

Annual CCR Surface Impoundment Inspection - Slag Pond North Pond A South Pond A Pond B

Edgewater Generating Station

Prepared for:

Wisconsin Power and Light Company
Edgewater Generating Station
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SCS ENGINEERS

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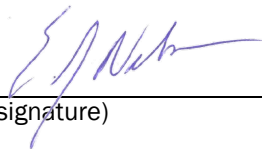
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PE CERTIFICATION

	<p>I, Eric J. Nelson, hereby certify that this 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: right;"> 12/11/2019 (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 July 31, 2020.</p>
	<p>Pages or sheets covered by this seal:</p> <p style="text-align: center;">All - 2019 Annual CCR Surface Impoundment Inspection</p>

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1.0 INTRODUCTION

SCS Engineers (SCS) completed an annual inspection of the Wisconsin Power and Light Company (WPL) Edgewater Generating Station (EDG) surface impoundments in Sheboygan, Wisconsin. The annual inspection was completed on August 27, 2019 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).

1.1 PURPOSE

According to 40 CFR 257.83(b)(1), an annual inspection by a qualified professional engineer is required for all existing and new CCR surface impoundments and any lateral expansion of a CCR surface impoundment. 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. 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 or 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 report has been prepared in accordance with 40 CFR 257.83(b)(2) to document the annual inspection.

1.2 BACKGROUND

The EDG facility includes four existing CCR surface impoundments. The four surface impoundments are located on the same property and include:

- Slag Pond
- North Pond A
- South Pond A
- Pond B

Based on the November 28, 2018, CCR Surface Impoundment Annual Inspection Report issued by Hard Hat Services (HHS) [HHS, 2018], the inspection requirements in 40 CFR 257.83(b)(1) apply to the four CCR units listed above.

The CCR surface impoundments at the EDG facility are described in detail in the History of Construction report issued by HHS on September 21, 2016 (HHS, 2016).

Since the September 2018 retirement of Unit 4 and the installation of a dry ash handling system for Unit 5, the CCR surface impoundments have not received additional CCR. At the time of the inspection, only South Pond A and Pond B continued to contain liquids. The Slag Pond and North Pond A were not in use at the time of our inspection.

According to conversations with WPL staff, all four ponds are scheduled to complete closure in 2020 in accordance with the requirements of the CCR Rule and approvals received from the Wisconsin Department of Natural Resources.

2.0 SUMMARY OF RESULTS AND RECOMMENDATIONS

SCS identified no deficiencies or releases during the annual inspection of the CCR surface impoundments at EDG. Deficiencies and releases must be remedied by the owner or operator as soon as feasible and the remedy documented.

SCS did identify conditions during the annual inspection that are not considered deficiencies but have the potential to become a deficiency if left unaddressed. Each condition and the recommendations provided by SCS to address them are summarized in the table below. These conditions, remedial recommendations, and activities completed or planned to remedy each item are described in further detail in **Section 4.0**.

Condition	CCR Unit / Location	Recommendation(s)	Report Section
Woody vegetation obstructing visual observation of inflow culvert	Pond B – Discharge from Slag and A Ponds	<ul style="list-style-type: none"> Remove woody vegetation Monitor for return during 7-day inspections 	4.6.5
Woody vegetation obstructing visual observation of discharge/outlet structure	Slag Pond – Discharge/outlet structure	<ul style="list-style-type: none"> Remove woody vegetation Monitor for return during 7-day inspections 	4.6.5
Thick vegetation interfering with visual observation of influent	Pond A (North and South) Influent Discharge	<ul style="list-style-type: none"> Trim or remove vegetation to allow observation Monitor for return during 7-day inspection 	4.6.5
Two animal burrows	Mid-slope of the south side berm between South Pond A and Pond C (a non-CCR surface impoundment located east of Pond B and south of South Pond A)	<ul style="list-style-type: none"> Remove animals if possible Backfill burrows Monitor for return during 7-day inspections 	4.6.6

Condition	CCR Unit / Location	Recommendation(s)	Report Section
Area of the bank of North Pond A is constructed of slag at a steep angle and is eroding	West Side of North Pond A	<ul style="list-style-type: none"> Place riprap to stabilize the bank and prevent adjacent landfill cover erosion Monitor area during 7-day inspections 	4.6.7
Eroded scour holes where water exits each discharge pipe into the pond	Discharge into South Pond A	<ul style="list-style-type: none"> Level/supplement existing stone scour pad Place stone scour pad to backfill erosion under second discharge pipe Monitor during 7-day inspections 	4.6.6
Internal slope erosion exposing clay liner	North Side of Slag Pond	<ul style="list-style-type: none"> Place riprap to stabilize the bank and prevent pond liner erosion Monitor during 7-day inspections 	4.6.6

