SCS ENGINEERS

Annual CCR Landfill Inspection

Lansing Landfill

Prepared for:

Interstate Power and Light Company

Lansing Generating Station
2320 Power Plant Drive
Lansing, Iowa 52151

Prepared by:

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

December 2016
File No. 25216070.00

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PE CERTIFICATION

I, Eric J. Nelson, hereby certify that this 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 Iowa.

(signature) 12/14/2016 (date)

Eric J. Nelson

(printed or typed name)

License number 23136

My license renewal date is December 31, 2016.

Pages or sheets covered by this seal:
Annual CCR Landfill Inspection - December 2016
IPL Lansing Landfill

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1.0 INTRODUCTION

1.1 PURPOSE

SCS Engineers (SCS) completed an annual inspection of the Interstate Power and Light Company (IPL) Lansing Landfill (LAN) in Lansing, Iowa. 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 LAN includes an active CCR landfill, which currently consists of a single CCR unit. The LAN has received CCR both before and after the effective date of the CCR Rule.

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

2.0 ANNUAL INSPECTION

Mr. Eric Nelson of SCS completed an annual inspection of the LAN on October 31, 2016. Mr. Nelson is a licensed professional engineer in Iowa 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. This was the second annual inspection of the LAN. 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 LAN prior to the visual inspection discussed in **Section 2.2**. Information reviewed by SCS included operating record materials provided by IPL and the information posted on Alliant Energy's CCR Rule Compliance Data and Information website for the LAN facility. The materials reviewed are summarized in **Table 1**.

2.2 VISUAL INSPECTION

SCS completed a visual inspection of the LAN to identify signs of distress or malfunction of the CCR unit.

The visual inspection included observations of the following:

- CCR placement areas including active filling areas, final cover areas, and exterior non-CCR berms or slopes.
- Contact water run-off management features including internal contact water drainage features and discharges to the LAN Upper Ash Pond.
- Non-contact storm water run-on and run-off control features including swales located adjacent to active fill areas.

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 second annual inspection of the LAN facility completed under 40 CFR 257.84(b)(1). No apparent changes in geometry were noted that would indicate distress or malfunction of the CCR unit at the facility. All changes in geometry observed during the annual inspection were the result of planned CCR filling activities.

At the time of the visual inspection, active CCR placement was evident. Landfill staff was actively grading CCR within the landfill at the time of the inspection. Final cover is in place along nearly the entire south and east slopes as it was during the initial annual inspection with the remaining landfill areas being open.

3.2 CCR VOLUMES

The approximate volume of CCR contained in the landfill at the time of inspection is 340,540 cubic yards. This estimated volume is based on the existing waste volume (311,000 cubic yards) as of November 24, 2015, plus the tons of CCR disposed between November 25, 2015, and October 31, 2016. The tons of CCR disposed were converted to cubic yards by assuming the CCR has an average unit weight of 0.9 tons per cubic yard. Disposal records used in this estimate were provided by IPL.

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

No signs of surface movement or instability were noted during the inspection.

Areas where slopes steeper than 3H:1V and evidence of inadequate compaction of exposed CCR were noted during the previous annual inspection have been addressed. The areas have been graded to flatten the slope and no evidence of inadequate compaction on the new slopes were noted during the inspection.

3.3.2 Inappropriate Vegetation Growth

No inappropriate vegetation growth was noted during the inspection.

The area where heavy grassy vegetation was noted during the previous annual inspection (the upper surface water/contact water retention area located within the landfill limits at the west end of the CCR unit) was re-inspected. The same vegetation conditions exist and still no signs of significant sediment buildup that might inhibit the discharge of water as designed were noted. Also, no signs of surface water/contact water discharges from the retention area other than through the outlet structure were observed.

3.3.3 Animal Burrows

No animal burrows were noted during the inspection.

3.3.4 Erosion Damage

Erosion damage to the ground surface along the alignment of the culvert pipe that carries water to the upper ash pond from the upper surface water/contact water retention area located within the landfill limits at the west end of the CCR unit was noted during the inspection. The erosion was present approximately 20 feet south of where the pipe outlets to the ash pond. The erosion appears to be caused by water flowing from a separated joint between two sections of the corrugate metal pipe (CMP). The pipe joint appears to have been damaged at some point, which led to the separation of the joint. A repair to the pipe is recommended and was discussed with plant staff during the inspection.

