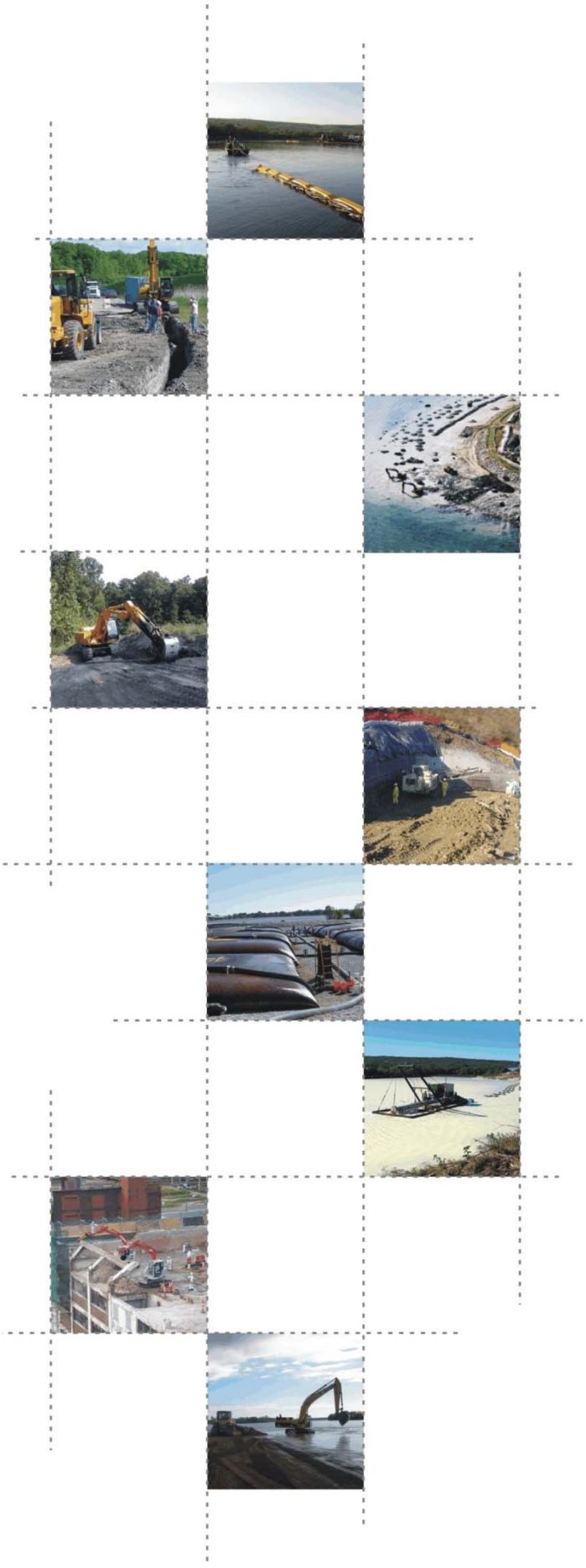
ALLIANT ENERGY
INTERSTATE POWER AND LIGHT
BURLINGTON GENERATING STATION

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, also known as CCR Rule) 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 Burlington Generating Station

The Interstate Power and Light Company (IPL), Burlington Generating Station (BGS) in Burlington, Iowa has four existing CCR surface impoundments, identified as follows:

- BGS Ash Seal Pond
- BGS Main Ash Pond
- BGS Economizer Pond
- BGS Upper Ash Pond

All four of the existing CCR surface impoundments identified at BGS meet the requirements of §257.73(b)(1) of the CCR Rule, as each of the existing CCR surface impoundments have a storage height greater than 5 feet and a storage volume greater than 20 acre-feet, and thus are subject to the periodic structural stability assessment requirements of §257.73(d) of the CCR Rule. Therefore, the existing CCR surface impoundments at BGS are 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 existing CCR surface impoundments at BGS was completed by a qualified PE on October 26, 2015. The annual inspection was completed by a qualified PE to ensure that the design, construction, operation, and maintenance of the existing CCR surface impoundments at BGS are consistent with recognized and generally accepted good engineering standards.

