

DAM SAFETY INSPECTION REPORT



UPPER SHAKER LAKE DAM

FILE NUMBER: 1314-002

INSPECTED: MARCH 29, 2023

CUYAHOGA COUNTY

CLASS I



Dam Safety Legal Obligations and Responsibilities in Ohio

In accordance with Ohio Revised Code (ORC) Section 1521.062, the owners of dams must monitor, maintain, and operate their dams safely. Negligence of owners in fulfilling these responsibilities can lead to the development of extremely hazardous conditions to downstream residents and properties. In the event of a dam failure, dam owners can be subject to liability claims and potential criminal charges.

The Chief of the Division of Water Resources has the responsibility to ensure that human life, health, and property are protected from the failure of dams. Conducting periodic safety inspections and working with dam owners to maintain and improve the overall condition of Ohio dams are vital aspects of achieving this purpose.

Representatives of the Chief conducted this inspection to evaluate the condition of the dam and its appurtenances under authority of Ohio Revised Code Section 1521.062. This inspection does not take the place of the owner's responsibility for performing dam inspections, nor does it provide any guarantee of the safety of the dam.

In accordance with Ohio Administrative Code (OAC) Rule 1501:21-21-03, the owners of dams must implement all remedial measures listed in the enclosed report.

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REQUIRED REMEDIAL MEASURES

The requirements listed below are based on observations made during inspection, calculations performed, and requirements of the Ohio Administrative Code (OAC). A checklist noting all observations made during the inspection is included as an appendix of this report. References to right and left in this report are oriented as if you were standing on the dam crest, looking downstream.

ENGINEER REPAIRS AND INVESTIGATIONS

The owner must retain the services of a registered professional engineer to address the following items. Plans, specifications, investigative reports, and other supporting documentation, as necessary, must be submitted to the Division of Water Resources for review and approval prior to construction. **These items have been noted previously and the appropriate time period for completion has already been exceeded. The owner must complete these items immediately.** A record of all repairs should be included in the operation, maintenance, and inspection manual. Please refer to the fact sheets included in the Dam Safety Fact Sheet Booklet for additional information.

1. Provide comprehensive plans and specifications for reconstructing the entire dam or provide plans for decommissioning. See Discussion Item Nos. 1 and 2 for additional information.

OWNER REPAIRS AND MONITORING

The dam owner must address the items below as part of the required dam maintenance. The owner may perform the work or hire a contractor. The owner must implement all owner repairs and monitoring items within a timely manner. Repair activities should be documented in the Operation, Maintenance, and Inspection Manual (OMI). Please refer to the fact sheets included in the Dam Safety Fact Sheet Booklet for additional information.

The monitoring items in this section must also be incorporated in the OMI. Information in the OMI must include inspection frequency, method of assessing the condition, and documentation of observations. See the Owner Dam Safety Program section of this report for additional information regarding an OMI.

Owner Repairs

1. Remove saplings and brush from the toe area of the right downstream slope and from along masonry wall. Seed all disturbed areas to establish a proper grass cover. See the "Trees and Brush" fact sheet for additional information.
2. Replenish rock riprap to repair the eroded areas of the emergency spillway. See the "Open Channel Spillways (Earth and Rock)" and "Outlet Erosion Control Structures" fact sheets for additional information.

Monitoring Items

3. Monitor the emergency spillway for erosion during and after flood events. See the "Open Channel Spillways (Earth and Rock)" and "Outlet Erosion Control Structures" fact sheets for additional information.

4. Monitor the principal spillway for seepage when the pool level rises significantly during storm events. Monitoring should include checking the embankment above the spillway for sinkholes and inspecting the outlet area for the recurrence of seepage. See the "Seepage Through Earthen Dams" fact sheet for guidance in monitoring the seepage for additional information.
5. Monitor the principal spillway inlet area for obstructions. Remove debris as needed.

Resolving all Engineering Repair and Investigation items as well as Owner Repair items listed in the sections above makes a dam eligible to receive a 15% discount off the annual fee for the dam. The Engineering items must be resolved as directed in this report. The Owner Repair items may be resolved by submitting a description of the repairs and photographs. There are no partial discounts available.

OWNER DAM SAFETY PROGRAM

Assuring the safety of dams is a cooperative effort between owners, consultants and the Division of Water Resources - Dam Safety Program, with the most important role being that of the owner. The owners see the dam regularly and through their surveillance and monitoring, can detect changing and/or deteriorating conditions.

The scope of a particular owner's dam safety program should be commensurate with the size, type, and complexity of the owner's dam(s). There is no "one size fits all" dam safety program. At a minimum, the owner's dam safety program must include:

- A person (owner or owner's designated representative) responsible for dam safety (Dam Safety Officer) with the authority to maintain dam safety (clear designation of responsibility, oversight, and authority).
- Access to sufficient technical resources and expertise.
- A proactive and informed owner inspection and engineering evaluation program.
- Adequate on-site presence and/or remote monitoring capability.
- An approved Operation, Maintenance, and Inspection Manual that is kept up-to-date, requirements and recommendations followed, and proper records kept.
- An approved Emergency Action Plan that is kept up-to-date and is well coordinated with the local emergency management agencies.

