



Quarterly Dam Inspection Report

Murphey Candler Park Dam, City of Brookhaven

October 12, 2021

SUBMITTED BY:

Dewberry

2835 Brandywine Road Suite 100
Atlanta, GA 30341
678.537.0022

SUBMITTED TO:

**City of Brookhaven Parks &
Recreation**

Brian Borden
3360 Osborne Road NE
Brookhaven, GA 30319



10/12/2021

Dewberry Engineers Inc.

COA#: PEF002398

Expires: 06/30/2022

Embankment (Earth) Dam Inspection Form

Name of Dam: Murphey Candler Park Dam

Inspection: 10/12/2021 8:30 am

Location of Dam (County): DeKalb County, GA

Inspected by (Print Name): Sam Crampton/Megan Hanifan/David Taylor

Weather: Cloudy

If an inspection item requires further action on your part, place a check mark to the left of the number of the item.

A. Crest (refer to Glossary for description)

1. How would you describe the vegetation on the crest? (Check all that apply)

Recently Mowed _____ Overgrown _____ Good Cover _____ Sparse _____

Other/Corrective Action (describe): The crest of the dam has a 20-ft wide asphalt paved road at the center with a concrete pedestrian walkway on either side. The narrow areas between the asphalt road and the pedestrian walkway are covered by sparse, recently mowed grass.

2. Are there any trees or other inappropriate or excessive vegetation on the crest? Yes _____ No

If yes, describe (type of vegetation, size, location, etc.)/Corrective Action: _____

3. Is there a paved road or driveway on the crest? Yes No _____

If yes, describe the condition (for example, good condition, numerous cracks, newly paved)/Corrective Action: The road is functional and in good condition (See Photos 1 and 2). Some minor cracks were observed on the paved road at a few locations as described in item 5 of this section (See Photos 3- 5).

4. Are there any depressions, ruts or holes on the crest? Yes No _____

If yes, describe (size, location, etc.)/Corrective Action: There is a minor depression at the downstream left side of the crest by the end of the road guard rail. This depression appears unchanged since the previous report in July (See Photo 5). Cracks remain in the concrete sidewalk pavement and the asphalt road at this location. These do not appear to be in any area of critical concern but should continue to be monitored.

5. Are there any cracks on the crest? Yes No _____

If yes, describe (length and width, location, direction of cracking, etc.)/Corrective Action: Several minor longitudinal cracks were observed towards the downstream edge of the roadway just left of the center of the dam (See Photos 3 and 4). Longitudinal cracking can be an indication of embankment slide, although there is no evidence that is the cause of these specific cracks. These cracks should continue to be monitored to ensure they do not increase in size or width, or otherwise worsen. The depressed area at the left, downstream edge of the dam crest (discussed in item 4 above) has created a semi-circular crack in the pavement (See Photo 5). These cracks should be monitored to ensure they do not increase in size or otherwise worsen.

6. Other observations on the crest/Corrective Action: _____

B. Upstream Slope (refer to Glossary for description)

1. What is the reservoir level today? At Normal Pool _____ Above Normal Pool 0.5 Feet Below Normal Pool _____ Feet

2. How would you describe the vegetation on the upstream slope? (Check all that apply)

Recently Mowed _____ Overgrown Good Cover _____ Sparse _____

Other/Corrective Action (describe): The upstream slope is primarily covered with unevenly distributed riprap and vegetative growth. Thick vegetation on the upstream slope has continued to spread and is noticeably more dense than noted in the July 2021 inspection (See Photos 6 and 7).

3. Are there any trees or other inappropriate or excessive vegetation on the slope? Yes No

If yes, describe (type of vegetation, size, location, etc.)/Corrective Action: Woody vegetation remains that should be removed. Vegetation last observed in the July 2021 inspection has been allowed to continue growing (See Photos 6-10). Several young trees initially reported in the July 2020 inspection have not been removed and are continuing to mature (See Photo 10). As more vegetation is allowed to take root and mature on the upstream face of the dam the potential for damage caused by roots is increasing. It is recommended that woody vegetation and saplings be cut down to the base or extracted from their roots to prevent growing back in the future.

