



Addendum to the Tritt's Mill Dam Project RFQ

1. Ohio Department of Natural Resources Response to Township of Springfield.
2. Ohio Department of Natural Resources Misc. Site Visit Report.



Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

JAMES ZEHRINGER, DIRECTOR

Division of Soil & Water Resources

Theodore R. Lozier, P.E. • Chief

December 13, 2011

Township of Springfield
Township Trustees
Deborah Davis
R. Bruce Killian
Dean A. Young
2465 Canfield Road
Akron, OH 44312

RE: Tritts Mill Pond Dam
File Number: 0713-019
Summit County, Springfield Township

Dear Trustees:

In response to the requirements of Division of Soil & Water Resources Notice of Violation (NOV) No. 2011-1004, your office submitted a schedule to bring Tritts Mill Pond Dam into compliance. The schedule indicates that plans and specifications will be submitted to the Division of Soil & Water Resources by November 16, 2012, construction to begin by April 19, 2013, and construction to be completed by October 31, 2013. The deadline for construction completion is 10 months past the deadline required by the NOV. This deadline extension is only acceptable provided that the lake drain remains open and the impoundment remains drained. Please amend the schedule to include the submittal of the as-built plans and engineer's certification at the completion of construction. Also, in accordance with Ohio Administrative Code (OAC) Rule 1501:21-21-04, this dam must have an operation, maintenance, and inspection manual (OMI) and an emergency action plan (EAP). Please add the development and submittal of these documents to the schedule. I have enclosed guidelines for the development of the OMI and EAP.

Please make the above changes and resubmit the schedule for approval. We appreciate your cooperation to increase public safety by taking action to bring this dam into compliance. If you have any questions, please contact Tina Griffin of the Division of Soil & Water Resources at (614) 265-6634.

Sincerely,

Theodore R. Lozier, P.E., Chief
Division of Soil & Water Resources

DEC 22 '11 PM 3:43

TRL:tmg

cc: Alan Brubaker, P.E., P.S., Summit County Engineer

enclosures

GUIDELINES FOR AN OPERATION, MAINTENANCE AND INSPECTION MANUAL

- I. INTRODUCTION - State or list pertinent facts about the dam and reservoir; height, freeboard, lake area, drainage area, elevations, spillway sizes, etc.... Indicate purpose of reservoir and any special pertinent information. The Ohio Division of Water Inventory form includes much of this information.
- II. INSPECTION - This section should indicate who, how frequent, and what is involved in an inspection. A form or forms should be included which can be used for each type of inspection or items to be monitored. Each dam should have specific problem areas which will require monitoring. These areas will be specified or outlined in past inspection reports either performed by ODNR or the owner's engineer.

<u>FREQUENCY</u>	<u>PERSONNEL</u>	<u>ITEMS TO INSPECT/MONITOR</u>	<u>FORM NO.</u>
As needed	Damtender	Rainfall	
Weekly	Damtender	Seepage / wet areas Toe drain flow Pool Level Trash rack debris Slides/cracks Rodent activity Vandalism	
Once Every 3 months	Damtender	Piezometer	
Yearly	Engineer/ Damtender	Slope protection/riprap Erosion Condition of vegetal cover Spillway condition Embankment condition Lake drain conditions Settlement monuments	
Periodic 3 to 5 years	ODNR/Engineer	Engineer's Safety Inspection	

- III. MAINTENANCE - Indicate items which will require periodic maintenance. Each dam should have specific items addressed (see examples). Conditions specified on past inspection reports should be included.

<u>ITEM</u>	<u>FREQUENCY</u>
Mow embankment and emergency spillway	2 times/year
Lubricate and repair as needed lake drain valve mechanism	yearly
Re-establish proper vegetal cover	as needed
Repair erosion	as needed
Repair rodent damage	as needed
Clean trashrack	as needed
Repair concrete	as needed
Other mechanical equipment	yearly
Replace/replenish riprap	yearly

IV. OPERATION - Give a brief but complete description of all operation procedures. Specific procedure for operation of mechanical equipment such as valves could be included here. Emergency operation should be covered in the Emergency Action Plan.

<u>ITEM/CONDITION</u>	<u>ACTION REQUIRED</u>
Lake Drain Valve	Open at least 2 times/year
Pool level drawdown for winter season	Open drain and lower pool at a safe rate
Record keeping	Maintain records of all maintenance and operation actions

V. SAFE RATE DRAWDOWN PLAN - This section should include the method to be used for drawing the lake down under emergency conditions. This could include the maximum release rate which will not cause downstream flooding, the proposed location for an emergency channel through an abutment, other ways to provide for rapid drawdown if needed. Hastily, ill-conceived action during emergency situations could increase the failure rate or actually cause failure.

