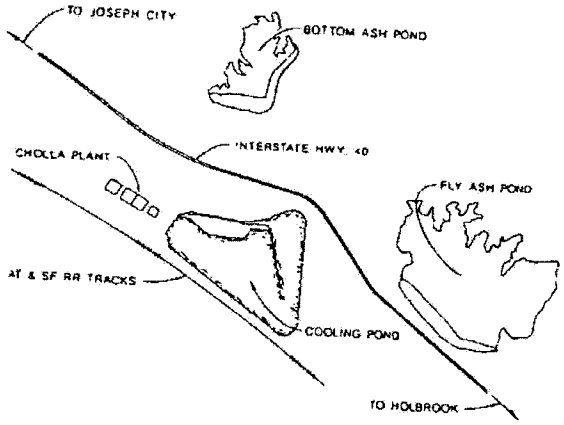
CHOLLA POWER PLANT
Fly Ash Dam, Bottom Ash Dam, and Bottom Ash Monofill

Annual CCR Impoundment and Landfill Inspection Report

2023



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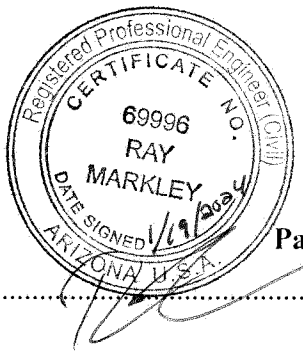

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1.0 INTRODUCTION

Arizona Public Service Company (APS) prepared this report to comply with the Environmental Protection Agency's (EPA) Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities: Final Rule (2015) requiring "*...inspections by a qualified professional engineer at intervals not exceeding one year to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards*" (40 CFR 257.83(b)(1) for CCR surface impoundments and 40 CFR 257.84(b)(1) for CCR landfills). AECOM staff participated in the CCR unit inspection and provided technical support in the preparation of this document.

This report includes a review of relevant data in the operating record and visual inspections of the Fly Ash Dam, Bottom Ash Dam, and the Bottom Ash Monofill. The Fly Ash Dam and Bottom Ash Dam are instrumented with piezometers, settlement monuments, seepage totalizers, and wells.

Inspection Conducted by

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2.0 SITE BACKGROUND AND INSPECTION CONDITIONS

The Cholla Power Plant (Cholla, the Plant) is located nine miles west of Holbrook, Arizona. The Plant is located in the north half of Section 23, Township 18 North, Range 19 East in Navajo County, adjacent to and north of the Little Colorado River. The Plant site and off-site facilities comprise portions of Sections 22 through 27 in Township 18 North, Range 19 East and Section 30 in Township 18 North, Range 20 East. The Plant began operation of Unit 1 at the site in 1961 and Units 2, 3, and 4 were constructed between 1976 and 1981. Unit 2 was removed from service on October 1, 2015. Unit 4 was removed from service on December 28, 2020. The two remaining operational units (Units 1 and 3) currently burn sub-bituminous coal to provide a total net generating capacity of 387 megawatts (MW). Units 1 and 3 are operated based on load and economic factors.

The coal combustion process produces Coal Combustion Residuals (CCR) including bottom ash (silty sand, Unified Soil Classification System SM), fly ash (low plasticity silt, Unified Soil Classification System ML), and Flue Gas Desulfurization (FGD) sludge. The Plant has three active CCR units: the Bottom Ash Pond, the Fly Ash Pond, and the Bottom Ash Monofill. A fourth CCR unit, the Sedimentation Pond, was closed in 2021 in accordance with 40 CFR 257.102(c) (closure by removal of CCR). The Bottom Ash Pond and the Fly Ash Pond are used for CCR disposal. The Bottom Ash Monofill is a coal combustion waste landfill used for long-term storage and disposal of dewatered bottom ash transferred from the Bottom Ash Pond. The three active CCR units are the subjects of this inspection report.

The field inspection was conducted on Monday, November 13, 2023, and Tuesday, November 14, 2023. Weather conditions were cool and mild (48-67 degrees Fahrenheit) with light winds (1-8 mph with gusts to 11 mph) and clear to mostly clear skies both days. Approximately 6.35 inches of precipitation had fallen between October 1, 2022, and September 30, 2023, based on data recorded near Holbrook, Arizona (Weather Underground 2023). Units 1 and 3 were running at the time of the inspection.

Instrumentation at the dams consists of open standpipe PVC piezometers, open well points, weirs, flow meters with totalizers, and brass survey caps on a concrete base measured using a Global Positioning System (GPS) survey. The water level in the piezometers is measured with an electronic water level indicator attached to a cable stamped with increments of 0.01 feet. The impounded water level in the Bottom Ash Pond is measured by an elevation indicator based on NGVD29 set at the edge of the water. The impounded water level in the Fly Ash Pond is measured on a monthly basis using GPS equipment.

The benchmark for the elevations reported for GPS surveys of the settlement monuments at the Cholla Power Plant is based on the Randell 2 monument located on the north side of the Joseph City I-40 overpass. Detailed information of Randell 2 can be found on the National Geodetic Survey (NGS) website. The latitude and longitude of the monument are based on the NAD83 datum. The NGS (2023) lists the elevation of the monument as 5088.09 feet (NAVD88).

3.0 UNIT DESCRIPTIONS

3.1 FLY ASH DAM

The Fly Ash Dam is represented on Figure 1 – Fly Ash Pond Site Map (attached).

The Fly Ash Dam (listed by the Arizona Department of Water Resources (ADWR) as Dam #09.28) was constructed between 1976 and 1978, has a capacity of 18,000 acre-feet, is approximately 80 feet high with an approximately 4,583-foot-long clay core zoned earth embankment, and has a Federal Emergency Management Agency (FEMA) rating of intermediate size and high hazard. The maximum normal operating water level is elevation (EL) 5114.0 feet. The water level was measured most recently by survey to be at EL 5080.599 feet on November 14, 2023. The original water level gauge has been abandoned. The gauge was first covered with sediment in early 2015. By the time the reservoir level had receded below the maximum elevation on the water level gauge in early 2016, the gauge had been covered with a thick layer of sediment and evaporite crystals, making it unusable.

3.2 BOTTOM ASH DAM

The Bottom Ash Dam is represented on Figure 2 – Bottom Ash Pond Site Map (attached).

The Bottom Ash Dam (ADWR Dam #09.27) was constructed between 1976 and 1978, has a capacity of 2,300 acre-feet, is approximately 73 feet high with an approximately 4,040-foot-long clay core zoned earth embankment, and has a FEMA rating of intermediate size and high hazard. The maximum operating water level is EL 5117.8 feet. The water level was observed to be at EL 5109.65 feet during the inspection on November 13, 2023 (NGVD29).

In 1993, the pond was re-permitted to an operating level of EL 5118.6 feet (NGVD29). In 1997, a reassessment of the flood pool allocation revealed the need to lower the operating level to EL 5117.8 feet (NGVD29). In April 1999, APS obtained a major modification of the ADEQ APP permit, File No. 100568, that allows dewatered bottom ash to be dredged from the pond and placed in a new facility known as the Bottom Ash Monofill located on a 43-acre parcel located adjacent to the north and east sides of the Bottom Ash Pond.

3.3 BOTTOM ASH MONOFILL

The Bottom Ash Monofill is represented on Figure 3 – Bottom Ash Monofill Site Map (attached).

The Bottom Ash Monofill is a coal combustion waste landfill that was constructed beginning in the late 1990s. In 2009, the Arizona Department of Environmental Quality (ADEQ) executed an amendment to Cholla Plant Aquifer Protection Permit No. P-100568 for the currently-permitted 43-acre footprint and maximum storage elevation of 5,261.0 feet, with final slopes of 4H:1V (horizontal : vertical). Storm water run on is diverted around the landfill by a diversion ditch sized to convey the peak 100-year flow. On-site storm water runoff is conveyed to a retention basin and eventually routed to the Bottom Ash Pond. The retention basin has a capacity of 8.2 acre-feet with an overall depth of 12 feet and 3H:1V side slopes.

In 2015, the Bottom Ash Monofill was expanded to the north and east to its maximum APP-permitted footprint to add capacity for continuing operations at the Plant.

4.0 FIELD INSPECTIONS

This section contains the 2023 annual field inspections conducted by APS and accompanied by a representative from AECOM at the Fly Ash Dam (Section 4.1), the Bottom Ash Dam (Section 4.2), and the Bottom Ash Monofill (Section 4.3).

4.1 APS FIELD INSPECTION – FLY ASH DAM

<table>
<tr><td colspan="2">Fly Ash Dam</td><td colspan="3">State Identification Number (SID): 09.28</td><td rowspan="16">Not Applicable</td><td rowspan="16">No</td><td rowspan="16">Yes</td><td rowspan="16">Monitor</td><td rowspan="16">Repair</td><td rowspan="16">Investigate</td></tr>
<tr><td>SID: 09.28</td><td>Dam Name: Fly Ash Dam</td><td>Type: Earth</td><td>Purpose: Fly ash disposal</td></tr>
<tr><td colspan="2">Contact(s): Ray Markley, P.E. (APS)</td><td colspan="2">Report Date: January 19, 2024</td></tr>
<tr><td colspan="2">Inspected by: Ray Markley, P.E. (APS)
Lee Wright, P.E. (AECOM)</td><td colspan="2">Inspection Date: November 13, 2023</td></tr>
<tr><td colspan="2">Reviewed by: Ray Markley, P.E. (APS)</td><td colspan="2">Review Date: January 11, 2024</td></tr>
<tr><td colspan="2">Design Dam Crest Elevation (ft): 5,120</td><td colspan="2">Design Spillway Crest Elevation: None</td></tr>
<tr><td colspan="2">Design Total Freeboard (ft): 6</td><td colspan="2">Measured Total Freeboard (ft): 37.3
(November 14, 2023; based on the elevation at Settlement Monument M-5 of 5117.899 feet)</td></tr>
<tr><td colspan="2">Statutory Dam Height (ft): 80</td><td colspan="2">Structural Height (ft): 80</td></tr>
<tr><td colspan="2">Dam Crest Length (ft): 4,583</td><td>Upstream Slope: 3:1</td><td>Downstream Slope: 3:1</td></tr>
<tr><td colspan="2" rowspan="2">Dam Crest Width (ft): 24</td><td>Lat: 34° 56' 10.0" N</td><td rowspan="2">Water Rights: N/A</td></tr>
<tr><td>Long: 110° 16' 06.0" W</td></tr>
<tr><td colspan="2">Reservoir Area (acres): 420</td><td colspan="2">Reservoir Storage (ac-ft): 18,000</td></tr>
<tr><td colspan="4">Inflow Design Flood/Safe Flood-Passing Capacity: PMF – fully contained</td></tr>
<tr><td colspan="2">Reservoir Level During Inspection (ft): EL 5080.599 (November 14, 2023)</td><td rowspan="2">Photos: Yes. See Appendix A.</td><td rowspan="2">Pages: 5</td></tr>
<tr><td colspan="2">Estimated Solids Level (ft): ~ EL 5096.56 at the discharge pipe</td></tr>
</table>

Fly Ash Dam		SID: **09.28**		N/A	No	Yes	Mon	Rep	Inv
COMPLIANCE CHECKLIST									
1	***CONDITION SUMMARY, LICENSE, EAP, NEXT INSPECTION***								
a	Recorded downstream hazard: **High**	Should hazard be revised?			**X**				
b	If high hazard, estimate downstream persons-at-risk (PAR): **>301**	Is there a significant increase since the last inspection?			**X**				
c	Recorded size: **Intermediate**	Should size be revised?			**X**				
d	Any safety deficiencies? **No**	Describe:			**X**				
e	Any statute or rule violations? **No**	Describe and list required action:			**X**				
f	Safe storage level on License: **5,114 feet**	Should level be revised:			**X**				
g	Any License violations? **No**	Describe and list required action:			**X**				
h	Date of current License: **10/21/1986**	Should new License be issued?			**X**				
i	Date of last Emergency Action Plan revision: **06/2022**	Should EAP be revised?			**X**				
j	Any Agency actions? **No**	Describe and list required action:			**X**				
k	Normal inspection frequency: **Weekly, Annually**	Should inspection frequency be revised?			**X**				
l	Recommended date for next inspection: **November 2024**								

MONITORING CHECKLIST									
2	***INSTRUMENTATION AND MONITORING***								
a	Describe: **1) 37 active piezometers and wells in and around the embankment as part of the CCR monitoring program. 2) 16 settlement monuments located along the crest. 3) The water level in the reservoir is measured by GPS survey each month. 4) Flow measurement devices at each downstream sump and the return lines to the reservoir to estimate seepage rates.**								
b	Any repair or replacement required? **No**	Describe: **See comment i.**			**X**				
c	Date of last report: **January 2023 (for 2022)**	Should new readings be taken and new report provided? **Annual reporting is required.**				**X**			

DAM EMBANKMENT CHECKLIST									
3	***DAM CREST***								
a	Settlements, slides, depressions? **See comment vii.**					**X**			**X**
b	Misalignment?				**X**				
c	Longitudinal/Transverse cracking? **None observed.**				**X**				
d	Animal burrows? **Ant hills were observed at various locations across the crest (Photos IMG_1443 and IMG_1496).**					**X**	**X**		
e	Adverse vegetation? **Some adverse vegetation is present (Photos IMG_1397, IMG_1490, and IMG_1505). Remove vegetation in accordance with APS's preferred protocol, the NMOSE "*Vegetation Management on Dams*" (2011) document.**					**X**		**X**	
f	Erosion?				**X**				
4	***UPSTREAM SLOPE***								
a	Erosion? **Erosion and minor soil wasting observed along the upstream shoulder. See also comment iii.**					**X**	**X**		
b	Inadequate ground cover?				**X**				
c	Adverse vegetation? **None observed. Continue to monitor vegetation.**				**X**		**X**		
d	Longitudinal/Transverse cracking?				**X**				
e	Inadequate riprap?				**X**				
f	Stone deterioration? **Minor deterioration observed. See comment iv.**					**X**	**X**		
g	Settlements, slides, depressions, bulges?				**X**				
h	Animal burrows? **None observed. Continue to monitor.**				**X**		**X**		

Fly Ash Dam		SID: **09.28**	N/A	No	Yes	Mon	Rep	Inv
5	***DOWNSTREAM SLOPE***							
a	Erosion?	**Erosion observed during the previous inspection was not as prominent during this inspection (Photos IMG_1510, IMG_1517, and IMG_1519); however, evidence of soil loss due to erosion at the downstream toe was present near the Geronimo Seep (IMG_1543). Continue to monitor and repair when the eroded depth exceeds 1 foot.**			**X**	**X**		
b	Inadequate ground cover?			**X**				
c	Adverse vegetation?	**None observed. Continue to monitor.**		**X**		**X**		
d	Longitudinal/Transverse cracking?			**X**				
e	Inadequate riprap?			**X**				
f	Stone deterioration?	**Minor deterioration observed. See comment iv.**			**X**	**X**		
g	Settlements, slides, depressions, bulges?			**X**				
h	Soft spots or boggy areas?	**There is evidence of historic seepage beyond the downstream toe. Continue to monitor.**			**X**	**X**		
i	Movement at or beyond toe?			**X**				
j	Animal burrows?	**None observed. Continue to monitor.**		**X**		**X**		
6	***ABUTMENT CONTACTS***							
a	Erosion?	**Approximately 1 foot of erosion observed at the Right Abutment groin. The erosion is in the colluvium at the Right Abutment and along the access road at the toe (Photos IMG_1482, IMG_1485, IMG_1587, and IMG_1589). Continue to monitor.**		**X**		**X**		
b	Differential movement?			**X**				
c	Cracks?			**X**				
d	Settlements, slides, depressions, bulges?			**X**				
e	Seepage?	**Historic seepage has been observed downstream of the Right Abutment during previous inspections. See comment v.**		**X**		**X**		
f	Animal burrows?	**None observed. Continue to monitor.**		**X**		**X**		
7	***SEEPAGE/PIPING CONTROL DESIGN FEATURE(S)***							
a	Describe:	**1) The Geronimo and Hunt seepage collection and pump back systems are located downstream of the dam near I-40 for fluid interception. See comment v.** **2) Discharge from the crest side of the reservoir creates a beach to prevent water from being stored against the upstream face.**						
b	Internal drains flowing?				**X**	**X**		
c	Seepage at or beyond toe?	**See comment v.**			**X**	**X**		
d	If so, does seepage contain fines?	**The water in the sumps appeared clear during the inspection. See comment v.**		**X**				
e	Evidence of sand boils at or beyond toe?			**X**				

RESERVOIR CHECKLIST								
8	***RESERVOIR***							
a	High water marks?			**X**				
b	Erosion/slides into pool area?			**X**				
c	Sediment accumulation?	**The reservoir was designed to impound sediment.**			**X**			
d	Floating debris present?			**X**				
e	Depressions, sinkholes, or vortices?			**X**				
f	Low ridges/saddles allowing overflow?			**X**				
g	Structures below dam crest elevation?			**X**				

Additional comments and recommendations for the Fly Ash Dam:

i. The original water level gauge has been abandoned. The gauge was first covered with sediment in early 2015. By the time the reservoir level had receded below the maximum elevation on the water level gauge in early 2016, the gauge had been covered with a thick layer of sediment and evaporite crystals, making it unusable. APS measures the reservoir level by GPS survey at the same time as the monthly monument readings. The accuracy of this method is assessed to be adequate as long as the water level remains low.

ii. In May 2021, APS replaced extraction wells GSX-1 and GSX-2; monitoring wells W-123 and W-126; and piezometers F-91, F-92, and F-111 in the Geronimo Sump area as part of a broader well and piezometer abandonment and replacement program (Wood 2022). Of these, piezometers F-91, F-92, and F-111; and well W-123 are monitored as part of the CCR program. Piezometers F-91, F-92, and F-111; and well W-123 were replaced with open-standpipe piezometers F-91R, F-92R, F-111R, and well W-123R, respectively.

iii. Erosion was observed along the upstream slope near the piezometers screened in the dam core (Photos IMG_1414, IMG_1417, IMG_1424, and IMG_1429). The eroded portions were observed to be deeper during this inspection compared to the 2022 inspection. The affected portion of the upstream slope is part of the dam crest widening constructed in early 2000 to accommodate piezometer installation activities. The crest is approximately 40 feet wide in this area (compared to the design crest width of 24 feet). The erosion appears to be within the extended portion and is not affecting the original crest.

