



REQUEST FOR PROPOSALS Dam Assessment and Plans

Date: July 13, 2021

Contact: Christine Craycroft, Executive Director
ccraycroft@portageparkdistrict.org; (330) 297-7728; portageparkdistrict.org

Due Date: July 26, 12:00 pm EST

Summary: The Portage Park District seeks proposals from qualified professionals for the inspection, evaluation and recommendations for improvements to dam safety, as well as Operations, Maintenance and Inspection Plans and Emergency Management Plans as required for Camp Spelman, owned by the Portage Park District, Portage County Ohio.

Submittals: Proposals must address the information requested and may be submitted electronically to admin@portageparkdistrict.org or on paper to Portage Park District 705 Oakwood St. Suite G-4, Ravenna, Ohio 44266. The proposal name must be labeled on the envelope or in the subject line. Download the RFP packet at <https://www.co.portage.oh.us/portage-county-park-district/news-publications/pages/public-notices>

The mission of the Portage Park District is to conserve Portage County's natural heritage and provide opportunities for its appreciation and enjoyment

REQUEST FOR PROPOSALS
Dam Assessment and Plans

INTRODUCTION

Portage Park District (PPD—aka the owner) owns and manages Camp Spelman with a manmade lake. PPD requests proposals from qualified firms to address the requirements of the ODNR inspection report for Camp Spelman Dam; and to develop an Operations, Maintenance and Inspections Manual (OMI) and Emergency Action Plan (EAP) as required by ODNR.

Appendix A is the ODNR report for Camp Spelman. Information about Ohio's Dam Safety program and requirements, including the Inspection Checklist and guides for developing the OMI and EAP can be found at <http://water.ohiodnr.gov/safety/dam-safety#ABO>

OBJECTIVE

The objective of this RFP is to obtain the information required to select and reach an agreement with a Qualified Professional to perform assessments and plans.

It is the Portage Park District's intention to ensure that the dam and related structures are appropriately classified, and that all requirements for dam inspections, maintenance, improvements and repairs are identified and managed to ensure dam safety and compliance with Ohio Law and best practices.

QUALIFIED PROFESSIONAL

The role of the Qualified Professional is laid out in [Ohio Revised Code section 1521.062 Inspection of dams and levees](#) and the [Ohio Administrative Code section 1501:21-3-02 Registered professional engineer and surveyor requirement](#).

The Qualified Professional is expected to direct and be involved throughout all phases of the project. If additional outside support, such as technical specialist consultation and quality assurance is required, it should be indicated in the Proposal.

SCOPE OF WORK

Phase 1 – Review of Available Information and Data

The project will commence with a start-up meeting to verify the project scope, timeline and the roles and responsibilities of the owner and the Qualified Professional. The Qualified Professional is expected to:

- Review the information and data available from the owner or other sources. Documents to be reviewed include but are not limited to:
 - Aerial photos and parcel maps
 - Topographic maps and surveys
 - Historical information
 - Construction plans and permits if available
 - Previous dam safety inspections, reports and recommendations
 - Correspondence with regulatory agencies;
 - Other available documents related to design, operation, maintenance, improvement, condition and performance of the dam or appurtenant works.

- Identify all possible hazards and their associated failure modes of the dam, based on an examination of available information.

Phase 2 – Field Review

- Carry out field review(s) of the dams, the impounded waters and the portions of the watershed both upstream and downstream of the dam to understand the condition of the dam and appurtenances, the flow control equipment, upstream hydrological impacts, and the development downstream of the dam.
- Perform surveys as necessary to determine topography and property ownership of the dam, spillway or related structures.
- Interview personnel and others who conduct routine surveillance and maintain the dam.
- Identify and discuss with the dam owner any changes to the scope of the project that need to be made as a result of this phase of work.