The initial annual inspection of the existing CCR surface impoundments at BGS included a review of available information regarding the status and condition of the existing CCR surface impoundments. The information reviewed included all relevant files available in

the operating record at the time of the initial annual inspection. These files for the existing CCR surface impoundments at BGS 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 impoundments in order to identify signs of distress or malfunction of the existing CCR surface impoundments and appurtenant structures. Additionally, the visual inspection included any hydraulic structures underlying the base of the existing CCR surface impoundments or passing through the dikes of the existing CCR surface impoundments for structural integrity and continued safe and reliable operation.

2.0 DESCRIPTION OF EXISTING CCR SURFACE IMPOUNDMENTS AT BGS

The following sub-sections provides a summary description of the existing CCR surface impoundments located at BGS.

2.1 BGS Ash Seal Pond

The BGS Ash Seal Pond is located south of the generating plant and east of the BGS Main Ash Pond. The CCR at BGS, in 1968, was originally managed by discharging into the BGS Ash Seal Pond for settling. Presently, the BGS Ash Seal Pond only receives storm water runoff from the surrounding area associated with the fly ash storage silo. The BGS Ash Seal Pond only receives facility process water, such as ash seal water, if there is an issue with the ash seal water pumps.

2.2 BGS Main Ash Pond

The BGS Main Ash Pond is located southwest of the generating plant and west of the BGS Ash Seal Pond. The CCR at BGS, prior to being sluiced to the BGS Main Ash Pond, was originally managed in the BGS Ash Seal Pond in 1968. In 1971, BGS managed CCR in the BGS Upper Ash Pond. In 1980, the BGS Main Ash Pond became a primary receiver of CCR, with the BGS Upper Ash Pond becoming a downstream receiver.

Presently, the BGS Main Ash Pond receives two types of CCR, bottom ash and fly ash (C-Stone). The bottom ash is sluiced from the generating plant to the northeast corner of the BGS Main Ash Pond. The sluiced bottom ash discharges into the northeast corner where the majority of the bottom ash settles out. The majority of bottom ash that settles out is recovered for beneficial reuse.

The fly ash from the on-site storage silo, when not transported off-site, is transported to the southeast corner of the BGS Main Ash Pond where it is then hydrated and placed in vertical lifts. The fly ash (C-Stone) is then ground and sold as aggregate materials for beneficial reuse.

The water that is used to sluice the bottom ash into the BGS Main Ash Pond is routed towards the west end of the BGS Main Ash Pond. The water flows to the west along the north side of a road constructed out of bottom ash through the center of the BGS Main Ash Pond. The water flows along the north side of the road until it reaches the west end where it transitions into a ponded area in the northwest corner of the BGS Main Ash

Pond. The water in the northwest corner of the BGS Main Ash Pond flows through two hydraulic structures (two corrugated metal pipe culverts) located under the generating plant entrance road. The water discharges into a small channel located north of the generating plant entrance road and west of the BGS Economizer Pond. The water in the channel flows to the west along the north side of the generating plant entrance road. The water is then routed to the north along the east side of Sullivan Slough Road, and then along the south side of the gravel dike of the BGS Upper Ash Pond until it discharges into the southwest corner of the BGS Upper Ash Pond.

2.3 BGS Economizer Pond

The BGS Economizer Pond is located northwest of the generating plant and north of the BGS Main Ash Pond. In 1986, BGS constructed the BGS Economizer Pond in the southern and eastern portion of the original footprint of the BGS Upper Ash Pond.

Presently, the BGS Economizer Pond receives economizer ash. The economizer ash is sluiced from the generating plant to the east end of the BGS Economizer Pond via a 10-inch diameter polyvinyl chloride pipe. The economizer ash settles out through the water column of the BGS Economizer Pond while the water flows to the west. The water discharges from the BGS Economizer Pond through a hydraulic structure (18-inch diameter high-density polyethylene pipe) into a storm water channel located along the south side of the Economizer Ash Pile. The storm water channel receives the majority of the generating plants collected storm water. The generating plants collected storm water drains into an oil/water separator located at the toe of the downstream slope of the east embankment of the BGS Economizer Pond. The oil/water separator also receives influent flows from the plant floor drains and water treatment process water. The water is then pumped up to the storm water channel. The storm water channel flows to the west along the south side of the Economizer Ash Pile until it discharges through a hydraulic structure (18-inch diameter high-density polyethylene pipe) located in the southwest corner of the Economizer Ash Pile. The water from the storm water channel discharges into a small channel located west of the Economizer Ash Pile and north of the generating plant entrance road. The water in the channel flows to the west along the north side of the generating plant entrance road. The water is then routed to the north along the east side of Sullivan Slough Road, and then along the south side of the gravel dike of the BGS Upper Ash Pond until it discharges into the southwest corner of the BGS Upper Ash Pond.