OPERATION, MAINTENANCE, AND INSPECTION MANUAL (OMI)

A dam, like any other infrastructure, will change and deteriorate over time. Appurtenances such as gates and valves must be routinely exercised to ensure their operability. Inspection and monitoring of the dam identifies changing conditions and problems as they develop, and maintenance prevents minor problems from developing into major ones. Dam owners must have these procedures documented in an OMI.

1. Upper Shaker Lake Dam has an approved, up-to-date OMI on file with the Division of Water Resources.

EMERGENCY ACTION PLAN (EAP)

Despite efforts to provide sufficient structural integrity and to perform inspection and maintenance, dams can develop problems that can lead to failure. Early detection and appropriate response are crucial for maintaining the safety of the dam and downstream people and property. The ORC requires the owner to fully and promptly notify the Division of Water Resources of any condition which threatens the safety of the structure. A rapidly changing condition may be an indication of a potentially dangerous problem. The Division of Water Resources - Dam Safety Program can be contacted at 614/265-6731 during business hours or at 614/799-9538 after business hours. Dam owners must have emergency preparedness procedures documented in an EAP. All contact names and phone numbers in the EAP must be verified on an annual basis. Any revisions to the EAP must be submitted to the Division of Water Resources and the local county Emergency Management Agency (EMA).

1. Upper Shaker Lake Dam has an approved, up-to-date Emergency Action Plan (EAP) on file with the Division of Water Resources.

Having an approved OMI and EAP on file with Division of Water Resources makes a dam eligible to receive a 10% discount off the annual fee charged to the dam.


DISCUSSION ITEMS

1. Due the continued deterioration and extent of problems with the dam, if a reconstruction remediation option is chosen, it must be comprehensive and include the following: removal of the principal and temporary emergency spillways; construction of a new spillway(s) to pass the required design flood; leveling of the dam crest; installation of a lake drain; reconstruction/improvement of the embankment to meet appropriate stability criteria and to control seepage; rehabilitation or abandonment of the piezometers; and repair of the upstream slope. The conditionally approved 2018 repair plans and specifications for Upper Shaker Lake Dam are no longer acceptable and if completed would not bring the dam into compliance.


In lieu of comprehensive reconstruction remediation of the dam, the dam may be decommissioned. See the "Remediation Alternatives" fact sheet for additional information.

2. Interim risk reduction measures have been implemented at the dam and include lowering the principal spillway inlet, slip-lining the discharge conduit, and constructing a grouted, rock riprap breach channel. These measures have significantly improved the safety of the dam and appear to be performing well. However, they are temporary improvements and will need to be removed if the dam is rehabilitated.

Representatives of the Chief of the Division of Water Resources conducted this inspection to evaluate the condition of the dam and its appurtenances. The owner(s) of the dam must implement all remedial measures listed in the report.




Keith Banachowski, P.E. May 1, 2023 Date
Project Manager
Dam Safety Program
Division of Water Resources



Ryan Heskett, E.I. 4/14/2023 Date
Project Engineer
Dam Safety Program
Division of Water Resources

This inspection was performed pursuant to the authority granted to the Chief of the Division of Water Resources in ORC Section 1521.062.



Mia Kannik, P.E. 5/1/2023 Date
Program Manager
On behalf of Dena C. Barnhouse, P.E., Chief
Division of Water Resources

SITE MAP



PHOTOGRAPHS



1. Overview from the right end of dam.



2. Grassed portion of the right downstream slope; notice the vegetation encroaching upon the toe area.



3. Upstream slope looking toward the principal spillway. Notice the tall brush and saplings along the masonry wall (former shoreline).



4. Upstream slope looking toward the right end. Notice the tall brush and saplings along the masonry wall (former shoreline). The arrow points to a piezometer.



5. Portion of the right downstream slope covered with rock riprap.



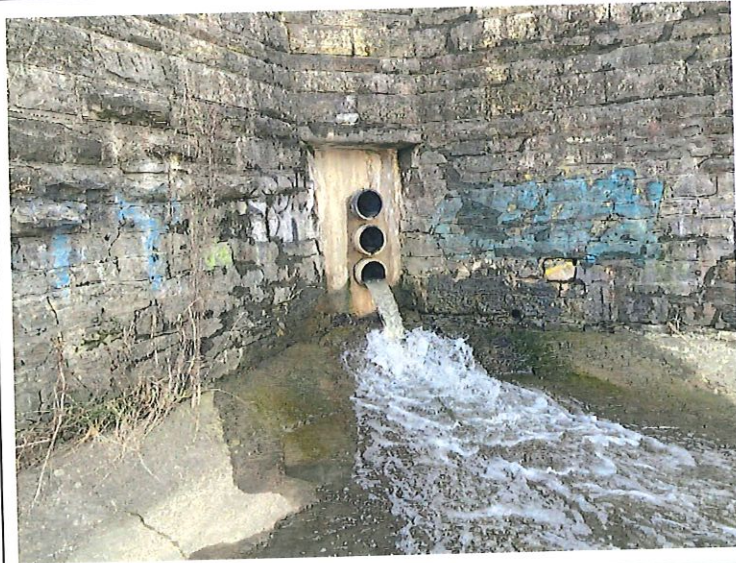
6. Principal spillway inlet area. The dotted line indicates the former normal pool level. The arrows point to the trashrack/debris collection system to keep the low-flow inlet clear.



