

LAKE DARPO DAM : D3530
Dams Preliminary Inspection Form



Inspector: Dani H Felkel

Start Date: 09/27/2018 Completed Date: 10/05/2018

Inspection Information		
1. Date of Inspection	09/27/2018	
2. Inspectors Present	Dani Felkel	
3. Other Persons Attending Inspection		
Name	Phone	Owner/Engineer/Other
Lee Andrews	843-639-3833	Darlington County Parks and Recreation
4. Is this a follow-up inspection?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA	
Observation/Instrumentation		
1. Estimate the current level of the water in the reservoir:	Breached	
Dam breached during Hurricane Florence and is holding little to no water. <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 45%;">  </div> <div style="width: 50%;"> <p>Photo Taken: 9/27/2018 9:33:09 AM</p> </div> </div>		
2. Describe the current weather & conditions:	Sunny, wet from overnight rain	
3. Recent rainfall quantity:	Less than 2"	
24-four rainfall totals between 1.75 and 2"		
4a. Are Piezometers or Observation Wells present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
4b. (If Present:) Condition of Piezometers/Observation Wells		
5a. Is a Staff Gauge or Recorder present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5b. (If Present:) Condition of Staff Gauge or Recorder		
6a. Are Measurement Weirs Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
6b. (If Present:) Condition of Weirs:		
7a. Number of Spillways Present	2	

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Observation/Instrumentation	
<i>7b. Type of Spillways Present</i>	Drop-Inlet, Low-Level Valve/Gate, Other (Specify In Comments)
Failure occurred at the auxiliary spillway, a 36" CMP that was placed horizontally through the dam.	
<i>8. Other:</i>	
<i>9. Additional Comments (Refer to item number if applicable)</i> The portion of the dam to the right of the breach was inaccessible during this inspection.	
Embankment: Crest	
<i>Is this section applicable for this dam?</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Breach prevented access to a large portion of the dam.	
<i>1. Grass Cover</i>	Action Required
Minimal grass coverage on the crest.	
<i>2. Deleterious Vegetation</i>	No Deficiency
<i>3. Trees</i>	No Deficiency
<i>4. Animal Activity</i>	Monitor
None observed on the small portion of the dam that was accessible.	
<i>5. Surface Cracking</i>	
Breach prevented access to a large portion of the dam.	
<i>6. Horizontal Alignment</i>	
Breach prevented access to a large portion of the dam.	
<i>7. Settlement</i>	
Breach prevented access to a large portion of the dam.	
<i>8. Sinkhole</i>	
Breach prevented access to a large portion of the dam.	
<i>9. Erosion</i>	Action Required
Dam breached near the left abutment, where the horizontal CMP was placed.	
<i>10a. Are Alterations/Repairs Present?</i>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<i>10b. (If Present:) Alterations/Repairs Condition</i>	
<i>11. Other:</i>	

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Completed Date: 10/05/2018

Embankment: Crest

12. Embankment: Crest Condition

Needs Maintenance,
Needs Permitted
Repair(s), Condition
Prevented Full
Inspection

**Violation Determined: 9/27/2018
DAMMAINTREP**

13. Additional Comments (Refer to item number if applicable)

Concrete/Masonry Dams: Crest

Is this section applicable for this dam?

Yes No

1. Surface Conditions

2. Horizontal Alignment

3. Vertical Alignment

4. Condition of Joints

5. Unusual Movement

6a. Are Alterations/Repairs Present?

Yes No

6b. (If Present:) Alterations/Repairs Condition

7. Other:

8. Concrete/Masonry Dam Crest Condition

9. Additional Comments (Refer to item number if applicable)

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Start Date: 09/27/2018 Completed Date: 10/05/2018

Embankment: Upstream Slope

Is this section applicable for this dam?

Yes No

Breach prevented access to a large portion of the dam.

Photo Taken: 9/27/2018 10:07:49 AM



1. Grass Cover

Action Required

Little to no grass cover.

2. Deleterious Vegetation

Action Required

Weeds, brush, and small trees present.

Photo Taken: 9/27/2018 9:34:07 AM



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Start Date: 09/27/2018 Completed Date: 10/05/2018

Embankment: Upstream Slope

3. Trees

Action Required

Some large trees present along the undamaged portion of the slope. Several fallen trees in the breached area.



Photo Taken: 9/27/2018 9:33:32 AM

4. Animal Activity

Monitor

5. Surface Cracking

Unable to observe. Breach prevented access to a large portion of the dam.

6. Subsidence, Sinkhole

Unable to observe. Breach prevented access to a large portion of the dam.

