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Wisconsin Power and Light Company

Nelson Dewey Generation Station
CCR Surface Impoundment Annual Inspection Report
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Executive Summary

This annual inspection report has been prepared in accordance with the requirements of the United States Environmental Protection Agency published Final Rule for Hazardous and Solid Waste Management System - Disposal of Coal Combustion Residual (CCR) from Electric Utilities (40 CFR Parts 257 and 261, also known as CCR Rule) and Extension of Compliance Deadlines for Certain Inactive Surface Impoundments.

This annual inspection report has been prepared to assess the condition of existing CCR surface impoundments. Primarily, the annual inspection report is focused on the structural stability of the CCR surface impoundments and to ensure that the operation and maintenance of the existing CCR surface impoundments is in accordance with recognized and generally accepted good engineering standards.

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1. INTRODUCTION

This annual inspection report has been prepared in accordance with the requirements of §257.83(b) of the United States Environmental Protection Agency (USEPA) published Final Rule for Hazardous and Solid Waste Management System - Disposal of Coal Combustion Residual (CCR), herein referenced as the CCR Rule and Extension of Compliance Deadlines for Certain Inactive Surface Impoundments.

1.1 CCR Rule Applicability

The CCR Rule requires annual inspections by a qualified professional engineer (PE) for existing CCR surface impoundments with a height of 5 feet or more and a storage volume of 20 acre-feet or more or the existing CCR surface impoundment has a height of 20 feet or more (40 CFR §§ 257.73(b), 257.73(d) and 257.83(b)).

1.2 Annual Inspection Applicability

The Wisconsin Power and Light Company (WPL), Nelson Dewey Generating Station (NED) in Cassville, Wisconsin has one existing CCR surface impoundment that meets the requirements of Section 1.1, identified as the NED Slag Pond.

NED also has one inactive CCR surface impoundment, identified as the NED WPDES Pond. An annual inspection of the NED WPDES Pond is not covered within this Report. An annual inspection of the NED WPDES Pond will be completed in accordance with the Extension of Compliance Deadlines for Certain Inactive Surface Impoundments, which extended the compliance dates for inactive CCR surface impoundments.

The annual inspection of the existing CCR surface impoundment at NED was completed by a qualified PE on October 24th, 2016. The annual inspection was

completed to ensure that the design, construction, operation, and maintenance of the existing CCR surface impoundments at NED are consistent with recognized and generally accepted good engineering standards.

The annual inspection of the existing CCR surface impoundment at NED included a review of available information regarding the status and condition of the existing CCR surface impoundment. The information reviewed included all relevant files available in the operating record at the time of the annual inspection, as well as all relevant publicly accessible internet site entries. These files for the existing CCR surface impoundment at NED include, but is not limited to, CCR surface impoundment design and construction information (history of construction), hazard potential classification, structural stability assessment, safety factor assessment, hydrologic and hydraulic capacities (inflow flood control plan), results of 7-day inspections and instrumentation monitoring by a qualified person, and results of the previous annual inspection.

The annual inspection also included a visual inspection of the existing CCR surface impoundment in order to identify signs of distress or malfunction of the existing CCR surface impoundment and appurtenant structures. Additionally, the visual inspection included hydraulic structures underlying the base of the existing CCR surface impoundment or passing through the dikes of the existing CCR surface impoundment for structural integrity and continued safe and reliable operation.

2. FACILITY DESCRIPTION

The following sub-section provides a summary description of the facility, as well as a description of the existing CCR surface impoundment located at NED.

NED is located north of the Village of Cassville, Wisconsin on the eastern shore of the Mississippi River in Grant County, at 11999 County Highway VV, Cassville, Wisconsin. Located north of the generating plant is Stonefield Village (a state historical landmark) and Nelson Dewey State Park.

NED was a fossil-fueled electric generating station consisting of two steam electric generating units that were retired in December 2015. Sub-bituminous coal was the primary fuel for producing steam. The burning of coal produced a by-product of CCR. The CCR at NED was categorized into two types, slag and fly ash. The fly ash was collected by the electrostatic precipitators and pneumatically conveyed to the on-site fly ash storage silo that is equipped with a baghouse for dust control. The fly ash was then transported off-site for beneficial reuse. The slag was sluiced to a surface impoundment identified as the NED Slag Pond. The NED Slag Pond is located northwest of the generating plant and is presently the only existing CCR surface impoundment at NED.

General Facility Information:

Date of Initial Facility Operations:	1959
WPDES Permit Number:	WI-0002381-07-0
Latitude / Longitude:	42° 43' 30.792" N -91° 0' 40.032" W
Site Coordinates:	Township 03 North, Range 05 West
Unit Nameplate Ratings:	Unit 1 (1959): 100 MW Unit 2 (1961): 100 MW

2.1 NED Slag Pond

The NED Slag Pond is located northwest of the generating plant and south of the on-site closed ash landfill. The NED Slag Pond receives storm water runoff from part of the on-site closed ash landfill, and the slag handling area. The NED Slag Pond was the primary receiver of process flows from the generating plant prior to December 31, 2015 when the facility's generating units retired. Wastewater was also periodically pumped from the NED WPDES Pond to the NED Slag Pond. Process flows, prior to the facility ceasing operations, included sluiced CCR (slag) from the slag tanks located inside the generating plant, and flows associated with the seal well sump pumps. Flows from the seal well sump pumps included soot blowers, air compressors, boiler blowdown, Unit 1 and Unit 2 floor sumps, oil and hydrogen coolers and demineralization/reverse osmosis multi-media units.

