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CCR North and South Surface Impoundments

2023 Annual Inspection Report

Riverside Generating Station

MidAmerican Energy Company
Riverside Generating Station

Bettendorf, Iowa
January 5, 2024

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CCR Surface Impoundments
2023 Annual Inspection Report

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Appendices

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Professional Engineer Certification

"I hereby certify that the CCR Surface Impoundments at the Riverside Generating Station, owned by the MidAmerican Energy Company, have been inspected. This report is prepared in general 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.

I hereby certify that these engineering documents were 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.

Gregory M. Shafer — 1/5/2024
Gregory M. Shafer — Date
Iowa License No. P26072
My license renewal date is December 31, 2025.

Pages or sheets covered by this seal:
All.

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's (MEC) Riverside impoundments were closed prior to the October 16, 2015 effective date of the CCR Rule and therefore requirements of the rule are not applicable to these impoundments. MEC requested HDR to perform a site visit and document visual observations. Although not required, MEC requested HDR use the same criteria in the federal CCR rule (40 CFR 257.83) to assess the Riverside impoundments. HDR Engineering, Inc. (HDR) conducted the 2023 annual inspection of the Riverside Generating Station (RGS) CCR surface impoundments (South Impoundment and North Impoundment) on September 14, 2023, 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 South and North Impoundments at the Riverside Generating Station are not required to conduct annual inspections under the CCR Rule. MEC requested an inspection which was conducted similar to a CCR Rule annual inspection. The requirements of the annual inspection for existing and new CCR surface impoundments or any lateral expansion 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).

1.2 Facility Background

The Riverside Generating Station is a retired gas and coal-fired generating plant located in Bettendorf, Iowa, along the west shore of the Mississippi River. The RGS has existing North and South CCR surface impoundments. These surface impoundments were closed prior to the effective date CCR Rule. This annual inspection report covers both RGS Surface Impoundments.

The RGS Surface Impoundments are located north and south of the plant and adjacent to the Mississippi River.

1.2.1 South Impoundment

Our understanding from discussions with MEC is that levee improvements designed to aid in slope stability for the South Impoundment were constructed in 2011. Additional levee improvement and closure cap construction was completed in 2016, as referenced to HGM's Quality Control and Assurance Report. The South Impoundment containment levee consists of a geotextile reinforced river-side slope (2:1) with an 18-inch riprap layer placed on top of a 6-inch sand-gravel layer.

The South Impoundment closure cap is comprised of 18 inches for a recompacted clay cap with 6 inches of topsoil to support vegetation as an erosion layer. Lime stabilization, riprap, and geosynthetic product were each possibly used in areas needing subgrade stabilization prior to compacted fill placement at the bottom of the cap elevation. Erosion control fabric was also utilized to direct water to outlet pipes. Fabric boots were installed at pipe inlets for the construction phase stormwater pollution prevention plan (SWPPP) for vegetation to be established.

Stormwater on the South Impoundment cap flows to one of three locations where flow is conveyed through a pipe which discharges to the Mississippi River.

The total surface area of the South Impoundment is approximately 18 acres.

1.2.2 North Impoundment

The North Impoundment closure cap was completed during the same construction project as the South Impoundment and included 18 inches recompacted clay cap with 6-inch topsoil layer for supporting vegetative cover.

General stormwater conveyance flows through two culverts, one located towards the north, and one located towards the south of the North Impoundment. The north culvert was installed during closure construction. A fabric boot was installed on the north pipe and believed to assist with erosion control during the construction project. The south

drainage culvert is a 60” corrugated metal pipe and was existing prior to closure construction.

The total surface area of the North Impoundment is approximately 15 acres.

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 RGS Surface Impoundments were reviewed before, during and after the site inspection, including:

- Geotechnical Site Evaluation Report prepared by Terracon dated December 8, 2020.
- Quarterly Inspections from October 5, 2022, March 8, 2023, April 25, 2023, September 14, 2023, and October 24, 2023.
- RGS North and South Impoundment Pond Capping Project Quality Control and Assurance Report prepared by HGM Associates Inc. dated July 18, 2016.
- Riverside Generating Station – South Impoundment Capping Record Drawings provided by HGM dated July 18, 2016.
- Riverside Generating Station – North Impoundment Capping Record Drawings provided by HGM dated July 18, 2016.

