2021 ANNUAL DAM AND DIKE INSPECTION REPORT

CCR ASH PONDS

WELSH POWER PLANT

CASON, TEXAS

December, 2021

Prepared by: American Electric Power Service Corporation

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Columbus, OH 43215

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2021 Dam & Dike Inspection Report

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INSPECTION DATE **October 19 and 20, 2021**

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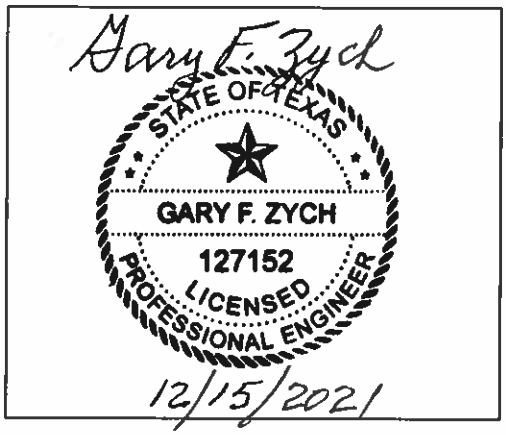

PROFESSIONAL ENGINEER SEAL & SIGNATURE

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 Ash ponds at the Welsh Plant include the Primary Bottom Ash Pond and the Bottom Ash Storage Pond. The Primary Bottom Ash Pond CCR unit is located southwest of the Plant and directly west of the Welsh Reservoir. 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. Figure 2 shows the two Ash Ponds general layout.

Mr. Brett A. Dreger, P.E., from the Geotechnical Engineering Services Section, conducted the Ash Ponds 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 October 19 and 20, 2021. Weather conditions were mostly sunny, with temperatures ranging from 59° F in the morning to low 80's° F in the afternoon.

This report has been prepared by Mr. Brett A. Dreger, P.E., under the direct supervision of Mr. Gary Zych, 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 Attachments B and C of this report.

2.0 DESCRIPTION OF IMPOUNDMENTS

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 dikes to the south and east. 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 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 Primary Bottom Ash Pond includes a drainage canal that receives overflow (clear) water from the Primary Bottom Ash Pond. The water level in the Primary Bottom Ash Pond is controlled by a weir box which discharges into the drainage canal. The clear water in the drainage canal flows east and discharges into the clear water pond. The Primary Bottom Ash Pond embankment is approximately 40 feet in height. The storage capacity of the Primary Bottom Ash Pond at elevation 334 feet above msl is approximately 319.22 acre-ft.

2.2 BOTTOM ASH STORAGE POND

The Bottom Ash Storage Pond (Winston Pond) was placed into operation in 2000, and is located in a topographically high area of the Plant. The Bottom Ash Storage Pond embankments are approximately 20 feet in height and are constructed of compacted clay on a 3:1 slope (3 feet horizontal, 1 foot vertical). The elevation at the base of the embankment is approximately 340 feet above msl, and the elevation at the top of the embankment around the perimeter of the Bottom Ash Storage Pond is approximately 360 feet above msl.

The Bottom Ash Storage Pond is approximately 22 acres in size. The principal spillway for the Bottom Ash Storage Pond is located near the southeast corner of the pond and consists primarily of an 18 inch pipe drain at elevation 350.5 feet above msl and also of a 40-foot-long broad-crested weir with a crest elevation of 355 feet above msl. The emergency spillway is an 8-foot-wide weir with a rock rip-rap discharge chute located along the southern embankment at an elevation of 358 feet above msl. The storage capacity of the Bottom Ash Storage Pond at elevation 358 feet above msl is approximately 344 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 CCR Ponds, 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 and the Bottom Ash Storage 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 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. Bottom Ash Storage Pond also stopped receiving all storm water runoff from the landfill and surrounding areas. 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	30.8 ft (330.8 ft)
Approximate **Maximum** depth of impounded water since last annual inspection	32.4 ft (332.40 ft)
Approximate **Present** depth of impounded water at the time of the inspection	31.7 ft (331.70 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	32.5 ft (332.50 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	102.22 acre-ft
Approximate volume of CCR at the time of the inspection	217 acre-ft