Phase 3 – Investigation, Evaluation and Draft Report

- Perform dam safety inspection checklists and determine the dam classification and safety expectations for each site.
- Based on these inspections determine the actual and potential deficiencies and summarize and prioritize the dam safety deficiencies and non-conformances. Determine required and recommended actions for the dam with associated cost estimates.
- Create a draft report of the dam conditions and recommendations. Include relevant maps, photos, plans, surveys, studies, typical drawings and references for recommended improvements and identify any permitting requirements.
- Create a draft Operation, Maintenance and Inspection (OMI) Manual.
- Create a draft Emergency Action Plan (EAP).
- Prepare draft correspondence and reports to ODNR as necessary.
- Submit to PPD electronic copies of the inspections, draft reports, plans and manuals, and review with PPD.

Phase 4 – Finalize Report

The Qualified Professional is expected to:

- Address all PPD comments when preparing the Final Report;
- Complete the project deliverables.

DELIVERABLES

The Qualified Professional shall submit:

- Two hard copies and one electronic copy of all final materials produced, organized and

separated by site:

- Dam inspection checklists
- Relevant maps, photos, plans, surveys, studies, typical drawings and references for recommended improvements, and any other materials appropriate for the proper understanding and management of the dam
- Report on recommended actions for each site
- Final OMI and EAP for each site
- Final correspondence to ODNR as needed for each site to ensure compliance with dam safety law

Quality assurance of the final DSR report will be the responsibility of the Qualified Professional and their associated consulting firm.

PROPOSAL SUBMITTALS

Format

Proposals may be submitted electronically in PDF format to admin@portageparkdistrict.org or on paper in a sealed envelope to:

Portage Park District
705 Oakwood St. Suite G-4
Ravenna, Ohio 44266

The title of the proposal (*Camp Spelman Dam Assessment and Plans Proposal*), should be included in the email subject field or written on the envelope. Proposals are due by July 26, 2021, 12:00 pm (EST)

Qualifications

- Include the professional qualifications, examples of relevant project experience and the fee structure for the Qualified Professional all other key personnel that will work on this project.
- Include project summaries of at least 2 other successful similar projects, including personnel associated with the project and project owner reference contacts

Cost Estimate and Schedule

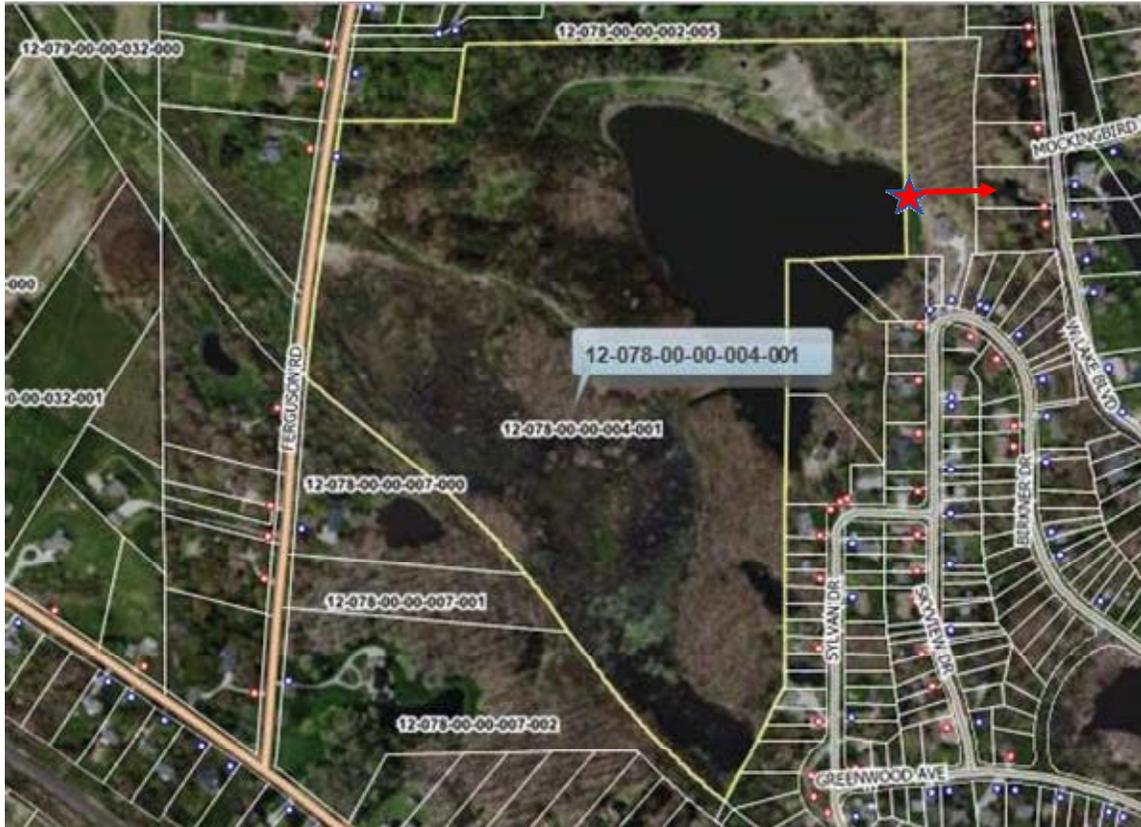
- Prepare a cost estimate broken out by personnel hours per task and by park site
- Include estimates for optional or as-needed services
- Prepare a work schedule based on the following phases, by site:
 - Project start and meeting with owner
 - Information gathering
 - Field review, site assessment and surveys, as needed
 - Evaluation and draft report
 - Review of draft report with owner
 - Final report and deliverables

