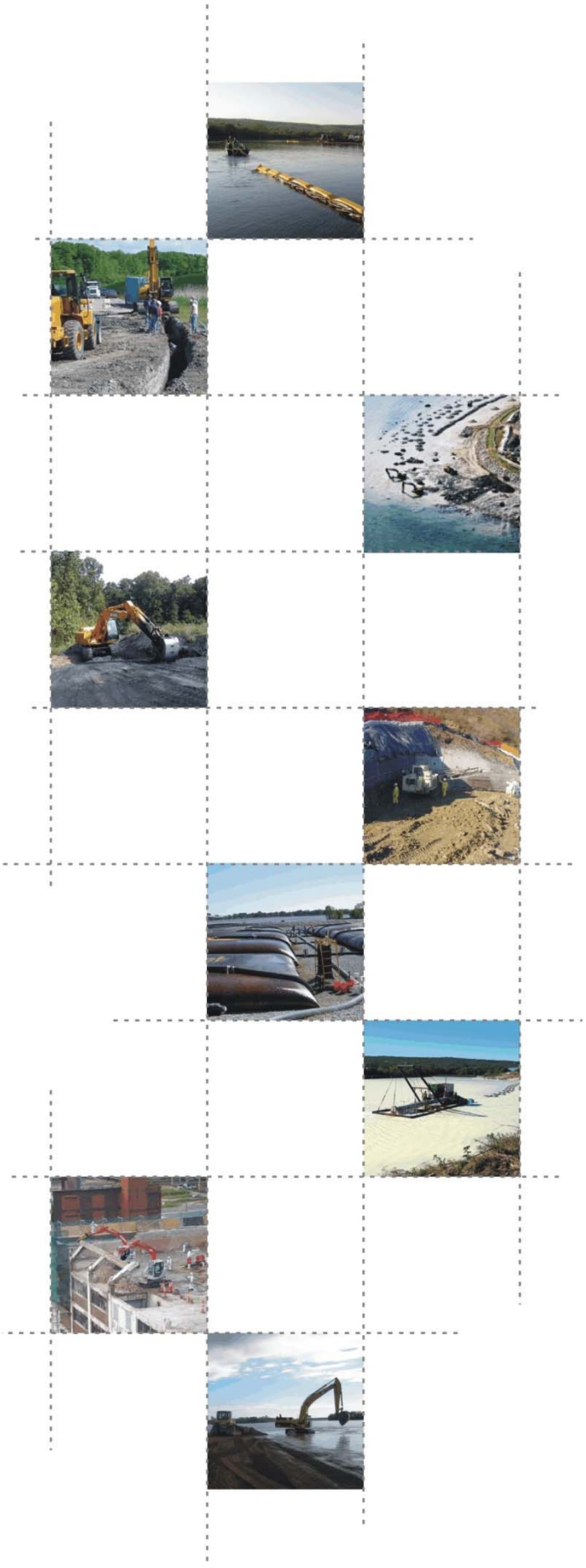
ALLIANT ENERGY
INTERSTATE POWER AND LIGHT
OTTUMWA GENERATING STATION

CCR SURFACE IMPOUNDMENT

ANNUAL INSPECTION REPORT

January 15, 2016



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EXECUTIVE SUMMARY

This annual inspection report has been prepared in accordance with the requirements of the United States Environmental Protection Agency (USEPA) published Final Rule for Hazardous and Solid Waste Management System – Disposal of Coal Combustion Residual (CCR) from Electric Utilities (40 CFR Parts 257 and 261) published on April 17, 2015 and effective October 19, 2015.

This annual inspection report has been prepared to assess the condition of existing CCR surface impoundments. Primarily, the annual inspection report is focused on the structural stability of the existing CCR surface impoundments and to ensure that the operation and maintenance of the existing CCR surface impoundments is in accordance with recognized and generally accepted good engineering standards.

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1.0 INTRODUCTION

This annual inspection report has been prepared in accordance with the requirements of §257.83(b) of the CCR Rule.

1.1 CCR Rule Applicability

The CCR Rule requires annual inspections by a qualified professional engineer (PE) for existing CCR surface impoundments with a height of 5 feet or more and a storage volume of 20 acre-feet or more or the existing CCR surface impoundment has a height of 20 feet or more (40 CFR §§ 257.73(b), 257.73(d) and 257.83(b)).