3.0 SURFACE IMPOUNDMENT INSPECTION

Mr. Eric Nelson of SCS completed an annual inspection of active CCR surface impoundments at EDG including Slag Pond, North Pond A, South Pond A, and Pond B on August 27, 2019. Mr. Nelson is a licensed professional engineer in Wisconsin and holds a Bachelor's of Science degree in Geological Engineering. He has over 20 years of experience in the design, construction, and operation of solid waste disposal facilities.

The scope of the annual inspection is described in **Sections 3.1** and **3.2**. The results of the annual inspection are discussed in **Section 4.0**.

3.1 OPERATING RECORD REVIEW

SCS reviewed the available information in the operating record for EDG. Information reviewed by SCS included operating record materials provided by WPL and the information posted on Alliant Energy's CCR Rule Compliance Data and Information website for the EDG facility.

3.2 VISUAL INSPECTION

SCS completed a visual inspection of the Slag Pond, North Pond A, South Pond A, and Pond B to identify signs of distress or malfunction of the CCR unit.

The visual inspection included observations of the following:

- The slopes and crest of the impoundment embankments
- Visible and accessible pipes/culverts passing through the impoundments embankments

4.0 INSPECTION RESULTS

The results of the annual inspection, along with a description of any deficiencies or releases identified during the visual inspection, are summarized in the following sections.

4.1 CHANGES IN GEOMETRY

Based on the description of the CCR surface impoundments in the operating record, the previous annual inspection completed by HHS, and the 7-day inspections completed since the previous annual inspection, no changes in geometry were noted that would indicate distress or malfunction of the CCR units at the facility since the previous annual inspection.

4.2 INSTRUMENTATION

Based on the SCS document review, field inspection, and discussions with WPL staff, the instrumentation that exists for the surface impoundments includes staff gauges. Staff gauges are located near the discharge structures of the Slag Pond, North Pond A, and South Pond A. The staff gauge in Pond B is located near the inlet structure at the northwest corner of the impoundment. Staff gauge data is recorded by WPL staff during the 7-day inspections.

In addition to the staff gauges, flow measurements are obtained for the combined discharge from the North Pond A and South Pond A to Pond B. Note that the discharge structure from the North Pond A has been plugged as described in the November 28, 2018 CCR Surface Impoundment Annual Inspection Report issued by HHS [HHS, 2018]. The flow monitoring infrastructure between the ponds is also described in HHS's 2018 inspection report. The maximum recorded flow reported by WPL over the period between the current and previous annual inspection was 2.18 million gallons per day (MGD) on September 20, 2018.

4.3 IMPOUNDED WATER AND CCR CONDITIONS

The approximate minimum, maximum, and August 27, 2019, impounded water depths and elevations of the ponds since the previous annual inspection are summarized below.

Surface Impoundment	Minimum Water Depth (feet)	Maximum Water Depth (feet)	Current Water Depth (feet)
Slag Pond	0	~1.7	0
North Pond A	0	~1.2	0
South Pond A	5.82	7.38	6.62
Pond B	4.21	5.03	5.03

Surface Impoundment	Minimum Water Elevation (feet amsl)	Maximum Water Elevation (feet amsl)	Current Water Elevation (feet amsl)
Slag Pond	Dry	606.81	~604
North Pond A	Dry	607.05	~604
South Pond A	607.82	609.38	608.62
Pond B	598.21	599.03	597.73

Depths and elevations summarized above are based on gauge readings over the period of September 27, 2018 through August 27, 2019, and top of sediment elevations from the 2015 and 2016 bathymetric survey.

Staff gauge readings on August 27, 2019, were as follows:

- Slag Pond – No measurement, pond dry
- North Pond A – No measurement, pond dry
- South Pond A – reading = 0.8 feet
- Pond B – reading = 0.5 - 0.55 feet

4.4 CURRENT STORAGE CAPACITY

The storage capacity based on the estimated freeboard at the time of the annual inspection is summarized in the table below. Storage capacity volume estimates are based on the difference between the approximate lowest elevation of the embankments surrounding each CCR unit and the water elevation at the time of inspection or the average sediment elevation if the unit was dry.