Some field observations appear to differ from the record drawings. For example, the drainage piping on Sheet M.01 for the South Impoundment indicates 18” steel culverts. These pipes were found to be HDPE in lieu of steel. Observation of pipe installation can be found on the October 3, 2015 weekly report. Another discrepancy is record drawing and field observation for the North Impoundment. Similar to the South, the North Impoundment indicated a steel culvert where field observations identified an HDPE pipe.

It was also noted from page 3 of the Terracon report for the South Impoundment that the riprap did not appear to have been extended to full design height locally at the north and south outlet pipe locations. The top of riprap appeared to be about a foot to a foot and a half low for lateral distances of about 15 to 25 feet. MEC’s contracted civil engineer (HGM) has previously indicated that this condition should be corrected as a part of general maintenance.

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 RGS Surface Impoundments for the North and South Impoundments was performed on September

14, 2023 by Greg Shafer, PE of HDR, accompanied by Janelle Spies (Contractor with MEC). Office reviews of available information were also conducted by HDR.

The weather during the site visit was clear and calm with temperatures ranging from about 54 to 56 degrees Fahrenheit and negligible wind.

3.1 Extent of Inspection

The visual inspection involved walking the entire perimeter of the RGS Surface Impoundments to visually inspect the exterior embankments. The interior was also visually inspected from all sides of the impoundments. The intent of the visual inspection was to identify signs of any distress or malfunction of the CCR surface impoundments 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 impoundments and appurtenant structures, this report does not address the condition of the groundwater monitoring system, access roads beyond the surface impoundments' perimeters, and structures, grades or drainage channels that are not an operational component of the RGS Surface Impoundments.

The field visit focused on the following:

- Perimeter embankments/berms condition (riprap observation, 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

CCR and non-CCR wastewater are no longer transported to the RGS Surface Impoundments and haven't been since March 2015. Piping that transported material to the impoundments has been abandoned or removed.

3.2 Inspection Findings

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

3.2.1 South Impoundment

- In general, full, and stable vegetation was observed on the cover system. This is generally improved from the previous yearly inspection.
- Some tree saplings that had been observed throughout the quarterly inspections have been addressed.

3.2.2 North Impoundment

- Previously identified dead grass patches have been addressed and full and stable vegetation was observed on the cover system.
- Some volunteer trees were observed around the power poles at the perimeter. Although these are outside of the capped area, MEC intends to remove them.

Overall, the RGS Surface Impoundments appeared to be well maintained and in good condition.

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 RGS Surface Impoundments remains similar to the closure grading completed in 2016.

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.

No instrumentation was present at either the North or South Impoundments.

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 ponded stormwater within the RGS Surface Impoundments visible at the time of inspection. CCR thickness varies across both the South Impoundment and North Impoundment. Based on record drawings of cap construction, CCR was regraded and stabilized by various methods including use of geosynthetic materials, lime and rip rap.

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.

CCR disposal had ceased at the RGS Surface Impoundments and therefore no additional storage of CCR or non-CCR wastewater streams are anticipated.

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 RGS Surface Impoundments does not actively impound water since closure and 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 available information, there were no reported, observed, or suspected changes that have weakened the site stability.

11 Recommendations

Items noted during the inspection should continue to be monitored, or observed, to ensure further movement or deterioration can be documented and addressed as necessary. These recommendations are intended to address items that were visually observed during the site inspection.

11.1 South Impoundment

Maintenance of vegetation, such as mowing, should be continued, any excess clippings should be removed to prevent causing distress to the underlying vegetation. During future mowing events, consider dispersing any piles to maintain vegetation.

Continue to monitor and repair any sloughing or erosion at inlet and outlet drainage piping. Consider installation of splash pads if necessary.

