

Closure Plan for Existing CCR Surface Impoundment – Amendment No. 2 Upper Ash Pond

Lansing Generating Station
2320 Power Plant Drive
Lansing, Iowa 52151

Prepared for:

Interstate Power and Light Company
2320 Power Plant Drive
Lansing, Iowa 52151

SCS ENGINEERS

25220100.00 | November 13, 2020

2830 Dairy Drive
Madison, WI 53718-6751
608-224-2830

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PE CERTIFICATION

 <p>11/13/20</p>	<p>I, Eric J. Nelson, hereby certify the following:</p> <ul style="list-style-type: none"> This Closure Plan meets the requirements of 40 CFR 257.102(b)(1) The final cover system described in this Closure Plan meets the design requirements in 40 CFR 257.102(d)(3) <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;"> 11/13/2020 (date) </div> </div>
	<p style="text-align: center;">Eric J. Nelson</p> <p style="text-align: center;">(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;">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 Upper Ash Pond at the Lansing Generating Station (LAN) 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 LAN facility includes two active coal combustion residual (CCR) units:

- LAN Upper Ash Pond
- LAN CCR Landfill

The subject of this updated Closure Plan is the Upper Ash Pond. **Figure 1** shows the site location, and **Figure 2** shows the site layout and location of the Upper Ash Pond. IPL is currently evaluating closure of the CCR surface impoundment 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 integrate the remedy into design plans and obtain permits/approvals from the State of Iowa to close the CCR surface impoundment. Additional information on the LAN Upper Ash Pond is provided below.

The Upper Ash Pond is located southwest of the plant and adjacent to the LAN CCR Landfill (**Figure 2**). The Upper Ash Pond was constructed for the purpose of settling CCR from the LAN process wastewater streams and clarification of water prior to discharge. Currently the pond receives CCR and non-CCR waste streams. Water from the LAN Upper Ash Pond discharges to the discharge canal from the plant via National Pollutant Discharge Elimination System (NPDES) permit Outfall 002. The surface impoundment is approximately 17 acres in size.

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 LAN Upper Ash Pond 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 LAN Upper Ash Pond closure will meet the requirements 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 portion of the surface impoundment
- 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 cover 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 may be adjusted but will not be more steep than 4H:1V or less than 2 percent (except the drainage swales).

CCR and accumulated sediment will be consolidated within the boundary of the impoundment and the area will be closed by covering the CCR with 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 LAN Upper Ash Pond 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 LAN. Treated water will be discharged via existing Outfall 002 (see **Figure 2**).

Removal of CCR will be guided visually by direct observation during mechanical excavation and by elevations with visual verification of sediment samples during hydraulic excavation.

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 LAN Upper Ash Pond 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 sufficient 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 (see **Figure 3** for detail) for the Upper Ash Pond will include the following, at a minimum, from the bottom up:

- Eighteen-inch-thick soil infiltration layer (minimum permeability of 1×10^{-5})
- 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 Upper Ash Pond final cover system will include an 18-inch soil layer with a permeability of 1×10^{-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 October 2017 “CCR Surface Impoundment Structural Stability Assessment” prepared by Hard Hat Services, for the LAN facility. There is no liner system present in the Upper Ash Pond.
- 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. The stability of the final cover system will be assessed 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 CFT 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 LAN Upper Ash Pond, over the active life of the Upper Ash Pond, is approximately 485,000 cubic yards of CCR are currently present in the LAN Upper Ash Pond. This estimate is based on 2020 in place survey, borings, and material test data. This volume does not include the volume present in the LAN CCR Landfill.

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.”*

Based on the geometry of the LAN Upper Ash Pond described above, the estimated largest area of final cover required would be approximately 17 acres. The 17 acres assumes the entire pond footprint must be capped and is 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 Upper Ash Pond 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 the Upper Ash Pond.

- (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 Upper Ash Pond 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 final cover construction. The engineer will 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, 2017, CCR Surface Impoundment Structural Stability Assessment, Lansing Generating Station, Interstate Power and Light Company, October 18, 2017.