    The concrete collar around piezometer F-123 is approximately 4 inches higher than the surrounding grade on the upstream shoulder (Photo IMG_1430). The concrete would have originally been even with the surrounding grade, indicating erosion along the downstream shoulder.

    There is a 1.5-foot-deep, predominantly horizontal, gap under the riprap on the upstream slope between settlement monuments M-2 and M-3 (Photos IMG_1469 and IMG_1472). It appears that soil has eroded from underneath the riprap, resulting in the gap between stones. The area should be monitored and the gap should be prevented from reaching the crest.

iv. Minor stone deterioration was also observed at various locations along the slopes during previous inspections. Continue to monitor.

v. Seepage has historically been observed at the Geronimo Seep, the Hunt seep, the I-40 seep, and in areas of relatively lower elevation along the downstream toe. The Geronimo and Hunt sumps were active during the inspection while areas downstream of the West Embankment were dry. APS replaced Geronimo Seep well pumps A and B (GSX-1 and GSX-2) in May 2021 after observing they were operating inconsistently, had relatively low extraction rates, and erratic water levels (Wood 2022). The well pump replacement coincided with the abandonment and replacement of the piezometers and wells described in comment ii.

    APS completed upgrading the seepage collection system at the Geronimo Seep in January 2023. APS installed four new extraction wells (EW-01 through EW-04) to replace the four Geronimo Seep well pumps (A through D) (Photos IMG_1519, IMG_1525, and IMG_1559). Water in the sumps associated with the new extraction wells appeared to be clear during the inspection. APS monitors the turbidity at Discharge Line "C" (i.e., the

"Charlie Line") by removing water directly from the sump. The turbidity ranged from 0.32 NTU to 1.62 NTU, averaging 0.85 NTU between January 2023 and September 2023. The turbidity during 2022 averaged 0.82 NTU between January and August (before construction began). The average turbidity results during 2021 and 2020 were 1.68 NTU and 0.51 NTU, respectively. A new turbidity meter was operational starting in March 2021. Continue to monitor the turbidity and review the results with the APS geotechnical engineer.

The I-40 seep was observed to be slightly damp during this inspection (Photos IMG_1593, IMG_1594). There had been no precipitation at the site since October 24, 2023. The elevation of the seep is still below the current reservoir level. Continue to monitor the I-40 seep. Any perceived increases in seepage volume, affected area, or perpetual standing water should be reviewed by the APS geotechnical engineer.

vi. APS installed 12 PittBoss downdraft evaporators, manufactured by Resource West Incorporated (RWI), in the Fly Ash Pond as part of its effort to reduce the impounded water volume prior to closure (Photos IMG_1365 and IMG_1366). The PittBoss evaporators float on the pond and blow air onto the water to create small waves, increasing the surface area available for evaporation.

In July and September 2023, APS installed two new sprinkler lines in the northeast section of the reservoir where salt is covering the ground surface (Photos IMG_1386 and IMG_1391). The southern (six sprinklers) and northern (five sprinklers) lines are connected to solar-powered pumps at the edge of the reservoir that send water up the slope through piping, ultimately discharging the water via a series of sprinklers along the pipe. The sprinklers distribute the water across the salt, increasing the available water surface area for evaporation. The system is rated to pump up to 60 gpm, but varies due to available sunlight throughout the day.

vii. Settlement monument M-2 appears to be more than one foot above the typical elevation of the crest (Photo IMG_1474). During the November 14, 2023 survey, settlement monument M-2 was recorded to be at EL 5120.402 feet. The original elevation recorded in 1978 was 5121.515 feet, indicating approximately 1 foot of settlement at the monument. It is not clear as to how much of the discrepancy between M-2 and the crest is due to historic surface grading activities or wind erosion of the crest.

Settlement Monument M-5 is approximately 2.1 feet lower than the design crest elevation. The available freeboard is sufficient to meet the capacity for the design storm. APS intends to continue removing water from the Fly Ash Pond and does not believe the lower crest is disruptive to the operation or safety of the CCR unit.

viii. Continue removing excessive natural vegetation in accordance with APS's preferred protocol, the NMOSE "*Vegetation Management on Dams*" (2011) document.

ix. The weekly inspection reports for the period between October 1, 2022, and September 30, 2023, were reviewed and indicate the following:

a. Erosion on the dam crest was noted as requiring repair starting with the 6/1/2023 weekly inspection. APS scheduled an earthwork contractor to complete the repair.

b. Animal burrows on the downstream slope were noted as requiring monitoring starting with the 6/1/2023 weekly inspection.

4.2 APS FIELD INSPECTION – BOTTOM ASH DAM

<table>
<tr><td colspan="2">Bottom Ash Dam</td><td colspan="2">State Identification Number (SID): 09.27</td><td rowspan="16">Not Applicable</td><td rowspan="16">No</td><td rowspan="16">Yes</td><td rowspan="16">Monitor</td><td rowspan="16">Repair</td><td rowspan="16">Investigate</td></tr>
<tr><td>SID: 09.27</td><td>Dam Name: Bottom Ash Dam</td><td>Type: Earth</td><td>Purpose: Bottom ash containment</td></tr>
<tr><td colspan="2">Contact(s): Ray Markley, P.E. (APS)</td><td colspan="2">Report Date: January 19, 2024</td></tr>
<tr><td colspan="2">Inspected by: Ray Markley, P.E. (APS)
Lee Wright, P.E. (AECOM)</td><td colspan="2">Inspection Date: November 13, 2023</td></tr>
<tr><td colspan="2">Reviewed by: Ray Markley, P.E. (APS)</td><td colspan="2">Review Date: January 11, 2024</td></tr>
<tr><td colspan="2">Design Dam Crest Elevation (ft): 5,123.3</td><td colspan="2">Design Spillway Crest Elevation: None</td></tr>
<tr><td colspan="2">Design Total Freeboard (ft): 5.5</td><td colspan="2">Measured Total Freeboard (ft): 13.65</td></tr>
<tr><td colspan="2">Statutory Dam Height (ft): 73</td><td colspan="2">Structural Height (ft): 73</td></tr>
<tr><td colspan="2">Dam Crest Length (ft): 4,040</td><td>Upstream Slope: 3:1</td><td>Downstream Slope: 3:1</td></tr>
<tr><td colspan="2" rowspan="2">Dam Crest Width (ft): 12</td><td>Lat: 34° 57' 07.0" N</td><td rowspan="2">Water Rights: N/A</td></tr>
<tr><td>Long: 110° 17' 22.7" W</td></tr>
<tr><td colspan="2">Reservoir Area (acres): 80</td><td colspan="2">Reservoir Storage (ac-ft): 2,300</td></tr>
<tr><td colspan="4">Inflow Design Flood/Safe Flood-Passing Capacity: PMF – fully contained.</td></tr>
<tr><td colspan="2">Reservoir Level During Inspection (ft): 5109.65</td><td rowspan="2">Photos: Yes. See Appendix B.</td><td rowspan="2">Pages: 4</td></tr>
<tr><td colspan="2">Estimated Solids Level (ft): Varies – approx. EL 5115 feet</td></tr>
</table>

Bottom Ash Dam			SID: **09.27**	N/A	No	Yes	Mon	Rep	Inv
COMPLIANCE CHECKLIST									
1	***CONDITION SUMMARY, LICENSE, EAP, NEXT INSPECTION***								
a	Recorded downstream hazard:	**High**	Should hazard be revised?		**X**				
b	If high hazard, estimate downstream persons-at-risk (PAR): **>301**		Is there a significant increase since the last inspection?		**X**				
c	Recorded size:	**Intermediate**	Should size be revisited?		**X**				
d	Any safety deficiencies?	**No**	Describe:		**X**				
e	Any statute or rule violations?	**No**	Describe and list required action:		**X**				
f	Safe storage level on License:	**5,117.8 feet**	Should level be revised:		**X**				
g	Any License violations?	**No**	Describe and list required action:		**X**				
h	Date of current License:	**12/11/1998**	Should new License be issued?		**X**				
i	Date of last Emergency Action Plan revision: **06/2022**		Should EAP be revised?		**X**				
j	Any Agency actions?	**No**	Describe and list required action:		**X**				
k	Normal inspection frequency:	**Weekly, Annually**	Should inspection frequency be revised?		**X**				
l	Recommended date for next inspection: **November 2024**								

MONITORING CHECKLIST									
2	***INSTRUMENTATION AND MONITORING***								
a	Describe:	**1) 19 active piezometers and wells in and around the embankment as part of the CCR monitoring program.** **2) 10 settlement monuments.** **3) A V-notch weir and seepage monitoring systems.** **4) Water level gauge in the reservoir.**							
b	Any repair or replacement required?	**No.**	Describe:		**X**				
c	Date of last report:	**January 2023 (for 2022)**	Should new readings be taken and new report provided? **Annual reporting is required.**			**X**			

DAM EMBANKMENT CHECKLIST									
3	***DAM CREST***								
a	Settlements, slides, depressions?	**See comment i.**			**X**		**X**		
b	Misalignment?				**X**				
c	Longitudinal/Transverse cracking?	**See comment ii.**				**X**	**X**		
d	Animal burrows?	**Ant hills were observed at various locations across the crest (example Photos IMG_1610, IMG_1686).**				**X**	**X**		
e	Adverse vegetation?	**Some vegetation was observed on the crest (Photos IMG_1645, IMG_1657, and IMG_1702). Remove vegetation in accordance with APS's preferred protocol, the NMOSE "*Vegetation Management on Dams*" (2011) document.**				**X**		**X**	
f	Erosion?	**See comment iii.**				**X**	**X**		
4	***UPSTREAM SLOPE***								
a	Erosion?	**The 21-inch-deep hole adjacent to the concrete on the west side of the central siphon line observed during the 2022 inspection was almost entirely filled in during this inspection (Photo IMG_1644). Minor erosion near the crest should also be monitored. See comment iii.**				**X**	**X**	**X**	
b	Inadequate ground cover?				**X**				
c	Adverse vegetation?	**There is woody vegetation in the pond near the Right Abutment (Photo IMG_1609), near the central siphon line (Photo IMG_1643), and along the upstream slope of the East Embankment (Photo IMG_1666).**				**X**		**X**	
d	Longitudinal/Transverse cracking?				**X**				
e	Inadequate riprap?				**X**				
f	Stone deterioration?				**X**				
g	Settlements, slides, depressions, bulges?				**X**				
h	Animal burrows?	**None observed. Continue to monitor.**			**X**		**X**		

Bottom Ash Dam		SID: **09.27**	N/A	No	Yes	Mon	Rep	Inv
5	***DOWNSTREAM SLOPE***							
a	Erosion?	**Erosion gullies at the toe of the East Embankment downstream slope do not appear to be affecting the embankment (Photos IMG_1723 and IMG_1728).**			**X**	**X**		
b	Inadequate ground cover?			**X**				
c	Adverse vegetation?	**The dense vegetation near the West Abutment Weir is growing back (Photos IMG_1803 and IMG_1805). Woody vegetation remains absent; however, some woody vegetation is beginning to grow along the toe and should be removed. Continue to monitor the area and remove vegetation in accordance with the NMOSE (2011) guidance.**			**X**	**X**	**X**	
d	Longitudinal/Transverse cracking?			**X**				
e	Inadequate riprap?			**X**				
f	Stone deterioration?	**Riprap deterioration does not appear to have accelerated since the previous inspection.**			**X**	**X**		
g	Settlements, slides, depressions, bulges?			**X**				
h	Soft spots or boggy areas?	**See comment iv.**			**X**	**X**		
i	Movement at or beyond toe?			**X**				
j	Animal burrows?	**None observed. Continue to monitor.**		**X**		**X**		
6	***ABUTMENT CONTACTS***							
a	Erosion?	**There is erosion in the downstream groin of the Right Abutment (Photo IMG_1600, IMG_1604, and IMG_1605). The erosion is as deep as 4 feet and should be repaired as directed by the APS geotechnical engineer.**			**X**		**X**	
b	Differential movement?			**X**				
c	Cracks?			**X**				
d	Settlements, slides, depressions, bulges?			**X**				
e	Seepage?	**Yes. Measured approximately 1.72 gpm at the West Abutment Weir during the inspection. Continue to monitor.**			**X**	**X**		
f	Animal burrows?	**None observed. Continue to monitor.**		**X**		**X**		
7	***SEEPAGE/PIPING CONTROL DESIGN FEATURE(S)***							
a	Describe:	**Several monitoring, seepage, and pump back collection systems are located downstream of the dam. The monitored seeps include the West Abutment Weir, the Toe Drain Seep, the Petroglyph Seep, the Tanner Wash Seep, and the P-226 Seep. The pump back collection system consists of three siphon lines extending from the toe into the reservoir along the South Embankment.**						
b	Internal drains flowing?				**X**	**X**		
c	Seepage at or beyond toe?	**See comment iv.**			**X**	**X**		
d	If so, does seepage contain fines?	**See comment iv.**			**X**	**X**		
e	Evidence of sand boils at or beyond toe?			**X**				

RESERVOIR CHECKLIST								
8	***RESERVOIR***							
a	High water marks?			**X**				
b	Erosion/slides into pool area?			**X**				
c	Sediment accumulation?	**Bottom ash settles in the reservoir, is removed, and is placed in the Bottom Ash Monofill.**			**X**			
d	Floating debris present?			**X**				
e	Depressions, sinkholes, or vortices?			**X**				
f	Low ridges/saddles allowing overflow?			**X**				
g	Structures below dam crest elevation?	**There is a divider dike in the center of the pond.**			**X**			

Additional comments and recommendations for the Bottom Ash Dam:

i. Several new erosion holes were observed (Photos IMG_1611, IMG_1612, IMG_1616, IMG_1617, IMG_1631, IMG_1679, IMG_1695, IMG_1696, IMG_1699, IMG_1702, IMG_1703, IMG_1718, and IMG_1736). The deepest measured erosion hole was at least 22 inches (on the East Embankment; Photo IMG_1703). Although erosion holes are more prevalent in some annual inspections compared to others, most individual erosion holes are not present in consecutive inspections. Holes that are observed in consecutive inspections are typically shallower or nearly filled in during the next annual inspection and are not present during the third annual inspection. The holes on the crest and shoulders should be monitored and repaired if the depth exceeds 1 foot or appears to reach the core.

ii. A portion of the supporting fill material on the downstream side of settlement monument M-13 is separated from the concrete base (Photo IMG_1628). The gap appears to be slowly filling in as it has been less prominent with each inspection since 2021. The supporting fill does not affect the structural integrity of the dam, but the crack should be monitored and repaired if a series of deviant readings are recorded for the horizontal or vertical measurements at M-13.

iii. Continue to monitor the erosion around the siphon line encasements (Photos IMG_1617), soil wasting along the downstream slope of the East Embankment, and erosion gullies (Photos IMG_1723 and IMG_1728) that were also observed during previous inspections. Repair erosion if the eroded depth exceeds 1 foot. Investigate the source of sediment collecting in the diversion ditch between the East Embankment access road and the East Embankment.

    Several erosion rills were observed along the shoulders of the crest (Photos IMG_1611, IMG_1612, IMG_1616, IMG_1696, and IMG_1702). The rills were generally less than 19 inches across and all were no deeper than 12 inches. The erosion should be monitored and repaired once the depth exceeds 12 inches or if it adversely affects the crest or slopes.

iv. Seepage and boggy areas were observed along the downstream toe in locations of known and active seepage (e.g., the Petroglyph Seep, the Tanner Wash Seep, the Bottom Ash Toe Drain Sump, the West Abutment Weir, and the P-226 seepage intercept area). At the time of the inspection, the water in the sumps appeared to be clear. All four sumps were running during the inspection. The West Abutment Weir was also flowing during the inspection; a turbidity assessment is not possible for this location.

v. The weekly inspection reports for the period between October 1, 2022, and September 30, 2023, were reviewed and indicate the following:

    a. Animal burrows on the crest and the downstream slope were noted as requiring monitoring starting with the 6/1/2023 weekly inspection.

