Maryland
Department of the Environment

Wes Moore, Governor
Aruna Miller, Lt. Governor

Serena McIlwain, Secretary Designate
Suzanne E. Dorsey, Deputy Secretary

January 11, 2024

Wayne Sharrer
Town of Emmitsburg
300A South Seton Avenue
Emmitsburg, Maryland 21727

Subject: Dam Inspection Findings
Emmitsburg Dam (MD Dam No. 18)

Dear Mr. Sharrer:

On November 11, 2022 and October 13, 2024, the Dam Safety Inspection and Compliance Division of the Maryland Department of the Environment (hereafter referred to as the Department) inspected the Emmitsburg Dam for a periodic dam inspection. The photos of the interior of the principal spillway pipes and weir structure are from the 2022 inspection. All other photos are from the more recent 2023 inspection.

The purpose of the periodic inspections is to attempt to detect any early signs of deterioration that may affect the safe operation of the dam and to identify maintenance items that, if performed routinely, can save costly repairs. The following persons were present for the inspection:

Kelly Flint	MDE Dam Safety Inspection and Compliance Division
Wayne Sharrer	Town of Emmitsburg Lead Water and Sewer Operator
Jared Bratner	Town of Emmitsburg Water and Sewer Superintendent

Inspections consist of a visual, but technical, examination of the dam and appurtenant works, as well as a limited review of the file maintained by the Department. Findings are based on visual observations of the inspector at the time of the inspection, unless otherwise noted. Accordingly, the contents of this inspection report should not be treated as an in-depth engineering evaluation, though such evaluations or detailed investigations may be recommended based on the findings.

The Department regulates dams in accordance with Sections 5-501 through 5-514, Annotated Code of Maryland, Environment Article, and promotes safe design, maintenance and operation of dams in accordance with national and local best practices. The inspection was performed under authority contained in the Annotated Code of Maryland, Environment Article, §5-509.

Common law holds that the storage of water is a hazardous activity and the Department does not assume any responsibility or risk for action or inaction of the dam owner and/or operator. Dam owners are responsible for the safe operations and maintenance of their impoundment structure (Appendix A).

Summary of Recommendations

- Within three (3) months of the date of this report, remove woody vegetation (trees and shrubs) with a diameter less than six (6) inches at chest height within fifteen (15) feet of the outfall and downstream left abutment and toe of slope, provide permanent stabilization and email photos of the completed maintenance electronically to the Department. Please refer to Policy Memorandum No. 1 – Maintenance and Repair Trees and Woody Vegetation for additional guidance (Appendix B).

- Within six (6) months of the date of this report install buoys in front of the spillway, if recreationists access the lake.

- Within six (6) months of the date of this report retain a professional engineer that is experienced in dam inspections, design and construction to evaluate:

    - removal of woody vegetation with diameters greater than six (6) inches at chest height within fifteen (15) feet of the outfall and downstream left abutment and toe of slope,

    - current condition of the concrete weir walls and box principal spillways pipes,

    - seepage locations at the concrete weir walls and box principal spillway pipes,

    - intake tower and its water control gate/valves condition,

    - the condition of the left and right filter toe drains which were installed in 1984 and 1999, as necessary,

    - and provide a detail for a color-coded reflective staff gage and location that is visible from a safe distance.

- Within one (1) year of the date of this report, submit a report to the Department containing the professional engineer's evaluation results and recommendations.

- Within one (1) year of the date of the engineer's evaluation install a reflective, color-coded staff gage in a location that is visible from a safe location.

- Within one (1) year of the date of this report, perform routine maintenance and exercise the operable upper valves in the intake tower and the blow-off valve at the downstream toe. Continue to maintain and exercise valves that are not used regularly for water intake at a minimum annually.

- Within one (1) year of the date of this report, complete a visual inspection of the dam and complete annual visual inspections of the dam following the initial inspection. Provide an inspection report to the Department within sixty (60) days following the inspection that includes an inspection checklist and photographs. Please refer to MDE's Inspection Checklist in Appendix C as an example.

Dam Location and Aerial View

The dam is located on the north side of Hampton Valley Road approximately 0.6 miles west of the intersection of Hampton Valley Road and Crystal Fountain Road in Emmitsburg, Maryland.

Figure 1 Location Map

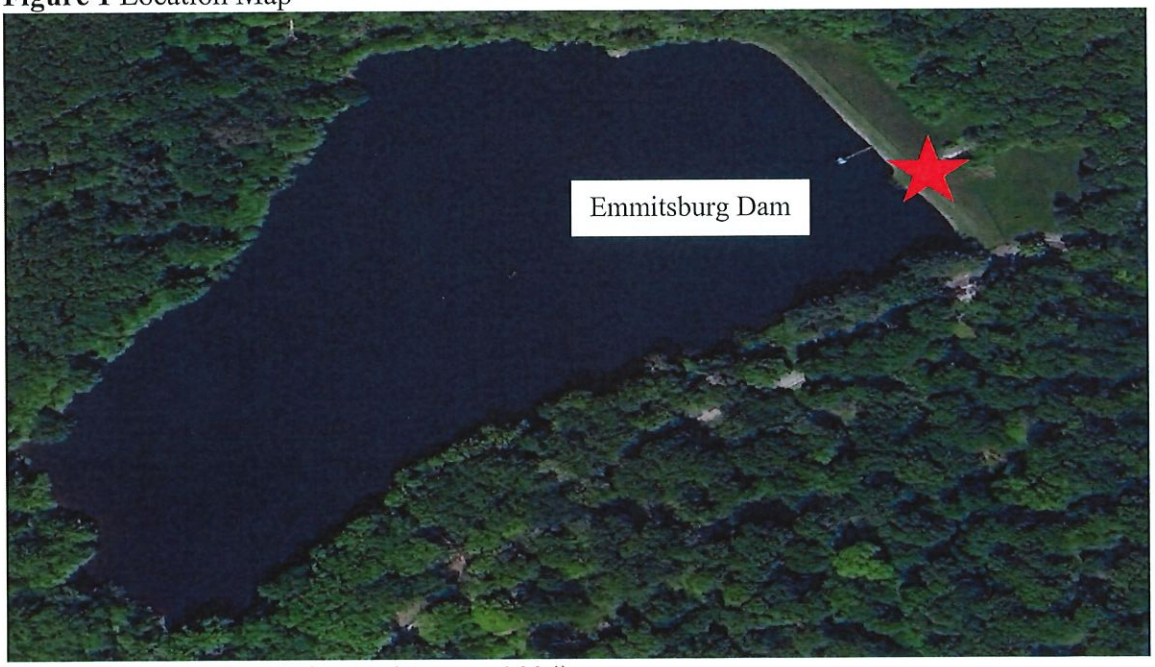


Figure 2 Aerial Photo of Dam (January 2024)

Dam History and Previous Findings

Our inventory record lists Emmitsburg Dam as being constructed in 1950. The dam is used for water supply. The 30-foot high dam with a 0.80 square mile watershed area creates a 13.5-acre lake. The embankment is 487 feet long. The principal spillway consists of a 38.5-foot-long weir wall with two-six foot wide box culvert spillways. The intake tower associated with the dam has four valves/gates. There is a 12-inch ductile iron pipe drain at the bottom of the control tower at elevation 850.00. There is a 12-inch sluice gate with an invert of 850.00. There are two 8-inch valves at elevation 854.00 and 863.00, respectively. In 1966 after a drought the Town raised the weir wall 3.5 feet to elevation 860.5. Raising of the weir wall is not indicated in any subsequent design drawings. It is only noted in the MDE SWM report. In 1984, the dam was raised approximately 5 feet and a 70-foot-wide auxiliary spillway was created on the left side to provide freeboard on the 100-year storm event. In addition, a four-foot by eight-foot high Miradrain panel and a 24-inch by 24-inch Number 6 aggregate toe drain with a six-inch slotted plastic pipe were added to the left side of the dam. Then in 1999, 160 linear feet of perforated 4-inch plastic pipe was added to create a drain field at the right toe of slope. Lastly in 2001, a 12-inch tee was added to the water distribution line near the downstream toe of slope. A 12-inch by 6-inch reducer was added to the downstream side of the tee on the water distribution line and a six-inch valve was added to both of the tee outlets. The structure is currently classified as a high hazard structure, because failure would likely result in loss of life, extensive property damage to homes and other structures, or cause flooding of major highways such as State roads or interstates.

Repairs have been performed based on inspection findings. In 1994 concrete repairs were made to the riser structure. Then in 1996 the gabion wall at the outlet was repaired after a storm event damaged the gabion wall. Recently, since 2014 deterioration and seepage spots in the concrete box culverts have been noted in inspection reports. In 2021, the Town informed Dam Safety that the lower two valves are not operated. The drain at the bottom of the intake tower is left in the open position. The upper two valves are exercised for water withdrawal. In addition, the 6-inch valve added at the downstream toe was exercised in 2021. The condition of the intake tower has deteriorated over time.

Inspection Findings and Recommendations

The following observations that are detailed in the attached Inspection Report were noted during the limited visual inspection of the dam. Please be advised that repairs recommended below may require permits from the Department prior to performing any work. Minor maintenance such as debris removal, vegetation control (unless removing root balls), filling of limited animal burrows, and patching or sealing of small areas typically does not require a permit. For work other than minor maintenance, or if there is uncertainty whether an action is considered minor maintenance, please contact the Dam Safety Division at 410-537-3538. For work requiring a permit, the dam owner will be required to retain the services of a registered professional engineer, experienced in the design and construction of dams, to develop any necessary plans and oversee the work.

In addition, legislation passed in 2017 within Title 5 of the Environment Article, Annotated Code of Maryland which requires owners of High and Significant Hazard dams to provide an Emergency

Action Plan (EAP) to the Department for review, and then complete annual updates by May 1 thereafter. A review of the electronic file indicates that the Department received an updated EAP for Emmitsburg Dam April 13, 2023. The legislation also requires dam owners to coordinate functional EAP exercises with local emergency officials at least once every five (5) years. The Department recommends coordinating with local and Frederick County emergency management to complete a table top exercise of the Emmitsburg Dam EAP.

Please contact Kelly Flint at (410) 537-3536 or kelly.flint@maryland.gov or Charles Wallis, Chief of the Dam Safety Inspection and Compliance Division, at (410) 537-3623, if you have questions regarding the inspection or recommendations included in this letter.

Sincerely,

Kelly R. Flint

Kelly Flint, P.E.
Dam Safety Permits Division

cc: Charles Wallis, P.E., Chief, Dam Safety Inspection and Compliance Division
John Roche, P.E., Chief, Dam Safety Permits Division
Jared Bratner, Water and Sewer Superintendent, Town of Emmitsburg
Cathy Willets, Town Manager, Town of Emmitsburg

APPENDIX A: ASDSO Dam Ownership Fact Sheet

Dam Ownership **Fact Sheet**

TOPIC:
OWNERSHIP RESPONSIBILITY & LIABILITY

Dams are owned and operated by individuals, private and public organizations, and the government. The responsibility for maintaining a safe dam rests with the owner. A dam failure resulting in an uncontrolled release of the reservoir can have a devastating effect on persons and property downstream. Tens of thousands of public and private dam owners in the United States have exposure to liability for the water stored behind their dams. Safely maintaining a dam is a key element in preventing a failure and limiting the liability that an owner could face.

