



Initial Annual Inspection
Inactive CCR Surface Impoundment -
WPDES Pond

**Nelson Dewey Generating Station
Cassville, Wisconsin**

Prepared for:

Wisconsin Power and Light Company

Nelson Dewey Generating Station
11999 County Highway VV
Cassville, Wisconsin 53806

Prepared by:

SCS ENGINEERS
137 Bluff Street, #202
Dubuque, Iowa 52001
(563) 940-0538

July 2017
File No. 25216054.00

Offices Nationwide
www.scsengineers.com

**Initial Annual Inspection
Inactive CCR Surface Impoundment – WPDES Pond
Nelson Dewey Generating Station
Cassville, Wisconsin**

Prepared for:

Wisconsin Power and Light Company
Nelson Dewey Generating Station
11999 County Highway VV
Cassville, Wisconsin 53806

Prepared by:

SCS ENGINEERS
137 Bluff Street, #202
Dubuque, Iowa 52001
(563) 940-0538

July 2017
File No. 25216054.00

Table of Contents

Section	Page
PE Certification.....	iii
1.0 Introduction.....	1
1.1 Purpose	1
1.2 Background	1
2.0 Surface Impoundment Inspection.....	2
2.1 Operating Record Review	2
2.2 Visual Inspections	3
3.0 Inspection Results.....	3
3.1 Changes in Geometry	3
3.2 Instrumentation.....	4
3.3 Historic Impounded Water and CCR Conditions.....	4
3.4 Current Storage Capacity.....	4
3.5 Current Impounded Water and CCR Conditions	5
3.6 Appearance of Structural Weakness.....	5
3.6.1 Seepage	5
3.6.2 Sloughing, Slumping, or Sliding	5
3.6.3 Excessive Settlement	5
3.6.4 Surface Cracking.....	5
3.6.5 Inappropriate Vegetation Growth.....	6
3.6.6 Animal Impacts.....	6
3.6.7 Erosion Damage.....	6
3.6.8 Failing Riprap.....	6
3.6.9 Failing Outlet or Outfall Structures	6
3.7 Disruptive Existing Conditions	6
3.8 Other Changes Since Previous Annual Inspection	7
4.0 References.....	7

Table


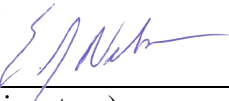
No.

1 Operating Record Summary

I:\25216054.00\Deliverables\WPDES Pond Annual Inspection\170713_NED WPDES Pond_Annual Inspection Rpt.docx

[This page left blank intentionally.]

PE CERTIFICATION

	<p>I, Eric J. Nelson, hereby certify that this Initial Annual CCR Surface Impoundment Inspection Report meets the requirements of 40 CFR 257.83(b)(2), was prepared by me or under my direct supervision, and that I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.</p>
	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  (signature) </div> <div style="text-align: center;"> 7/13/2017 (date) </div> </div>
	<p style="text-align: center;">Eric J. Nelson (printed or typed name)</p>
	<p>License number <u> E-37855-6 </u></p> <p>My license renewal date is <u> 7/31/2018 </u>.</p>
	<p>Pages or sheets covered by this seal: <u>Initial Annual Inspection, Inactive CCR Surface Impoundment - WPDES Pond dated July 2017</u></p>

[This page left blank intentionally.]

1.0 INTRODUCTION

On June 9, 2017, SCS Engineers (SCS) completed an initial annual inspection of the Wisconsin Pollutant Discharge Elimination System (WPDES) Pond at the Wisconsin Power and Light Company (WPL) Nelson Dewey Generating Station (NED) in Cassville, Wisconsin. The inspection was completed in accordance with the U.S. Environmental Protection Agency (USEPA) Coal Combustion Residuals (CCR) rule, 40 CFR 257 Subpart D, in particular 257.83(b)(1). WPL is currently in the process of closing the WPDES Pond. However, closure construction activities had not started at the time of the initial annual inspection.