7. Interior of the principal spillway riser; no leakage noted and free of obstructions.



8. Downstream slope to the left of the principal spillway; arrow points to a piezometer.



9. Principal spillway outlet.



10. Left sidewall at the principal spillway outlet; seepage has been reduced compared to previous observations (see Photograph No. 11)



11. Photograph from April 18, 2018; iron staining is indicative of seepage.



12. Overview of the area where the principal spillway and emergency spillway combine to flow into the receiving stream.



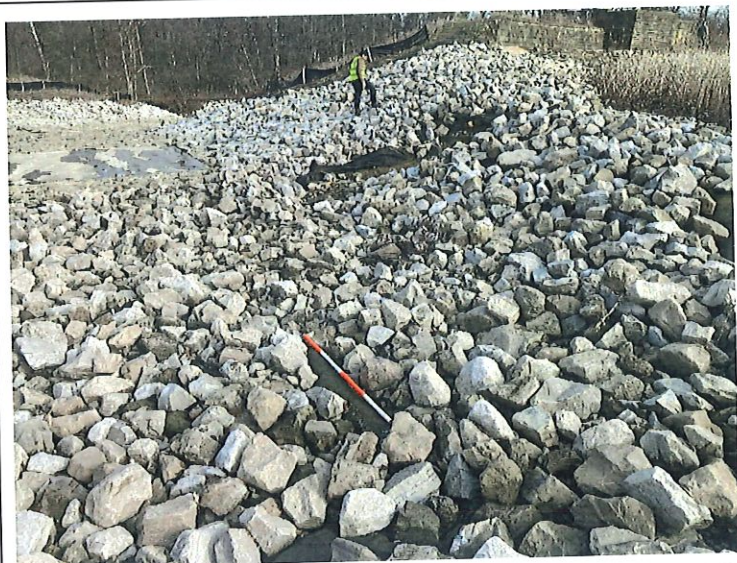
13. Emergency spillway outlet; arrows point to the underdrain outlets; left (referenced looking downstream) had trickle flow, and the right was dry.



14. Emergency spillway channel inlet area; arrows point to eroded areas.



15. Close up an eroded area.



16. Area where rock riprap had been eroded and the underlying filter fabric was exposed.



17. Overview of the emergency spillway channel.



18. Overview of the emergency spillway channel.

CLASSIFICATION

Upper Shaker Lake Dam

		Class
Height	30.0 ft	III
Storage	155.0 ac-ft	III
Potential Downstream Hazard		I
Final Class:		I

The classification of a dam is based on three factors:

- the dam's height,
- storage capacity, and
- potential downstream hazard.

The height of the dam is the vertical distance from the top of dam (crest) elevation to the lowest point along the downstream toe. The storage capacity is the total volume of water that the dam can impound at the top of dam (crest) elevation. The potential downstream hazard consists of roads, buildings, homes, and other structures that would be damaged

HEIGHT AND STORAGE CRITERIA		
Class	Height (ft)	Storage (ac-ft)
I	> 60	> 5000
II	> 40	> 500
III	> 25	> 50
IV	≤ 25	≤ 50
Exempt	< 10	and < 50
Exempt	< 6	or < 15

in the event of a dam failure. Potential for loss of life is also evaluated. Various dam failure scenarios must be considered, and they include failures when the dam is at normal pool level and failures during significant flood events. Each of the three factors is evaluated, and the final classification of the dam is based on the highest individual factor. Class I is the highest and Class IV is the lowest. The classification of a dam can change based on future development or other changes along the downstream channel or from changes made to the dam.

