CCR Surface Impoundment 2021 Annual Inspection Report

Louisa Generating Station

MidAmerican Energy Company
Louisa Generating Station

Muscatine, Iowa
January 7, 2022

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Table of Contents

Appendices

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Professional Engineer Certification

"I hereby certify that the CCR Surface Impoundment at the Louisa Generating Station, owned and operated by the MidAmerican Energy Company, has been inspected and this report prepared in accordance with the Coal Combustion Residual Rule 40 CFR §257.83(b). I am a duly licensed Professional Engineer under the laws of the State of Iowa."

Print Name: Garrett M. Williams

Signature: _____

Date: January 7, 2022

License #: P24856

My license renewal date is December 31, 2023.

1 Introduction

On April 17, 2015, the United States Environmental Protection Agency (EPA) published the final rule for the regulation and management of coal combustion residuals (CCR) under Subtitle D of the Resource Conservation and Recovery Act [RCRA, 42 United States Code (U.S.C.) §6901 et seq.]. The CCR Rule defines a set of requirements for the disposal and handling of CCR within CCR units (defined as either landfills or surface impoundments). MidAmerican Energy Company (MEC) is subject to the CCR Rule and therefore must have a qualified professional engineer conduct an annual inspection of its CCR surface impoundments in accordance with 40 CFR §257.83. HDR Engineering, Inc. (HDR) conducted the 2021 annual inspection of the Louisa Generating Station (LGS) CCR surface impoundment (LGS Surface Impoundment) on September 28, 2021, on behalf of MEC. This report contains the results and observations of the inspection.

1.1 Purpose

The CCR Rule requires inspections of CCR units and reports to be completed and filed on an annual basis. The completion date of the last inspection report (i.e. placed in the facility operating record) establishes the deadline to complete the next inspection and report. The requirements of the annual inspection for CCR surface impoundments include:

- A review of available information regarding the status and condition of the CCR unit, weekly inspections, structural stability assessments, and previous annual inspections - §257.83(b)(1)(i)
- A visual inspection of the CCR unit and appurtenant structures to identify signs of distress or malfunction - §257.83(b)(1)(ii)
- A visual inspection of any hydraulic structures underlying the base or passing through the dike of the CCR unit for structural integrity and continued safe and reliable operation - §257.83(b)(1)(iii)
- An inspection report that includes the following:
    - Changes in geometry since the last inspection - §257.83(b)(2)(i)
    - Location and type of existing instrumentation and maximum recorded readings - §257.83(b)(2)(ii)
    - Approximate minimum, maximum and present depth and elevation of impounded water and CCR - §257.83(b)(2)(iii)
    - Storage capacity of the impounding structure at time of inspection - §257.83(b)(2)(iv)
    - Approximate volume of impounded water and CCR in unit at time of inspection - §257.83(b)(2)(v)
    - Appearance of actual or potential structural weakness of the CCR unit - §257.83(b)(2)(vi)
    - Any other changes which may have affected the stability or operation of the CCR unit since the last inspection - §257.83(b)(2)(vii)

MEC, as owner and operator of the LGS CCR Surface Impoundment, must notify the Iowa Department of Natural Resources (IDNR) Director within 30 days of placing the CCR Surface Impoundment Annual Inspection Report in the operating record and date of posting to the CCR website (40 CFR §257.106(g)(7) and §257.107(g)(7)).

1.2 Facility Background

The Louisa Generating Station is a coal-fired generating plant located south of Muscatine, Iowa, along the west shore of the Mississippi River. The LGS has an existing CCR landfill and an existing CCR surface impoundment. This annual inspection report covers the LGS Surface Impoundment.

The LGS Surface Impoundment is located east of the operating plant and adjacent to the Mississippi River. The impoundment was previously split into two portions, a large Primary Storage Pond and a secondary pond (Reclaim Water Pond) which had accepted flow from the primary storage pond. Historically, water from the Reclaim Water Pond was discharged to the Mississippi River through a permitted outfall or recirculated to the plant for reuse as bottom ash transport water. An outfall structure from the Primary Storage Pond conveyed water to the Reclaim Water Pond and a lift station, located at the northwest corner of the Reclaim Water Pond, pumped liquids back to the plant for reuse.

