SCS ENGINEERS

Initial Annual CCR Landfill Inspection
Modules 1 - 3

Columbia Dry Ash Disposal Facility

Prepared for:

Wisconsin Power and Light Company

Columbia Energy Center
W8375 Murray Road
Pardeeville, Wisconsin 53954

Prepared by:

SCS ENGINEERS
2830 Dairy Drive
Madison, Wisconsin 53718-6751
(608) 224-2830

January 2016
File No. 25215159.00

Offices Nationwide
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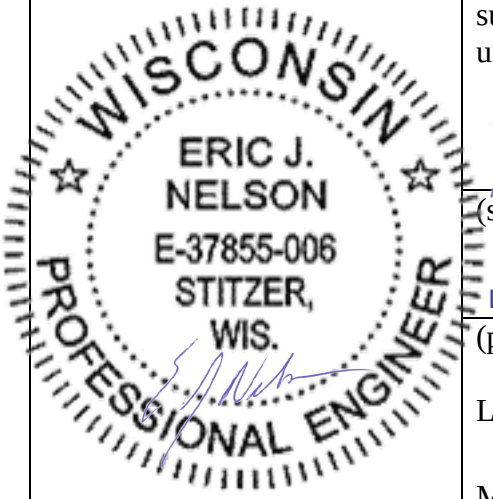
PE CERTIFICATION



I, Eric J. Nelson, hereby certify that this Initial Annual CCR Landfill Inspection Report meets the requirements of 40 CFR 257.84(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.

01/18/2016

(signature) (date)

Eric J. Nelson

(printed or typed name)

License number E37855-6

My license renewal date is 07/31/2016.

Pages or sheets covered by this seal:

Initial Annual CCR Landfill Inspection Report text and Table 1 dated January 2016, and delivered January 18, 2016.

1.0 INTRODUCTION

1.1 PURPOSE

SCS Engineers (SCS) completed an annual inspection of the Wisconsin Power and Light Company (WPL) Columbia Dry Ash Disposal Facility (COL) in Pardeeville, Wisconsin. The annual 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 257.84(b)(1). According to 40 CFR 257.84(b)(1), an annual inspection by a qualified professional engineer is required for all existing and new CCR landfills and any lateral expansion of a CCR landfill. 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., the results of inspections by a qualified person, and results of previous annual inspections); and

- A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit.

This report has been prepared in accordance with 40 CFR 257.84(b)(2) to document the annual inspection.

1.2 BACKGROUND

The COL Dry Ash Disposal Facility includes an active CCR landfill, which currently consists of three CCR units, all located in Phase 1 of the facility.

The active CCR landfill at COL is comprised of three existing CCR Units:

- Module 1
- Module 2
- Module 3

The inspection requirements in 40 CFR 257.84(b)(1) apply to the three existing (active) CCR units listed above.

At the time of the inspection, the active CCR landfill modules were in various stages of development and use as described in the table below.

Disposal Phase	Module	CCR Rule Status	Basis for Status
Phase 1	Module 1	Existing, Accepting CCR	Module received CCR before and after the effective date of the CCR Rule.
	Module 2	Existing, Accepting CCR	Module received CCR before and after the effective date of the CCR Rule.
	Module 3	Existing, Not Accepting CCR	Liner is under construction. Consistent construction presence was initiated in September 2015, prior to effective date of CCR Rule.

2.0 ANNUAL INSPECTION

Mr. Eric Nelson of SCS completed an annual inspection of active CCR landfill areas at COL, including Module 1, Module 2, and Module 3 on December 2, 2015. Mr. Nelson is a licensed professional engineer in Wisconsin and holds a Bachelor's of Science degree in Geological Engineering. He has over 17 years of experience in the design, construction, and operation of solid waste disposal facilities. This was the initial annual inspection of Module 1, Module 2, and Module 3 at COL. 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 COL prior to the visual inspection discussed in **Section 2.2**. 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 COL facility. These materials reviewed are summarized in **Table 1**.