Prior to the facility ceasing operations, the sluiced slag was discharged into the east end of the NED Slag Pond where the majority of CCR was recovered. A dozer was used to push the CCR towards an excavator for dredging. Prior to October 19, 2015, the dredged CCR was stockpiled adjacent to the NED Slag Pond for dewatering. Once dewatered, the CCR was transported off-site for beneficial use. CCR has not been added to any stockpiles outside of the NED Slag Pond on or after October 19, 2015, the effective date of the CCR Rule.

The water used to sluice the CCR from the generating plant to the NED Slag Pond flowed from the east end to the west end of the NED Slag Pond. The southwest corner of the NED Slag Pond consists of the facility's Wisconsin Pollution Discharge Elimination System (WPDES) Outfall 002. The concrete outfall structure includes a rectangular weir restriction that discharges into a 30-inch diameter reinforced concrete pipe (RCP). The water flows through the WPDES Outfall 002, under the embankment on the west side of the NED Slag



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Pond, and discharges into a riprap lined swale that flows to the southwest into the Mississippi River.

3. ANNUAL INSPECTION REPORTING CRITERIA

The following sub-sections address the annual inspection reporting criteria per §257.83(b)(2) of the CCR Rule for the existing CCR surface impoundment located at NED.

3.1 NED Slag Pond

3.1.1 Changes in Geometry (§257.83(b)(2)(i))

After conducting the annual inspection, as well as review of available information provided by NED pertaining to the status and condition of the existing CCR surface impoundment, and discussions with NED facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, there have been no identified changes in the geometry since the previous annual inspection.

3.1.2 Existing Instrumentation (§257.83(b)(2)(ii))

Instrumentation that supports the operation of the NED Slag Pond includes a flow meter that monitors the discharge through WPDES Outfall 002, as well as a surveyed-in waters edge marker utilized to monitor the water elevation of the NED Slag Pond. The flow meter and surveyed-in waters edge marker are located in the southwest corner of the NED Slag Pond.

The flow data associated with the NED Slag Pond WPDES Outfall 002 discharge (e.g. maximum daily flow), since the previous annual inspection, was provided by WPL for 2015 and 2016 (October 01, 2015 through October 31, 2016). Reviewing the provided flow data, the maximum daily flow recorded through WPDES Outfall 002 was 2.44 million gallons (November 2015). Note, there was no flow data available after March 19, 2016 due to the water elevation within the NED Slag Pond had receded below the invert elevation of the hydraulic structure and ceased discharging through WPDES Outfall 002.

The surveyed-in waters edge marker water elevation data, since the previous annual inspection, was provided by WPL and included sixteen measurement dates (June 29, 2016 through October 20, 2016). After review of the provided water elevation data, the maximum water elevation recorded within the NED Slag Pond during that time was 612.2 feet.

3.1.3 Depth and Elevation of Impounded CCR and Water (§257.83(b)(2)(iii))

The approximate minimum, maximum, and present depths and elevations of the impounded CCR and water in the NED Slag Pond since the previous annual inspection were determined using information that was collected during the annual inspection, as well as from historical information that was previously provided from WPL.

At the time of the annual inspection a survey was completed in order to determine the present surface water elevation of the CCR surface impoundment. Additionally, depth measurements from the water surface to the top of CCR/sediment were obtained in order to determine present depths/elevations.

The historical information provided from WPL included water elevation data since the previous annual inspection, an initial site preparation drawing from an Ash Disposal Facility Plan of Operation prepared by Warzyn Engineering (1978) which shows the original contour elevation prior to the construction of the NED Slag Pond, the most recent bathymetric survey drawing of the NED Slag Pond prepared by BT² (2006), as well as the most recent topographic survey drawing of the area surrounding the NED Slag Pond prepared by SCS Engineers (2016). Reviewing the information provided within the above mentioned documents, as well as the data collected during the annual inspection, the following minimum, maximum, and present depths and elevations were approximated for the impounded CCR and water:

