Emergency Action Plan
Upper Girard Lake Dam

City of Girard, Ohio
100 West Main Street
Girard, Ohio 44420

February 2010

EMERGENCY ACTION PLAN
UPPER GIRARD LAKE DAM

PREPARED FOR

THE CITY OF GIRARD, OHIO

FEBRUARY 2010

BURGESS & NIPLE, INC.
ENGINEERS • ENVIRONMENTAL SCIENTISTS • GEOLOGISTS
5085 REED ROAD
COLUMBUS, OHIO 43220

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Emergency Condition
A, B, or C

Observer

Water Department
Maint. Supervisor
Howard Zicklfoose
Work: (330)545-4208
Cell: (330)???-????

(2) Water Dept. Employee
Jim Petruzzi
Work: (330)545-4208
Home: (330)545-0354

(3) Water Dept. Employee
John Kay
Work: (330)545-4208
Cell: (330)720-8701

(1) City of Girard
Police Department
(330) 545-0211
Radio: Transmit 154.770 MHz
Receive 155.595 MHz

(As Necessary) City of Girard
Fire Department
(330) 545-0318
Radio: Transmit 158.880 MHz
Receive 154.430 MHz

(1) Director of
Public Services
Jerome "Jerry" Lambert
Work: (330)545-3306
Cell: (330)770-4491

(As Necessary) Emergency Condition
C : Imminent Failure
or Failure Occurred
Notify Residents

(1) John Rodomsky
1514 Squaw Creek Dr.
330-545-1717

(2) David Rodomsky
1505 Squaw Creek Dr.
330-545-2921

(3) Stephen Martin
154 Pittsburg Ave.
330-545-9524

(4) Emil E. David
152 Pittsburg Ave.
330-545-9131

(5) David Cummins
148 Pittsburg Ave.
330-545-5532

(6) Karen Ackerman
144 Pittsburg Ave.
No Phone
Brother: 330-539-5817

(7) John D. Barber
145 Pittsburg Ave.
330-545-1504

(8) Barbara or Tammy Komlanc
141 Pittsburg Ave.
330-545-1716

(9) Vacant (Storage)
157 Pittsburg Ave.
330-545-6201

Emergency Condition
A or B : Large Flows
or Potential Failure

(1) DM Engineering LLC
Dennis Meek
Cellular: (216)316-6847

(2) ODNR, Div. of Water
Engineering Group
Business Hours
(614)265-6731
Non-Business Hours
(614)799-9538

(3) Burgess & Niple, Inc.
George Biemel
Work: (614)459-2050

(4) A.P. O'Horo (Contractor)
Work: (330)759-9317
Tom Metzinger
Home: (330)797-9102
Dan O'Horo
Cellular: (330)360-4111
Home: (330)793-9823
Radio: Transmit 35.82 MHz
Receive 35.85 MHz

(5) Trumbull County EMA
Linda Beil
Work: (330)675-2666

Emergency Condition
C : Imminent Failure
or Failure Occurred

(1) Trumbull County EMA
Linda Beil
Work: (330)675-2666

(2) ODNR, Div. of Water
Engineering Group
Business Hours
(614)265-6731
Non-Business Hours
(614)799-9538

(3) DM Engineering LLC
Dennis Meek
Cellular: (216)316-6847

(4) Burgess & Niple, Inc.
George Biemel
Work: (614)459-2050

(1) Priority of Call

CITY OF GIRARD
UPPER GIRARD LAKE DAM
EMERGENCY ACTION PLAN

EXHIBIT 1

NOTIFICATION FLOWCHART

JANUARY 2010

BURGESS & NIPLE
Engineers ■ Environmental Scientists ■ Geologists

1.0 NOTIFICATION FLOW CHART

1.1 General

Exhibit 1 is the Notification Flowchart for potential emergency conditions at Upper Girard Lake Dam in Girard, Ohio. The Notification Flowchart provides the hierarchy for notification in the event of an emergency for the following conditions:

- Condition A: Nonfailure Emergency Condition.
- Condition B: Potential Failure Condition.
- Condition C: Imminent Failure or Failure Has Occurred Condition.

Section 4 of this Emergency Action Plan (EAP) provides further descriptions of these conditions. In addition, it is recommended that your agency and all involved in the Notification Flowchart, highlight the sections pertinent to them for clearer identification in an emergency situation.

1.2 Sample Messages

In the event of an emergency condition at the dam, the following notifications shall be made. Sample messages are provided below to expedite transfer of accurate and timely information in the event of such a situation. Underlined items are provided to indicate where information specific to the caller or call must be given.

1.2.1 Emergency Condition A – Nonfailure Emergency Condition

- Standby Alert Notification from Water Department Maintenance Supervisor to City of Girard Police Department.

    - *"This is (your name) of the Water Department. I am calling to advise you that we are starting constant surveillance of Upper Girard Lake Dam according to the Emergency Action Plan due to a nonfailure emergency condition at the dam. At this time, we do not anticipate that the dam will fail, but are notifying you so you are aware of the situation. We will call you again if the condition worsens, if a decision to evacuate is made, or when cancellation of this standby alert has been made." (Note, be prepared to provide additional information regarding the nature of the*

emergency condition). Indicate whether the Police Department should notify the Fire Department.

- Standby Alert Notification from Water Department Maintenance Supervisor to Water Department Employee(s).

  - *"This is (your name) of the Water Department. I am calling to advise you that we are starting constant surveillance of Upper Girard Lake Dam according to the Emergency Action Plan due to a nonfailure emergency condition at the dam. Please report to the water department as soon as possible."*

- Standby Alert Notification from City of Girard Police to Director of Public Services.

  - *This is (your name) at the Girard Police Department. I am calling to advise you that we are starting constant surveillance of Upper Girard Lake Dam according to the Emergency Action Plan due to a nonfailure emergency condition at the dam. At this time, we do not anticipate that the dam will fail, but are notifying you so you are aware of the situation. We will call you again if the condition worsens, if a decision to evacuate is made, or when cancellation of this standby alert has been made. Please notify Burgess & Niple, the Ohio Department of Natural Resources, A.P. O'Horo, and the Trumbull County Emergency Management Agency according to the Notification Flow Chart." (Note, be prepared to provide additional information regarding the nature of the emergency condition).*

- Standby Alert Notification from City of Girard Police to City of Girard Fire Department. (As necessary.)

  - *This is (your name) at the Police Department. I am calling to advise you that we are starting constant surveillance of Upper Girard Lake Dam according to the Emergency Action Plan due to a nonfailure emergency condition at the dam. At this time, we do not anticipate that the dam will fail, but are notifying you so you are aware of the situation. We will call you again if the condition worsens, if a decision to evacuate is made, or when cancellation of this standby alert has been made." (Note, be prepared to provide additional information regarding the nature of the emergency condition).*

- Standby Alert Notification from Director of Public Services to Ohio Department of Natural Resources (ODNR).

  - *"This is (your name) of the City of Girard. I am calling to advise you that we are starting constant surveillance of Upper Girard Lake Dam according to our Emergency Action Plan due to a nonfailure emergency condition at the dam. At this time, we do not anticipate that the dam will fail, but are notifying you so you are aware of the situation. We will call you again if the condition worsens, if a decision to evacuate is made, or when cancellation of this standby alert has been made." (Note, be prepared to provide additional information to ODNR regarding the nature of the emergency condition).*

- Standby Alert Notification from the Director of Public Services to A.P. O'Horo (Contractor).

  - *"This is (your name) of the City of Girard. I am calling to advise you that we are starting constant surveillance of Upper Girard Lake Dam according to our Emergency Action Plan due to a nonfailure emergency condition at the dam. At this time, we do not anticipate that the dam will fail, but are notifying you so you are aware of the situation. [Describe the situation and request appropriate equipment and materials be brought to the site.] Please respond as quickly as possible." (Note, be prepared to provide additional information to the contractor regarding the nature of the emergency condition and the types).*

- Standby Alert Notification from Director of Public Services to Trumbull County EMA

  - *"This is (your name) of the City of Girard I am calling to advise you that we are starting constant surveillance at Upper Girard Lake Dam according to our Emergency Action Plan due to a nonfailure emergency condition at the dam. At this time, we do not anticipate that the dam will fail, but are notifying you so you are aware of the situation. (Note, be prepared to provide additional information to the contractors regarding the nature of the emergency condition).*

1.2.2 Emergency Condition B – Potential Failure Condition

- Notification from Water Department Maintenance Supervisor to City of Girard Police Department.

    - *"This is (your name) at the Water Department. I am calling to notify you that a potential failure condition exists at Upper Girard Lake Dam. We have been directed to notify you of the potential failure condition of the dam so preparation measures can be taken if an evacuation notice is issued. Please note this is NOT presently an evacuation situation and we will call again if it becomes necessary to evacuate potential flood prone areas. Please check your agency's copy of the dam's Emergency Action Plan, specifically Appendix A, for maps of potential flooded areas in case an evacuation order is given. These maps indicate areas which may be flooded and would require evacuation should it become necessary. Again, this is NOT an evacuation condition at this time."*

- Notification from Water Department Maintenance Supervisor to Water Department Employees.