There are also non-emergency circumstances under which the lake level must be lowered. An example of this would be drawing the lake down to repair boat docks. A safe rate for non-emergency drawdown should also be determined and included in this section of the manual.

VI. EMERGENCY ACTION PLAN (EAP)

The Interagency Committee On Dam Safety (ICODS) EAP Guidelines for Dam Owners, is recommended for consistency and uniformity. The format also serves as a checklist for completeness. When completed, the EAP should have two distinct sections: the basic EAP and the appendices.

Title Page/Cover Sheet/Table of Contents

- I. Notification Flowchart
- II. Statement of Purpose
- III. Project Description
- IV. Emergency Detection, Evaluation, and Classification
- V. General Responsibilities
 - A. Dam Owner
 - B. Notification
 - C. Evacuation
 - D. Termination and follow-up
 - E. EAP coordination
- VI. Preparedness
- VII. Inundation Maps
- VIII. Appendices
 - Appendix A: Investigation and Analyses of Dam Break Floods
 - Appendix B: Plans for Training, Exercising, Updating, and Posting the EAP
 - Appendix C: Site-Specific Concerns
 - Appendix D: Approval of the EAP

For more information on the ICODS Emergency Action Plan Guidelines, please contact the Division of Water, Dam Safety Engineering Program at 614/265-6731 or visit our website at www.dnr.state.oh.us/odnr/water.

VII. APPENDIX (POSSIBLE ITEMS)

1. Inspection forms
2. Past inspection reports
3. Reduced size as-built drawings
4. Stage-storage-area curve
5. Spillway rating curve
6. Drain rating curve
7. Pictures
8. ODNR inventory form

Preface to ICODS Guidelines May 17, 2007

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 identifies changing conditions and problems as they develop, and maintenance prevents minor problems from developing into major ones. Despite efforts to keep the dam in good condition and to perform inspection and maintenance, a dam 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. An emergency action plan (EAP) is a collection of information that helps a dam owner properly respond to many potential problems at the dam.

The Interagency Committee on Dam Safety (ICODS) was established in 1980. The committee consists of representatives from over nine federal agencies with dam safety interests. The committee encourages the establishment and maintenance of effective federal programs, policies, and guidelines to enhance dam safety and security. One of the products that the committee developed is a set of guidelines to organize the format and content of EAPs. The guidelines were developed to provide consistency and uniformity.

The Ohio Department of Natural Resources, Division of Water, uses the ICODS guidelines as the foundation for the format and content of Class I EAPs. In certain cases, an owner of a Class I dam may be inclined to use a different format or incorporate the content of the ICODS guidelines into an existing set of procedures. This is acceptable if the new format contains all appropriate content from the guidelines. The ICODS guidelines can also be used to develop EAPs for Class II and Class III dams. The guidelines were developed for dams that are generally bigger and have more potential downstream hazard. For smaller dams with less downstream hazard, similar to many Class II and III dams, some of the sections can be reduced or eliminated (see table below). However, much of the content is applicable and should be included. Please contact the Division of Water for clarification.

<u>EAP Section</u>	<u>Class I Dams</u>	<u>Smaller, Less Hazardous Dams</u>
Section I	Required	Required - Brief
Section II	Required	Required
Section III	Required	Required
Section IV	Required – Engineer needed	Required – Engineer not required
Section V	Required	Required - V(a) can be brief
Section VI	Required	Required - Brief
Section VII	Required - Must include investigation of 3 scenarios: sunny day, 100-year flood/25% PMF, and design flood; see "Dam Failure Inundation Mapping - Items for Submittal"; engineer needed	Usually not required – See inspection report
Section VIII	Required	As appropriate

Ohio Administrative Code Rules Pertinent to EAPs

1501:21-21-04 (A) Pursuant to the provisions of section 1521.062 of the Revised Code, the owner of a dam or levee shall be responsible for the continued safe operation and use of the structure so that it does not constitute a hazard to life, health, or property.

(B) In the interest of safeguarding life, health, and property, the chief may require the owner to prepare a written manual detailing the operation, maintenance, and inspection procedures necessary for the continued safe operation and use of the dam or levee, and an emergency action plan. The contents of such manual and plan shall be as described respectively in rules 1501:21-15-06 and 1501:21-15-07 of the Administrative Code.