Public safety around dams is also the responsibility of the owner. Dams can create a hazardous environment and dangerous hydraulic features. Dam owners need to consider issues with accessibility by the public to the dam and the surrounding area.

DAM FAILURE

The failure of a dam has the potential for loss of life and catastrophic impact on communities, private property and public works downstream. The data shows that there are approximately 10 to 20 failures per year involving uncontrolled release of reservoirs. Failure of even small dams can result in serious injuries, fatalities, disruption of business operations, damage to critical infrastructure and other extensive property damage.

"In today's litigious society it is safe to assume that in the case of catastrophic dam failure, extensive litigation will ensue. Any competent lawyer, representing the victims, will sue all possible wrong doers in seeking redress...including...the owners and operators of the facility, and...architects, engineers, contractors, sub-contractors, and consultants involved in the original construction and any subsequent modifications...."

— Denis Binder, Professor of Law, Chapman University

LOSS FROM FAILURE

The cost of dam failure is difficult to assess because flooding can affect large areas, often beyond the floodplain areas where flood insurance is required. The dam owner loses a valuable asset and faces reconstruction costs and possible liability for downstream damages. Local communities may be directly impacted due to building damage, injuries, fatalities, lost water supply, damaged transportation systems and infrastructure, and lost recreational assets.

Common law holds that the storage of water is a hazardous activity.

COMPLIANCE

Compliance with government or professional standards does not absolve an owner from liability, but it does establish a minimum standard of care to be used by owners. The extent of liability in any situation depends on the facts of the case and how those facts are interpreted by a judge or jury.

Consequently, actions that result in owner liability in one state may not result in liability in different states. In general, a dam owner is required to use "reasonable care" in the operation and maintenance of a dam and reservoir.

STRICT LIABILITY AND NEGLIGENCE

The extent of an owner's liability will vary from state to state, depending on the statutes and case law precedents. The concept of strict liability imposes liability on a dam owner for damages that occur regardless of the cause of failure. The alternative theory of negligence considers the degree of care employed by the owner in constructing, operating and maintaining a dam. Historically, courts have sought to compensate those injured by a dam failure. When assessing liability, the standard of care exercised by an owner will be closely examined. The standard of care should be in proportion to the downstream hazards involved. Where the risk is great, owners must be especially cautious. In many cases, a dam regulated by the federal government or a state dam safety program must be designed to withstand an unprecedented flood or earthquake.

RISK MANAGEMENT

An essential and logical part of an organization's management program is the control of potential losses that may arise. To manage risks, an owner can utilize a combination of standard operating procedures, employee training, regular maintenance, emergency preparedness and liability insurance.

A dam owner can take several actions to protect against financial loss. Technical guidance and information is available from your state's Dam Safety office.

Each dam should have:

- A state dam safety permit (if applicable).
- An operation plan, documented regular maintenance plan and emergency action plan.
- Documented periodic inspections.
- Warning signs and controlled access.

RESOURCES

ASDSO Resources
The ASDSO website houses national guidelines on dams. Go to:
DamSafety.Org/ManualsandGuidelines

For more information, videos and tools for dam owners go to:
DamOwner.Org

Access your state's Dam Safety Program by clicking your state at:
DamSafety.Org/States

State Attorney General's Office
State Office of Emergency Services

APPENDIX B: Policy Memorandum Number 1

DAM SAFETY

POLICY MEMORANDUM #1

TO: Dam Owners, Operators, and Engineers

FROM: Sediment, Stormwater, and Dam Safety Program
Water and Science Administration

DATE: February 25, 2019 (Updated August 3, 2020)

SUBJECT: Maintenance and Repair: Trees and Woody Vegetation

Policy Statement

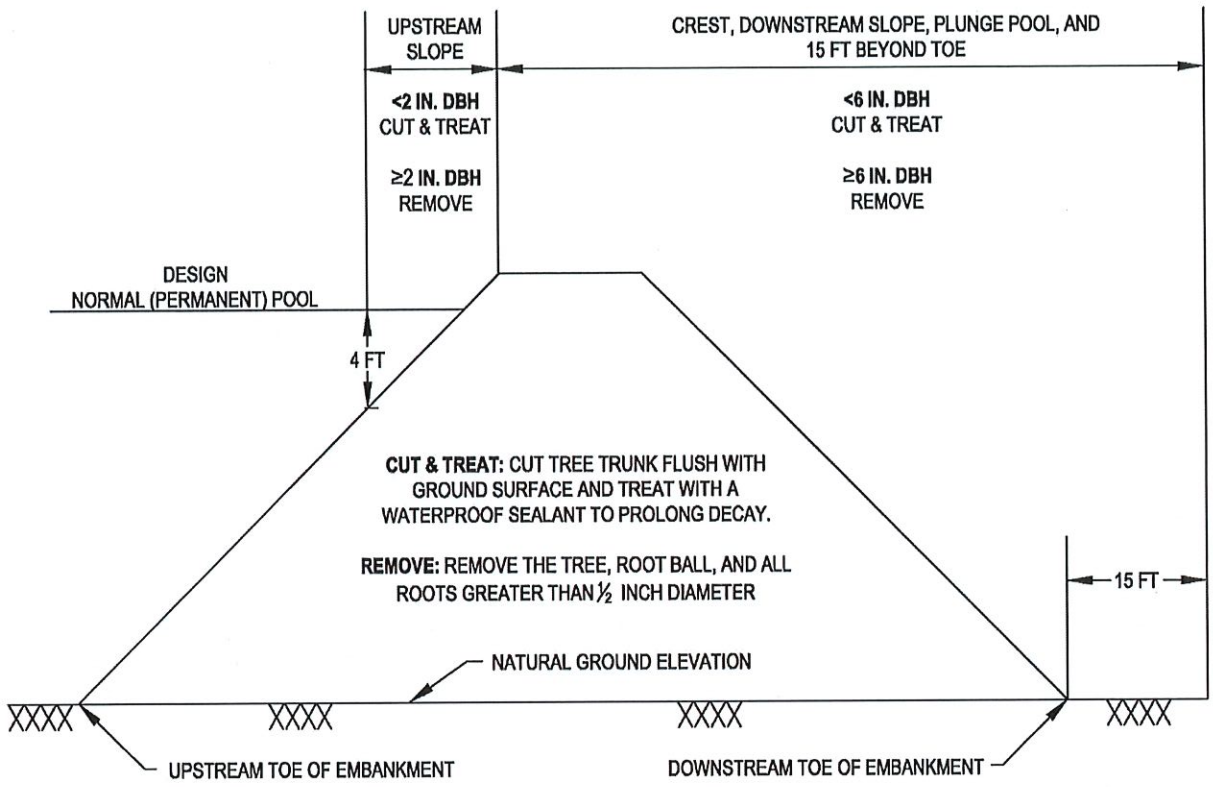
It is the policy of the Maryland Department of the Environment (the Department) that trees and other woody vegetation shall not be permitted to grow on or near dams or their appurtenant works. Prompt removal of woody vegetation in accordance with this policy is required of all dam owners in the State of Maryland.

Background

The growth of trees and woody vegetation negatively affects the integrity of the dam structure. Extensive root systems can weaken and loosen the soil matrix and provide seepage pathways for water. Trees that blow down or fall over can leave large holes in the embankment that can lead to increased erosion, loss of freeboard, and even failure of the dam. Brush obscures the surface and limits visual inspection, provides a haven for burrowing animals, and retards growth of non-woody vegetation. Tree and brush growth adjacent to concrete walls and structures may eventually cause damage and must be removed.

Removal of Trees and Woody Vegetation

Dam owners must maintain all areas of the dam free from trees and woody vegetation. These include areas within 15 feet of the upstream and downstream toe of embankment; within a 25-foot radius of the control structure; and within 15 feet of the abutment contacts, outlet, spillway area, and plunge pool. In emergency/auxiliary spillway channels, trees and woody vegetation must be removed in the zone extending 15 feet (horizontal) from the bottom edge of the spillway channel, or to a point two (2) feet above the water surface elevation in the channel during the design storm, whichever is greater. Where trees and woody vegetation exist in these areas, the extent of remedial activities (flush cut or full removal) will depend on the location and size of the tree, as presented in Figure 1. Removal of the stump and root ball and placement of controlled embankment fill material must be performed in accordance with detail TR-1 "Removal of Woody Vegetation on Dams".



Notes:

1. Diameter at breast height (DBH) refers to the tree trunk diameter measured at 4.5 feet above the ground.
2. For dams with no permanent pool, tree cutting and root removal shall extend 15 feet beyond the toe of the upstream slope.
3. Trees within the 25-foot "no-tree" zone around spillways, but greater than 15 feet from the upstream slope shall be removed or cut flush to the ground and treated regardless of DBH.

Figure 1: Tree Cutting and Removal Zones

Where the limits of the dam embankment are unknown or uncertain, the dam owner must coordinate with the Dam Safety Division, local Soil Conservation District, or other approving agency as designated by the Department to determine the appropriate extents of removal. The extents of removal should be based on a conservative estimate of the dam embankment location, with the understanding that tree removal is in the best public interest as it can reduce the potential for dam failure. Establishment of an arbitrary delineation without clear physical changes (e.g., slope changes, barriers such as guardrails, fence lines) should be avoided to ensure that maintenance crews have a clear understanding of "maintain" versus "no-maintenance" areas in the future after trees have been removed and acceptable vegetation has been established.

Removal of the stump and roots of a tree and placement of embankment fill may require a permit from the Department's Dam Safety Permits Division for any dam listed on the Maryland Dam Inventory. For low hazard dams not on the Dam Inventory, approval may be required from the appropriate approval authority (the local Soil Conservation District, the Department's Plan Review Division, or other delegated entity). It is important to note that in many cases wet pool elevations

will need to be drawn down prior to vegetation removal. Where a significant portion of the embankment will be disturbed due to the removal of a large number of trees, or where the removal of the trees may impact the spillway, internal drains and filters, the impervious core, or other dam appurtenances, special details must be provided by a Maryland registered professional engineer for review by the appropriate approval authority.

Restoration of Disturbed Areas

Following tree removal activities, a dense cover of low-growing grassy vegetation must be established where the earth has been disturbed or in areas of sparse ground cover. Grassy vegetation is recommended because it will provide protection from surface erosion, but its root structure does not penetrate the embankment so deeply as to weaken the dam structure. Deeper-rooted grasses should be planted in vegetated earth spillways. Seeding should be accomplished between optimum planting dates. Seeding late in the year may result in winterkill of young seedlings. The following spring an inspection of the seeded area should be made to determine if plant survival is satisfactory.

Before seeding, topsoil, fertilizer, and lime must be applied. Application rates will vary with soil type and condition, and can be determined by having the soil tested. The fertilizer and lime should be raked, disked or harrowed into the soil to a depth of not less than three (3) to five (5) inches. Periodic fertilization is necessary to maintain vigorous vegetation. Immediately following seeding, the area should be mulched.

