2025 Annual Surface Impoundment Inspection

Cell 5

Prepared for
Minnkota Power Cooperative, Inc.
Milton R. Young Station

Prepared by
Barr Engineering Co.

January 2026

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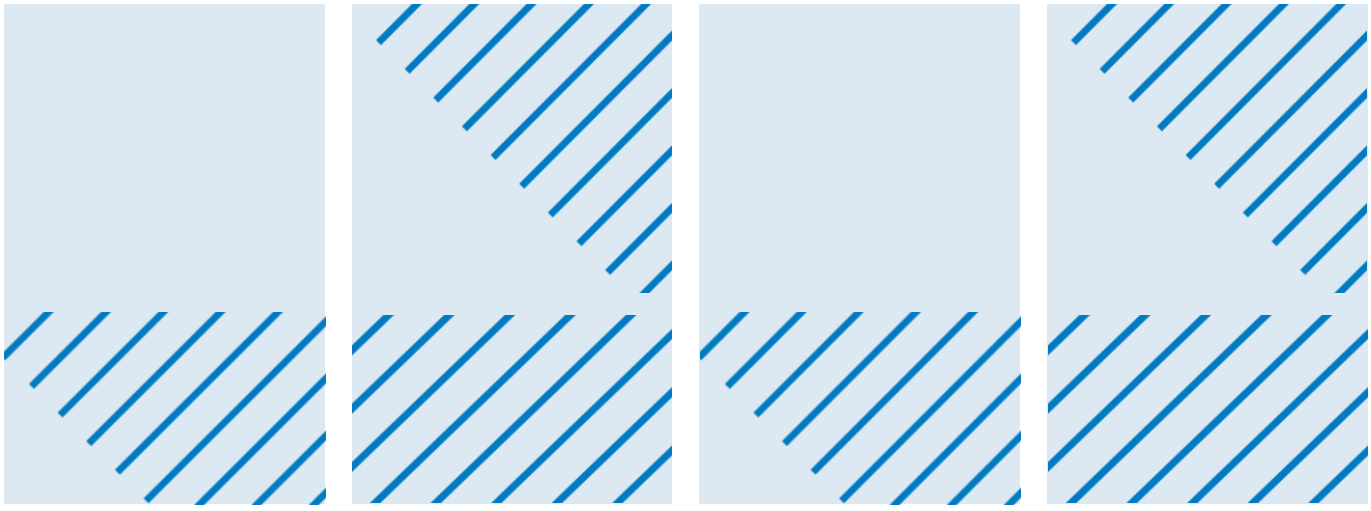
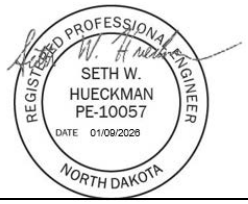


Certification

I hereby certify that I have examined the facility and, being familiar with the provisions of NDAC Title 33.1, Article 20, Chapter 08, attest that this Annual Surface Impoundment Inspection report has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and the requirements of NDAC 33.1-20-08-05.4.



Seth W. Hueckman
ND Registration Number PE-10057

January 9, 2026
Date

Seth Hueckman

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1 Introduction

Minnkota Power Cooperative, Inc. (MPC) operates the Milton R. Young Station (MRY), near Center, North Dakota. MRY operates two lignite-fired cyclone boilers, resulting in production of coal combustion residuals (CCR). MPC manages CCR generated at MRY in its Coal Combustion Waste Disposal Facility (CCWDF), which is regulated by the North Dakota Department of Environmental Quality (NDDEQ) division of waste management, Permit Number 0159. CCR management is subject to the provisions of North Dakota Administrative Code (NDAC) Title 33.1, Article 20, Chapter 8, these standards will be referred to herein as the CCR Rule. Cell 5 of the CCWDF is considered a CCR surface impoundment. Under NDAC 33.1-20-08-05.4, CCR surface impoundments are subject to annual inspections by a qualified professional engineer (QPE). This report documents the annual inspection performed by Seth W. Hueckman, P.E. on September 22, 2025, as required by the CCR Rule. Other annual inspection duties, including a review of the available information regarding the status and condition of the CCR unit and storage capacity evaluations, were performed prior and following the on-site inspection.