The main function of the Primary Storage Pond was to allow CCR materials to settle and permit sediment free liquids to drain to the Reclaim Water Pond. Both portions of the surface impoundment were lined with rip rap for slope protection on the interior of the embankments. The exterior slopes of the embankments were vegetated. The Reclaim Water Pond has since been disconnected from the Primary Storage Pond by way of demolishing the outfall structure connecting the two ponds. Furthermore, all CCR materials and the old liner system were removed from the Reclaim Water Pond area, then lined with an HDPE membrane. This area is no longer a CCR surface impoundment as it was closed by removal in 2017 and repurposed for process water. It is now referred to as the Process Water Pond which remains in service for low volume wastewater to service the plant water needs.

The total surface area of the remaining LGS Surface Impoundment (Bottom Ash Impoundment) is approximately 26.4 acres with an estimated 872,000 cubic yards of CCR. The Process Water Pond has a surface area of approximately 2.8 acres.

Closure activities for the LGS Surface Impoundment were complete at the time of the inspection. This included final cover system and established vegetation in accordance with the closure plan dated March 2, 2018.

2 Review of Available Information

Section 257.83(b)(1)(i) of the CCR Rule requires that available information regarding the status and condition of the CCR surface impoundment such as the previous weekly and annual inspections and structural stability assessment are to be reviewed. Several

documents pertaining to the operation and structural integrity of the LGS Surface Impoundment were reviewed before, during and after the site inspection, including:

- Previous initial structural stability assessment prepared by Burns and McDonnell, October 10, 2016.
- Previous annual inspection report for 2020 by HDR.
- The LGS Surface Impoundment weekly reports from October 28, 2020 to April 13,2021.
- Quarterly inspection completed on July 6, 2021.
- Closure Plan for Bottom Ash Impoundment, March 2, 2018, GHD.
- Professional Engineer's Certification of Closure dated December 17, 2020.
- Louisa Generating Station Notification of CCR Unit Closure report dated January 4, 2021.
- Iowa Department of Natural Resources Approval of Final Closure Compliance Report dated February 1, 2021

Review of the above documents did not uncover any unresolved issues that indicated operational, safety or structural concerns of the LGS Surface Impoundment.

3 Visual Site Inspection

Section 257.83(b)(1)(ii) and (iii) of the CCR Rule requires a visual inspection of the CCR surface impoundment be performed. A site inspection of the LGS Surface Impoundment was performed on September 28, 2021 by Garrett Williams, PE, and Andy Lee of HDR. Office reviews of available information were also conducted by HDR.

The weather during the site visit was sunny with temperatures ranging from 54 to 80 degrees Fahrenheit and wind speeds around 8 mph.

3.1 Extent of Inspection

The visual inspection involved walking the entire perimeter of the impoundment to visually inspect the toe, mid-slope and crest of the exterior embankments. The interior was also visually inspected along all sides of the LGS Surface Impoundment. The intent of the visual inspection was to identify signs of any distress or malfunction of the CCR surface impoundment and appurtenant structures including a check of the hydraulic structures for structural integrity and continued safe and reliable operation. As the CCR Rule only requires the inspection of the existing CCR surface impoundment and appurtenant structures, this report does not address the condition of the groundwater monitoring system, access roads beyond the surface impoundment perimeter, and structures, grades or drainage channels that are not an operational component of the LGS Surface Impoundment.

The field visit focused on the following:

- Perimeter embankments/berms condition (surface cracking, erosion, slides/sloughs, inadequate slope protection, poor vegetation, animal burrows, settlement, seepage)

- Interior berms condition
- Hydraulic structures
    - Inlet condition
    - Equalization structure condition
    - Outfall structure condition/pump station inlets
- Perimeter drainage

The plant was previously converted to dry ash handling. CCR or non-CCR wastewater are no longer transported to the LGS Surface Impoundment. Piping that transported material to the pond have been abandoned.

3.2 Inspection Findings

Based on the observations made at the time of the visual inspection, the following are the findings of the LGS Surface Impoundment inspection:

3.2.1 Bottom Ash Impoundment

- Localized low point was observed near the north west corner of the pond. This area is near the area of stormwater management post-closure.
- A cover system has been installed and is further described in the Closure Plan.
- The hydraulic equalization structure was previously demolished and permanently plugged. The water elevation gauge was removed as part of the demolition.
- Full and stable vegetation was observed along the interior and exterior slopes of the embankments.
- Full and stable vegetation was observed on the cover system.

3.2.2 Process Water Pond

- The process water pond had CCR removed and a HDPE liner system installed.
- The pond was in good condition and was now being used as a low volume wastewater pond which recirculated water for plant operations.
- Water was observed in the pond.
- No CCR streams are conveyed to this pond.

Overall, the LGS Surface Impoundment appeared to be well maintained and in good condition. No significant deficiencies were identified.

