MWG

Midwest Generation, LLC

Waukegan Generating Station

2023 Hazard Potential Classification Assessment for East Ash Pond & West Ash Pond

Revision 0

October 13, 2023

Issue Purpose: Use

Project No.: A12661.098

55 East Monroe Street
Chicago, IL 60603-5780 USA
312-269-2000
www.sargentlundy.com

Sargent & Lundy

TABLE OF CONTENTS

1.0 PURPOSE & SCOPE

1.1 PURPOSE

The East Ash Pond and West Ash Pond at Midwest Generation, LLC's (MWG) Waukegan Generating Station ("Waukegan" or the "Station") are existing coal combustion residual (CCR) surface impoundments that are regulated by the Illinois Pollution Control Board's "Standards for the Disposal of Coal Combustion Residuals in CCR Surface Impoundments." These regulations are codified in Part 845 to Title 35 of the Illinois Administrative Code (35 Ill. Adm. Code 845, Ref. 1) and are also referred to herein as the "Illinois CCR Rule." Pursuant to 35 Ill. Adm. Code 845.440(a)(1), MWG must conduct and complete an annual hazard potential classification assessment that documents the hazard potential classifications for the East and West Ash Ponds in accordance with the hazard potential classifications defined in 35 Ill. Adm. Code 845.120.

This report documents the 2023 hazard potential classification assessment conducted and completed in accordance with the Illinois CCR Rule by Sargent & Lundy (S&L) on behalf of MWG for the East and West Ash Ponds at Waukegan. This report:

- Lists the inputs and assumptions used in the 2023 hazard potential classification assessment,
- Lists and compares the definitions for the hazard potential classifications for CCR surface impoundments promulgated by the Illinois CCR Rule and by the U.S. Environmental Protection Agency's regulations for CCR surface impoundments,
- Discusses the methodology used to conduct the 2023 hazard potential classification assessment,
- Provides the 2023 hazard potential classifications for the East and West Ash Ponds in accordance with 35 Ill. Adm. Code 845.440(a)(1).

1.2 SCOPE

In addition to being regulated under the Illinois CCR Rule, the East and West Ash Ponds at Waukegan are also regulated by the U.S. Environmental Protection Agency's (EPA) "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," 40 CFR Part 257 Subpart D (Ref. 2), also referred to herein as the "Federal CCR Rule." Per the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act, the East and West Ash Ponds will continue to be subject to both the Illinois and Federal CCR Rules until the U.S. EPA approves the Illinois EPA's CCR permit program; the Illinois EPA has yet to publish a timeline for submitting its proposed CCR permit program to the U.S. EPA for approval. However, the scope of this 2023 hazard potential classification assessment is strictly limited to demonstrating compliance with the Illinois CCR Rule. Pursuant to 40 CFR 257.73(f)(3), the next hazard potential classification assessment for demonstrating compliance with the Federal CCR Rule will be completed in 2026, five years after the last federal assessment was completed (2021).

2.0 INPUTS

Hazard Potential Classifications

The Illinois CCR Rule (Ref. 1, § 845.120) defines "hazard potential classification" as "the possible adverse incremental consequences that result from the release of water or stored contents due to failure of the diked CCR surface impoundment or mis-operation of the diked CCR surface impoundment or its appurtenances." The Illinois CCR Rule (Ref. 1, § 845.440(a)(1)) requires a CCR surface impoundment be designated as either a Class 1 CCR surface impoundment or a Class 2 CCR surface impoundment. Per 35 Ill. Adm. Code 845.120, the two Illinois hazard potential classifications are defined as follows:

- *Class 1 CCR surface impoundment* means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.
- *Class 2 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.

The Federal CCR Rule (Ref. 2, § 257.53) has the same definition for "hazard potential classification" as the Illinois CCR Rule. However, the Federal CCR Rule has three hazard potential classifications instead of the two designations promulgated by the Illinois CCR Rule. Per 40 CFR 257.53, the three federal hazard potential classifications are defined 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.
- *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.
- *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.