2.4 BGS Upper Ash Pond

The BGS Upper Ash Pond is located northwest of the generating plant and north of the BGS Economizer Pond. In 1971, BGS began managing CCR in the BGS Upper Ash Pond. In 1980, the BGS Main Ash Pond became the primary receiver of CCR and the BGS Upper Ash Pond became a downstream receiver of the BGS Main Ash Pond.

Presently, the BGS Upper Ash Pond receives influent flows from the BGS Main Ash Pond, BGS Economizer Pond, and storm water flow from the generating plant. The influent flows all discharge into a small channel located west of the BGS Economizer Pond and north of the generating plant entrance road. The water in the channel flows to the west along the north side of the generating plant entrance road. The water is then routed to the north along the east side of Sullivan Slough Road, and then along the south side of the gravel dike of the BGS Upper Ash Pond until it discharges into the southwest corner of the BGS Upper Ash Pond.

The water flows through the BGS Upper Ash Pond to the northeast towards the facility's National Pollution Discharge Elimination System (NPDES) Outfall 001. The water flows through the NPDES Outfall 001 hydraulic structure, which consists of a 24-inch wide precast concrete parshall flume that discharges into a concrete catch basin. The water in the catch basin flows through a 15-inch diameter polyvinyl chloride pipe and discharges into the BGS Lower Pond. Instrumentation associated with BGS Upper Ash Pond includes a flow meter that monitors the discharges through NPDES Outfall 001.

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 impoundments located at BGS.

3.1 BGS Ash Seal Pond

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

After review of available information provided by BGS pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with BGS 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 BGS Ash Seal Pond.

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

The BGS Ash Seal Pond, at the time of this initial CCR Rule annual inspection, does not have instrumentation that supports the operation of the existing CCR surface impoundment.

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 BGS Ash Seal Pond from a previous annual inspection that was available for review.

However, historical information was previously provided from IPL staff, including a drawing of the original structural site preparation grading plan contours of the BGS Ash Seal Pond prepared by Black & Veatch (1965), as well as the most recent topographic survey of the BGS Ash Seal Pond (2008). Reviewing the information provided within the above mentioned documents, the following depths and elevations were approximated for the impounded CCR and water:

- From the 1965 drawing of the original structural site preparation grading plan contours of the BGS Ash Seal Pond, the original bottom contour elevation of the existing CCR surface impoundment was approximately 521.
- From the 2008 topographic survey data, the water elevation of the BGS Ash Seal Pond was approximately 531.5. Note, at the time of the initial CCR Rule annual inspection, there was no water identified within the BGS Ash Seal Pond.
- From historical annual inspections completed in 2011 through 2014, prior to this initial CCR Rule annual inspection, the top of CCR/sediment was measured to be approximately 4 feet below the top of crest of the south embankment. From the 2008 topographic survey data, the elevation of the top of the south embankment was approximately 533. Therefore, the elevation of the CCR/sediment was approximately 529.5.
- Comparing the calculated bathymetric surface elevation (529.5) to the 1965 drawing of the original structural site preparation grading plan bottom countour elevation (521), the total deposition thickness of the BGS Ash Seal Pond to be approximately 8.5 feet.

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

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

At the time of the initial annual inspection, there was no water identified within the BGS Ash Seal Pond, therefoere, the available storage capacity was not calculated. However, historical information previously provided from IPL staff, allowed for the calculation of the historical storage capacity of the BGS Ash Seal Pond. From the 2008 topographic survey data, the water elevation of the BGS Ash Seal Pond was approximately 531.5. Comparing the 2008 surveyed water elevation (531.5) to the estimated elevation of the top of the CCR/sediment (529.5), the total depth of water within the BGS Ash Seal Pond was approximately 2 feet. The total surface area of the BGS Ash Seal Pond was approximately 5.7 acres. Thus, the total storage capacity within the BGS Ash Seal Pond, based on historical information, was approximately 18,000 cubic yards.

