

DAM SAFETY INSPECTION REPORT



OBERLIN WATERWORKS UPGROUND NO. 1&2

FILE NUMBER: 1221-018

INSPECTED: SEPTEMBER 18, 2018

LORAIN COUNTY

CLASS II



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 exterior 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 exterior.

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. The owner must complete these items and implement all engineered plans for improvement within 5 years unless otherwise stated. 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. In accordance with OAC Rule 1501:21-13-03 (D), every upground reservoir shall have an overflow or other device to preclude overfilling of the reservoir during normal filling operation. Prepare plans and specifications to install an overflow or other device. See Discussion Item #1 included in this section for additional information. **This item has been noted previously and the appropriate time period for completion has already been exceeded. The owner must complete this item immediately.**
2. The embankment crest alignment must be uniform. Perform a survey of the entire embankment and appurtenant structures, including existing and abandoned conduits and drains and, as necessary, prepare plans and specifications for the correction of any problems. The survey must include topographic contours of the entire embankment. Submit the completed survey to the Division. **This item has been noted previously and the appropriate time period for completion has already been exceeded. The owner must complete this item immediately.**
3. In accordance with OAC Rule 1501:21-13-07, the maximum operating pool must be lowered and/or a request for a freeboard variance with supporting justification must be submitted to the division. Additionally, the reservoir pool level must be monitored weekly until the pool is lowered below the maximum operating pool level. This item should be completed in coordination with Item #1 above. See Discussion Item #2 of this section for additional information.
4. The unused and abandoned piping must be removed or properly abandoned. Prepare plans and specifications for removal or abandonment. The condition of the unused and abandoned piping must be monitored quarterly until repairs can be made. See Discussion Item #4 included in this section for additional information.
5. Seepage from the dam must be controlled to prevent stability and maintenance problems. Investigate the sudden drop in pool level in Reservoir No. 2 and determine the cause. As necessary, prepare plans and specifications for the collection, control, and/or monitoring of the seepage. Until repairs can be made, the pool level must be monitored weekly. See the "Seepage Through Earthen Dams" fact sheet for additional information.

6. This dam must have a device to permit draining of the reservoir within a reasonable period of time in accordance with OAC Rule 1501:21-13-06. Prepare plans and specifications for the installation of such a device. An alternate plan may be considered in lieu of installing a lake drain device. However, the alternate plans must be detailed in an Operation, Maintenance, and Inspection manual for this dam. Contact the Division of Water Resources for further discussion.
7. This dam must have a dam failure inundation study and map included in an Emergency Action Plan (EAP) in accordance with OAC Rule 1501:21-21-04. A registered professional engineer must prepare the inundation map and Section IV (Emergency Detection, Evaluation, and Classification) of the EAP. It is recommended that your engineer contact the Division of Water Resources prior to undertaking the engineering study for the inundation map. The inundation study and supporting calculations, including computer modeling, must be submitted to the Division of Water Resources for review and approval. See the additional information in the Owner Dam Safety Program section of this report for additional information. See Discussion Item #5 included in this section 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. 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 the trees and brush from the entire embankment. Seed all disturbed areas to establish a proper grass cover. See the "Trees and Brush" fact sheet for additional information.
2. Install a staff gauge to facilitate accurate monitoring of the pool level. Please note that the graduations should extend below the normal pool level to allow monitoring during drawdowns. See Discussion Item #3 included in this section for additional information.
3. Seed the bare areas on the embankment to establish a proper grass cover. See the "Ground Cover" fact sheet for additional information.
4. Repair the erosion on the crest and interior slopes. See the "Ground Cover" fact sheet for additional information.
5. Repair the rodent burrows on the entire embankment. See the "Rodent Control" fact sheet for additional information.
6. Repair the footpaths on the crest. See the "Ground Cover" fact sheet for additional information.

