SCS ENGINEERS

Initial Annual CCR Landfill Inspection
OML Existing Landfill
OML Expansion Phase 1

Ottumwa-Midland Landfill

Prepared for:

Interstate Power and Light Company

Ottumwa-Midland Landfill
15300 130th Street
Ottumwa, Iowa 52501

Prepared by:

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

January 2016
File No. 25215159.00

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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 Iowa.

01/18/2016

(signature) (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:

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 Interstate Power and Light Company (IPL) Ottumwa-Midland Landfill (OML) in Ottumwa, 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 OML Landfill includes an active CCR landfill, which currently consists of two CCR units:

- OML Existing Landfill
- OML Expansion Phase 1

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

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

CCR Unit	CCR Rule Status	Basis for Status
OML Existing Landfill	Existing, Accepting CCR	Module received CCR before and after the effective date of the CCR Rule.
OML Expansion Phase 1	Existing, Not Currently Accepting CCR	Liner is constructed and currently awaiting state approval of construction. Consistent construction presence was initiated in May 2014, prior to effective date of CCR Rule.

2.0 ANNUAL INSPECTION

Mr. Eric Nelson of SCS completed an annual inspection of the active CCR units at OML, including the Existing Landfill and Expansion Phase 1 on December 17, 2015. Mr. Nelson is a licensed professional engineer in Iowa 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 the Existing Landfill and Expansion Phase 1 at OML. 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 OML 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 OML facility. These materials reviewed are summarized in **Table 1**.

2.2 VISUAL INSPECTION

SCS completed a visual inspection of the Existing Landfill and Expansion Phase 1 at OML to identify signs of distress or malfunction of the CCR units. SCS also provided oversight of the recent construction activities for Phase 1.

The visual inspection included observations of the following:

- CCR placement areas including active filling areas, intermediate cover areas, and exterior non-CCR berms or slopes.
- Leachate collection and removal system components including visible leachate drainage layer materials, leachate vaults, cleanouts, and the leachate storage lagoon.
- Contact water run-off management features including internal contact water drainage features and Temporary Contact Water Basin 1/2.
- Non-contact storm water run-on and run-off control features including swales and sedimentation basins located adjacent to active fill areas but outside the landfill limits.
- Groundwater underdrain system components including the visible underdrain discharge pipes.

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 the Existing Landfill and Expansion Phase 1 at the OML 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 the Existing Landfill. Intermediate cover was in place along a portion of the north slope, east slope, most of the south slope, and all but the northwest quadrant of the top of the landfill where active CCR placement was ongoing.

As noted in **Section 1.2** and in the facility operating records reviewed for this inspection, Expansion Phase 1 is currently awaiting state approval of the liner construction. CCR placed in Expansion Phase 1 as of the date of the visual inspection is limited to bottom ash used to construct a ramp and operating pad above the leachate drainage layer as part of liner construction activities.

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 the inspection is summarized below. A description of how the estimate was developed and the sources used are also summarized below.

CCR Unit	Estimated Volume of CCR in Place	Basis for Estimate and Source
OML Existing Landfill	767,000 cubic yards	Estimated airspace consumed based on 3/4/15 topographic survey compared to as-built top of leachate collection layer grades (699,600 cubic yards) plus estimated disposal from 3/5/15 to 12/17/15 based on IPL-provided actual and forecast disposal rates for this period (67,400 cubic yards).
OML Expansion Phase 1	10,000 cubic yards	CCR placed in this unit is limited to the ramp and operating pad installed within the cell during construction. The ramp and pad were constructed of bottom ash.

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

A slope in excess of 3H:1V was noted in one specific location during the inspection of the Existing Landfill. A steep slope (approximately 2H:1V) was observed at the southern edge of the active filling operation in the Existing Landfill. The slope is located where the active filling operation abuts a previously active fill area within the unit that has received intermediate cover. The slope observed is relatively short (vertically only about 5 feet high) and showed no visual signs of structural weakness.

The condition noted is not currently considered an operating deficiency since it is unlikely to have significant impact on the function of the CCR unit. However, additional observation of this area is recommended to ensure that the conditions observed during the visual inspection, or similar future conditions, 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.

3.3.2 Inappropriate Vegetation Growth

No inappropriate vegetation growth was noted during the inspection.

3.3.3 Animal Burrows

No animal burrows were noted during the inspection.

3.3.4 Erosion Damage

Mild gully erosion of the Existing Landfill intermediate cover materials was noted during the inspection in the following locations:

- At the east end of the diversion berm on the south slope
- On the access ramp above the west end of the diversion berm on the south slope
- On the north slope adjacent to the boundary between the Existing Landfill and Expansion Phase 1

The minor gully erosion in these areas is not currently considered an operating deficiency since it is unlikely to have significant impact on the function of the CCR unit.

Erosion of the bottom ash ramp into Expansion Phase 1 was noted during the inspection. Bottom ash has eroded along the north side of the ramp and into the culvert that allows the free flow of contact water under the ramp. Currently, the condition is not prohibiting the proper management of contact water because a temporary rain cover is installed over the south end of the culvert, so the culvert serves no current function. Non-contact water generated in the temporary rain cover area is properly managed by facility staff by pumping it to the adjacent sedimentation basin to the north.

The site received approximately 1.99 inches of precipitation over the seven days prior to the inspection[1], which may have contributed to the erosion observed. Based on the inspection, the conditions noted are not currently considered an operating deficiency since they are unlikely to have a significant impact on the function of the CCR unit. However, erosion and the resulting deposit of sediment in surface water and contact water management features have the potential to cause ponding of water that may impact the overall stability of the CCR unit. Additional observation of these areas and repair 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 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 EXISTING CONDITIONS

No disruptive existing conditions were noted during the inspection.

3.5 OTHER CHANGES SINCE PREVIOUS ANNUAL INSPECTION

This is the initial annual inspection of the Existing Landfill and Expansion Phase 1 at the OML 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).

1 Source is Weather Underground (http://www.wunderground.com/) for Kirkville, Iowa from 12/10-12/16/15.

Changes to site conditions that may have affected the stability or operation of the Existing Landfill and Expansion Phase 1 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 the Existing Landfill and Expansion Phase 1 must be completed within one year of the placement of this inspection report in the operating record for the OML facility.

4.2 NEW CCR LANDFILLS AND LATERAL EXPANSIONS

As discussed above, all of the CCR units at the OML facility are considered existing CCR units. The initial annual inspection for CCR units 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
IPL Ottumwa-Midland Landfill / Ottumwa, Iowa
SCS Engineers Project #25215159.00

	Record Date	Source
Operating Criteria		
CCR Fugitive Dust Control Plan	9/23/2015	Website
7-Day Inspection	10/15/2015	IPL
7-Day Inspection	10/22/2015	IPL
7-Day Inspection	10/29/2015	IPL
7-Day Inspection	11/5/2015	IPL
7-Day Inspection	11/12/2015	IPL
7-Day Inspection	11/18/2015	IPL
7-Day Inspection	11/25/2015	IPL
7-Day Inspection	12/2/2015	IPL
7-Day Inspection	12/9/2015	IPL
7-Day Inspection	12/16/2015	IPL

Notes:
1) Items sourced to the Website are from Alliant Energy's CCR Rule Compliance Data and Information website as of 1/05/16.
See http://ccr.alliantenergy.com/Ottumwa/Landfills/index.htm
2) Items sourced to IPL are from the facility Operating Record as of the date of inspection.

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