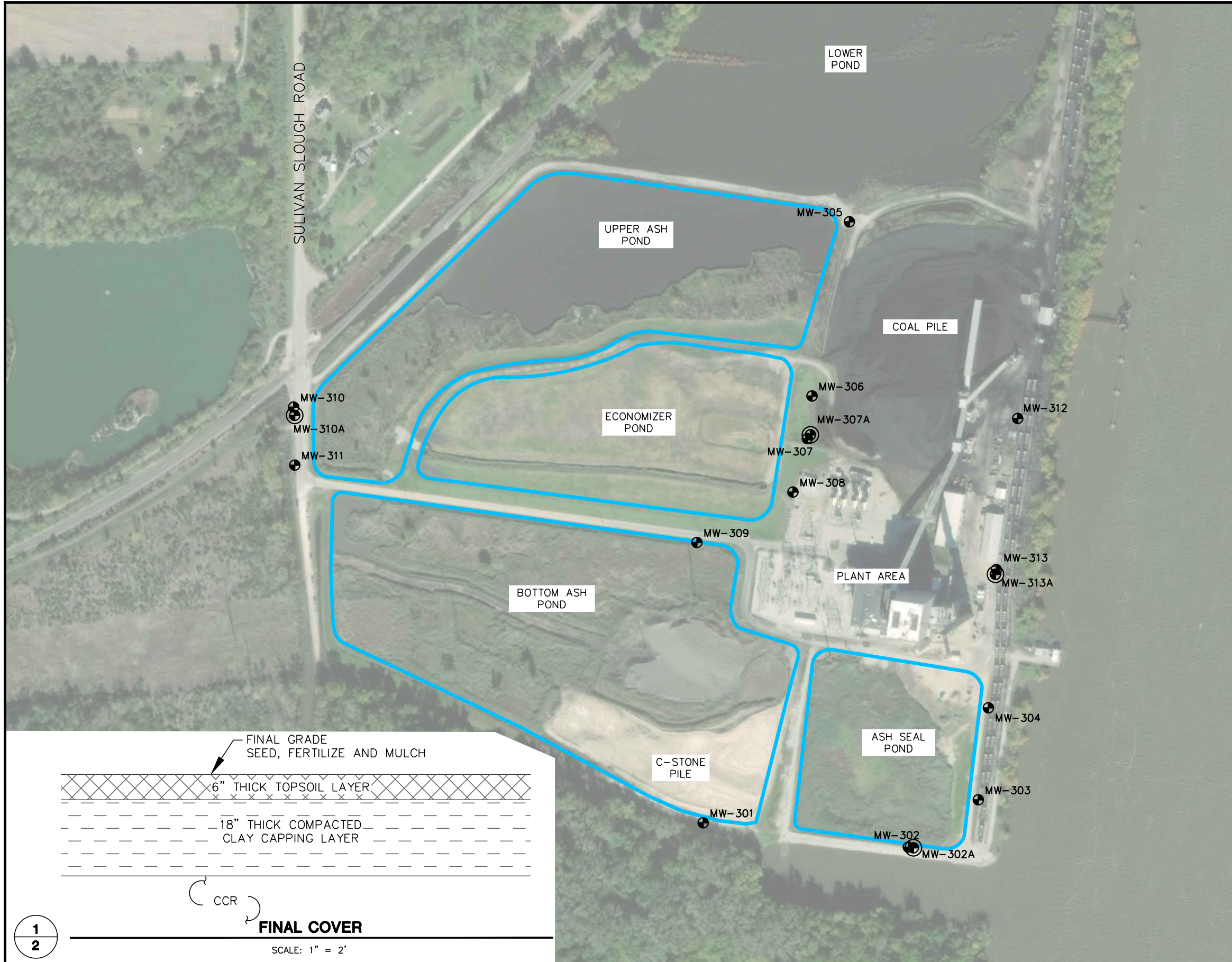
LOMAX QUADRANGLE  
 ILLINOIS / IOWA-DES MOINES CO.  
 7.5 MINUTE SERIES (TOPOGRAPHIC)  
 2018  
 SCALE: 1" = 2,000'



CLIENT	INTERSTATE POWER AND LIGHT 4282 SULLIVAN SLOUGH ROAD BURLINGTON, IOWA 52601		SITE	BURLINGTON GENERATING STATION 4282 SULLIVAN SLOUGH RD BURLINGTON, IA 52601		ENGINEER	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830		FIGURE 1
	PROJECT NO.	25219168.00		DRAWN BY:	RJG		APPROVED BY:	EJN 11/12/2020	
	DRAWN:	09/09/19	CHECKED BY:	PG					
	REVISED:	09/28/19							

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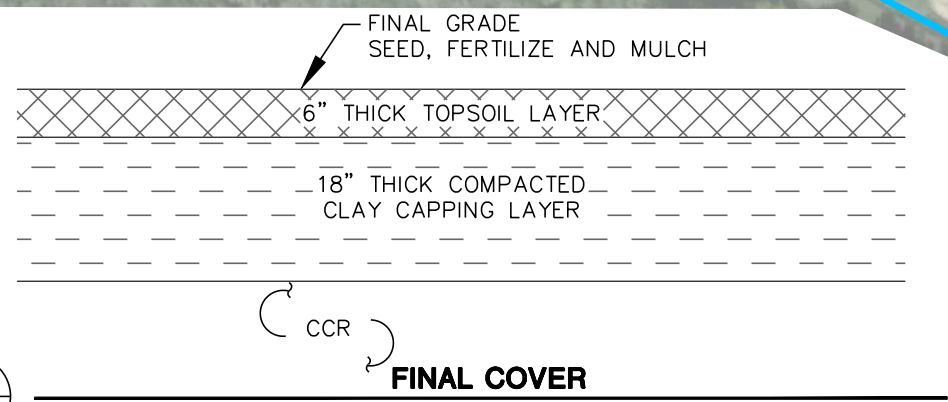


LEGEND

- EXISTING CCR RULE MONITORING WELL
- EXISTING CCR RULE PIEZOMETER
- CCR UNITS

NOTES:

1. MONITORING WELLS MW-303 THROUGH MW-308 WERE INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS ON DECEMBER 15-17, 2015.
2. MONITORING WELLS MW-301, MW-302, AND MW-309 THROUGH MW-311 WERE INSTALLED BY DIRECT PUSH ANALYTICAL SERVICES CORP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM FEBRUARY 29, 2016 TO MARCH 1, 2016.
3. MONITORING WELLS MW-312 AND MW-313 WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN MAY 2019.
4. 2018 AERIAL PHOTOGRAPH SOURCES: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, USDA FSA, USGS, AEX, GETMAPPING, AEROGRIID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY.



1  
2

FINAL COVER

SCALE: 1" = 2'

PROJECT NO.	25220081.00	DRAWN BY:	RJG
DRAWN:	11/14/2019	CHECKED BY:	PG
REVISED:	09/29/2020	APPROVED BY:	EJN 11/12/2020


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SITE INTERSTATE POWER AND LIGHT  
 BURLINGTON GENERATING STATION  
 BURLINGTON, IOWA

SITE PLAN

FIGURE  
2



Appendix A  
Closure Schedule