Recommended seeding mixtures, planting dates, and fertilizer application rates for dams are provided in Appendix B-4-5, "Standards and Specifications for Permanent Stabilization" in the *2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control.*

Plantings on Roadway Dams

The Department allows a limited exception to this policy for planting of certain trees or similar woody vegetation along the crest of roadway embankments used as dry stormwater management structures (i.e., those structures that act as dams, rather than culverts). While planting trees on roadway embankments is discouraged, the following conditions must be met to allow limited woody vegetation plantings:

1. The structure shall have no permanent wet pool.
2. The dam shall be classified as low hazard only.
3. The structure shall have a minimum of three (3) feet of freeboard between the peak 100-year water surface elevation (WSEL) and the lowest point on the crest of the dam.
4. The width of the dam embankment measured three (3) feet above the peak 100-year WSEL shall be no less than 50 feet.
5. Woody vegetation planting is acceptable only on the top of the dam along the edge of the roadway. Woody vegetation planting shall not be permitted on the side slopes.
6. Woody vegetation planting is not permitted within 15 feet from the spillway, toe, or abutments of the dam.
7. Planting may consist only of trees or shrubs with a shallow root system (less than three (3)

feet depth) when mature. A landscape plan showing the type and location of plantings shall be submitted for review and approval by the appropriate authority. The plan shall be prepared by a Maryland registered landscape architect with a note certifying that the proposed plantings have a shallow root system. Planting must be intentional. Volunteer tree growth is not acceptable.

Figure 2 illustrates acceptable and unacceptable applications of this policy exemption.

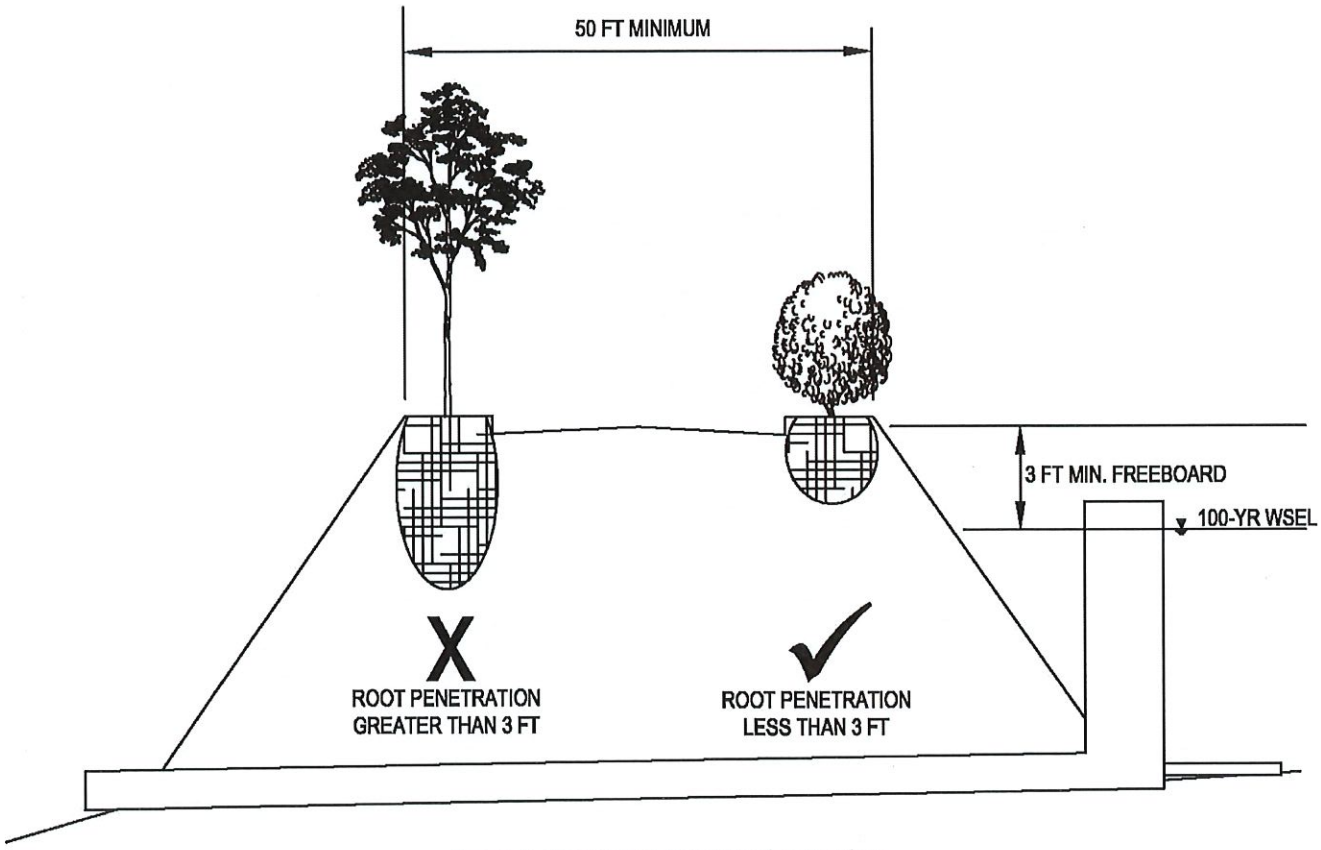
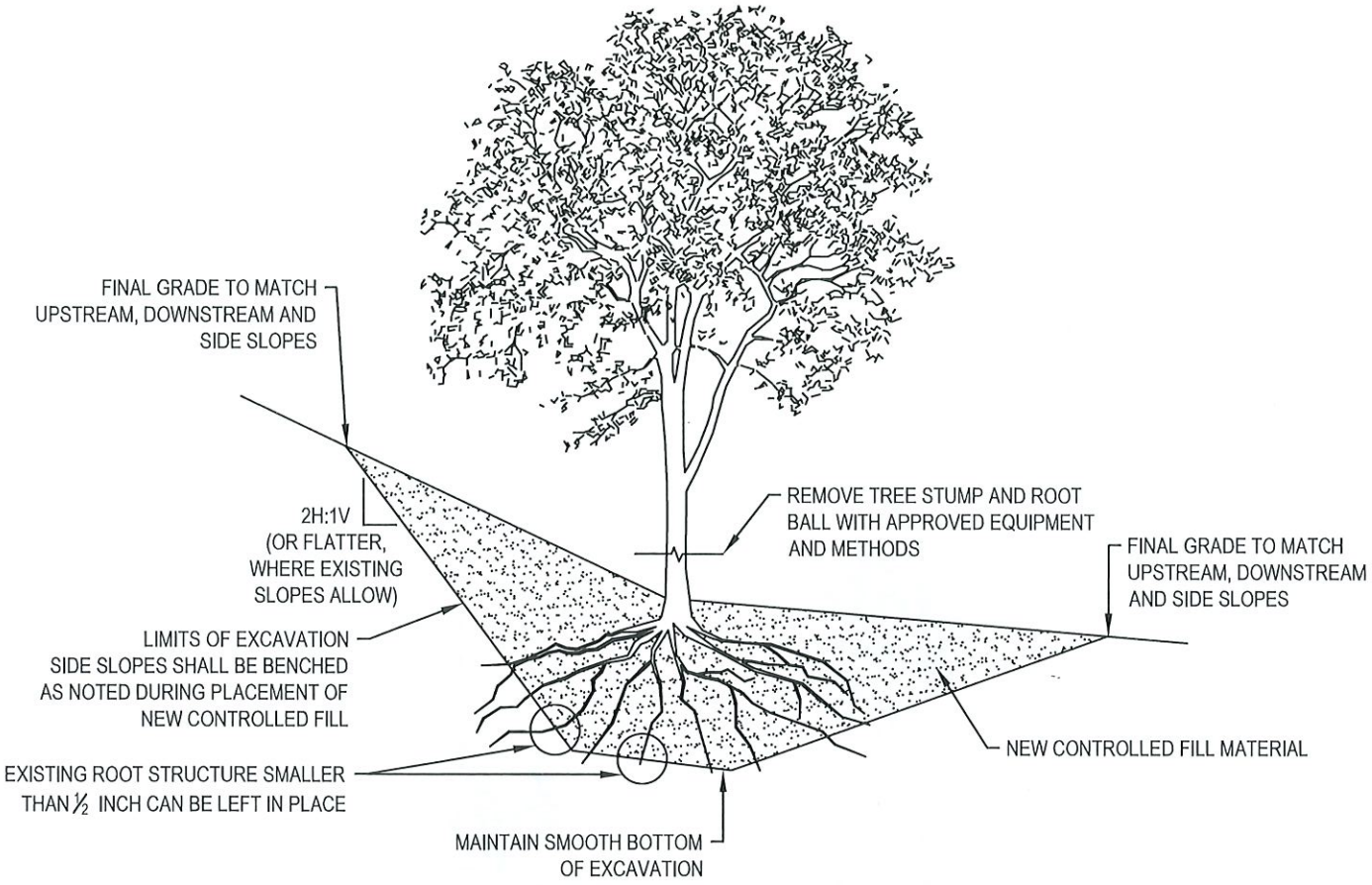


Figure 2: Plantings on Dams Used as Roadway

Additional Information

For additional information on this subject, refer to "Technical Manual for Dam Owners – Impacts of Plants on Earthen Dams", Chapter 5 – Controlling Tree and Woody Vegetation Growth (FEMA 534/ September 2005).

Questions about this policy or other items relating to ponds and dams can be directed to the Chief of the Dam Safety Inspection and Compliance Division at 410-537-3538.



NOTES:

