Documentation of Initial Hazard Potential Classification Assessment

Primary Ash Pond
Newton Power Station
Jasper County, Illinois

Stantec Consulting Services Inc.
Design with community in mind
www.stantec.com

Prepared for:
Dynegy

October 12, 2016

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Executive Summary

This report documents the hazard potential classification assessment for the Primary Ash Pond at the Newton Power Station as required per the CCR Rule in 40 C.F.R. § 257.73- (a)(2). The applicable hazard potential classifications are defined in 40 C.F.R. § 257.53 as follows:

> (1) High hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.
>
> (2) Significant hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.
>
> (3) Low hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the surface impoundment owner's property.

Based on these definitions and the analysis herein, the Primary Ash Pond should be classified as a Significant Hazard potential CCR surface impoundment

This report contains supporting documentation for the hazard potential classification assessment. The hazard potential classification for this CCR unit was determined by a visual assessment conducted by Stantec in August, 2016.

1. Introduction

1.1. Background

The CCR Rule was published in the Federal Register on April 17, 2015. The Rule requires that a hazard potential classification assessment be performed for existing CCR surface impoundments that are not incised. A previously completed assessment may be used in lieu of the initial assessment provided the previous hazard assessment was completed no earlier than April 17, 2013. The applicable hazard potential classifications are defined in the CCR Rule 40 C.F.R. § 257.53 as follows:

High Hazard Potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.

Significant Hazard Potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.

Low Hazard Potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the surface impoundment owner's property.

Dynegy has contracted Stantec Consulting Services Inc. (Stantec) to prepare hazard potential classification assessments for selected impoundments[1].

It was determined that there was no existing available hazard potential classification assessment documentation for the Primary Ash Pond.

1.2. Location

The Newton Power Station is located on the west bank of Newton Lake in South Muddy Township, Jasper County, Illinois. The station is located approximately eight miles southwest of the Town of Newton, Illinois.

The Primary Ash Pond is located south of the power station adjacent to Landfill 1. A site layout and overview map is included as Figure 1 in Appendix A.

2. Source Data

The following information was used to perform the hazard assessment of the Primary Ash Pond:

[1] Dynegy Administrative Services Company (Dynegy) contracted Stantec on behalf of the Newton Power Station owner, Illinois Power Generating Company. Thus, Dynegy is referenced in this report.

- Aerial Imagery (USDA National Aerial Imagery Program 2015)
- Topographic Survey Information for the area around the Primary Ash Pond and Landfill 1 (Weaver Consultants Group for Dynegy, December 2015) – 1 foot contour data and planimetrics
- LiDAR Data (Illinois Height Modernization Program ILHMP 2011) – < 9 cm vertical accuracy

3. Potential Failure Scenarios

3.1. Unit Description

The Primary Ash Pond is a diked earthen impoundment extending over an area of approximately 670 acres. The crest of the impoundment is about 15 foot wide at an approximate elevation of 555.0 feet (unless noted, all elevations are referenced to the North American Vertical Datum of 1988 (NAVD88)) with an average adjacent ground elevation outside of the impoundment of about 530.0 feet. The pond has an operating pool about 268.8 acres in size, which currently has a water surface elevation of about 533.5 feet (the interior base of the pond is partially incised). The Primary Ash Pond discharges to the southwest through a concrete control structure to the Secondary Ash Pond.

The Secondary Ash Pond is a diked earthen impoundment covering about 20.9 acres with an average embankment height of about 10 feet. Water from the Primary Ash Pond discharges into the north side of the Secondary Ash Pond, while water from the Secondary Ash Pond discharges into Newton Lake at the south side of the impoundment.

3.2. Failure Scenarios

The Primary Ash Pond earthen dike is elevated above the adjacent grade by about 20 to 25 feet. The impoundment could potentially fail due to a breach of the embankment at any point along its length; therefore, no areas were excluded from evaluation. The embankment was split into sections, and four failure scenarios were evaluated as summarized below.