7. Slide, Slough, Scarp

Action Required

Some sloughing around the breach. Unable to fully observe. Breach prevented access to a large portion of the dam.



Photo Taken: 9/27/2018 9:33:22 AM

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Embankment: Upstream Slope	
8. Groins	
Unable to observe. Breach prevented access to a large portion of the dam.	
9. Erosion	Action Required
Dam is breached.	
10a. Slope Protection/Armoring Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
10b. (If Present:) Slope Protection/Armoring	
11a. Alterations/Repairs Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
11b. (If Present:) Alterations/Repairs Condition	
12. Other:	
13. Embankment: Upstream Slope Condition	Needs Maintenance, Needs Permitted Repair(s), Condition Prevented Full Inspection
<div style="border: 1px solid black; padding: 5px;"> Violation Determined: 9/27/2018 DAMMAINTREP </div>	
14. Additional Comments (Refer to item number if applicable)	
Concrete/Masonry Dams: Upstream Face	
Is this section applicable for this dam? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
1. Surface Conditions	
2. Condition of Joints	
3. Unusual Movement	
4. Abutments	
5a. Alterations/Repairs Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No
5b. (If Present:) Alterations/Repairs Condition	
6. Other:	
7. Concrete/Masonry Dams: Upstream Face Condition	
8. Additional Comments (Refer to item number if applicable)	

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Inspector: Dani H Felkel
Start Date: 09/27/2018 Completed Date: 10/05/2018

Embankment: Downstream Slope

Is this section applicable for this dam?

Yes No

Breach prevented access to a large portion of the dam.

Photo Taken: 9/27/2018 9:33:54 AM



<i>1. Grass Cover</i>	Action Required
Little to no grass coverage.	
<i>2. Deleterious Vegetation</i>	Action Required
Weeds, brush, and small trees present.	
<i>3. Trees</i>	Action Required
Large trees observed along the downstream slope. Several fallen trees in and around the breached area.	
<i>4. Animal Activity</i>	Monitor
Unable to observe. Breach prevented access to a large portion of the dam.	
<i>5. Surface Cracking</i>	
Unable to observe. Breach prevented access to a large portion of the dam.	
<i>6. Subsidence, Sinkhole</i>	
Unable to observe. Breach prevented access to a large portion of the dam.	
<i>7. Slide, Slough, Scarp</i>	
Unable to observe. Breach prevented access to a large portion of the dam.	
<i>8. Groins</i>	
Unable to observe. Breach prevented access to a large portion of the dam.	

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Embankment: Downstream Slope	
9. Erosion	Action Required
<input type="text" value="Dam is breached."/>	
10a. Slope Protection/Armoring Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
10b. (If Present:) Slope Protection Condition	
11. Wet Areas	
<input type="text" value="Unable to observe. Breach prevented access to a large portion of the dam."/>	
12a. Seepage	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input type="text" value="Dam is breached and holding no water."/>	
12b. (If Present): Seepage Flow	
13a. Drainage System Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
13b. (If Present:) Drainage System Condition	
14a. Alterations/Repairs Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
14b. (If Present:) Alterations/Repairs Condition	
15. Other:	
16. Embankment: Downstream Slope Condition	Needs Maintenance, Needs Permitted Repair(s), Condition Prevented Full Inspection
<div style="background-color: #cccccc; padding: 5px;">Violation Determined: 9/27/2018 DAMMAINTREP</div>	
17. Additional Comments (Refer to item number if applicable)	
Concrete/Masonry Dams: Downstream Face	
Is this section applicable for this dam?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
1. Surface Conditions	
2. Condition of Joints	
3. Unusual Movement	
4. Drains	
5. Leakage	
6. Abutments	

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Concrete/Masonry Dams: Downstream Face

7a. Alterations/Repairs Present?

Yes No

7b. (If Present:) Alterations/Repairs Condition

8. Other:

9. Concrete/Masonry Dam: Downstream Face Condition

10. Additional Comments (Refer to item number if applicable)

Downstream Area

Is this section applicable for this dam?

Yes No

Breach prevented access to a large portion of the dam and downstream area.

Is Downstream Area clear?

Yes No

Debris from flooding and dam failure immediately downstream.
Cleared power line just below the downstream area.

Photo Taken: 9/27/2018 10:08:12 AM



1. Trees

Action Required

Small and large trees present.

2. Deleterious Vegetation

3. Wet Areas

Standing water in downstream area.

4a. Seepage

Yes No NA

Dam is breached and holding no water. Standing water in downstream area.

