DAM SAFETY INSPECTION REPORT

Woodside Lake Dam
File Number: 1005-008
Class II
Mahoning County, Austintown Township
Inspection Date: April 19, 2016

In accordance with Ohio Revised Code 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, owners can be subject to liability claims.

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

Table of Contents

Required Remedial Measures

Photographs

Dam Classification Checklist

Flood Routing Summary

Location Map

Dam Inventory Sheet

Dam Safety Inspection Checklist

Agencies Associated with Dams and Lakes

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 has been enclosed. References to right and left in this report are oriented as if you were standing on the dam crest and looking downstream.

Engineer Repairs and Investigations: The owner must retain the services of a 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 1 year unless otherwise stated.** A record of all repairs should be included in the operation, maintenance, and inspection manual.

1. The dam's discharge/storage capacity must be sufficient to safely pass the required design flood. Perform a hydrologic and hydraulic study to determine the adequacy of the dam's discharge/storage capacity to safely pass the required design flood. Prepare plans and specifications as necessary to increase the discharge/storage capacity to pass the required design flood. In accordance with OAC Rule 1501:21-13-02, the minimum design flood for Class II dams is 50 percent of the Probable Maximum Flood or the critical flood. See the Flood Routing Summary section of this report for additional information.

2. The entire spillway system must be replaced. Prepare plans and specifications for replacement of the spillway system. The condition of the spillway system must be monitored monthly and during large storm events for further deterioration. This item should be completed in coordination with Item 1 above.

3. The stability of the embankment must be maintained. Prepare plans and specifications for the repair of the concrete cutoff wall to the right of the right principal spillway sidewall, for the compacted fill that needs to be placed on the downstream slope where the seepage has eroded the slope, and for the installation of a seepage drain pipe behind the right principal spillway sidewall. The crack in the cutoff wall and overall stability of the embankment must be monitored monthly and during large storm events.

4. The owner must install 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.

Owner Repairs: The owner must address the following items. The owner may perform the work or hire a contractor. Repair activities should be documented in the operation, maintenance, and inspection manual.

☐ No owner repairs for this report.

☒ Trees and brush are not permitted on embankment surfaces or earthen spillways.
Clear the trees, brush, and tall vegetation from the entire embankment and establish a healthy grass cover on the dam.

☒ The embankment crest must have a uniform elevation.
Level the crest.

☒ Rodent burrows weaken dam embankments and must be repaired. Rodent activity must be controlled.
Eliminate the rodent population and repair the rodent burrows on the dam.

☐ The embankment and spillways must be protected from erosion. A healthy grass cover should be present on embankment and spillways as needed, and rock riprap must be cleared of vegetation and replenished periodically.

- [ ] A satisfactory trashrack and/or antivortex plate must be present at the inlet of the principal spillway.

- [ ] Spillways must be able to flow at their full capacities; debris and vegetation must be periodically removed.

- [ ] The lake drain must be operable and accessible. Routine maintenance of the lake drain should be performed annually and should include operation and lubrication of the valve/sluice gate in accordance with the manufacturer's specifications. Use caution if the operability is unknown. If the drain no longer functions contact the Division of Water Resources to discuss repair or replacement.

- [ ] Embankment drains and spillway drains must be periodically maintained to ease monitoring and functionality. Pipe outlets should be marked and cleared regularly to allow the owner to quickly identify changing seepage conditions in the dam.

- [ ] A spillway must convey flow without excessive leakage.

- [x] This dam must have an operation, maintenance, and inspection manual (OMI) and an emergency action plan (EAP). Prepare an OMI and/or an EAP and submit for approval. Guidelines for the preparation of these documents are included with this report.
  This dam must have an operation, maintenance, and inspection manual (OMI) and an emergency action plan (EAP) in accordance with OAC Rule 1501:21-21-04. Prepare an OMI and an EAP. Guidelines for the preparation of these documents are included with this report.

- [ ] Flow through a deteriorated spillway subjects it to further deterioration and potentially failure.