    - *"This is (your name) at the Water Department. I am calling to notify you that a potential failure condition was identified for Upper Girard Lake Dam at (time). Please report to the Water Department as soon as possible." (Note, be prepared to provide additional information regarding the nature of the emergency condition).*

- Standby Alert Notification from City of Girard Police to Director of Public Services.

    - *"This is Officer (your name) at the Girard Police Department. I am calling to notify you that a potential failure condition exists at Upper Girard Lake Dam. I have been directed to notify you of the potential failure condition of the dam so preparation measures can be taken if an evacuation notice is issued. Please note this is NOT presently an evacuation situation and we will call again if it becomes necessary to evacuate potential flood prone areas. Again, this is NOT an evacuation condition at this time. Please notify Burgess & Niple, the Ohio Department of Natural Resources, A.P. O'Horo, and the Trumbull County Emergency Management Agency according to the Notification Flow Chart. "*

- Notification from City of Girard Police to City of Girard Fire Department.

- *"This is Officer (your name) at the Girard Police Department. I am calling to notify you that a potential failure condition exists at Upper Girard Lake Dam. I have been directed to notify you of the potential failure condition of the dam so preparation measures can be taken if an evacuation notice is issued. Please note this is NOT presently an evacuation situation and we will call again if it becomes necessary to evacuate potential flood prone areas. Please check your agency's copy of the dam's Emergency Action Plan, specifically Appendix A, for maps of potential flooded areas in case an evacuation order is given. These maps indicate areas which may be flooded and would require evacuation should it become necessary. Again, this is NOT an evacuation condition at this time."*

- Notification from Director of Public Services to Ohio Department of Natural Resources (ODNR).

  - *"This is (your name) of the City of Girard. I am calling to notify you that a potential failure condition was identified for Upper Girard Lake Dam by the Water Department Maintenance Supervisor at (time). We have initiated notifications according to our Emergency Action Plan. We will call you again to inform you if the condition worsens, if a decision to evacuate is made, or when cancellation of this standby alert has been made" (Note, be prepared to provide additional information to ODNR regarding the nature of the emergency condition).*

- Notification from the Director of Public Services to A.P. O'Horo (Contractor.)

  - *"This is (your name) of the City of Girard. I am calling to notify you that a potential failure condition was identified for Upper Girard Lake Dam by the Water Department Maintenance Supervisor at (time). [Describe the situation and request appropriate equipment and materials be brought to the site.] Please respond as quickly as possible." (Note, be prepared to provide additional information to the contractors regarding the nature of the emergency condition).*

- Notification from Director of Public Services to Trumbull County EMA "911."

  - *"This is (your name) at the City of Girard. I am calling to notify you that we have a potential failure condition at Upper Girard Lake Dam. Please note that this is NOT*

presently an evacuation situation and we will call again if it becomes necessary to evacuate potential flood prone areas."

1.2.3 Emergency Condition C – Imminent Failure or Failure Has Occurred Condition

- Notification from Water Department Maintenance Supervisor to City of Girard Police Department

  - *"This is (your name) of the City Water Department. I am calling to notify you that an evacuation order for Upper Girard Lake Dam downstream/upstream flooding area was issued at (time). Please notify the emergency response organizations, including the Fire Department, according to the Emergency Action Plan. Maps of potentially flooded areas are in Appendix A of the dam's Emergency Action Plan. You can use the maps to determine areas from which people should be evacuated. Also, the five roads that cross Squaw Creek should be closed to the public immediately. Again, we are asking you to begin the evacuations and road closures immediately."*

- Notification from Water Department Maintenance Supervisor to Water Department Employees

  - *"This is (your name) at the Water Department. I am calling to notify you that failure of Upper Girard Lake Dam is imminent/has occurred. You are needed at this time. Please respond as quickly as possible." (Note, be prepared to provide additional information to the contractors regarding the nature of the emergency condition).*

- Notification from City of Girard Police Department to Director of Public Services

  - *"This is Officer (your name) at the Girard Police Department. I am calling to notify you that an evacuation order for Upper Girard Lake Dam downstream/upstream flooding area was given at (time). Maps of potentially flooded areas are in Appendix A of the dam's Emergency Action Plan. You can use the maps to determine areas from which people should be evacuated. Please notify the Trumbull County EMA and the Ohio Department of Natural Resources as indicated on the Notification Flow Chart. Again, we are asking you to begin the evacuations immediately."*

- Notification from City of Girard Police Department to City of Girard Fire Department

  - *"This is Officer (your name) at the Girard Police Department. I am calling to notify you that an evacuation order for Upper Girard Lake Dam downstream/upstream flooding area was given at (time). Maps of potentially flooded areas are in Appendix A of the dam's Emergency Action Plan. You can use the maps to determine areas from which people should be evacuated. Again, we are asking you to assist our offices to begin the evacuations immediately."*

- Notification from City of Girard Police Department to Residents

  - *"An evacuation order for Upper Girard Lake Dam flood prone area has been given. Please evacuate this area to higher ground immediately. This is an emergency. Please leave now!"*

- Notification from Director of Public Services to Trumbull County EMA

  - *"This is (your name) of the City of Girard. I am calling to notify you that failure of Upper Girard Lake Dam is imminent/has occurred. Please notify all available emergency personnel according to the Emergency Action Plan for the dam. Specific details can be found in the Notification Flowchart, Exhibit 1 in the EAP. Evacuation of flood prone areas downstream/upstream of the dam as shown in the Emergency Action Plan should be started immediately."*

- Notification from Director of Public Services to ODNR

  - *"This is (your name) of the City of Girard. I am calling to notify you that failure of Upper Girard Lake Dam is imminent/has occurred. We have already notified "911" according to the Emergency Action Plan for the dam. We have told them that evacuation of flood prone areas (as shown in the Emergency Action Plan) should be started immediately." (Note, be prepared to provide additional information to ODNR regarding the nature of the emergency condition).*

2.0 EXECUTIVE SUMMARY

This Emergency Action Plan (EAP), required by the Ohio Department of Natural Resources (ODNR), creates an organizational framework in the event of failure of the Upper Girard Lake Dam. This emergency plan outlines and assigns responsibilities to the various public entities that will respond to the three conditional emergencies that are described herein. The site location and potentially flooded areas have been identified on maps. In addition, a flowchart outlining the parties to be contacted was created to avoid confusion and expedite responses. Sample messages have been included so during emergencies a script can be followed and pertinent details included. Finally, a list of emergency supplies and resources has been included. This document is intended to be used as a tool outlining the proper procedures for an organized and swift response should an emergency condition or failure occur at the Upper Girard Lake Dam.

3.0 INTRODUCTION

3.1 Statement of Purpose

The purpose of this EAP is to safeguard lives and to reduce damage to the property of the citizens of Trumbull County who live or are traveling in close proximity to the Upper Girard Lake Dam in the event of failure of the dam or flooding caused by large flow releases from the dam. The EAP was prepared to meet the requirements of ODNR for an EAP as provided in Ohio Administrative Code (OAC) 1501:21-15-07 and 1501:21-21-04 and as further detailed in ODNR's EAP Guidelines.

3.2 Project Description

Upper Girard Lake Dam is located in Trumbull County, Ohio and controls a drainage area of 13 square miles. The dam is one of two lakes that were created by damming Squaw Creek in 1920. The focus of this EAP is the Upper Girard Lake Dam, however, the Lower Girard Lake (formerly Liberty Lake) Dam will be impacted as a result of failure of the Upper Girard Lake Dam. Upper Girard Lake has a surface area of approximately 175 acres and a maximum depth of 45 feet. Upper Girard Lake Dam is located 2.8 miles upstream from the confluence of Squaw Creek and the Mahoning River. Both the Upper and Lower Girard Lakes were purchased by the City of Girard in 1995 from the Ohio Water Service Company. Exhibit 2 shows the vicinity map of the Upper Girard Lake Dam location.