7. Remove the obstructions from the emergency overflow catch basin.

Monitoring Items

8. Monitor the wet area on the southern exterior toe monthly for any signs of increased flow, muddy flow, or instability on or adjacent to the embankment. See the "Seepage Through Earthen Dams" fact sheet for guidance in monitoring the wet area and for additional information. Please note that repairs may be needed if this problem worsens.

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. Oberlin Waterworks Upground No. 1&2 does not have an OMI on file. Prepare an OMI and submit for approval. Guidelines for the preparation of this document can be found online at: <http://water.ohiodnr.gov/safety/dam-safety#ADD>.

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. Oberlin Waterworks Upground No. 1&2 does not have an approved Emergency Action Plan (EAP). Prepare an EAP and submit for approval. A registered professional engineer must prepare a dam failure inundation map and Section IV (Emergency Detection, Evaluation, and Classification) of the EAP. Guidelines for the preparation of this document can be found online at: <http://water.ohiodnr.gov/safety/dam-safety#ADD>. The fillable EAP is not appropriate for Oberlin Waterworks Upground No. 1&2 because of its downstream hazard potential.

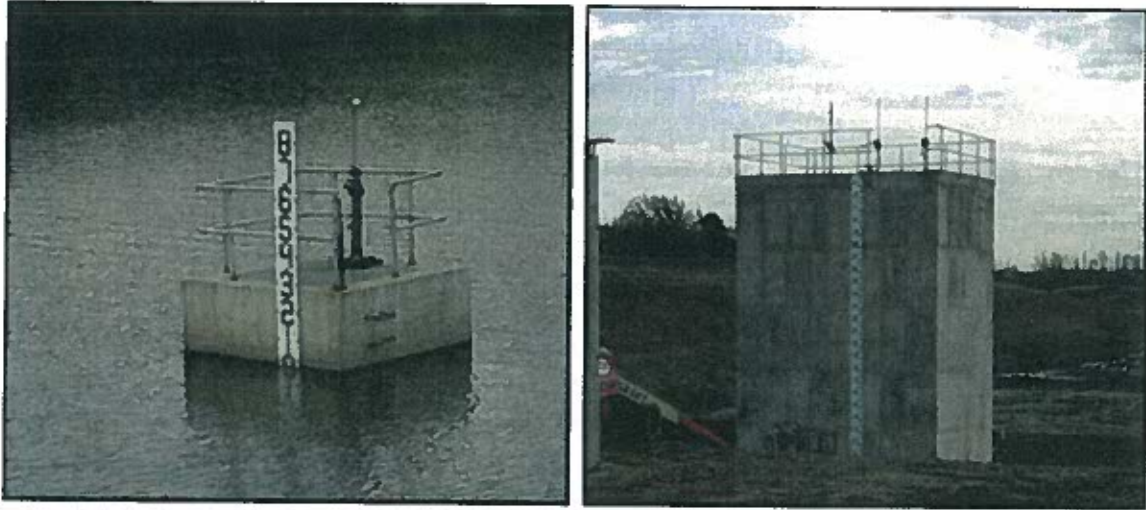
Having an approved OMI and EAP on file with Division of Water Resources makes a dam eligible to receive a 10% discount off the annual fee charged to the dam.

DISCUSSION ITEMS

1. The elevation of an overflow device must be no more than 0.5 foot above the actual maximum operating pool level of the reservoir. Both reservoirs must have an overflow device. There is reportedly a 6-inch transfer pipe with valve in the common embankment between the two reservoirs; however, the valve must be removed or permanently disabled in the open position to allow for Reservoir No. 2 to overflow into Reservoir No. 1. If a device other than an overflow (e.g., an auto-shutoff for the inflow pumps) is used to preclude overfilling of the reservoir then the device must prevent the reservoir from rising 0.5 foot above the actual maximum operating pool level. Please note that in accordance with OAC Rule 1501:21-13-07, Class II upground reservoirs must have at least 5 feet of freeboard above the actual maximum operating pool level. See the "Freeboard and Overflow Protection" section for additional information.
2. In accordance with OAC Rule 1501:21-13-07, the minimum elevation of the crest of a Class II upground reservoir shall be at least 5 feet higher than the elevation of the actual maximum operating pool level unless otherwise approved by the Chief. A written request for a variance from this rule may be made to the chief if adequate justification is provided. The minimum

freeboard allowed under this variance would be not less than 3 feet. See the "Freeboard and Overflow Protection" section for additional information.