6.2 BOTTOM ASH STORAGE POND

Table 2 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 2 - Summary of Relevant Storage Information for Bottom Ash Storage Pond

	Bottom Ash Storage Pond
Approximate **Minimum** depth of impounded water since last annual inspection	9.6 ft (349.6 ft)
Approximate **Maximum** depth of impounded water since last annual inspection	10.8 ft (350.8 ft)
Approximate **Present** depth of impounded water at the time of the inspection	10.7 ft (350.7 ft)
Approximate **Minimum** depth of CCR since last annual inspection	10.5ft (350.5 ft)
Approximate **Maximum** depth of CCR since last annual inspection	18.0ft (358.0 ft)
Approximate **Present** depth of CCR at the time of the inspection	18.0ft (358.0 ft)
Storage Capacity of impounding structure at the time of the inspection	344 acre-ft
Approximate volume of impounded water at the time of the inspection	39 acre-ft
Approximate volume of CCR at the time of the inspection	292 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 particular 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. Photographs location map and inspection photographs are included in Appendices B and C.

7.2.1 PRIMARY BOTTOM ASH POND

(i) Typical condition of the upstream slope, crest, and downstream slope is illustrated in Photographs No. 1-4. 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 near the rock rip rap. There was some minor damage of the downstream slope near the crest from mowing activities (Photograph No. 3)

(ii) The two ash discharge pipes and ash sluice location 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.

(iii) Photograph No. 5 illustrates the emergency spillway located towards the southeast section of the south dike. The emergency spillway appeared to be functioning as needed but was covered with overgrown vegetation preventing a full inspection of the area.

(iv) A canal is located at the south end of the pond. A typical view of the discharge canal concrete weir box is illustrated in Photograph No. 6. The canal conveys water from southwest corner of the ash pond to the Clearwater pond located at the west southeast end. The canal indicated positive drainage condition. Excessive vegetation was noticed along the banks of the canal.

7.2.2 BOTTOM ASH STORAGE POND

(i) The east portion of the downstream slope is illustrated in Photographs No. 7 and 8. Slightly overgrown vegetation was noticed on these slopes. The slope appeared in satisfactory and stable condition with no signs of settlement, misalignment, sloughing or erosion.

(ii) Photographs No. 9 and 10 illustrate the south downstream slope areas. The slopes appeared in satisfactory and stable condition with some minor overgrown vegetation. There were no signs of settlement, misalignment, sloughing or erosion.

(iii) The northwest section of the west dike downstream slope is illustrated in Photograph No. 11. The slope appeared in satisfactory and stable condition with overgrown vegetation preventing a full inspection of the slopes. There were no signs of settlement, misalignment, sloughing or erosion.

(iv) Photograph No. 12 illustrates the emergency spillway location at the southwest section of the south dike. The spillway riprap was in satisfactory condition with some vegetation near the edges of the rock rip rap.

(v) Photographs No. 13 and 14 illustrate the interior conditions, upstream slope and crest areas of the pond. The upstream slope appeared to be in good and stable condition and mostly buttress with ash. The geosynthetic liner appeared intact and in good condition. The crest appeared in good and stable condition. Overgrown vegetation was noticed throughout the interior of the pond and on the crest area.

(vi) A small area within the pond is used as a control weir with a principal spillway inlet and outlet pipe located in southeast corner (Photograph No. 15). The principal spillway basin

was dry at the time of inspection with no flow through the inlet or outlet pipes. The basin is silted up with ash sediment to the flow line of the inlet and outlet pipes and could possibly restrict flows when passing water from the main pond through the basin to the outlet pipe.

(vii) There are two pipe culverts located at the northwest corner of the pond that used to convey storm water from the landfill and surrounding areas into the pond. The storm water runoff channel and inlet pipes have been plugged to prevent storm water runoff from entering the pond (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. There is no monitoring instrumentation for the Bottom Ash Storage Pond (Winston Pond). The location of the instrumentation is shown in Attachment D, Figure 4A. The maximum and minimum readings of Piezometer B-2 since the last annual inspection, a time period of October 2020 to October 2021, were 325.07 ft msl and 318.22 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). There was a recent dip in one of the monthly readings which is most likely due to an error. The results of the measurements of the piezometer is shown in Appendix D, 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.