POTENTIAL DOWNSTREAM HAZARD

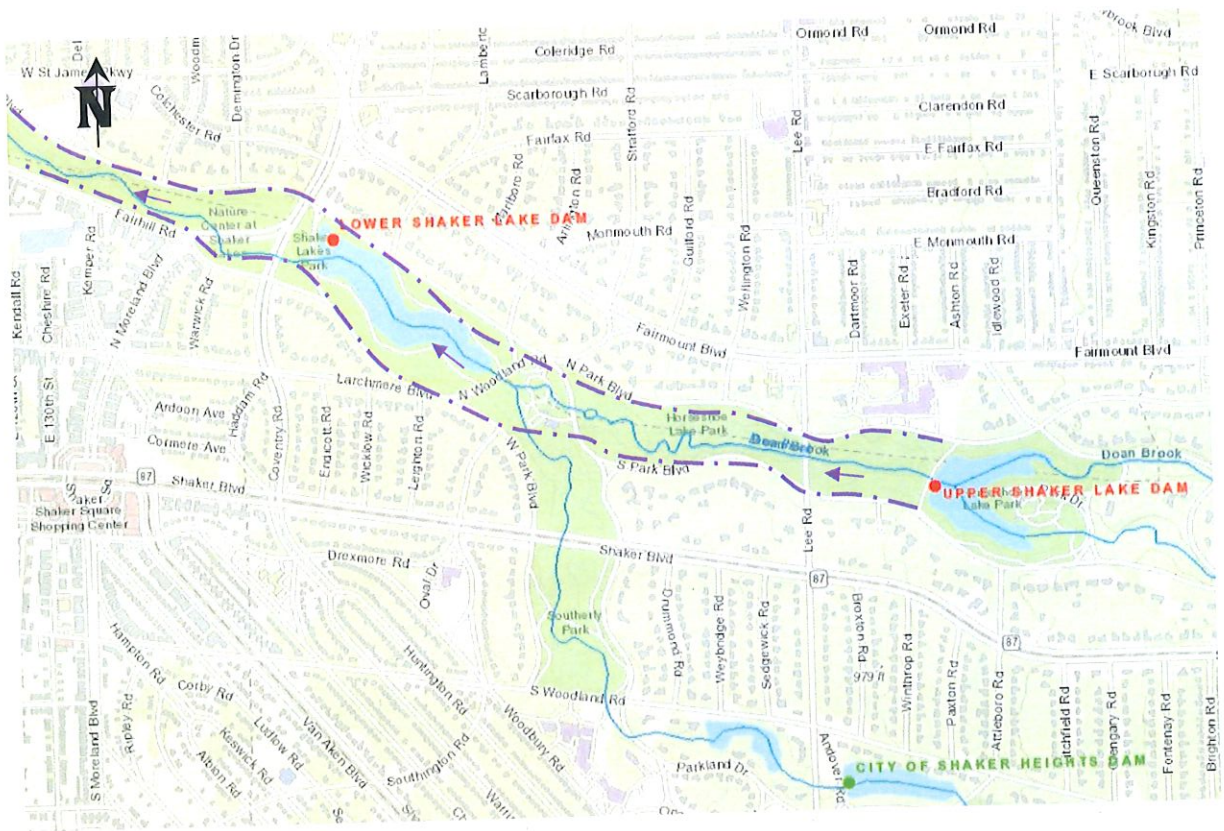
The following table shows the structures such as homes, businesses, roads, etc. that have been identified as part of the potential downstream hazard investigation. The letter in the table corresponds to the structure on the aerial photograph. The table is intended to establish or verify the appropriate classification in accordance with the OAC. It does not necessarily show all potential hazards or the full extent of inundation. Furthermore, in the event of dam failure, property owners in addition to those identified in the table should be made aware of the situation. This potential downstream hazard investigation is based dam failure inundation mapping from the approved emergency action plan for the dam.

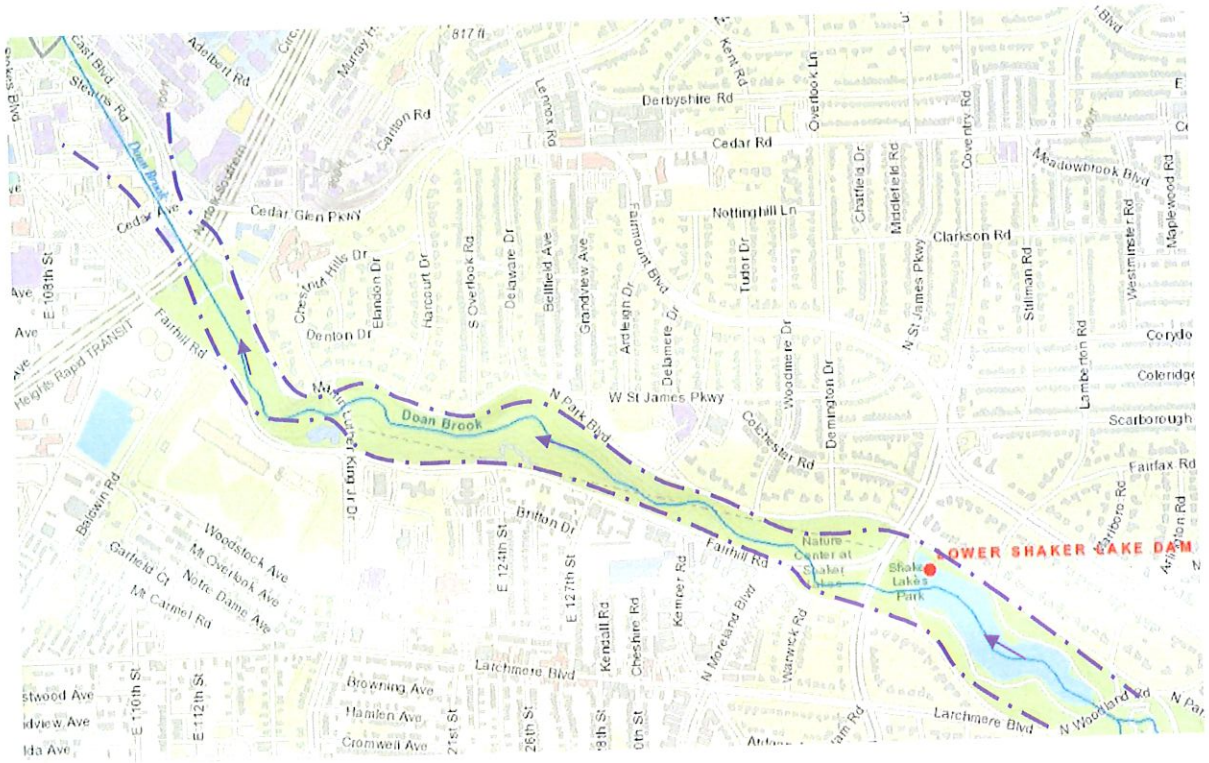
Upper Shaker Lake Dam Potential Downstream Hazard Classification