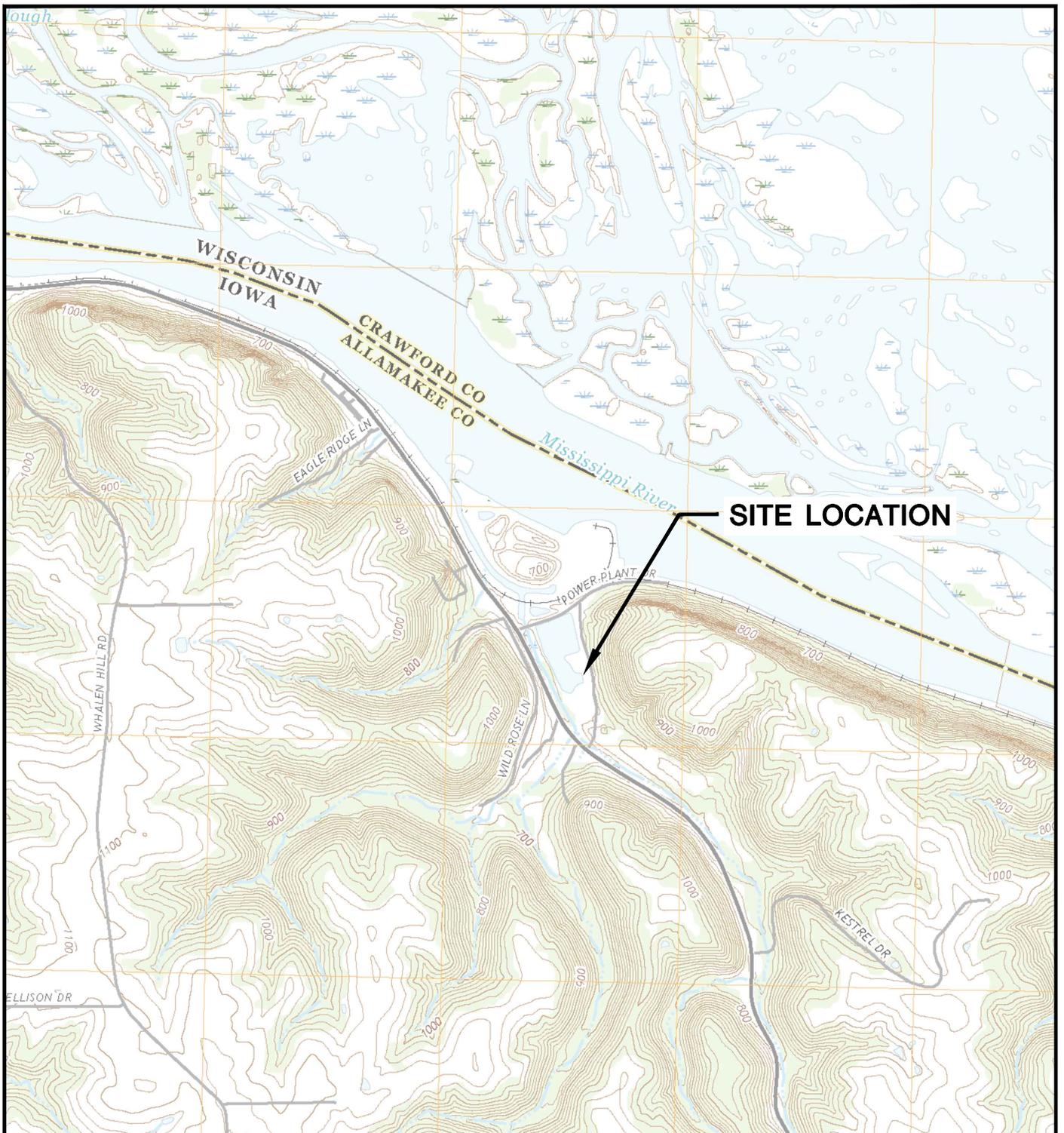
Sargent & Lundy, 2016, Closure Plan for Existing CCR Surface Impoundment, Lansing Generating Station, Interstate Power and Light Company, August 26, 2016.