3.2.1. Scenario 1: West and North Embankment Failure

A failure of this section of the embankment toward the north would discharge into the low area contained to the north and east by the railroad and the west by Landfill 1. A breach in this area would discharge westward towards Landfill 1 along the ditch located at the toe of the Primary Ash Pond embankment. The flow would split at the northwest corner of the Primary Ash Pond and be routed south on either side of Landfill 2. Once the flow passes Landfill 2, it will partially be captured by the Landfill Stormwater Runoff Pond No. 1, with the remaining flow discharging into the western branch of Newton Lake.

A failure of this section of the embankment to the west would be guided by Landfill 1 and 2. Discharge from this breach would also flow into the Landfill Stormwater Runoff Pond No. 1 and the western branch of Newton Lake.

3.2.2. Scenario 2: Northeast Embankment Failure

A failure of this section of the embankment to the northeast would discharge into the area around the Construction Pond and to the eastern branch of Newton Lake. There is a railroad that runs along the base of the embankment that would be significantly impacted by a failure in this direction. However, any structures that might be impacted by a breach in this direction are believed to be temporary facilities associated with the Newton Power Station.

3.2.3. Scenario 3: Southeast Embankment Failure

A failure of this section of the embankment in the southeast direction would result in CCR and water being discharged into the eastern branch of Newton Lake causing significant environmental impacts.

Theoretically, a breach in this direction could cause the pool level in Newton Lake to rise, with the extent of the rise being dependent on the volume of the breach. Based on approximate calculations, the Primary Ash Pond has a pool area of about 270 acres. If the average depth is about 20 feet, about 5,400 acre-feet of water would be lost during a breach. Newton Lake is approximately 2,720 acres in size. A complete breach of the Primary Ash Pond pool that spreads out over the entirety of Newton Lake would result in a rise of about 2 feet.

In addition, if the average depth of stacked waste over the remaining 400 acres of the pond is about 10 feet, that constitutes another potential 4,000 acre-feet of volume. If it is assumed that only about a third of the solids would be lost during a breach event, the combination of solids and water would result in about 6,800 acre-feet of volume for a rise of about 2.5 feet in Newton Lake. The assumption that 1/3 of the solids volume would be lost is based in part on Stantec's experience with other CCR surface impoundment failures and is supported by industry literature. Additionally, for breach purposes solid outflow was conservatively assumed to behave the same as liquids.

There does not appear to be any permanent structures or roadways along Newton Lake that would be adversely impacted by a breach related rise to the extent that lives would be placed at risk. There are two recreation areas with parking lots adjacent to the lake within a 1 mile travel distance of the Primary Ash Pond, but these areas are sufficiently elevated above the lake to pose minimal risk to any people that might be present at the time of a breach.

3.2.4. Scenario 4: Southwest Embankment Failure

A failure of the pond in the southwest direction would result in a discharge of water and CCR into the Secondary Pond and the east and west branches of Newton Lake.

Similar to the southeast embankment failure, it is unlikely this scenario would impact any structures or put any lives at risk downstream. However, there would be an environmental impact to Newton Lake.

4. Hazard Classification

Areas of potential impact were identified with results discussed in Section 3.2 of this report. Based on the results from the analysis of the Primary Ash Pond, it is Stantec's opinion that a breach of the Primary Ash Pond would not result in probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.

Therefore, the Primary Ash Pond fits the definition for Significant Hazard Potential CCR surface impoundments (as defined in the CCR Rule §257.53) (Reference 1).