4 Changes in Geometry

Section 257.83(b)(2)(i) of the CCR rule requires that any changes in geometry be noted since the previous annual inspection.

The geometry of the LGS Surface Impoundment has changed since the previous inspection. The changes are in accordance with the closure activities as described in the Closure Plan and there were no changes of concern noted during this inspection.

5 Instrumentation

Section 257.83(b)(2)(ii) of the CCR rule requires location and type of existing instrumentation and maximum recorded readings of each instrument since the previous annual inspection.

The instrumentation for the LGS Surface Impoundment was removed during 2018, prior to the previous inspection in 2019. There are three piezometers located in the CCR and a sump which are above the LGS Surface Impoundment cover system.

6 Approximate Depth - Impounded Water and CCR

Section 257.83(b)(2)(iii) requires the approximate minimum, maximum and present depth and elevation of the impounded water and CCR to be identified since the previous annual inspection.

There was no water within the LGS Surface Impoundment visible at the time of inspection.

The CCR within the Impoundment is graded to a maximum elevation of 570 MSL, which approximately 28 feet above the floor of 542 MSL

7 Storage Capacity

Section 257.83(b)(2)(iv) requires the storage capacity of the impounding structure at the time of inspection to be identified.

Disposal had been ceased in the LGS Surface Impoundment and therefore no additional storage of CCR or non-CCR wastewater streams are anticipated at this time.

8 Approximate Volume - Impounded Water and CCR

Section 257.83(b)(2)(v) requires the approximate volume of CCR and water in the CCR surface impoundment to be estimated as part of the annual inspection report. The previous annual inspection estimated a total CCR volume disposed within the impoundment as 872,000 cubic yards as of November 2017 according to GHD's Notice of Intent to Initiate Closure, dated December 13, 2017. No CCR has been added to the impoundment since November 2017.

The LGS Surface Impoundment had no surface water at the time of inspection.

9 Appearance of Structural Weakness

Section 257.83(b)(2)(vi) of the CCR Rule requires any appearances of actual or potential structural weakness or conditions that could disrupt or potentially disrupt

operation and safety of the CCR surface impoundment and appurtenant structures be noted in the inspection report.

Based on the visual inspection findings reported above in Section 3, no apparent or potential structural weaknesses were observed.

10 Changes Affecting Stability or Operation

Section 257.83(b)(2)(vii) of the CCR Rule requires that changes that affect stability or operation of the impounding structure be identified since the last annual inspection.

Based on review of final weekly inspection and the Initial Structural Stability Assessment, completed by Burns and McDonnell, there were no reported, observed, or suspected changes that have weakened the site stability.