1.2 Annual Inspection Applicability to the Ottumwa Generating Station

The Interstate Power and Light Company (IPL), Ottumwa Generating Station (OGS) in Ottumwa, Iowa has one existing CCR surface impoundment, identified as the OGS Ash Pond. The OGS Ash Pond meets the requirements of §257.73(b)(1) and §257.73(b)(2) of the CCR Rule, as the existing CCR surface impoundment has a storage height greater than 20 feet and a storage volume greater than 20 acre-feet, and thus is subject to the periodic structural stability assessment requirements of §257.73(d) of the CCR Rule. Therefore, the existing CCR surface impoundment at OGS is required to be inspected by a qualified PE on a periodic basis per §257.83(b) of the CCR Rule.

The initial annual inspection of the OGS Ash Pond was completed by a qualified PE on October 27, 2015. The annual inspection was completed by a qualified PE to ensure that the design, construction, operation, and maintenance of the existing CCR surface impoundment at OGS is consistent with recognized and generally accepted good engineering standards.

The initial annual inspection of the OGS Ash Pond included a review of available information regarding the status and condition of the existing CCR surface impoundment. The information reviewed included all relevant files available in the operating record at the time of the initial annual inspection. These files for the OGS Ash Pond included the 7-day inspection forms and 30-day instrumentation monitoring forms.

The initial annual inspection also included a visual inspection of the existing CCR surface impoundment in order to identify signs of distress or malfunction of the existing CCR surface impoundment and appurtenant structures. Additionally, the visual inspection

included any hydraulic structures underlying the base of the existing CCR surface impoundment or passing through the dikes of the existing CCR surface impoundment for structural integrity and continued safe and reliable operation.

2.0 DESCRIPTION OF EXISTING CCR SURFACE IMPOUNDMENT AT OGS

The following sub-section provides a summary description of the existing CCR surface impoundment located at OGS.

2.1 OGS Ash Pond

The OGS Ash Pond is located east of the generating plant on the eastern portion of the site. The OGS Ash Pond receives influent flows from the generating plant floor drains, oil/water separator, boiler blow down water, solid contact unit sludge, sluiced CCR (bottom ash and economizer fly ash), and surface water runoff.

The sluiced CCR is discharged into the west end of the OGS Ash Pond. The sluiced CCR is discharged into a collection pad area where the majority of CCR is recovered. A dozer is utilized to scrape the collection pad and push the CCR into a stockpile for dewatering. Once dewatered, the CCR is then loaded into over-the-road haul trucks for transporting off-site. The sluiced water from the CCR drains into a narrow channel that flows into the southwest portion of the OGS Ash Pond. Routine maintenance dredging of the narrow channel occurs as the CCR settles out in the channel.

The water in the OGS Ash Pond flows to the east and discharges through the facility's National Pollution Discharge Elimination System (NPDES) Outfall 001, located in the northeast corner of the OGS Ash Pond. NPDES Outfall 001 consists of a concrete discharge structure that includes a parshall flume and instrumentation to measure the flow of the discharged water. The water flows through the NPDES Outfall 001 and discharges into an un-named creek. The un-named creek flows to the east and discharges into the Des Moines River.

3.0 ANNUAL INSPECTION REPORTING CRITERIA

The following sub-sections address the annual inspection reporting criteria per §257.83(b)(2) of the CCR Rule for the existing CCR surface impoundment located at OGS.

3.1 OGS Ash Pond

3.1.1 Changes in Geometry (§257.83(b)(2)(i))

After review of available information provided by OGS pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with OGS facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, there have been no identified changes in the geometry of the impounding structure that would warrant additional investigation or remedial activities.

Additionally, review of historical annual inspections completed in 2011 through 2014, prior to this initial CCR Rule annual inspection, has shown there have been no previously identified changes in the geometry of the OGS Ash Pond.

3.1.2 Existing Instrumentation (§257.83(b)(2)(ii))

Instrumentation that supports the operation of the OGS Ash Pond includes a parshall flume discharge structure and instrumentation to measure the flow of the discharged water. The instrumentation is located in the northeast corner of the OGS Ash Pond and is associated with the NPDES Outfall 001 at OGS.