4.3 APS FIELD INSPECTION – BOTTOM ASH MONOFILL

<table>
<tr><td colspan="2">Bottom Ash Monofill</td><td colspan="3">State Identification Number (SID): N/A</td><td rowspan="13">Not Applicable</td><td rowspan="13">No</td><td rowspan="13">Yes</td><td rowspan="13">Monitor</td><td rowspan="13">Repair</td><td rowspan="13">Investigate</td></tr>
<tr><td>SID: N/A</td><td>Landfill Name: Bottom Ash Monofill</td><td>Type: Landfill</td><td colspan="2">Purpose: Permanent Storage of Dry Bottom Ash Dredged from Bottom Ash Pond</td></tr>
<tr><td colspan="2">Contact(s): Ray Markley, P.E. (APS)</td><td colspan="3">Report Date: January 19, 2024</td></tr>
<tr><td colspan="2">Inspected by: Ray Markley, P.E. (APS)
Lee Wright, P.E. (AECOM)</td><td colspan="3">Inspection Date: November 14, 2023</td></tr>
<tr><td colspan="2">Reviewed by: Ray Markley, P.E. (APS)</td><td colspan="3">Review Date: January 11, 2024</td></tr>
<tr><td colspan="2">Design Maximum Ash Elevation (ft): 5261</td><td colspan="3">Current Ash Elevation: 5184 feet for capped west portion, 5116 feet for east portion.</td></tr>
<tr><td colspan="2">Dam Crest Length (ft): Not a dam, not applicable.</td><td>Design Side Slope: 4:1 (Final)</td><td colspan="2">Observed Side Slope: 3:1, steeper (2:1) towards the south end of the west side.</td></tr>
<tr><td colspan="2" rowspan="2">Dam Crest Width (ft): Not a dam, not applicable.</td><td>Lat: 34° 57' 35.4"N</td><td rowspan="2">Water Rights: N/A</td><td rowspan="2"></td></tr>
<tr><td>Long: 110° 17' 06.3"W</td></tr>
<tr><td colspan="2">Landfill Area (acres): 43 (maximum permitted area)</td><td colspan="3">Landfill Capacity (ac-ft): 2,417</td></tr>
<tr><td colspan="5">Inflow Design Flood/Safe Flood-Passing Capacity: Diversion of 100-year, 24-hour run-on storm</td></tr>
<tr><td colspan="2">Photos: Yes. See Appendix C.</td><td colspan="3">Pages: 3</td></tr>
</table>

Bottom Ash Monofill		SID: N/A		N/A	No	Yes	Mon	Rep	Inv
MONITORING CHECKLIST									
1	***INSTRUMENTATION AND MONITORING***								
a	Describe:	**There are no instruments or other monitoring devices for this structure.**							
b	Any repair or replacement required? **N/A**		Describe: **N/A**	**X**					
c	Date of last report:	**January 2023 (for 2022)**	Should new readings be taken and new report provided? **Annual reporting is required.**	**X**		**X**			
2	***CONDITION SUMMARY***								
a	Waste placed in good practices?			**X**					
3	***LANDFILL CONFIGURATION***								
a	Settlements, slides, slope instability?	**See comment ii.**			**X**			**X**	
b	Cracking?				**X**				
c	Run on control?	**See comment iii.**				**X**		**X**	
d	Run off control?	**See comment iii.**				**X**			
e	Erosion?	**See comment iii.**				**X**		**X**	
f	Dust control issues?	**See comment iv.**					**X**		

Additional comments and recommendations for the Bottom Ash Monofill:

i. APS did not move any CCR from the Bottom Ash Pond to the Bottom Ash Monofill in 2023. APS began removing CCR from the Bottom Ash Monofill in August 2023. The CCR is being taken to the Fly Ash Pond and the Bottom Ash Pond to be used in pre-closure construction activities. Approximately 155,000 cubic yards of CCR had been removed prior to November 23.

ii. There is an exposed section of the ash on the southern face of the Bottom Ash Monofill (Photos IMG_1902). The section is approximately 46 feet wide and 12 feet high. APS's contractor had removed the cover soil in this area for future use; however, the underlying ash remains exposed. The slope is oversteepened in this area, which could lead to a slope failure in the future. The area should be repaired.

iii. The Bottom Ash Monofill layout features a perimeter drainage channel designed to capture and convey the 24-hour, 100-year offsite/run-on flows produced by the 98-acre watershed toward one of three historic discharge points. The design storm magnitude exceeds the 24-hour, 25-year requirement in § 257.81 of the CCR Rule (EPA 2015).

Standing water (attributed to recent precipitation events) was present at several locations along the perimeter drainage channel during the 2022 inspection. No standing water was present during the 2023 inspection; however, there had been no recent precipitation events in the days prior to the observations. The perimeter drainage channel should be cleared of excessive vegetation and the design grade should be maintained along the length of the channel. In addition, erosion features on the channel slopes should be repaired (Photos IMG_1815, IMG_1818, IMG_1819, IMG_1825, and IMG_1832).

The Stormwater Detention Basin is an incised structure with no offsite conveyance. Over the last few years, APS has repaired erosion damage at the northwest corner, the southwest corner, and the inlet; however, erosion has continued in these areas (Photos IMG_1942, IMG_1943, IMG_1949, and IMG_1950). APS should assess the gradients entering the Stormwater Detention Basin at these locations and either reduce the entrance slope or place

riprap to reduce the erosive potential of the run-on in order to prevent excessive erosion after the Plant closes.

Erosion rills and gullies, including some exceeding 3 feet deep, were observed throughout the CCR unit (Photos IMG_1810, IMG_1840, IMG_1865, IMG_1874, IMG_1878, IMG_1879, IMG_1897, IMG_1954, and IMG_1955). In some of the erosion gullies, it was evident that the erosion had extended through the cover soil and into the underlying ash. Continue to monitor these areas and repair erosion where the eroded depth exceeds 1 foot.

CCR eroded from the slopes during precipitation events, including ash exposed due to the cover soil being absent, should be removed to prevent discharge into the Stormwater Detention Basin. In addition, ash and precipitation should be conveyed to the Stormwater Detention Basin and not allowed to leave the Bottom Ash Monofill footprint.

iv. The excavation contractor has removed a portion of the soil cover to gain access to the stockpiled ash within the CCR unit. Most of the west side, part of the top surface, and approximately half of the east side of the CCR unit no longer have a soil cover. Consequently, the exposed ash is at risk of being blown off the surface during periods of high winds. The soil cover should only be removed to the extent it is needed to excavate CCR.

v. The weekly inspection reports for the period between October 1, 2022, and September 30, 2023, were reviewed and indicate the following:

    a. Erosion on the landfill crest was noted as requiring repair starting with the 6/1/2023 weekly inspection. APS scheduled an earthwork contractor to complete the repair.

5.0 DATA REVIEW

5.1 FLY ASH DAM

5.1.1 Geometry Changes Since Last Inspection

There have not been any significant changes to the geometry of the unit since the last inspection in 2022.

APS installed 12 PittBoss downdraft evaporators in August 2022. The PittBoss units float on the Fly Ash Pond surface and do not affect the dam. The PittBoss supplier has made several modifications to the evaporators to sustain their performance since installation. APS reported that the evaporators have generally been running as intended during 2023.

APS is currently installing dewatering wells on the beach within the reservoir as part of pre-closure activities. None of the dewatering wells are currently within the dam footprint; all are designed to be screened either in the impounded ash or in the alluvium underlying the reservoir.

APS performed a site survey, which included an aerial survey and bathymetry in the Fly Ash Pond, in 2022. The data from this survey was used to update elevations, the depth of CCR, and relevant site information for this report.

5.1.2 Instrumentation

The locations of geotechnical and other related instrumentation in the vicinity of the Fly Ash Dam are shown on Figure 4 – Fly Ash Dam Instrumentation Map.

The minimum and maximum recorded readings for each instrument over the October 1, 2022 – September 30, 2023 (current) review period are reported in the following table:

Instrument Name	Minimum	Maximum	Unit
Open Standpipe Piezometers (10/1/22 to 9/30/23)			
F-81	5058.53	5059.26	Water Elevation (ft)
F-88	5003.00	5008.31	Water Elevation (ft)
F-89	5051.71	5053.64	Water Elevation (ft)
F-90	4995.41	5001.20	Water Elevation (ft)
F-91R[1]	4998.61	5002.11	Water Elevation (ft)
F-92R[1]	5008.28	5014.48	Water Elevation (ft)
F-93	5017.60	5017.73	Water Elevation (ft)
F-100	5076.38	5081.17	Water Elevation (ft)
F-101	5047.42	5048.77	Water Elevation (ft)
F-102	5024.88	5026.20	Water Elevation (ft)
F-103	5017.63	5018.67	Water Elevation (ft)
F-104	5062.89	5067.26	Water Elevation (ft)
F-105	5079.56	5085.61	Water Elevation (ft)

Instrument Name	Minimum	Maximum	Unit
F-106	5014.89	5016.75	Water Elevation (ft)
F-107	5024.72	5026.79	Water Elevation (ft)
F-108	5056.93	5059.40	Water Elevation (ft)
F-109	5031.28	5034.67	Water Elevation (ft)
F-110	5083.68	5095.34[3]	Water Elevation (ft)
F-111R[1]	5007.53	5013.92	Water Elevation (ft)
F-112	5027.23	5028.26	Water Elevation (ft)
F-113	5042.88	5044.82	Water Elevation (ft)
F-114	5025.04	5026.30	Water Elevation (ft)
F-115	5033.43	5041.62	Water Elevation (ft)
F-117	5082.87	5083.65	Water Elevation (ft)
F-123	5081.28	5085.02	Water Elevation (ft)
F-124	5083.03	5085.53	Water Elevation (ft)
F-125	5072.95	5072.95	Water Elevation (ft)
F-126	5074.38	5077.41	Water Elevation (ft)
F-127	5068.76	5072.14	Water Elevation (ft)
F-128	5087.34	5089.22	Water Elevation (ft)
F-129	5081.08	5083.80	Water Elevation (ft)
F-130	5072.40	5076.42	Water Elevation (ft)
F-131	5054.50	5057.98	Water Elevation (ft)
F-132	5082.65	5085.52	Water Elevation (ft)
F-133	5074.12	5078.81	Water Elevation (ft)
F-134	5059.11	5063.16	Water Elevation (ft)
W-123R[1]	5033.11	5035.54	Water Elevation (ft)
Settlement Monuments (10/1/22 to 9/30/23)			
M-1	5120.901	5121.023	Monument Elevation (ft)
M-2	5120.365	5120.477	Monument Elevation (ft)
M-3	5119.708	5119.835	Monument Elevation (ft)
M-4	5118.895	5118.980	Monument Elevation (ft)
M-5	5117.856	5117.927	Monument Elevation (ft)
M-5A	5117.672	5117.760	Monument Elevation (ft)
M-5B	5117.458	5117.554	Monument Elevation (ft)
M-5C	5117.771	5117.857	Monument Elevation (ft)
M-6	5118.915	5119.007	Monument Elevation (ft)
M-6A	5118.550	5118.644	Monument Elevation (ft)
M-6B	5119.564	5119.689	Monument Elevation (ft)
M-6C	5119.933	5120.037	Monument Elevation (ft)
M-7	5119.392	5119.468	Monument Elevation (ft)

Instrument Name	Minimum	Maximum	Unit
M-8	5119.500	5119.625	Monument Elevation (ft)
M-9	5119.917	5120.000	Monument Elevation (ft)
M-10	5119.894	5119.972	Monument Elevation (ft)
Totalizers (10/1/22 to 9/30/23)			
Geronimo	0.88[2]	20.37[2]	Average Flowrate (gpm)
Hunt	0.16[2]	9.38[2]	Average Flowrate (gpm)

1) Instrument was abandoned and replaced in May 2021. The "R" suffix designates the name assigned to the nearby replacement instrument.
2) The reference values are the minimum and maximum of calculated average flowrates based on weekly readings at the instruments.
3) As recorded in the field. Inconsistent with previous and subsequent measurements.

The data for the piezometers during the current review period indicate that the water levels recorded in piezometers F-105 (screened in the alluvium on the upstream side of the cutoff wall), F-110 (screened in the alluvium underlying the dam), F-117 (screened in the Moqui Member of the Moenkopi Formation at the Left Abutment), and all four piezometers screened in the core of the dam – F-123, F-124, F-128, and F-132 – are higher than the most recently measured (present) reservoir water level (5080.599 feet on November 14, 2023). In addition, a relatively slower decrease in the water level measured in piezometer F-129 and a 4-foot increase in the water level measured in piezometer F-100 resulted in the water levels at both piezometers being nearly equal to the reservoir elevation by the end of 2023. The higher water levels in the piezometers are attributed to the intentionally rapid decrease in the reservoir level as APS prepares the Fly Ash Pond for closure, the relatively low hydraulic permeability of the core, and the slurry cutoff wall underlying the dam. Approximately 50 feet of CCR is impounded against the upstream slope of the dam near these piezometers, forming a buttress to prevent slope instability. APS will continue to monitor these and nearby instruments.

Most of the settlement monuments are below the design crest elevation at EL 5120 feet. The highest total settlement recorded at any of the Fly Ash Dam monuments is approximately 2.2 feet at Settlement Monument M-5, in the vicinity of the greatest depth to rock along the embankment. Approximately half of the total settlement at M-5 took place throughout the first four years after the Fly Ash Dam was constructed. The trend at Settlement Monument M-5 is similar to the trends at other settlement monuments where the majority of settlement was recorded within the first few years after construction. APS will continue to monitor the settlement monuments for adverse conditions related to dam safety.

APS completed replacing the extraction wells at the Geronimo Seep in early 2023. Extraction Wells EW-01, EW-02, EW-03, and EW-04 and GSX-1R replace Geronimo Sumps A, B, C, and D. APS obtains turbidity measurements from Sump C on a monthly basis.

The data for the totalizers during the current review period indicate no significant changes or trends related to the performance of the dam. APS installed new totalizers in November 2022. The Geronimo totalizer values decreased along with the decreasing pond level throughout 2023. The Hunt totalizer values varied throughout 2023; however, the Hunt stations are several hundred feet downstream of the dam toe.

5.1.3 CCR and Water Elevations

The approximate minimum, maximum, and present depth, and elevation of the impounded water and CCR since the previous annual inspection (the October 1, 2022 – September 30, 2023 review period) are presented in the following table:

Water	Depth of Water (ft) (calculated)	Water Elevation (ft) (surveyed)	Measurement Location
Minimum	12.068	5081.068 (9/19/23)	East Side of Pond
Maximum	14.731	5083.731 (2/28/23)	East Side of Pond
Present (this inspection)	11.599	5080.599 (11/14/23)	East Side of Pond
CCR	**Depth of CCR (ft) (calculated)**	**CCR Elevation (ft) (estimated)**	**Measurement Location**
Minimum	56.98	~5095.98 (2022 inspection)	Inlet Pipe
Maximum	57.56	~5096.56 (2023 inspection)	Inlet Pipe
Present (this inspection)	57.56	~5096.56	Inlet Pipe

Water elevation measurements are made by Plant surveyors using GPS techniques on a monthly basis.

The CCR elevation is estimated by measuring the gap from the invert of the discharge pipe to the top of the CCR surface at the time of the annual inspection. Based on these measurements, the CCR elevation was measured to be slightly higher during the 2023 inspection when compared to the same measurement during the 2022 inspection.

Reported water depths are calculated relative to the estimated lowest elevation of natural ground within the Fly Ash Pond. APS commissioned a bathymetric survey, performed in late August 2022, to aid in closure design. This bathymetry showed the lowest point in the reservoir is approximately EL 5069 feet (Industrial Aerobotics 2022). The 2022 bathymetry was used to estimate the maximum and minimum water depth during the review period. Reported CCR depths are calculated relative to the estimated lowest elevation (approximately EL 5039 feet) of the intersection of the upstream slope of the dam with natural ground, based on original as-built dam construction drawings (APS 1977).

5.1.4 Storage Capacity

The storage capacity of the CCR unit at the time of the inspection was 18,000 acre-feet (ac-ft). This value is based on the existing dam design.

5.1.5 Approximate Impounded Volume at Time of Inspection

The approximate volume of impounded water and CCR at the time of the inspection was 6,333 ac-ft. The volume is estimated via three steps: 1) the volume of CCR and water below the current water level from the Elevation-Area-Capacity curve for the reservoir; 2) the volume of CCR above the water level based on the maximum elevation measured during the inspection, areal measurements, and a truncated pyramid volume estimate; and 3) the reported volume of ash relocated from Ash Pond 1 and the Bottom Ash Monofill (Section 5.1.6). The approximate

impounded volume is less than the 2022 inspection because more water has been removed compared to the volume of CCR that has been added.

