

2023 ANNUAL DAM AND DIKE INSPECTION REPORT

CCR - PRIMARY BOTTOM ASH POND

WELSH POWER PLANT
CASON, TEXAS

July 2023

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2023 Annual Dam & Dike Inspection Report

CCR-Primary Bottom Ash Pond

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INSPECTION DATE: June 20, 2023

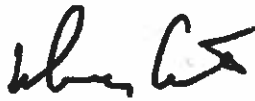
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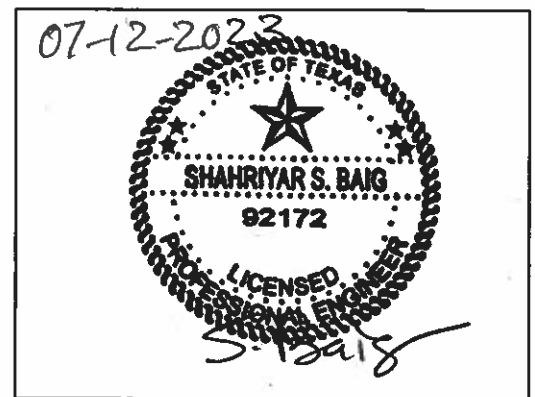


DATE:

07/14/2023

Bryan W. Brunton, P.E.

Manager - Geotechnical Engineering



PROFESSIONAL ENGINEER
SEAL & SIGNATURE

I certify to the best of my knowledge, information, and belief the information contained in this report meets the requirements of 40 CFR § 257.83(b).

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1.0 INTRODUCTION

This report was prepared by AEP- Geotechnical Engineering Services (GES) section, in part, to fulfill requirements of 30 TAC 352.831 (40 CFR 257.83) and to provide Southwestern Electric Power Company (SWEPCO) and Welsh Power Plant with an evaluation of the facility.

The AEP J. Robert Welsh Plant is located in southern Titus County, approximately 8 miles northeast of Pittsburg, Texas, and approximately two miles northwest of Cason, Texas. Figure 1 shows the plant inspection vicinity map. The CCR units at the Welsh Plant includes the Primary Bottom Ash Pond (PBAP), Bottom Ash Storage Pond (BASP), and the Landfill. The Primary Bottom Ash Pond CCR unit is located southwest of the Plant and directly west of the Welsh Reservoir and the Landfill is located between the PBAP and the BASP. The Bottom Ash Storage Pond CCR unit is located at the south end of the Plant and approximately 1,000 feet west of the Welsh Reservoir. A non-CCR pond (Clearwater Pond) is located at the southeast corner of PBAP and east of the Landfill. Figure 2 shows the two ash ponds general layout.

Mr. Shah Baig, P.E., from the Geotechnical Engineering Services Section, conducted the PBAP inspection. Mr. Greg Carter, P.E. Regional Engineering for Welsh Plant was the facility contact for the inspection and participated during the inspection. The inspection was performed on June 20, 2023. Weather conditions were mostly sunny, clear skies, light breeze, with temperatures ranging from 90° F in the morning to high 100's° F in the afternoon. There was 5.06 inches of rainfall over the seven days prior to the inspection.

This report has been prepared by Mr. Shah Baig, P.E., under the direct supervision of Mr. Bryan Brunton, P.E., AEP's Geotechnical section manager. The report presents: Description of the impoundments, Summary of Visual Observations; Conclusions; and Recommendations. Photographs identifying typical conditions of area findings, items that need correction or requiring additional monitoring, have been selected from the inspection field photographic file and provided in the Appendices B and C of this report.