2.2 VISUAL INSPECTION

SCS completed a visual inspection of Module 1, Module 2, and Module 3 to identify signs of distress or malfunction of the CCR units. SCS is also currently providing oversight of construction activities in Module 3.

The visual inspection included observations of the following:

- CCR placement areas including active filling areas, intermediate cover areas, final cover areas, and exterior non-CCR berms or slopes.
- Leachate collection and removal system components including visible leachate drainage layer materials.

- Leachate and contact water run-off management features including internal contact water drainage features, leachate collection system discharge pipe, and the leachate/surface water pond.

- Non-contact storm water run-on and run-off control features including swales located adjacent to active fill areas but outside the landfill limits and the south sedimentation basin.

3.0 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.

3.1 CHANGES IN GEOMETRY

This is the initial annual inspection of Module 1, Module 2, and Module 3 at the COL facility completed under 40 CFR 257.84(b)(1). There are no previous annual inspections to which SCS could compare the current geometry of the landfill structure.

At the time of the visual inspection, active CCR placement was evident in Module 1. Final cover was in place along a portion of the south, west, and east slopes. Intermediate cover soils had been placed on a portion of the west slope.

At the time of the visual inspection, active CCR placement was evident in Module 2. No final cover has been constructed in Module 2. Intermediate cover soils had been placed on a portion of the west slope.

As noted in **Section 1.2** and in the facility operating records reviewed for this inspection, Module 3 is currently under construction. No CCR had been received in Module 3 as of the date of the visual inspection.

Changes to geometry of the landfill structure will be assessed at the time of the next annual inspection.

3.2 CCR VOLUMES

The approximate volume of CCR contained in each of the active modules at the time of inspection is summarized below. A description of how the estimate was developed and the sources used are also summarized below.

Disposal Phase	Module	Estimated Volume of CCR in Place	Basis for Estimate and Source
Phase 1	Module 1	452,400 cubic yards	Estimated airspace consumed based on December 4, 2014 topographic survey compared to as-built base and top of leachate collection layer grades plus estimated disposal from 12/2014 through 11/2015 based on WPL-provided actual and forecast disposal rates for this period (81,437 cubic yards). Estimated disposal volume is split between Module 1 and Module 2 based on the ratio of open active fill area in each module.
	Module 2	117,800 cubic yards	Same as above.
	Module 3	0 cubic yards	Liner is under construction and no CCR has been placed in this module.

3.3 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:

- Signs of surface movement or instability:
  - Sloughing, slumping, or sliding
  - Surface cracking
  - Slopes in excess of 3 horizontal to 1 vertical (3H:1V)
  - Toe of slope bench movement
  - Evidence of inadequate compaction of exposed CCR
- Inappropriate vegetation growth
- Animal burrows
- Erosion damage
- Unusual surface damage caused by vehicle traffic

3.3.1 Signs of Surface Movement or Instability

Slopes in excess of 3H:1V and evidence of inadequate compaction of exposed CCR were noted in one specific location during the inspection of Module 2. A steep slope (approximately 2H:1V) was observed in Module 2 on an intermediate waste slope adjacent to the contact water management area at the east side of the CCR unit. Inadequate compaction in portions of this slope was indicated by gully erosion in the exposed bottom ash.

The slope observed is relatively short (vertically only about 10 feet high) and the erosion areas are localized. At the top of the slope is a 30 to 40 foot wide bench for landfill equipment access and drainage. Although steep, it is notable that the slope is, and has been, supporting landfill equipment traffic without issue. The site received approximately 0.01 inches of precipitation the day before the inspection[1] and 0.93 inches of precipitation over the seven days prior to the inspection[2], which may have contributed to the erosion observed. These conditions are unlikely to have a significant impact on the overall stability of the CCR fill in this module. The conditions and potential improvements such as flattening the steep slope were discussed with COL facility staff during the inspection.