Hazard Class:	I	II					III		IV	—	Distance (ft)			
Potential Hazard	Probable loss of human life.	Loss of public water supply or wastewater treatment facility, release of health hazardous waste	Flooding of structure or high-value property	Damage to high-value or Class I, II, III dam or levee	Damage to major road (US or state route), disruption of only access to residential or critical facility area	Damage to railroad or public utility	Damage to rural building, not otherwise high-valued property, or Class IV dam or levee	Damage to local road (county and township)	Loss restricted mainly to the dam or agricultural, rural land	No hazard to structure noted	No hazard assessment; further investigation needed	Downstream - Dam to affected structure	Vertical - Streambed to base of affected structure	Horizontal - Stream to affected structure
Various	x		x	x	x	x	x	x			Various --	-----	---->	

Downstream Map

See approved EAP for detailed mapping.





FLOOD CAPACITY

A dam must be able to safely pass severe flood events. A dam uses a combination of spillway discharge capacity and the reservoir's ability to store floodwater (storage capacity), known as discharge/storage capacity, to prevent floodwater from overtopping the embankment crest and destabilizing the dam. When a dam has inadequate discharge/storage capacity, floodwater will overtop and most likely erode the embankment. This can cause severe damage and dam failure.

As part of this inspection, the Division of Water Resources did not thoroughly investigate the ability of this dam to safely pass the required design flood. However, in 2009, a consultant performed hydrologic and hydraulic calculations to estimate the size of the design flood and the total spillway discharge capacity of the dam based on the former configuration and normal pool. These calculations combined with the reservoir storage capacity were used in the flood routings to estimate the maximum water surface elevation in the reservoir for various flood events (see Table).

Upper Shaker Lake Dam is a Class I dam; therefore, in accordance with OAC Rule 1501:21-13-02, the required design flood is 100% of the Probable Maximum Flood (PMF) or the critical flood. This dam and its spillway system must safely pass the design flood without overtopping the embankment crest. Flood routing calculations indicate that the dam can pass less than 12% of the PMF; Upper Shaker Lake Dam does not appear to be able to safely pass the design flood. It should be noted that the recent modifications (lowering the pool level and installing an emergency spillway) have increased the flood capacity to about 17% PMF.

Flood Routing Summary

Flood Event	Maximum Inflow (cubic feet per second)	Maximum WSEL ¹ (feet)	Overtopping	
			Depth ² (feet)	Duration (hours)
PMF	8743	984.93	2.73	5.5
75% PMF	6557	984.40	2.20	4.9
50% PMF	4371	983.81	1.61	4.5
25% PMF	2185	983.03	0.83	3.0
12% PMF ³	1049	982.50	0.30	1.0

1. WSEL – water surface elevation, in feet

2. A negative number indicates that the dam does not overtop and represents the elevation difference between the Maximum WSEL and the Top of Dam Elevation (freeboard)

3. 12% PMF is similar to the 100-year flood. The 100-year flood event has a 1% chance of occurring in any given year. This is only an approximation.