- [ ] Seepage from the dam must be controlled to prevent stability and maintenance problems. Monitor the seepage and/or wet area for any signs of increased flow, muddy flow, or instability on or adjacent to the embankment.

- [x] *Remove the debris that has been dumped on the downstream slope.*

- [ ]

Owner Dam Safety Program: In accordance with Ohio Revised Code (ORC) Section 1521.062, the owner of a dam shall maintain a safe structure and appurtenances through inspection, maintenance, and operation. A dam, like any other part of the 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 identify 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.

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 Dam Safety Program of any condition which threatens the safety of the structure. A rapidly changing condition may be an indication of a potentially dangerous problem. The 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.

The following references regarding dam safety and lake management are provided for your use and information:
(1) Common Problems for Small Dams, including seven fact sheets
(2) "Ohio Pond Management Handbook"

7/28/16

Neil Shop, E.I.
Project Engineer
Dam Safety Program
Division of Water Resources

Date

7-28-2016

Doug Evans, P.E.
Project Manager
Dam Safety Program
Division of Water Resources

Date

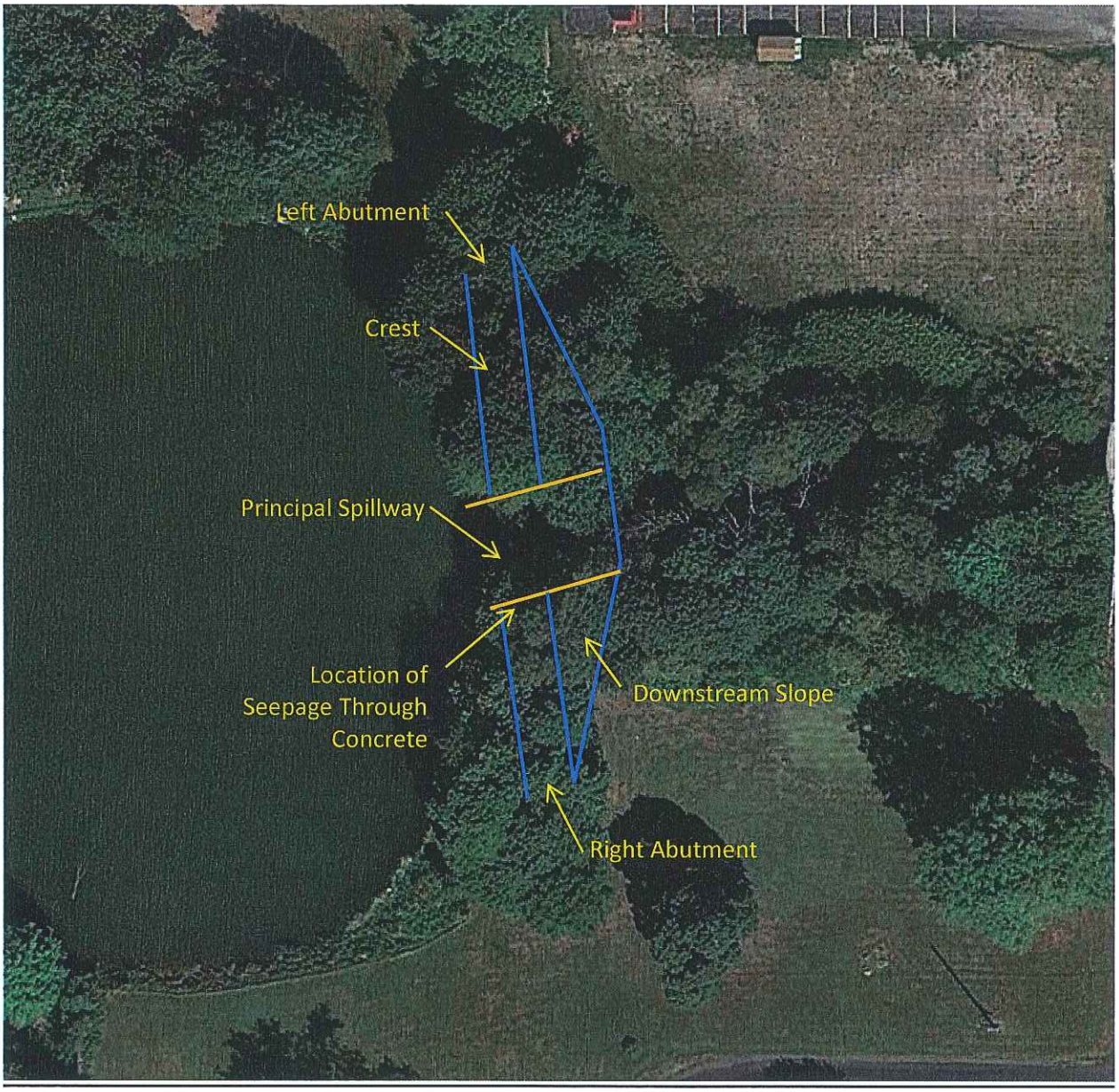
This inspection was performed pursuant to the authority granted to the Chief of the Division of Water Resources in ORC Section 1521.062.