Surface Impoundment	Estimated Volume of Impounded Water (cubic yards)	Estimated Storage Capacity (cubic yards)	Basis for Estimate and Source
Slag Pond	0	5,800	CCR unit was dry at the time of inspection on August 27, 2019. Lowest embankment elevation = 609 feet.
North Pond A	0	14,800	CCR unit was dry at the time of inspection on August 27, 2019. Lowest embankment elevation = 611 feet.
South Pond A	10,530	7,250	Estimated water volume based on water surface elevation on August 27, 2019 (EL. 608.62) less the average sediment elevation (EL. 605.2) from April 2018 SCS field investigation and total surface area of pond (83,140 sf). Lowest embankment elevation = 611 feet.
Pond B	12,050	40,300	Estimated water volume based on water surface elevation on August 27, 2019 (EL. 597.73) less the average sediment elevation (EL. 594.13) from April 2018 SCS field investigation and total surface area of pond (90,349 sf). Lowest embankment elevation = 608 feet.

Due to the September 2018 retirement of Unit 4 and the installation of a dry ash handling system for Unit 5, the CCR surface impoundments have not received appreciable volumes of additional CCR since the previous annual inspection. Thus, no significant change to the interior storage height of any of the CCR units is anticipated.

4.5 VOLUME OF IMPOUNDED WATER AND CCR

As described above, no appreciable change in the impounded CCR volume is anticipated based on the limited use of the CCR surface impoundments for low volume wastewater discharges since the previous inspection. Therefore, the volume of impounded CCR and water is summarized below based on the CCR volumes reported in the 2018 Annual Inspection Report (HHS 2018) and the impounded water conditions at the time of the current annual inspection.

CCR Unit	Estimated Volume of Impounded CCR - Previous Annual Inspection Report (cubic yards)	Estimated Volume of Impounded CCR and Water - Current Inspection (cubic yards)	Basis for Estimate and Source
Slag Pond	40,300	40,300	Estimated volume of impounded CCR from the previous annual inspection (HHS 2018) is based on the reported volume of CCR and water (42,600 cy) less the reported storage capacity at the time of inspection in 2018 (2,300 cy). The Slag Pond was dry at the time of inspection on August 27, 2019.
North Pond A	54,500	54,500	Estimated volume of impounded CCR from the previous annual inspection (HHS 2018) is based on the reported volume of CCR and water (55,300 cy) less the reported storage capacity at the time of inspection in 2018 (800 cy). The North Pond A was dry at the time of inspection on August 27, 2019.
South Pond A	63,800	74,330	Estimated volume of impounded CCR from the previous annual inspection (HHS 2018) is based on the reported volume of CCR and water (74,500 cy) less the reported storage capacity at the time of inspection in 2018 (10,700 cy). Add current storage volume from Section 4.4 to previously reported CCR volume for current volume of impounded CCR and water.
Pond B	31,000	43,050	Estimated volume of impounded CCR from the previous annual inspection (HHS 2018) is based on the reported volume of CCR and water (50,200 cy) less the reported storage capacity at the time of inspection in 2018 (19,200 cy). Add current storage volume from Section 4.4 to previously reported CCR volume for current volume of impounded CCR and water.

4.6 APPEARANCE OF STRUCTURAL WEAKNESS

The inspection included a review of the appearance of an actual or potential structural weakness of the CCR unit. The visual inspection included a review of CCR fill areas including the top slopes, internal side slopes, external side slopes, and internal ramps/haul roads for the presence of the following conditions:

- Seepage
- Signs of surface movement or instability
 - Sloughing, slumping, or sliding
 - Surface cracking
 - Excessive settlement
- Inappropriate vegetation growth
- Animal burrows
- Erosion damage
- Failing riprap
- Failing outlet or outfall structures

4.6.1 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.

Seepage from the east end of the Slag Pond was noted in the June 12, 2019 7-Day Inspection recorded by WPL. No seepage was noted in the previous and subsequent 7-Day Inspections on June 5 or June 19, 2019. Based on discussions with WPL staff and observations by SCS, the apparent seep was identified on June 11, 2019. The seepage rate was estimated at up to 2 gallons per minute. The seepage did not appear to be carrying any sediment or CCR. Based on WPL observations, the seepage was no longer active on June 14, 2019, following the cessation of temporary plant wastewater discharges to the Slag Pond. Per WPL staff, the facility has not resumed discharges to the Slag Pond and the seep has not been observed again. The apparent seep was managed as a non-failure event in accordance with the April 2017 CCR Surface Impoundment Emergency Action Plan prepared by HHS.