Per the preceding sets of definitions for the federal and Illinois hazard potential classifications, a high hazard potential CCR surface impoundment per the Federal CCR Rule is the same as a Class 1 CCR surface impoundment per the Illinois CCR Rule. Similarly, a CCR surface impoundment that is classified as a low or significant hazard potential per the Federal CCR Rule is considered to be a Class 2 CCR surface impoundment per the Illinois CCR Rule.

A CCR surface impoundment's hazard potential classification is not a reflection of the probability of a hypothetical failure event associated with the surface impoundment. Hazard potential classifications are not contingent upon a CCR surface impoundment's structural stability; they only classify the potential impacts

should a hypothetical failure occur. For example, a well-maintained CCR surface impoundment with appropriate factors of safety may be classified as a Class 1 hazard potential solely because a loss of human life would be probable if a hypothetical failure event did occur. Instead, the structural integrity of a CCR surface impoundment and its potential for failure are evaluated and documented in the structural stability and safety factor assessments prepared pursuant to 35 Ill. Adm. Code 845.450
(Ref. 3) and 35 Ill. Adm. Code 845.460 (Ref. 4).

Site Topography

Two topographic datasets for the East Ash Pond, the West Ash Pond, and the surrounding areas were obtained: one from the U.S. Geological Survey's (USGS) National Elevation Dataset (NED) (Ref. 5) and one from the U.S. Department of Agriculture's (USDA) National Digital Elevation Program (NDEP) (Ref. 6). The USGS dataset was published in 2011 and was utilized in the initial federal hazard potential classification assessment and the 2016 dike breach analysis. The USGS topography reflects elevation data collected in 2007 at a resolution of approximately 3 meters. Based on a review of the USGS NED, the 2007 USGS elevation dataset is the most recent topographic dataset at a 3-meter or better resolution for the Station and surrounding areas. Meanwhile, the USDA topography reflects elevation data collected in 2010 at a 1-meter resolution and was utilized in this 2023 assessment to determine whether the site topography referenced in the initial federal hazard potential classification assessment and the 2016 dike breach analysis should be updated.

Impacted Areas

Areas impacted by a hypothetical failure at either the East Ash Pond or the West Ash Pond were obtained from the ponds' initial federal hazard potential classification assessment (Ref. 7), the dike breach analyses conducted in 2016 for the ponds' northern and southern dikes (Refs. 8 and 9), and the dike breach inundation maps included in the ponds' Emergency Action Plan (Ref. 10). The inputs, assumptions, and methodology utilized to identify areas impacted by failures at each of the ponds' dikes were evaluated to determine whether any updates to these analyses were warranted.

Appendix A provides the initial federal hazard potential classification assessment conducted by Geosyntec Consultants in 2016 for the East and West Ash Ponds.

Aerial Images

Historical and recent aerial images of the Station and surrounding areas were obtained from Google Earth Pro (Ref. 11).

Property Boundaries

Boundaries for the Station's property and adjacent properties were obtained from the geographic information system (GIS) for Lake County, Illinois (Ref. 12).

Ash Pond Conditions

The operating and physical conditions for the East and West Ash Ponds were based on a September 19, 2023 site visit by S&L, discussions with MWG personnel and, the annual inspection reports prepared for the CCR surface impoundments in accordance with 40 CFR 257.83(b) and 35 Ill. Adm. Code 845.540(b) (Refs. 13 through 18).

3.0 ASSUMPTIONS

There are no assumptions in this document that require verification.

4.0 METHODOLOGY

As documented in last year's hazard potential classification assessment, the 2022 hazard potential classifications assigned to the East and West Ash Ponds were based on the initial federal hazard potential classifications assigned in 2016 pursuant to the Federal CCR Rule after it was determined that the bases for the initial federal hazard potential classifications were still valid. Accordingly, the bases for the East and West Ash Ponds' initial federal hazard potential classifications as documented within the ponds' initial federal hazard potential classification assessment were re-evaluated to determine if any changes have occurred since the initial assessment was completed. Identified changes were then evaluated to determine if the ponds' 2022 hazard potential classifications warrant adjustments. Where no changes were noted for a given input, or where identified changes were determined to have no impact to the results and conclusions of the initial federal hazard potential classification assessment, the previous evaluation of that input was considered to still be valid for this 2023 assessment.