8/4/16

Mia P. Kannik, P.E.
Program Manager
On behalf of Andrew D. Ware, Acting Chief
Division of Water Resources

Date

Sketch of Dam



	Photograph No. 1: View of the upstream slope from the right abutment. Note the tall vegetation growing on the slope.
	Photograph No. 2: Another view of the upstream slope.
	Photograph No. 3: View of the crest from the right abutment.

	Photograph No. 4: View of the downstream slope from the left end of the dam. Note the trees and brush on the slope.
	Photograph No. 5: View of the downstream slope from the left end of the dam.
	Photograph No. 6: View of the principal spillway weir.

	Photograph No. 7: View of the principal spillway. Note the right sidewall has collapsed and has been washed downstream.
	Photograph No. 8: View behind the left sidewall of the principal spillway. Note the large crack in the concrete and the large amounts of water seeping through.
	Photograph No. 9: View of the left sidewall. The water leaking from the crack in the picture above is eroding the soil behind the sidewall and seeping through cracks in the sidewall.

	Photograph No. 10: Another view of the left sidewall. Note the severe damage to the concrete.

Dam Classification Checklist

Name of Dam:	Woodside Lake Dam			File Number:	1005-008
County:	Mahoning	Date:	April 19, 2016	Engineer:	NAS

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 crest to the downstream toe. The storage capacity is the volume of water that the dam can impound at the top of dam (crest) elevation. The 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 along the downstream channel.

This checklist is intended to establish or verify the appropriate classification in accordance with the Ohio Administrative Code – it does not necessarily show all potential hazards or the full extent of inundation. In addition, elevations and dimensions are estimated.

HEIGHT CLASSIFICATION	***STORAGE CLASSIFICATION***	***EXEMPT~NON-REGULATED***
Dam Height = 15.00 feet	Stor. Capacity (top of dam)= 77.20 acre-feet	
____ > 60' - Class I	____ > 5000 acre-feet - Class I	____ Height ≤ 6 feet
____ > 40' - Class II	____ > 500 acre-feet - Class II	____ Storage ≤ 15 acre-feet
____ > 25' - Class III	X > 50 acre-feet - Class III	____ 6 ft. < Height < 10 ft. & Stor. ≤ 50 ac-ft
X ≤ 25' - Class IV	____ ≤ 50 acre-feet - Class IV	

Height Class:	IV		
Storage Class:	III		
Hazard Class (see next page):	II	**Estimated Population at Risk:**	(none 1-5 6-15 16+)
Final Class:	II		