Sargent & Lundy, 2018, Closure Plan for Existing CCR Surface Impoundment (Revision 1), Lansing Generating Station, Interstate Power and Light Company, February 14, 2018.

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Figures

- 1 Site Location Map
- 2 Site Plan



SITE LOCATION

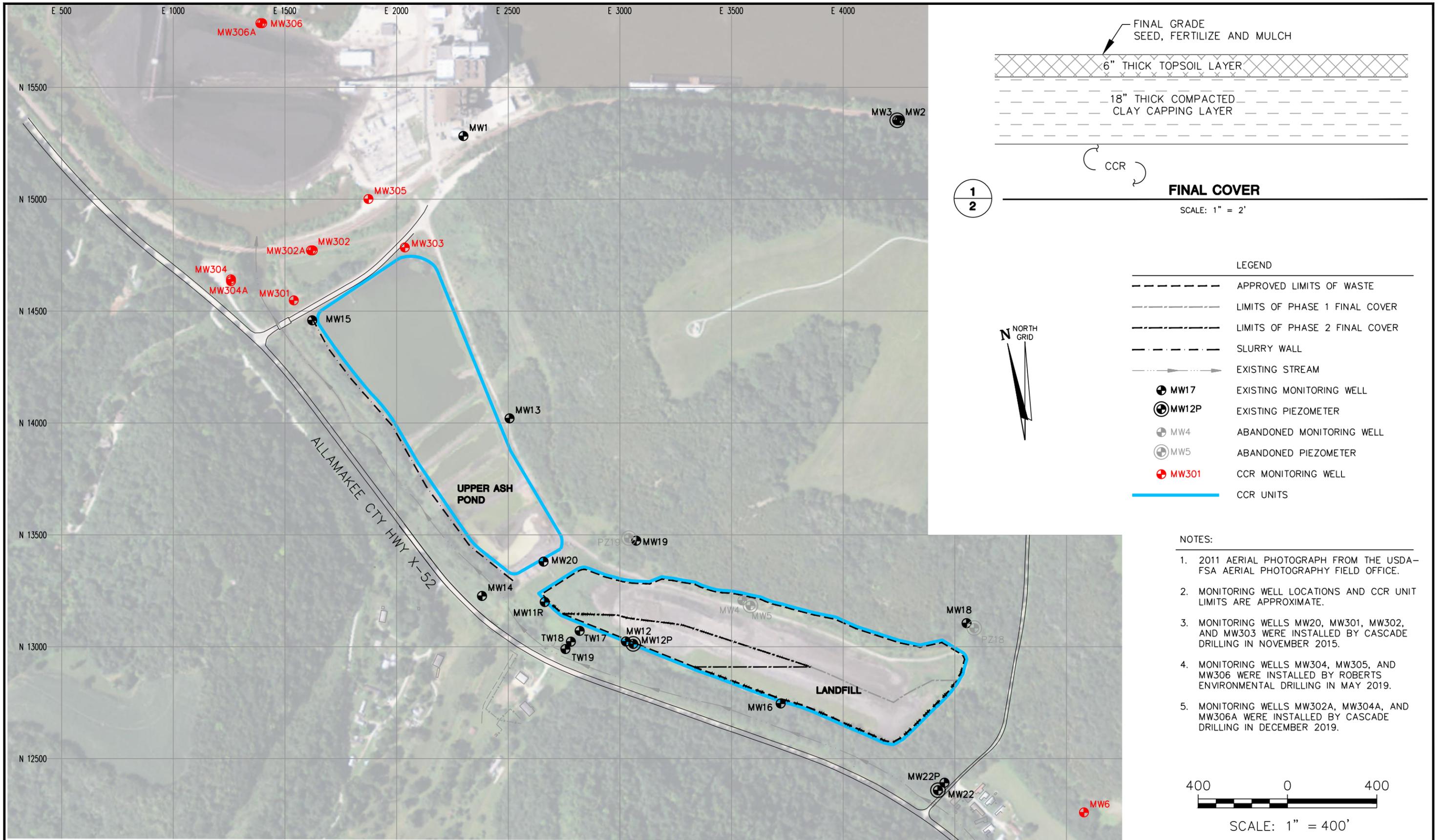


LANSING QUADRANGLE
 IOWA-ALLAMAKEE CO.
 7.5 MINUTE SERIES (TOPOGRAPHIC)
 2018
 SCALE: 1" = 2,000'



CLIENT	INTERSTATE POWER AND LIGHT 2320 POWER PLANT DRIVE LANSING, IA 52151-9733		SITE	INTERSTATE POWER AND LIGHT LANSING GENERATING STATION LANSING, IOWA		ENGINEER	SITE LOCATION MAP		FIGURE 1
	PROJECT NO.	25220100.00		DRAWN BY:	RJG		SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830		
DRAWN:	11/27/2019	CHECKED BY:	PG						
REVISED:	09/25/20	APPROVED BY:	EJN 11/13/2020						

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FINAL COVER

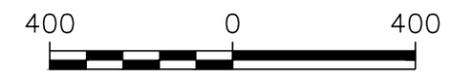
SCALE: 1" = 2'

LEGEND

- APPROVED LIMITS OF WASTE
- LIMITS OF PHASE 1 FINAL COVER
- LIMITS OF PHASE 2 FINAL COVER
- SLURRY WALL
- EXISTING STREAM
- MW17 EXISTING MONITORING WELL
- ⊕ MW12P EXISTING PIEZOMETER
- ⊕ MW4 ABANDONED MONITORING WELL
- ⊕ MW5 ABANDONED PIEZOMETER
- ⊕ MW301 CCR MONITORING WELL
- CCR UNITS

NOTES:

1. 2011 AERIAL PHOTOGRAPH FROM THE USDA-FSA AERIAL PHOTOGRAPHY FIELD OFFICE.
2. MONITORING WELL LOCATIONS AND CCR UNIT LIMITS ARE APPROXIMATE.
3. MONITORING WELLS MW20, MW301, MW302, AND MW303 WERE INSTALLED BY CASCADE DRILLING IN NOVEMBER 2015.
4. MONITORING WELLS MW304, MW305, AND MW306 WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN MAY 2019.