Dam and Spillway Elevations

Top of Dam	982.2
Normal Pool (former)	977.5

HISTORY

Upper Shaker Lake Dam

1852	Dam constructed.
1977	Dam Safety Inspection by the Division of Water Resources.
1979	USACE Phase I Inspection
1985	Dam Safety Inspection by the Division of Water Resources.
1988	Removed trees and brush from the masonry wall on upstream slope; repaired undermined areas of wall and pressure grouted.
1995	Dam Safety Inspection by the Division of Water Resources.
1996	Dam Safety Inspection by the Division of Water Resources.
2009	Hydrology and Hydraulics Study submitted and approved.
2009	Emergency Preparedness Plan submitted and approved.
April 29, 2009	Dam Safety Inspection by the Division of Water Resources.
May 29, 2012	Plans and specifications approved to install roller compacted concrete; plans were not implemented.
2013	Interior of principal spillway conduit reinforced with steel I-beams for stability issues with the ceiling.
July 25, 2014	The embankment overtopped during a small flood and displaced rock riprap on the downstream slope. The riprap was replaced after the flood.
Sep. 30, 2014	Dam Safety Inspection by the Division of Water Resources.
2016 - 2018	Basis of Design Report and Preliminary Engineering Report and Draft Plans and Specifications submitted; conditional approval provided. These plans are no longer acceptable.
Apr. 18, 2018	Dam Safety Inspection by the Division of Water Resources.
2018	During the April 18 inspection, a sinkhole was discovered, and the pool level was lowered 3 feet in response.
2019	Plans and specifications for remediation submitted; comments provided.
2021	Interim Risk Reduction Measures Implemented: lowered principal spillway to 970.9 feet (6.6 feet below normal pool); slip-lined conduit with (3) 14-inch HDPE pipes and grouted masonry conduit; and, installed an grouted-riprap open channel emergency spillway at elevation 972 feet.
July 25, 2022	EAP and OMI approved.
March 29, 2023	Dam Safety Inspection by the Division of Water Resources.

APPENDIX - LOCATION MAP, INVENTORY, INSPECTION CHECKLIST, OTHER AGENCIES

Dam Inventory Sheet

Name: UPPER SHAKER LAKE DAM **File No:** 1314-002
National #: OH00353
Permit No.: N/A
Reservoir: HORSESHOE LAKE **Class (Ht-Vol):** I (III - III)

Owner Information

Owner: Multiple Owners - 1314-002 **Owner Type:** Public, Local
Address: **Multi-Dams:** -
Parcel No.:
City: **State:** **Zip:**
Contact: Patricia Speese (Shaker Heights) **Phone No.:** 216-491-1495

Location Information

County: Cuyahoga **Latitude Deg.:** 41 **Min.:** 28 **Sec.:** 59
Township: City Of Shaker Heights **Longitude Deg.:** 81 **Min.:** 33 **Sec.:** 38
Stream: Doan Brook **USGS Basin No.:** 04110003
USGS Quad.: Shaker Heights

Design/Construction Information

Designed By: North Union Shaker Colony
Constructed By: North Union Shaker Colony
Completed: 1852 **Plan Available:** YES **At:** REPAIRS PLANS AT ODNR
Failure/Incident/Breach:

Structure Information

Purpose: Recreation, Public
Type of Impound.: Dam And Spillway
Type of Structure: Earthfill
Drainage Area (sq. miles): 1.89 **or (acres):** 1210
Embankment Data
Length (ft): 615 **Upstream Slope:** 2H:1V
Height (ft): 30 **Downstream Slope:** 3.5H:1V
Top Width (ft): 14 **Volume of Fill (cub. yds.):** 50000

Spillway Outlet Works Data
Lake Drain: CAST IRON PIPE OF UNKNOWN SIZE (DEFUNCT)
Principal: NOTCHED STONE-MASONRY DROP INLET W/ (3) 14-IN HDPE PIPES IN GROUTED 2.5-
Emergency: TEMP 20-FT-W GROUTED RR CHANNEL, 3:1 SS
Maximum Spillway Discharge (cfs): 1400 **Design Flood:** 1.0 **Flood Capacity:** 0.17

Dam Reservoir Data	Elevation (ft-MSL)*	Area (acres)	Storage (acre-feet)
Top of Dam:	982.2	23	155
Emergency Spillway:	972		
Principal Spillway:	977.5	11.4	76
Streambed:	952.6		

*Elevations are not necessarily related to a USGS benchmark

Inspection Information

Inspection	3/29/2023 KRB	Phase I: 10/25/1979
History:	4/18/2018 MJH	Other Visits: 3/29/95
	9/30/2014 DCB	
	4/29/2009 TMG	Inspection Year: B
	6/21/2004 DMR	
	5/21/1996 TML	
	9/17/1985	
11/29/1977	CLEV	

Operation Information/Remarks

Downstream slope has layer of rock riprap.

Emergency Action Plan: Approved **Format:** ICODS **OMI:** Approved
Last Entry: 3/24/2023

Dam Safety Inspection Checklist

Cuyahoga County

Name of Dam: Upper Shaker Lake Dam
 Date of Inspection: March 29, 2023
 File Number: 1314-002
 Class: I Design Flood: 1.0 Flood Capacity: 0.17
 Haz.: I, Height: III, Volume: III

Required Action
 None Mon. Maint. Eng.