4. Are there any depressions, bulges, ruts or holes (such as animal burrows) on the slope? Yes No

If yes, describe (size, location, etc.)/Corrective Action: Multiple depressions due to inadequate riprap coverage were observed along the upstream face of the dam. See comment in item 7 of this section for more detail.

5. Are there any eroded areas on the slope (such as wave erosion along the shoreline)? Yes No

If yes, describe (size of area, location, severity, etc.)/Corrective Action: Significant erosion of the soil beneath the riprap continues to progress near the left wing wall of the concrete spillway. The erosion depth is up to 2-ft vertically in some locations immediately adjacent to the end of the left wing wall, comparison with previous inspection photos shows that 6 inches of soil have eroded since the December 2020 inspection in one location. (See Photos 11- 13). There is both undercutting and erosion perpendicular to the wall. Horizontal undercutting adjacent to the wing wall seen in Photo 11 has removed soil up to one foot under the wingwall. Future rain and high flow events can cause increased erosion and undercutting. Corrective actions are required and include filling and compacting the soil and near the concrete spillway. Repairs are necessary to prevent further erosion. There is insufficient riprap coverage in the area immediately adjacent to the right wing wall also, as noted in previous inspection reports (See Photos 27 and 30). Soil has started to erode from beneath the sidewalk on the upstream side of the dam crest as well, leaving a void several inches beneath the sidewalk in some places. (See Photo 21). Recommend backfilling soil in the void beneath the sidewalk and placing a filter material and additional well-graded riprap to prevent continued erosion.

6. Are there any cracks, sloughs or slides (vertical cliffs) on the slope? Yes No

If yes, describe (length, width, height, location, etc.)/Corrective Action: _____

7. Is there any type of slope protection along the shoreline (such as riprap)? Yes No

If yes, describe what type and its condition (for example, riprap - adequate, inadequate, sparse)/Corrective Action: Coverage of riprap is inconsistent across the width and height of the dam face (See Photos 6, 9, 14-16). The upper section of the dam face lacks adequate riprap coverage to provide protection at higher water levels. Recommend replacing riprap as needed across dam face to create uniform coverage up to sidewalk elevation. Notable areas include: 1) The right (west) side of the dam near the concrete spillway where it is visibly very sparse compared to the rest of the dam face (See Photo 15), 2) Several makeshift pathways leading from the pedestrian walkway to the water near the upstream left abutment and near the principle spillway riser (See Photo 16). Corrective action includes placing riprap along the dam face to create adequate uniform coverage of slope up to sidewalk elevation.

8. Other observations on the upstream slope/Corrective Action:

C. Downstream Slope (refer to Glossary for description)

1. How would you describe the vegetation on the downstream slope? (Check all that apply)

Recently Mowed Overgrown Good Cover Sparse

Other/Corrective Action (describe): The downstream slope of the dam is covered in well maintained recently mowed grass (See Photo 17 and 18). Several patches of missing grass on the right and left sides of the downstream slope have exposed the underlying soil (See Photos 19 and 20). Recommend these areas be re-seeded and monitored to ensure that they don't grow larger or lead to increased erosion.

2. Are there any trees or other inappropriate or excessive vegetation on the slope? Yes No

If yes, describe (type of vegetation, size, location, etc.)/Corrective Action: _____