5.1.6 Structural Weakness or Operational Change/Disruption

No conditions associated with structural weakness were identified during the field inspection.

No conditions that are or could be disruptive to the operation and safety of the CCR unit and appurtenant structures were identified during the field inspection.

APS is currently transferring CCR from the Bottom Ash Monofill to a stockpile within the Fly Ash Pond. At the time of the inspection, APS estimates that approximately 155,000 cubic yards have been transferred since hauling began in August 2023. This is in addition to APS relocating 766,988.8 cubic yards (475.4 ac-ft) of CCR from Ash Pond 1 to the Fly Ash Pond reservoir for use as fill during closure construction in 2022. The Ash Pond 1 material was placed within the reservoir, above the pond level, on the left abutment/hillside. The CCR from the Bottom Ash Monofill is being placed in a stockpile on top of the material from Ash Pond 1 to serve as bridging lift fill.

APS installed two separate sprinkler systems in the northeast drainage ditch to facilitate dewatering in July and September 2023. A solar-powered pump at the edge of the reservoir transfers water up the drainage slope toward a natural low spot, where the sprinklers distribute the water across the salt, increasing the available water surface area for evaporation.

5.2 BOTTOM ASH DAM

5.2.1 Geometry Changes Since Last Inspection

There have not been any significant changes to the geometry of the unit since the last inspection in 2021.

5.2.2 Instrumentation

The locations of geotechnical and other related instrumentation in the vicinity of the Bottom Ash Dam are shown on Figure 5 – Bottom Ash Dam Instrumentation Map.

The minimum and maximum recorded readings for each instrument over the October 1, 2022 – September 30, 2023 (current) review period are reported in the following table:

Instrument Name	Minimum	Maximum	Unit
Open Standpipe Piezometers (10/1/22 to 9/30/23)			
B-200	5047.11	5049.87	Water Elevation (ft)
B-201	5043.28	5046.00	Water Elevation (ft)
B-202	5040.26	5041.93	Water Elevation (ft)
B-204	5097.60	5101.42	Water Elevation (ft)
B-206	5027.90	5029.56	Water Elevation (ft)
B-207	5030.43	5032.23	Water Elevation (ft)
B-208B	Dry	Dry	Water Elevation (ft)
B-209	5072.19	5073.50	Water Elevation (ft)
B-210	5066.10	5067.36	Water Elevation (ft)
B-211	Dry	Dry	Water Elevation (ft)
B-212	5090.37	5092.51	Water Elevation (ft)
B-213	5079.33	5080.96	Water Elevation (ft)
B-214	5079.30	5080.57	Water Elevation (ft)
B-215	5078.08	5079.83	Water Elevation (ft)
B-216	5070.57	5073.63	Water Elevation (ft)
B-217	5101.04	5102.21	Water Elevation (ft)
B-218	5093.76	5097.49	Water Elevation (ft)
B-225	5059.15	5060.55	Water Elevation (ft)
W-227	5090.48	5094.17	Water Elevation (ft)
Settlement Monuments (10/1/22 to 9/30/23)			
M-11	5123.204	5123.321	Monument Elevation (ft)
M-12	5122.609	5122.756	Monument Elevation (ft)
M-13	5122.542	5122.678	Monument Elevation (ft)
M-14	5119.237	5119.412	Monument Elevation (ft)
M-15	5122.891	5123.035	Monument Elevation (ft)
M-16	5123.389	5123.509	Monument Elevation (ft)

Instrument Name	Minimum	Maximum	Unit
M-17	5122.894	5122.981	Monument Elevation (ft)
M-18	5123.213	5123.309	Monument Elevation (ft)
M-19	5123.330	5123.446	Monument Elevation (ft)
PI	5123.361	5123.451	Monument Elevation (ft)
Totalizers (10/1/22 to 9/30/23)			
West Abutment Totalizer	5.63[1]	6.46[1]	Average Flowrate (gpm)
West Abutment Weir	1.30[1]	4.00[1]	Average Flowrate (gpm)
P-226	1.71[1]	6.47[1]	Average Flowrate (gpm)
Tanner Wash Totalizer	0.19[1]	5.37[1]	Average Flowrate (gpm)
Petroglyph	1.01[1]	3.75[1]	Average Flowrate (gpm)

1) The third quarter totalizer reading was recorded in October 2023 and is not included with this data set.
2) The reference values are the minimum and maximum of calculated average flowrates for the available quarters.

The water levels recorded in the piezometers monitored at the Bottom Ash Dam generally followed the trends exhibited by the Bottom Ash Pond level throughout the year. The data for the piezometers indicate no significant elevation changes or trends related to the performance of the dam during the current review period.

The data for the settlement monuments during the current review period indicate no significant elevation changes or trends related to the performance of the dam.

The data for the totalizers and seeps during the current review period indicates that the seepage flow rates appear to change in response to changes in the Bottom Ash Pond water elevation. The higher flowrates were typically recorded in early 2023 when the Bottom Ash Pond exceeded EL 5111 feet. The Bottom Ash Pond receded to its 2023 minimum at EL 5108.85 feet in July.

5.2.3 CCR and Water Elevations

The approximate minimum, maximum, and present depth, and elevation of the impounded water and CCR since the previous annual inspection (the October 1, 2022 – September 30, 2023 review period) are presented in the following table:

Water	Depth of Water (ft) (calculated)	Water Elevation (ft) (measured)	Measurement Location
Minimum	8.85	5108.85 (7/17/2023)	Upstream slope at the staff gauge
Maximum	12.0	5112.0 (3/31-4/4/2023)	Upstream slope at the staff gauge
Present (this inspection)	9.65	5109.65 (NGVD29)	Upstream slope at the staff gauge
CCR	**Depth of CCR (ft) (calculated)**	**CCR Elevation (ft) (estimated)**	**Measurement Location**
Minimum	30-45	5115-5130 (NGVD29)	Visual observation in the north end of the impoundment and around the divider dikes
Maximum	~45	~5100 (NGVD29)	Upstream slope at the staff gauge
Present (this inspection)	30-45	5100-5115 (NGVD29)	Visual observation in the East Decant Cell

Water elevation measurements are made by Plant personnel on a daily basis by reading the staff gauge on the upstream slope along the South Embankment of the dam. APS constructed divider dikes in 2009 to create the East and West Decant Cells in the northern half of the reservoir. The divider dikes were constructed on top of the existing impounded ash and currently prevent most of the newly deposited ash from reaching the South Embankment. Since the water elevation is measured against the South Embankment, the resulting water depth is calculated based on the depth of impounded water to the top of previously deposited bottom ash.

The CCR elevation varies throughout the year based on the volume of ash discharged to the reservoir and the volume of ash taken to the Bottom Ash Monofill. The CCR elevation and depth of CCR are estimated based on observations of ash levels around the divider dikes, ash levels in the East Decant Cell, recent ash excavation activity, and preconstruction topography. CCR depths are based on a minimum original ground surface elevation of 5055 feet along the upstream toe of the South Embankment near the current staff gauge location (APS Drawing #G-44556). The maximum CCR depth is typically along the southeast side of the East Decant Cell divider dike where the original topography is lowest and the minimum CCR depth is typically in the north half of the reservoir where the original topography is relatively higher.

APS historically excavated bottom ash from the Bottom Ash Pond at various times throughout the year and would place it in the Bottom Ash Monofill. However, APS did not remove any ash in 2023.

5.2.4 Storage Capacity

The storage capacity of the CCR unit at the time of the inspection was 2,300 ac-ft. This value is based on the existing dam design.

5.2.5 Approximate Impounded Volume at Time of Inspection

APS did not remove any CCR from the Bottom Ash Pond in 2023. Based on a bathymetry survey in the southern end of the reservoir conducted in June 2023, digitized contours from the pond construction documents, and the as-built EAC, the approximate impounded volume of CCR and water at the time of the inspection was 2,045 ac-ft.

5.2.6 Structural Weakness or Operational Change/Disruption

No conditions associated with structural weakness were identified during the field inspection.

No conditions that are or could be disruptive to the operation and safety of the CCR unit and appurtenant structures were identified during the field inspection.

There are no significant changes to the structural integrity or operation of the impoundment since the 2022 inspection.

5.3 BOTTOM ASH MONOFILL

5.3.1 Geometry Changes Since Last Inspection

APS did not move any ash from the Bottom Ash Pond into the Bottom Ash Monofill in 2023. APS began removing CCR from the Bottom Ash Monofill in August 2023 to facilitate closure at the Fly Ash Pond and the Bottom Ash Pond. APS's construction contractor removed the soil cover from most of the west side, part of the top surface, and approximately half of the east side of the CCR unit. The primary CCR removal location is from the top of the CCR unit at the time of the inspection and the Bottom Ash Monofill's footprint remains unchanged since the 2022 inspection.

5.3.2 Instrumentation

There are no instruments associated with the Bottom Ash Monofill.

5.3.3 CCR Volume

The CCR unit is estimated to contain approximately 1,311.84 ac-ft at the time of the inspection. This value is higher than the 2022 estimate because the 2022 estimate was based on approximate haul volumes over the course of several years. The basis for this report's estimate is the November 2023 aerial survey conducted as part of the regular monitoring for the ash removal work at the Bottom Ash Monofill. The estimated maximum storage capacity is based on the design volume approved as part of the ADEQ APP (e.g., 2,417 ac-ft). APS did not move any ash from the Bottom Ash Pond into the Bottom Ash Monofill in 2023, instead opting to remove ash and soil cover as described in Subsection 5.3.1.

5.3.4 Structural Weakness or Operational Change/Disruption

Erosion gullies exceeding 3 feet were observed in several locations on slopes throughout the CCR unit. It was evident that the erosion had extended through the cover soil and into the underlying ash as CCR was observed at the toe of the monofill slopes.

APS started removing CCR from the Bottom Ash Monofill in August 2023. APS historically excavated CCR from the Bottom Ash Pond and placed it in the Bottom Ash Monofill. The operational change is the result of APS requiring structural fill for access roads at the Fly Ash Pond and the Bottom Ash Pond in addition to other construction activities in advance of closing the CCR units.

6.0 OPERATION AND MAINTENANCE RECOMMENDATIONS

6.1 FLY ASH DAM

6.1.1 Current Fly Ash Dam Action Items

The following items were noted during this inspection as requiring attention.

Action Item	Action Status
1) Continue identifying and remediating scattered animal burrows and ant hills.	Mark ant hills and animal burrows identified during weekly inspections. NOTE: This will always be an ongoing maintenance activity.
2) Continue monitoring the groin of the Right Abutment, the downstream slope, and the access road near the Geronimo sumps for erosion.	Repair the erosion at the Right Abutment and continue to repair other areas when the eroded depth exceeds 1 foot.
3) Continue to maintain, treat, and remove excessive vegetation.	Remove trees, shrubs, and other deleterious vegetation on the dam as per NMOSE (2011). Large stumps should be removed, and the resulting void should be filled with compacted soil. NOTE: This will always be an ongoing maintenance activity.
4) Continue monitoring the riprap for additional signs of deterioration.	Replace riprap as needed.
5) There is erosion around piezometer F-123.	Repair if the eroded depth around the piezometer exceeds 1 foot.
6) There is a gap in the riprap on the upstream slope.	Repair the gap in the riprap.
7) Monitor erosion and soil wasting along the upstream slope.	Repair if the eroded depth exceeds 1 foot or if erosion reaches the original 24-foot-wide dam crest.
8) Continue to monitor seepage through the embankment.	NOTE: This will always be an ongoing maintenance activity.
9) Continue to monitor the I-40 seep.	Any perceived increases in seepage volume, affected area, or perpetual standing water should be reviewed by the APS geotechnical engineer.
10) Settlement monument M-2 is at least one foot higher than the crest.	Reconcile the difference between M-2 and the crest either by restoring the crest to EL 5120 feet or install a new survey monument on the crest.

Action Item	Action Status
11) The 2023 turbidity measurements at the Geronimo Sump remain elevated compared to previous years.	Turbidity measurements over 1.0 should be reported to the APS geotechnical engineer to assess the significance of the trend. APS began using a new turbidity meter in March 2021 and completed upgrades to the Geronimo Seep in January 2023. The turbidity values have typically been higher since the new meter was introduced.

6.1.2 Previous Fly Ash Dam Action Items

The following items were noted during the three previous annual inspections and have been addressed.

Action Item and First Instance of Observation	Resolution
1) Monitor the 20-foot long, discontinuous, longitudinal crack on the upstream half of the crest near Settlement Monument M-5B (2020 inspection).	The crack was not present during the 2021, 2022, or 2023 inspections. Continue to monitor the area for reappearance.
2) Monitor the 6-foot-long longitudinal crack on the upstream shoulder of the crest south of Piezometer F-124 (2020 inspection).	The crack was not present during the 2021, 2022 or 2023 inspections. Continue to monitor the area for reappearance.

6.2 BOTTOM ASH DAM

6.2.1 Current Bottom Ash Dam Action Items

The following items were noted during this inspection as requiring attention.

Action Item	Action Status
1) Monitor the crest for erosion holes during weekly inspections. Record the location and sizes of erosion holes during the weekly inspections. There is a 21-inch-deep hole adjacent to the concrete on the west side of the central siphon line.	Establish a regular schedule (e.g., semi-annually) to remediate holes identified in the crest. Establish a procedure to track the appearance of new holes and the disappearance of old holes. NOTE: This will always be an ongoing maintenance activity. Repair the 21-inch-deep hole.
2) Repair the 4-foot-deep erosion in the downstream groin of the Right Abutment.	The erosion should be restored with compacted, well-graded fill at the direction of the APS geotechnical engineer.
3) Repair the erosion gullies at the downstream slope of the East Embankment and the erosion in the downstream groin of the Right Abutment.	Repair erosion that has exceeded 1 foot in depth.
4) Continue identifying and remediating scattered animal burrows and ant hills.	Mark ant hills and animal burrows identified during weekly inspections. NOTE: This will always be an ongoing maintenance activity.
5) Continue to maintain, treat, and remove excessive vegetation, including vegetation on the upstream and downstream slopes.	Remove trees, shrubs, and other deleterious vegetation on the dam as per NMOSE (2011). Large stumps should be removed, and the resulting void should be filled with compacted soil. NOTE: This will always be an ongoing maintenance activity.
6) Continue monitoring the riprap for additional signs of deterioration.	Replace riprap as needed.
7) Continue to monitor seepage through the embankment.	Sumps should be clear of algae and other obstructions to facilitate observations of clear or cloudy seepage. NOTE: This will always be an ongoing maintenance activity.

Action Item	Action Status
8) Continue to monitor seepage areas, including the West Abutment Weir, for excessive vegetation.	Woody vegetation rooted in the embankment should be removed and the resulting disturbed area should be replaced with compacted material similar to the embankment material per NMOSE (2011).
9) Remove vegetation from the upstream slope at the Right Abutment.	Woody vegetation rooted in the embankment should be removed and the resulting disturbed area should be replaced with compacted material similar to the embankment material per NMOSE (2011).
10) Continue to monitor the erosion around the siphon line encasements and on the shoulder of the crest.	Repair erosion if the eroded depth exceeds 1 foot.
11) Continue to monitor the soil wasting observed along the downstream slope of the East Embankment near the Left Abutment access road.	Investigate the source of sediment collecting in the diversion ditch between the East Embankment access road and the East Embankment.
12) The downstream section of support material is separating from the concrete at Settlement Monument M-13.	Monitor M-13 and repair the section of support material that is separating from the concrete only if a series of deviant readings are recorded for the horizontal or vertical measurements. Record the position of M-13 via GPS immediately before and after any repairs.

6.2.2 Previous Bottom Ash Dam Action Items

The following items were noted during the three previous annual inspections and have been addressed.

Action Item and First Instance of Observation	Resolution
1) The pumpback flowmeter at the eastern siphon line is broken (2021 inspection).	The flowmeter was replaced on December 22, 2021.

6.3 BOTTOM ASH MONOFILL

6.3.1 Current Bottom Ash Monofill Action Items

The following items were noted during this inspection as requiring attention.

Action Item	Action Status
1) Erosion gullies several feet deep were observed at various locations at the CCR unit. Some erosion gullies extended into the ash underlying the soil cover.	Repair the erosion once it exceeds 1 foot in depth or reaches the underlying ash. NOTE: This will always be an ongoing maintenance activity.
2) There is CCR at the eastern toe of the Bottom Ash Monofill, west of the Stormwater Detention Basin that has eroded off the eastern slope.	Repair the slope and remove the CCR from the toe. Ash and precipitation should be conveyed to the Stormwater Detention Basin and not allowed to leave the Bottom Ash Monofill footprint.
3) Standing water was observed in the perimeter drainage channel during the 2022 inspection.	Grade the channel to drain to the Stormwater Detention Basin.
4) Severe erosion on the west side of the perimeter drainage channel has resulted in a tunnel leading into the channel.	Repair the erosion and fill in the tunnel with compacted fill under the direction of the APS Geotechnical Engineer.
5) There is an erosion gully several feet deep near the south end of the Bottom Ash Monofill.	Repair the erosion.
6) There was a low spot on the toe road where stormwater is ponding behind a berm during the 2022 inspection.	Regrade the area such that water does not pond.
7) Severe erosion around the Stormwater Detention Basin.	Repair the erosion. Assess the gradients entering the Basin and consider reducing the entrance slope or placing riprap along the slopes to reduce the erosive potential of the run-on.
8) There is an exposed section of the ash on the southern face of the Bottom Ash Monofill. The slope is now oversteepened and may fail in the future.	The area should be repaired.
9) A portion of the soil cover has been removed to gain access to the stockpiled ash within the CCR unit.	The soil cover should only be removed to the extent it is needed to excavate CCR. Consider applying a dust palliative to prevent fugitive CCR from leaving the Bottom Ash Monofill during wind events.