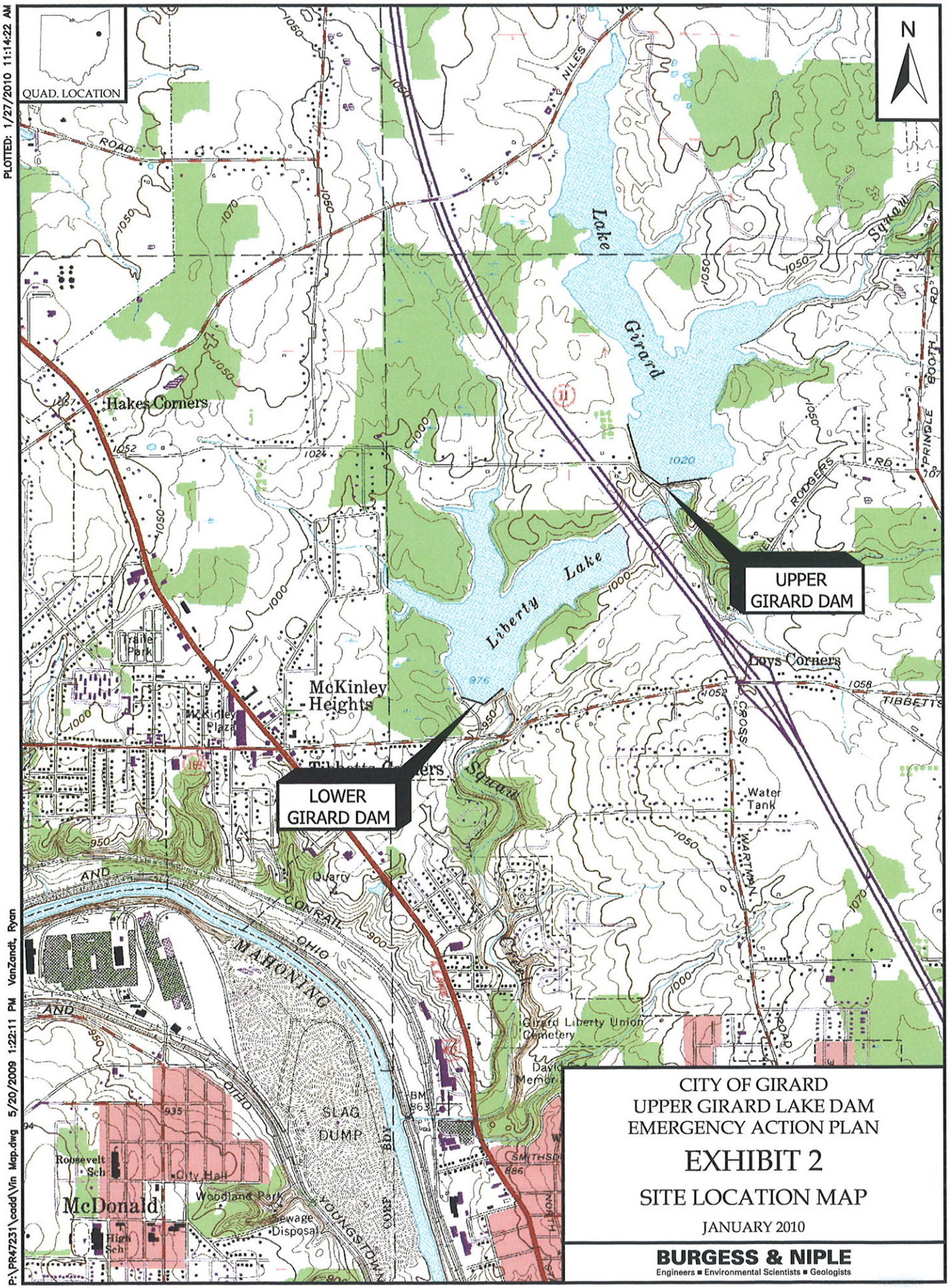
Upper Girard Lake Dam consists of a rolled earth embankment, approximately 2,720 feet in length with a maximum height of 55 feet. The principal spillway a 40-foot diameter Morning Glory type riser which discharges into a 17.5-foot horseshoe shaped concrete pipe. The spillway elevation is 1020.6 feet and the top of the dam is 1027.6 feet. The lake can be drawn down using four 30-inch pipes at the spillway. At the crest of the spillway, the upper lake has a surface area of about 175 acres and impounds approximately 2,760 acre-feet. Pertinent information for the streambed, spillway, and top of dam are shown in Table 1. Exhibit 3 is a site plan for the Upper Girard Lake Dam.

Table 1
Dam Reservoir Data(1)

Item	Elevation (feet-MSL)	Surface Area (acres)	Storage Volume (acre-feet)
Streambed	973	0	0
Principal Spillway	1020.6	175	2,760
Top of Dam	1027.6	210	4,289

(1)Source: ODNR Dam Safety Inspection Report, Inspection Date: June 15, 2006, Dam Inventory Sheet.

The Lower Girard Lake dam is located approximately 0.9 mile downstream from the Upper Girard Lake Dam and 1.9 miles upstream from the confluence of Squaw Creek and the Mahoning River. The dam is a combination of a concrete buttress Ambursen dam and an earth embankment. In 2008, the Ambursen dam was partially breached by removing several concrete panels along the bottom of the dam and the reservoir was drained. Squaw Creek currently flows through the opening created where the concrete panels were removed. The U.S. Army Corps of Engineers (USACE) is developing plans to rehabilitate the dam and return it to service.



CITY OF GIRARD
UPPER GIRARD LAKE DAM
EMERGENCY ACTION PLAN

EXHIBIT 2

SITE LOCATION MAP

JANUARY 2010

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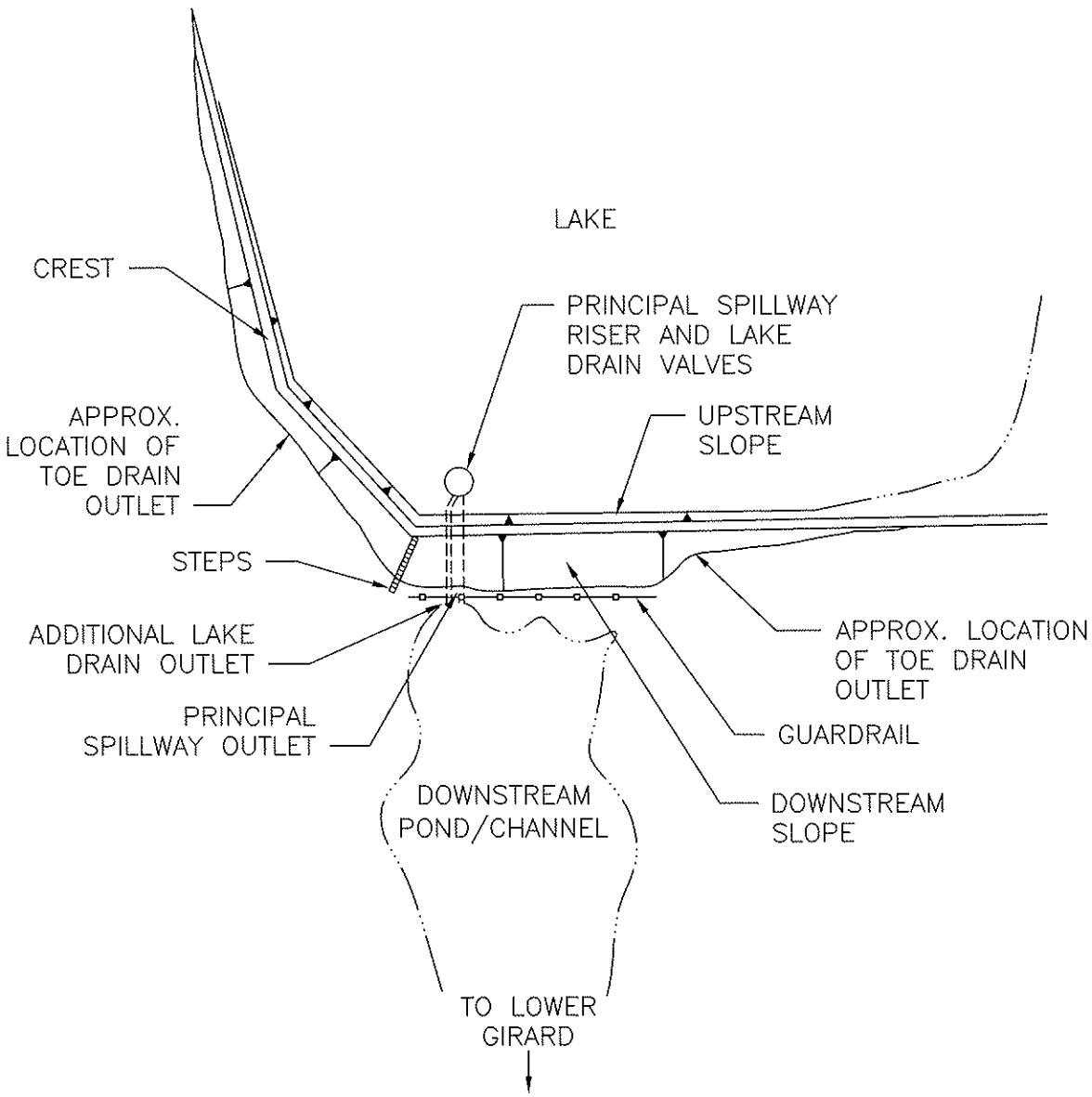
PLOTTED: 1/27/2010 11:14:22 AM
P:\PR47231\cadd\Vin Map.dwg 5/20/2009 1:22:11 PM VanZandt, Ryan



SCALE: NONE

SOURCE: ODNR 2006 DAM SAFETY INSPECTION REPORT

CITY OF GIRARD
UPPER GIRARD LAKE DAM
EMERGENCY ACTION PLAN

EXHIBIT 3

SITE SKETCH

JANUARY 2010

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4.0 EMERGENCY CONDITIONS AND CLASSIFICATIONS

If any of the following conditions are developing, appear imminent or have occurred, implement the notification plan immediately.