The damage to the pipe is not currently considered an operating deficiency since the condition is not having an impact on the function of the CCR unit. Water from the upper surface water/contact water retention area is still able to drain as required to prevent the ponding of water within the landfill. Pipe repairs will rectify the erosion.

The area where erosion damage to exposed CCR surfaces along the steep slope adjacent to the northern landfill access road that was noted during the previous annual inspection have been addressed as discussed in **Section 3.3.1**.

The areas where erosion in the surface water/contact water management feature (perimeter ditch) located along the northern limits of the landfill that were noted during the previous annual inspection were observed as recommended in the January 2016 inspection report. Although similar erosion was noted during the current inspection, no significant changes to the conditions observed during the last annual inspection were noted, and this feature continues to function as intended. The erosion does not appear to be impacting the stability of the CCR unit.

The conditions in the perimeter ditch are not currently considered an operating deficiency since they are unlikely to have significant impact on the function of the CCR unit. However, continued observation of this area during 7-day and annual inspections is recommended to ensure that these features are maintained to prevent the uncontrolled flow of surface and contact water, as erosion and uncontrolled flow of surface water or contact water has the potential to impact the stability of the CCR unit.

No other erosion damage was noted during the inspection.

3.3.5 Unusual Surface Damage Caused by Vehicle Traffic

No unusual surface damage caused by vehicle traffic was noted during the inspection.

3.4 DISRUPTIVE CONDITIONS

3.4.1 Existing Disruptive Conditions

3.4.1.1 Current Inspection

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

3.4.1.2 Previous Inspection

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

3.4.2 Potentially Disruptive Conditions

3.4.2.1 Current Inspection

No potentially disruptive conditions were noted during the annual inspection.

3.4.2.2 Previous Inspection

No potentially disruptive conditions were noted during the previous inspection.

3.5 OTHER CHANGES SINCE PREVIOUS ANNUAL INSPECTION

No other changes to site conditions that appear to have the potential to affect the stability or operation of the facility were noted during the 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 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 LAN must be completed within 1 year of the placement of this inspection report in the operating record for the LAN facility.

4.2 NEW CCR LANDFILLS AND LATERAL EXPANSIONS

The initial annual inspection for any lateral expansion 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 1

Operating Record Summary

Table 1. Operating Record Summary
IPL Lansing Landfill / Lansing, Iowa
SCS Engineers Project #25216070.00

	Record Date	Source
Location Restrictions		
No materials in operating record as of 12/2/16		Website
Design Criteria		
No materials in operating record as of 12/2/16		Website
Operating Criteria		
CCR Fugitive Dust Control Plan	9/23/2015	Website
7-Day Inspection	10/19/2015	IPL
7-Day Inspection	10/22/2015	IPL
7-Day Inspection	10/26/2015	IPL
7-Day Inspection	10/29/2015	IPL
7-Day Inspection	11/5/2015	IPL
7-Day Inspection	11/9/2015	IPL
7-Day Inspection	11/11/2015	IPL
7-Day Inspection	11/16/2015	IPL
7-Day Inspection	11/19/2015	IPL
7-Day Inspection	11/23/2015	IPL
7-Day Inspection	11/26/2015	IPL
7-Day Inspection	11/30/2015	IPL
7-Day Inspection	12/3/2015	IPL
7-Day Inspection	12/7/2015	IPL
7-Day Inspection	12/10/2015	IPL
7-Day Inspection	12/14/2015	IPL
7-Day Inspection	12/17/2015	IPL
7-Day Inspection	12/22/2015	IPL
7-Day Inspection	12/24/2015	IPL
7-Day Inspection	12/28/2015	IPL
7-Day Inspection	12/31/2015	IPL
7-Day Inspection	1/4/2016	IPL
7-Day Inspection	1/7/2016	IPL
7-Day Inspection	1/11/2016	IPL
7-Day Inspection	1/14/2016	IPL
Initial Annual CCR Landfill Inspection	1/18/2016	Website
7-Day Inspection	1/25/2016	IPL
7-Day Inspection	1/29/2016	IPL
7-Day Inspection	2/1/2016	IPL
7-Day Inspection	2/4/2016	IPL
7-Day Inspection	2/8/2016	IPL
7-Day Inspection	2/11/2016	IPL
7-Day Inspection	2/15/2016	IPL
7-Day Inspection	2/18/2016	IPL
7-Day Inspection	2/22/2016	IPL
7-Day Inspection	2/25/2016	IPL
7-Day Inspection	2/29/2016	IPL
7-Day Inspection	3/2/2016	IPL