1. TREE STUMP REMOVAL ON OR WITHIN 15 FEET OF A DAM SHALL BE COMPLETED IN STRICT ACCORDANCE WITH THE DETAIL AND UNDER THE SUPERVISION OF A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF MARYLAND EXPERIENCED IN DAM DESIGN AND CONSTRUCTION.
2. POOL LEVELS SHALL BE DRAWN DOWN AND MAINTAINED TO AN ELEVATION EQUAL TO OR LOWER THAN THE ANTICIPATED ELEVATION AT THE BOTTOM OF EXCAVATION OR TO THE BOTTOM OF THE POND PRIOR TO MAKING ANY EXCAVATIONS TO REMOVE STUMPS AND ROOTS.
3. A QUALIFIED PROFESSIONAL ENGINEER, OR THEIR REPRESENTATIVE, MUST BE ON-SITE FULL-TIME DURING STUMP REMOVAL.TREE STUMP EXCAVATIONS SHALL BE BACKFILLED AND APPROVED PRIOR TO BEGINNING ADDITIONAL REMOVALS AND EXCAVATIONS.
4. TREE STUMPS SHALL BE REMOVED TO A DEPTH SUCH THAT NO ROOT STRUCTURE LARGER THAN ½ INCH DIAMETER IS LEFT IN PLACE. THE ENGINEER SUPERVISING THE WORK MAY EXERCISE JUDGEMENT WHERE TAP ROOTS EXTEND TO SIGNIFICANT DEPTHS BELOW EXISTING GRADES.
5. THE EXCAVATION SHALL EXTEND TO THE DEPTH WHERE SUITABLE AND STABLE SOILS ARE ENCOUNTERED. THE EXCAVATION SHALL BE AS SMALL AS POSSIBLE. THE BOTTOM OF THE EXCAVATION SHALL BE AS FLAT AS POSSIBLE. ALL LOOSE SOIL SHALL BE REMOVED FROM THE EXCAVATION.
6. EXCAVATIONS SHALL NOT EXTEND TO DEPTHS GREATER THAN FOUR (4) FEET BELOW EXISTING GRADES, MEASURED FROM THE HIGHEST UPSTREAM POINT OF THE EXCAVATION, UNLESS APPROVED BY THE ENGINEER. EXCAVATIONS SHALL BE MADE IN ACCORDANCE WITH ALL APPLICABLE OSHA EXCAVATION AND TRENCHING SAFETY REQUIREMENTS.
7. ALL NEW CONTROLLED FILL SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN SIX (6) INCHES, FROZEN OR OTHER OBJECTIONABLE MATERIALS. FILL SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION GC, SC, CH OR CL AND SHALL HAVE AT LEAST 30% PASSING THE #200 SIEVE. FILL SHALL BE PLACED IN LIFTS NO GREATER THAN EIGHT (8) INCHES LOOSE THICKNESS AND COMPACTED TO A MINIMUM OF 95% MAXIMUM DRY DENSITY (ASTM D698, STANDARD PROCTOR) WITH A MOISTURE CONTENT WITHIN +/- 2% OF THE OPTIMUM .
8. IN GENERAL, ALL SLOPING EXCAVATIONS CREATED FROM THE REMOVAL AND EXCAVATION PROCESS SHOULD BE NO STEEPER THAN 2 HORIZONTAL TO 1 VERTICAL (2:1), WHERE PRACTICABLE, AND SHALL BE BENCHED OR NOTCHED SO THAT A SMOOTH SLOPING INTERFACE BETWEEN EXISTING GROUND AND NEW FILL IS NOT PRESENT.
9. NO DEBRIS GENERATED FROM THE STUMP REMOVAL SHALL REMAIN ON, OR WITHIN 15 FEET OF THE DAM EMBANKMENT FOLLOWING THE COMPLETION OF WORK. DEBRIS MUST BE DISPOSED OF IN A MANNER CONSISTENT WITH ALL LOCAL AND STATE REGULATIONS.
10. IF WATER IS ENCOUNTERED IN THE TREE STUMP CAVITY AND/OR EXCAVATION, A PERMANENT FILTER DRAIN MAY BE REQUIRED TO CONTROL SEEPAGE. IMMEDIATELY BACKFILL THE EXCAVATION WITH FINE AGGREGATE MEETING THE REQUIREMENTS OF SECTION 901, AGGREGATES OF THE MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION, 2017 STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, THEN CONTACT THE MDE DAM SAFETY DIVISION FOR FURTHER GUIDANCE.
11. THIS DETAIL DOES NOT APPLY WHERE EXCAVATIONS TO REMOVE TREE STUMPS MAY INTERCEPT OR DAMAGE EXISTING FILTERS, INTERNAL DRAINS, IMPERVIOUS CORES, SPILLWAY CONDUITS OR SIMILAR DAM ELEMENTS, FOR WHICH PROJECT SPECIFIC DETAILS SHALL BE DEVELOPED FOR REVIEW BY THE APPROPRIATE APPROVAL AUTHORITY.

Maryland Department of the Environment

DETAIL TR–1: REMOVAL OF WOODY VEGETATION ON DAMS

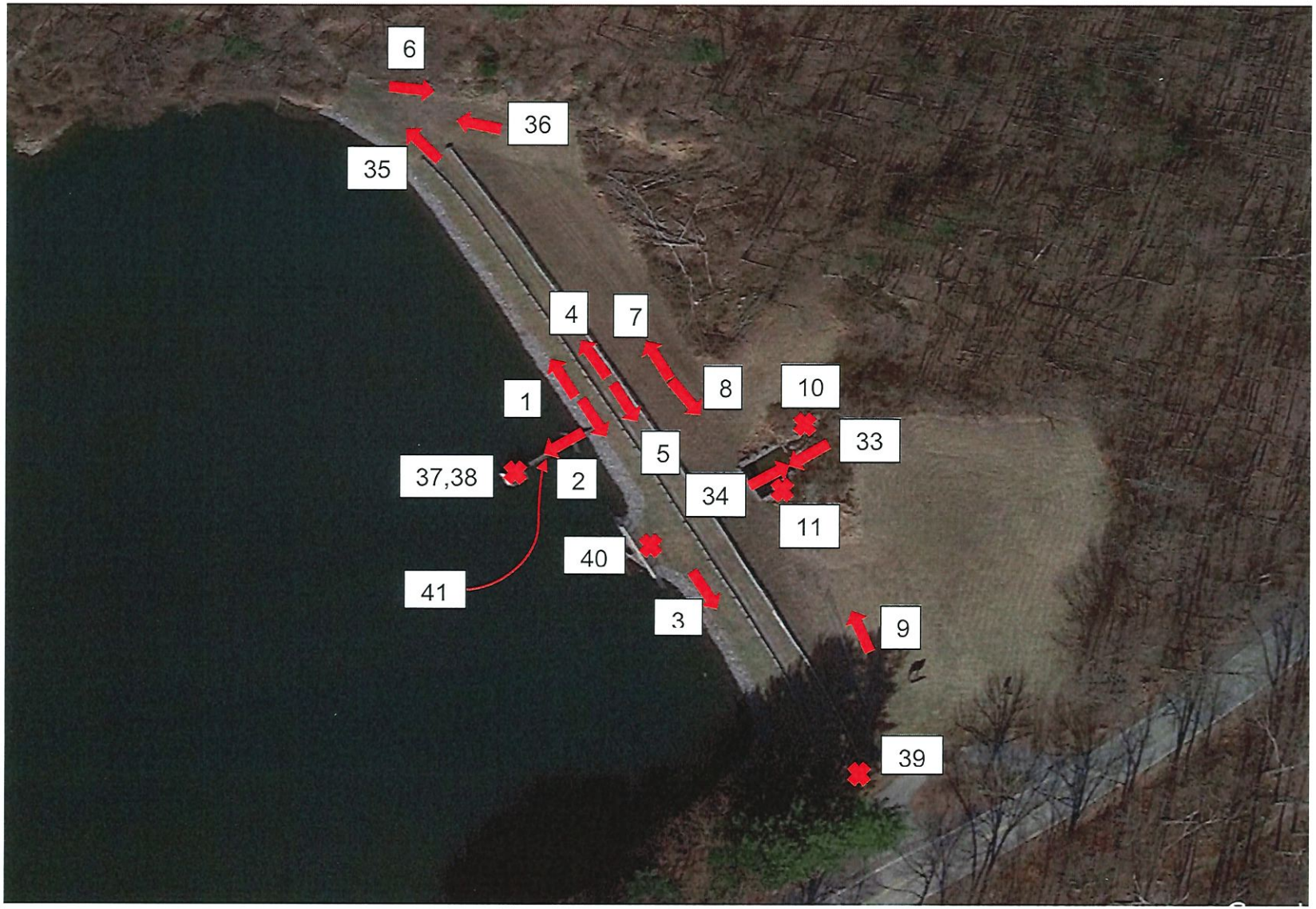
APPROVED: FEBRUARY 2019, REV.1

WATER AND SCIENCE ADMINISTRATION
SEDIMENT, STORMWATER, AND DAM SAFETY PROGRAM

APPENDIX C: Maryland Dam Inspection Checklist

MARYLAND DAM INSPECTION CHECKLIST	Y	N	Monitor Repair
1. CREST			
Ground cover in good condition			
Settlements Depressions Cracks			
2. UPSTREAM SLOPE			
Ground cover in good condition			
Riprap in good condition			
Erosion Animal Burrows Trees Shrubs			
Settlements Depressions Bulges Cracks			
3. DOWNSTREAM SLOPE			
Ground cover in good condition			
Erosion Animal Burrows Trees Shrubs			
Settlements Depressions Bulges Cracks			
Seepage_____gpm			
4. INTERNAL DRAINAGE SYSTEM			
Seepage/drain flow: Left_____gpm Right_____gpm Other_____gpm			
Does seepage contain fines?			
5. ABUTMENT CONTACTS			
Trees Shrubs Erosion			
Seepage_____gpm			
6. SPILLWAY/RISER STRUCTURE Concrete or Metal Pipe			
Spalling Cracking Corrosion Erosion Scaling Exposed Reinforcement			
Joints: Displacement Leakage Loss of joint material			
Trash racks: Operational Broken Bent Rusted Debris Obstructed			
Sluice/Drain gates: Operational Broken Bent Corroded Leaking			
7. SPILLWAY CONDUIT Concrete or Metal Pipe			
Debris Cracking Leakage Spalling Exposed reinforcement			
Joints: Displacement Leakage Loss of joint material			
8. STILLING BASIN/PLUNGE POOL Riprap or Concrete			
Spalling Cracking Erosion Scaling Exposed Reinforcement Joint Deterioration			
Undercutting Eroding			
Outlet channel condition:			
Tailwater elevation and flow condition:			
9. EMERGENCY SPILLWAY			
Ground cover in good condition			
Erosion Trees Shrubs Obstructions			
OVERALL CONDITION: Excellent Good Fair Poor Unsafe			

PHOTO LOCATION MAP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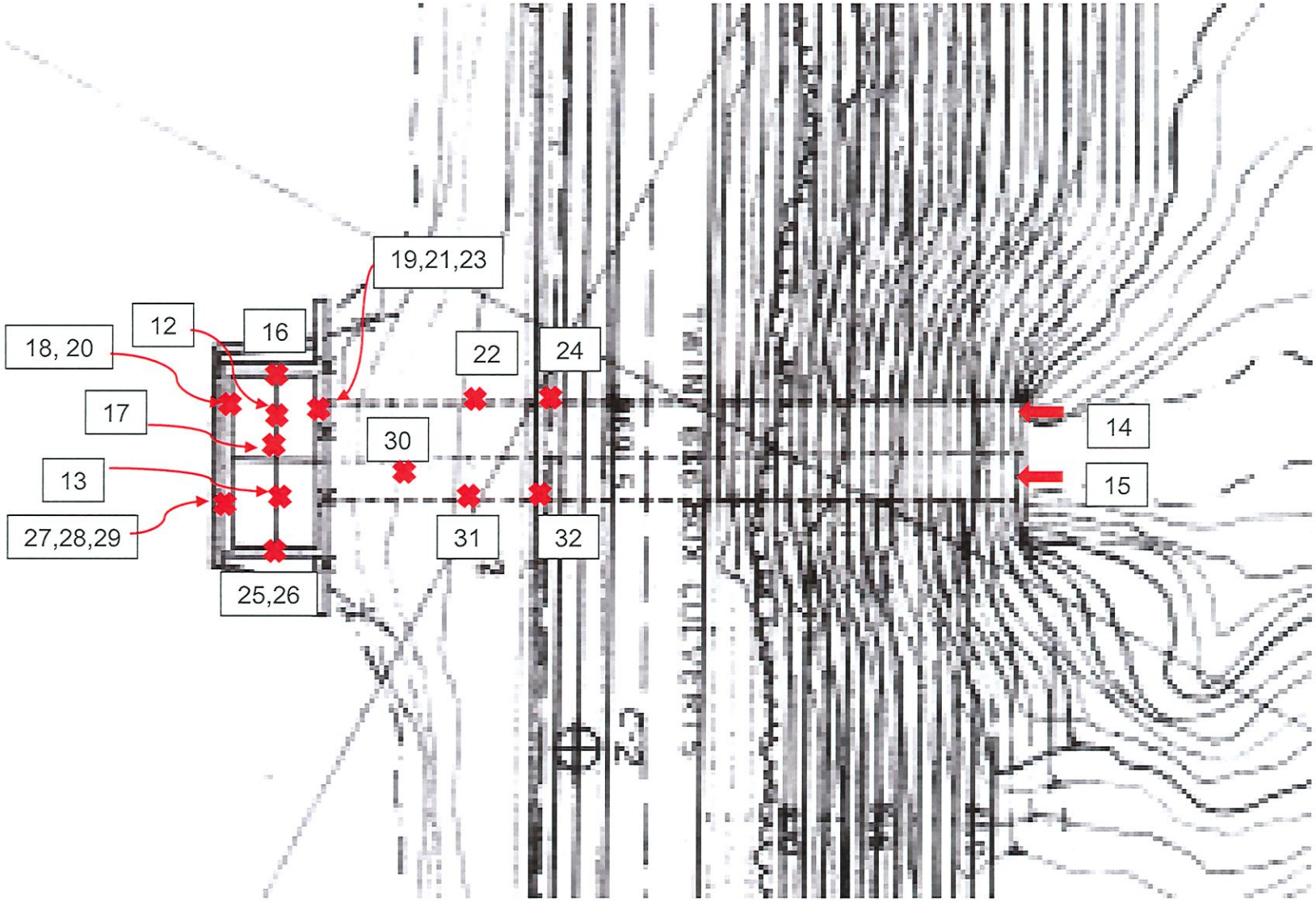
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INSPECTION REPORT