1.1 PURPOSE

The purpose of the annual inspection is to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. Per 40 CFR 257.83(b)(1), the inspection must, at a minimum, include:

- A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., CCR unit design and construction information required by 257.73(c)(1) and 257.74(c)(1), previous periodic structural stability assessments required under 257.73(d) and 257.74(d), the results of inspections by a qualified person, and results of previous annual inspections)
- A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit and appurtenant structures
- A visual inspection of any hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit for structural integrity and continued safe and reliable operation

This initial annual inspection report has been prepared in accordance with the requirements of 40 CFR 257.83(b)(2) to document the annual inspection.

1.2 BACKGROUND

The WPDES Pond at NED is an inactive CCR surface impoundment. Inactive CCR surface impoundments are subject to the requirements for existing CCR surface impoundments. This happened effective October 4, 2016, with the USEPA's direct final action on the CCR rule published August 5, 2016.

According to 40 CFR 257.83(b)(1), an annual inspection by a qualified professional engineer is required for CCR surface impoundments that are subject to the periodic structural assessment requirements in 40 CFR 257.73(d) or 257.74(d). Based on information provided in the December 27, 2012 assessment of dam safety of coal combustion surface impoundments at NED completed by GZA GeoEnvironmental, Inc. (GZA, 2012), the WPDES Pond has a height of

5 feet or more (10 feet per GZA) and a storage volume of 20-acre feet or more (26 acre-feet per GZA), so it is subject to the requirements of 40 CFR 257.73(d).

According to GZA's assessment report, the WPDES Pond was originally constructed around 1976, but its interior slopes were reconfigured and the pond was resized in 1999. The WPDES Pond is incised on its south and west sides. To the east and north, the WPDES Pond embankment rises to a height of up to 10 feet. The approximate elevation of the top of the embankment is 620 feet above mean seal level (MSL). The WPDES Pond has an approximate footprint of roughly 5 acres.

CCR was sluiced to the WPDES Pond from NED during boiler maintenance activities. The WPDES Pond also received storm water runoff and coal pile runoff from adjacent areas. CCR and sediment in runoff settled into the pond and water flowed through a series of culverts via gravity through the internal embankments that separate the WPDES Pond into four distinct areas. Water in the WPDES Pond was used for dust control in the coal yard, evaporated, or eventually discharged to the Slag Pond. The water in the Slag Pond was discharged to the Mississippi River under a WPDES permit issued by the Wisconsin Department of Natural Resources (WDNR) (GZA, 2012).

The WPDES Pond and surrounding infrastructure are still in place even though the WPDES Pond stopped receiving CCR prior to October 19, 2015, and WPL stopped generating activities at NED in December 2015. WPL is in the process of decommissioning the plant and plans to begin closure construction activities for the WPDES Pond in July 2017.

2.0 SURFACE IMPOUNDMENT INSPECTION

Mr. Eric Nelson of SCS completed an annual inspection of the WPDES Pond on June 9, 2017 in accordance with 40 CFR 257.83(b)(1). Mr. Nelson is a licensed professional engineer in Wisconsin and holds a Bachelor's of Science degree in Geological Engineering. He has over 18 years of experience in the design, construction, and operation of solid waste disposal facilities and impoundment closures.

The scope of the annual inspection is described in **Sections 2.1** and **2.2**. The results of the annual inspection are discussed in **Section 3.0**.

2.1 OPERATING RECORD REVIEW

SCS reviewed the available information in the operating record for the WPDES Pond prior to the visual inspection discussed in **Section 2.2**. SCS reviewed operating record materials provided by WPL and the information posted on Alliant Energy's CCR Rule Compliance Data and Information website for the NED facility. The materials reviewed are summarized in **Table 1**.