2.0 DESCRIPTION OF IMPOUNDMENT

2.1 PRIMARY BOTTOM ASH POND

The Primary Bottom Ash Pond was placed into operation in 1977 and is located in a topographically low area that had been an unnamed intermittent tributary of Swauano Creek prior to development of the Site. The Primary Bottom Ash Pond is bounded by natural ground surface (topographically higher areas) to the north and west, and embankment dike to the east and canal to the south. The elevation at the top of embankment along the crest area is approximately 340.0 feet above msl and the toe elevation of the embankment is approximately 300.0 feet above msl. The Primary Bottom Ash Pond embankment is approximately 40 feet in height. The downstream slope of the Primary Bottom Ash Pond embankment is inundated by the cooling lake reservoir (Normal Lake Level is 320.0 feet above msl). These dikes are predominantly constructed of compacted sandy clay and clayey sand. The embankment dike south of the PBAP includes a drainage canal that receives overflow (clear) water from the PBAP. The water level in the PBAP is controlled by a weir box which discharges into the drainage canal. The primary emergency spillway, which consists of a concrete weir set within an earthen channel that discharges into the drainage canal; the primary emergency spillway is approximately 950 feet to the west of the embankment. The clear water in the drainage canal flows east and discharges into the clear water pond. The secondary emergency spillway is located at the right end of the embankment and discharges directly into the Clearwater Pond. Dimensions of the secondary emergency spillway are a 30-foot bottom width at crest elevation 335 feet msl with 10H:1V side slopes, for a total width of 130 feet and depth of 5 feet. Flows through the secondary emergency spillway would discharge directly into the Clearwater Pond. The storage capacity of the Primary Bottom Ash Pond at elevation 334 feet above msl is approximately 319.22 acre-ft.

3.0 REVIEW OF AVAILABLE INFORMATION (257.83(b)(1)(i))

A review of available information regarding the status and condition of the PBAP, which include files available in the CCR operating record, such as design and construction information, periodic structural stability assessments, previous 7-day inspection reports, 30-day instrumentation data, and previous annual inspections has been conducted. Based on the review of the data there were

no signs of actual or potential structural weakness or adverse conditions.

4.0 CHANGES IN GEOMETRY SINCE LAST INSPECTION (257.83(b)(2)(i))

No modifications have been made to the geometry of the Primary Bottom Ash Pond since the last annual inspection. The geometry of the impoundment has remained essentially unchanged.

5.0 CHANGES THAT EFFECT STABILITY OR OPERATION (257.83(b)(2)(vii))

Based on interviews with plant support personnel and field observations there were no changes to the Primary Bottom Ash Pond since the last annual inspection that would affect the stability or operation of the impounding structure.

In April of 2021, the Bottom Ash Storage Pond ceased operations and no longer receives any CCR transport waters or CCR materials into the pond. These operational changes would not be expected to affect the stability of the impounding structure.

6.0 IMPOUNDMENT CHARACTERISTICS (257.83(b)(2)(iii, iv, v))

6.1 PRIMARY BOTTOM ASH POND

Table 1 is a summary of the minimum, maximum, and present depth, and elevation of the impounded water since the previous annual inspection; the storage capacity of the impounding structure at the time of the inspection; and the approximate volume of the impounded water at the time of the inspection.

Table 1 - Summary of Relevant Storage Information for Primary Bottom Ash Pond

	Primary Bottom Ash Pond
Approximate Minimum depth of impounded water since last annual inspection	30.5 ft (330.5 ft)
Approximate Maximum depth of impounded water since last annual inspection	33.8 ft (333.8 ft)
Approximate Present depth of impounded water at the time of the inspection	32.17 ft (332.17 ft)

Approximate Minimum depth of CCR since last annual inspection	10.0 ft (310.0 ft)
Approximate Maximum depth of CCR since last annual inspection	33.8 ft (333.80 ft)
Approximate Present depth of CCR at the time of the inspection	32.5 ft (332.50 ft)
Storage Capacity of impounding structure at the time of the inspection	319.22 acre-ft
Approximate volume of impounded water at the time of the inspection	99.22 acre-ft
Approximate volume of CCR at the time of the inspection	220 acre-ft

7.0 INSPECTION (257.83(b)(1)(ii))

7.1 GENERAL

The summary of the visual observations uses terms to describe the general appearance or condition of an observed item, activity, or structure. Their meaning is understood as follows:

- Good: A condition or activity that is generally better or slightly better than what is minimally expected or anticipated from a design or maintenance point of view.
- Fair or Satisfactory: A condition or activity that generally meets what is minimally expected or anticipated from a design or maintenance point of view.
- Poor: A condition or activity that is generally below what is minimally expected or anticipated from a design or maintenance point of view.
- Minor: A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is below what is normal or desired, but which is not currently causing concern from a structure safety or stability point of view.
- Significant: A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance program has neglected to improve the

condition. Usually, conditions that have been previously identified in the previous inspections but have not yet been corrected.