In instances where changes to one or more factors used as the bases for the 2022 hazard potential classifications that were identified (*e.g.*, downstream development that was not present in 2016), hypothetical dike breaches were considered at each of the two CCR surface impoundments to evaluate the impacts that a release of CCR and CCR wastewater would have on the identified factor(s). These hypothetical dike breaches were evaluated regardless of potential causes and/or apparent dike stability. When evaluating a hypothetical dike breach at a subject CCR surface impoundment, the solid waste materials in the CCR surface impoundment were conservatively considered as an equivalent volume of liquid, and the CCR surface impoundment was assumed to be entirely filled with liquid.

When evaluating the downstream impacts from a hypothetical dike breach at a CCR surface impoundment, the primary consideration examined was whether a loss of human life is probable under the given hypothetical failure scenario. Loss of human life is the critical aspect of the Class 1 hazard potential classification. If a loss of human life is unlikely to occur, then the CCR surface impoundment was not considered to be a Class 1 hazard potential and was instead classified as a Class 2 hazard potential.

5.0 ASSESSMENT

5.1 SUMMARY OF 2022 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

The previous hazard potential classification assessment for the East and West Ash Ponds was completed on October 14, 2022. Ultimately, the 2022 hazard potential classifications for the East and West Ash Ponds were based on the initial federal hazard potential classifications that were assigned to the ponds in 2016 after it was determined that the bases for the initial federal hazard potential classifications were still valid. Per the initial federal hazard potential classification assessment for the East and West Ash Ponds, the ponds were classified as significant hazard potential CCR surface impoundments pursuant to 40 CFR 257.53. Based on the comparison between the Federal and Illinois CCR Rules' definitions for hazard potential classifications in Section 2.0, a significant hazard potential CCR surface impoundment under the Federal CCR Rule is the equivalent of a Class 2 CCR surface impoundment under the Illinois CCR Rule. Therefore, the East and West Ash Ponds were classified as Class 2 CCR surface impoundments in the 2022 hazard potential classification assessment.

5.2 SUMMARY OF INITIAL FEDERAL HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

The initial federal hazard potential classification assessment for the East and West Ash Ponds was completed in October 2016 and is included in its entirety in Appendix A. This assessment evaluated the potential consequences of hypothetical dike failures for both ponds. A quantitative dike breach analysis was also conducted for the northern and southern dikes of each pond, which were determined to pose the most risk to human life due to their proximities to occupied buildings and the adjacent topography sloping towards the occupied buildings. Specifically, several Station buildings are downstream of the ponds' northern dikes, and the Waukegan Water Reclamation Facility (WWRF) is downstream of the ponds' southern dikes. The 2016 dike breach analysis also assumed that the East and West Ash Ponds were full at the time of the hypothetical failure. Moreover, the analysis assumed that a hypothetical failure at either pond's southern dike occurred concurrently with the peak flow of stormwater within the unnamed channel during the probable maximum flood event for the area.

5.2.1 SOUTHERN DIKE BREACH ANALYSES

Per Figures 2 through 5 in Appendix A, the 2016 dike breach analysis concluded that the flood released through a hypothetical breach in the East Ash Pond's southern dike could impact eight occupied buildings at the WWRF. Meanwhile, it was determined that a flood released through a similar breach at the West Ash Pond's southern dike could impact an additional six occupied buildings at the WWRF (14 buildings in total). The 2016 dike breach analysis also concluded that the combination of the estimated flood velocity and depth at each of these occupied buildings is within the U.S. Department of the Interior, Bureau of Reclamation's

(USBR) “Low Danger Zone” (see Figure 10 in Appendix A). In its “Downstream Hazard Classification Guidelines” (Ref. 19), the USBR states that if the depth-velocity combination of a hazard (*e.g.*, flood) for a given area plots within the “Low Danger Zone,” “the number of lives-in-jeopardy associated with possible downstream hazards is assumed to be zero.” In other words, floods plotting within the USBR’s “Low Danger Zone” are unlikely to cause a probable loss of human life. Therefore, the initial federal hazard potential classification assessment concluded that a failure at the southern dike of either the East Ash Pond or the West Ash Pond would not result in a probable loss of human life.