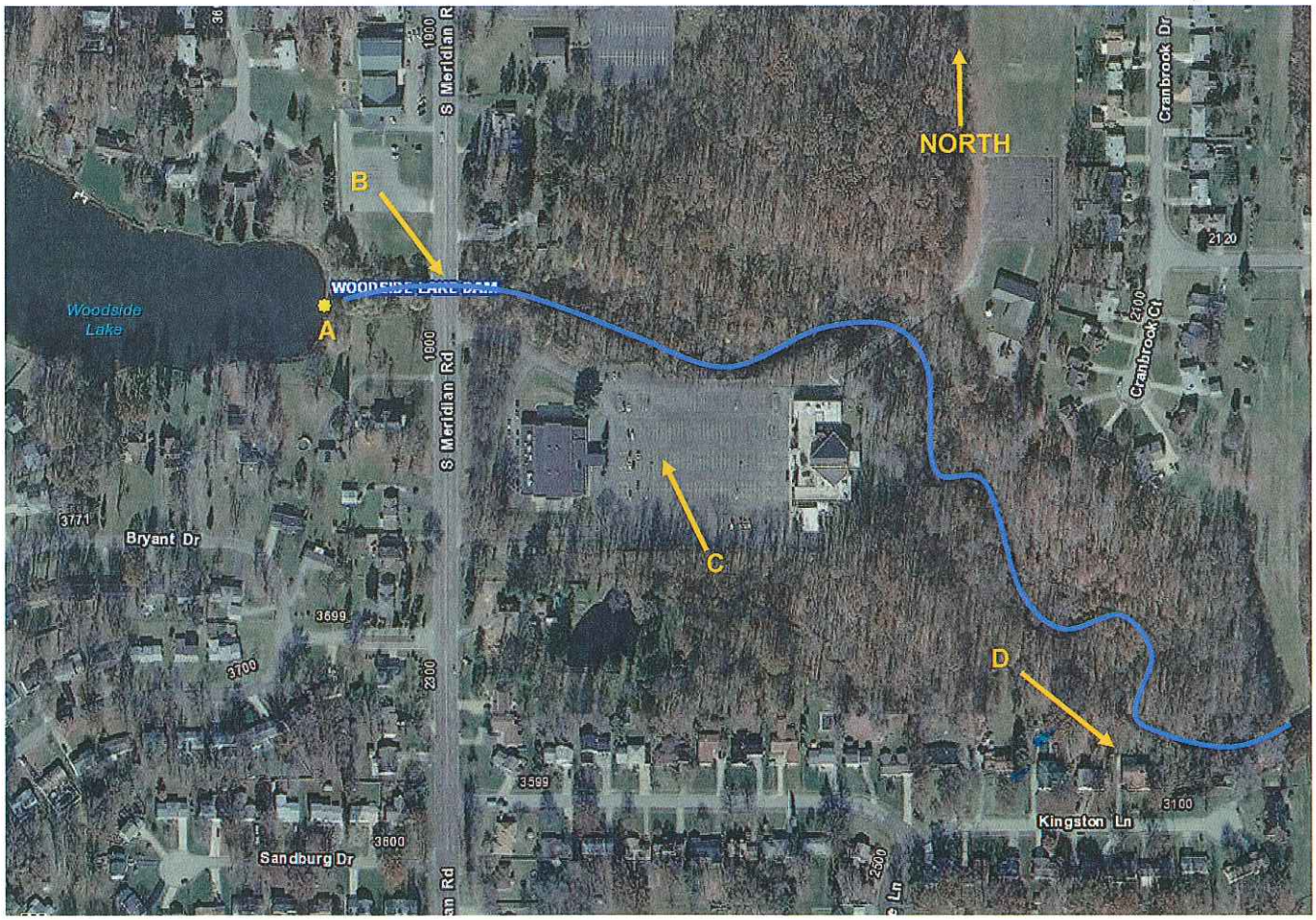
Class Changed (Yes, **No**)

Potential Downstream Hazard

I	II					III		IV	-	-				
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*	Distance downstream of dam to affected structure (feet)	Vertical distance from streambed to base of affected structure (feet)	Horizontal distance from stream to affected structure (feet)	
								A			-	-	-	Dam
							B				220	10	-	South Meridian Rd
									C		800	20	150	Church
		D									2700	7	50	Home

This checklist 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.