3. Are there any depressions, bulges, ruts or holes (such as animal burrows) on the slope? Yes _____ No
- If yes, describe (size, location, etc.)/Corrective Action: _____
4. Are there any eroded areas on the slope (such as along abutment contacts)? Yes No _____
- If yes, describe (size of area, location, severity, etc.)/Corrective Action: Minor erosion/bare spots were observed in high-traffic areas such as near the sprinkler box, the batting cages, principal spillway outlet box and near the right downstream abutment (See Photo 23). Corrective actions in these areas includes filling in bare spots, compacting and grassing or adding a layer of gravel if grass continues not to grow.
5. Are there any cracks, sloughs or slides (vertical cliffs) on the slope? Yes _____ No
- If yes, describe (length, width, height, location, etc.)/Corrective Action: _____
6. Are there any wet areas or areas of hydrophilic (lush, water-loving) vegetation? Yes _____ No
- If yes, describe (size of area, location, etc.)/Corrective Action: _____
7. Do any wet areas indicate seepage through the dam (such as rust-colored, stained water)? Yes _____ No _____ N/A
- If yes, describe (for example, new area of seepage, no change from past observations, size of area, location) /Corrective Action: _____
8. Are there any leaks (flowing water) from the slope or beyond the toe of the dam? Yes _____ No
- If yes, describe (location, rate of flow, turbidity of flow)/Corrective Action: _____
9. Other observations on the downstream slope/Corrective Action: An animal guard on the toe drain located roughly at the center of the downstream dam face should be straightened and secured from bottom to provide adequate barrier against small animals entering the drainpipe (See Photo 24). Previously noted minor damage to a utility box adjacent to a small concrete marker on the right side of the downstream face near the dam crest remains with no evidence of repair (See Photo 22). As previously noted, a hole has formed in the fiberglass structure on the downstream side of the box. This hole should be repaired to ensure erosion does not occur around the utility box. Once repaired, the soil around the box should be backfilled and compacted to avoid any future erosion.

D. Plunge Pool (refer to Glossary for description)

1. Is there any type of erosion protection around the plunge pool (such as riprap)? Yes No _____
- If yes, describe what type and its condition (for example, riprap - adequate, inadequate, obstructed by vegetation) Chute blocks and baffle blocks are used to dissipate the water energy. Additionally, riprap is used downstream of the stilling basin to protect the natural channel bottom from erosion. The current channel erosion protection measures appear adequate and functional. New riprap bank protection placed along channel downstream of plunge pool is functioning well.
2. Is there any erosion and or seeps around or going into the plunge pool? Yes No _____
- If yes, describe (size of area, location, severity, etc.) /Corrective Action: There is potentially a cavity forming beneath the lower right (west) face of the spillway directly above the plunge pool (See Photo 43). During the December 2019 and October 2021 inspections, striking the face of the spillway with a survey rod produced a hollow tone in this location, distinct from solid sounds produced by striking elsewhere on the spillway. There is no readily apparent cause of the cavity. Further investigation with ground penetrating radar or another suitable non-destructive method is recommended to confirm the existence and size of any cavity. Corrective action includes injecting flowable fill or other suitable material into the cavity and monitoring the area for any signs of worsening condition. Investigation is strongly recommended to determine if corrective action is needed. A cavity in this location poses a significant risk and has potential to cause costly spillway failure if left unaddressed. This area was not examined during this inspection.
3. Other observations around the plunge pool/Corrective Action: _____
- 1). Erosion previously observed at the right stream bank downstream of the plunge pool immediately next to the storm drain headwall has been addressed by placing new riprap bank protection along both side of the channel.

E. Principal and Emergency Spillways (refer to Glossary for description)

↑ Check if corrective action is noted/required.