1501:21-15-07 An emergency action plan shall be required for all class I, II and III structures. The emergency action plan for all class I structures shall include but not be limited to an inundation map of the critical routing reach. An inundation map may also be required for class II and III dams as designated by the chief. The required detail of this map depends upon the complexity of the downstream hazard and shall be acceptable to the chief. Three copies of the emergency action plan shall be submitted to the chief for approval upon the completion of construction or as otherwise directed by the chief. The chief may require additional copies as necessary.

Emergency Action Plan (EAP) Guidelines

Interagency Committee on Dam Safety (ICODS) Format

The ICODES EAP Guidelines for Dam Owners is recommended for consistency and uniformity. The format also serves as a checklist for completeness. When completed, the EAP will have two sections: the basic EAP and the appendices.

Format and Content

Title Page/Cover Sheet/Table of Contents

- I. Notification Flowchart
- II. Statement of Purpose
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- V. General Responsibilities
 - A. Dam Owner
 - B. Notification
 - C. Evacuation
 - D. Termination and follow-up
 - E. EAP coordination
- VI. Preparedness
- VII. Inundation Maps
- VIII. Appendices
 - Appendix A: Investigation and Analyses of Dam Break Floods
 - Appendix B: Plans for Training, Exercising, Updating, and Posting EAP
 - Appendix C: Site-Specific Concerns
 - Appendix D: Approval of the EAP

TITLE PAGE/COVER SHEET/TABLE OF CONTENTS

The purpose of the title page and cover sheet of an EAP is to identify the document as an EAP and to specify the name of the dam. The table of contents, which will list all the major sections and subsections in the EAP, provides a quick means for locating information.

Section I: NOTIFICATION FLOWCHART

The notification flowchart provides the hierarchy for notification in the event of an emergency. The flowchart must include the following essential information.

- Who notifies whom
- Names, titles, telephone numbers, alternate contacts, and communication mechanisms

The notification flowcharts should be brief, simple, and easy to follow. Notification must flow in both directions and the number of people notified by each individual should be limited. The flowchart should be prominently displayed on the first page of the EAP and also posted as a stand-alone chart. Only one flowchart should be used for emergency (warning) and one for a non-emergency (watch), if possible.

Color-coding is helpful. The individuals and entities that included on the notification flowchart:

- Dam Owner
- Appropriate Federal, State, and Local Agencies
ODNR, Division of Water (614) 265-6731 or (614) 799-9538
- County Sheriff, County Emergency Management Agency
- Residents and property owners downstream of the dam
- Operators of other dams
- Managers of recreational facilities
- National Weather Service (NWS)
- News Media
- Others

Section II: STATEMENT OF PURPOSE

This section defines the purpose and scope of the EAP. (1 or 2 paragraphs)

Section III: PROJECT DESCRIPTION

Must include the following:

- Description and drawing of the dam and appurtenant parts of the dam
- Project location (vicinity map) (State and County)
- Note significant upstream and downstream dams
- Downstream communities potentially affected by a dam failure or flooding as a result of large operational releases
- Any other relevant information

Section IV: EMERGENCY DETECTION, EVALUATION, AND CLASSIFICATION

- Detection of the emergency condition
 - Data and information collection system
 - Process for analyzing data
- Evaluation of information
 - Procedures for assessing information
 - Provisions for establishing the severity and magnitude of the emergency
- Classification of emergency based on urgency
 - Indicates urgency of the situation
 - Emergency classification chosen and agreed to by dam owner and emergency management dam safety officials
 - Must be relevant to emergency conditions

Potential failure situation is developing (Non-Emergency Watch)

Situations where failure may occur, but preplanned actions may prevent or mitigate failure
Assess situation and put agencies on alert:

- Give urgency condition
- Provide periodic updates
- Agencies decide their own course of action
- As situation worsens, provide a smooth transition from Non-Emergency Watch to Emergency Warning

Failure is imminent or has occurred (Emergency Warning)

Issued when no time is available to attempt corrective measures.

- How much time from imminent to failure:
 - Impossible to determine, but very short!
 - Assume that failure is imminent and failure has occurred are essentially the same condition

Section V: GENERAL RESPONSIBILITIES

The General Responsibilities section of the EAP is:

- Dam owner responsibilities
- Responsibility for notification
- Responsibility for evacuation
- Responsibility for duration, termination, security, and follow-up
- EAP coordinator responsibility

Dam Owner Responsibilities

The responsibilities of the dam owner must be clearly and specifically defined. The following responsibilities should be delineated:

- The decision-making process, including the selection of the appropriate emergency condition
- Specific actions to be taken
- Who will take the actions
- Internal (at the dam) and external (off-site) notification activities

This section should provide guidance on communicating the emergency situation to others and should spell out the chain of command and specific emergency actions.