4.6.2 Sloughing, Slumping, or Sliding

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

4.6.3 Surface Cracking

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

4.6.4 Excessive Settlement

No excessive settlement was noted during the inspection.

4.6.5 Inappropriate Vegetation Growth

No inappropriate vegetation growth impacting the CCR unit was noted during the inspection of the impoundments, except as observed below:

- **Woody vegetation obstructing visual observation of inflow culvert in Pond B.** SCS recommends the removal of woody vegetation and continued monitoring for any inappropriate vegetation during 7-day inspections. Based on discussions with WPL staff, vegetation maintenance at the facility is completed on a regular schedule with events in the spring, summer, and fall of each year. Per WPL, this vegetation will be addressed during the next regularly scheduled maintenance event.
- **Woody vegetation obstructing visual observation of discharge/outlet structure in the Slag Pond.** SCS recommends the removal of woody vegetation and continued monitoring during 7-day inspections. Per WPL, this vegetation will be addressed during the next regularly scheduled maintenance event.
- **Thick vegetation interfering with visual observation of influent discharge in both North and South Pond A.** SCS recommends the removal of this vegetation. Based on discussions with WPL and a subsequent review of this area by SCS, this vegetation has been removed. WPL will continue to monitor this area during 7-day inspections.

4.6.6 Animal Burrows

Two animal burrows were identified mid-slope on the south outside berm of South Pond A. SCS recommended that the animal burrows be backfilled and animals removed, if possible. Based on discussions with WPL and a subsequent review of this area by SCS, the two burrows have been backfilled and the suspect animals removed. WPL will continue to monitor slopes for animal burrows during 7-day inspections.

4.6.7 Erosion Damage

The following erosion or potential erosion items were observed during the inspection of the impoundments and are listed below:

- The north bank of North Pond A is eroding due to the steep angle of the bank.
- Eroded scour holes were visible at the discharge pipes into South Pond A.
- Internal slope erosion is exposing clay liner on the north slope of the Slag Pond.

Resolution of the erosion and potential erosion items were discussed with plant staff and included the placement of riprap or fill material to prevent further erosion. Based on discussions with WPL, documentation provided by facility staff, and/or subsequent review of these areas by SCS, the erosion damage observed during the annual inspection has been addressed.

No other erosion damage was noted during the inspection of the Slag Pond, North Pond A, South Pond A, and Pond B.

4.6.8 Failing Riprap

No failing riprap was noted during the inspection of the Slag Pond, North Pond A, South Pond A, and Pond B.

4.6.9 Failing Outlet or Outfall Structures

No failing outlet or outfall structures were noted during the inspection of the Slag Pond, North Pond A, South Pond A, and Pond B.

4.7 DISRUPTIVE CONDITIONS

4.7.1 Existing Disruptive Conditions

4.7.1.1 Current Inspection

No existing conditions that were disrupting the operation and safety of the CCR units were noted during the annual inspection.

4.7.1.2 Previous Inspection

No existing conditions that were disrupting the operation and safety of the CCR units were noted during the previous inspection.

4.7.2 Potentially Disruptive Conditions

4.7.2.1 Current Inspection

No other potentially disruptive conditions beyond the items discussed in Section 4.6 were noted during the inspection of CCR surface impoundments.

4.7.2.2 Previous Inspections

No potentially disruptive conditions were noted during the inspection of the CCR surface impoundments in the previous annual inspection.

4.8 OTHER CHANGES SINCE PREVIOUS ANNUAL INSPECTION

No site changes were noted during the inspection of the CCR surface impoundments when comparing to the previous annual inspection.

5.0 FUTURE INSPECTIONS

5.1 EXISTING CCR SURFACE IMPOUNDMENTS

As stated in 40 CFR 257.83(b)(4), the owner or operator of the CCR unit must conduct the inspection required by paragraphs (b)(1) and (2) of this section on an annual basis. The date of completing the inspection report is the basis for establishing the deadline to complete the next subsequent inspection. Any required inspection may be conducted prior to the required deadline, provided the owner or operator places the completed inspection report into the facility's operating record, within a reasonable amount of time. In all cases, the deadline for completing subsequent inspection reports is based on the date of completing the previous inspection report. The owner or operator has completed an inspection when the inspection report has been placed in the facility's operating record.

The next annual inspection of the CCR surface impoundments (Slag Pond, North Pond A, South Pond A, and Pond B) must be completed within 1 year of the placement of this inspection report in the operating record for the facility.