1. What types of spillways does the dam have (such as corrugated metal, concrete or siphon pipe; concrete or earth channel)?
Principal Spillway 30-inch diameter CMP with concrete riser Emergency Spillway Concrete Channel
Other/Corrective Action: _____
2. Has the emergency spillway activated (had flow) since the last inspection? Yes No _____
If yes describe (date(s) of flow, reason for activation, depth of flow) /Corrective Action: The emergency spillway experiences continuous service flows (See Photo 27).
3. For pipe spillways, is the intake obstructed in any way (such as with excessive debris)? Yes _____ No
If yes, describe (type of debris, reason for obstruction, etc.) /Corrective Action: On 6/21/2017, DeKalb County Fire & Rescue divers inspected the principal upstream riser structure (See Photo 28). The divers did not identify any issues in the outer part of the riser or sluice gate. They did note that the orifice was buried in soft silt. An inspection has not been performed since. Wasps have built a nest inside the riser tube. The wasp nest should be removed to avoid potential hazards during any maintenance or emergency operation of the spillway riser.
4. For pipe spillways, what is the condition of any trash racks (for example, adequate, inadequate, damaged)? /Corrective Action:
Pipe is submerged and could not be observed. Divers on 6/21/2017 indicated that trash racks appeared to be in-place and consistent with the plans provided by GA SDP. An inspection has not been performed since.
5. For pipe spillways, are there any visible cracks, separations or holes in the pipe(s) (intake or outlet)? Yes No _____
If yes, describe (location, width of crack or separation, etc.) /Corrective Action: Crawler type CCTV of the principal spillway pipe captured on March 20, 2020 was provided to Dewberry. Review of this footage indicated deteriorated sections of the pipe, some joint separation and soil intrusion. As previously discussed with city officials, the principal spillway should be rehabilitated. It is not recommended to operate the spillway for non-emergency purposes until this has occurred. In the event of an emergency, operation of the spillway should be performed with extreme caution, including but not limited to closing of the road over the dam, continuous monitoring, and being prepared to fully implement the emergency action plan to mitigate the potential for loss of life in the event of a dam failure. The outlet to the pipe was visually inspected from the brick chamber on the downstream slope. Dewberry is currently assisting Brookhaven with plans to use CIPP to rehabilitate the emergency spillway.
6. For pipe spillways, are there any apparent leaks in the pipe(s)? Yes _____ No
If yes, describe (location, rate of flow from leak, etc.) /Corrective Action _____
7. For pipe spillways, how would you describe the overall condition of the pipe(s)? (Check all that apply)
Functioning Normally ___ Not Functional ___ Deteriorated Damaged ___ Adequate ___ Inadequate ___
8. For concrete or earth channel spillways, is the entrance or channel obstructed in any way? Yes No _____
If yes, describe (type of obstruction, location, etc.) /Corrective Action: Minor amounts of woody debris have begun collecting at the upstream end of the spillway platform (See Photo 29). This debris should continue to be removed as it collects. The mat of grassy vegetation growing from the right bank into the concrete spillway was previously cleared but has begun growing back. Vegetation and silt are starting to collect again along the right side of the upstream spillway (See Photo 30). Grass should be periodically cut back and removed as it grows back to prevent increased accumulation of sediment and debris in the spillway. Grass has again begun growing in the concrete spillway. The concrete joint at this location also needs to be resealed, as noted in section 12 below (See Photo 35).
9. For earth channel spillways, how would you describe the vegetation in the spillway? (Check all that apply)
Recently Mowed _____ Overgrown _____ Good Cover _____ Sparse _____
Other (describe) /Corrective Action: N/A
10. For earth channel spillways, are there any trees or other inappropriate vegetation in the spillway? Yes _____ No _____
If yes, describe (type of vegetation, size, location, etc.) /Corrective Action: N/A
11. For earth channel spillways, are there any eroded areas in the spillway? Yes _____ No _____
If yes, describe (size of area, location, severity, etc.) /Corrective Action: _____

↑ Check if corrective action is noted/required.