Because of the timing of the inspection and the inactive status of the WPDES Pond, the current materials in the operating record are limited. A majority of the operating record files listed in 40 CFR 257.83(b)(1)(i) for review as part of the annual inspection are not yet required due to the

compliance deadlines in the USEPA direct final action and have not been prepared. Items that have compliance deadlines after the date of the SCS inspection and the initial inspection reporting deadline; and have not yet been completed or placed into the operating record are listed below:

- CCR unit design and construction information required by 40 CFR 257.73(c)(1)
- Previous periodic structural stability assessments required under 40 CFR 257.73(d)
- Results of previous annual inspections

2.2 VISUAL INSPECTIONS

SCS completed a visual inspection of the WPDES Pond to identify signs of distress or malfunction of the CCR unit and appurtenant structures per 40 CFR 257.83(b)(1)(ii). The visual inspection also included a review of the hydraulic structures underlying the base of the CCR unit or passing through the embankment of the CCR unit for structural integrity and continued safe and reliable operation per 40 CFR 257.83(b)(1)(iii).

The visual inspection included observations of the following:

- The slopes and crest of the impoundment embankment
- Visible and accessible pipes/culverts entering the impoundment
- The existing pump house

3.0 INSPECTION RESULTS

The results of the annual inspection, along with a description of any deficiencies identified during the visual inspection, are summarized in the following sections in accordance with 40 CFR Part 257.83(b)(2).

3.1 CHANGES IN GEOMETRY

This is the initial annual inspection of the WPDES Pond at the NED facility completed under 40 CFR 257.83(b)(1). There are no previous annual inspections in the operating record to which SCS could compare the current geometry of the impounding structure. Based on the description of the WPDES Pond and photos provided in the assessment report prepared by GZA in 2012, no changes to the geometry of the WPDES Pond were evident. However, the water level in the WPDES Pond at the time of the initial annual inspection was approximately 6 to 7 feet lower than the operating water level observed by GZA in 2011.

Changes to geometry of the impounding structure will be assessed at the time of the next annual inspection if the pond has not completed closure.

3.2 INSTRUMENTATION

Based on the SCS document review, field inspection, and discussions with WPL staff, the instrumentation that exists for the WPDES Pond includes the following:

- Two staff gauges (SG-10 and SG-11)
- One monitoring well (B-28)
- A flow meter in the pump house (used to pump water from the WPDES Pond to the Slag Pond)

The two staff gauges are located at the north end of the WPDES Pond. Both staff gauges were dry at the time of the inspection. Water level data for the staff gauges is recorded during semiannual groundwater monitoring activities conducted for the closed WDNR permitted CCR landfill located to the northwest of the WPDES Pond. The staff gauges have been dry since the WPDES Pond became inactive according to data reported on the WDNR Groundwater and Environmental Monitoring System (GEMS) database.

Monitoring well B-28 is located to the southeast of the WPDES Pond. Water level data for B-28 is recorded during semiannual groundwater monitoring activities conducted for the closed CCR landfill. The water level in B-28 was not measured during the inspection. Based on data available from the WDNR GEMS database for B-28, the maximum recorded water level elevation in B-28 since the WPDES Pond became inactive is 609.94 feet.

There is a flow meter in the pump house located at the northwest end of the WPDES Pond. There was no power to the pump house at the time of the inspection and no water was being pumped from the WPDES Pond, so no flow reading was recorded. No other flow readings have been recorded since the WPDES Pond became inactive.

3.3 HISTORIC IMPOUNDED WATER AND CCR CONDITIONS

This is the initial annual inspection of the WPDES Pond at the NED facility under 40 CFR 257.83(b)(1). There are no previous annual inspections in the operating record from which the approximate minimum, maximum, and present depth and elevation of impounded water have been recorded.

3.4 CURRENT STORAGE CAPACITY

The estimated storage capacity of the areas where water was impounded at the time of the inspection is 27 acre-feet (2.3 acre bottom area and an estimated top area of 4.5 acres with 8 feet of freeboard, assuming an estimated water elevation of 612 feet and a top elevation of 620 feet above MSL). This estimate is slightly higher than the capacity of the WPDES Pond reported by GZA in 2012.