Responsibility for Notification

Clearly identify the dam owner personnel authorized to notify local officials. The most important elements of this section are:

- Specificity
- Delegation of responsibility and authority

- Timely notification
- Procedures for notifying agencies such as the National Weather Service
- Procedures for notifying media
- Sample messages

Responsibility for Evacuation

Agencies with a statutory obligation are responsible for evacuation. The dam owner:

- Should not assume agency responsibility
- Should coordinate with appropriate officials

This section of the EAP should specify coordinated and agreed-to evacuation responsibilities of the dam owner, if any. Inundation maps help the evacuation effort.

Responsibility for Duration, Security, Termination, and Follow-Up

- The dam owner and dam personnel must monitor the emergency situation at the dam and keep the authorities informed of developing conditions.
- The dam owner must specify security measures at the dam during the emergency.
- Officials and agencies are responsible for terminating emergency status in affected areas.
- The dam owner terminates the emergency of the dam.
- There should be a follow-up evaluation by the participants involved in the emergency.

EAP Coordinator Responsibility

The following are responsibilities of the EAP coordinator:

- Revised EAP
- Establishes training seminars
- Coordinated EAP exercises
- Serves as the EAP contact for:
 - emergencies
 - Non-emergencies

Section VI: PREPAREDNESS

There are two primary objectives to this section of the EAP: to describe preplanned and emergency actions and to specify emergency measures. The rationale for the first objective of this section is to describe preplanned and emergency actions. This may:

- Prevent a failure from developing
- If possible, minimize loss of life and property damage
- Issue timely warning, and facilitate operation of the dam

The seven areas that must be considered in the development of the section on emergency measures are:

- Surveillance
- Response during darkness
- Access to site
- Response during weekends and holidays
- Response during adverse weather
- Alternate means of communication
- Emergency supplies and resources

Surveillance

- Provisions for prompt detection and evacuation
- Instrumental and/or physical inspections
- Unattended dams (not continuously attended 24 hours a day)
 - Surveillance procedures and systems, such as remote detection systems
 - Instrumental, telemetry, audible alarms
 - Headwater/tail water detectors
 - Coordination of special procedures with local authorities

Response During Darkness

- Actions to illuminate the dam to facilitate gate and other operations
- Operation of equipment during power failure
- Procedures for notifying officials
- Impact on expected response times
- Non-business hours
- Other instructions

Access to Site

- Primary and secondary routes
- Means for reaching the site under various conditions (e.g. foot, boat, car, ATV)
- Expected travel times
- Special instructions

Response During Weekends and Holidays

- Planned actions based on the dam operator's schedule
- Special instructions

Response During Adverse Weather

- Actions to be taken for different conditions, including when the dam will not be attended
- Methods of access
- Expected response time
- Special instructions

Alternate Means of Communication

- Availability and use of alternative systems
- Alternative channels

- Proper procedures
- Special instructions

Emergency Supplies and Resources

- The stockpiling of materials and equipment
- Coordination of information on flood flows
 - National Weather Service, dam owners (up and downstream)
 - Actions to lower the reservoir (i.e., reduce inflow and increase outflow)
 - Who, when, and how to take action
 - Provisions of alternative sources of power, including location, mode of operation, and transportation
 - Site-specific actions

Section VII: INUNDATION MAPS

The inundation maps are of extreme importance in the development of the notification flowchart.

The following are considerations in the development of the inundation maps for the EAP:

- The inundation maps are the responsibility of the dam owner to have completed. An engineer is usually required.
- The development of the maps must be coordinated with relevant agencies.
 - Maps must provide information required by the agencies because the agencies will depend on the maps for evacuation
- The maps must be usable and of appropriate scale. They must be clear and not cluttered with extraneous information.
- The maps must identify antecedent flow conditions:
 - Inflow design flood
 - Color should be used for different scenarios.
- Probable Maximum Flood (PMF) flows as related to the classification of the dam (25%, 50%, 100%) and dam failures.
 - Color should be used for different scenarios.
- The maps must show peak discharge, maximum flood elevation, and travel time.
- An index should be used if the map covers several pages.
- Existing field conditions should be shown on the base map.
- The accuracy and limitation of the maps should be described.
- The maps should be supplemented with a narrative description of the areas affected by the dam break, with surface profiles, and with a characteristic of the failure condition assumed in the preparation of the inundation maps.