3. A staff gauge helps the owner more accurately document pool levels during flood events and during routine inspections. It is very helpful to correlate seepage through drains to pool level. Please note that the graduations/numbers should extend beneath the lake level so that lowering of the pool (should it be needed or desired) can be monitored. It should be positioned to allow easy reading from a safe location. An example of a staff gauge is shown below.



4. The deterioration of an old or unused pipe can lead to structural collapse or seepage along the pipe. As a result, piping can occur. Piping is when soil particles are carried out of the dam with the seepage, leaving voids in the embankment. Piping will lead to failure of the dam. Unused or old piping should be removed or properly abandoned in place. Abandoning in place requires the entire pipe to be filled with concrete or grout. Both alternatives must be completed under the supervision of a registered professional engineer.
5. As part of this inspection, the classification of the dam was evaluated according to the mandates of OAC Rule 1501:21-13-01. Based on field observations, it appears that there is potential a higher classification of the dam. A detailed study of the downstream hazard must be conducted prior to preparing plans and specifications for the repair of the dam. A detailed analysis of the downstream hazard is also required as part of the EAP for this dam. If the detailed analysis shows that there is no threat of loss of life due to failure of the dam, then the classification of the dam may remain as is.

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 Libben, P.E.

Project Manager

Dam Safety Program

Division of Water Resources

1/11/2019

Date

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



Mia P. Kannik, P.E.

Program Manager

On behalf of Rodney J. Tornes, P.E.