Emergency conditions shall be classified as follows:

4.1 Condition A: Nonfailure Emergency Condition

Emergency conditions with no immediate threat to the integrity of the dam; such as:

- Water impounding behind the dam such that flow is 2.5 feet deep or more over the principal spillway (spillway crest elevation is 1020.6 feet).
- Obstructions are present at principal spillway.
- Sinkhole develops downstream with no water present.
- Structural damage to discharge pipe.
- Severe erosion downstream of dam.

4.2 Condition B: Potential Failure Condition

Failure may occur but corrective measures may prevent or mitigate failure; such as:

- Water is impounding behind the dam such that flow is 4 feet deep or more over the principal spillway (approximately 3 feet below the crest of the dam)..
- Cracks develop in the concrete Morning Glory spillway and water is seeping through the cracks.
- Seepage occurs through the dam embankment and/or foundation at a rate of less than 25 gallons per minute (gpm) but no soil particles are observed.

- Unusual crack develops in the embankment and/or foundation with minor seepage (wet spots on the surfaces) or controllable flow is observed.

- Water is observed in a sinkhole downstream but there are no soil particles in the water.

- A large slump or slide develops in the embankment and threatens to release the impounded water.

- A clear discharge is observed at the toe of the embankment.

4.3 Condition C: Imminent Failure or Failure has Occurred Condition

No time is available to attempt corrective measures, such as:

- Water level is within 2 feet of the top of dam.

- Uncontrolled water flows through cracks in the concrete Morning Glory spillway, the embankment and/or the foundation, steadily increasing in size and volume.

- Water is observed in a sinkhole downstream where soil particles are noted in the water.

- Multiple slumps or slides are observed and are continuing to enlarge.

- Whirlpool is observed in the impounded water.

- Dam sections are displaced or separated.

Evacuation should be implemented immediately if any of the above Condition C criteria exist.

5.0 GENERAL RESPONSIBILITIES

5.1 Responsibility for Notification

The City of Girard Water Department would likely be first notified of a potential problem at the dam and be the first on the scene. The maintenance supervisor will notify the city officials and have key personnel proceed to the dam for corrective measures. If the supervisor/neighbors observe that dam failure is imminent before city personnel arrive, he would notify the emergency agencies and initiate the evacuation plan. Once city officials arrive at the dam, they will assume the responsibility of notifying and maintaining communication with the emergency agencies.

5.2 Upper Girard Lake Dam Owner Responsibilities

5.2.1 EAP Coordinator

- The Water Department Maintenance Supervisor shall be the EAP Coordinator and be responsible for:
    - Periodically reviewing and updating the EAP, see Appendix B.
    - Establishing a training program for personnel to make them familiar with the EAP and knowledgeable of the tasks to be performed in the event of an emergency at the dam, in accordance with Appendix B of this EAP.
    - Preparing the annual emergency preparedness exercise as described in Appendix B of this EAP.
    - Serving as the EAP Contact Person

5.2.2 Emergency Response Director

- The **Water Department Maintenance Supervisor** shall service as the Emergency Response Director in the event of an emergency condition at the dam. The **Director of Public Service** shall serve as the back-up Emergency Response Director. In the event that neither of these individuals is available, the ranking City staff person shall

take responsibility to make appropriate notifications and to request assistance from the ODNR and/or a professional engineer. The Emergency Response Director shall:

- Upon arrival at the site, assume responsibility for the emergency condition, determine initial emergency condition classification, and continue to evaluate condition.
- Make notifications according to Exhibit 1, Notification Flowchart.
- Provide constant surveillance of the dam.
- Direct corrective actions at the dam in consultation with ODNR and a professional engineer.
- Maintain communication with the City of Girard Police Department.
- Determine the need for evacuation and initiate evacuation plan. This shall include evacuation downstream of the dam due to an incident at the dam.
- Coordinate with construction contractor(s) as needed.
- Terminate emergency status at the dam.

5.3 Responsibility for Evacuation

5.3.1 City of Girard Police Department – Primary Responsibility

- Due to the short travel time of the flood wave, the City of Girard Police Department should activate the Trumbull County Emergency Alert System in conjunction with notifying all residents of evacuation by loud speaker equipped squad cars while safety personnel are being deployed.

- If failure of the dam is considered to be a strong possibility, the Police Department shall close all roads that may be flooded by a flood wave from the dam, specifically, Shannon Cross Wartman Road, State Route 11, Tibbetts Wick Road, Glendale Avenue, and U.S. Route 422 (State Street).

5.3.2 City of Girard Fire Department – Secondary Responsibility

- Assist City of Girard Police Department with evacuation of residents as needed.

5.4 Responsibility for Termination

The Emergency Response Director or ranking member of the City of Girard will be responsible for cancellation of the emergency condition after consultation with ODNR and determination that the threat of dam failure or any additional downstream damage has been minimized. The emergency agencies shall be notified following Exhibit 1, Notification Flowchart once the emergency condition has been concluded.

5.5. Agency Duties

The following tables list potential duties that each agency may be called upon to perform should an emergency condition arise at the Upper Girard Lake Dam. The hierarchy of notification can be found in the Notification Flowchart (see Figure 1).

A. Duties and Responsibilities for Condition A: Nonfailure Emergency

Organization	Condition A Duties
City of Girard Water Department	• Coordinate response activities at the dam.
City of Girard Police Department	• Notify City Director of Public Services at beginning of emergency condition.. • Notify City Fire Department at beginning of emergency condition, if necessary. • Review the flood inundation maps contained in Appendix A of the dam's EAP to be familiar with areas that may require evacuation if an evacuation order is given.
City of Girard Director of Public Services	• Notify ODNR at beginning of emergency condition. • Mobilize local contractors if needed. • Notify ODNR when emergency condition ends.

Organization	Condition A Duties
City of Girard Fire Department	• Review the flood inundation maps contained in Appendix A of the dam's EAP to be familiar with areas that may require evacuation if an evacuation order is given.
ODNR	• Monitor events at the dam. • Offer technical advice to City staff.
Local Contractor 1. O'Horo Contractor	• Provide construction equipment, materials, and personnel to assist City staff in responding to the emergency condition.
Trumbull County EMA	• Review the flood inundation maps contained in Appendix A of the dam's EAP to be familiar with areas that may require evacuation if an evacuation order is given.

B. Duties and Responsibilities for Condition B: Potential Failure

Organization	Condition B Duties
City of Girard Water Department	• Coordinate response activities at the dam.
City of Girard Police Department	• Notify City Director of Public Services at beginning of emergency condition.. • Notify City Fire Department at beginning of emergency condition, if necessary. • Review the flood inundation maps contained in Appendix A of the dam's EAP to be familiar with areas that may require evacuation if an evacuation order is given.
City of Girard Director of Public Services	• Notify ODNR at beginning of emergency condition. • Mobilize local contractors if needed. • Notify ODNR when emergency condition ends.
City of Girard Fire Department	• Review the flood inundation maps contained in Appendix A of the dam's EAP to be familiar with areas that may require evacuation if an evacuation order is given.
ODNR	• Monitor events at the dam. • Offer technical advice to City staff.
Local Contractor 1. O'Horo Contractor	• Provide construction equipment, materials, and personnel to assist City staff in responding to the emergency condition.
Trumbull County EMA	• Review the flood inundation maps contained in Appendix A of the dam's EAP to be familiar with areas that may require evacuation if an evacuation order is given.

C. Duties and Responsibilities for Condition C: Imminent Failure or Failure of the Dam

Organization	Condition C Duties
City of Girard Water Department	• Coordinate response activities at the dam.
City of Girard Police Department	• Notify City Director of Public Services at beginning of emergency condition.. • Notify City Fire Department at beginning of emergency condition. • IMMEDIATELY BEGIN EVACUATION of flood prone areas downstream of the dam as shown on the flood inundation maps contained in Appendix A of the dam's EAP. • Evacuation activities may include physical evacuation, calling, knocking on doors, announcements with bullhorns, etc. • Restrict public access to the following streets where they cross Squaw Creek until the emergency condition is controlled or past: Shannon Cross Wartman Road, SR 11, Tibbetts Wick Road, Glendale Avenue, and U.S. Route 422 (State Street). • Coordinate community evacuation and response activities of all available response organizations.
City of Girard Director of Public Services	• Notify ODNR at beginning of emergency condition. • Mobilize local contractors if needed. • Notify ODNR when emergency condition ends.
City of Girard Fire Department	• Assist police department in notifying residents downstream of the dam to evacuate. • Assist in response activities such as resident evacuation, rescue of stranded residents, placing sandbags, and other duties, as required. • Assist in evacuating sick, elderly, and/or disabled residents and other duties, as required.
ODNR	• Monitor events at the dam. • Offer technical advice to City staff.
Local Contractor 1. O'Horo Contractor	• Provide construction equipment, materials, and personnel to assist City staff in responding to the emergency condition.
Trumbull County EMA	• Review the flood inundation maps contained in Appendix A of the dam's EAP to be familiar with areas that may require evacuation if an evacuation order is given. • Assist police department in notifying residents downstream of the dam to evacuate.