Excessive: A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is below or worse than what is normal or desired, and which may have affected the ability of the observer to properly evaluate the structure or area being observed or which may be a concern from a structure safety or stability point of view.

In addition, a “deficiency” is some evidence that a dam/dike has developed a problem that could impact the structural integrity of the dam/dike. There are four general categories of deficiencies.

These four categories are described below:

1. Uncontrolled Seepage

Uncontrolled seepage is seepage that is not behaving as the design engineer has intended. An example of uncontrolled seepage is seepage that comes through or around the embankment and is not picked up and safely carried off by a drain. Seepage that is collected by a drain can still be uncontrolled if it is not safely collected and transported, such as seepage that is not clear. Seepage that is unable to be measured and/or observe it is considered uncontrolled seepage.

[Wet or soft areas are not considered as uncontrolled seepage but can lead to this type of deficiency. These areas should be monitored frequently]

2. Displacement:

Displacement of the embankment is large scale movement of part of the dam/dike. Common signs of displacement are cracks, scraps, bulges, depressions, sinkholes, and slides.

3. Blockage of Control Features:

Blockage of Control Features is the restriction of flow at spillways, decant or pipe spillways, or drains.

4. Erosion:

Erosion is the gradual movement of surface material by water, wind, or ice. Erosion is considered a deficiency when it is more than a minor routine maintenance item.

7.2 VISUAL INSPECTION (257.83(b)(2)(i))

A visual inspection of the CCR Ponds was conducted to identify any signs of distress or malfunction of the impoundment and appurtenant structures. Specific items inspected included all structural elements of the dam such as upstream and downstream slopes, crest, and toe. Photograph's location map and inspection photographs are included in Appendices B and C.

7.2.1 PRIMARY BOTTOM ASH POND

- (i) The two ash discharge pipes are located at the northeast corner of the pond. Other effluent from the plant is discharge at the north dike. All the sluice pipes and base support did not indicate any sign of misalignment, settlement, or deterioration. Overall, the discharge pipes appeared in good functional condition. Photograph No. 1 illustrate the northeast area of the pond where the sluice discharge pipes are located.

- (ii) Typical condition of the upstream slope, crest, and downstream slope of the east dike is illustrated in Photographs No. 1-8. The dike appeared in satisfactory and stable condition. There were no signs of settlement, misalignment, sloughing or erosion. Slightly overgrown vegetation was noticed along the upstream slope and on the downstream slope at the riprap (Photograph No. 6).

- (iii) Typical view of the south section of the dike is illustrated in Photograph No. 9. Slightly overgrown vegetation was notices along the upstream slope. The dike appeared in good and functional condition without any significant erosion, settlement, or misalignment.

- (iv) Photograph No. 10 illustrate the overall view of the north dike upstream slope. The north dike also supporting the railroad appeared in good and stable condition. Excessive vegetation was noticed covering the upstream slope.

- (iii) Photographs No. 11-13 illustrates the primary emergency spillway located towards the southeast section of the south dike. A concrete weir is located at the spillway was mostly buried in the ground. The primary emergency spillway appeared to be in satisfactory

condition. The secondary emergency spillway (discharge canal) was in satisfactory condition and showed no signs of erosion, misalignment, deterioration, or misplaced rip rap material.

- (iv) A discharge canal is located at the south end of the pond. A typical view of the overflow discharge structure, weir box, and canal are illustrated in Photographs No. 14-16. The canal conveys water from southwest corner of the ash pond to the Clearwater Pond located at the southeast end. The canal indicated positive drainage condition (Photograph No. 16).

7.3 INSTRUMENTATION (257.83(b)(2)(ii))

The monitoring instrumentation for the Primary Bottom Ash Pond consists of the one (1) active piezometer (B-2) located through the main embankment area. The location of the instrumentation is shown in Attachment C, Figure 4A. The maximum and minimum readings of Piezometer B-2 since the last annual inspection, a time period between November 2022 to July 2023, were 324.77 ft msl and 322.57 ft msl, respectively. Piezometer B-2 levels appeared consistent from month to month and reacted to the fluctuation in tail water levels (i.e., main lake). The results of the measurements of the piezometer are shown in Appendix C, Figure 4B.