12. For concrete channel spillways, are there any cracks or holes in the spillway? Yes No

If yes, describe (width of crack or hole, location, etc.)/Corrective Action: The cutoff wall at the upstream face of the concrete spillway appeared to be in good condition and functioning well. 1) There are multiple areas of uplifting concrete at the joint of the spillway and the masonry wall on the left side of the flume downstream of West Nancy Creek Drive (See Photos 31- 33). Corrective action includes sealing the cracks to prevent widening or lengthening. Concrete is completely separated from one of these locations, leaving a hole 2 to 3 inches deep at the masonry wall joint (See Photo 33). Corrective action includes grouting and patching holes left behind by chipped or concrete spalls. 2) The caulk in the joints between the spillway bottom and the retaining walls along the left side of the spillway is missing or eroded over the majority of the spillway length (See Photos 32). Corrective action includes removing old caulk and reapplying caulk to the joints between the spillway base and the retaining walls of the spillway along its entire length. 3) Along the masonry retaining wall at the left side of the concrete spillway, there are cracks and areas missing grout between many of the stones(See Photo 36-39). Vines and other vegetation have resumed growing on the masonry wall directly downstream of West Nancy Creek Drive (See Photo 39). Corrective action includes removing any vegetation and re-grouting impacted areas. The prescribed repairs should be considered a provisional solution, and the aging masonry wall should eventually be replaced with a concrete wall. 4) Caulk between concrete slabs making up the spillway bottom is peeling and working loose from the lateral seams in multiple locations. The lateral seam directly upstream of the West Nancy Creek Drive bridge was observed to be undermined, and a cavity roughly 6 inches deep directly under the joint was observed. As noted in previous reports, caulk is also peeling from the lateral seam downstream of the bridge (See Photos 40 and 41). Corrective action includes removing old caulk and replacing with new caulk. 4) Concrete has completely separated from the bottom of a vertical crack at the top right of the plunge pool face (See Photo 44). This area of the spillway sees continuous flows, and the cracked concrete is a potential entry point for water to erode soil beneath the spillway. Corrective action includes sealing the cracks to prevent widening or lengthening. 5) Some of the trees and vegetation growing along the fence line on both sides of the spillway were previously cut back but have begun growing again (See Photos 39 and 42). Corrective action includes cutting/removing trees/vegetation including the remaining lower trunks of cut trees to prevent new growth. Any holes must be filled and compacted. It is recommended that any trees within 15 feet of the spillway walls be removed. Grass was observed growing between lateral seams in the spillway (See Photo 35). All grassy vegetation should be cleared from the spillway channel and joints resealed. Previously completed repairs to spillway slab adjacent to concrete wall appear to be holding up well (See Photo 34).

13. For concrete channel spillways, are there any leaks or evidence of undermining (flow under the concrete)? Yes No

If yes, describe (location, rate of flow from leak, indicators of undermining, etc.)/Corrective Action: _____

14. For earth or concrete channel spillways, how would you describe the overall condition of the spillway? (Check all that apply)

Functioning Normally Not Functional Deteriorated Damaged Adequate Inadequate

15. Other observations on the spillways/Corrective Action: _____

F. Instrumentation (refer to Glossary for description)

1. Are there any toe drains at the downstream toe or any other seepage drains on the dam? Yes No

If yes, describe the condition (for example, clogged, free flowing, deteriorated, good condition) /Corrective Action: There is a toe drain near the center of the downstream slope (See Photo 24). There is no flow from the toe drain and it appears clear of large debris. Additionally, there are six spillway underdrains located on the spillway face above the plunge pool. Minor flows were observed from some spillway underdrains but were not measured due to access (See Photo 43). A small toe drain at the right side of the plunge pool was previously observed to be emitting a rust colored liquid. A sample was collected from this drain during the March 2021 inspection and allowed to settle. Settled solids from this runoff were found to be attracted to a magnet held against the container, verifying that the solid material in the pipe runoff is composed

largely of iron. The pipe leading to this toe drain is being steadily corroded and should be replaced to avoid further issues resulting from flow from the compromised pipe creating voids in the surrounding soil. New riprap has recently been placed along the channel banks in this area including a large stone directly in front of this pipe outlet (See Photos 25 and 26). This stone does not appear to be integral to bank protection. Recommend moving this stone so that the pipe can continue to be monitored for increasing signs of deterioration until pipe is repaired.

For drains, is an animal guard installed at the outlet of each drain? Yes _____ No

If no, which drains lack animal guards? /Corrective Action: The damaged animal guard at the toe drain located near the center of the downstream slope observed in previous inspections has not been repaired (See Photo 24), it is recommended that the bars be straightened and secured at the bottom of the pipe to function effectively Animal guards are missing from three of the spillway underdrains on the right side of the spillway (See Photo 43). Corrective action includes replacing missing animal guards.