Maryland Dam Safety Inspection Checklist

Dam # **18 Emmitsburg Dam**

Date: **10/13/2023 9:30 AM**

Inspectors: **Kelly R. Flint, PE**

Inspection type: **Periodic**

Who else is present at the inspection: Wayne Sharrer, Town of Emmitsburg Lead Water and Sewer Operator
Jared Bratner, Town of Emmitsburg Water and Sewer Superintendent

Weather: **Sunny**

Temperature (F): **52**

Other: **No rain in previous 48 hours.**

Date of last inspection: **11/03/2022**

DAM INFORMATION

Drainage area (sq mi): **0.8**

County: **Frederick**

Normal surface area (ac): **13.5**

Watershed: **Turkey Creek**

Maximum surface area (ac): **~18.2**

Dam Classification: **HIGH**

Dam location: **39.6959, -77.38854**

Owner: **Town of Emmitsburg**
Cathy Willets, Town Manager

Address: **300A South Seton Avenue**
Emmitsburg, MD 21727

Phone: **(301) 600-6300**

Email: **cwillets@emmitsburgmd.gov,**

Is the owner the operator: **No**

Operator: **Wayne Sharrer**

Address: **300A South Seton Avenue**
Emmitsburg, MD 21727

Phone: **(240) 674-0053**

Email: **wsharrer@emmitsburgmd.gov**

Is there an EAP on file? **Yes**

EAP Type:

EAP Date: **April 14, 2008**

EAP Revised: **April 10, 2023**

Date exercised:

How has the plan been exercised?

Specify other:

EAP Primary Contact: **Wayne Sharrer**

Primary contact phone: **(240) 674-0053**

What issues are present with the EAP?

None

Action required for EAP: **Complete Tabletop Exercise of the EAP**

Dam Height (ft): **30**

Dam Length (ft): **487**

Top Width (ft): **10**

Upstream slope: **2**

Downstream slope: **2**

Normal storage capacity (ac-ft): **110**

Maximum storage capacity (ac-ft): **222**

Normal pool elevation (ft): **21.5**

Designed by: **Emmitsburg Water Co.**

Year built: **1950E**

Dam summary: Our inventory record lists Emmitsburg Dam as being constructed in 1950. The dam is used for water supply. The 30-foot high dam with a 0.80 square mile watershed area creates a 13.5-acre lake. The embankment is 487 feet long. The principal spillway consists of a 38.5-foot-long weir wall with two-six foot wide box culvert spillways. The intake tower associated with the dam has four valves/gates. There is a 12-inch ductile iron pipe drain at the bottom of the control tower at elevation 850.00. There is a 12-inch sluice gate with an invert of 850.00. There are two 8-inch valves at elevation 854.00 and 863.00, respectively. In 1966 after a drought the Town raised the weir wall 3.5 feet to elevation 860.5. Raising of the weir wall is not indicated in any subsequent design drawings. It is only noted in the MDE SWM report. In 1984, the dam was raised approximately 5 feet and a 70-foot-wide auxiliary spillway was created on the left side to provide freeboard on the 100-year storm event. In addition, a four-foot by eight-foot high Miradrain panel and a 24-inch by 24-inch Number 6 aggregate toe drain with a six-inch slotted plastic pipe were added to the left side of the dam. Then in 1999, 160 linear feet of perforated 4-inch plastic pipe was added to create a drain field at the right toe of slope. Lastly in 2001, a 12-inch tee was added to the water distribution line near the downstream toe of slope. A 12-inch by 6-inch reducer was added to the downstream side of the tee on the water distribution line and a six-inch valve was added to both of the tee outlets. The structure is currently classified as a high hazard structure, because failure would likely result in loss of life, extensive property damage to homes and other structures, or cause flooding of major highways such as State roads or interstates.

Inspection history: Repairs have been performed based on inspection findings. In 1994 concrete repairs were made to the riser structure. Then in 1996 the gabion wall at the outlet was repaired after a storm event damaged the gabion wall. Recently, since 2014 deterioration and seepage spots in the concrete box culverts have been noted in inspection reports. In 2021, the Town informed Dam Safety that the lower two valves are not operated. The drain at the bottom of the intake tower is left in the open position. The upper two valves are exercised for water withdrawal. In addition, the 6-inch valve added at the downstream toe was exercised in 2021. The condition of the intake tower has deteriorated over time.

Update dam information: **No**

DAM OPERATION

Frequency of operation of lake drain: One of the values is operated when the normal pool level is low. Two of the valves are not exercised regularly.

Accessibility of lake drain: The drain valve at the downstream toe is accessible. There are gates in the control house that could be accessed via the walkway for a sunny day or maintenance problem. The Town plans to install a fall protection hook, replace the boards on the walkway, replace the roof and clean sediment from the bottom of the tower to make access to the control tower gates safe.

Frequency of mowing: The Town has contracted with a company to mow the embankment once per month.

Operating problems since last inspection: Unknown

History of repairs since last inspection: Unknown

Do you do a seasonal drawdown? No **How many feet is it lowered?**

Years between inspections: 1

Does owner regularly inspect the dam during storm events? Yes

DOWNSTREAM HAZARD CLASSIFICATION

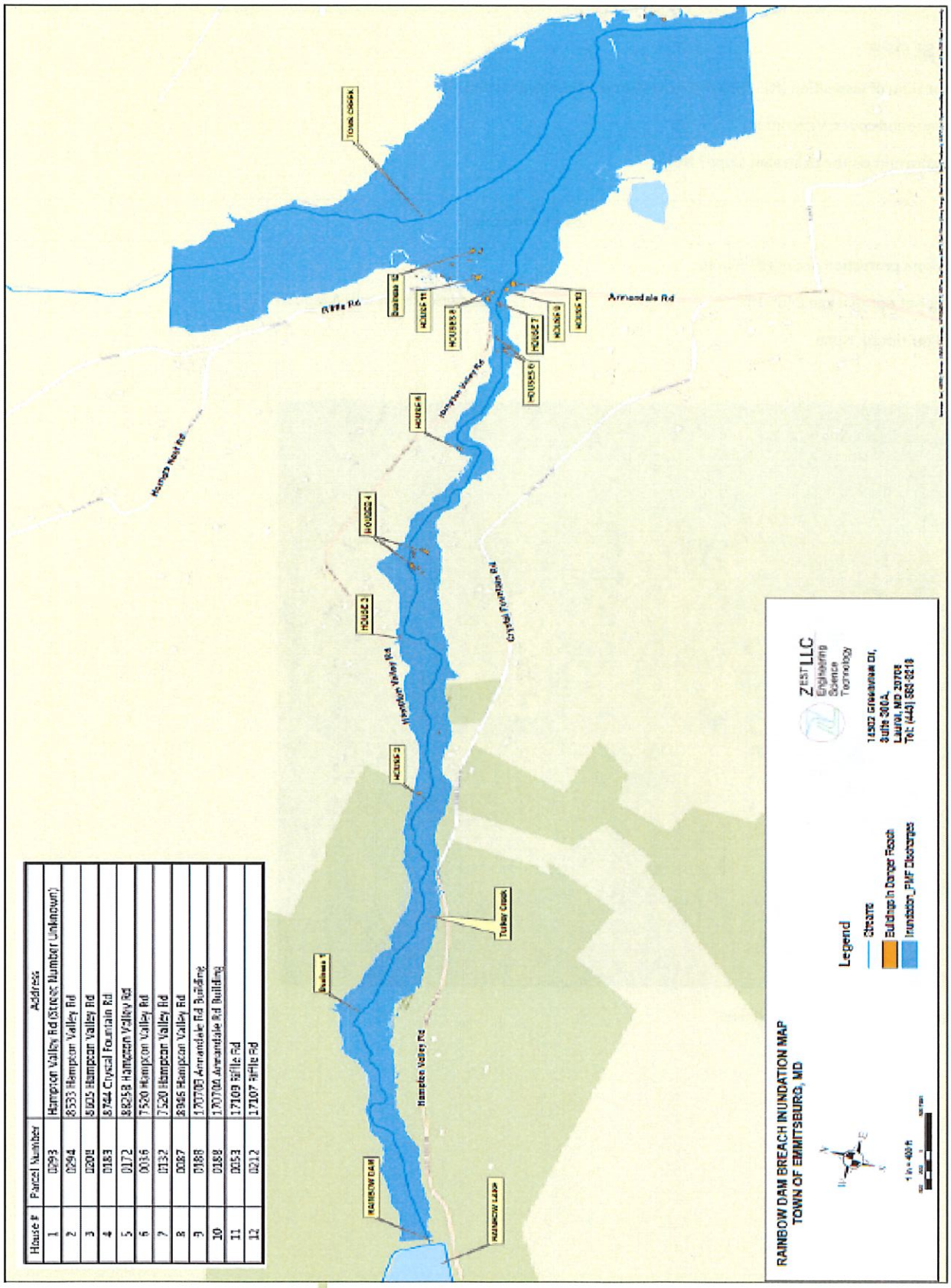
Current classification: HIGH

Was an inundation map used to determine hazard classification? Yes

Have there been any changes in land use or habitations since the last inspection? No

Is the current classification appropriate? Yes

Downstream hazard images: See next page.