Cover any exposed geotextile beneath gravel roads. Stockpile any rock for roadway maintenance, in an area outside of the limit of the impoundment.

11.2 North Impoundment

Continue to monitor vegetation and overseed where needed.

Monitor drainage piping inlets and outlets for sloughing and erosion. Repair any erosion and remove silt fence or geotextile once vegetation has been established.

Appendix A
Closure Grading As-Built Surveys

LEGEND: SUBGRADE TREATMENTS USED BELOW RCL, LISTED HIGHEST TO LOWEST ELEVATION

- TENCATE PP105 (75x300 PRE-SEWN PANEL, OVERLAPPED BY 2' HEAT-WELD MELTED TOGETHER)
- 8 OZ. GSE FABRINET 200 MIL GEOCOMPOSITE FABRIC
- LIME STABILIZATION IN AT LEAST 1 LIFT
- RIP RAP FOR STABILIZATION

INSTALLED TEMPORARY ORANGE CONSTRUCTION SAFETY FENCE

REMOVED ALL TREES. NOT ALL TRESS ARE SHOWN

EAST CROSS SECTION ALIGNMENT

EXTENTS OF GRADING (TYP.)

EXTENTS OF GRADING (TYP.)

REMOVED EX. STEEL PIPE

RED PRINTING ON WHITE WITH 2" LETTERS (REFLECTIVE)

12"x18"

PRIVATE PROPERTY
NO
TRESPASSING

POST: 8' 2lb/ft V-CHANNEL GALVANIZED

SIGN PANEL: ENGINEERING GRADE RETROREFLECTIVE SHEET PANEL

4' MIN.

3' MIN.

DETAIL 1
NOT TO SCALE

INSTALLED NO TRESPASSING SIGN (TYPICAL 3) SEE DETAIL THIS SHEET

18"ø STEEL CULVERT. REFER TO M.01 FOR DETAILS

18"ø STEEL CULVERT. REFER TO M.01 FOR DETAILS

1.0% DITCH GRADE

FL. 569.00

FL. 569.00

H.P.=573.00

WATER ELEVATION IS 573' ON 9-9-14

WATER ELEVATION IS 571' ON 9-9-14

MISSISSIPPI RIVER ELEVATION = 560.00 9-9-14

TILE LINE END I.E. = 574.02

TILE LINE END I.E. = 571.23

TILE LINE END I.E. = 565.10

TILE LINE TEE I.E. = 567.57

TILE LINE TEE I.E. = 566.62

TILE LINE END I.E. = 566.52

TILE LINE TEE I.E. = 565.02

ADS SINGLE WALL HEAVY DUTY 6" CORRUGATED PE PIPE

RIPRAP ARMORING

POND SURFACE WATER LIMIT (TYP.)

0 25 50 100
FEET

NOTE:

ALL DEWATERING DISCHARGE AND/OR SURFACE DRAINAGE FROM UNCAPPED AREAS OF THE IMPOUNDMENT SHALL ONLY BE ALLOWED TO DISCHARGE FROM THE LOCATION OF THE EXISTING OUTLET AT THE NORTH END OF THE IMPOUNDMENT. ALL DISCHARGE FROM DEWATERING AND/OR SURFACE DRAINAGE SHALL BE REQUIRED TO MEET THE REQUIREMENTS WITHIN THE DEWATERING SPECIFICATION.

ALL OUTLETS SHALL BE TEMPORARILY PLUGGED WITH A PNEUMATIC PLUG (CHERNE OR EQUAL) UNTIL THE FINAL RE-COMPACTED CLAY LAYER IS INSTALLED. PLUGS SHALL INCLUDE RUPTURE DISCS, GAUGES, AND POLY LIFT LINES. FOLLOW MANUFACTURES RECOMMENDATIONS.