<u>Primary Bottom Ash Pond:</u>

- 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.

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

Bottom Ash Storage (Winston) Pond:

- There is no evidence of distress that would indicate the possibility of immediate sliding, slope instability, settlement, misalignment or cracking of the bottom ash pond embankments. As such it is concluded that the dam and dikes are performing as designed.

- Vegetation management for the facilities is considered satisfactory. However, some areas are overgrown and should be managed accordingly.

- The principal spillway basin is silted up with ash sediment to the flow line of the inlet and outlet pipes and could possibly restrict flows when passing water from the main pond through the basin to the outlet pipe.

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 in order to control and properly manage it.

- The damaged slope area from mowing activities on the downstream slope of the primary ash storage pond should be repaired and seeded.

- The sediment buildup in the principal spillway basin area of the bottom ash storage pond should be cleaned out to promote un-obstructive flows through the basin area to the outlet pipe.

9.1 MAINTENANCE ITEMS

The following maintenance items were identified during the visual inspection:

- Vegetation management for the facilities is considered satisfactory. Some areas are overgrown and should be managed with controlled vegetation growth, however, there are a few areas that have sparse vegetation.

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 with regard to this report, please contact Brett Dreger at Audinet: 200-2258 or Gary Zych at Audinet: 200-2917.

Appendix A

Figure 1 - Vicinity Map
Figure 2 - CCR Pond Complex General Layout

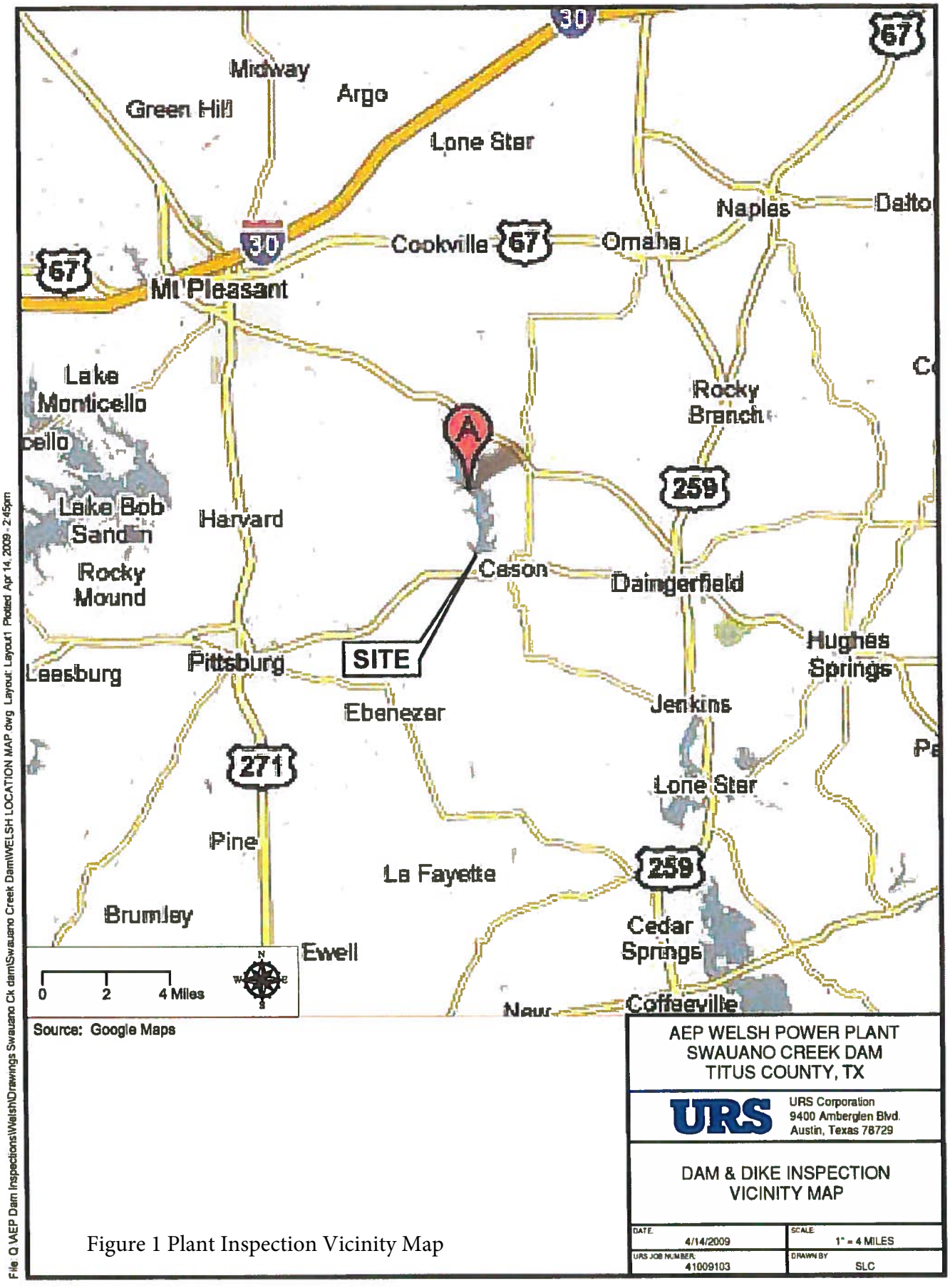

Figure 1 Plant Inspection Vicinity Map

FIGURE 2 - SITE LOCATION MAP

WELSH POWER PLANT, CASON, TX

Appendix B

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

FIGURE 3A - PHOTOGRAPH LOCATION MAP

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

Photo # 1	
Typical view of Primary Bottom Ash Pond upstream slope and interior conditions.	
Photo # 2	
Typical view of Primary Bottom Ash Pond downstream slope.	
Photo # 3	
View of disturbed areas from mowing activities on downstream slope near the crest.	

Photo # 4	
Typical crest area of Primary Bottom Ash Pond.	
Photo # 5	
Emergency spillway channel of Primary Bottom Ash Pond.	
Photo # 6	
View of the Primary Bottom Ash Pond discharge canal concrete weir box.	