The conditions noted are not currently considered an operating deficiency since they are unlikely to have significant impact on the function of the CCR unit. However, additional observation of these areas is recommended to ensure that the conditions observed during the visual inspection, or similar future conditions, are addressed and do not have an impact on the overall stability of the CCR unit.

No other signs of surface movement or instability were noted during the inspection of Module 1, Module 2, and Module 3.

3.3.2 Inappropriate Vegetation Growth

No inappropriate vegetation growth was noted during the inspection of Module 1, Module 2, and Module 3.

3.3.3 Animal Burrows

No animal burrows were noted during the inspection of Module 1, Module 2, and Module 3.

3.3.4 Erosion Damage

Erosion damage to exposed CCR surfaces was noted during the inspection of Module 2 as discussed in **Section 3.3.1**. Mild gully erosion of exposed CCR in Module 2 along the steep slope adjacent to the contact water management area was observed. The erosion observed does not appear to impact the overall stability of the CCR fill.

No other erosion damage was noted during the inspection of Module 1, Module 2, and Module 3.

3.3.5 Unusual Surface Damage Caused by Vehicle Traffic

No unusual surface damage caused by vehicle traffic was noted during the inspection of Module 1, Module 2, and Module 3.

1 Source is Weather Underground (http://www.wunderground.com/) for Portage, Wisconsin on 12/01/15.
2 Source is Weather Underground (http://www.wunderground.com/) for Portage, Wisconsin from 11/25-12/01/15.

3.4 DISRUPTIVE EXISTING CONDITIONS

No disruptive existing conditions were noted during the inspection of Module 1, Module 2, and Module 3.

3.5 OTHER CHANGES SINCE PREVIOUS ANNUAL INSPECTION

This is the initial annual inspection of Module 1, Module 2, and Module 3 at the COL facility completed under 40 CFR 257.84(b)(1). There are no previous annual inspections to which SCS could compare the current site conditions of the landfill to fulfill the requirement in 40 CFR 257.84(b)(2)(iv).

Changes to site conditions that may have affected the stability or operation of Module 1, Module 2, and Module 3 will be assessed at the time of the next annual inspection.

4.0 FUTURE INSPECTIONS

4.1 EXISTING CCR LANDFILL

As stated in 40 CFR 257.84(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 initial inspection report is the basis for establishing the deadline to complete the first 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 Module 1, Module 2, and Module 3 must be completed within one year of the placement of this inspection report in the operating record for the COL facility.

4.2 NEW CCR LANDFILLS AND LATERAL EXPANSIONS

As discussed above, all of the CCR units at the COL facility are considered existing CCR units. The initial annual inspection for modules constructed in the future must be completed within 14 months of the initial receipt of CCR in the module per 40 CFR 257.84(b)(4).

TABLE

Table 1. Operating Record Summary
WPL Columbia Dry Ash Disposal Facility / Pardeeville, Wisconsin
SCS Engineers Project #25215159.00

	Record Date	Source
Operating Criteria		
CCR Fugitive Dust Control Plan	11/23/2015	Website
7-Day Inspection	10/19/2015	WPL
7-Day Inspection	10/23/2015	WPL
7-Day Inspection	10/26/2015	WPL
7-Day Inspection	10/30/2015	WPL
7-Day Inspection	11/2/2015	WPL
7-Day Inspection	11/6/2015	WPL
7-Day Inspection	11/9/2015	WPL
7-Day Inspection	11/13/2015	WPL
7-Day Inspection	11/16/2015	WPL
7-Day Inspection	11/19/2015	WPL
7-Day Inspection	11/23/2015	WPL
7-Day Inspection	11/28/2015	WPL

Notes:
1) Items sourced to the Website are from Alliant Energy's CCR Rule Compliance Data and Information website as of 12/21/15.
See http://ccr.alliantenergy.com/Columbia/index.htm
2) Items sourced to WPL are from the facility Operating Record as of the date of inspection.

I:\25215159\Reports\COL Initial Annual\[Table 1 Operating Record Summary_COL.xlsx]Summary