4b. (If Present): Seepage Flow

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Downstream Area	
5a. Boils	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
Dam is breached and holding no water.	
5b. (If Present): Boil Flow	
6a. Alterations/Repairs Present	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
6b. (If Present:) Alterations/Repairs Condition	
7. Other:	
8. Downstream Area Condition	Needs Maintenance, Needs Permitted Repair(s), Condition Prevented Full Inspection
Violation Determined: 9/27/2018 DAMMAINTREP Unable to observe. Breach prevented access to a large portion of the dam.	
9. Additional Comments (Refer to item number if applicable)	
Spillways: Erodible Channel	
Is this section applicable for this dam?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
1. Location	
2. Grass Cover	
3. Deleterious Vegetation	
4. Trees	
5. Animal Activity	
6. Subsidence, Sinkhole	
7. Slide, Slough, Scarp	
8. Erosion	
9. Debris	
10. Flowing?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
11a. Alterations/Repairs Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
11b. (If Present:) Alterations/Repairs Condition	
12. Other:	

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Spillways: Erodible Channel	
<i>13. Spillway: Erodible Channel Condition</i>	
<i>14. Additional Comments (Refer to item number if applicable)</i>	
Spillways: Non-Erodible Channel	
<i>Is this section applicable for this dam?</i>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<i>1. Location</i>	
<i>2. Approach Area</i>	
<i>3. Weir/Control</i>	
<i>4. Sidewalls</i>	
<i>5. Channel Floor</i>	
<i>6. Condition of Joints</i>	
<i>7. Surface Condition</i>	
<i>8. Unusual Movement</i>	
<i>9. Discharge Channel</i>	
<i>10. Debris</i>	
<i>11. Flowing?</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<i>12a. Boils</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<i>12b. (If Present): Boils</i>	
<i>13a. Alterations/Repairs Present</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<i>13b. (If Present:) Alterations/Repairs Condition</i>	
<i>14. Other:</i>	
<i>15. Spillway: Non-Erodible Channel Condition</i>	
<i>16. Additional Comments (Refer to item number if applicable)</i>	

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Start Date: 09/27/2018 Completed Date: 10/05/2018

Spillways: Inlet Structure

Is this section applicable for this dam?

Yes No

Breach prevented access to the primary inlet



Photo Taken: 9/27/2018 10:08:29 AM

1. Location

Approximate coordinates from Google Earth: 34.457158, -79.880505

2a. Intake Structure

Unable to observe. Breach prevented access to the primary inlet.

2b. Intake Structure Types

Drop Inlet, Vertical Gate, Low-Level Gate

Primary inlet has a vertical gate and low level gate feature.

3. Trashrack

Unable to observe. Breach prevented access to the primary inlet.

4a. Low-Level Valve Present?

Yes No NA

4b. (If Present:) Low-Level Valve Condition

Monitor

Low level gate is open.

5. Debris

Unable to observe. Breach prevented access to the primary inlet.

6a. Repairs/Alterations Present

Yes No NA

6b. (If Present:) Alterations/Repairs Condition

7. Other:

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Spillways: Inlet Structure

8. *Spillway: Inlet Structure Condition* Condition Prevented Full Inspection

Violation Determined: 9/27/2018
DAMMAINTREP
Unable to observe. Breach prevented access to the primary inlet.

9. *Additional Comments (Refer to item number if applicable)*
Secondary spillway was a 36" CMP extending horizontally through the dam. Location from Google Earth: (34.457768, -79.880445). Failure of the dam occurred at this location and washed the pipe downstream.



Photo Taken: 9/27/2018 10:04:40 AM

Spillways: Outlet Works

Is this section applicable for this dam? Yes No

Unable to observe. Breach prevented access to the outlet works.

1. *Location*
Location from previous inspection report: 34.457125, -79.880249

2a. *Outlet Structure*
Unable to access outlet works.

2b. *Outlet Structure Type* Pipe
Information from previous inspection

3. *Outlet Pipe*
Unable to access outlet works.