1

RECORD DRAWING 06/27/16

hgm ASSOCIATES INC.
640 FIFTH AVENUE COUNCIL BLUFFS, IA
PHONE: 712-323-0530

1 – REVISION 1 6-24-2015

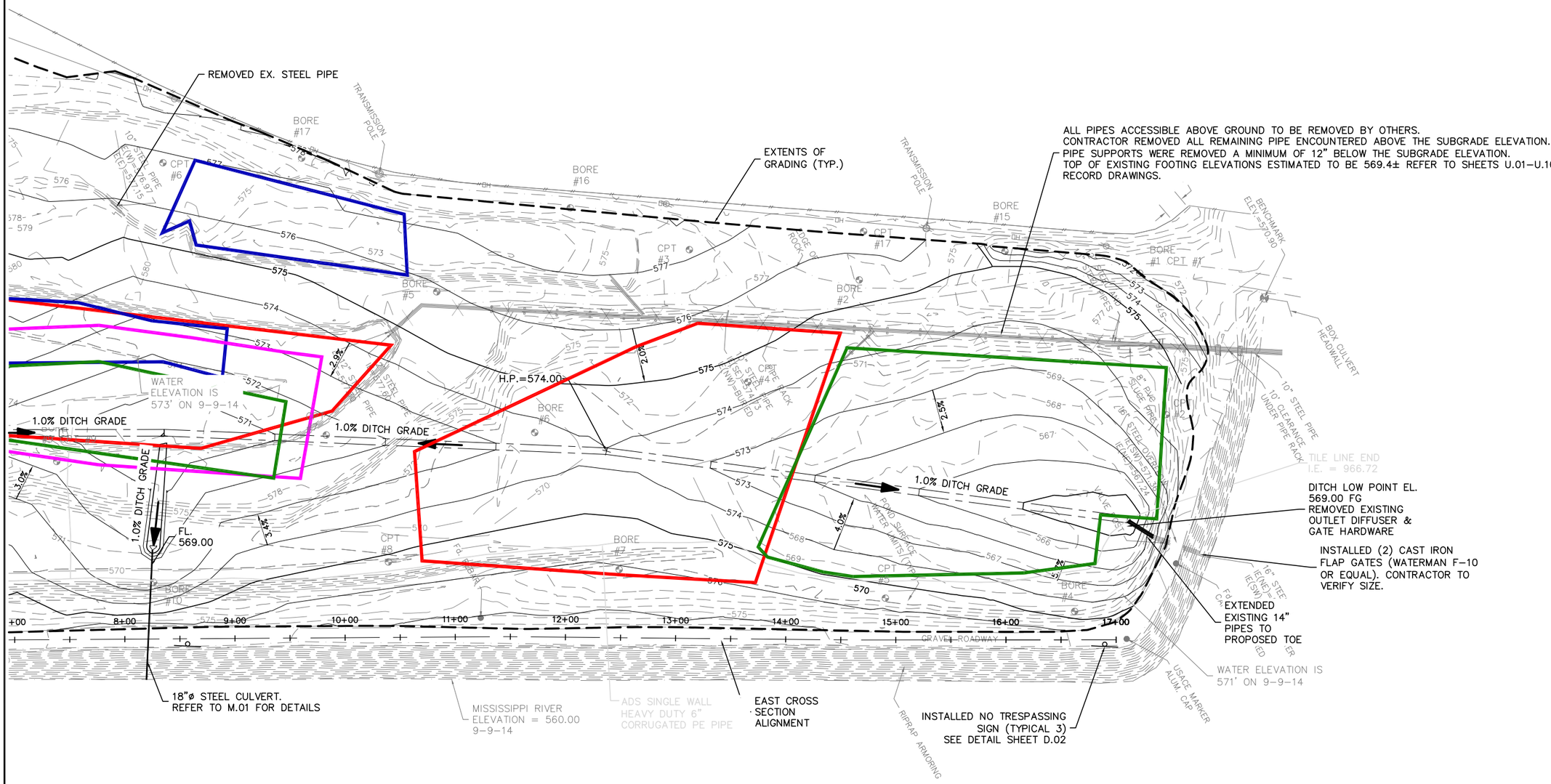
RKF	drawn	
BJR	designed	
TLS	approved	
APRIL '15	date	revision date