5. MONITORING WELLS MW302A, MW304A, AND MW306A WERE INSTALLED BY CASCADE DRILLING IN DECEMBER 2019.



SCALE: 1" = 400'

PROJECT NO. 25219070.00	DRAWN BY: RJG	ENGINEER	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT	INTERSTATE POWER AND LIGHT 2320 POWER PLANT DRIVE LANSING, IA 52151-9733	SITE	INTERSTATE POWER AND LIGHT LANSING POWER STATION LANSING, IOWA	SITE PLAN	FIGURE
DRAWN: 11/27/2019	CHECKED BY: PG								2
REVISED: 01/20/2020	APPROVED BY: EJN 11/13/2020								

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Appendix A
Pond Closure Schedule

Estimated Pond Closure Schedule
 Lansing Generating Station
 Iowa Power and Light Company

ID	Task Name	Duration	Start	Finish	2020												2021												2022												2023												2024																																			
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec																								
1	Engineering	411 days	Thu 3/5/20	Thu 9/30/21	[Gantt bar from Mar 2020 to Sep 2021]																																																																																			
2	Permitting	293 days	Wed 11/18/20	Fri 12/31/21													[Gantt bar from Nov 2020 to Dec 2021]																																																																							
3	Procurement	257 days	Wed 4/14/21	Thu 4/7/22																									[Gantt bar from Apr 2021 to Apr 2022]																																																											
4	Dewatering and Closure Construction	207 days	Mon 1/2/23	Tue 10/17/23																																					[Gantt bar from Jan 2023 to Oct 2023]																																															