Interview with Owner (at the site):

Owner/Representative present: (Yes, No) Name(s): Chuck Orłowski, Joe Ciuni, Tony Ferrone
 Owner's Name(s): Multiple Owners - 1314-002 We also met via Teams prior to the inspection
 Address: _____
 City: _____ State: _____ Zip (+4): _____
 Contact Person: Patricia Speese (Shaker Heights) Telephone: 216-491-1495
 Email Address: _____
 Purpose of dam: Recreation, Public

Owner Dam Safety Program

Emergency Action Plan Approved ICODS Up-to-date? (yes, ~~no~~)
 EAP (document): _____
 Downstream development: None

Operation, Maintenance, and Inspection Approved Acceptable Up-to-date? (yes, ~~no~~)
 OMI (document): _____
 All drains operable? (~~yes~~, no) Deteriorated and significant sediment; lake has been lowered 6.6 feet.

Normal rate of drawdown: N/A Accessibility for operation: N/A
Maintenance
 Frequency of mowing: Routine for remaining embankment
 Other maintenance: Plan to repair eroded area on the inlet area of the principal spillway

Inspection
 Frequency and thoroughness of day-to-day & routine inspections: Routine visual for WSEL and flow through breach channel
 Problems found during inspections: Erosion in breach channel

Field Information
 Pool Elevation (during inspection): +0.2 ft to notch / 6.4 foot below former NP Time: 10:00 am (a.m. p.m.)
 Site Conditions (temp., weather, ground moisture): 45 degrees, partly cloudy, dry
 Inspection Party: KRB, RGH

Confirm the Following: Dam Height (ft): 30 NP Area (ac): 11.4

Reference Information

City of Cleveland owns the dam; City of Shaker Heights (216-491-1495, Patricia Speese) and City of Cleveland Heights (216-291-3737, Carl Czaga) lease the property and take responsibility for managing the dam; copy City of Cleveland on correspondence: Dept of Water Pollution Control, 12302 Kirby Avenue, Cleveland, OH, 44108-1617, Ramona Lowery, Commissioner
 Patricia Speese
 Impound. Type: Dam And Spillway
 Structure Type: Earthfill
 Township: City Of Shaker Heights
 Stream: Doan Brook
 Designed By: North Union Shaker Colony
 Constr. By: North Union Shaker Colony
 Year Compl.: 1852 Plans Avail.? Yes At: Repairs Plans At Odnr
 Fail./Incid.:

Downstream Slope Has Layer Of Rock Riprap.				
	Elev.	Area (ac)	Stor. (ac-ft)	(in.)
TOD:	982.2	23	155	0.8
Em. S/w:	972			
Prin. S/w:	977.5	11.4	76	
Strmbd:	952.6			
Basin (ac):	1210			

Required Action

Upstream Slope

Gradient: 2H:1V

Typical Problems: shoreline erosion, trees & brush, surface erosion, ruts, rodent burrows, earth slides, cracks

None	Monitor	Repair	Engineer
X			
			X
		X	

- Left end of masonry wall was removed for breach channel
- Remaining masonry wall is unchanged; previously found to require engineering repair
- Slope is becoming overgrown (mostly weeds and brush)

Crest

Width (ft): 14 Length (ft): 615 Total Freeboard (ft): 4.70

Typical Problems: low areas, trees & brush, surface erosion, ruts, cracks

None	Mon.	Rep.	Eng.
X			
			X
			X

- Walkway and grass cover; well maintained; no cracking or signs of instability
- Previous inspections noted low areas at ends; needs to be addressed as part of flood capacity
- Sinkholes had been previously noted in the area above the principal spillway. This area was covered with a concrete pad and enclosed by a short masonry parapet wall. The concrete pad had been replaced recently; no evidence of sinkholes was noted; the parapet wall continues to deteriorate.

Downstream Slope

Gradient: 3.5H:1V

Typical Problems: trees & brush, surface erosion, ruts, rodent burrows, earth slides, cracks, seepage

None	Mon.	Rep.	Eng.
X			
		X	
			X
			X
	X		

- Right side: good grass cover and rock riprap protection - no problems with erosion
- Right toe area (grassed portion) had brush encroaching onto toe (need to clear another ~25 feet downstream)
- Joe reported that there had been a wet on the right toe area; now covered with rock riprap; no evidence of continued seepage currently, but needs to be addressed
- There were two piezometers (left and right) near the crest; did not appear to be working; need to maintain or abandon
- Seepage previously noted at left downstream end of principal spillway outlet wall not observed, indicating that the lowered pool and grouted conduit have improved this hazardous condition

Principal Spillway

Notched Stone-masonry Drop Inlet W/ (3) 14-in Hdpe Pipes In Grouted 2.5-ft X 6.25-ft Co

Typical Problems: Inlet obstructed, unsatisfactory trashrack/anti-vortex plate, material deterioration, misalignment, open joints, outlet erosion, outlet overgrown, undermining

None	Mon.	Rep.	Eng.
			X
X			
	X		

- Overall, the entire spillway needs to be replaced
- The spillway has been modified to lower the pool level and diminish the potential for erosion along the discharge conduit. No problems with the recent modifications were noted. All discharge pipes were unobstructed
- The modified spillway should continue to be monitored for the recurrence of seepage and clogging, especially during flood events

Sufficient measurements to perform hydraulics (dimensions, riser depth, outlet elevation)

Agencies Associated with Dams and Lakes

The Division of Soil & Water Resources has the responsibility to ensure that human life, health, and property are protected from dam failures. The division provides fact sheets and dam safety information for dam owners on the division's web site: www.dnr.state.oh/water. Other governmental agencies are involved with the lakes and streams associated with dams, but have other responsibilities. Listed below are several relevant agencies that dam owners may be interested in contacting.