Sketch of Developments Downstream of Dam



Flood Routing Summary

A dam must be able to safely pass severe flood events. A dam uses a combination of spillway discharge capacity and reservoir 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 erode the embankment. This can cause severe damage and dam failure.

Dam embankment prior to severe flood.

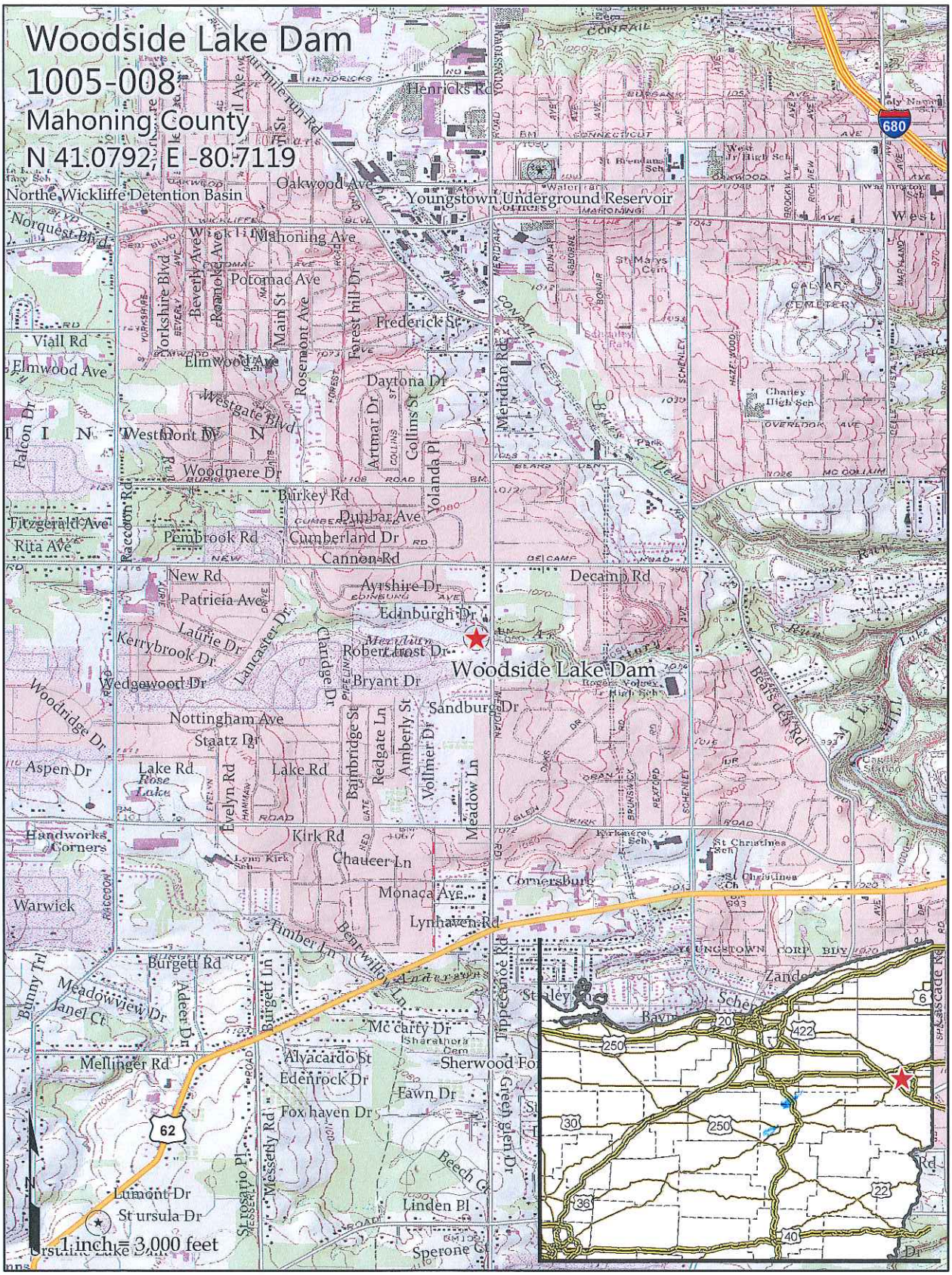
Erosion caused by floodwater overtopping the dam – a result of inadequate discharge/storage capacity.