project: RIVERSIDE GENERATING STATION
SOUTH IMPOUNDMENT POND CAPPING
client: MIDAMERICAN ENERGY COMPANY
sheet: **CLOSURE CAP PLAN**

project no. 111914
sheet **D.02**

LEGEND: SUBGRADE TREATMENTS USED BELOW RCL, LISTED HIGHEST TO LOWEST ELEVATION

- TENCATE PP105 (75x300 PRE-SEWN PANEL, OVERLAPPED BY 2' HEAT-WELD MELTED TOGETHER)
- 8 OZ. GSE FABRINET 200 MIL GEOCOMPOSITE FABRIC
- LIME STABILIZATION IN AT LEAST 1 LIFT
- RIP RAP FOR STABILIZATION



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ALL OUTLETS SHALL BE TEMPORARILY PLUGGED WITH A PNEUMATIC PLUG (CHERNE OR EQUAL) UNTIL THE FINAL RE-COMPACTED CLAY LAYER IS INSTALLED. PLUGS SHALL INCLUDE RUPTURE DISCS, GAUGES, AND POLY LIFT LINES. FOLLOW MANUFACTURES RECOMMENDATIONS.

1

0 25 50 100
FEET

RECORD DRAWING 06/27/16

hgm ASSOCIATES INC.
640 FIFTH AVENUE COUNCIL BLUFFS, IA
PHONE: 712-323-0530

1 - REVISION 1 6-24-2015

RKF	BJR	TLS	APRIL '15
drawn	designed	approved	date

project: RIVERSIDE GENERATING STATION
SOUTH IMPOUNDMENT POND CAPPING
client: MIDAMERICAN ENERGY COMPANY
sheet: **CLOSURE CAP PLAN**

project no. 111914
sheet **D.03**

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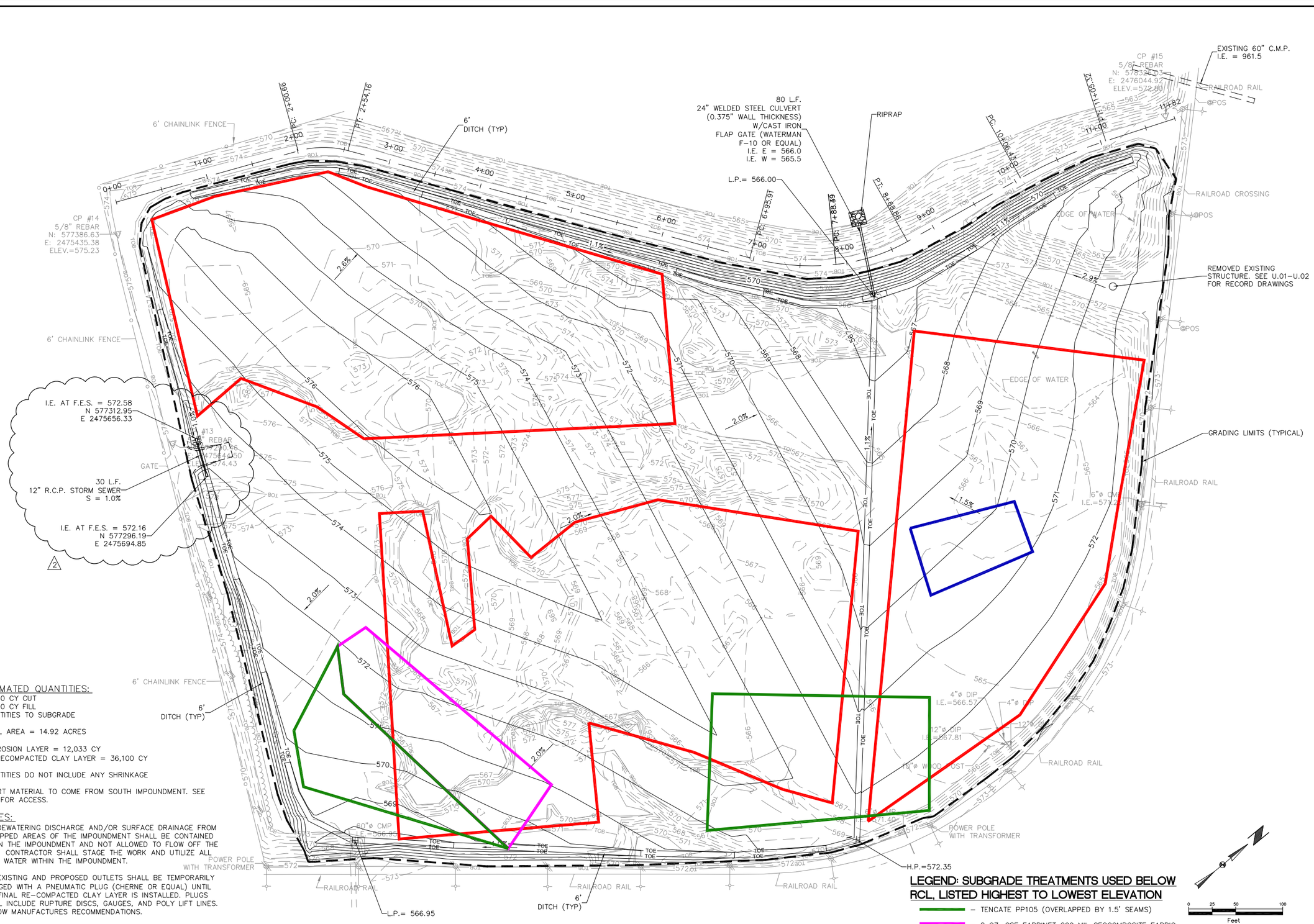