4. *Primary Closure/Control*

5. *Secondary Closure/Control (If Applicable)*

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Spillways: Outlet Works	
<i>6. Unusual Movement</i>	
<i>7a. Seepage</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
<i>7b. (If Present): Seepage</i>	
<i>8. Stilling Basin</i>	
<i>9. Normal Flow Quantity</i>	
<i>10. Low-Level Flow Quantity</i>	
<i>11a. Alterations/Repairs Present</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<i>11b. (If Present:) Alterations/Repairs</i>	
<i>12. Other:</i>	
<i>13. Outlet Works Condition</i>	Condition Prevented Full Inspection
<div style="border: 1px solid black; padding: 5px;"> <p>Violation Determined: 9/27/2018 DAMMAINTREP Unable to access and evaluate outlet works.</p> </div>	
<i>14. Additional Comments (Refer to item number if applicable)</i>	
Emergency Action Plan	
<i>Is this section applicable for this dam?</i>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<i>1. Date of last update of emergency plan:</i>	
<i>2a. EAP provided by owner?</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<i>2b. (If EAP was not provided, was a copy of the EAP form left with the owner?)</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<i>3. Does EAP contain emergency alert plan?</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<i>4. Does EAP contain specific actions to take if the dam has failed or is failing?</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<i>5. Additional Comments (Refer to item number if applicable)</i>	

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Downstream Hazard Check

1. *Satellite Imagery*

Yes No NA

Photo Taken: 9/27/2018 2:31:59 PM



2. *Inundation Map*

Yes No NA

Recent DSS Wise run available.

3. *Structures/Developments*

Yes No NA

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Downstream Hazard Check

4. Roads/Railways

Yes No NA

US Highway 52 is approximately 0.4 miles downstream. Debris in culvert (see photos).
Society Hill Road is 2.3 miles downstream (below D3539).



Photo Taken: 9/27/2018 10:29:39 AM



Photo Taken: 9/27/2018 10:29:49 AM

5. Utilities

Yes No NA

Power line easement through dam's downstream area.

6. Consider For Reclass?

Yes No NA

Consider for reclassification to C1 based on potential impacts to Highway 52 (3,900 cars/day), downstream dam, D3539, and Society Hill Road (2,100 cars/day).

7. Additional Comments (Refer to item number if applicable)

Inspection Summary

1. Overall Condition (*Per National Inventory of Dams Definition)

Not Rated

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Inspection Summary

-----NID Definitions-----

(SATISFACTORY) No existing or potential dam safety deficiencies are recognized.

Acceptable performance is expected under all loading conditions in accordance with state engineer's rules and regulations for dams or tolerable risk guidelines.

(FAIR) No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take further action.

(POOR) A dam safety deficiency is recognized for loading conditions, which may realistically occur. Remedial action is necessary. A POOR condition is used when uncertainties exist as to critical analysis parameters, which identify a potential dam safety deficiency. Further investigations and studies are necessary.

(UNSATISFACTORY) A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

(NOT RATED) This should only be used if it is not possible to assess to dam's condition due to site constraints on visibility on the day of inspection. If vegetation is a problem the owner should be ordered perform maintenance to remove it before the next visit.

3. Final Comments

Dam was breached as a result of Hurricane Florence. Failure occurred near the left abutment, where an auxiliary spillway (horizontal CMP) was placed through the dam. A large portion of the dam was inaccessible as a result of the location of the failure and impassible roads in the area surrounding the dam.

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Inspection Summary

Preliminary Dam Inspection Disclaimer:

The information contained in the preliminary inspection report is intended as an aid to identify those dams that require maintenance and/or repair actions to reduce their danger to human life or property only. It is not intended as professional engineering or consulting advice for conditions or situations present at individual dams. It is not a substitute for a detailed inspection, nor does it replace the need for services provided by registered professional engineers. If your dam is experiencing an unusual situation consult with engineering professionals to find an appropriate remedy. Preliminary inspections conducted by South Carolina Department of Health and Environmental Control (the Department) are provided "AS IS" and "as available", without warranties of any kind, either express or implied. Preliminary inspections consist only of a visual but technical examination of the dam and its appurtenant works. All findings are based solely on visual observations of the inspector at the time of the inspection. Common law holds that the storage of water is a hazardous activity and the Department does not assume any responsibility or risk for your actions or inactions. Dam owners are responsible for the safe operations and maintenance of their impoundment structures.

LAKE DARPO DAM (D3530)
Violation List



Form	Determined	Description	Sec. #
Dams Preliminary Inspection Form	9/27/2018	Reference: DAMMAINTREP	
Dams Preliminary Inspection Form	9/27/2018	Reference: DAMMAINTREP	
Dams Preliminary Inspection Form	9/27/2018	Reference: DAMMAINTREP	
Dams Preliminary Inspection Form	9/27/2018	Reference: DAMMAINTREP Unable to observe. Breach prevented access to a large portion of the dam.	
Dams Preliminary Inspection Form	9/27/2018	Reference: DAMMAINTREP Unable to observe. Breach prevented access to the primary inlet.	
Dams Preliminary Inspection Form	9/27/2018	Reference: DAMMAINTREP Unable to access and evaluate outlet works.	