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 BGS Ash Seal Pond at the time of the initial annual inspection was not readily available. Note, at the time of the initial annual inspection, there was no water identified within the BGS Ash Seal Pond.

However, historical information was previously provided from IPL staff, including a drawing of the original structural site preparation grading plan contours of the BGS Ash Seal Pond prepared by Black & Veatch (1965), as well as the most recent topographic survey of the BGS Ash Seal Pond (2008). Reviewing the information provided within the above mentioned documents, the approximate volume of impounded CCR and water in the BGS Ash Seal Pond was calculated.

From historical annual inspections completed in 2011 through 2014, prior to this initial CCR Rule annual inspection, the top of CCR/sediment was measured to be approximately 4 feet below the top of crest of the south embankment. From the 2008 topographic survey data, the elevation of the top of the south embankment was approximately 533. Therefore, the elevation of the CCR/sediment was approximately 529.5. From the 1965 drawing of the original structural site preparation grading plan contours, the bottom contour elevation of the BGS Ash Seal Pond was approximately 12 feet below the top of crest of the south embankment at elevation 521. Thus, the interior storage height of the BGS Ash Seal Pond was estimated to be approximately 8.5 feet.

The total surface area of the BGS Ash Seal Pond was approximately 5.7 acres. Thus, the total volume of impounded CCR and water within the BGS Ash Seal Pond was approximately 79,000 cubic yards.

If water was present within the BGS Ash Seal Pond, at the same elevation that was identified in the 2008 topographic survey, the total volume of impounded CCR and water within the BGS Ash Seal Pond would be approximately 97,000 cubic yards.

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

After review of available information provided by BGS pertaining to the status and condition of the existing CCR surface impoundment, discussions with BGS 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 are no hydraulic structures associated with the BGS Ash Seal Pond.

Regarding the existing conditions of the BGS Ash Seal 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 bottom half (1/2) of the downstream slope of the south embankment of the BGS Ash Seal Pond could not be properly inspected due to the presence of dense/tall grassy vegetation. 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 south embankment of the BGS Ash Seal Pond could not be properly inspected due to the presence of dense/tall grassy vegetation (e.g. reeds). 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.

{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 BGS pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with BGS 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 BGS Ash Seal 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 BGS Ash Seal Pond.

3.2 BGS Main Ash Pond

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

After review of available information provided by BGS pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with BGS

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 BGS Main Ash Pond.

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

The BGS Main Ash Pond, at the time of this initial CCR Rule annual inspection, does not have instrumentation that supports the operation of the existing CCR surface impoundment.

3.2.3 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 BGS Main Ash Pond from a previous annual inspection that was available for review.

However, historical information was previously provided from IPL staff, including a drawing of the original structural site preparation grading plan contours prepared by Black & Veach (1965), which show the original contours prior to the construction of the BGS Main Ash Pond. Additional historical information included the most recent topographic survey of the BGS Main Ash Pond (2008). Reviewing the information provided within the above mentioned documents, the following depths and elevations were approximated for the impounded CCR and water:

- From the 1965 drawing of the original structural site preparation grading plan contours, the bottom contour elevation that was present prior to the construction of the BGS Main Ash Pond was approximately 524.
- From the 2008 topographic survey data, the water elevation of the BGS Main Ash Pond varied from east to west. The water elevation, located adjacent to the CCR handling activities in the eastern half of the BGS Main Ash Pond, was approximately 535.5. The water elevation, located in the northwest corner of the BGS Main Ash Pond, was approximately 531.3. The variance in water elevation was approximately 4 feet.

- From historical annual inspections completed in 2011 through 2014, prior to this initial CCR Rule annual inspection, the top of CCR/sediment was measured to be approximately 2 feet below the top of crest of the south and west embankments. From the 2008 topographic survey data, the elevation of the top of the south and west embankments was approximately 534. Therefore, the elevation of the CCR/sediment was approximately 532.
- Comparing the calculated bathymetric surface elevation (532) to the 1965 drawing of the original structural site preparation grading plan bottom contour elevation (524), the total deposition thickness of the BGS Main Ash Pond was approximately 8 feet. Note, this deposition thickness does not account for the volume of CCR accumulated in the southeast corner of the BGS Main Ash Pond where the C-Stone Pile is located.