Section VIII: APPENDICES

There are four appendices to be developed for the EAP:

- Appendix A: Investigation and Analyses of Dam Break Floods
- Appendix B: Plans for Training, Exercising, Updating, and Posting the EAP
- Appendix C: Site-Specific Concerns
- Appendix D: Approval of the EAP

Appendix A: Investigation and Analysis of Dam Break Floods

- Methodology
- Prevailing stream flow conditions
- Breach assumptions
- Termination of downstream routing

Appendix B: Plans for Training, Exercising, Updating, and Posting the EAP

Training

- Training plan and schedule, with provisions for annual training
- Familiarity with EAP
- Problem detection and evaluation

Exercising

- Exercising plan and schedule, with provisions for annual drills
- Tabletop and functional exercises
- Test remote sensing equipment
- Evaluation of exercises
- Follow-up on recommendation

The follow-up training course focuses on exercising the EAP.

Updating

- Process for revisions
 - Annual review
 - Updating for personnel changes
 - Exercise lessons learned
- Distribution of updated plans

Posting the EAP

- Posting must be up-to-date
- Place EAP in prominent locations
- Post copies of complete and up-to-date EAP in a location near the posted flowcharts

Appendix C: Site-Specific Concerns

- Site-Specific concerns that affect the EAP
- A Glossary, if needed

Appendix D: Approval of the EAP

- Must be signed by all parties
- Indicates the approval and acceptance of responsibilities
- Helps ensure that all parties understand the EAP and their roles and responsibilities



MISCELLANEOUS SITE VISIT REPORT

Name of Dam: Tritts Mill Pond Dam **File Number:** 0713-019

County: Summit **Date of Inspection:** 08/12/11

Site Conditions: The sky was sunny and clear, the temperature was about 80 degrees, and the ground was dry.

Inspectors: Tina Griffin, P.E., and Jim Huitger

Others Present: Dick Kaylor, Springfield Township Road Superintendent

Comments: On August 12, 2011, Dick Kaylor contacted our office to inform us that he was proceeding with a directive from the Springfield Township Trustees to open up the 48" lake drain to the Tritts Mill Pond Dam, effectively lowering the pool level by approximately 3 feet. This will relieve some pressure on the dam while providing additional storage volume for future rainfall events. Mr. Kaylor informed me that the directive was issued as a result of damages that occurred due to overtopping of the dam during a storm event on July 17, 2011. Damages included erosion on the downstream face of the right side of the dam, undermining of the left downstream slope protection, and separation of the right side of the concrete apron at the toe of the principal spillway. Mr. Kaylor reported that this storm produced approximately 6-1/4" of rainfall in a 2-hour duration.

On August 12, 2011, Tina Griffin and I stopped at the Tritts Mill Pond Dam for a site investigation. We arrived at approximately 11:30 a.m. Mr. Kaylor had opened the 48" lake drain at approximately 8:30 a.m., and was still at the site. Mr. Kaylor reported that he got the lake drain opened (about 1/2 of full opening) and that the pool level at that time was approximately 3" above the spillway elevation. Upon our arrival, we observed the lake level was approximately 3" below the spillway elevation.

Several changes to the dam since the June 22, 2010 periodic dam safety inspection were observed and documented:

1. The large longitudinal crack on the right downstream face enlarged from 1/2" to 1-1/2", leaning downstream from the remaining wall.
2. Erosion along the bottom of the right downstream face of the dam. The erosion was most severe near the right abutment of the principal spillway. Mr. Kaylor reported seepage

through the concrete wall continued to occur at this location since the flooding event. With the lake level down approximately 3” below the spillway elevation by the time of our arrival, we did not observe any seepage.

3. Undermining of the concrete pad on the left downstream face, near the left abutment. It is believed that the undermining is the result of an opening in the left wall between the left abutment and the 48” sluice gate for the lake drain. It did not appear that any undermining at the left abutment had occurred.

4. A large portion (approximately one-half) of the concrete apron along the right side of the downstream toe of the dam was washed downstream 50’ to 100’.

Jim Huitger
Construction Specialist
Dam Safety Engineering Program
Division of Soil and Water Resources

Tina Griffin, P.E.
Project Manager
Dam Safety Engineering Program
Division of Soil and Water Resources

Date