8.0 SUMMARY OF FINDINGS

Based on the visual observations and the inspection of the facilities, the dam and appurtenances are generally in satisfactory condition. Specific conclusions related to this inspection is included as follows.

- There is no evidence of distress that would indicate the possibility of immediate sliding, slope instability, settlement, misalignment or cracking of the ash pond embankments. As such it is concluded that the dam and dikes are performing as designed.
- The hog rutting damage previously noticed on the downstream slope of the Primary Bottom Ash Pond was fixed.

- Overgrown vegetation was noticed throughout the pond areas and should be maintained accordingly.

9.0 RECOMMENDATIONS

A summary of our recommendations for general maintenance and continued monitoring, as well as any recommendations for remedial activities, is provided as follows:

- As noted, all the excessive vegetation should be cut down and maintained consistently to control and properly manage it.

9.1 MAINTENANCE ITEMS

The following maintenance items were identified during the visual inspection:

- Vegetation management for the facilities is considered satisfactory and should continue to have controlled vegetation growth.

9.2 ITEMS TO MONITOR

- No items to monitor

9.3 DEFICIENCIES (257.83(b)(2)(vi))

There were no deficiencies or signs of structural weakness or disruptive conditions that were observed at the time of the inspection that would require additional investigation or remedial action. There were no deficiencies noted during any of the quarterly inspections. If any of these conditions occur before the next annual inspection, contact AEP Geotechnical Engineering immediately.

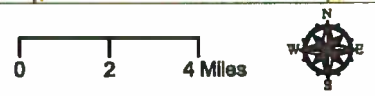
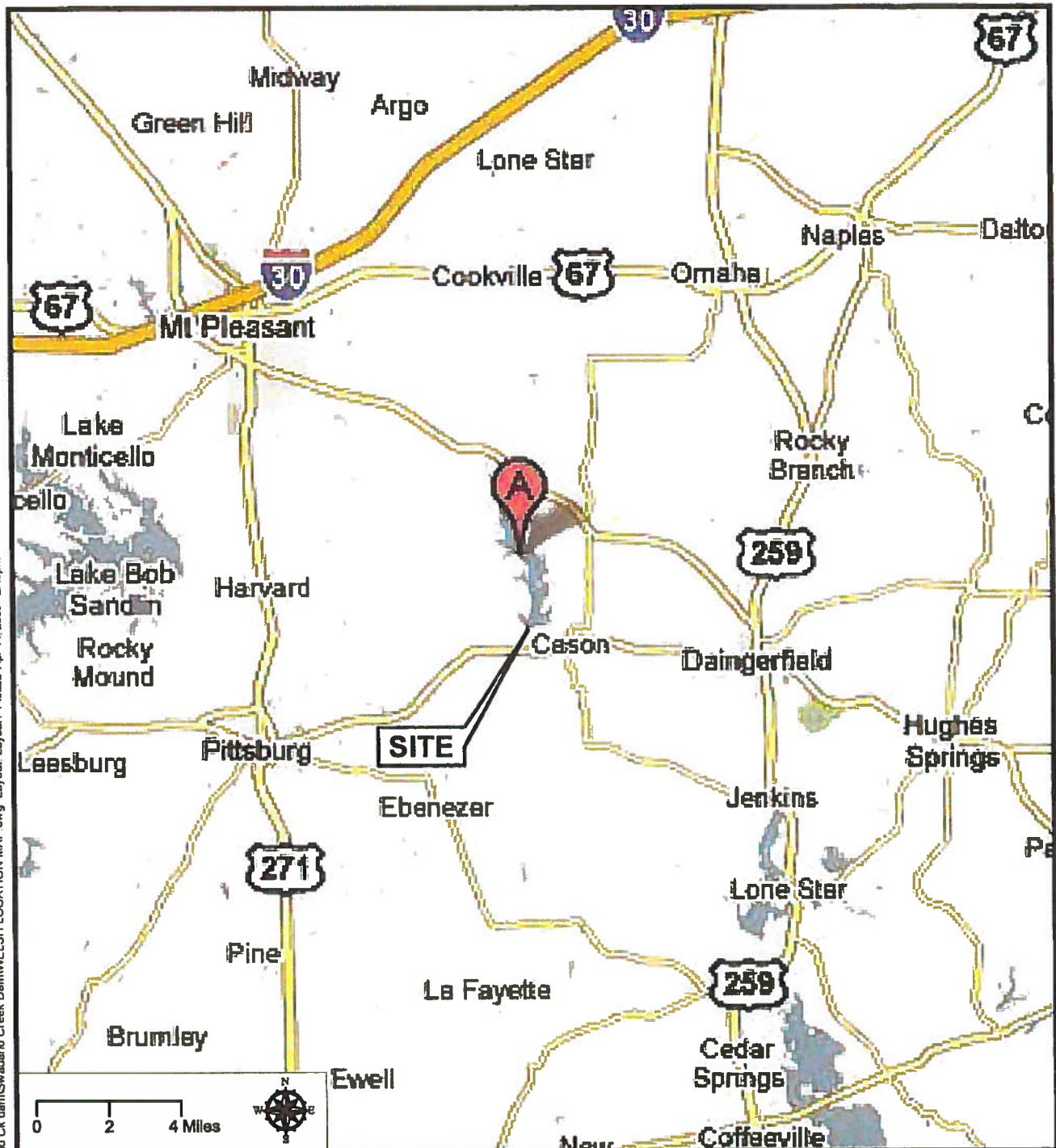
If you have any questions regarding this report, please contact Shah Baig (Audinet: 200-2241, Phone: 614-716-2241, email: sbaig@aep.com) or Bryan Brunton (Audinet: 200-3090, Phone: 614716-3090, bwbrunton@aep.com)