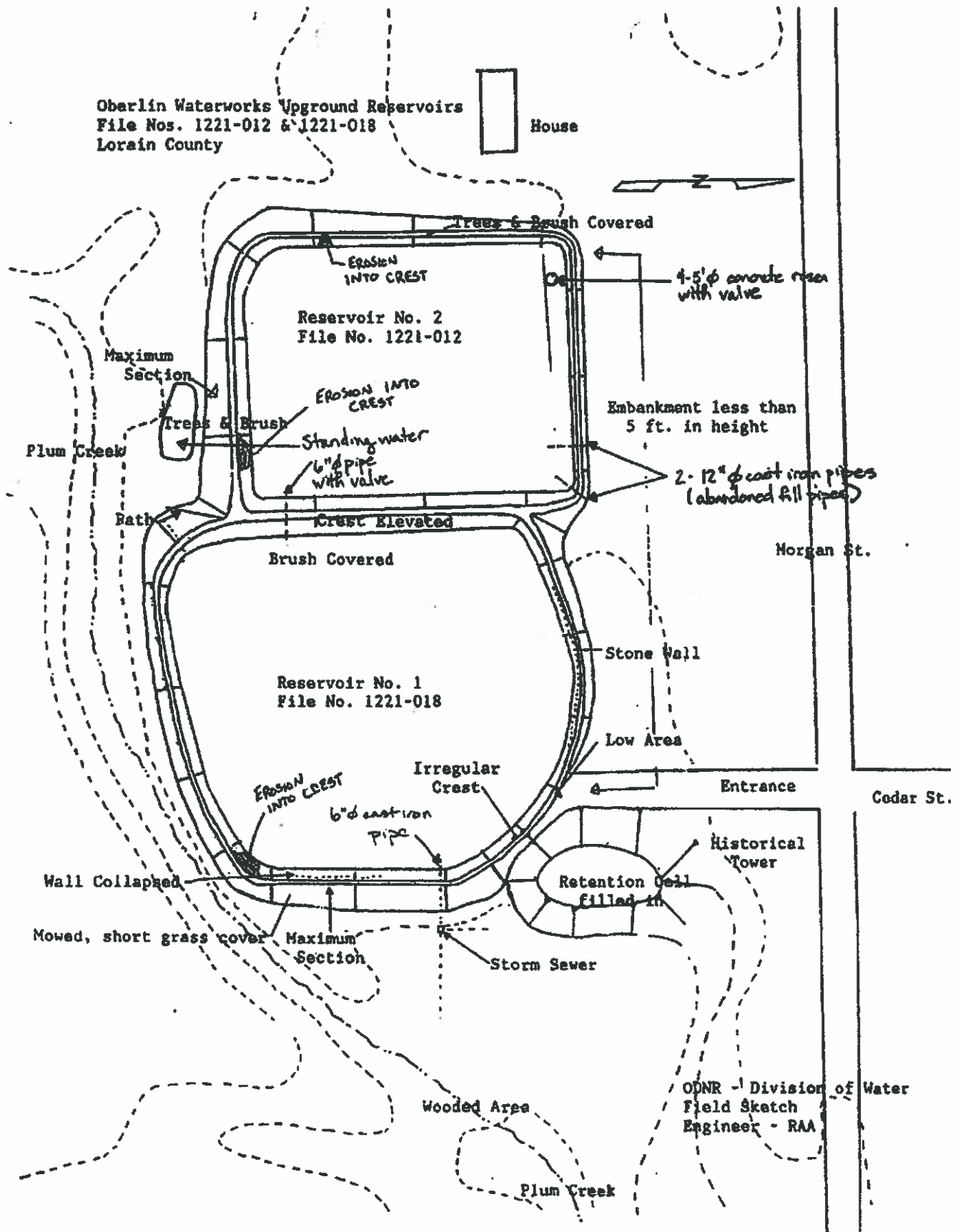
Acting Chief

Division of Water Resources

1/11/19

Date

SITE MAP



PHOTOGRAPHS



1. The east embankment along Reservoir No. 1.



2. The north embankment along Reservoir No.1.



3. One of multiple unused piping located within the embankment.



4. The old masonry riser in Reservoir No. 2.



5. Interior of the masonry riser.



6. Dense trees and brush covered the majority of the embankment.

Notice the bare areas from the pedestrian footpath.



7. Dense trees and brush obstructed visual inspection of the exterior slope.



8. A concrete headwall was located along the southern exterior toe of Reservoir No. 2.



9. The common embankment between the two reservoirs.



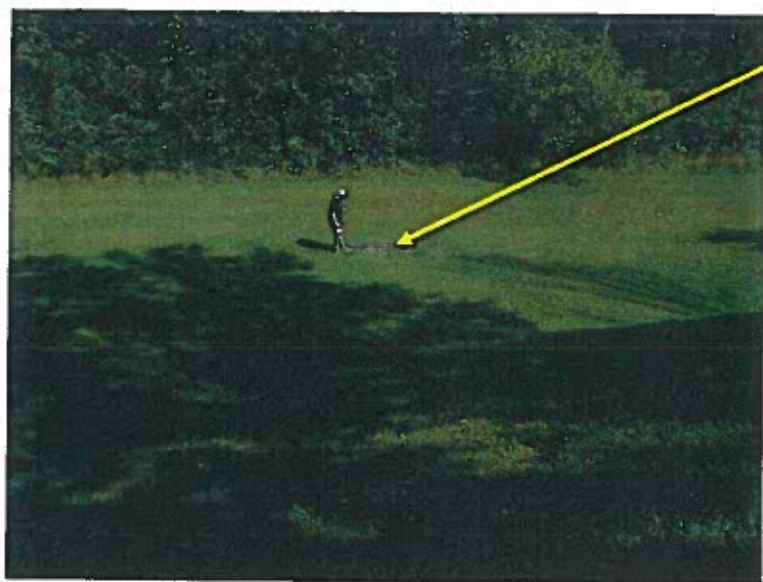
10. The embankment along Reservoir No. 1.