6.0 PREPAREDNESS

6.1 Access to the Site

Upper Girard Lake Dam can be accessed via Anderson Morris Road from the west or Shannon Cross Wartman Road via Oriel Rodgers Road from the east.

6.2 Emergency Corrective Measures

6.2.1 High Pool Levels/Overtopping Condition

- The existing lake drains can only be operated by SCUBA divers – they are not accessible from the service platform at the Morning Glory spillway. If conditions are safe for a diver, the lake drains can be opened to lower the pool level.

- Pumps and/or siphons may be necessary if the lake drains cannot be accessed or are not functioning properly.

- In an extreme condition, a notch could be excavated in the far east or far north sections of the embankment (far from the Morning Glory spillway). This action should only be taken as a last resort because it will severely impair the embankment's integrity and will require an engineered repair once the emergency condition has been abated.

- Contact a Professional Engineer for permanent repair recommendations.

6.2.2 Leakage/Cracking Condition

- The existing lake drains can only be operated by SCUBA divers – they are not accessible from the service platform at the Morning Glory spillway. If conditions are safe for a diver, the lake drains can be opened to lower the pool level.

- Pumps and/or siphons may be necessary if the lake drains cannot be accessed or are not functioning properly.

- In an extreme condition, a notch could be excavated in the far east or far north sections of the embankment (far from the Morning Glory spillway). This action should only be taken as a last resort because it will severely impair the embankment's integrity and will require an engineered repair once the emergency condition has been abated.

- After the reservoir is drained to the appropriate level, contact a Professional Engineer for permanent repair recommendation.

6.2.3 Sinkhole Condition

- Contact contractor to fill sinkhole with earth or rockfill. These materials are available through A.P. O'Horo (Contractor.)

- Contact a Professional Engineer for permanent repair recommendations.

6.2.4 Lake Drain Blockage Condition

- If some of the lake drains are still operable, use them to lower the water level to allow access to the blocked lake drain.

- Lower the reservoir level using pumps and/or siphons if the lake drains cannot be accessed or all drains are not functioning.

- If conditions are safe, utilize a diver to investigate and, if possible, remove the blockage.

- Remove blockage from lake drain once water recedes. If the lake drain is structurally damaged, contact a Professional Engineer for permanent repair recommendations.

6.2.5 Severe Downstream Erosion or Minor Structural Damage

- Monitor and log condition of structures or downstream erosion.

- Contact a Professional Engineer for permanent repair recommendations.

6.3 Emergency Supplies and Resources

Name	Emergency Items	Address	Phone
A.P. O'Horo Contractor	Riprap, Gravel, Fill, Backhoes, Dozers, Excavators	3130 Belmont Avenue P.O. Box 2228 Youngstown, Oh 44504	General 330.759.9313 Dan O'Horo 330.360.411 330.793.9823 Tom Metzinger 330.797.9317

6.4 Training and Updating of the EAP

The EAP should be reviewed and updated by the Owner and all affected parties at least once a year or as necessary. When updating the EAP, check all contact names and phone numbers for verification. If there are significant changes to the plan, such as dam ownership or major modifications to the dam, the EAP should be updated as soon as possible.

7.0 INUNDATION MAPS

Appendix A contains a Flood Inundation Mapping Report (September 2009) prepared by Burgess & Niple, Inc. (B&N). The report presents pertinent background information and results of a failure inundation mapping study for the downstream area below the Upper Girard Lake Dam. The study was completed in response to requests by the ODNR concerning Upper Girard Lake Dam and provides the base data for preparation of this EAP.

The study considers events of an extremely remote nature. The results are not in any way intended to reflect the integrity of the Upper Girard Lake Dam.

The study analyzed flooding results for four events at the dam – Probable Maximum Flood (PMF) without and with failure of Upper Girard Lake Dam, the 25 percent PMF with failure of the dam, and the normal pool with failure event. The breach configuration was determined based on (1) guidelines given in the June 1980 publication, Flood Emergency Plans – Guidelines for Corps Dams, by the U.S. Army Corps of Engineers (USACE) Hydrologic Engineering Center and (2) methodology in Washington State Department of Ecology Technical Note 1, *Dam Break Inundation Analysis and Downstream Hazard Classification*, July 1992. The USACE's Hydrologic Engineering Center HEC-1 model was used to model the flood events downstream from Upper Girard Lake Dam.

APPENDIX A

DAM FAILURE INUNDATION MAPPING REPORT

APPENDIX A
DAM FAILURE INUNDATION MAPPING REPORT
UPPER GIRARD DAM

PREPARED FOR
CITY OF GIRARD, OHIO

FEBRUARY 2010

BURGESS & NIPLE, INC.
5085 REED ROAD
COLUMBUS, OHIO 43220

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APPENDIX A

UPPER GIRARD LAKE DAM

FAILURE INUNDATION MAPPING REPORT

This report presents pertinent background information for and results of a failure inundation mapping study below Upper Girard Lake Dam on Squaw Creek in Girard, Ohio. This study responds to requests by the Ohio Department of Natural Resources (ODNR) concerning Upper Girard Lake Dam, and provides the base data for preparation of the Emergency Action Plan (EAP).

1.0 AUTHORITY FOR STUDY

Burgess & Niple, Inc. (B&N) was authorized by the Agreement signed December 30, 2008 by the City of Girard, Ohio, to provide flood inundation mapping below Upper Girard Lake Dam as part of the preparation of an EAP.

2.0 SCOPE OF STUDY

The City retained B&N to complete hydrologic and hydraulic modeling of potential downstream flooding along Squaw Creek below the Upper Girard Dam under four conditions:

1. Probable Maximum Flood (PMF) without failure of the dam
2. PMF with failure of the dam
3. 25 Percent PMF or 100-year flood with failure of the dam
4. Normal pool ("Sunny day") failure of the dam.

In 1980, B&N prepared a Flood Hazard Evaluation Study (FHES) for both the Upper and Lower Girard Dams (then known as Liberty Dam and Girard Dam). That study was based on only embankment overtopping failure during flood events; of particular interest were the PMF without and with failure of the dams. For the current work, B&N and ODNR discussed using the results of the FHES for defining the potentially flooded areas and ODNR agreed that, for the purposes of an EAP, the 1980 FHES modeling approach is acceptable, but that breach parameters needed to be revised per current understanding of breach formation, with resultant modified flooding impacts included in the EAP.

The 1980 FHES did not include evaluation of downstream flooding potential for a normal pool failure; therefore it was necessary to complete additional modeling for this condition. The HEC-1 model that was used for the 1980 FHES was used as the basis for modeling the normal pool failure condition for the EAP.

In addition to the PMF and normal pool conditions described above, the ODNR requires that either the 25 percent PMF with failure or the 100-year flood event with failure of the dam be modeled. For this evaluation the 25 percent PMF with failure of the dam was analyzed. The HEC-1 model that was developed for the 1980 FHES was used for modeling the 25 percent PMF with failure condition.

In the 1980 FHES, failure of the Upper Girard Dam, the State Route (SR) 11 embankment, and the Lower Girard Dam were all assumed to fail when overtopped by 0.8 foot of water, which was considered to provide critical erosive velocities that would breach the embankments. Following current guidance for this study, failure was assumed to occur when the pool behind each embankment reached its maximum water surface elevation.

This failure condition results in a slightly higher upstream water surface elevation at the time of failure than was used in the 1980 analysis.

3.0 BASE INFORMATION

3.1 Data Sources

Existing information from the FHES has been utilized where applicable. The FHES used a combination of HEC-2 and HEC-1 modeling to develop the downstream flooding elevations. The HEC-2 model was used to develop elevation-storage-flow relationships for flood routing in the channel sections from the Upper Girard Dam to the SR 11 embankment and from the Lower Girard Dam to US 422. This information along with PMF inflows and reservoir elevation-storage-outflow information was entered into the HEC-1 model to determine flows and flood elevations from the Upper Girard Dam down to US 422.