2 Review of Existing Information

A review of existing information was performed to ensure that the design, construction, operation and maintenance of the surface impoundment is consistent with recognized and generally accepted good engineering standards. The existing information reviewed is described in the following subsections.

2.1 Design and Construction

Cell 5 was designed by Barr Engineering Co. (Barr) and was constructed in two phases extending over two construction seasons:

- Phase 1A (2022) – Site stripping, overburden removal and coal mining in the west half of the cell, and perimeter embankment construction.
- Phase 1B (2023) – Completion of overburden removal and coal mining, piping systems installation, and composite liner installation.

The following design and construction documentation reports were reviewed in conjunction with the annual inspection:

- Cell 5 Liner Documentation for New Surface Impoundment, Barr Engineering, April 2023
- Cell 5 CCR Liner Construction Certification, Barr Engineering, October 2023
- Cell 5 Design and Construction Plans Rev. 1, Barr Engineering, January 2024
- Construction Documentation Report – Cell 5 – Phase 1, Barr Engineering, December 2023

No deficiencies were found.

2.2 Previous Periodic Structural Assessments

The following initial structural assessments as required by NDAC 33.1-20-04.3 were prepared by Barr and reviewed as part of this annual inspection:

- Initial Hazard Potential Classification for Cell 5, Barr Engineering, August 2023
- Initial Structural Stability Assessment for Cell 5, Barr Engineering, August 2023
- Initial Safety Factor Assessment for Cell 5, Barr Engineering, August 2023

No deficiencies were found.

2.3 Results of Weekly Inspections

Weekly inspection reports from January 6, 2025 through December 29, 2025 were reviewed as part of this annual inspection. No deficiencies were found.

2.4 Results of Monthly Instrumentation Monitoring

The surface impoundment is a clay and geomembrane lined surface impoundment with relatively flat 4.5 horizontal-to-1.0 vertical (4.5h:1.0v) exterior slopes and 2.5h:1.0v interior slopes and, per previously performed slope stability evaluations, acceptable slope stability factors of safety. As a result, the surface impoundment does not have any instrumentation installed in the perimeter embankments and therefore, no results of monthly monitoring were reviewed.

2.5 Results of Monthly Instrumentation Monitoring

Cell 5 construction in 2022-2023 included subsurface geotechnical drilling in the shared embankment of Cells 4 and 5. The drilling was initiated and completed during the first week of December 2022. The drilling included sampling of embankment soils for further testing of shear strength to aid future structural stability modeling of the Cell 4/Cell 5 embankment. Temporary vibrating wire piezometers (VWP's) to monitor phreatic surface location within the embankment during Cell 5 construction were also installed to further aid future stability modeling of Cell 5. Readings from the VWP's were collected at 8-hr intervals. Review of the of results in 2022-2023 showed no significant increases in phreatic surface within the embankment. At the conclusion of Cell 5 Phase 1 construction in 2023, monitoring of the temporary piezometers ceased.

The surface impoundment is a clay and geomembrane lined surface impoundment with relatively flat 4.5 horizontal-to-1.0 vertical (4.5h:1.0v) exterior slopes on the east embankment, 3.5h:1.0v exterior slopes on the west embankment, 3.0h:1.0v exterior slopes on the south embankment, and 3.0h:1.0v or flatter interior slopes, and per previously performed slope stability evaluations, acceptable slope stability factors of safety. As a result, the surface impoundment does not have any additional instrumentation installed in the perimeter embankments.

2.6 Results of Previous Annual Inspections

The annual inspection performed in September 2024 documented the following visual observations and associated remedial activities:

- An erosion channel was identified on the south west corner of Cell 5's exterior embankment. MPC repaired in the erosion and installed additional erosion control measures in October 2024.