Appendix A
Facility Site Map

NOTE: AERIAL IMAGE PROVIDED BY GOOGLE EARTH 4/2019

1000 500 0 1000
FEET

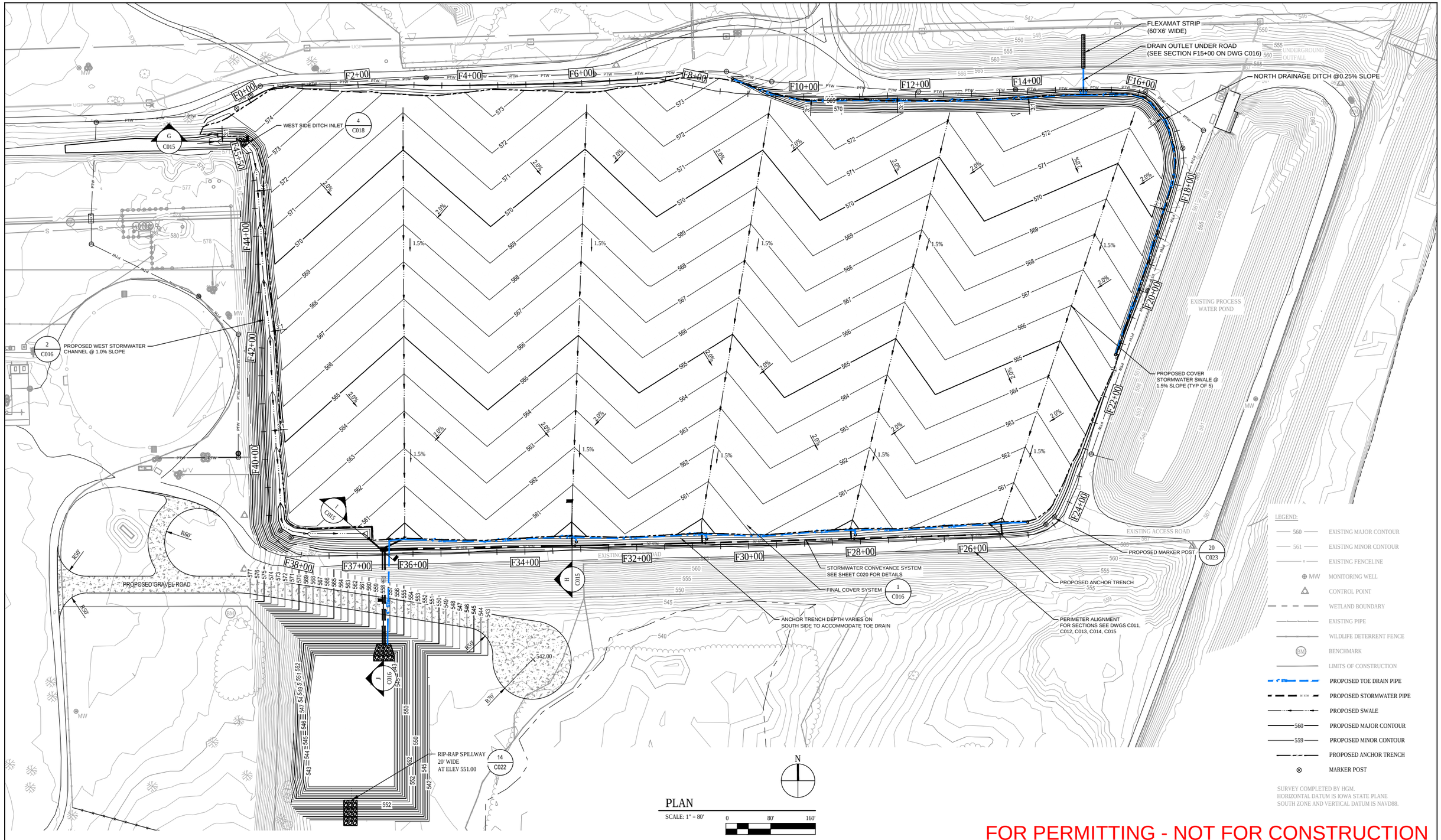
2020 ANNUAL INSPECTION REPORT
LOUISA GENERATING STATION - CCR SURFACE IMPOUNDMENT
FACILITY SITE MAP

APPENDIX A

DATE
JANUARY 2021

FIGURE
1

Appendix B
Final Cover Plan (GHD Plan excerpt from CCR website published Closure Plan)



LEGEND:

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING FENCELINE
- MONITORING WELL
- CONTROL POINT
- WETLAND BOUNDARY
- EXISTING PIPE
- WILDLIFE DETERRENT FENCE
- BENCHMARK
- LIMITS OF CONSTRUCTION
- PROPOSED TOE DRAIN PIPE
- PROPOSED STORMWATER PIPE
- PROPOSED SWALE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED ANCHOR TRENCH
- MARKER POST

SURVEY COMPLETED BY HGM.
HORIZONTAL DATUM IS IOWA STATE PLANE SOUTH ZONE AND VERTICAL DATUM IS NAVD88.

FOR PERMITTING - NOT FOR CONSTRUCTION

No.	Issue	Drawn	Approved	Date
ê	ê	ê	ê	ê
ê	ê	ê	ê	ê
ê	ê	ê	ê	ê
ê	ê	ê	ê	ê
0	ISSUED FOR BID	SRP	MJA	02/05/18

Bar is one inch on original size sheet
0 1"

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Drawn	S. PIKE	Designer	M. ZUCKWEILER
Drafting Check	M. ZUCKWEILER	Design Check	M. ALOWITZ
Project Manager	K. ARMSTRONG	Date	NOVEMBER 2017
This document shall not be used for construction unless signed and sealed for construction.		Scale	1"=80'

Client MIDAMERICAN ENERGY COMPANY
Project LOUISA BOTTOM ASH IMPOUNDMENT
Title FINAL COVER PLAN - BOTTOM ASH IMPOUNDMENT PERIMETER ALIGNMENT AND ANCHOR TRENCH
Project No. 11114676
Original Size ANSI D
Sheet No. 111-14676-C008

Plot Date: 5 February 2018 - 3:40 PM Plotted By: Sean Pike Filename: P:\Drawings\111140000s\11114676 - Louisa\11114676-BOTTOM ASH POND CLOSURE\11114676 - Drawings\Civil\111-14676-C008.dwg