5.2.2 NORTHERN DIKE BREACH ANALYSES

Per Figures 6 through 9 in Appendix A, the 2016 dike breach analysis concluded that the flood released through a hypothetical breach in the northern dike of either the East Ash Pond or the West Ash Pond could impact several unoccupied buildings and three occupied buildings at the Station. The 2016 dike breach analysis also concluded that the combination of the estimated flood velocity and depth at each of these occupied buildings is within the USBR’s “Low Danger Zone” (see Figure 10 in Appendix A). As previously stated, depth-velocity combinations plotting within the “Low Danger Zone” are unlikely to cause a probable loss of human life. Therefore, the initial federal hazard potential classification assessment concluded that a failure at the northern dike of either the East Ash Pond or the West Ash Pond would not result in a probable loss of human life.

5.2.3 HAZARD POTENTIAL CLASSIFICATIONS

Although a hypothetical failure at either the East Ash Pond or the West Ash Pond was determined to not cause a probable loss of human life, it was also determined that wastewater released from a dike breach at either pond had the potential to flow directly into Lake Michigan and cause offsite environmental impacts. Therefore, the East and West Ash Ponds were both classified as significant hazard potential CCR surface impoundments.

5.3 CHANGES IN BASES FOR INITIAL FEDERAL HAZARD POTENTIAL CLASSIFICATIONS

5.3.1 CHANGES IN ASH POND OPERATIONS & EMBANKMENT GEOMETRY

In June 2020, Waukegan took the West Ash Pond out of service for routine cleaning. During a site visit in September 2021, it was noted that most of the CCR previously stored in the West Ash Pond had been removed and minimal surface water remained. In April 2021, MWG filed a notice of intent to close the West Ash Pond in accordance with the Federal CCR Rule’s closure criteria (Ref. § 257.102). Following the retirements of Units 7 and 8 in June 2022, Waukegan ceased placing CCR wastestreams in the East Ash Pond. However, the pond will continue to manage stormwater run-off from the Station property until an

alternate stormwater retention basin is constructed at the site, at which point MWG will file a notice of intent to close the East Ash Pond. Closure construction activities will commence at both ponds upon receipt of closure construction permits from the Illinois EPA in accordance with Subpart B of the Illinois CCR Rule.

As previously mentioned in Section 5.1, the 2016 federal hazard potential classification assessment for the East and West Ash Ponds examined hypothetical breach scenarios assuming both ponds were at capacity; therefore, the assumed operating conditions used for the initial assessment are conservative for the ponds' current operating conditions. Therefore, there is no basis to re-evaluate the surface water elevations used to conduct the initial federal hazard potential classification assessment for the East and West Ash Ponds.

Based on reviews of the annual inspection reports (Refs. 13 through 18) and Google Earth aerial images (Ref. 11), there have been no significant modifications to the East and West Ash Ponds (mass excavations, major embankment modifications, *etc*.) since the initial federal hazard potential classification assessment was completed. It should be noted that the lowering of the East Ash Pond's eastern dike in the fall of 2016, as noted in the 2017 annual inspection report (Ref. 13), was incorporated into the initial federal hazard potential classification assessment and 2016 dike breach analysis. Therefore, there is no basis to re-evaluate the embankment geometry for this 2023 assessment.

5.3.2 CHANGES IN SITE TOPOGRAPHY

When comparing the 2007 USGS topography (Ref. 5) used in the initial federal hazard potential classification assessment and the 2010 USDA elevation dataset for the area (Ref. 6), no significant differences in the topography adjacent to the ash ponds and within the dike breach impact areas were identified. Moreover, Google Earth aerial images (Ref. 11) indicated that there have been no significant modifications to the ground surfaces (mass excavations, mass fill placement, *etc*.) adjacent to the East and West Ash Ponds or within the dike breach impact areas since 2010, the source date for the USDA elevation dataset. Based on these observations, the topographic data used by the initial federal hazard potential classification assessment remains valid for this 2023 assessment.