As this is the initial CCR Rule annual inspection, there is no historical record of available information regarding the maximum recorded readings of each instrument from a previous annual inspection that was available for review. However, flow data associated with the NPDES Outfall 001 discharge (e.g. maximum daily flow) was provided by IPL staff for 2015 (January 01, 2015 through October 22, 2015). Reviewing the provided flow data, the maximum daily flow recorded through NPDES Outfall 001 was approximately 5.01 million gallons (June 2015).

3.1.3 Depth and Elevation of Impounded CCR and Water (§257.83(b)(2)(iii))

As this is the initial CCR Rule annual inspection, there is no historical record of available information regarding the approximate minimum, maximum, and present depths and elevations of the impounded CCR and water in the OGS Ash Pond from a previous annual inspection that was available for review.

However, historical information was previously provided from IPL staff, including a report titled "Settling Pond Maintenance Plan" prepared for OGS by Hard Hat Services (2006). The information and data contained within the report included the most recent bathymetric survey of the OGS Ash Pond, as well as the estimated original design contours of the OGS Ash Pond. Reviewing the information provided within the above mentioned documents, the following depths and elevations were approximated for the impounded CCR and water:

- The average elevation surveyed of the top of the impounding structure was approximately 680.
- The original bathymetry of the OGS Ash Pond, obtained from estimated original design contours, varies in elevation from east to west. The maximum depth of the OGS Ash Pond, at elevation 656, was located near the northeast corner of the OGS Ash Pond. As the OGS Ash Pond extends from east to west, the estimated original design contour bathymetric elevation rises from 656 in the northeast corner to an elevation of 674 near the west end.

The bathymetric survey completed in 2006 was compared to the estimated original design contours in order to provide estimated thicknesses of deposition of CCR/sediment/solid contact unit sludge present in the OGS Ash Pond. The surveyed bathymetry in the northeast corner of the OGS Ash Pond was at elevation 662, which showed a deposition of approximately 6 feet. As the OGS Ash Pond extends to the west, the thickness of deposition varied from 6 feet in the northeast corner to approximately 14 feet in the center of the OGS Ash Pond. The far west end of the OGS Ash Pond showed a deposition thickness of approximately 3 feet.

- The bathymetric survey completed in 2006 provided the water elevation of the OGS Ash Pond, which was approximately 677. The average minimum water elevation of the OGS Ash Pond is approximately 675, as this was the design invert elevation of a concrete mixing channel located in the northeast corner of the OGS Ash Pond. The water in the OGS Ash Pond flows through the concrete mixing channel prior to discharging through the NPDES Outfall 001.
- The average water depth within the OGS Ash Pond, based off of the 2006 Settling Pond Maintenance Plan, ranged from approximately 13 feet in the northeast corner to 1 foot in the west end of the OGS Ash Pond.

Reviewing aerial photographs, it appears that deposition of CCR/sediment/solid contact unit sludge has occurred within the OGS Ash Pond since the 2006 Settling Pond

Maintenance Plan was prepared. The depths and elevations of the impounded CCR and water in the OGS Ash Pond have likely changed.

3.1.4 Storage Capacity of Impounding Structure (§257.83(b)(2)(iv))

The storage capacity (water volume) of the OGS Ash Pond at the time of the initial annual inspection was not readily available.

However, historical information was previously provided from IPL staff, including a report titled "Settling Pond Maintenance Plan" prepared for OGS by Hard Hat Services (2006). The information and data contained within the report included the most recent bathymetric survey of the OGS Ash Pond, as well as the estimated original design contours of the OGS Ash Pond. Reviewing the information within the above mentioned documents, the approximate storage capacity of the OGS Ash Pond was calculated.

From the 2006 Settling Pond Maintenace Plan, the estimated volume of water within the OGS Ash Pond was approximately 186,000 cubic yards.

Reviewing aerial photographs, it appears that deposition of CCR/sediment/solid contact unit sludge has occurred within the OGS Ash Pond since the 2006 Settling Pond Maintenance Plan was prepared. The storage capacity of the OGS Ash Pond has likely been reduced.

3.1.5 Volume of Impounded CCR and Water (§257.83(b)(2)(v))

The volume of impounded CCR and water (total volume) within the OGS Ash Pond at the time of the initial annual inspection was not readily available.

However, historical information was previously provided from IPL staff, including a report titled "Settling Pond Maintenance Plan" prepared for OGS by Hard Hat Services (2006). The information and data contained within the report included the most recent bathymetric survey of the OGS Ash Pond, as well as the estimated original design contours of the OGS Ash Pond. Reviewing the information provided within the above mentioned documents, the approximate volume of impounded water and CCR/sediment/solid contact unit sludge was approximately 556,000 cubic yards.