Erosion caused by floodwater overtopping the dam – a result of inadequate discharge/storage capacity and debris obstructing the 5-foot-diameter spillway pipe.

As part of this inspection, the Division of Water Resources did not thoroughly investigate this dam's discharge/storage capacity or its ability to safely pass the required design flood. In 2003, the Division of Water Resources performed hydrologic and hydraulic calculations to estimate the size of the design flood and the discharge/storage capacity of the dam. These calculations were used in the flood routings to determine the maximum water surface elevation in the reservoir for various flood events.

Woodside Lake Dam is a Class II dam; therefore, in accordance with OAC Rule 1501:21-13-02, the required design flood is 50% 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 and destabilizing the dam. Flood routing calculations indicate that the dam can pass approximately 2% of the PMF; Woodside Lake Dam does not appear to be able to safely pass the design flood.

LOCATION MAP



Dam Inventory Sheet

Name: WOODSIDE LAKE DAM

Reservoir:

File No: 1005-008
National #: OH03086
Permit No.: N/A
Class (Ht-Vol): II (IV - III)

Owner Information

Owner: State of Ohio
Address: c/o Mahoning County Auditor
120 Market Street
City: Youngstown **State:** OH **Zip:** 44503
Contact: Cheri Lyn Donofrio

Owner Type: Public, State
Multi-Dams: -
Parcel No.: 480050211000
Phone No.: 330/740-2010

Location Information

County: Mahoning
Township: Austintown
Stream: Factory Run Tributary To Mill Creek
USGS Quad.: Youngstown

Latitude Deg.: 41 **Min.:** 04 **Sec.:** 45
Longitude Deg.: 80 **Min.:** 42 **Sec.:** 43
USGS Basin No.: 05030103

Design/Construction Information

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

Structure Information

Purpose: Unknown
Type of Impound.: Dam And Spillway
Type of Structure: Earthfill
Drainage Area (sq. miles): 2.61 **or (acres):** 1669

Embankment Data

Length (ft): 235
Height (ft): 15
Top Width (ft): 8

Upstream Slope: 2.5H:1V
Downstream Slope: 1.5H:1V
Volume of Fill (cub. yds.):

Spillway Outlet Works Data

Lake Drain: NONE
Principal: 40-FT-WIDE SANDSTONE BLOCK WEIR
Emergency: NONE
Maximum Spillway Discharge (cfs): 253 **Design Flood:** 0.50 **Flood Capacity:** 0.02

Dam Reservoir Data	Elevation (ft-MSL)*	Area (acres)	Storage (acre-feet)
Top of Dam:	1059	18.4	77.2
Emergency Spillway:			
Principal Spillway:	1057.3	11.7	51.9
Streambed:	1044		
Foundation:			

*Elevations are not necessarily related to a USGS benchmark

Inspection Information

Inspection History:
4/19/2016 NAS
6/8/2011 WDE
1/21/2004 MEM

Phase I:
Other Visits:

Inspection Year: D

Operation Information/Remarks

Emergency Action Plan: Not Approved **Format:** No Plan **OMI:** No
Last Entry: 6/6/2016

Dam Safety Inspection Checklist

Name of Dam: Woodside Lake Dam

Mahoning County

Date of Inspection: 4/19/16

Required Action

File Number: 1005-008

None Mon. Maint. Eng.