11. The east embankment along Reservoir No. 1.



12. The emergency overflow pipe located in Reservoir No. 1.



13. The emergency overflow pipe catch basin located at the exterior toe of Reservoir No. 1.



14. The interior of the catch basin in photograph no. 13.

Notice the obstructions in the catch basin.

CLASSIFICATION

Oberlin Waterworks Upground No. 1&2

		Class
Height	11.5 ft	IV
Storage	60.6 ac-ft	III
Potential Downstream Hazard		II
Final Class:		II

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 exterior 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

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.

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

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 on field observations, 2007 LiDAR data obtained from the Ohio Geographically Referenced Information Program, and aerial photography from Google.

Oberlin Waterworks Upground No. 1&2 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
Morgan St.								A				1420	10
S. Professor St.								B				1600	12
Home			C									1850	8

Downstream Map

(See Next Page)



NOTE: Contours as shown were determined from LIDAR data gathered in 2008 through the Ohio State Wide Imagery Program (OSWIPI)



0 300 600 Feet

DOWNSTREAM HAZARD MAP
 OBERLIN OLD UPGROUND RESERVOIR No. 1 & No. 2 DAM
 File Number: 1221-018
 DRAWN BY: DAN MURPHY
 Date: 6/2/2014



FREEBOARD AND OVERFILLING PREVENTION FOR UPGROUND RESERVOIRS

Unintentional misoperation/overfilling has caused reservoirs to fail throughout the nation and several incidents have occurred in Ohio. Three important factors for preventing overfilling are (1) establishing proper freeboard, (2) setting and monitoring the maximum operating pool, and (3) having an emergency overflow or pump shutoff.

Freeboard: OAC Rule 1501:21-13-07 requires that an upground reservoir have sufficient freeboard to prevent overtopping of the embankment crest. Freeboard is the elevation difference between the top of dam elevation and the maximum operating pool level. For Class II dams that are upground reservoirs, the minimum elevation of the embankment crest shall be at least 5 feet higher than the elevation of the actual maximum operating pool level unless otherwise approved by the chief.

No reduction of freeboard has been granted for this upground reservoir. Therefore, the required freeboard for this Class II upground reservoir is 5 feet.

Maximum Operating Level: Although many reservoirs are designed to have fluctuating pool levels, there should be a designed maximum operating pool level that is established and not to be exceeded. During the inspection, the actual maximum operating pool level was determined from observations and discussion. The following table describes the reservoir operation based on information available to the division.

	Elevation in feet above msl
Top of Dam Elevation:	813.4
Ungated Overflow Elevation:	811.0
Designed Maximum Operating Pool Level:	Unknown
Actual Maximum Operating Pool Level:	811.0
Required Freeboard:	5 ft
Actual Operating Freeboard:	2.4 ft

The reservoir is not being operated with sufficient freeboard. The maximum operating pool must be lowered and/or a request for a freeboard variance must be submitted to the division with supporting justification.

Overflow/Pump Shutoff: In accordance with OAC Rule 1501:21-13-03, every upground reservoir shall have an overflow or other device to preclude overfilling the reservoir by more than ½ foot during normal filling operations.

Oberlin Waterworks Upground No. 1&2 has an emergency overflow at elevation 811.0 feet. The overflow consists of a 6-inch ungated pipe in the northeast corner of Reservoir No. 1. A 6-inch transfer pipe with a valve is reportedly located on the common embankment which would allow for overflow between the reservoirs; however, this pipe could not be located. This system is not acceptable for meeting this requirement.