6.3.2 Previous Bottom Ash Monofill Action Items

All items noted during the three previous annual inspections either have been addressed or remain outstanding.

7.0 REFERENCES

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FIGURES

Last saved by: LEE.WRIGHT(2022-11-28) Last Plotted: 2022-11-28
Filename: L:\DCS\PROJECTS_WTR\60692686_APS_CH_2022_DAM_INSP\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 1 - FLY ASH POND.DWG

ANSI A 8.5" x 11"

CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

FLY ASH POND
SITE MAP

AECOM

FIGURE 1

Last saved by: LEE.WRIGHT(2022-11-28) Last Plotted: 2022-11-28
Filename: L:\DCS\PROJECTS_WTR\60692686_APS_CH_2022_DAM_INSP\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 2 - BOTTOM ASH POND.DWG
ANSI A 8.5" x 11"

CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

BOTTOM ASH POND
SITE MAP

AECOM

FIGURE 2

Last saved by: LEE.WRIGHT(2022-11-28) Last Plotted: 2022-11-28
Filename: L:\DCS\PROJECTS_WTR\60692686_APS_CH_2022_DAM_INSP\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 3 - BOTTOM ASH MONOFILL.DWG
ANSI A 8.5" x 11"

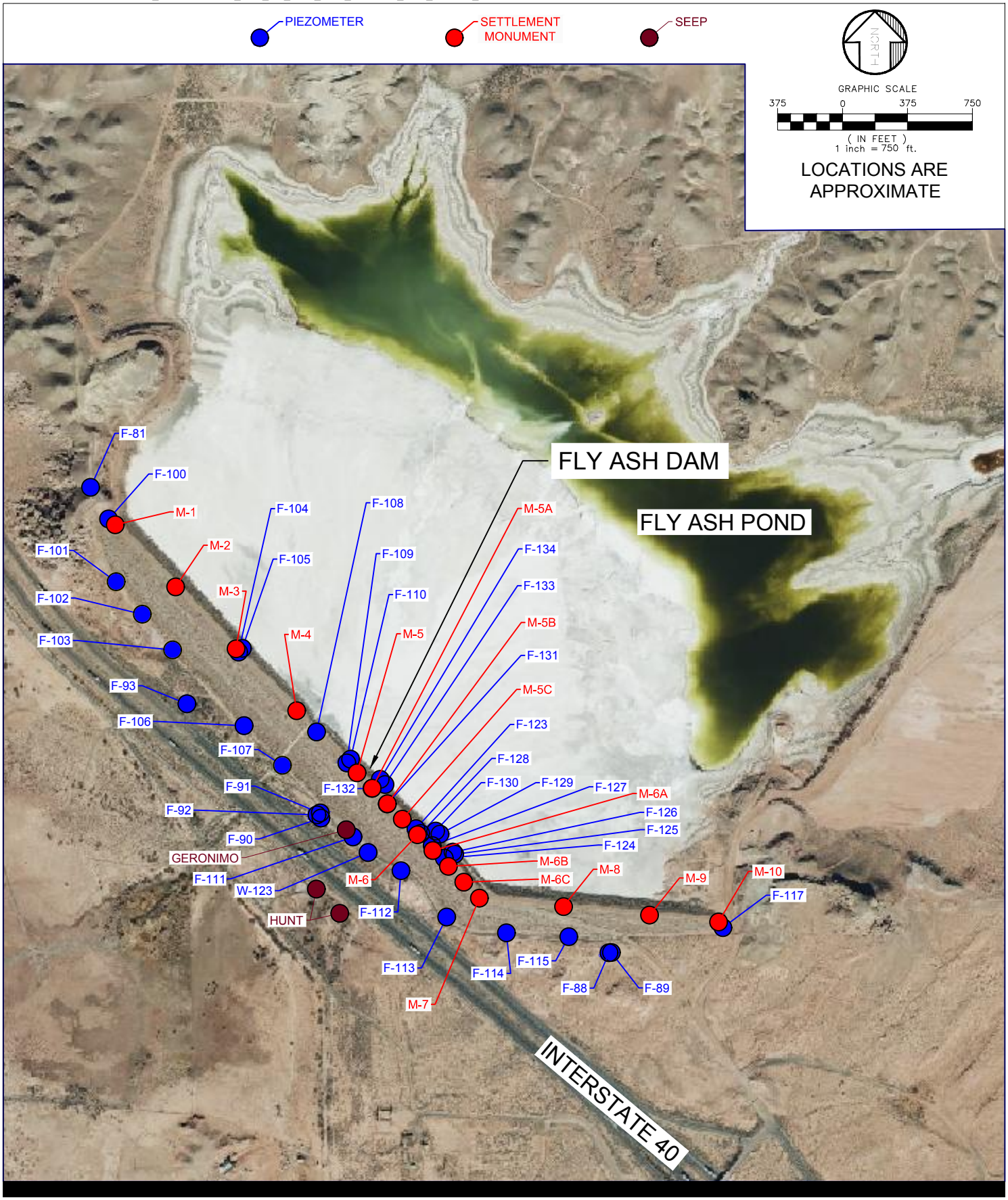
CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

BOTTOM ASH MONOFILL
SITE MAP

AECOM

FIGURE 3

Last saved by: LEE.WRIGHT(2022-11-28) Last Plotted: 2022-11-28
Filename: L:\DCS\PROJECTS_WTR\60692686_APS_CH_2022_DAM_INSP\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 4 - FLY ASH DAM INSTRUMENTS.DWG
ANSI A 8.5" x 11"



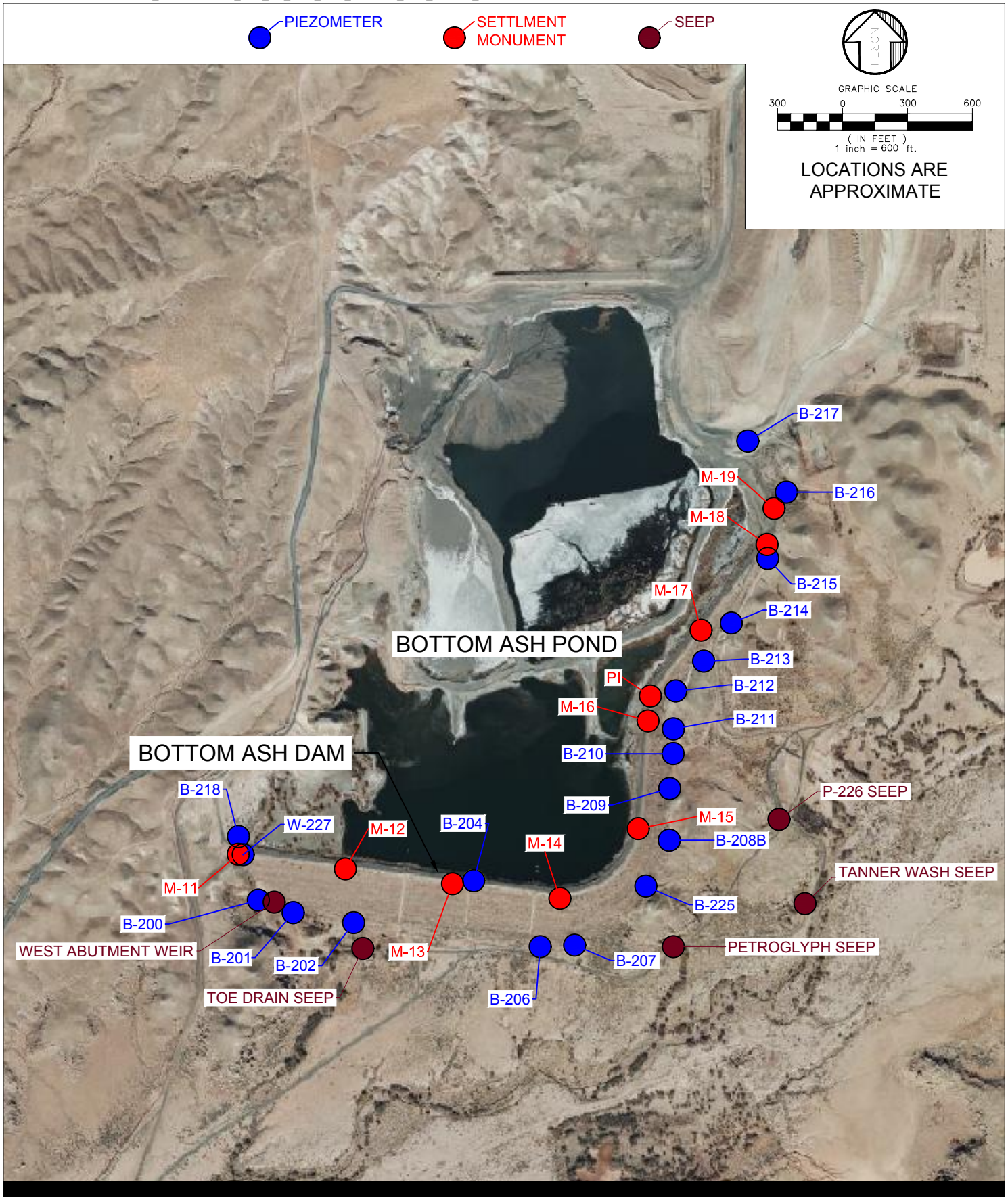
CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

FLY ASH DAM
INSTRUMENTATION MAP

AECOM

FIGURE 4

Last saved by: LEE.WRIGHT(2022-11-28) Last Plotted: 2022-11-28
Filename: L:\DCS\PROJECTS_WTR\60692686_APS_CH_2022_DAM_INSP\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 5 - BOTTOM ASH DAM INSTRUMENTS.DWG
ANSI A 8.5" x 11"



CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

BOTTOM ASH DAM
INSTRUMENTATION MAP

AECOM

FIGURE 5

APPENDIX A

FLY ASH DAM PHOTO LOG

20231113 – IMG_1365
Downdraft evaporators in the Fly Ash Pond.

20231113 – IMG_1366
Downdraft evaporators in the Fly Ash Pond. One evaporator being removed for repairs.

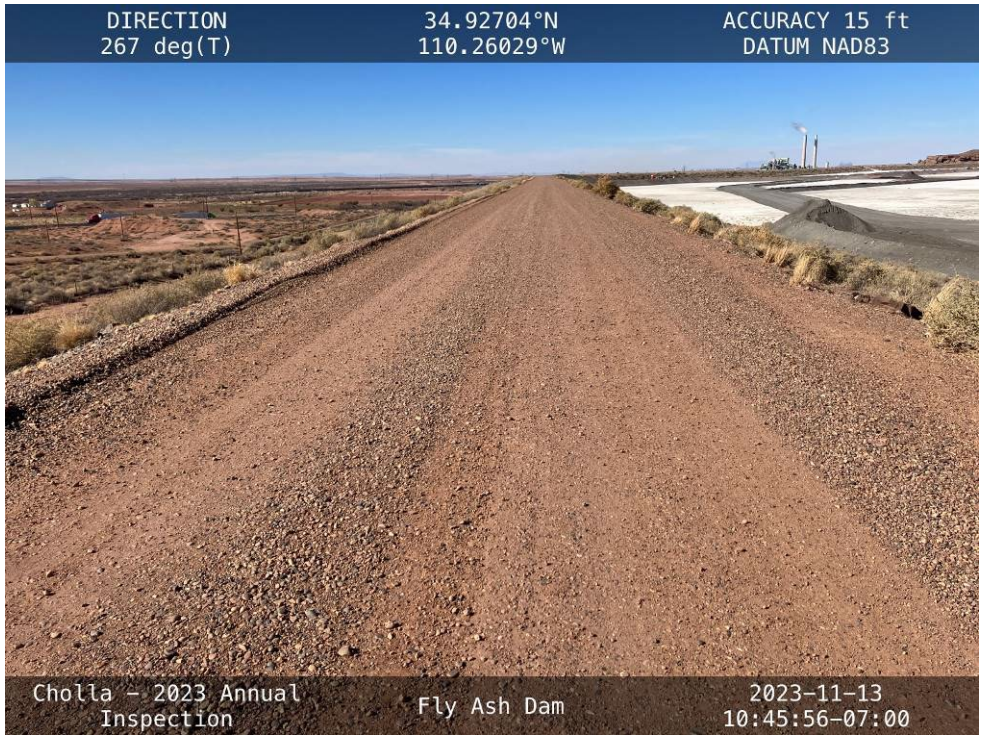
20231113 – IMG_1386

A sprinkler installed on the higher-elevation salt to accelerate water removal via evaporation.

20231113 – IMG_1391

A sprinkler installed on the higher-elevation salt to accelerate water removal via evaporation.

20231113 – IMG_1392
The downstream slope of the South Embankment, facing west from the Left Abutment.



20231113 – IMG_1393
The crest of the South Embankment, facing west from the Left Abutment.

20231113 – IMG_1394
The upstream slope of the South Embankment, facing west from the Left Abutment.

20231113 – IMG_1396
Access roads for wells installed as part of pre-closure work.

20231113 – IMG_1397
Vegetation to be removed from the upstream shoulder of the South Embankment crest.

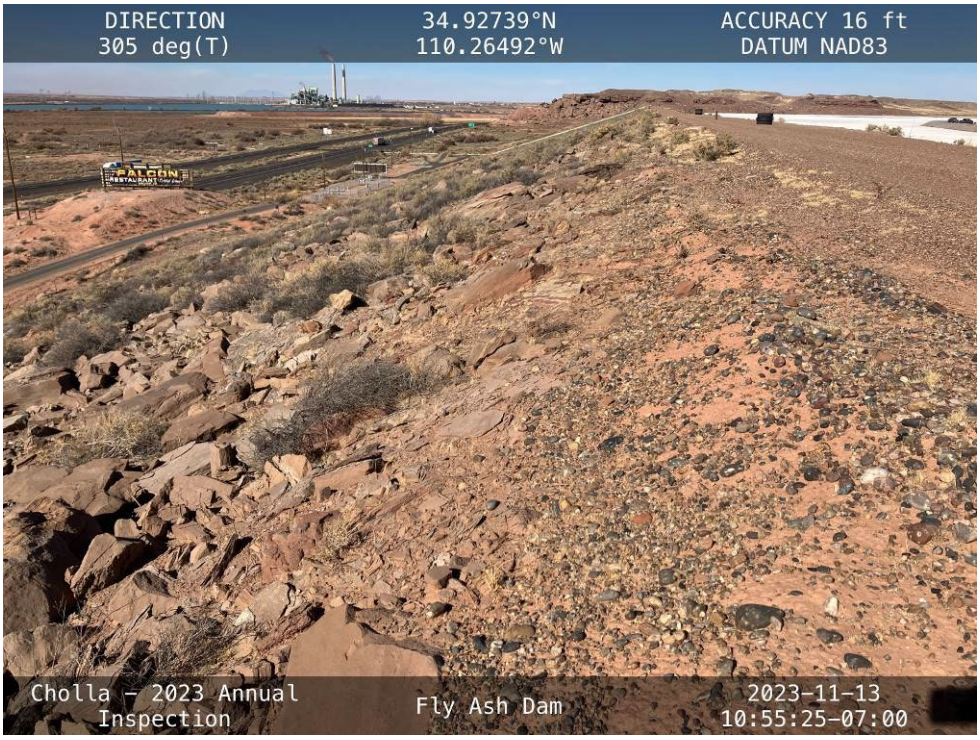
20231113 – IMG_1399
The downstream slope of the South Embankment, facing east.

20231113 – IMG_1401
The upstream slope of the South Embankment, facing east.

20231113 – IMG_1402
The crest of the South Embankment, facing east.

20231113 – IMG_1403
The upstream slope of the West Embankment, facing northwest.

20231113 – IMG_1404
The crest of the West Embankment, facing northwest.



20231113 – IMG_1405
The downstream slope of the West Embankment, facing northwest.

20231113 – IMG_1411
The crest of the West Embankment, facing northwest. Tires placed around the piezometer for protection.

20231113 – IMG_1414

One foot of erosion on the upstream side of the crest in an area where the crest is wider.

20231113 – IMG_1417

1.5 feet of erosion on the upstream side of the crest in an area where the crest is wider.