3.2 Upper Girard Lake Dam

Upper Girard Lake Dam is on Squaw Creek, 2 miles north of Girard, Ohio and about 2.5 miles upstream from the confluence with the Mahoning River. It controls a drainage area of 13.03 square miles. The dam is an earthen embankment with a 40-foot diameter Morning Glory spillway. The spillway crest is at Elevation 1020.6 and the top of dam elevation is 1027.6 feet.

3.3 Lower Girard Lake Dam

Lower Girard Lake Dam is on Squaw Creek, 1.5 miles north of Girard, Ohio and about 2.0 miles upstream from the confluence with the Mahoning River. It controls a drainage area of 17.2 square miles. The dam consists of a 70-foot-long broad crested weir spillway, and 436 feet of Ambursen buttress dam and earthen embankment sections. The spillway crest elevation is 975.4 and the top of the dam elevation is 979.9. The emergency spillways consist of two natural channels, 180 and 450 feet wide. In 2008, the dam was partially breached by removal of several concrete bottom panels from the Ambursen buttress section of the dam, consequently, the lake is currently maintained in a drained condition (i.e., no pool). For this evaluation, an outflow rating curve was developed based on the dam with the partial breach. During a flood event, water will both discharge through the partial breach and fill the pool behind the dam, and, under extreme flood conditions, the principal spillway will be in service.

3.4 Initial Conditions

The U.S. Army Corps of Engineers (USACE) HEC-1 computer model was used to perform the reservoir and river routing for this study. For the conditions modeled, initial pool elevations in the reservoirs were set at the spillway crest elevation for Upper Girard Dam, Elevation 1020.6, and at the reservoir's bottom elevation for Lower Girard Dam, Elevation 975.4.

3.5 Breach Definition

Upper Girard Lake Dam - A breach in an earthen dam such as Upper Girard Lake Dam is typically considered to be trapezoidal in cross-section and is defined by its bottom width, the elevation of the bottom of the breach, the side slopes of the breach, and the time period over which the breach forms. The USACE Hydrologic Engineering Center (HEC) has developed general guidelines for establishing the breach parameters and the Washington State Department of Ecology prepared a numeric methodology for estimating breach parameters and peak outflows, as presented in the Technical Note 1, *Dam Break Inundation Analysis and Downstream Hazard Classification*, July 1992.

Washington State's Technical Note 1 provides a methodology that can be used to predict both the breach parameters and the estimated maximum discharge from the breach in the dam. This methodology was used to establish the breach parameters for the Upper Girard Lake Dam. The water depth in the reservoir is different for each failure condition (PMF, 25 percent PMF, and normal pool), therefore the breach parameters may vary for each condition. Based on the predicted breach parameters and maximum breach outflow, preliminary computer modeling runs were completed in which the physical breach parameters (i.e., breach bottom width and formation time) were varied to bring the modeled outflow into reasonable agreement with the predicted breach outflow. For the Upper Girard Lake Dam, breach formation was assumed to begin when the pool reaches its maximum level for the PMF and 25 percent PMF with failure conditions. For the normal pool failure condition, failure was set to begin at normal pool level.

Table A-1 summarizes the breach parameters which were used for the Upper Girard Lake Dam.

Table A-1
Breach Parameters for the Upper Girard Lake Dam

Parameter	PMF	25 Percent PMF	Normal Pool
Elevation of Bottom of Breach (feet)	974.6	974.6	974.6
Elevation at which Breach Initiates (feet)	1028.96	1024.94	1020.6
Bottom Width (feet)	120	120	120
Side Slopes Z (Z:1)	1	1	1
Breach Formation Time (hour)	1.4	1.1	0.85

In the above breach definitions, the elevation of the bottom of the breach was set at the bottom of the reservoir storage pool.

State Route 11 - The SR 11 embankment is approximately 30 feet high. The breach bottom width was set at 30 feet, side slopes at 1:1, breach bottom elevation at 975.4 (bottom of upstream creek bed), and a breach formation time of 1 hour. These parameters were maintained for all embankment failure conditions. For the PMF, 25 percent PMF, and normal pool with failure conditions, the elevation at which the SR 11 breach initiates was set at the maximum elevation reached following failure of the upstream dam.

Lower Girard Lake Dam - The Lower Girard Lake Dam breach parameters were established based on failure of two complete sections of the concrete Ambursen section of the dam. The breach bottom width was set at 30 feet (two 15-foot sections), side slopes at 0:1 (vertical), breach bottom elevation at 937.5 (bottom of upstream creek bed), and a breach formation time of 0.1 hour. These parameters are consistent with breach parameters that were used for the Lower Girard Lake Dam's EAP. For the PMF, 25 percent PMF, and normal pool with failure conditions, the elevation at which the Lower Girard Lake Dam's breach initiates was set at the maximum elevation reached following failure of the upstream dam and the SR 11 embankment.

3.6 Bridges

There are five bridges that cross Squaw Creek along the modeled reach and they were included in the model as follows:

- Shannon Cross Wartman Road - The Shannon Cross Wartman Road bridge is located immediately below Upper Girard Lake Dam and has a very low profile, therefore it was not included in the model.

- State Route (SR) 11 – SR 11 is a four-lane divided highway with a center median located approximately 0.2 mile downstream of Upper Girard Lake Dam. The road was constructed on an earthern embankment approximately 30 feet in height. Squaw Creek passes through the SR 11 embankment via a box culvert. The SR 11 embankment and box culvert were modeled in HEC-1 as a "dam" because large flooding events would back up water behind the roadway embankment and would cause overtopping of the embankment.

- Tibbetts Wick Road – Tibbetts Wick Road is located approximately 0.14 mile downstream of the Lower Girard Lake Dam and was modeled using routing parameters developed from the 1980 FHES.

- Glendale Avenue – Glendale Avenue is located approximately 0.9 mile downstream of the Lower Girard Lake Dam and was modeled using routing parameters developed from the 1980 FHES.

- U.S. Route 422 (State Street) – U.S. Route 422 is located approximately 1.6 mile downstream of the Lower Girard Lake Dam and was modeled using routing parameters developed from the 1980 FHES.

3.7 Reservoir Storage and Spillway Ratings.

Reservoir storage and spillway rating curves were used as given in the FHES for the Upper Girard Lake Dam and the SR 11 embankment.

The Lower Girard Lake Dam was modified in 2008 with a "partial breach" of the concrete Ambursen section of the dam. A series of upstream concrete face plates were removed along the bottom of the Ambursen section to drain the pool and pass flows up to the 100-year event with non-pressure flow through the opening. Using a HEC-RAS model developed for the design of the partial breach, a rating curve was developed for the opening in the dam. This rating curve controls flow from the Lower Girard Lake ranging from normal low flows up to major precipitation events that fill the reservoir storage to the point where the existing principal spillway, emergency overflow spillways, and top of dam begin to discharge water at their respective control elevations. This total flow rating curve combining the discharge capabilities of the partial breach, the principal spillway, emergency overflow spillways, and the top of dam was used for routing the modeled flood events through the Lower Girard Lake.

4.0 STUDY RESULTS

4.1 PMF Without and With Failure

The Probable Maximum Flood (PMF) was modeled for the conditions of (1) no failure of the dams or the SR 11 embankment when over topped and (2) with failure of the dams and the SR 11 embankment when each pool reached its maximum pool level. Table A-3 summarizes the results of the modeling at key locations. The extent of flooding is shown on the *Upper Girard Dam Emergency Action Plan Flood Inundation Mapping* exhibit.

4.2 25 Percent PMF With Failure

The 25 Percent PMF was modeled for the conditions of failure of the dams and the SR 11 embankment when each pool reached its maximum pool level. Table A-3 summarizes the results of the modeling at key locations. The extent of flooding for this event is shown on the *Upper Girard Dam Emergency Action Plan Flood Inundation Mapping* exhibit.

4.3 Normal Pool Failure

Normal pool failure is defined a failure of the dam under nonflood conditions. The outflow hydrograph from the dam reaches a sharp peak and recedes rapidly back to base flow. The peak is attenuated as it moves downstream. The peak flow of 68,901 cfs from Upper Girard Lake Dam is reduced to 38,558 cfs at the U.S. Route 422 (State Street) Bridge. Peak flow and maximum water surface elevations are summarized in Table A-3. The extent of flooding is shown on the *Upper Girard Dam Emergency Action Plan Flood Inundation Mapping* exhibit.