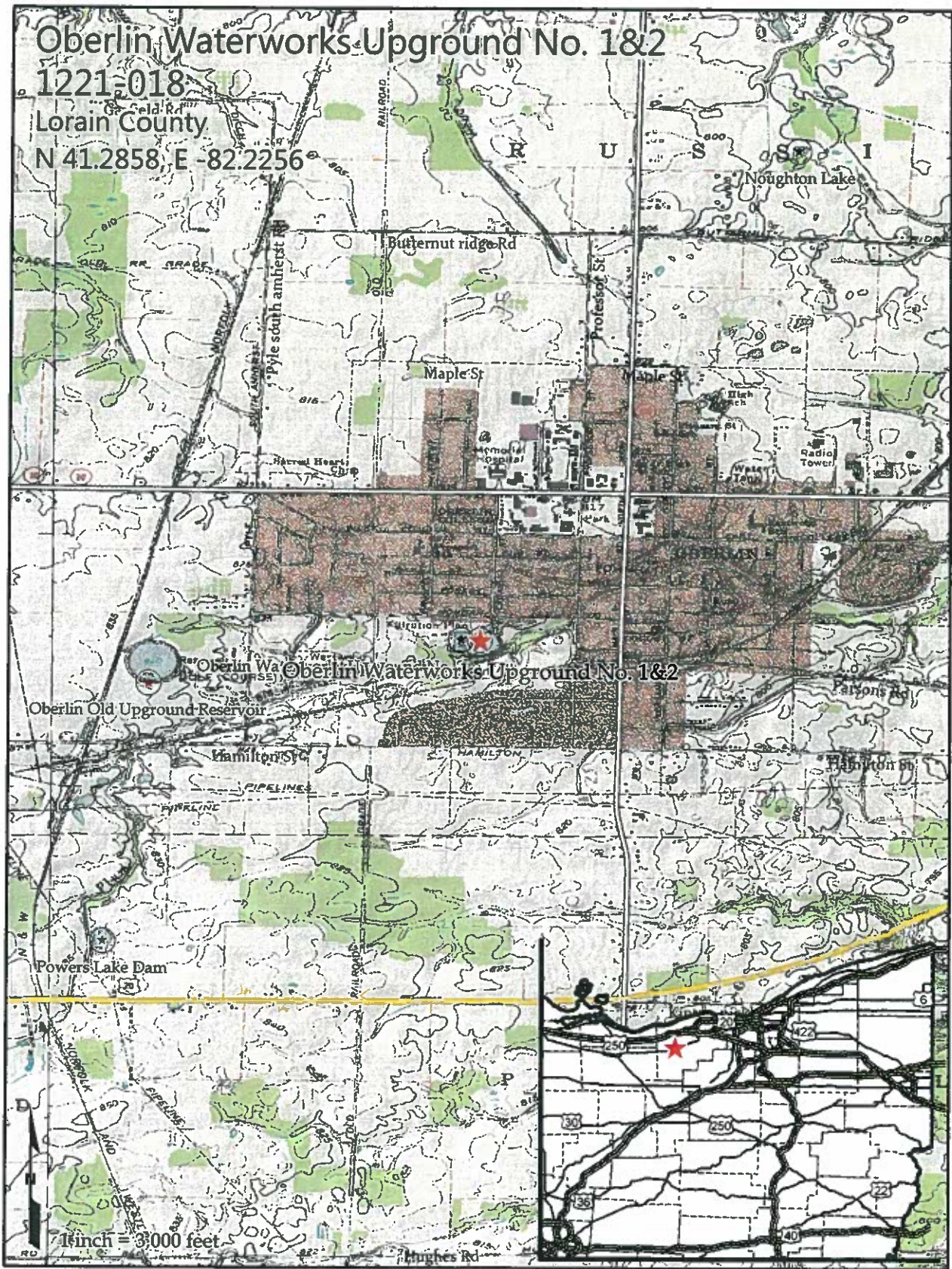
HISTORY

Oberlin Waterworks Upground No. 1&2

Unknown	Dam constructed.
July 24, 1985	Dam inventoried.
September 23, 1992	Dam safety inspection by the Division of Water Resources.
June 2, 2009	Dam safety inspection by the Division of Water Resources.
May 1, 2014	Dam safety inspection by the Division of Water Resources.
September 18, 2018	Dam safety inspection by the Division of Water Resources.