20231113 – IMG_1424

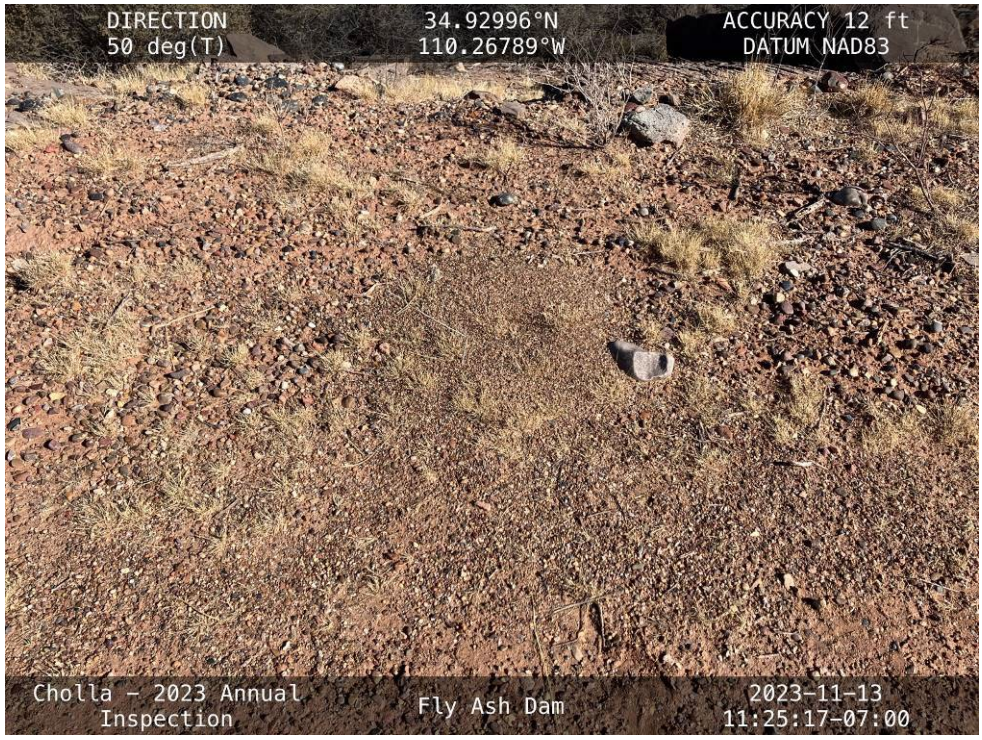
Erosion (2 feet wide, 1 foot deep) on the upstream side of the crest where the crest is wider.

20231113 – IMG_1429

Erosion (3.25 feet wide, 1.5 feet deep) on the upstream side of the crest where the crest is wider.

20231113 – IMG_1430
Erosion around piezometer F-123 on the downstream shoulder of the West Embankment crest.

20231113 – IMG_1442
The area with a 3.5-inch-deep erosion hole observed during the 2022 inspection. No hole observed during this inspection.



20231113 – IMG_1443
An ant hill on the West Embankment crest.

20231113 – IMG_1444
The inlet pipes along the upstream slope.

20231113 – IMG_1445
The inlet pipes along the downstream slope.

20231113 – IMG_1446
The downstream slope along the southern half of the West Embankment, facing southeast.

20231113 – IMG_1447
The downstream slope along the northern half of the West Embankment, facing northwest.

20231113 – IMG_1448
The upstream slope along the northern half of the West Embankment, facing northwest.

20231113 – IMG_1450
The crest along the northern half of the West Embankment, facing northwest.

20231113 – IMG_1451
The crest along the southern half of the West Embankment, facing southeast.

20231113 – IMG_1452
The inlet pipe depositing CCR into the impoundment.

20231113 – IMG_1469
A 1.5-foot-deep gap formed as soil erodes away between riprap on the upstream slope.

20231113 – IMG_1472
Riprap overhanging the gap shown in IMG_1469, as seen from the upstream shoulder.

20231113 – IMG_1474
Settlement monument M-2 on the crest of the West Embankment.

20231113 – IMG_1476
The upstream slope of the Fly Ash Dam, facing southeast from the Right Abutment.

20231113 – IMG_1477
The crest of the Fly Ash Dam, facing southeast from the Right Abutment.

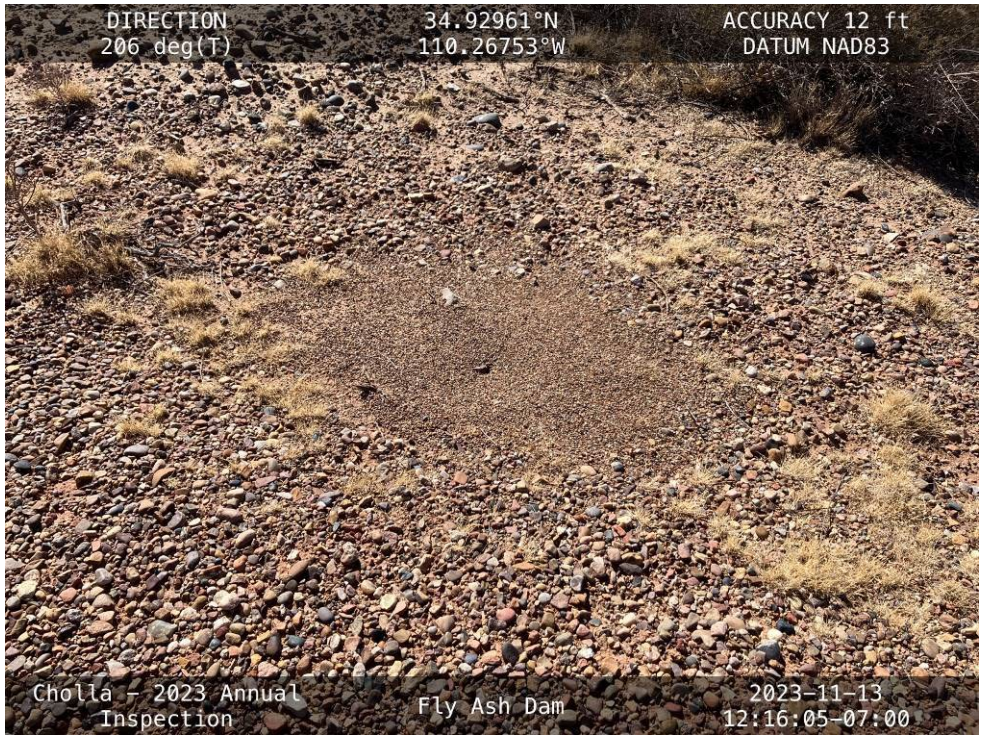
20231113 – IMG_1478
The downstream slope of the Fly Ash Dam, facing southeast from the Right Abutment.

20231113 – IMG_1482
Erosion on the downstream side of the Right Abutment contact.

20231113 – IMG_1485
Erosion on the downstream side of the Right Abutment contact.

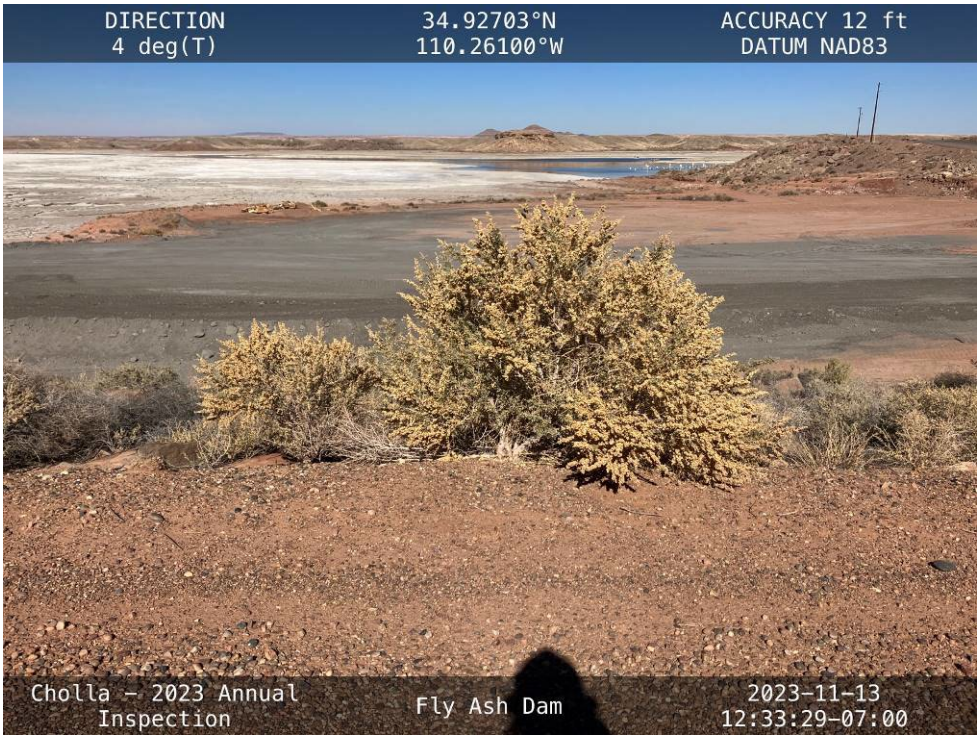
20231113 – IMG_1490
Vegetation to be removed from the West Embankment downstream shoulder.

20231113 – IMG_1492
The deposition path along the northern half of the West Embankment, facing north.



20231113 – IMG_1496
An ant hill on the West Embankment downstream shoulder.

20231113 – IMG_1501
The upstream slope along the northern half of the West Embankment, facing west.



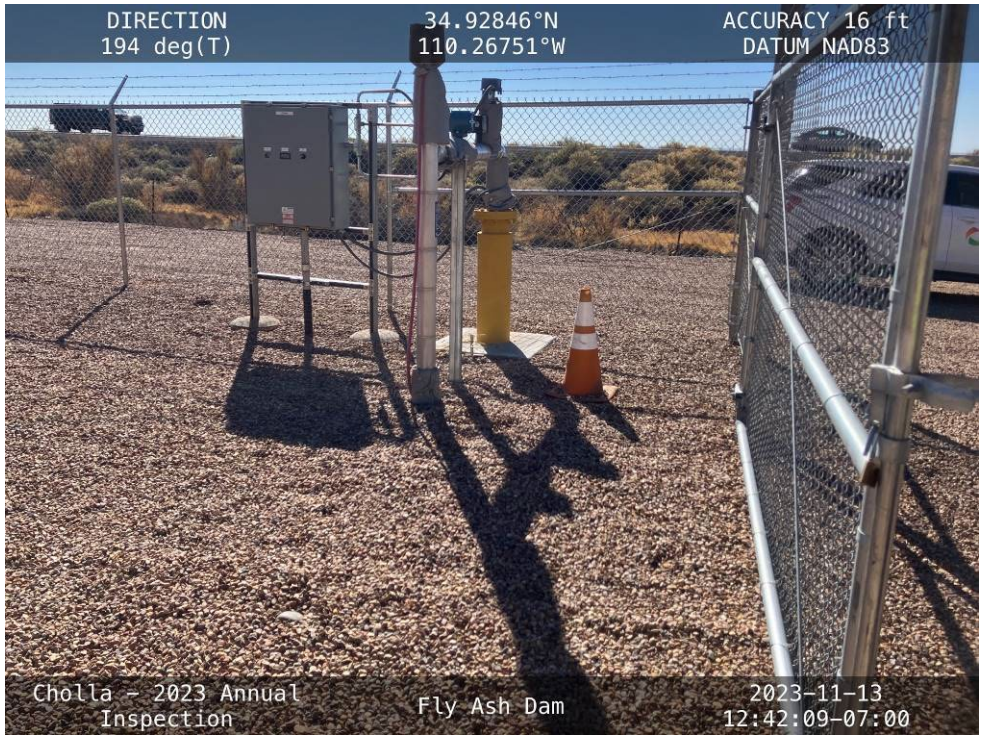
20231113 – IMG_1505
Vegetation to be removed from the South Embankment upstream shoulder.

20231113 – IMG_1506
Sign identifying allowed and disallowed materials in the Fly Ash Pond.

20231113 – IMG_1510
The downstream slope and toe of the South Embankment.

20231113 – IMG_1517
The downstream slope and toe of the West Embankment.

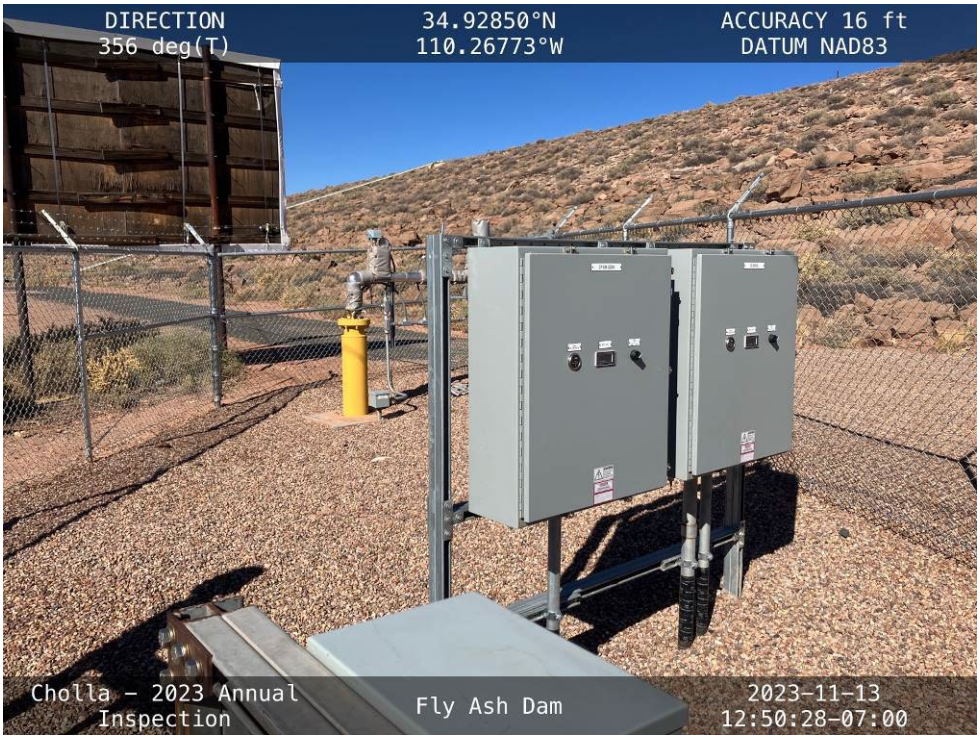
20231113 – IMG_1519
The Geronimo Seep area, with new monitoring wells, fencing, and extraction wells.



20231113 – IMG_1525
New extraction well CP-EW-03 at the Geronimo Seep area.

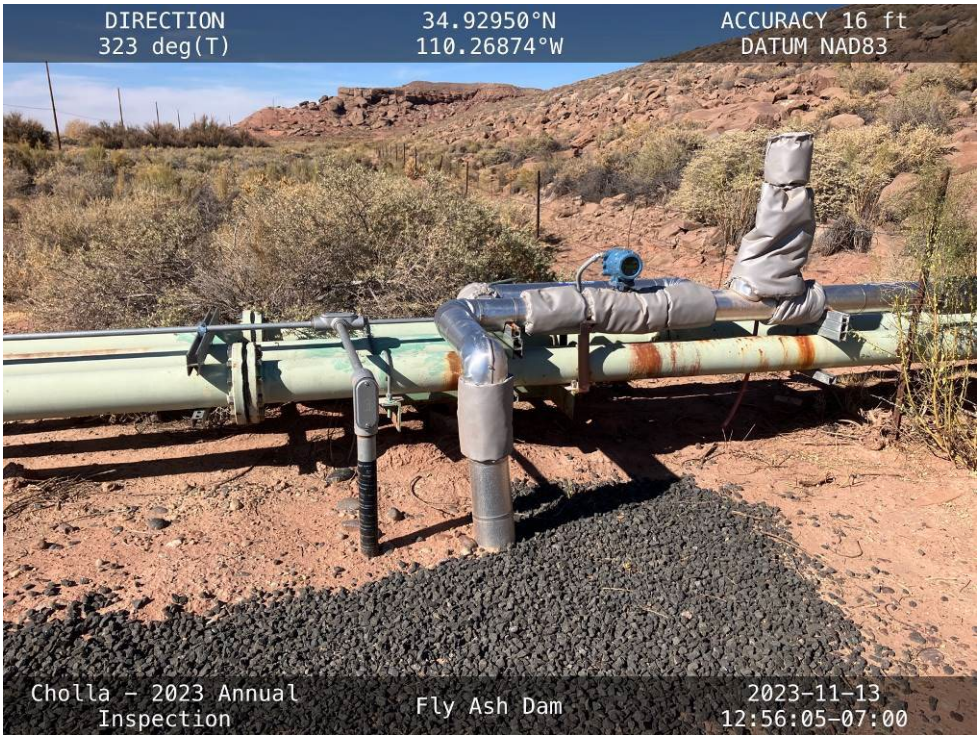
20231113 – IMG_1542
The downstream toe of the Fly Ash Dam at the Geronimo Seep area, facing southeast.

20231113 – IMG_1543
The downstream toe of the Fly Ash Dam at the Geronimo Seep area, facing northwest.