5.3.3 CHANGES IN DOWNSTREAM PROPERTY DEVELOPMENTS

Based on reviews of Google Earth aerial images (Ref. 11) and the Lake County, Illinois GIS (Ref. 12), no new buildings or transport corridors (roads, rail lines, *etc*.) have been constructed since the initial hazard potential classification assessment within the dike breach impact areas. Thus, there is no basis to reevaluate the potential impacts to the areas downstream of the East and West Ash Ponds for this 2023 assessment.

5.3.4 CHANGES IN USBR DEPTH-VELOCITY FLOOD DANGER LEVELS

The USBR has not updated the depth-velocity flood danger level relationships presented in its "Downstream Hazard Classification Guidelines" (Ref. 19) since the initial federal hazard potential classification assessment for the East and West Ash Ponds was completed in 2016. Therefore, there is no basis to re-evaluate the danger levels assigned to the occupied buildings identified within the inundation areas downstream of the northern and southern dikes for the East and West Ash Ponds.

5.4 2023 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

Other than the changes in the operational statuses of the East and West Ash Ponds, there have been no significant modifications to the East and West Ash Ponds; no significant modifications to the topography adjacent to and downstream of these CCR surface impoundments; and no significant buildings or transport corridors that have been constructed in the areas downstream of the CCR surface impoundments that would be impacted by a hypothetical dike breach. There have also been no changes to the USBR's depth-velocity flood danger level relationships, which were used in the 2016 federal hazard potential classification assessment. Therefore, the initial federal hazard potential classification assessment completed in 2016 for these CCR surface impoundments remains valid. In addition, the 2016 dike breach analyses for the ponds' northern and southern dikes still represent the worst-case failure scenarios for each pond since these dikes are the closest to occupied Station and WWRF buildings.

Based on the preceding observations, the initial federal significant hazard potential classifications assigned to the East and West Ash Ponds in accordance with 40 CFR 257.73(a)(2) and the bases for these assignments remain valid for this 2023 assessment. A loss of human life is unlikely to result from a hypothetical failure at these CCR surface impoundments, but potential offsite environmental damage could occur to Lake Michigan. As discussed in Section 2.0, a CCR surface impoundment classified as a significant hazard potential per the Federal CCR Rule is considered to be an Illinois Class 2 CCR surface impoundment. Therefore, the East and West Ash Ponds remain classified as Class 2 CCR surface impoundments pursuant to 35 Ill. Adm. Code 845.440(a)(1). However, this is not a reflection of the potential for the impoundments to fail. The 2023 annual safety factor assessment conducted pursuant to 35 Ill. Adm. Code 845.460 (Ref. 4) shows that the East and West Ash Ponds are stable under design operating conditions. Moreover, no visual signs of distress that could be indicative of dike instability were observed during the September 19, 2023, condition assessment performed by S&L in support of the ponds' 2023 annual structural stability assessment under 35 Ill. Adm. Code 845.450 (Ref. 3).

6.0 CONCLUSIONS

This assessment re-evaluated the factors and design inputs used as the bases for the initial federal hazard potential classification assessment completed in 2016 in accordance with the Federal CCR Rule for Waukegan's East and West Ash Ponds. It was determined that no significant operational or physical changes to these CCR surface impoundments and no new downstream developments within the dike breach inundation areas have occurred within the last seven years that would necessitate changing either pond's initial federal hazard potential classification. Therefore, because the 2022 Illinois hazard potential classifications for the East and West Ash Ponds were based on their respective 2016 federal hazard potential classifications, the 2022 Illinois hazard potential classifications assigned to the East and West Ash Ponds and the bases for these assignments remain valid for 2023.

Table 6-1 presents the 2023 hazard potential classifications assigned to the East and West Ash Ponds at Waukegan in accordance with 35 Ill. Adm. Code 845.440(a)(1).