The volume of CCR/sediment/solid contact unit sludge within the OGS Ash Pond was approximately 370,000 cubic yards of the 556,000 cubic yards of total volume. The volume of CCR/sediment/solid contact unit sludge present in the OGS Ash Pond was

calculated by subtracting the available storage capacity (water volume) of the OGS Ash Pond from the total storage volume of the OGS Ash Pond.

Reviewing aerial photographs, it appears that deposition of CCR/sediment/solid contact unit sludge has occurred within the OGS Ash Pond since the 2006 Settling Pond Maintenance Plan was prepared. The volume of impounded water in the OGS Ash Pond has likely been reduced. Concurrently, the volume of CCR/sediment/solid contact unit sludge has likely increased.

3.1.6 Structural Weaknesses and Disruptive Conditions (§257.83(b)(2)(vi))

After review of available information provided by OGS pertaining to the status and condition of the existing CCR surface impoundment, discussions with OGS facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, as well as conducting the on-site visual inspection of the existing CCR surface impoundment, there have been no identified appearances of an actual or potential structural weakness of the existing CCR surface impoundment that would warrant additional investigation or remedial activities. Additionally, there were no identified issues with the structural integrity of the hydraulic structures (NPDES Outfall 001) associated with the OGS Ash Pond.

Regarding the existing conditions of the OGS Ash Pond that are disrupting or have the potential to disrupt the operation and safety of the existing CCR surface impoundment and appurtenant structures, the following conditions were identified:

- Vegetation Overgrowth
    - The upstream slope of the north embankment of the OGS Ash Pond could not be properly inspected due to the presence of dense/tall grassy vegetation (e.g. reeds) from the water surface along the bottom third (1/3) of the slope. Additionally, moderately dense/tall brush (e.g. shrubs) protruded through riprap along the top two thirds (2/3) of the slope. The vegetation restricted the ability to properly inspect the embankment for stability. Items such as erosion, seeps, and animal activity (if present) were unable to be observed due to the vegetation overgrowth.
    - The upstream slope of the east embankment of the OGS Ash Pond could not be properly inspected due to the presence of dense/tall grassy vegetation (e.g. reeds) from the water surface to half (1/2) way up the slope. The vegetation restricted the ability to properly inspect the embankment for stability. Items such as erosion, seeps, and animal activity (if present) were unable to be observed due to the vegetation overgrowth.

- The downstream slope of the north embankment of the OGS Ash Pond could not be properly inspected due to the presence of moderately dense/tall brush (e.g. shrubs and small diameter trees) protruding through riprap along the entire slope. The vegetation restricted the ability to properly inspect the embankment for stability. Items such as erosion, seeps, and animal activity (if present) were unable to be observed due to the vegetation overgrowth.
- The downstream slope of the east embankment of the OGS Ash Pond, north of the railroad tracks, could not be properly inspected due to the presence of dense/tall grassy vegetation adjacent to the discharge end of the NPDES Outfall 001 hydraulic structure. The vegetation restriced the ability to properly inspect the embankment and the area adjacent to the hydraulic structure for structural integrity. Items such as erosion, seeps, and animal activity (if present) were unable to be observed due to the vegetation overgrowth.

{Note: Embankments of existing CCR surface impoundments located in or adjacent to floodplains, sovereign lands, property boundaries, wetlands, and potential other restrictive areas may require various types of permits prior to conducting vegetation management activities.}

3.1.7 Other Changes Affecting Stability or Operation of Impounding Structure (§257.83(b)(2)(vii))

After review of available information provided by OGS pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with OGS facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, there have been no other identified changes that have affected the stability or operation of the OGS Ash Pond.

Additionally, review of historical annual inspections completed in 2011 through 2014, prior to this initial CCR Rule annual inspection, has shown there have been no previously identified changes that have affected the stability or operation of the OGS Ash Pond.

4.0 CERTIFICATION

To meet the requirements of 40 CFR 257.83(b), I Mark W. Loerop hereby certify that I am a licensed professional engineer in the State of Iowa; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in 40 CFR 257.83(b).

By: _____

Name: Mark Loerop

Date: Jan 15, 2016