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

LOCATION MAP



Dam Inventory Sheet

Name: OBERLIN WATERWORKS UPGROUND NO. 1&2 **File No:** 1221-018
Reservoir: **National #:** OH01964
Permit No.: N/A
Class (Ht-Vol): II (IV - III)

Owner: City of Oberlin **Owner Type:** Public, Local
Address: Oberlin Water Treatment Plant
43885 Parsons Road **Multi-Dams:** Yes: 3, Class I:1
City: Oberlin **State:** OH **Parcel No.:**
Contact: Bill Albrecht **Zip:** 44074
Phone No.: 440/775-7290

County: Lorain **Latitude Deg.:** 41 **Min.:** 17 **Sec.:** 9
Township: Russia **Longitude Deg.:** 82 **Min.:** 13 **Sec.:** 32
Stream: Plum Creek - Offstream
USGS Quad.: Oberlin **USGS Basin No.:** 04110001

Designed By:
Constructed By:
Completed: **Plan Available:** **At:**
Failure/Incident/Breach:

Structure Information

Purpose: Water Supply, Public
Type of Impound.: Upground
Type of Structure: Earthfill
Drainage Area (sq. miles): 0.01 **or (acres):** 7

Embankment Data

Length (ft): 2440 **Upstream Slope:** 2H:1V
Height (ft): 11.5 **Downstream Slope:** 3H:1V
Top Width (ft): 5 **Volume of Fill (cub. yds.):**

Spillway Outlet Works Data

Lake Drain: 10-IN-DIA CAST IRON PIPE AND PUMP STATION (INOPERABLE)
Principal: 6-IN-DIA WATER MAIN DISCHARGING TO STORM SEWER
Emergency: LOW NATURAL GROUND AT GRAVEL ACCESS RD & EMB INTERSECTION
Maximum Spillway Discharge (cfs): 1 **Design Flood:** 0.50 **Flood Capacity:** 0.5

<u>Dam Reservoir Data</u>	<u>Elevation (ft-MSL)*</u>	<u>Area (acres)</u>	<u>Storage (acre-feet)</u>
Top of Dam:	813.4	6.7	60.6
Emergency Spillway:	812.3	6.4	52
Principal Spillway:	811	6	43.5
Streambed:	803.2		

Foundation: *Elevations are not necessarily related to a USGS benchmark

Inspection 9/18/2018 NTL **Phase I:**
History: 5/1/2014 DSM **Other Visits:** 7/24/85 INV, 7/21/88 INV
6/2/2009 MPK
9/23/1992 RAA
Inspection Year: B

Operation Information/Remarks: OBER
CITY OF OBERLIN - OFFICE OF PUBLIC WORKS, 85 SOUTH MAIN STREET, OBERLIN, OH. PHONE (216)775-1531.

Emergency Action Plan: Not Approved

Format: No Plan

OMI: No
Last Entry: 10/9/2018

Dam Safety Inspection Checklist for Upground Reservoirs

Complete All Portions of This Section (Pre-inspection)

Name of Dam: Oberlin Waterworks Upground No. 1&2 Morgan st.

Lorain County

Date of Inspection: September 18, 2018

Required Action
None Mon. Maint. Eng.

File Number: 1221-018

Class: II

Design Freeboard (ELEV_{TOD}-ELEV_{NP}): ? 24ft actual

☐ ☐ ☐ ☒

Interview with Owner (at the site):

Owner/Representative present: (Yes, No) Name(s): John Aone, Bill Albrecht

Owner's Name(s): City of Oberlin

Address: Oberlin Water Treatment Plant, 43885 Parsons Road,

City: Oberlin

State: OH

Zip (+4): 44074

Contact Person: Bill Albrecht
Jerry Hade, Superintendent

Telephone: 440/775-7290 cell (440) 935-1744

Email Address:

Purpose of dam: Water Supply, Public

Owner's Dam Safety Program

Emergency Action Plan

EAP (document): ☒ Not Approved ☐ No Plan Up-to-date? (yes, no) ☐ ☐ ☒ ☐

Exercised:

Downstream development: None

Security: None

Operation, Maintenance, and Inspection

OMI (document): ☒ No ☐ Up-to-date? (yes, no) ☐ ☐ ☒ ☐

Operation of drains/gates

All operable? (yes, no)