Table 1. Operating Record Summary
IPL Lansing Landfill / Lansing, Iowa
SCS Engineers Project #25216070.00

	Record Date	Source
7-Day Inspection	3/7/2016	IPL
7-Day Inspection	3/10/2016	IPL
7-Day Inspection	3/16/2016	IPL
7-Day Inspection	3/17/2016	IPL
7-Day Inspection	3/21/2016	IPL
7-Day Inspection	3/28/2016	IPL
7-Day Inspection	4/1/2016	IPL
7-Day Inspection	4/4/2016	IPL
7-Day Inspection	4/7/2016	IPL
7-Day Inspection	4/11/2016	IPL
7-Day Inspection	4/14/2016	IPL
7-Day Inspection	4/18/2016	IPL
7-Day Inspection	4/21/2016	IPL
7-Day Inspection	4/25/2016	IPL
7-Day Inspection	4/28/2016	IPL
7-Day Inspection	5/2/2016	IPL
7-Day Inspection	5/5/2016	IPL
7-Day Inspection	5/9/2016	IPL
7-Day Inspection	5/16/2016	IPL
7-Day Inspection	5/19/2016	IPL
7-Day Inspection	5/23/2016	IPL
7-Day Inspection	5/26/2016	IPL
7-Day Inspection	5/31/2016	IPL
7-Day Inspection	6/2/2016	IPL
7-Day Inspection	6/6/2016	IPL
7-Day Inspection	6/10/2016	IPL
7-Day Inspection	6/13/2016	IPL
7-Day Inspection	6/16/2016	IPL
7-Day Inspection	6/20/2016	IPL
7-Day Inspection	6/23/2016	IPL
7-Day Inspection	6/27/2016	IPL
7-Day Inspection	6/30/2016	IPL
7-Day Inspection	7/5/2016	IPL
7-Day Inspection	7/7/2016	IPL
7-Day Inspection	7/14/2016	IPL
7-Day Inspection	7/18/2016	IPL
7-Day Inspection	7/21/2016	IPL
7-Day Inspection	7/25/2016	IPL
7-Day Inspection	7/28/2016	IPL
7-Day Inspection	8/1/2016	IPL
7-Day Inspection	8/4/2016	IPL
7-Day Inspection	8/8/2016	IPL
7-Day Inspection	8/15/2016	IPL
7-Day Inspection	8/16/2016	IPL
7-Day Inspection	8/18/2016	IPL
7-Day Inspection	8/22/2016	IPL

Table 1. Operating Record Summary
IPL Lansing Landfill / Lansing, Iowa
SCS Engineers Project #25216070.00

	Record Date	Source
7-Day Inspection	8/25/2016	IPL
7-Day Inspection	8/29/2016	IPL
7-Day Inspection	9/5/2016	IPL
7-Day Inspection	9/8/2016	IPL
7-Day Inspection	9/11/2016	IPL
7-Day Inspection	9/12/2016	IPL
7-Day Inspection	9/15/2016	IPL
7-Day Inspection	9/20/2016	IPL
Run-On and Run-Off Control Plan	9/21/2016	Website
7-Day Inspection	9/26/2016	IPL
7-Day Inspection	9/29/2016	IPL
7-Day Inspection	10/3/2016	IPL
7-Day Inspection	10/6/2016	IPL
7-Day Inspection	10/10/2016	IPL
7-Day Inspection	10/13/2016	IPL
7-Day Inspection	10/17/2016	IPL
7-Day Inspection	10/24/2016	IPL
7-Day Inspection	10/27/2016	IPL
7-Day Inspection	10/31/2016	IPL
Annual CCR Fugitive Dust Control Report	11/30/2016	Website
Groundwater Monitoring		
No materials in operating record as of 12/2/16		Website
Closure/Post-Closure Care		
Initial Closure Plan	9/21/2016	Website
Post-Closure Care Plan	9/21/2016	Website

Notes:
1) Items sourced to the Website are from Alliant Energy's CCR Rule Compliance Data and Information website as of 12/2/16.
   See http://ccr.alliantenergy.com/Lansing/index.htm
2) Items sourced to IPL are from the facility Operating Record as of the date of inspection.

I:\25216070.00\Reports\2016 Federal Inspection\Operating Record Files\[Table 1 Operating Record Summary_LAN.xlsx]Summary