House #	Parcel Number	Address
1	0293	Hampton Valley Rd (Street Number Unknown)
2	0294	8533 Hampton Valley Rd
3	0209	8565 Hampton Valley Rd
4	0183	8744 Crystal Fountain Rd
5	0172	88258 Hampton Valley Rd
6	0036	7520 Hampton Valley Rd
7	0132	7520 Hampton Valley Rd
8	0087	8946 Hampton Valley Rd
9	0188	1707703 Armendale Rd Building
10	0189	1707704 Armendale Rd Building
11	0253	17109 Tellis Rd
12	0212	17107 Tellis Rd

Figure description: Inundation Map

UPSTREAM SLOPE

Pool elevation at time of inspection (ft): ~859.0 (Below normal pool elevation 860.5)

Upstream slope ground cover: Vegetation

What issues are present on the upstream slope? None

Slope Protection

What types of slope protection are used? Riprap

Average diameter of riprap: Type C (6"-18")

Condition of riprap: Adequate

Action required for riprap: None

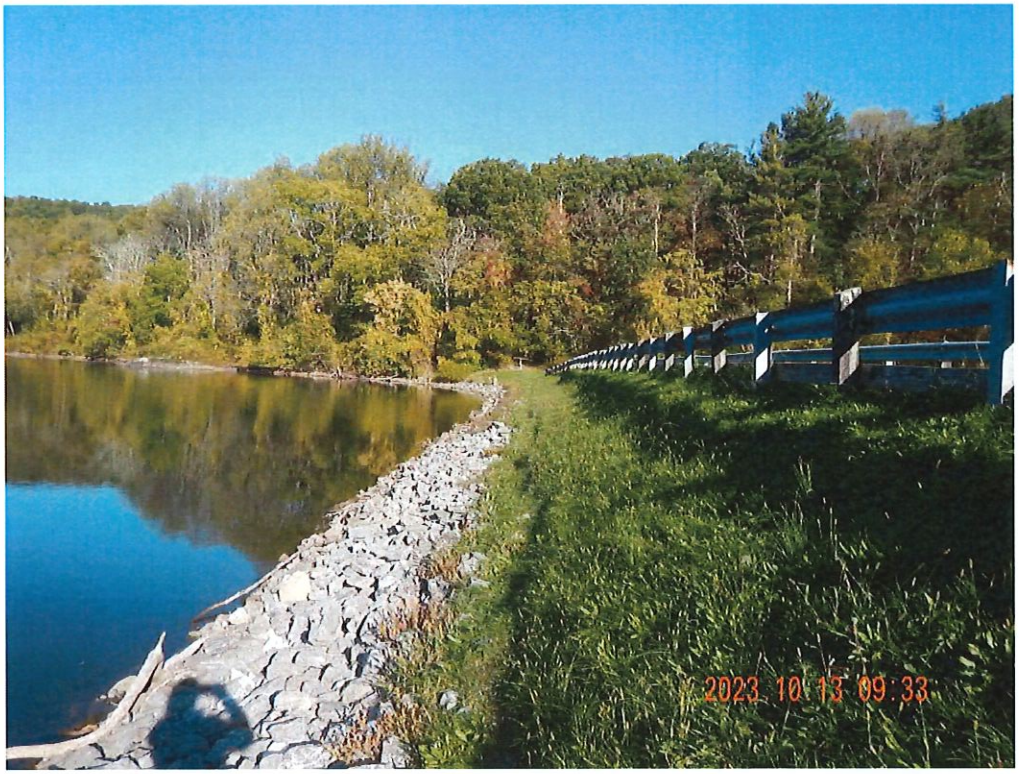


Photo 1 description: Upstream Slope Left Side

Photo 2 description: Upstream Slope Center

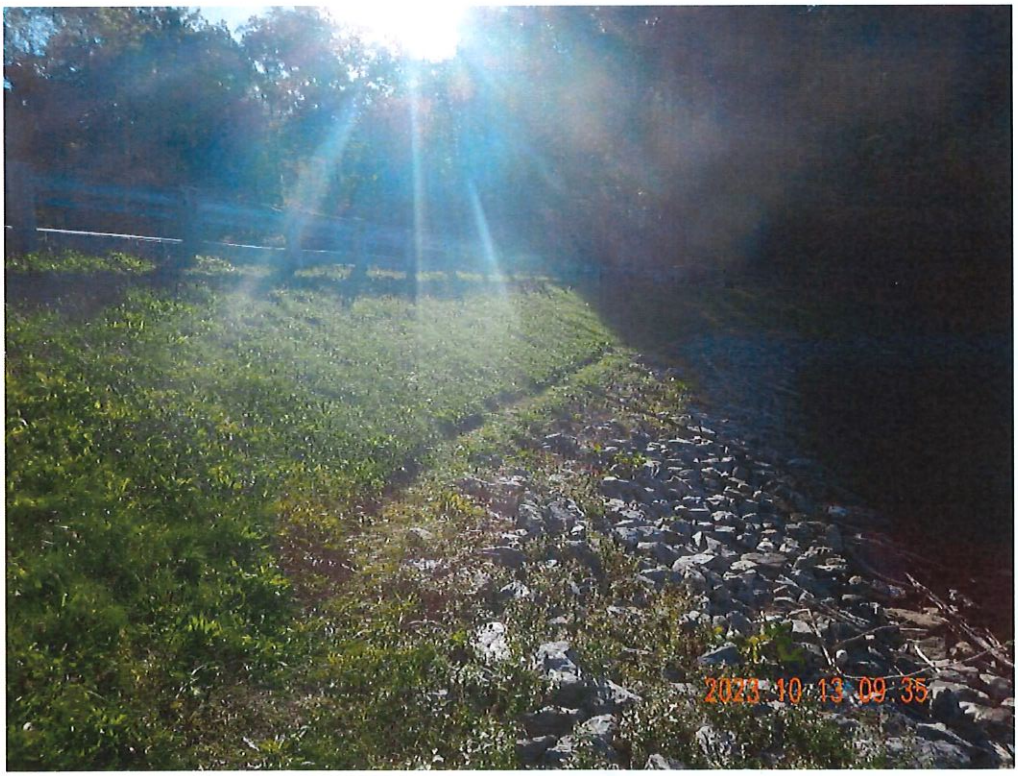


Photo 3 description: Upstream Slope Right Side

CREST

Approximate width of crest (ft): 10

Approximate freeboard (ft): 0

Crest ground cover: Vegetation/gravel in tire ruts

What issues are present on the crest?: None

Photo 4 description: Crest Left Side

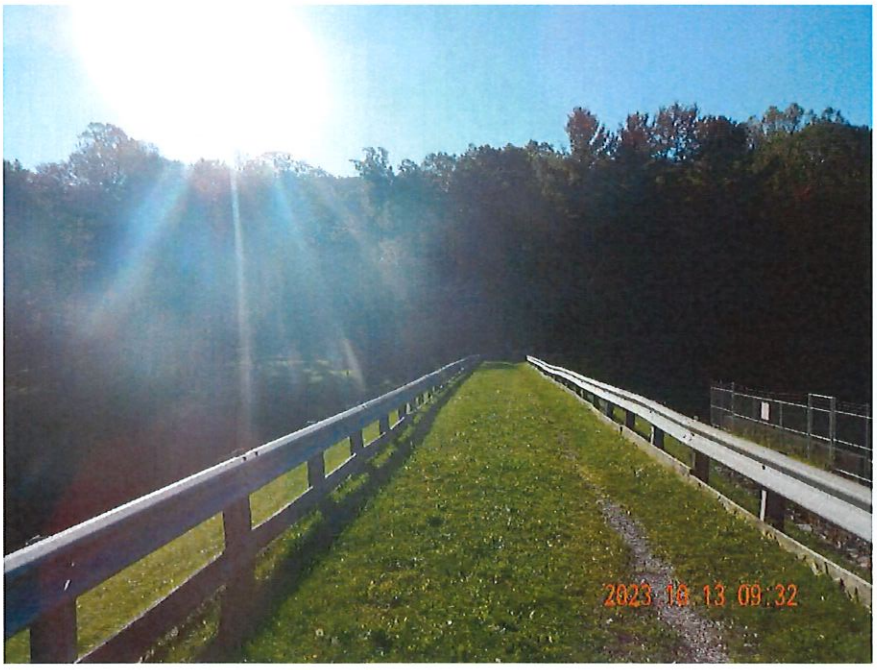


Photo 5 description: Crest Right Side

DOWNSTREAM SLOPE

Downstream slope ground cover: Vegetation

What issues are present on the downstream slope? Woody Vegetation, Brush

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Trees/Woody Vegetation

Shrubs coverage: Dense

Brush location: Toe on the left side, outlet

Action required for brush: Maintenance

Describe action required: Remove woody vegetation (trees and shrubs) with a diameter less than six (6) inches at chest height within 15 feet of the downstream toe of slope and outlet. Please refer to Policy Memorandum No. 1 – Maintenance and Repair Trees and Woody Vegetation for additional guidance. Please retain a professional engineer experienced in dam inspections, design and construction to evaluate removal of woody vegetation with diameters greater than 6 inches at chest height within 15 feet of the downstream toe of slope and outlet and make recommendations.

https://mde.maryland.gov/programs/water/DamSafety/Documents/Policy%20Memorandum%20No.%201%20-%20Maintenance%20and%20Repair%20Trees%20and%20Woody%20Vegetation%20(UPDATE%201).pdf

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Embankment / Internal Drains

What types of embankment drains are present? Toe Drains

Toe Drains

Approximate toe drain flow rate (gpm): < 1 **Measurement method**: Visual

Approximate toe drain size (in): 4

Location of toe drain: Left and right of concrete spillway pad

Action required: Monitor

Describe action required: Monitor seepage from toe drains during annual inspections.