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

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

However, historical information was previously provided from IPL staff, including the most recent topographic survey of the BGS Main Ash Pond (2008). Reviewing the information provided within the above mentioned documents, the approximate storage capacity of the BGS Main Ash Pond was calculated.

From the 2008 topographic survey, the water depth of the BGS Main Ash Pond in the areas where water was present was estimated to be approximately 2 feet. The total surface area of the BGS Main Ash Pond, in the aras where water was present, was approximately 1.2 acres. Thus, the total storage capacity within the BGS Main Ash Pond was approximately 3,700 cubic yards.

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

The volume of impounded CCR and water (total volume) within the BGS Main 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 drawing of the original structural site preparation grading plan contours prepared by Black & Veach (1965), which show the original contours prior to the construction of the BGS Main Ash Pond. Additional historical information included the most recent topographic survey of the BGS Main Ash Pond (2008). Reviewing the information

provided within the above mentioned documents, the approximate volume of impounded CCR and water in the BGS Ash Seal Pond was calculated.

From historical annual inspections completed in 2011 through 2014, prior to this initial CCR Rule annual inspection, the top of CCR/sediment was measured to be approximately 2 feet below the top of crest of the south and west embankments. From the 2008 topographic survey data, the elevation of the top of the south and west embankments was approximately 534. Comparing the calculated bathymetric surface elevation (532) to the 1965 drawing of the original structural site preparation grading plan bottom contour (524), the total interior storage height of the BGS Main Ash Pond was estimated to be 8 feet.

The total surface area of the BGS Main Ash Pond was approximately 18.7 acres. Thus, the total volume of impounded CCR and water within the BGS Main Ash Pond was approximately 240,000 cubic yards. Note, from the 2008 topographic survey data, additional volumes of CCR were calculated for the bottom ash storage area and C-stone pile located in the eastern half of the BGS Main Ash Pond. The approximate quantities above the elevation of the top of the CCR surface impoundment, were a total of 104,000 cubic yards. Note, the C-stone pile, during the initial CCR Rule annual inspection, was observed to be reduced in volume since the 2008 topographic survey was completed.

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

After review of available information provided by BGS pertaining to the status and condition of the existing CCR surface impoundment, discussions with BGS 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 (two corrugated metal pipe culverts) associated with the BGS Main Ash Pond.

Regarding the existing conditions of the BGS Main 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 downstream slope of the south embankment of the BGS Main Ash Pond could not be properly inspected due to the presence of dense/tall brush and woody vegetation (e.g. shrubs, small/large diameter trees) 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 upstream slope of the south embankment of the BGS Main Ash Pond could not be properly inspected due to the presence of dense/tall grassy vegetation (e.g. reeds) along the entire slope. Additionally, a few isolated small diameter trees were located along the upstream 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 and downstream slopes of the west embankment of the BGS Main Ash Pond could not be properly inspected due to the presence of dense/tall grassy vegetation (e.g. reeds) along the entire slope. The vegetation restricted the ability to properly inspect the embankments for stability. 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.}

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

After review of available information provided by BGS pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with BGS 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 BGS Main 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 BGS Main Ash Pond.

3.3 BGS Economizer Pond

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

After review of available information provided by BGS pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with BGS 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 BGS Economizer Pond.

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

The BGS Economizer Pond, at the time of this initial CCR Rule annual inspection, does not have instrumentation that supports the operation of the existing CCR surface impoundment.

3.3.3 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 BGS Economizer Pond from a previous annual inspection that was available for review.