3. For drains, measure the rate of flow from each drain and record below (use additional pages if necessary):

Designation/Location of Drain	Flow Rate	Flow Rate in GPM*	Turbidity of Flow (describe – clear, muddy, etc.)
Toe drain downstream slope	None	None	None
Primary principal drain	N/A	N/A	N/A

4. Are there any piezometers on the dam? Yes _____ No

If yes, describe the condition (for example, good condition, damaged, etc.)/Corrective Action: _____

5. For piezometers, does each piezometer have a cap with a lock? Yes _____ No _____

If no, which piezometers need caps (to prevent rain water intrusion) and/or locks (to prevent tampering)? /Corrective Action: _____

6. For piezometers, are you able to take a measurement (depth to water) in each piezometer? Yes _____ No _____

If yes, record depth to water (in feet) in each piezometer, record on a separate page, and attach to this form.

7. Are there any other monitoring devices on the dam? Yes _____ No

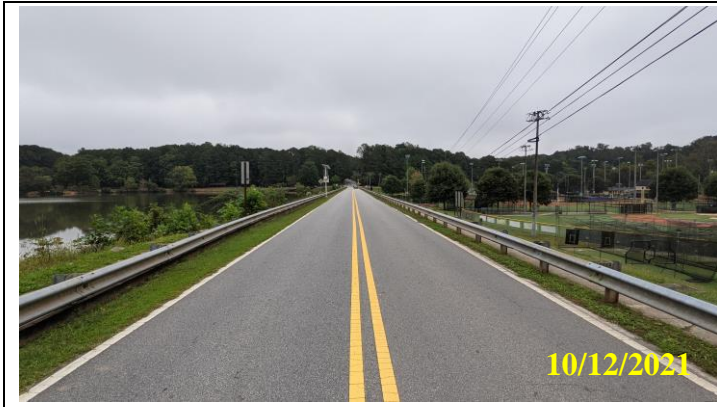
If yes, describe what type and the condition (for example, monitoring wells - good condition, damaged) /Corrective Action: _____

8. Other observations on instrumentation/Corrective Action: _____

*GPM (gallons per minute): to convert from oz/sec multiply by 0.4688; to convert from ml/sec multiply by 0.01585

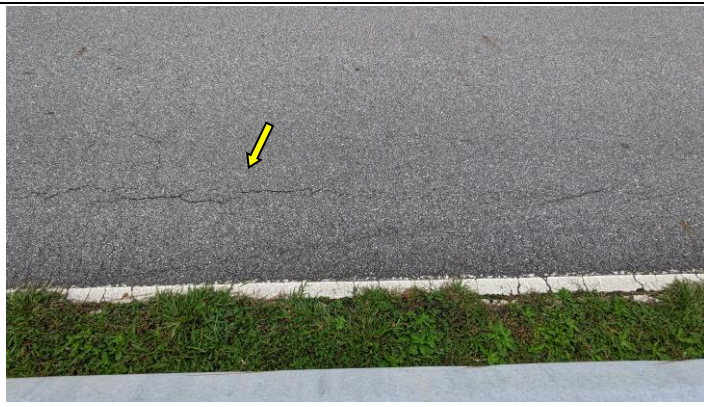
. Photographs

At a minimum, photographs should be taken of the crest, upstream slope, downstream slope and any other notable features. List of photographs (be sure to date stamp the photos):



1. Standing on crest of dam looking toward left abutment

2. Standing on crest of dam looking toward right abutment



3. Cracks in paved road on dam crest at left bridge abutment

4. Additional crack in paved road on dam crest



5. Depressed area on dam crest with crack on road pavement

6. View of upstream side looking towards left abutment



7. View of upstream side looking towards right abutment

8. View of vegetation on upstream face of the dam



9. View of vegetation on upstream face of the dam



10. View of woody vegetation on upstream face of the dam



11. Inadequate riprap grading at the left wing wall of the concrete spillway resulting in erosion and undercutting of riprap. See Photo 12 for location of this photo



12. Inadequate riprap grading at the left wing wall of the concrete spillway resulting in erosion and undercutting of riprap. Yellow circled area is location of Photo 11 and red circled area is location of Photo 13