Instrumentation

What types of monitoring instruments are in use? Piezometers

Who inspects the piezometers? Town of Emmitsburg

How frequently are the piezometers inspected? Monthly

Action required for piezometers: None

Photo 6 description: Downstream Slope Left Abutment

Photo 7 description: Downstream Slope Left Side

Photo 8 description: Downstream Slope Right Side

Photo 9 description: Downstream Slope Right Abutment

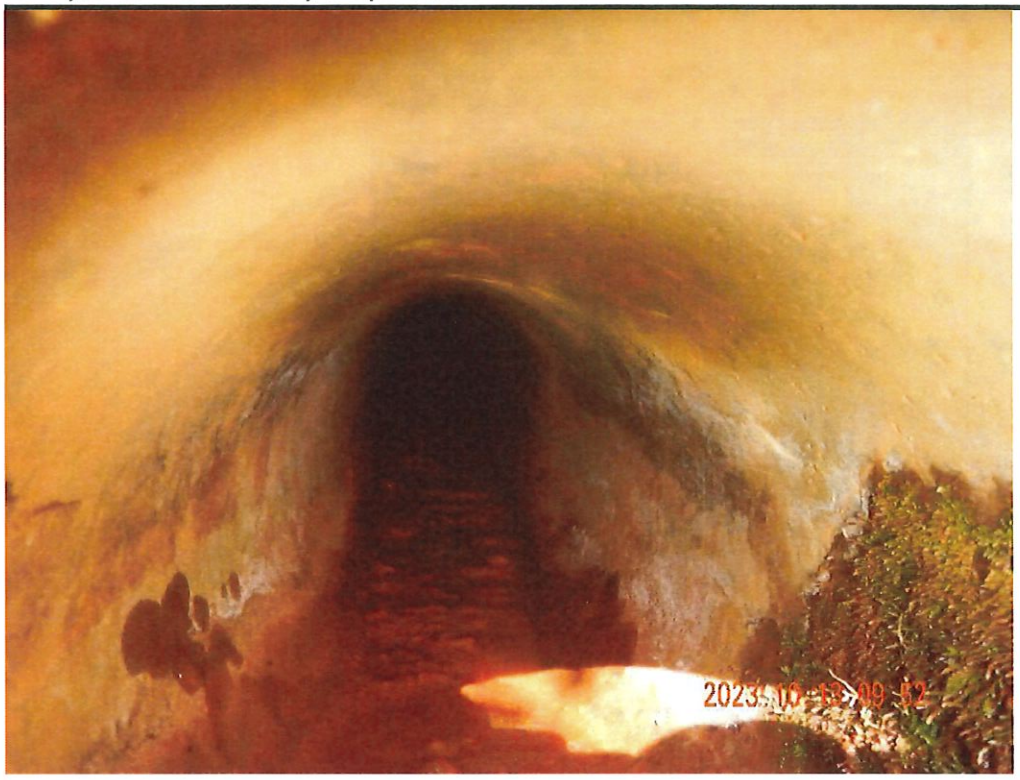

Photo 10 description: Left Filter Toe Drain Outlet

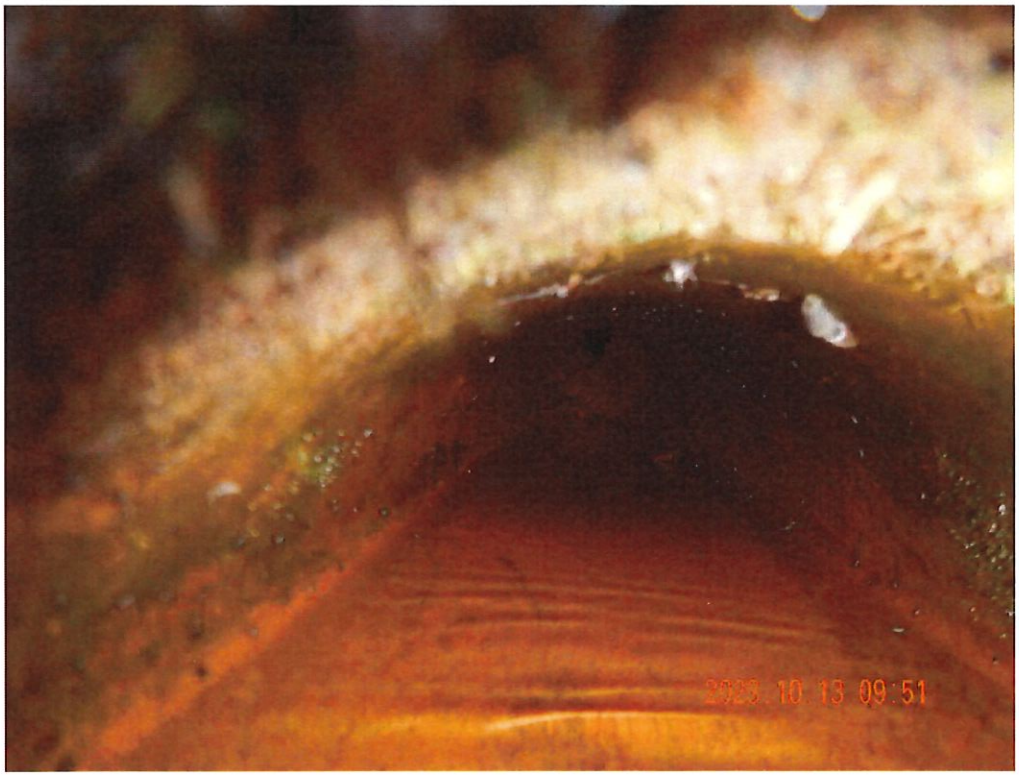

Photo 11 description: Right Filter Toe Drain Outlet

PRINCIPAL SPILLWAY

What type of spillway is present? Weir Wall

What is the primary material used in the spillway? Concrete

Which components are present? Trash rack

What issues are present with the primary spillway? Trash rack Issues, Deteriorating Materials

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Trash Racks

What type of trashrack is in use? Rust

Trashrack opening size: Adequate

What is the condition of the trashrack? Rust/Pitting.

Action required for the trashrack: Maintenance

Describe action required: Clean and paint trash racks.

Material Deterioration

What materials are deteriorating in the spillway? Concrete

What issues are noted with the concrete components? Spalling, Surface Erosion, Scaling/Exposed Rebar, Cracks, Seepage

Where are the issues located?

Spalling: Spot on the right wall of the right half of weir spillway and a few localized spots on the walls of the right and left box spillways.

Surface Erosion: All the interior walls of both sides of the weir wall spillway.

Scaling/Exposed Rebar: At the joint between the back wall of the left half of the weir spillway and the left box spillway.

Cracks: A few on both the transition spillways of the front walls of the left and right sides weir wall.

Seepage: Along the joint between the portion of the original back weir wall and the additional section of the back wall. Seepage runs down the back wall on both sides of the weir box. Another significant spot at the joint between the back wall of the left half of the spillway and the left box spillway. Multiple spots in both the right and left box spillways.

Action required for concrete components of the spillway: Engineer

Describe action required: Please retain a professional engineer experienced in dam inspections, design and construction to evaluate the concrete condition and make recommendations.

Erosion Control / Energy Dissipation

What type of erosion control structure is in place? Baffle Blocks, End Sill

Are there any issues with the outlet erosion control structure? None

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Gates / Valves

Does the spillway include a gate? No

Additional comments: The control tower has four gates/valves.