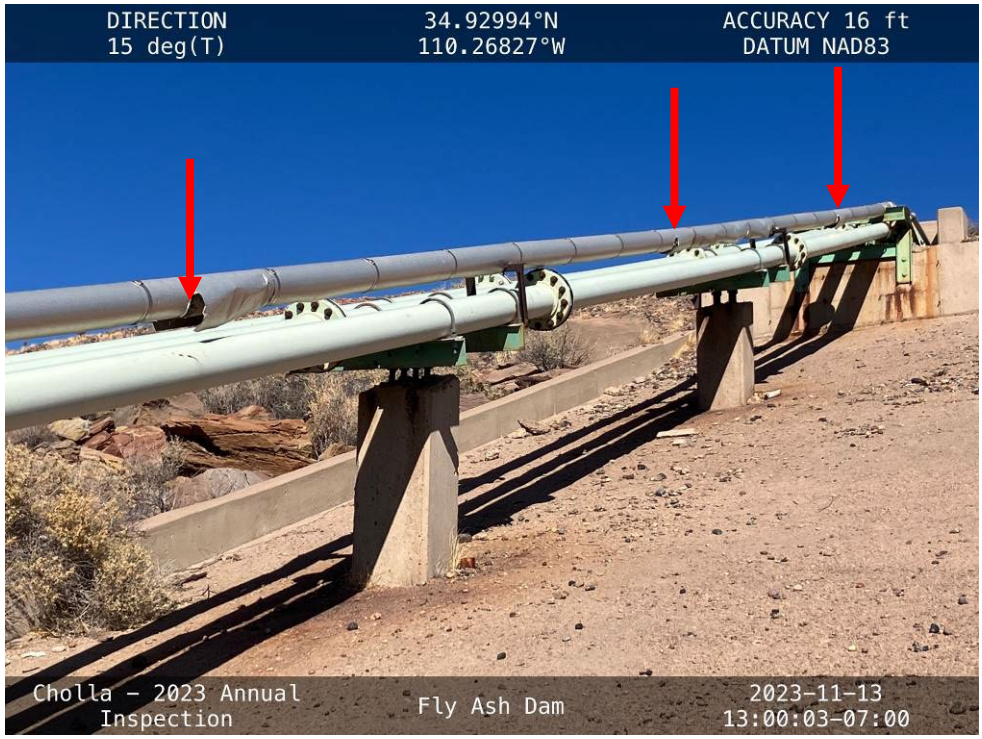
20231113 – IMG_1559
New panels for extraction wells CP-EW-GSX4 and CP-EW-02, formerly Geronimo Seep Well Pump D.

20231113 – IMG_1561
The inlet pipes at the Hunt totalizer, facing southwest toward I-40.



20231113 – IMG_1567
The Geronimo totalizer.

20231113 – IMG_1573
A broken pipe support along the inlet lines.



20231113 – IMG_1575
Missing pipe supports along the inlet lines.

20231113 – IMG_1576
The downstream toe of the West Embankment, facing northwest from the inlet pipes.

20231113 – IMG_1580
The downstream toe of the West Embankment, facing southeast from the inlet pipes.

20231113 – IMG_1587

The Right Abutment groin on the downstream slope, facing toward the abutment contact.

20231113 – IMG_1589

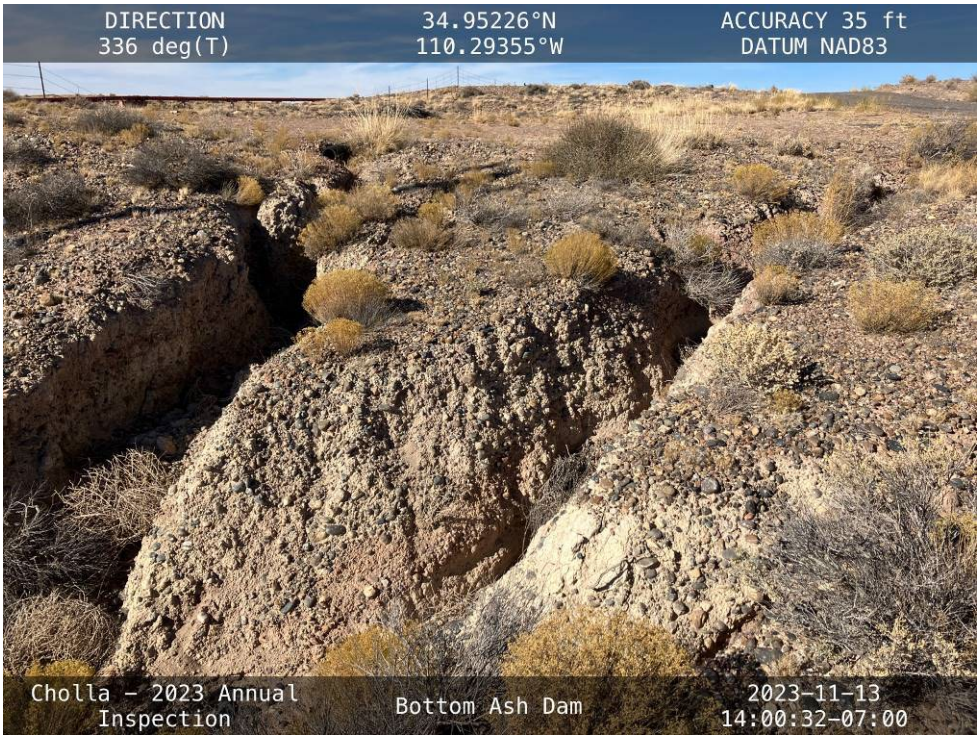
Erosion on the slope coming down from the Right Abutment groin.

20231113 – IMG_1593
The I-40 seep.

20231113 – IMG_1594
The I-40 seep.

APPENDIX B

BOTTOM ASH DAM PHOTO LOG



20231113 – IMG_1600

Erosion near the downstream groin of the Right Abutment, facing northwest toward the abutment contact.

20231113 – IMG_1604

4 feet of erosion in the downstream groin of the Right Abutment.

20231113 – IMG_1605
Erosion in the downstream groin of the Right Abutment, facing south from the abutment contact, more extensive than during the 2022 inspection.

20231113 – IMG_1607
The downstream slope of the South Embankment, facing east from the Right Abutment.

20231113 – IMG_1608
The South Embankment crest, facing east from the Right Abutment.

20231113 – IMG_1609
Trees and other woody vegetation to be removed from the South Embankment upstream slope.

20231113 – IMG_1610
An ant hill on the upstream shoulder at the Right Abutment.

20231113 – IMG_1611
12 inches of erosion on the upstream side of the South Embankment shoulder.

20231113 – IMG_1612
10 inches of erosion on the upstream side of the South Embankment shoulder.

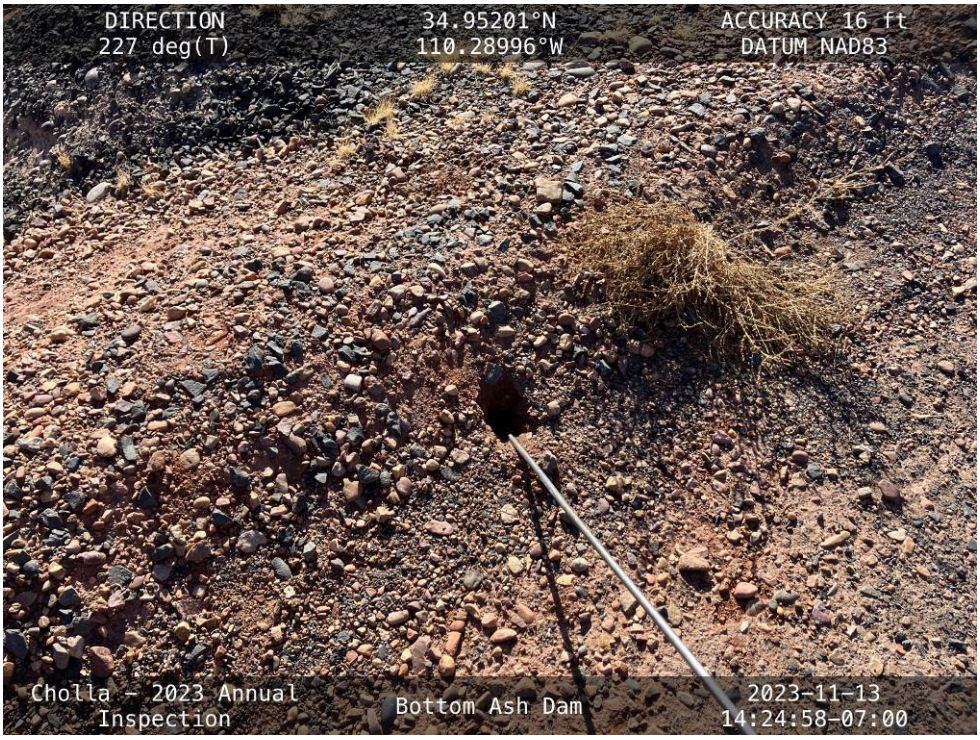
20231113 – IMG_1616
12 inches of erosion on the upstream side of the South Embankment shoulder.

20231113 – IMG_1617
Minor erosion around the concrete encasement for the western siphon line, facing upstream.

20231113 – IMG_1619
The western siphon line along the upstream slope of the South Embankment.

20231113 – IMG_1620
The western siphon line along the downstream slope of the South Embankment.

20231113 – IMG_1628
The support material on the downstream side of M-13 separating from the concrete.



20231113 – IMG_1631
An erosion hole on the downstream shoulder of the South Embankment.

20231113 – IMG_1632
The central siphon lines along the upstream slope of the South Embankment.

20231113 – IMG_1633
The central siphon lines along the downstream slope of the South Embankment.

20231113 – IMG_1636
The reservoir level staff gauge adjacent to the central siphon lines. The water level is at EL 5109.65 feet.

20231113 – IMG_1641
The upstream slope along the western half of the South Embankment, facing west.

20231113 – IMG_1643
The upstream slope along the eastern half of the South Embankment with vegetation to be removed, facing east.

20231113 – IMG_1644

A hole adjacent to the concrete on the west side of the central siphon line, filled in since the 2022 inspection, on the upstream slope.

20231113 – IMG_1645

The upstream slope and crest along the eastern half of the South Embankment, with vegetation to be removed.

20231113 – IMG_1647
The eastern siphon line along the upstream slope of the South Embankment.

20231113 – IMG_1650
The eastern siphon line along the downstream slope of the South Embankment.

20231113 – IMG_1656
The upstream slope at the eastern end of the South Embankment, facing west.

20231113 – IMG_1657
The crest at the eastern end of the South Embankment, facing west.

20231113 – IMG_1661
The upstream slope at the southern end of the East Embankment, facing north.

20231113 – IMG_1663
The upstream slope of the South Embankment, facing west.

20231113 – IMG_1664
Vegetation to be removed along the downstream slope of the South Embankment.

20231113 – IMG_1666
Vegetation to be removed along the upstream slope of the East Embankment.

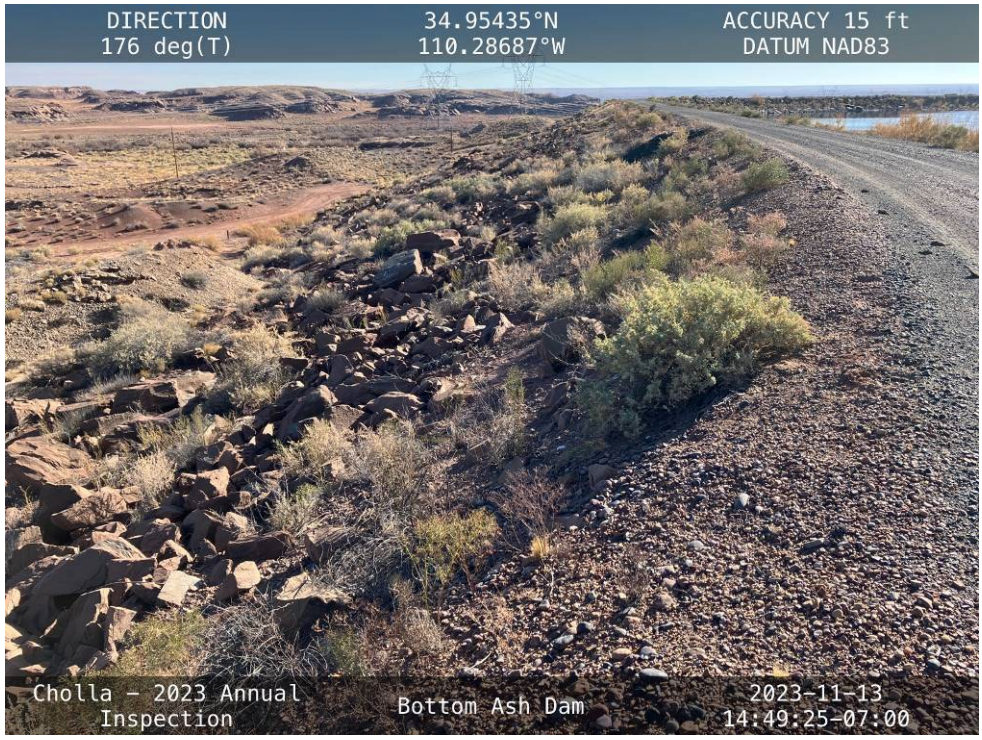
20231113 – IMG_1675
The downstream slope of the East Embankment, facing north from the southern end.

20231113 – IMG_1677
The Divider Dike in the reservoir and vegetation on the upstream side of the East Embankment.

20231113 – IMG_1679
A hole in the crest of the East Embankment, approximately 13 inches deep.

20231113 – IMG_1680
The northern half of the East Embankment crest, facing northeast.

20231113 – IMG_1681
The southern half of the East Embankment crest, facing southwest.



20231113 – IMG_1682
The downstream slope of the southern half of the East Embankment, facing south.

20231113 – IMG_1685
The downstream slope of the northern half of the East Embankment, facing northeast.

20231113 – IMG_1686
An ant hill on the upstream shoulder near Monument PI.

20231113 – IMG_1695

A 12-inch-deep erosion hole on the upstream shoulder of the East Embankment crest.

20231113 – IMG_1696

Erosion rills on the upstream slope of the East Embankment. The ruler is 22 inches long.

20231113 – IMG_1699
An 18-inch-long erosion hole in the crest and a 12-inch-long erosion hole on the downstream shoulder of the East Embankment.

20231113 – IMG_1702
Depressions on the upstream slope of the East Embankment and vegetation to be removed. The ruler is 19 inches long.

20231113 – IMG_1703
A 22-inch-long erosion hole on the upstream half of the East Embankment crest.

20231113 – IMG_1704
The upstream slope of the East Embankment at the Left Abutment, facing southwest.

20231113 – IMG_1705
The crest of the East Embankment at the Left Abutment, facing southwest.

20231113 – IMG_1706
The access road along the downstream slope of the East Embankment, facing south.

20231113 – IMG_1713
An erosion tunnel on the upstream side of the East Embankment, near the Left Abutment.

20231113 – IMG_1718
A shallow erosion hole and two depressions in the crest of the East Embankment.

20231113 – IMG_1723

An erosion gully on the downstream slope along the northern half of the East Embankment.

20231113 – IMG_1728

An erosion gully on the downstream slope along the northern half of the East Embankment.

20231113 – IMG_1729
The downstream slope and toe of the East Embankment, facing southwest.

20231113 – IMG_1732
The downstream slope and toe of the East Embankment, facing northeast.

20231113 – IMG_1736

A 9-inch-deep erosion hole and three shallower holes along the East Embankment downstream shoulder.

20231113 – IMG_1742

Sign identifying allowed and disallowed materials for the Bottom Ash Pond.

20231113 – IMG_1744
Ash and water being deposited into the Bottom Ash Pond.

20231113 – IMG_1761
Some standing water in the ditch adjacent to the Petroglyph Seep, cleaned up since the 2022 inspection.

20231113 – IMG_1768
The area around the Tanner Wash Seep, cleaned up since the 2022 inspection.

20231113 – IMG_1781
The P-226 seepage intercept area.

20231113 – IMG_1783

The downstream slope and toe of the Bottom Ash Dam, facing north from the southeast corner.

20231113 – IMG_1785

Monitoring wells MW-69A and MW-70M on the downstream side of the South Embankment.

20231113 – IMG_1788

The downstream slope and toe of the Bottom Ash Dam, facing west from the southeast corner.

20231113 – IMG_1789

The downstream slope and toe of the Bottom Ash Dam, facing north near the central siphon lines.

20231113 – IMG_1800
The West Abutment Weir, flowing at approximately 1.72 gpm.

20231113 – IMG_1803
Grassy vegetation growing in the area near the West Abutment Weir.

20231113 – IMG_1805

The downstream slope of the South Embankment, facing east from the West Abutment Weir.

20231113 – IMG_1806

The downstream slope of the South Embankment, facing east near the West Abutment Weir.