Table 6-1 – 2023 Illinois Hazard Potential Classifications for East Ash Pond & West Ash Pond at the Waukegan Generating Station

CCR Surface Impoundment	2023 Illinois Hazard Potential Classification
East Ash Pond	Class 2
West Ash Pond	Class 2

However, as noted above, the 2023 hazard potential classifications for the East and West Ash Ponds do not reflect the probability of a hypothetical failure event associated with the ponds and are not contingent upon the ponds' structural stabilities. Indeed, the 2023 annual safety factor assessment conducted pursuant to 35 Ill. Adm. Code 845.460 (Ref. 4) shows that the East and West Ash Ponds are structurally stable under design operating conditions. Moreover, no visual signs of distress that could be indicative of dike instability were observed during S&L's September 19, 2023, condition assessment performed in support of the ponds' 2023 annual structural stability assessment under 35 Ill. Adm. Code 845.450 (Ref. 3).

7.0 CERTIFICATION

I certify that:

- This hazard potential classification assessment was prepared by me or under my direct supervision.
- The work was conducted in accordance with the requirements of 35 Ill. Adm. Code 845.440.
- I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin Date: October 13, 2023

Seal:

Thomas Dehlin
2023.10.13
09:36:43-05'00'

8.0 REFERENCES

1. Illinois Pollution Control Board. “Standards for Disposal of Coal Combustion Residuals in CCR Surface Impoundments.” 35 Ill. Adm. Code 845. Accessed October 13, 2023.
2. U.S. Environmental Protection Agency. “Standards for Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments.” 40 CFR Part 257 Subpart D. https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-257/subpart-D. Accessed October 13, 2023.
3. Sargent & Lundy. “2023 Structural Stability Assessment for East Ash Pond & West Ash Pond.” October 13, 2023.
4. Sargent & Lundy. “2023 Safety Factor Assessment for East Ash Pond & West Ash Pond.” October 13, 2023.
5. U.S. Geological Survey, National Elevation Dataset. ned19_n42x50_w088x00_il_lakeco_2007 1/9 arc-second 2011 15 x 15 minute IMG (April 16, 2007 – May 7, 2007). Published January 1, 2011.
6. U.S. Department of Agriculture, Natural Resources Conservation Service, National Geospatial Center of Excellence. “LiDAR Elevation Dataset - Bare Earth DEM - 1 Meter.” (2010). Processed June 2021.
7. Geosyntec Consultants. “Hazard Potential Classification Assessment, East and West Ash Basins, Waukegan Station.” October 2016.
8. Geosyntec Consultants. “Waukegan Station, East Ash Basin, Hazard Potential Classification Assessment Embankment Breach Analysis.” October 17, 2016.
9. Geosyntec Consultants. “Waukegan Station, West Ash Basin, Hazard Potential Classification Assessment Embankment Breach Analysis.” October 17, 2016.
10. Civil & Environmental Consultants, Inc. “Emergency Action Plan, East and West Ash Basins, Waukegan Station.” November 2022.
11. Google Earth Pro v7.3.0.3832. Accessed October 13, 2023.
12. Lake County, Illinois Maps Online. https://maps.lakecountyil.gov/mapsonline/. Accessed October 13, 2023.
13. Geosyntec Consultants. “Annual Inspection Report, West and East Ash Basins, Waukegan Station.” October 9, 2017.
14. Civil & Environmental Consultants, Inc. “Annual Inspection Report, East Ash Pond and West Ash Pond, Waukegan Station.” October 16, 2018.

15. Civil & Environmental Consultants, Inc. “Annual Inspection Report, East Ash Pond and West Ash Pond, Waukegan Station.” October 16, 2019.
16. Civil & Environmental Consultants, Inc. “Annual Inspection Report, East Ash Pond and West Ash Pond, Waukegan Station.” October 9, 2020.
17. Civil & Environmental Consultants, Inc. “Annual Inspection Report, East Ash Pond and West Ash Pond, Waukegan Station.” October 13, 2021.
18. Civil & Environmental Consultants, Inc. “Annual Inspection Report, East Ash Pond and West Ash Pond, Waukegan Station.” October 26, 2022.
19. U.S. Department of the Interior, Bureau of Reclamation. “Downstream Hazard Classification Guidelines.” ACER Technical Memorandum No. 11. December 1988.

APPENDIX A: 2016 FEDERAL HAZARD POTENTIAL CLASSIFICATION ASSESSMENT FOR EAST & WEST ASH PONDS