However, historical information was previously provided from IPL staff, including a drawing of the original structural site preparation grading plan contours prepared by Black & Veach (1965), which show the original contours prior to the construction of the BGS Economizer Pond. Additional historical information included the most recent topographic survey of the BGS Economizer Pond (2011). Reviewing the information provided within the above mentioned documents, the following depths and elevations were approximated for the impounded CCR and water:

- From the 1965 drawing of the original structural site preparation grading plan contours, the bottom contour elevation that was present prior to the construction of the BGS Economizer Pond was approximately 521.
- From the 2011 topographic survey data, the water elevation of the BGS Economizer Pond was approximately 546. The surveyed bottom contour elevation

of the BGS Economizer Pond was approximately 540. Thus, the total water depth of the BGS Economizer Pond was approximately 6 feet. Note, the water depth varies as deposition occurs within the BGS Economizer Pond, however, maintenance dredging of the BGS Economizer Ash Pond is completed on an annual basis.

- From the 2011 topographic survey data, the average elevation of the top of the Economizer Ash Pile was approximately 548.
- Comparing the 1965 drawing of the original structural site preparation grading plan bottom countour elevation (521) to the 2011 topographic survey average elevation of the top of the Economizer Ash Pile (548), the total deposition thickness of the Economizer Ash Pile was approximately 27 feet.

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

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

However, historical information was previously provided from IPL staff, including the most recent topographic survey of the BGS Economizer Pond (2011). Reviewing the information provided within the above mentioned documents, the approximate storage capacity of the BGS Economizer Pond was calculated.

From the 2011 topographic survey, the water depth of the BGS Economizer Pond was approximately 6 feet. The total surface area of the BGS Economizer Pond was approximately 0.3 acres. Thus, the total storage capacity within the BGS Economizer Pond was approximately 3,000 cubic yards.

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

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

However, historical information was previously provided from IPL staff, including a drawing of the original structural site preparation grading plan contours prepared by Black & Veach (1965), which show the original contours prior to the construction of the BGS Economizer Pond. Additional historical information included the most recent topographic survey of the BGS Economizer Pond (2011). Reviewing the information provided within the above mentioned documents, the approximate volume of impounded CCR and water in the BGS Economizer Pond was calculated. Note, the total volume of CCR and water includes the volume of the Economizer Ash Pile.

From the 2011 topographic survey data, the average elevation of the top of the Economizer Ash Pile was approximately 548. From the 1965 drawing of the original structural site preparation grading plan contours, the bottom contour elevation that was present prior to the construction of the BGS Economizer Pond was approximately 521. Thus, the total storage height of the BGS Economizer Pond and Economizer Ash PIle was estimated to be 27 feet.

The total surface area of the BGS Economizer Pond and Economizer Ash Pile was approximately 11 acres. Thus, the total volume of impounded CCR and water within the BGS Economizer Pond was approximately 480,000 cubic yards.

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

After review of available information provided by BGS pertaining to the status and condition of the existing CCR surface impoundment, discussions with BGS 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 (two 18-inch diameter high-density polyethyelen pipes) associated with the BGS Economizer Pond.

Regarding the existing conditions of the BGS Economizer 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 downstream slope of the west embankment of the BGS Economizer Pond could not be properly inspected due to the presence of dense/tall grassy vegetation along the bottom third (1/3) 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.

{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.}

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

After review of available information provided by BGS pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with BGS 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 BGS Economizer Pond.

However, review of historical annual inspections completed in 2011 through 2014, prior to this initial CCR Rule annual inspection, has shown there have been previously identified changes that have affected the stability and operation of the BGS Economizer Pond. These identified changes included the following:

- Relocation of the footprint of the BGS Economizer Pond to the center of the east end of the Economizer Ash Pile, as well as reduction of the footprint of the existing CCR surface impoundment (2011);
- Removal of the BGS Economizer Pond drainage channel previously located along the north side of the Economizer Ash Pile. The discharge of the BGS Economizer Pond was rerouted to the existing drainage channel located along the south side of the Economizer Ash Pile (2011);
- Reduction of the slope along the eastern half of the north embankment of the Economizer Ash Pile, to a 5:1 slope, in order to increase the structural stability of the north embankment (2011); and
- Instalation of a toe berm along the western half of the north embankment of the Economizer Ash Pile in order to increase the structural stability of the north embankment (2011).

3.4 BGS Upper Ash Pond

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

After review of available information provided by BGS pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with BGS 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 BGS Upper Ash Pond.

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

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

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 September 30, 2015). Reviewing the provided flow data, the maximum daily flow recorded through NPDES Outfall 001 was approximately 4.29 million gallons (August 2015).