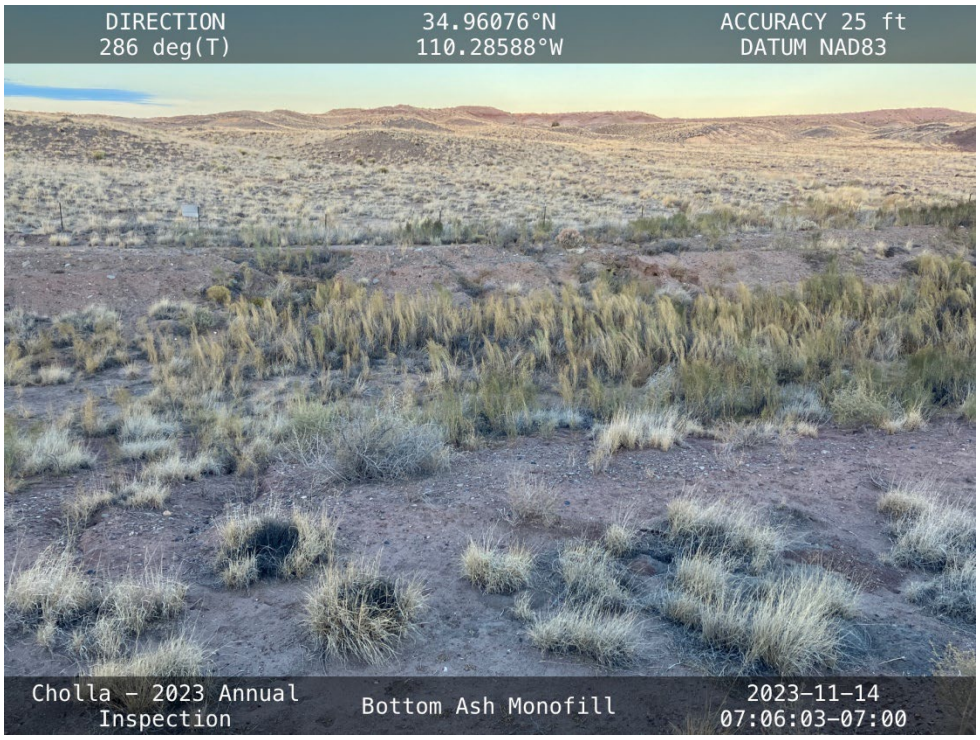
APPENDIX C

BOTTOM ASH MONOFILL PHOTO LOG

20231114 – IMG_1808
The west side of the BAM, facing north.

20231114 – IMG_1809
The west side of the BAM, facing east.

20231114 – IMG_1810
An erosion rill on the west side of the BAM, facing east.



20231114 – IMG_1815
Erosion gullies and tunnels on the west side of the diversion ditch. See also IMG_1818 and IMG_1819.

20231114 – IMG_1818

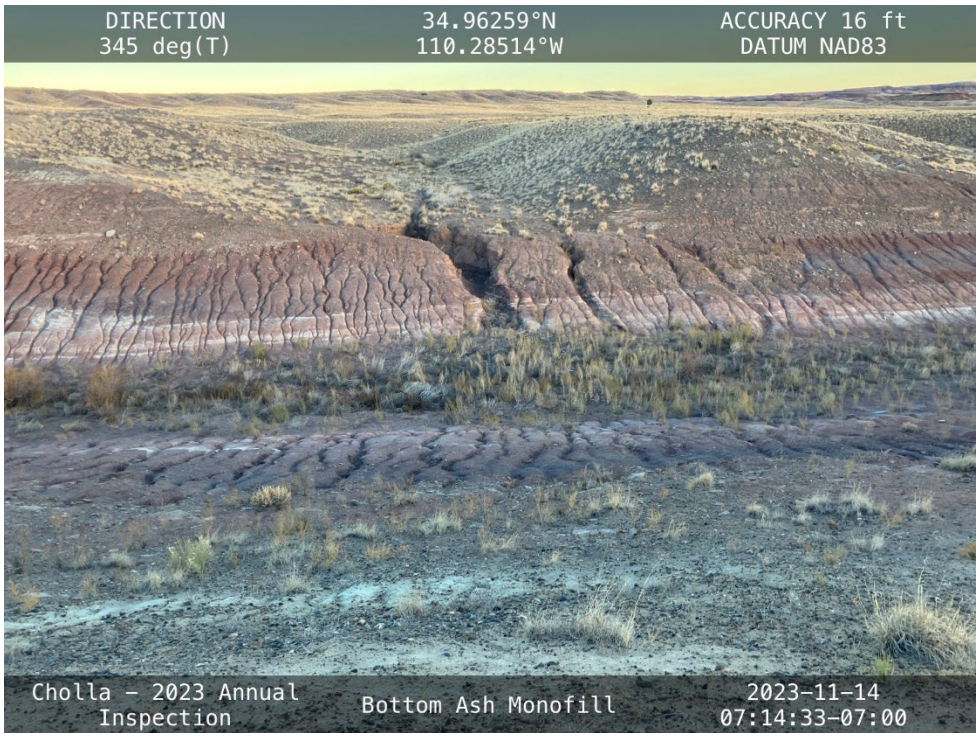
A tunnel on the west side of the western perimeter drainage channel that has formed by erosion.

20231114 – IMG_1819

The head of the tunnel on the west side of the perimeter drainage channel that has formed by erosion.

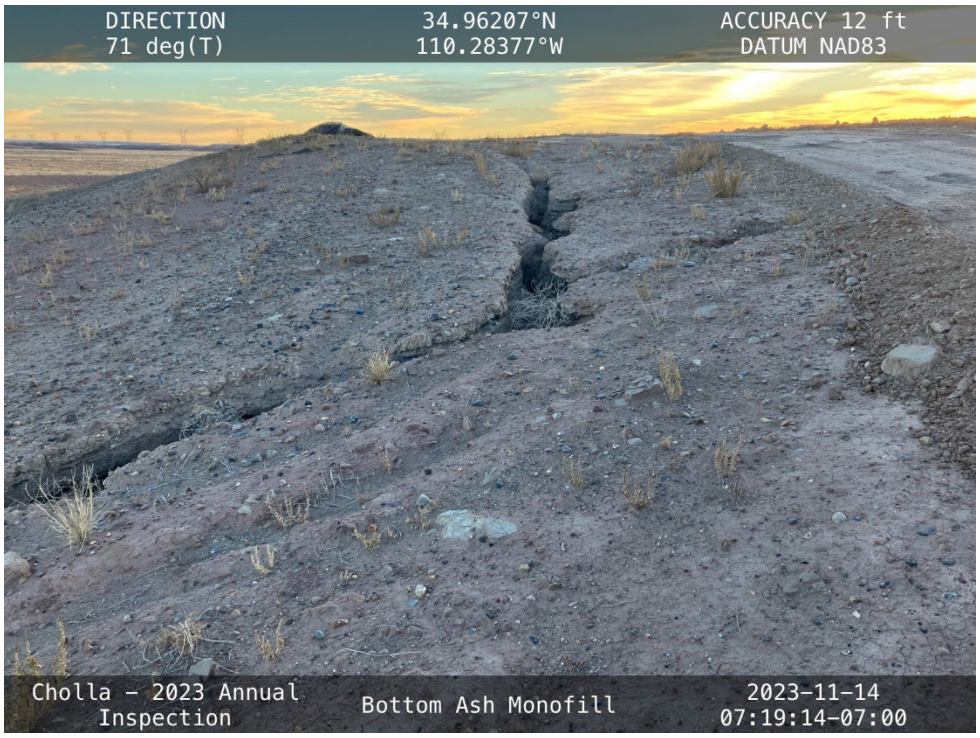
20231114 – IMG_1822
The west side of the BAM, facing north toward an area that had ponded water during the 2022 inspection.

20231114 – IMG_1825
Erosion gullies on the west side of the drainage channel.

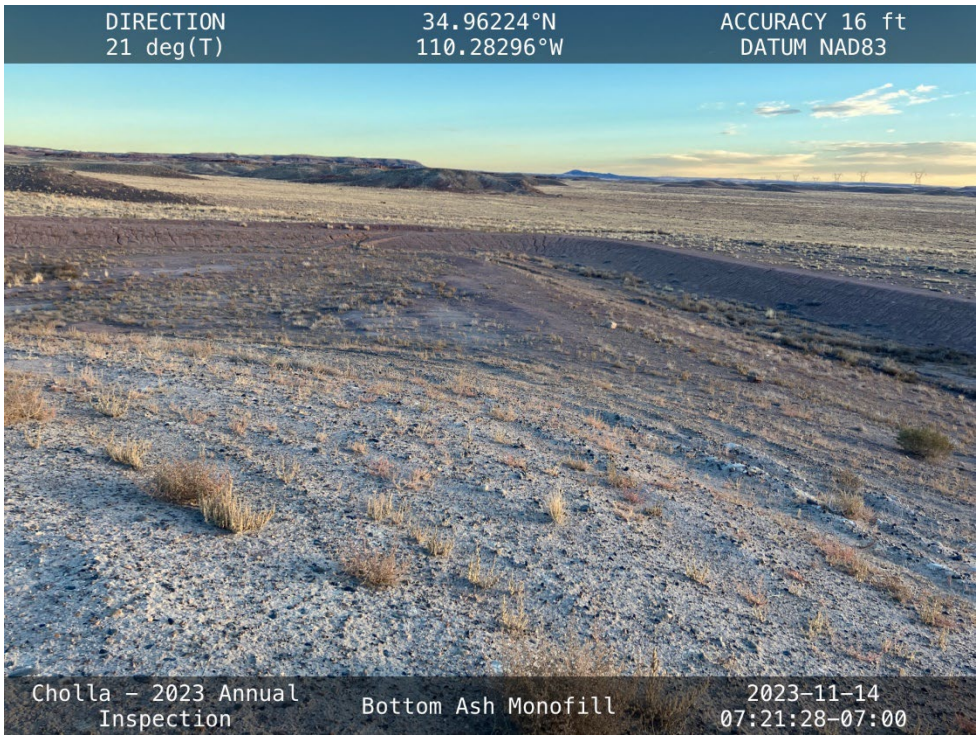


20231114 – IMG_1832
Erosion gullies on the north side of the drainage channel.

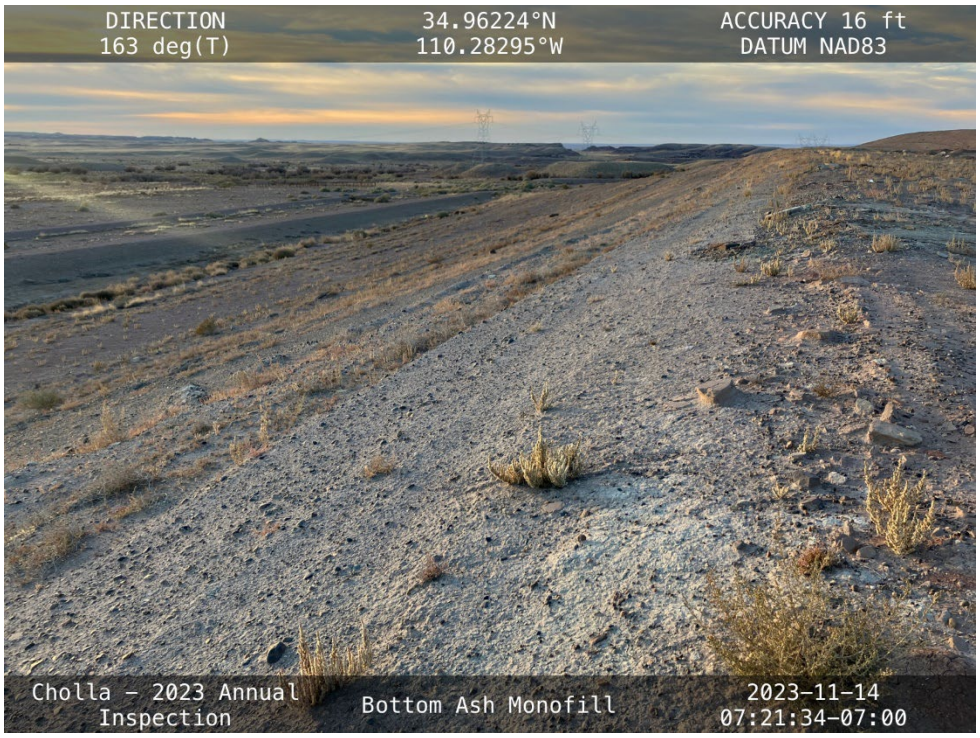
20231114 – IMG_1839
The north side of the BAM, facing south.



20231114 – IMG_1840
An erosion gully on north side of the BAM, facing south.



20231114 – IMG_1846
The northeast corner of the BAM and diversion ditch, facing northeast.

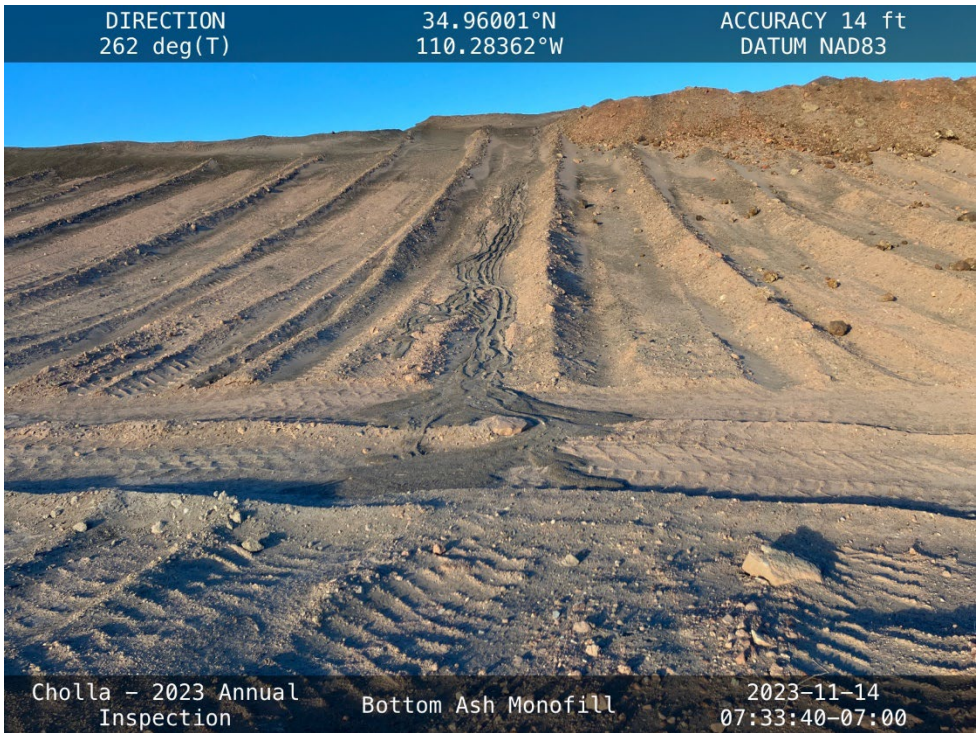


20231114 – IMG_1850
The southeast corner of the BAM and diversion ditch, facing south.

20231114 – IMG_1851
Stockpiled cover soil on the BAM, facing south.

20231114 – IMG_1852
The north side of the BAM.

20231114 – IMG_1862
A streak of cemented ash along the downstream slope of the East Embankment.



20231114 – IMG_1865
An erosion channel at the top and east side of the BAM with sediment at the toe.

20231114 – IMG_1871
The Detention Basin at the downstream end of the perimeter drainage channel.

20231114 – IMG_1874

A pair of 2-foot-deep erosion rills on the eastern slope of the lower section, also observed in 2022.

20231114 – IMG_1878

A 1-foot-deep erosion gully (see also IMG_1879) and resulting fan deposit on the southeast slope of the BAM, also observed in 2022.

20231114 – IMG_1879
A 1-foot-deep erosion gully (see also IMG_1878) on the southeast slope of the BAM, also observed in 2022.

20231114 – IMG_1881
A low spot on the perimeter road, facing north.

20231114 – IMG_1897
An erosion area on the lower half of the East Embankment slope, just east of the access road.

20231114 – IMG_1902
The south end of the BAM with a zone of topsoil removed from the eastern half of the slope, facing north.

20231114 – IMG_1915
The CCR excavation area on top of the BAM.

20231114 – IMG_1924
The CCR excavation area on top of the BAM.

20231114 – IMG_1923

The surface of the BAM with cover soil removed to facilitate transfer to the Fly Ash Pond, facing south.

20231114 – IMG_1927

The eastern portion of the BAM, facing northeast from the top of the Monofill.

20231114 – IMG_1942

Erosion on the north side of the Stormwater Detention Basin where a tunnel was observed in 2022.

20231114 – IMG_1943

Erosion on the north side of the Stormwater Detention Basin similar to the 2022 inspection.

20231114 – IMG_1949
Erosion on the east side of the Stormwater Detention Basin.

20231114 – IMG_1950
The west side of the Stormwater Detention Basin and the southern end of the BAM, facing west from the east side of the Stormwater Detention Basin.

20231114 – IMG_1954
An erosion gully on the east side of the BAM, west of the Stormwater Detention Basin.

20231114 – IMG_1955
Soil cover eroded and ash exposed in an erosion gully along the southeast side of the BAM.