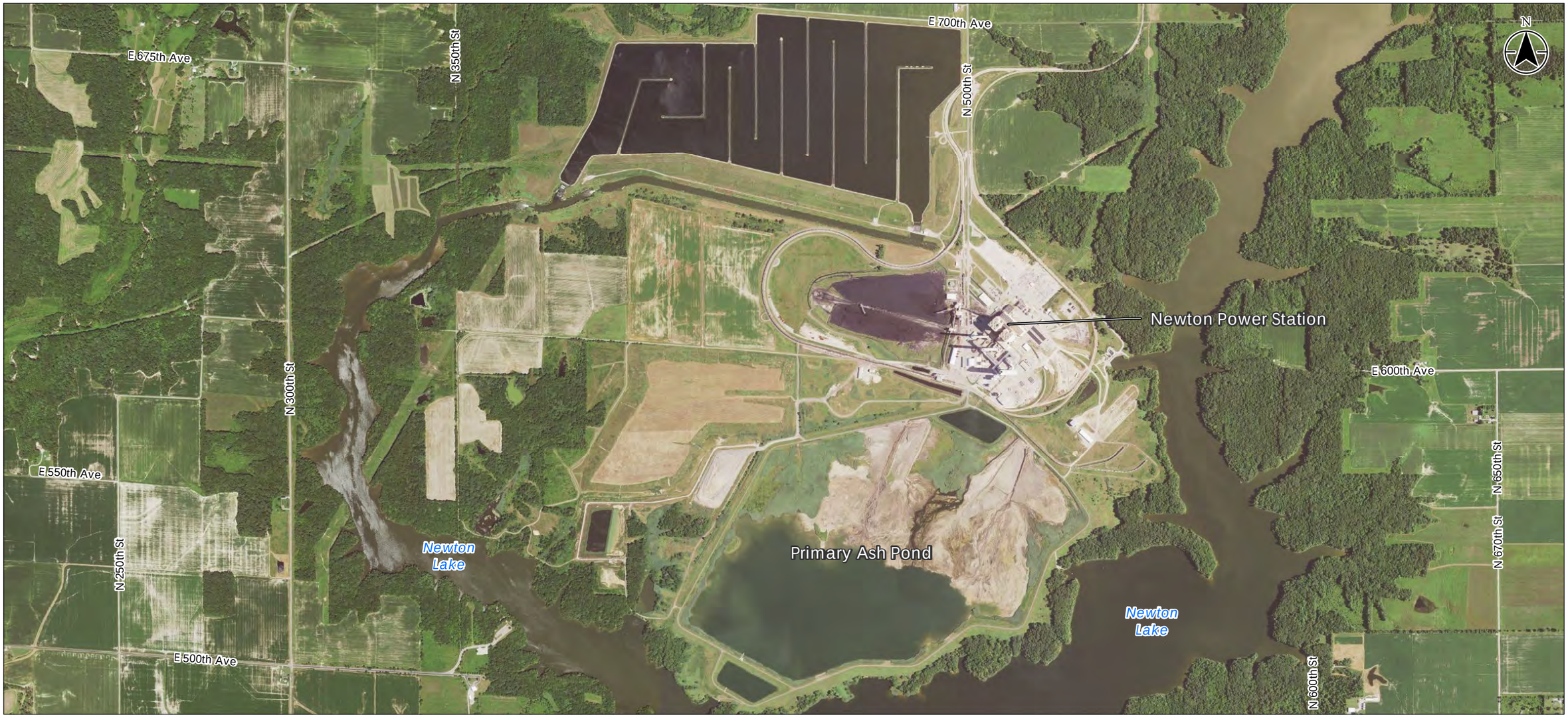
5. References

1. EPA Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities, 40 CFR § 257 and § 261 (effective April 17, 2015).

2. Newton Power Station; Coal Ash Impoundment Site Assessment Report (April 2011).

Appendix A

Site Overview Figure



Notes
1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Aerial Source: 2015 NAIP Imagery
3. Impoundment Boundaries Provided by Client (Dated 9/9/2015)

0 2,000 Feet

1:24,000 (At original document size of 11x17)

Stantec DYNEGY

Project Location	175605019
Latitude: 38.936621	Prepared by WSW on 2016-10-05
Longitude: -88.277038	Technical Review by NS on 2016-10-05
Jasper County, Illinois	Independent Review by MH on 2016-10-05

Client/Project
Dynegy
Hazard Potential Classification Assessment
Newton Power Station

Figure No.
1

Title
Site Overview Figure
Primary Ash Pond
Newton Power Station