3.4.3 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 BGS Upper Ash Pond from a previous annual inspection that was available for review.

However, historical information was previously provided from IPL staff, including a drawing of the original structural site preparation grading plan contours prepared by Black & Veach (1965), which show the original contours prior to the construction of the BGS Upper Ash Pond. Additional historical information included a topographic survey of the north embankment of the BGS Upper Ash Pond (2011). Reviewing the information provided within the above mentioned documents, the following depths and elevations were approximated for the impounded CCR and water:

- From the 1965 drawing of the original structural site preparation grading plan contours, the bottom contour elevation that was present prior to the construction of the BGS Upper Ash Pond was approximately 521.
- From the 2011 topographic survey data, the normal water elevation of the BGS Upper Ash Pond was approximately 528.

- From the 2011 topographic survey data, the lowest elevation surveyed along the top of the north embankment was approximately 530.

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

The storage capacity (water volume) of the BGS Upper 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 drawing of the original structural site preparation grading plan contours prepared by Black & Veach (1965), which show the original contours prior to the construction of the BGS Upper Ash Pond. Additional historical information included a topographic survey of the north embankment of the BGS Upper Ash Pond (2011). Reviewing the information provided within the above mentioned documents, the estimated volume of water within the BGS Upper Ash Pond was calculated.

From the 2011 topographic survey, the normal water elevation was approximately 528. From the 1965 drawing of the original structural site preparation grading plan contours, the bottom contour elevation that was present prior to the construction of the BGS Upper Ash Pond was approximately 521. Thus, the total interior storage height of the BGS Upper Ash Pond was approximately 7 feet. Note, the calculated interior storage height does not account for any deposition of CCR/sediment since 1965, as there was no available information regarding recent bathymetric survey data to determine the deposition thickness.

The total surface area of the BGS Upper Ash Pond was approximately 13.3 acres. Thus, the total volume of water within the BGS Upper Ash Pond available for storage was approximately 150,000 cubic yards.

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

The volume of impounded CCR and water (total volume) within the BGS Upper 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 drawing of the original structural site preparation grading plan contours prepared by Black & Veach (1965), which show the original contours prior to the construction of the BGS Upper Ash Pond. Additional historical information included a topographic survey of the north embankment of the BGS Upper Ash Pond (2011). Reviewing the information

provided within the above mentioned documents, the approximate volume of impounded CCR and water in the BGS Upper Ash Pond was calculated.

From the 2011 topographic survey, the normal water elevation was approximately 528. From the 1965 drawing of the original structural site preparation grading plan contours, the bottom contour elevation that was present prior to the construction of the BGS Upper Ash Pond was approximately 521. Thus, the total interior storage height of the BGS Upper Ash Pond was approximately 7 feet.

The total surface area of the BGS Upper Ash Pond was approximately 13.3 acres. Thus, the total volume of impounded CCR and water within the BGS Upper Ash Pond was approximately 150,000 cubic yards.

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

After review of available information provided by BGS pertaining to the status and condition of the existing CCR surface impoundment, discussions with BGS 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 BGS Upper Ash Pond.

Regarding the existing conditions of the BGS Upper 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 south end of the west embankment of the BGS Upper Ash Pond could not be properly inspected due to the presence of dense grassy vegetation (e.g. reeds). 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 west embankment of the BGS Upper Ash Pond could not be properly inspected due to the presence of dense grassy vegetation (e.g. reeds). 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.

{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.}

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

After review of available information provided by BGS pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with BGS 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 BGS Upper Ash Pond.

However, review of historical annual inspections completed in 2011 through 2014, prior to this initial CCR Rule annual inspection, has shown there have been previously identified changes that have affected the operation of the BGS Upper Ash Pond. These identified changes included the following:

- Reconfiguration of the NPDES Outfall 001 (2011). Reconfiguration included the replacement of a 15-inch diameter pvc discharge pipe with a 24-inch wide precast concrete parshall flume. Additionally, the NPDES Outfall 001 reconfiguration included the replacement of the flow monitoring instrumentation. The in-pipe area velocity flow sensor was replaced with an ultrasonic transducer down look sensor.

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