- NED Slag Pond (Area of Impounded Water – Western Half)
 - At the time of the annual inspection, the water surface elevation of the NED Slag Pond was surveyed to be 611.07 feet, 13.93 feet below the crests of the south and west sides of the CCR surface impoundment, which had an elevation of approximately 625 feet at the lowest point of the crests.
 - At the time of the annual inspection, the water depths that were measured within the CCR surface impoundment varied between 1.35 feet and 1.85 feet.
 - From the water depth measurements at the time of the annual inspection, the elevation of the top of CCR/sediment that was measured varied between an elevation of 609.72 feet and 609.22 feet.
 - From the 1978 initial site preparation drawing, the original bottom contour elevation in the area of the NED Slag Pond was approximately 608 feet. The depth of the NED Slag Pond varied between 609.72 feet and 609.22 feet. Comparing the results from the water depth measurements at the time of the annual inspection to the 1978 initial site preparation drawing contour elevation, the deposition thickness in the western portion of the CCR surface impoundment where water was present varied between 1.72 feet and 1.22 feet.
- NED Slag Pond (CCR Handling Area – Eastern Half)
 - From the 2006 bathymetric survey drawing, the contours in the eastern half of the CCR surface impoundment varied in elevation between 611 feet and 615 feet. Comparing the 2006 bathymetric survey drawing contour elevations to the 1978 initial site preparation drawing contour elevation, the deposition

thickness in the eastern portion of the CCR surface impoundment varied between 3 feet and 7 feet.

3.1.4 Storage Capacity of Impounding Structure (§257.83(b)(2)(iv))

The storage capacity (i.e. water volume) of the CCR surface impoundment at the time of the annual inspection was calculated based on the acreage of the CCR surface impoundment in the area where water was present, and the approximate depth of water within that area of the CCR surface impoundment. The water depth measurements of the CCR surface impoundment were collected at the time of the annual inspection.

At the time of the annual inspection, the water surface elevation of the NED Slag Pond was surveyed to be 611.07 feet. From the 2006 bathymetric survey drawing, the area of the water surface of the CCR surface impoundment at an elevation of 611 feet was 1.45 acres. From the water depth data that was collected during the annual inspection, the average water depth within the CCR surface impoundment was 1.48 feet. Thus, the storage capacity within the NED Slag Pond at the time of the annual inspection was approximately 3,500 cubic yards.

3.1.5 Volume of Impounded CCR and Water (§257.83(b)(2)(v))

The volume of impounded CCR and water (i.e. total volume) within the NED Slag Pond at the time of the annual inspection was determined using information that was collected during the annual inspection, as well as from historical information that was previously provided from WPL. Historical information provided from WPL included an initial site preparation drawing from an Ash Disposal Facility Plan of Operation prepared by Warzyn Engineering (1978) which shows the contour elevation prior to the construction of the NED Slag Pond, the most recent bathymetric survey drawing of the NED Slag Pond prepared by BT² (2006), as well as the most recent topographic

survey drawing of the area surrounding the NED Slag Pond prepared by SCS Engineers (2016).

The surveyed elevation of the top of water within the CCR surface impoundment at the time of the annual inspection was 611.07 feet. From the 2006 bathymetric survey drawing of the NED Slag Pond, the contour elevations of the top of CCR/sediment outside the footprint of the water surface varied between 611 feet and 615 feet with an average elevation of approximately 613 feet. From the 1978 initial site preparation drawing, the original bottom contour elevation in the area of the NED Slag Pond was approximately 608 feet. Thus, the interior storage height of the NED Slag Pond (water portion) was 3.07 feet and the interior storage height of the CCR/sediment located outside the footprint of the water surface was approximately 5 feet.

The surface area of the NED Slag Pond, in the area where water was present, was 1.45 acres. Thus, the volume of impounded CCR and water within the NED Slag Pond, within the area where water was present, was approximately 7,000 cubic yards. The surface area of the NED Slag Pond, in the area located outside of the footprint of the water portion, was 3.19 acres. Thus, the volume of impounded CCR within the NED Slag Pond, in the area located outside of the footprint of the water portion, was approximately 26,000 cubic yards. The total volume of impounded CCR and water within the NED Slag Pond at the time of the annual inspection was approximately 33,000 cubic yards.

3.1.6 Structural Weaknesses and Disruptive Conditions (§257.83(b)(2)(vi))

After review of available information provided by NED pertaining to the status and condition of the existing CCR surface impoundment, discussions with NED facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, as well as conducting the on-site visual inspection of the existing CCR surface

impoundment, there have been no identified appearances of an actual or potential structural weakness of the existing CCR surface impoundment. Additionally, there were no identified issues with the structural integrity of the hydraulic structures (WPDES Outfall 002) associated with the NED Slag Pond.

Regarding the existing conditions of the NED Slag Pond, there were no existing conditions identified along the upstream and downstream slopes of the embankments that were disrupting or have the potential to disrupt the operation and safety of the existing CCR surface impoundment.


3.1.7 Other Changes Affecting Stability or Operation of Impounding Structure (§257.83(b)(2)(vii))

After review of available information provided by NED pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with NED facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, there has been one identified change since the previous annual inspection that has affected the operation of the NED Slag Pond.

As of December 2015, NED ceased generating operations with the retirement of the two steam electric generating units. As a result, CCR sluice water and other miscellaneous process waters from the facility no longer discharged into the NED Slag Pond. Thus, the water surface elevation within the CCR surface impoundment has significantly reduced below the invert of the hydraulic structure.

4. CERTIFICATION

To meet the requirements of 40 CFR 257.83(b), I Mark W. Loerop hereby certify that I am a licensed professional engineer in the State of Wisconsin; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in 40 CFR 257.83(b).

By: 
Name: MARK LOEROP
Date: DEC 21, 2016