Appendix A

Figure 1 - Vicinity Map

Figure 2 - CCR Pond Complex General Layout

File: Q:\AEP Dam Inspections\Welsh\Drawings\Swauano Ck dam\Swauano Creek Dam\WELSH LOCATION MAP.dwg Layout: Layout1 Plotted Apr 14, 2009 - 2:45pm



Source: Google Maps

AEP WELSH POWER PLANT SWAUANO CREEK DAM TITUS COUNTY, TX	
	URS Corporation 9400 Amberglen Blvd. Austin, Texas 78729
DAM & DIKE INSPECTION VICINITY MAP	
DATE	4/14/2009
SCALE	1" = 4 MILES
URS JOB NUMBER	41009103
DRAWN BY	SLC

Figure 1 Plant Inspection Vicinity Map

FIGURE 2 - SITE LOCATION MAP

WELSH POWER PLANT, CASON, TX



Appendix B

Figure 3 – Photograph Location Map, Primary Bottom Ash Pond
Photographs of Primary Bottom Ash Pond

FIGURE 3 - PHOTOGRAPH LOCATION MAP

PRIMARY BOTTOM ASH POND, WELSH POWER PLANT, CASON, TX



Photograph No. 1

Ash sluice discharge pipes in the northeast corner of the pond.



Photograph No. 2

Typical view of Primary Bottom Ash Pond upstream slope and downstream of discharge pipes.



Photograph No. 3

Typical crest of the Primary Bottom Ash Pond.



Photograph No. 4
Typical downstream slope
(looking north).



Photograph No. 5
Typical downstream slope
(looking south).



Photograph No. 6
Lower riprap section of the
downstream slope.



Photograph No. 7

Downstream slope and crest of the east dike.



Photograph No. 8

The upstream slope of the east dike and the pond (looking north).



Photograph No. 9

Typical section of the south dike.



Photograph No. 10
The upstream slope of the north dike supporting the railroad.



Photograph No. 11
Emergency spillway.



Photograph No. 12
Emergency spillway (looking north).



Photograph No. 13
Emergency spillway (looking south)



Photograph No. 14
Overflow discharge structure.



Photograph No. 15
Overflow weir at the discharge structure.



Photograph No. 16
Overflow canal.



Appendix C

Figure 4A - Piezometers Location Map

Figure 4B - Primary Bottom Ash Pond Piezometer Data