Photo 12 description: Left Grate/Weir Wall

Photo 13 description: Right Grate/Wier Wall

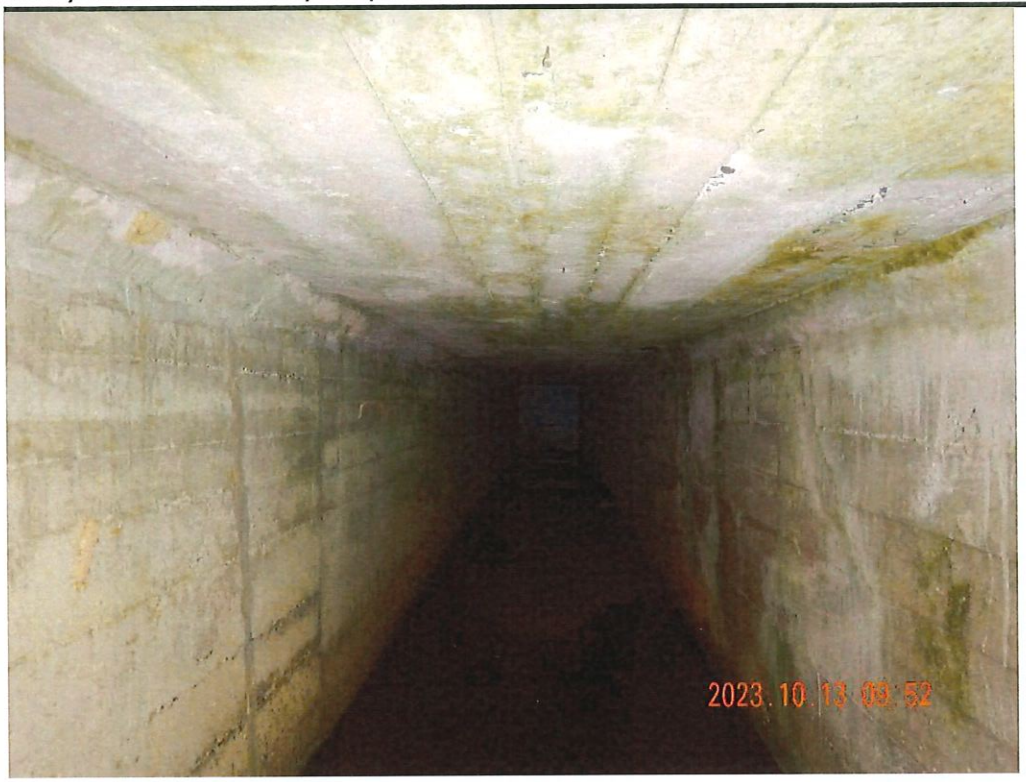

Photo 14 description: Interior Left Spillway

Photo 15 description: Interior Right Spillway

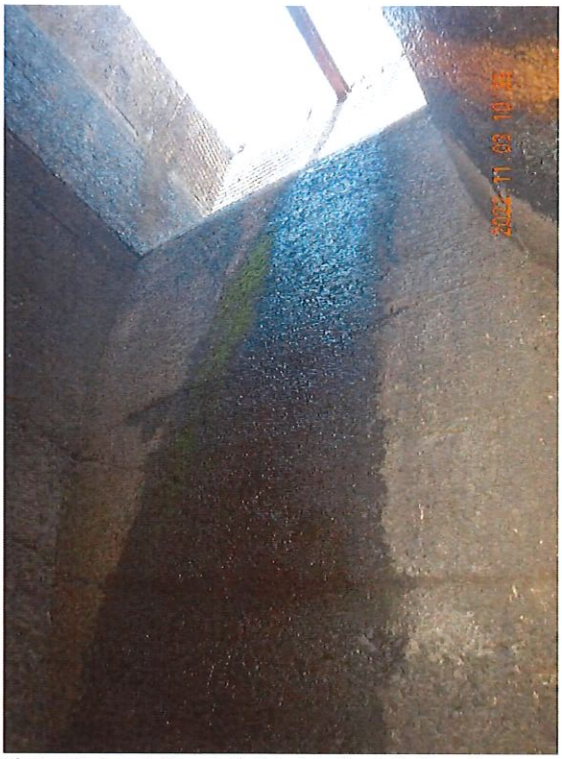

Photo 16 description: Left Side Interior Left Riser Box

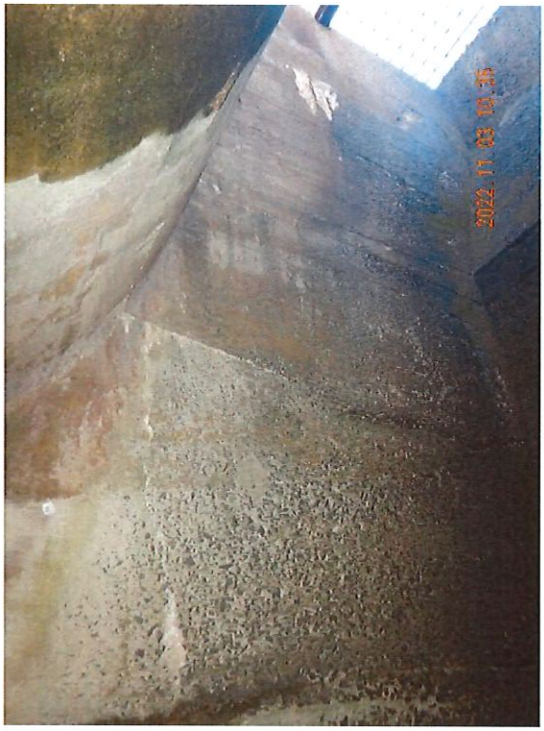

Photo 17 description: Right Side Interior Left Riser Box

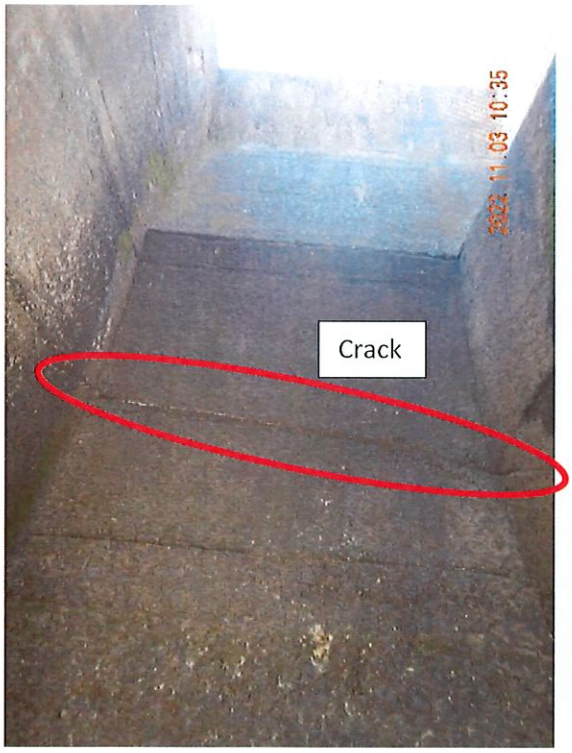

Photo 18 description: Front Side Interior Left Riser Box

Photo 19 description: Back Side Interior Left Riser Box

Photo 20 description: Transition Interior Left Spillway to Box Spillway

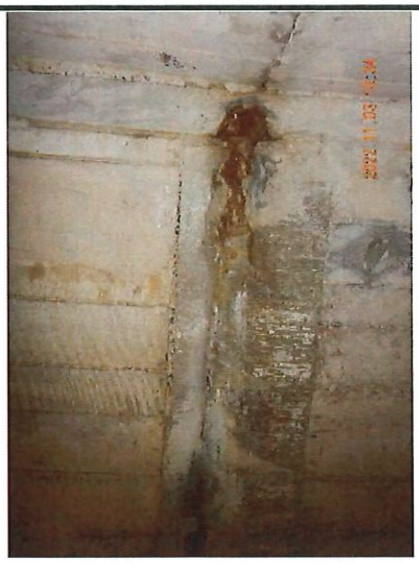

Photo 22 description: Seepage Point Left Side Interior Left Box Spillway

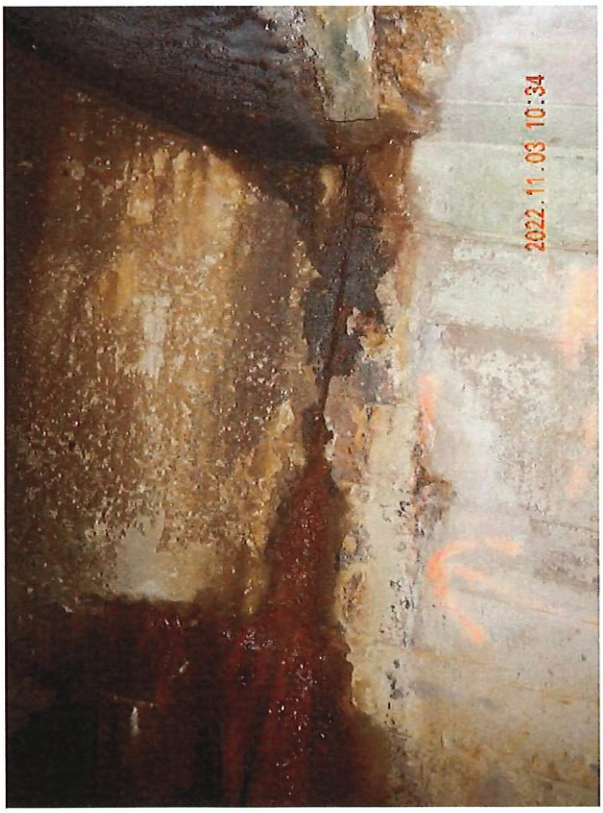

Photo 21 description: Seepage at Joint Between Left Riser Box and Left Box Spillway (Left Side)

Photo 23 description: Seepage and Broken Rebar near Joint Between Back Wall Left Riser Box and Left Box Spillway

Photo 24 description: Seepage Point Left Side Interior Left Box Spillway

Photo 25 description: Left Side Interior Right Riser Box

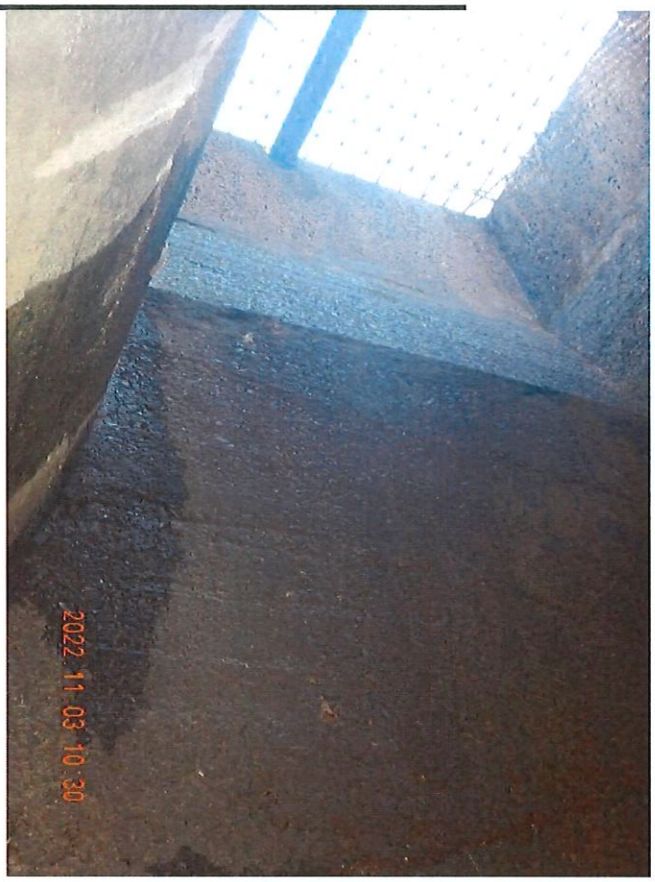

Photo 26 description: Right Side Interior Rightt Riser Box

Photo 27 description: Front Side Interior Right Riser Box

Photo 28 description: Transition Interior Right Spillway to Right Box Spillway

Photo 29 description: Transition Interior Right Spillway to Right Box Spillway

Photo 30 description: Seepage at Joint Between Right Riser Box and Left Box Spillway (Left Side)

Photo 31 description: Seepage at Joints Right Box Spillway (Right Side)

Photo 32 description: Seepage Point Right Box Spillway (Right Side)

Photo 33 description: Principal Spillway Outfall/Gabion Basket Endwall

Photo 34 description: Baffle Blocks and End Sill

AUXILIARY SPILLWAY

What type of spillway is present? Open Channel

What is the primary material used in the spillway? Earth

What issues are present with the auxiliary spillway? None

What type of erosion control structure is in place? None

Photo 35 description: Auxiliary Spillway Control Section

Photo 36 description: Auxiliary Spillway Exit Channel

APPURTENANT STRUCTURES

Appurtenant structures: Water Control Tower, Gates & Valves

What issues are present with the lake drain? Could Not Inspect, Unknown Operability

Action required for lake drain: Maintenance, Engineer

Describe action required: Please perform any routing maintenance of the valves and exercise operable valves at a minimum annually. Please retain a professional engineer experienced in dam inspections, design and construction to evaluate the water control tower and gates/valves condition and make recommendations.

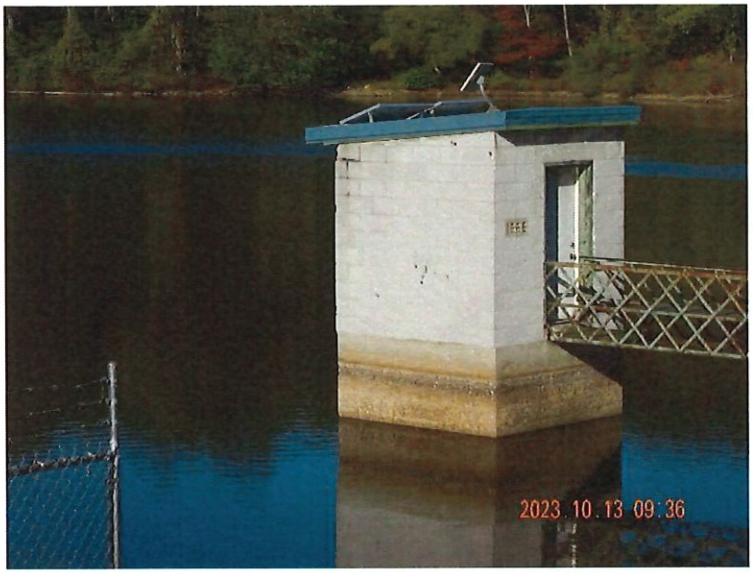

Photo 37 description: Control Tower Exterior

Photo 38 description: Interior Control Tower

GATES & VALVES

Does this dam include a lake drain? Yes

What issues are present with the lake drain? Could Not Inspect, Unknown Operability

Action required for lake drain: Engineer

Describe action required: Please retain a professional engineer experienced in dam inspections, design and construction to evaluate the lake drain condition and make recommendations.

OTHER

Warning signs, alarms, buoys: Warning sign on the gate blocking access to dam crest and on the safety fence at the weir wall.

Security features: There is a locked gate at entrance to the dam crest and the entrance of the walkway to the control tower.

Staff gage: No staff gage.

Photo 39 description: Warning Signs and Locked Gate at Access to the Dam Crest

Photo 40 description: Warning Sign on Safety Fence at Principal Spillway

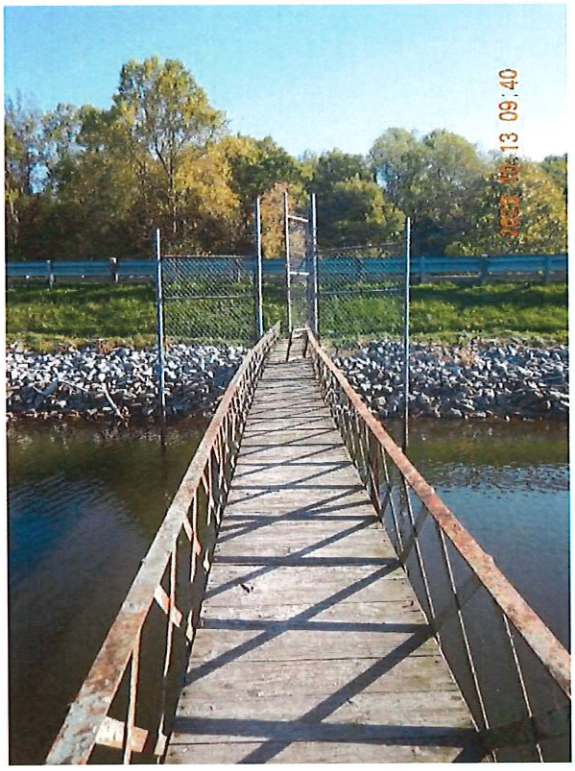

Photo 41 description: Locked Gate at Access Walkway to Intake Tower

DAM CONDITION

Overall dam condition: Fair

Overall inspection comments: Cracks/scaling/exposed rebar/surface erosion/seepage of concrete weir walls and box spillways, woody vegetation within 15 feet of the downstream toe of slope and outlet, an absence of a legible, reflective staff gage visible from a safe location, unknown operability of gates/valves, deterioration of the control tower and difficult access to the blow-off valve at the downstream slope were observations made during the inspection.