Class: II Design Flood: 0.50 Flood Capacity: 0.02 ☐ ☐ ☐ ☑

Haz.: II, Height: IV, Volume: III

Interview with Owner (at the site):

Owner/Representative present: (Yes, No) Name(s): Ralph Meachum, Cheri Donofrio

Owner's Name(s): State of Ohio

Address: c/o Mahoning County Auditor, 120 Market Street,

City: Youngstown State: OH Zip (+4): 44503

Contact Person: Cheri Lyn Donofrio Telephone: 330/740-2010

Email Address: -

Purpose of dam: Unknown

Owner Dam Safety Program

Emergency Action Plan Not Approved No Plan

None Mon. Maint. Eng.

EAP (document): Up-to-date? (yes, no) ☐ ☐ ☑ ☐

Downstream development:

Operation, Maintenance, and Inspection No

None Mon. Maint. Eng.

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

All drains operable? (~~yes, no~~) None

Normal rate of drawdown: - Accessibility for operation: -

Maintenance

Frequency of mowing: None

Other maintenance: -

Inspection

Frequency and thoroughness of day-to-day & routine inspections: None

Problems found during inspections: -

Field Information

Pool Elevation (during inspection): Normal Pool Time: 1:00 (a.m. p.m.)

Site Conditions (temp., weather, ground moisture): 65°, Sunny, Dry

Inspection Party: Neil Shop, Doug Evans

Confirm the Following: ☑ Dam Height (ft): 15 ☑ NP Area (ac): 11.7

Reference Information

Property has been forfeited to the State of Ohio. The Mahoning County Auditor acts as the agent of the state for ownership. Contact is Cheri Lyn Donofrio at 330/740-2010 ext.7569

2011 - class changed from III to II.

	Elev.	Area (ac)	Stor. (ac-ft)	(in.)
TOD:	1059	18.4	77.2	0.2
Em. S/w:				
Prin. S/w:	1057.3	11.7	51.9	
Strmbd:	1044			

Basin (ac): 1669

Impound. Type: Dam And Spillway

Structure Type: Earthfill

Township: Austintown

Stream: Factory Run Tributary To Mill Creek

Designed By: Unknown

Constr. By: Unknown

Year Compl.: Plans Avail.? At:

Fail./Incid.:

Required Action

Upstream Slope

☑ Gradient: 2.5H:1V

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

	None	Monitor	Repair	Engineer
- Trees and brush along slope			✓	
- Tall vegetation along slope			✓	
- Rodent burrows along shoreline			✓	

Crest

☑ Width (ft): 8 ☑ Length (ft): 235 ☑ Total Freeboard (ft): 1.70

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

	None	Mon.	Rep.	Eng.
- Trees and brush			✓	
- Multiple low areas along crest			✓	
- Sparse areas of grass on right half			✓	

Downstream Slope

☑ Gradient: 1.5H:1V

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

	None	Mon.	Rep.	Eng.
- Trees and brush along entire slope			✓	
- Debris dumped onto downstream slope			✓	
- Severe erosion on slope were seepage through cutoff wall is occurring				✓

Principal Spillway

☑ 40-ft-wide Sandstone Block Weir

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

	None	Mon.	Rep.	Eng.
- Left sidewall collapsed and washed away				✓
- 150 GPM leaking through concrete behind right sidewall				✓
- Seepage through right sidewall				✓
- Uneven weir				✓
- Severe damage to right sidewall				✓

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

Required Action

Emergency Spillway

☑ None
☑ Freeboard (to normal pool, feet)

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

	None	Monitor	Repair	Engineer
- None	✓			

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

Lake Drain

☑ None

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

	None	Mon.	Rep.	Eng.
- None				✓

Other

	None	Mon.	Rep.	Eng.

☑ All Field Data Gathered (inspector's inititals): NAS | NDE

Site Sketch

- 7.5' x 18' CONCRETE BOX Culvert @ ~~Merdi~~ Meridian Road. Road Surface is 10' ABOVE STREAM channel.

- Home Located At 3174 Kingston Lane, First floor is approx. 7' ABOVE Streambed and 50' FROM Channel.

☑ 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/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: 330 740-2200

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/OFFICESSWCDS/DistrictOffices/tabid/9093/Default.aspx

330-740-7995 - 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