County Emergency Management Agency



County Emergency Management Agencies (EMAs) serve the public in disaster preparedness, public safety, and emergency management at the county level. County EMAs are responsible for coordinating relief efforts related to manmade and natural disasters. In the case of a dam emergency, the County EMA is one of the dam owner's first contacts. Telephone: 216-443-5700
State Web Site: <http://ema.ohio.gov/index.aspx>



Soil & Water Conservation District

County soil and water conservation districts (SWCDs) serve communities by providing assistance to urban and agricultural land users. SWCDs specialize in soil erosion prevention and water management. Some of services offered by county SWCD offices include survey and design of grassed waterways, erosion control structures, surface and subsurface drainage, farm ponds, and livestock waste management facilities. SWCDs also sponsor a number of information and education programs. In addition to these services, SWCDs may utilize assistance from the USDA Natural Resources Conservation Service (NRCS) for some technical matters. http://www.dnr.state.oh.us/H_Nav2/OFFICESWCDSDistrictOffices/tabid/9093/Default.aspx
216-524-6580 - Telephone

Natural Resources Conservation Service



Since 1935, the Natural Resources Conservation Service (originally called the Soil Conservation Service) has provided leadership in a partnership effort to help America's private landowners and managers conserve their soil, water, and other natural resources. NRCS employees provide technical assistance based on sound science and suited to a customer's specific needs. NRCS provides financial assistance for many conservation activities. Web Site: <http://www.nrcs.usda.gov/>

Division of Wildlife



The Division of Wildlife within the Ohio Department of Natural Resources manages fish and wildlife of the state. The division offers assistance in stream improvement and pollution investigations and provides fishery information and publications on pond stocking. Information regarding pest and rodent control can be obtained by visiting the division website or by contacting the regional office. The Division of Wildlife should be contacted before starting any construction activity where loss of aquatic life is anticipated. 330-644-2293 - District Office 3
<http://ohiodnr.com/Home/ContactUs/tabid/18270/Default.aspx> - Web Site

Ohio Environmental Protection Agency



The Ohio Environmental Protection Agency (EPA) establishes environmental guidance and enforcement standards for the state. In particular, the Division of Surface Water provides assistance for matters pertaining to rivers, lakes, and streams in Ohio. The Division of Surface Water can provide information and assistance in developing best management practices for the control of point and non-point pollution sources and spills. Suspected pollution spills can be reported directly by using the Ohio EPA Spill Hotline at 1-800-282-9378. District Office Northeast: 330-963-1200
State Web Site: <http://www.epa.state.oh.us/>

OSU Extension



The Ohio State University (OSU) Extension utilizes knowledge and research developed by the Ohio Agricultural Research and Development Center, Ohio State, and other land-grant universities to assist communities, businesses, and individuals. In addition to a wide variety of community leadership and agricultural services for all ages, county OSU Extension offices offer information and assistance in agricultural water resource conservation and management, farm pond management, and safety, Ohio hydrologic cycles and non-point source pollution management. Information regarding dry hydrant fire protection and legal liabilities associated with farm ponds in Ohio can be found on the extension website. 330-263-3831 - Extension Region: North East
<http://extension.osu.edu/locate-an-office> - Web Site

Emergency Spillway

- Temp 20-ft-w Grouted Rr Channel, 3:1 Ss
- Freeboard (to normal pool, feet) -5.50

Typical Problems: Flowpath obstructed, material deterioration, erosion, misalignment, overgrown, undermining

- An eroded area about 4 feet deep, and 6 feet in diameter was located about 15 feet upstream of the grouted rock riprap on the right side of the inlet area; there was also exposed filter fabric in this area
- The overall channel was in good condition
- There was a trickle flow from the left underdrain outlet and the right underdrain outlet was dry

Required Action			
None	Monitor	Repair	Engineer
		X	
X			
X			

- Sufficient measurements to perform hydraulics (dimensions, breadth, side slopes)

Lake Drain

- Cast Iron Pipe Of Unknown Size (defunct)

Typical Problems: Poor operating access, inoperable, deteriorated/missing components, outlet erosion

- Not functional; dam remediation will need a lake drain

None	Mon.	Rep.	Eng.
			X

Other

None	Mon.	Rep.	Eng.

- All Field Data Gathered (inspector's initials): KRB

Site Sketch

See Report

- Investigate Downstream Hazard