4.4 Mapping Flood Information

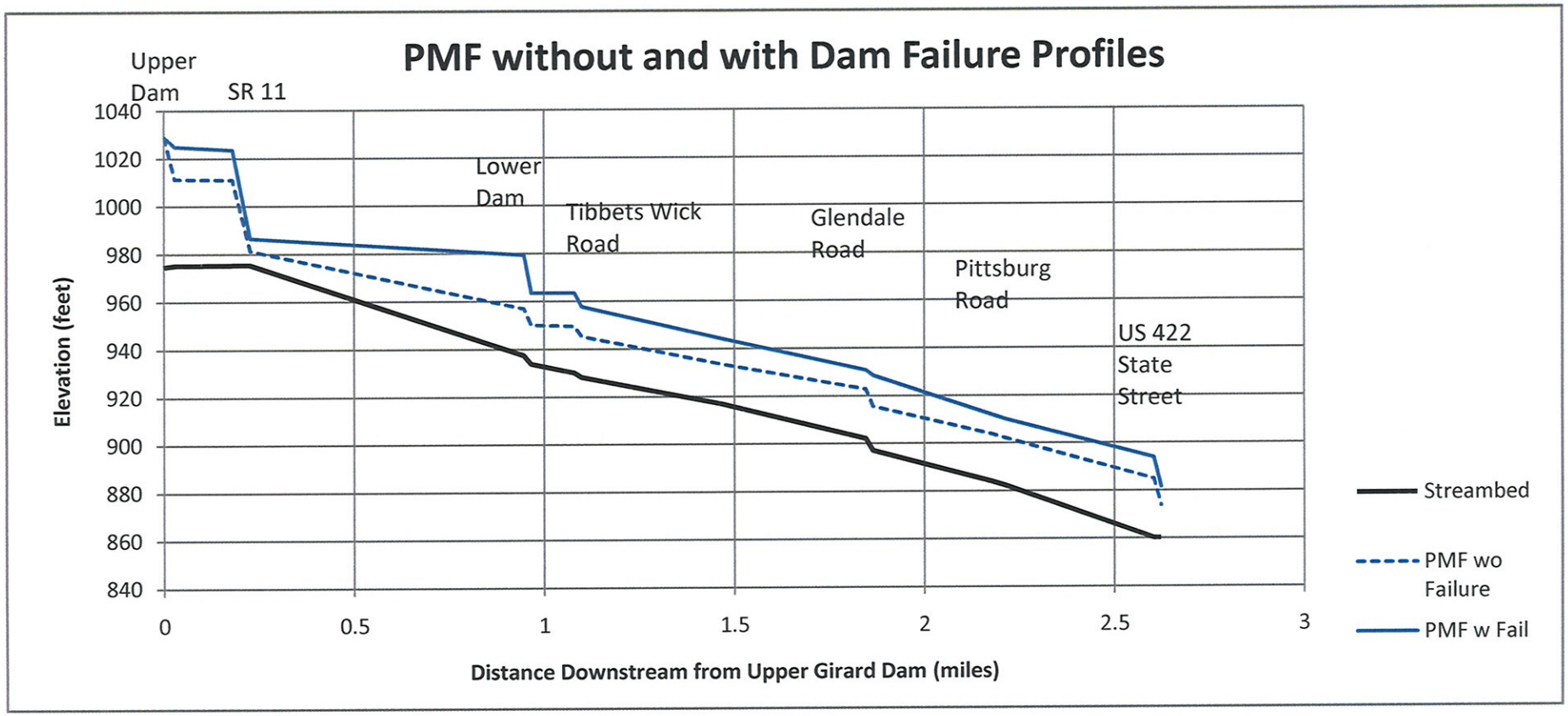
Flood information is provided at selected cross sections on the inundation map. Definitions of the peak time and peak elevation are listed in the legend. Elapsed time for each event is measured from the time when the Upper Girard Lake Dam failure begins.

Table A-3
Summary of Flood Routing Results

Location	PMF without Failure		PMF With Failure		25% PMF w/Failure		Normal Pool Failure	
	Maximum Flow (cfs)	Maximum Water Surface Elevation (feet)	Maximum Flow (cfs)	Maximum Water Surface Elevation (feet)	Maximum Flow	Maximum Water Surface Elevation (feet)	Maximum Flow (cfs)	Maximum Water Surface Elevation (feet)
Upper Dam	19,328	1028.96	89,211	1028.96	76,584	1024.95	68,901	1020.6
SR 11	19,284	1011.09	85,554	1023.55	72,818	1021.16	48,590	1018.06
Lower Dam	27,657	956.90	75,769	979.43	47,779	968.20	36,288	961.19
Tibbetts Wick Road	27,646	949.57	75,046	963.50	47,976	955.55	37,864	952.57
Glendale Road	27,585	922.78	71,801	930.87	48,396	926.59	37,479	924.59
Near Pittsburg Road	27,596	903.76	70,578	911.89	49,026	907.82	35,032	905.17
US 422	27,604	884.85	69,401	893.88	48,003	889.26	38,558	887.22

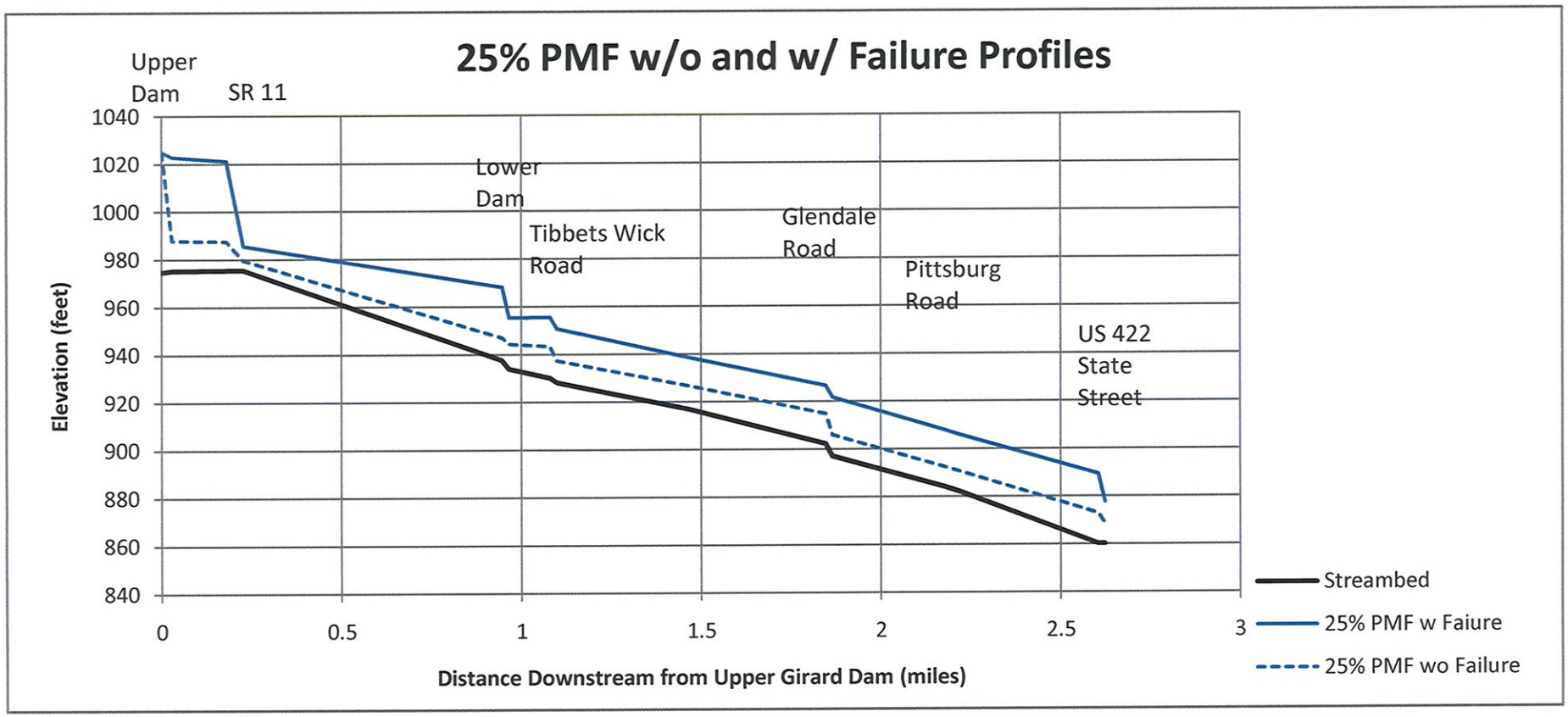
PROBABLE MAXIMUM FLOOD WITH FAILURE

WATER SURFACE PROFILE


PMF without and with Dam Failure Profiles
Upper Dam
SR 11
Lower Dam
Tibbets Wick Road
Glendale Road
Pittsburg Road
US 422 State Street
Elevation (feet)
1040
1020
1000
980
960
940
920
900
880
860
840
0
0.5
1
1.5
2
2.5
3
Distance Downstream from Upper Girard Dam (miles)
Streambed
PMF wo Failure
PMF w Fail