ESTIMATED QUANTITIES:
24,250 CY CUT
47,200 CY FILL
QUANTITIES TO SUBGRADE

TOTAL AREA = 14.92 ACRES

6" EROSION LAYER = 12,033 CY
18" RECOMPACTED CLAY LAYER = 36,100 CY

QUANTITIES DO NOT INCLUDE ANY SHRINKAGE

IMPORT MATERIAL TO COME FROM SOUTH IMPOUNDMENT. SEE A.02 FOR ACCESS.

NOTES:
ALL DEWATERING DISCHARGE AND/OR SURFACE DRAINAGE FROM UNCAPPED AREAS OF THE IMPOUNDMENT SHALL BE CONTAINED WITHIN THE IMPOUNDMENT AND NOT ALLOWED TO FLOW OFF THE SITE. CONTRACTOR SHALL STAGE THE WORK AND UTILIZE ALL SUCH WATER WITHIN THE IMPOUNDMENT.

ALL EXISTING AND PROPOSED OUTLETS SHALL BE TEMPORARILY PLUGGED WITH A PNEUMATIC PLUG (CHERNE OR EQUAL) UNTIL THE FINAL RE-COMPACTED CLAY LAYER IS INSTALLED. PLUGS SHALL INCLUDE RUPTURE DISCS, GAUGES, AND POLY LIFT LINES. FOLLOW MANUFACTURES RECOMMENDATIONS.

LEGEND: SUBGRADE TREATMENTS USED BELOW RCL, LISTED HIGHEST TO LOWEST ELEVATION

- TENCATE PP105 (OVERLAPPED BY 1.5' SEAMS)
- 8 OZ. GSE FABRINET 200 MIL GEOCOMPOSITE FABRIC
- LIME STABILIZATION IN AT LEAST 1 LIFT
- RIP RAP FOR STABILIZATION

0 25 50 100 Feet

NOTE: CONTOURS SHOWN ARE TOP OF EROSION LAYER

RECORD DRAWING 06/27/16

hgm ASSOCIATES INC.
ENGINEERING ARCHITECTURE SURVEYING
council bluffs omaha

1 - REVISION 1 6-24-2015
2 - REVISION 2 9-02-2015

JNG drawn | BJR designed | TLS approved | JUNE'15 date | revision | date

project RIVERSIDE GENERATING STATION
NORTH IMPOUNDMENT CAPPING
client MidAmerican Energy Company
sheet CLOSURE CAP OVERALL PLAN

project no. 111914
sheet D.01