Appendix C

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

FIGURE 3B - PHOTOGRAPH LOCATION MAP

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

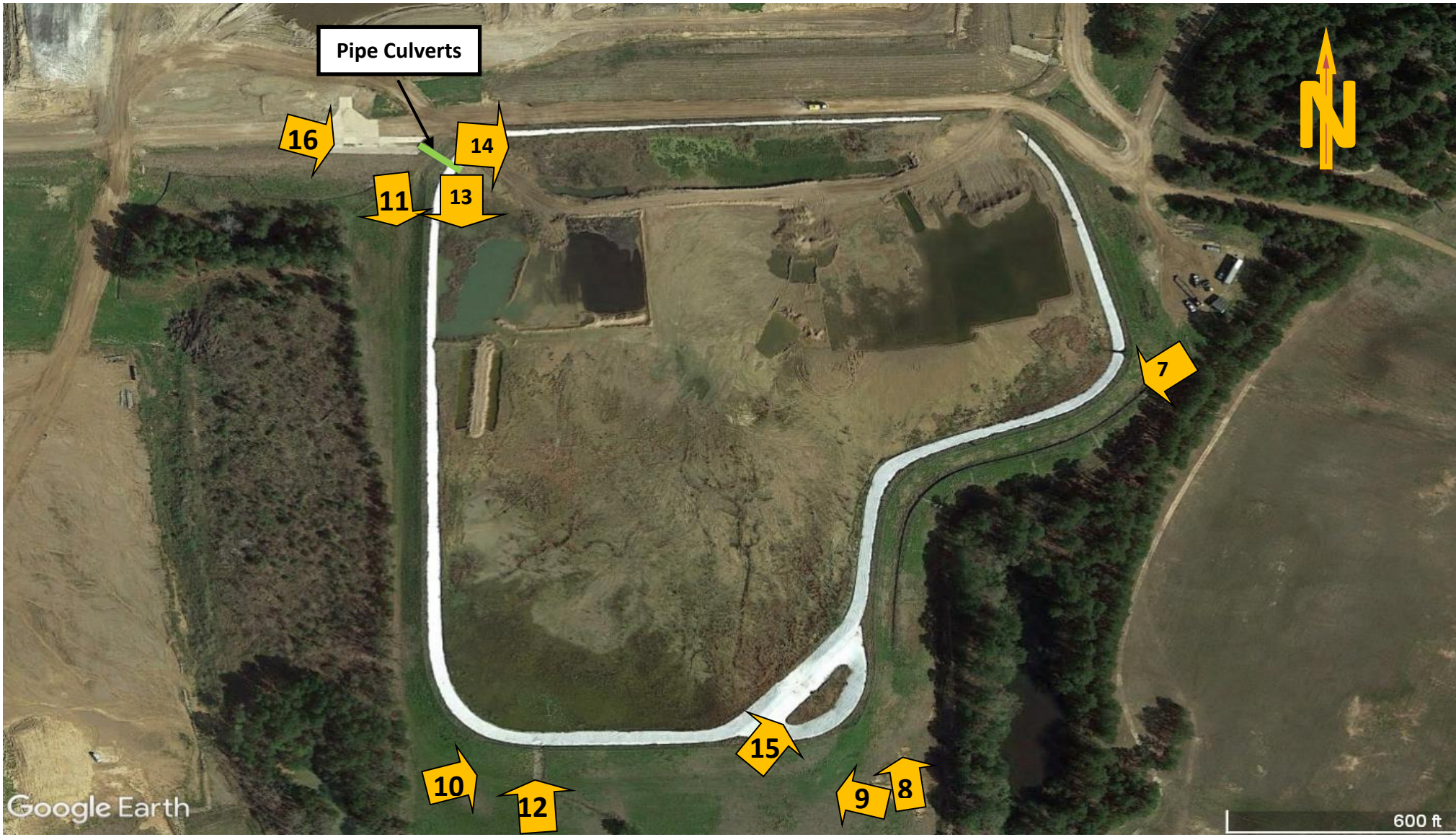

Photo # 7 Bottom Ash Storage Pond (Winston Pond) looking at downstream slope conditions on east side.	
Photo # 8 Bottom Ash Storage Pond (Winston Pond) looking at downstream slope conditions on southeast side.	
Photo # 9 Bottom Ash Storage Pond (Winston Pond) Looking at downstream slope conditions on south side.	

Photo # 10	
Bottom Ash Storage Pond (Winston Pond) Looking at downstream slope conditions on southwest side.	
Photo # 11	
Bottom Ash Storage Pond (Winston Pond) looking at downstream slope conditions on west side.	
Photo # 12	
Bottom Ash Storage Pond (Winston Pond) downstream slope looking at emergency spillway channel.	

Photo # 13 Bottom Ash Storage Pond (Winston Pond) looking at typical interior conditions.	
Photo # 14 Bottom Ash Storage Pond (Winston Pond) looking at typical interior conditions.	
Photo # 15 Bottom Ash Storage Pond (Winston Pond) interior area looking at principal spillway outlet pipe and control weir at southeast corner.	