Norm./Emrg. drawdown: — Staff Gauge/Monitoring: None

Accessibility for operation: —

Ungated overflow or auto-shutoff? Lower cell has ungated overflow

How does reservoir operate (infl./efflu.): None

Maintenance

Frequency of mowing: None

Other maintenance: None

Inspection

Frequency and thoroughness of day-to-day and routine inspections: occasional visual

Frequency and thoroughness of event-driven inspections: none

Problems found during inspections: sudden drop in water level

Field Information

Freeboard (during inspection): varies Time: 3 (a.m. p.m.)

Site Conditions (temp., weather, ground moisture): 85°F, clear, dry

Inspection Party: Nathan Libbman, Keith Libbman, Melissa Manerney

Height: 11.5 feet (meas. / inv. o.k.) Norm. Pool Area: 6 Ac. (meas. / inv. o.k.)

Reservoirs no longer used for water supply. Water is not pumped into or out of the reservoirs. Parks dept. does the maintenance.
There is a 6" diameter transfer pipe with valve between the two cells.
There is a 6" cast-iron pipe in the NE corner of the east reservoir that is an emergency overflow. There are two abandoned 12" cast iron pipes in the NE corner of the west reservoir. There is also an abandoned riser and valve in the NW corner of the west reservoir (below the water

City Of Oberlin - Office Of Public Works, 85 South Main Street,
Oberlin, Oh. Phone (216)775-1531.

Site Sketch

Interior Slope

☒ Gradient: 2H:1V

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

Required
Action

None
Monitor
Repair/Maint.
Engineer

Interior slope completely covered in trees and brush. Unable to fully inspect slope.

Some erosion present

muskrat burrows observed

Crest

☒ Width (ft): 5

☒ Length (ft): 2440

☒ Total Freeboard (ft): 2.40

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

None
Mon.
R./M.
Eng.

Crest varies in elevation

Base soil footpath on much of the crest

Exterior Slope

☒ Gradient: 3H:1V

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

None
Mon.
R./M.
Eng.

Trees and brush covering entire slope, unable to fully inspect

Owners noted that the water level in the upper cell has dropped several feet. They suspect seepage. Given that seepage could not be located at the exterior toe, it is likely to be seeping through the common embankment with the lower cell.

Old headwall was located in the ^{south} exterior slope of the upper cell, unclear what the purpose or associated structure is. There are several unused pipes penetrating the embankment.

Required
Action

Structures

Influent, Transfer, Effluent, Lake Drain

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

	None	Monitor	Rep./Maint.	Engineer
There is no operable influent or effluent lines, all unused lines penetrating the embankment should be properly abandoned.				X
6" Transfer pipe between upper and lower cells is reported to be operable. Valve should be left open and locked in that position as the only available overflow is in the lower cell.			X	X
No staff gauges			X	
No operable electric lake drain				X

Overfilling Prevention

Emergency Overflow/Auto-shutoff

Typical Problems: Flowpath obstructed, material deterioration, erosion, too high, overgrown, undermining

	None	Mon.	R./M.	Eng.
6" overflow pipe in lower cell appeared in good condition, partially clogged at outlet in manhole.			X	X
Elevation of overflow is not in accordance with designed freeboard. A variance should be requested and the overflow altered.			X	X

Other

	None	Mon.	R./M.	Eng.

Failure Modes

Overfilling

Sufficient info. has been gathered to evaluate design and operating freeboard.

Sufficient info. has been gathered to evaluate design and performance of the emergency overflow or auto-shutoff.

Seepage/Instability

Sufficient info. has been gathered to evaluate the performance and monitoring of the internal drainage system.

Assessed

☒ ☒

☒

☒ All Field Data Gathered (inspector's initials): N7 KRL

☒ Investigate Downstream Hazard

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.us/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: 440 329-5117

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

440-326-5800 - Telephone

Service (NRCS)

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