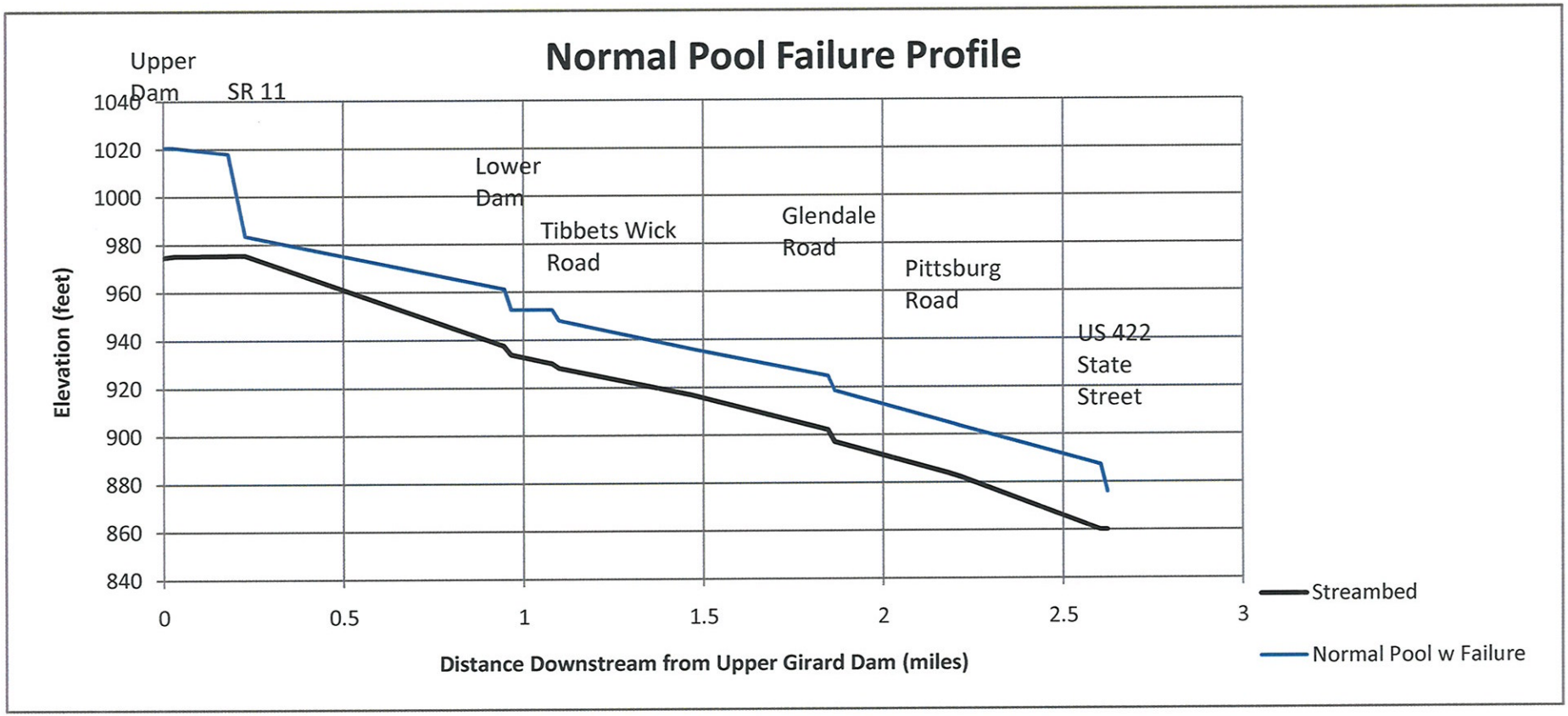
25 PERCENT PROBABLE MAXIMUM FLOOD WITH FAILURE

WATER SURFACE PROFILE


25% PMF w/o and w/ Failure Profiles
Upper Dam
SR 11
Lower Dam
Tibbets Wick Road
Glendale Road
Pittsburg Road
US 422
State Street
Elevation (feet)
1040
1020
1000
980
960
940
920
900
880
860
840
0
0.5
1
1.5
2
2.5
3
Distance Downstream from Upper Girard Dam (miles)
Streambed
25% PMF w Faiure
25% PMF wo Failure

NORMAL POOL FAILURE EVENT

WATER SURFACE PROFILE


Normal Pool Failure Profile
Upper Dam
SR 11
Lower Dam
Tibbets Wick Road
Glendale Road
Pittsburg Road
US 422 State Street
Elevation (feet)
1040
1020
1000
980
960
940
920
900
880
860
840
0
0.5
1
1.5
2
2.5
3
Distance Downstream from Upper Girard Dam (miles)
Streambed
Normal Pool w Failure

FLOOD INUNDATION MAPPING

APPENDIX B

TRAINING, EXERCISING, UPDATING, AND POSTING THE EAP

1.0 TRAINING

The City of Girard Director of Public Service shall be thoroughly familiar with the Emergency Action Plan (EAP) and the actions that may be required under the EAP.

The Director of Public Service shall be responsible for training alternate City staff to complete the Director of Public Service's duties in the event (s)he is not available during a period of emergency as described in this EAP. The Water Department Maintenance Supervisor shall also be familiar with those duties and able to carry them out.

In addition, the Director of Public Service shall be responsible for training dam maintenance staff and other City staff in the actions and responses that they may be called upon to complete in the event of an emergency at the dam.

2.0 EXERCISING

The Director of Public Service shall plan and convene an emergency exercise one time each year. The exercise shall include appropriate City administrative and maintenance personnel. Response organizations shall be invited to participate, however, their unavailability shall not be cause for canceling the exercise. The exercise shall be performed to test the procedures and determine appropriate actions in the event of an emergency.

At the conclusion of the exercise, the personnel shall review the exercise and prepare a written summary of lessons learned and items that can be improved upon.

3.0 UPDATING THE EAP

The Director of Public Service shall be responsible for keeping the EAP up-to-date. The Director of Public Service shall review the EAP at least annually for changes that may have taken place such as:

- Names of City staff or other response personnel specifically called out in the EAP.
- Contractor to be called in the event of an emergency at the dam.
- Alterations to the dam.
- Additions or deletions to the list of Emergency Supplies and Resources.
- Changed telephone numbers.

In addition, the EAP shall be updated if it is found to require modification as a result of an actual emergency situation.

Upon completion of each annual review, the Director of Public Service shall complete the form on the following page to document the review and update.

Every five years the City shall retain a Professional Engineer to review the EAP to assure that it remains viable in the event that an emergency should occur at the dam. At a minimum, the Professional Engineer's activities should include:

- A site visit to inspect the dam and appurtenances and to review staffing and emergency responses by City personnel.
- Review of the written plan.
- Confirm that Emergency Supplies and Resources are current.
- Complete any necessary updates to the EAP and submit it to the City.

4.0 POSTING THE EAP

The Director of Public Service shall be responsible for maintaining one copy of the EAP at City offices and for distribution of one copy of the final EAP, as approved by the ODNR, to each of the following organizations:

- Ohio Department of Natural Resources.
- Trumbull County Emergency Management Agency.
- City of Girard Police Department.
- City of Girard Fire Department.
- Burgess & Niple, Inc.

In addition to the above distribution of the EAP, the Notification Flowchart shall be posted in a public location in the City offices.

UPPER GIRARD LAKE DAM
EMERGENCY ACTION PLAN
PLAN REVIEW AND UPDATE RECORD

The EAP must be reviewed and updated (if necessary) annually for accuracy of information provided, particularly to keep contact names and telephone numbers up-to-date. At the conclusion of each review and update the changes shall be indicated in the following table.

Date Review Completed	Name and Title of Reviewer	Changes Made

If changes to contact information are made, copies of the revised sheets shall be provided to all holders of copies of the EAP.

APPENDIX C

PREPARATION AND APPROVAL OF THE EAP

1.0 PLAN PREPARATION

This Emergency Action Plan (EAP) was prepared by Burgess & Niple, Inc. (B&N), Columbus, Ohio for Upper Girard Lake Dam. The EAP was prepared based on observations made during site visits, information provided by the City, information obtained from Ohio Department of Natural Resources (ODNR) inspection reports, and modeling of flooding conditions as prepared by B&N. The EAP was prepared to meet the requirements of the ODNR for an EAP as provided in Ohio Administrative Code (OAC) 1501:21-15-07 and 1501:21-21-04 and as further detailed in ODNR's EAP Guidelines.

2.0 GIRARD MAYOR APPROVAL

This EAP for Upper Girard Lake Dam was prepared under my direction as the Mayor for the City of Girard. By signing this Approval, I certify that I have read and understand the EAP and the actions that may be required under it, and the information contained herein is accurate as of the date of my signature.

_____ _____

(Signature) (Date)

James J. Melfi
Mayor, City of Girard

3.0 ODNR APPROVAL

This EAP shall be submitted to the ODNR for review and approval. Upon receipt of written approval from the ODNR, a copy of ODNR's approval letter shall be attached in this EAP following this page and a copy of the approval letter shall be forwarded to each holder of a copy of the EAP.

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UPPER GIRARD LAKE DAM
EMERGENCY ACTION PLAN
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_____ _____

(Signature) (Date)

James J. Melfi
Mayor, City of Girard

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