Photo # 16	
Bottom Ash Storage Pond (Winston Pond) storm water runoff channel and inlet pipes have been plugged to prevent storm water runoff from entering the pond.	
Photo # 17	
.	
Photo # 18	

Appendix D

Figure 4A - Piezometers Location Map
Figure 4B - Primary Bottom Ash Pond Piezometer Data

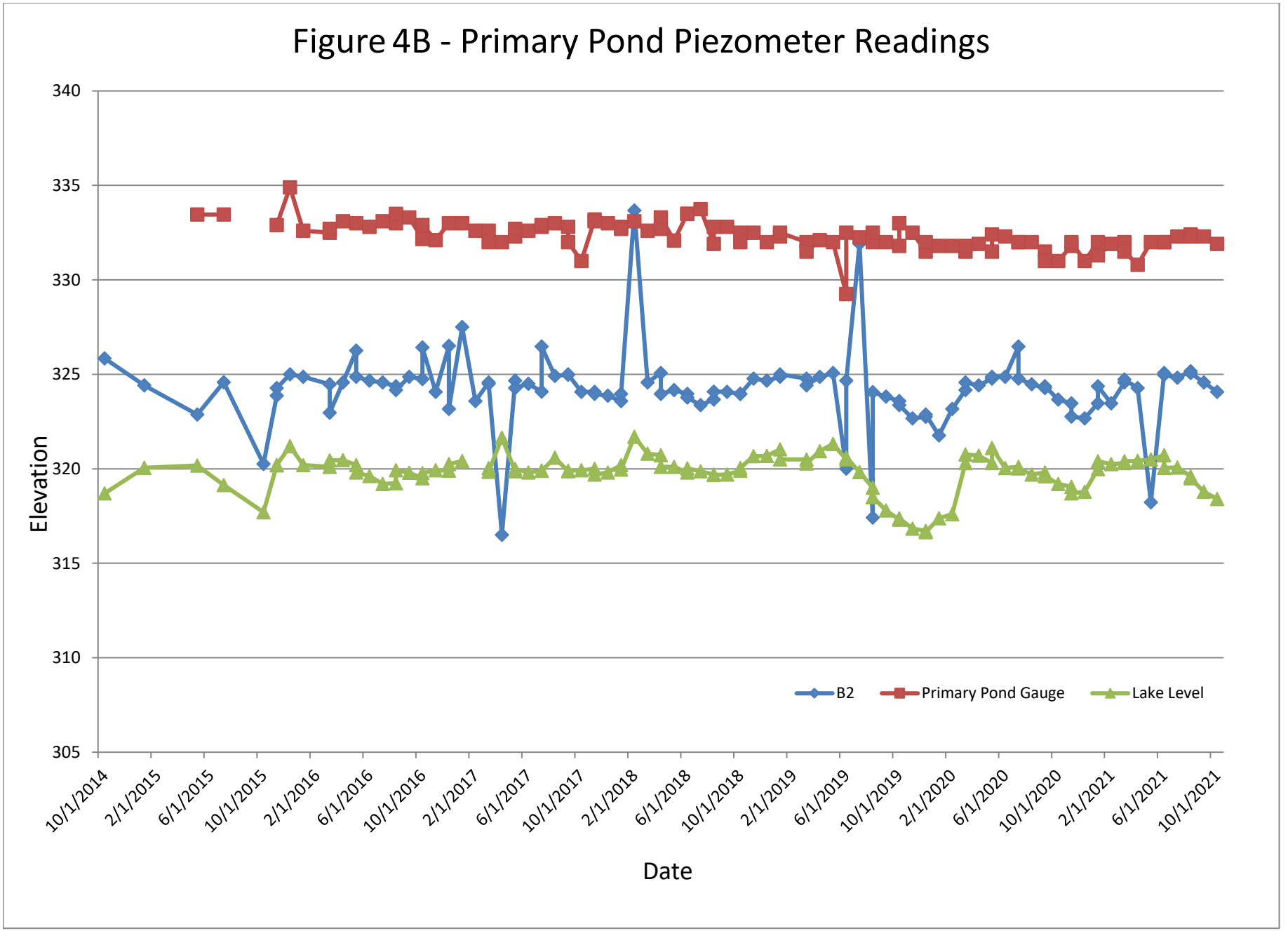
Figure 4B - Primary Pond Piezometer Readings
340
335
330
325
320
315
310
305
Elevation
B2
Primary Pond Gauge
Lake Level
10/1/2014
2/1/2015
6/1/2015
10/1/2015
2/1/2016
6/1/2016
10/1/2016
2/1/2017
6/1/2017
10/1/2017
2/1/2018
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