3 Structural Integrity Review

An on-site inspection was performed to visually identify signs of distress or malfunction of the CCR unit and appurtenant structures. The results of the inspection are included in the following subsections.

3.1 Visual Inspection of CCR Unit

The surface impoundment was visually inspected for structural weakness. Inspection consisted of on-foot inspection of impoundment embankments, including toe-of-slope, mid-slope, and crest-of-slope of embankments. Visual inspection items and results are summarized in the following table:

Table 1 Summary of Visual Inspection

Item	Structural Weakness Description	Visibly Present/Deficient (Yes/No)	Notes
1	Excessive, turbid, or sediment-laden seepage	No	No seepage present.
2	Signs of piping and other internal erosion	No	No piping present.
3	Transverse, longitudinal, and desiccation cracking	No	No significant cracking present.
4	Slides, bulges, boils, sloughs, scarps, sinkholes, or depressions	No	No structural weaknesses identified.
5	Changes in geometry of impounding structure	No	No geometry changes observed.
6	Damage to liner systems	Yes	An approximately 8-foot long tear in welded geomembrane seam was identified on the north slope of Cell 5, 5-feet above the waterline. MPC repaired the tear in October 2025.
7	Abnormally high or low pool levels	No	Normal pool level at time of inspection.
8	Animal burrows	No	No burrows of significance observed
9	Excessive or lacking vegetative cover	No	Vegetation appeared well established and well maintained. Outer embankments were mowed in 2025 to maintain woody vegetation. Barr recommends this to be continued in 2026.
10	Slope erosion	Yes	An erosion channel approximately 25-feet long at the toe of the west embankment was observed during the inspection. MPC repaired the erosion and installed additional erosion controls in October 2025.
11	Debris	No	No debris of significance present.

3.2 Visual Inspection of Hydraulic Structures

The surface impoundment includes subsurface drainage features to prevent hydraulic pressure build-up in a nearby Hagel coal bed seam wherein if such pressure build-up had occurred and went unchecked during initial liner construction, it potentially could have interfered with liner and embankment construction activities. One drainage feature on the interior slope of the impoundment, consisting of a 6-inch diameter high density polyethylene (HDPE) pipe embedded in drainage aggregate, is of small enough diameter such that, even if it failed, it would not be expected to have a detrimental impact on performance of the overlying 8-foot thick clay liner and geomembrane liner. An additional drainage feature, consisting of a minimum 4-foot wide by 4-foot tall granular finger drain, was constructed through the west embankment and day-lighted at the toe of the exterior slope in areas where the Hagel coal bed seam outcropped within the embankment fill. These drainage features were not designed to be inspected and inspection is not warranted. The surface impoundment does not have any other hydraulic structures underlying the base or passing through the dike and therefore, no visual inspection of hydraulic structures was performed.

3.3 Other Changes

No changes to the surface impoundment design, maintenance, or operations were observed that could affect the stability or operation of the impounding structure.

4 Impoundment Storage Capacity

A bathymetric survey of the surface impoundment was performed in conjunction with the on-site annual inspection to calculate volumes of impounded water and CCR. Additional information was provided by MPC for the estimated minimum and maximum depths experienced this past year. The following table summarizes the storage capacity of Cell 5 over the last year.

Table 2 Approximate Minimum, Maximum, and Present Depth and Elevation of Impounded Water and CCR

Water Level	Approx. Elevation	Approx. Depth of Impounded CCR and Water	Approx. Volume of Impounded CCR and Water	Approx. Volume of CCR	Design Volume of Cell 5 (Assumes 4' of freeboard at EL. 2076))	Approx. Percentage of Storage Capacity Remaining
Minimum	2068.0	48.0 ft	1.26 MCY	-	1.60 MCY	-
Maximum	2072.1	52.1 ft	1.42 MCY	-	1.60 MCY	-
Inspection	2070.4	50.4 ft	1.36 MCY	0.51 MCY	1.60 MCY	68%