3.5 CURRENT IMPOUNDED WATER AND CCR CONDITIONS

At the time of the SCS inspection, water was impounded in the WPDES Pond at a depth of a few inches to a few feet depending on the area within the pond. The approximate water level elevation in the WPDES Pond was 611 to 612 feet above MSL. The area of impounded water was estimated to be approximately 100,000 square feet, or 2.3 acres. The estimated volume of water in the WPDES Pond at the time of the inspection is estimated to be 3.4 acre-feet (2.3 acre-feet with an estimated average depth of approximately 18 inches of water).

The volume of CCR and sediment impounded in the WPDES Pond at the time of our inspection is approximately 200,000 cubic yards. This is based on the closure plan for the WPDES Pond that was prepared by WPL for WDNR approval (SCS, 2017).

3.6 APPEARANCE OF STRUCTURAL WEAKNESS

The inspection included a review of the appearance of an actual or potential structural weakness of the WPDES Pond. The visual inspection included a review of the areas described in **Section 2.2** for the presence of the following conditions:

- Seepage
- Sloughing, slumping, or sliding
- Excessive settlement
- Surface cracking
- Inappropriate vegetation growth
- Animal impacts
- Erosion damage
- Failing riprap
- Failing outlet or outfall structures

3.6.1 Seepage

No active seeps or signs of seepage such as open pathways in slopes or around outlet pipes, boils, or sinkholes were noted during the inspection.

3.6.2 Sloughing, Slumping, or Sliding

No sloughing, slumping, or sliding of the impoundment embankments was noted during the inspection.

3.6.3 Excessive Settlement

No excessive settlement of the impoundment embankments was noted during the inspection.

3.6.4 Surface Cracking

No surface cracking of the impoundment embankments was noted during the inspection.

3.6.5 Inappropriate Vegetation Growth

No inappropriate vegetation growth was noted during the inspection.

3.6.6 Animal Impacts

Burrowing animal activity was noted in the area of the north embankment to the west of the pump house, along the perimeter fence at the southeast corner of the pond, and on the internal embankments between the larger southern pool and northern two areas of the pond. The 7-day inspections completed by qualified WPL staff have also noted burrowing animal activity.

Backfilling animal burrows as they are identified is part of WPL's current inspection and maintenance program as documented in the 7-day inspection reports. Continued backfilling of the burrows with a 1 to 10 ratio of cement to soil slurry mix or bentonite repairs the damage and limits any further impact to the operation or safety of the impoundment. Therefore, the animal burrows identified during our inspection do not constitute a deficiency.

3.6.7 Erosion Damage

No erosion damage of the impoundment embankments indicative of structural weakness was noted during the inspection.

3.6.8 Failing Riprap

No failing riprap was noted during the inspection.

3.6.9 Failing Outlet or Outfall Structures

The outlet from the WPDES Pond to the pump house is the intake pipe for the pump house, which is buried below the WPDES Pond and pump house and is not visible. A small portion of the intake pipe was exposed and visible above the impounded water level in the WPDES Pond. There was no indication of a failure of the intake pipe. The outlet pipe is located at the north end of the pond where the pond is incised, so the potential for the outlet pipe to cause structural weakness is low even though the full length of the intake pipe is not visible to inspect.

The outfall structure for the WPDES Pond is an exposed pipe at the Slag Pond. There was no indication of a failure of the exposed pipe or the discharge piping running between the WPDES Pond and Slag Pond noted during the inspection.

3.7 DISRUPTIVE EXISTING CONDITIONS

No disruptive existing conditions were noted during the inspection.