13. Inadequate riprap grading at the left wing wall of the concrete spillway resulting in erosion and undercutting of riprap



14. Sparse riprap near pedestrian walkway



15. Sparse riprap coverage and uneven riprap sizing at right side of upstream dam face



16. Pedestrian pathway showing sparse riprap near principal spillway riser



17. View of downstream slope looking toward right abutment



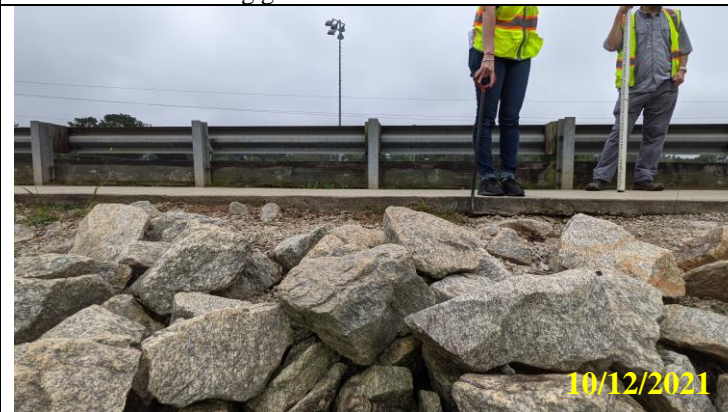
18. View of downstream slope looking toward left abutment



19. Patches of missing grass on downstream dam face



20. Patches of missing grass on downstream dam face



21. Minor undercutting and erosion at the pedestrian walkway on upstream dam crest



22. Damaged utility box on downstream face of dam



23. Right side of downstream dam face showing erosion and missing grass



24. Toe drain at center of downstream dam face showing damaged animal guard



25. Toe drain at right side of plunge pool obscured by newly placed riprap



26. Matching toe drain on left side of plunge pool



27. View of overgrown vegetation and sparse poorly graded riprap at the right upstream wingwall



28. Principal spillway riser



29. Woody debris accumulating in the upstream section of concrete spillway



30. Vegetation and silt obstructing right side of upstream spillway. Sparse riprap along the right wing wall of the spillway



31. Concrete spillway cracking and uplift at masonry wall joint



32. Concrete spillway cracking and uplift at masonry wall joint with exposed seal



33. Concrete spillway cracking and spalling concrete at masonry wall joint



34. Previously completed repairs to spillway upholding well



35. Grass growing between slabs in concrete spillway



36. Missing grout and cracks in masonry wall at spillway entrance



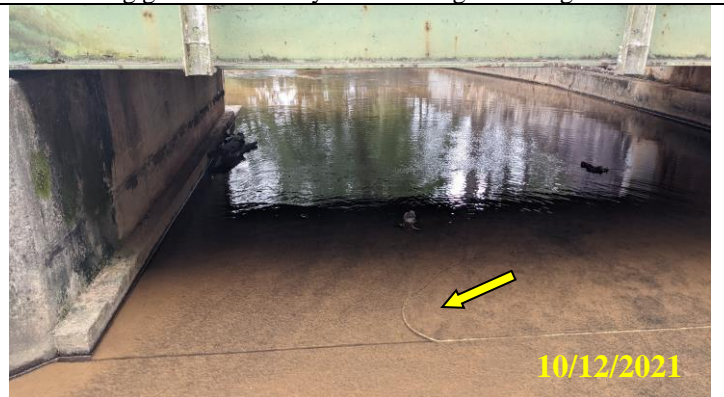
37. Missing grout in masonry wall at bridge crossing



38. Missing grout in masonry wall at bridge crossing



39. Vines and vegetations on masonry wall downstream of bridge crossing



40. Caulking peeling from between spillway slabs at bridge crossing



41. Caulk peeling from between spillway slabs downstream of bridge crossing



42. Trees at spillway fence



43. Spillway face above plunge pool showing locations of toe drains with missing animal guards. Yellow circle shows general area of suspected void behind spillway face



44. Cracked and missing concrete at top left of plunge pool face