3.8 OTHER CHANGES SINCE PREVIOUS ANNUAL INSPECTION

This is the initial annual inspection of the WPDES Pond at the NED facility under 40 CFR 257.83(b)(1). There are no previous annual inspections in the operating record to which SCS could compare the current site conditions of the landfill to fulfill the requirement in 40 CFR 257.83(b)(2)(iv).

Changes to site conditions that may have affected the stability or operation of the WPDES Pond will be assessed at the time of the next annual inspection if the pond has not completed closure.

4.0 REFERENCES

GZA GeoEnvironmental, Inc., FINAL Assessment of Dam Safety of Coal Combustion Surface Impoundments at the Nelson Dewey Generating Station, December 27, 2016.

SCS Engineers, Closure Plan, Wisconsin Power and Light Company, Nelson Dewey Generating Station, March 31, 2017.

[This page left blank intentionally.]

TABLE

- 1 Operating Record Summary

Table 1. Operating Record Summary
WPDES Pond - WPL Nelson Dewey Generating Station / Cassville, WI
SCS Engineers Project #25216054.00

	Record Date	Source
Location Restrictions		
No materials in operating record as of 6/29/17		Website
Design Criteria		
No materials in operating record as of 6/29/17		Website
		Website
Operating Criteria		
7-Day Inspection	12/8/2016	WPL
7-Day Inspection	12/15/2016	WPL
7-Day Inspection	12/22/2016	WPL
7-Day Inspection	12/29/2016	WPL
7-Day Inspection	1/3/2017	WPL
7-Day Inspection	1/9/2017	WPL
7-Day Inspection	1/12/2017	WPL
7-Day Inspection	1/16/2017	WPL
7-Day Inspection	1/23/2017	WPL
7-Day Inspection	1/27/2017	WPL
7-Day Inspection	2/1/2017	WPL
7-Day Inspection	2/6/2017	WPL
7-Day Inspection	2/13/2017	WPL
7-Day Inspection	2/15/2017	WPL
7-Day Inspection	2/22/2017	WPL
7-Day Inspection	2/27/2017	WPL
7-Day Inspection	3/1/2017	WPL
7-Day Inspection	3/8/2017	WPL
7-Day Inspection	3/13/2017	WPL
CCR Fugitive Dust Control Plan	3/17/2017	Website
7-Day Inspection	3/20/2017	WPL
7-Day Inspection	3/27/2017	WPL
7-Day Inspection	4/1/2017	WPL
7-Day Inspection	4/7/2017	WPL
7-Day Inspection	4/10/2017	WPL
7-Day Inspection	4/13/2017	WPL
7-Day Inspection	4/18/2017	WPL
7-Day Inspection	4/21/2017	WPL
7-Day Inspection	4/27/2017	WPL
7-Day Inspection	5/1/2017	WPL
7-Day Inspection	5/8/2017	WPL
7-Day Inspection	5/15/2017	WPL
7-Day Inspection	5/16/2017	WPL
7-Day Inspection	5/22/2017	WPL
7-Day Inspection	5/26/2017	WPL
7-Day Inspection	6/1/2017	WPL

**Table 1. Operating Record Summary
 WPDES Pond - WPL Nelson Dewey Generating Station / Cassville, WI
 SCS Engineers Project #25216054.00**

	Record Date	Source
7-Day Inspection	6/5/2017	WPL
7-Day Inspection	6/8/2017	WPL
Groundwater Monitoring		
No materials in operating record as of 6/29/17		Website
Closure/Post-Closure Care		
Notification of Intent to Close - WPDES Pond	12/14/2015	Website

Notes:

- 1) Items sourced to the Website are from Alliant Energy's CCR Rule Compliance Data and Information website as of 6/29/17.
 See <http://ccr.alliantenergy.com/NelsonDewey/Ponds/index.htm>
- 2) Items sourced to WPL are from the facility Operating Record as of the date of inspection.

I:\25216054.00\Deliverables\WPDES Pond Annual Inspection\[Table 1 Operating Record Summary_NED_WPDES Ponds.xlsx]Summary