PROPOSAL EVALUATION

The Portage Park District shall review all proposals received by the deadline and consider professional qualifications, experience, availability and capacity to perform work within a reasonable timeframe, and cost. PPD will enter into a contract with the selected firm based on agreed upon scope of work and timeline.

APPENDIX A

Camp Spelman Site Information and ODNR Dam Inspection Report



Camp Spelman is a ~58-acre undeveloped park property located at 7650 Ferguson Road in Franklin Township, Portage County. The lake was created prior to Park District ownership, and the park district has no record of the construction or plans. The outlet structure and a portion of the embankment are located on private property. Drainage flows to the east and eventually into West Twin Lake.

 Outlet location



Ohio Department of Natural Resources

MIKE DeWINE, GOVERNOR

MARY MERTZ, DIRECTOR

Division of Water Resources

Rodney J. Tornes, Chief

2045 Morse Road/Building B-3

Columbus, Ohio 43229

614-265-6620

dswc@dnr.state.oh.us

December 2, 2019

Portage Park District
Christine Craycroft, Executive Director
705 Oakwood St, Suite G-4
Ravenna, Ohio 44266

Martha & Arden Sommers
7598 Birkner Drive
Kent, Ohio 44240

Re: Camp Spelman Lake Dam
File No: 1112-071
Portage County

Dear Dam Owners:

The Division of Water Resources is responsible for regulating dams throughout Ohio. A jurisdictional dam located at the "Camp Spelman" property in Portage County, Franklin Township was brought to the Division's attention. A site map showing the dam and its appurtenant structures and their location relative to the county parcel map has been enclosed. If you believe that you are not an owner of this dam and/or appurtenant structure(s) or believe that there are additional owners not addressed in this communication, please contact our office at 614/265-6731.

A site visit was made to the structure on May 29, 2019, to inventory the size and potential downstream hazard in order to classify the dam in accordance with Ohio Administrative Code 1501:21-13-01. Based on information found during this site visit the dam has been determined to be a Class I, high hazard, dam due to the potential for structural collapse of at least one residence and/or probable loss of human life if the dam were to fail.

Under the provisions of Ohio Revised Code Section 1521.063, all owners of a dam that is classified as a class I, class II, or class III dam shall pay an annual fee which is based upon the classification, the height of the dam, the linear foot length of the dam, and the volume of water impounded by the dam. The fee shall be paid to the Division of Water Resources on or before the thirtieth day of June of each year. An invoice shall be sent to you beginning in 2020.

The Chief of the Division of Water Resources has the responsibility to ensure that human life, health, and property are protected from dam failures. 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. Dams are inspected by watershed on a 5-year cycle. The next periodic inspection of this watershed is scheduled to occur in Spring 2021.

Camp Spelman Lake Dam
December 2, 2019
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While this site visit did not include a full inspection and assessment of the dam and appurtenances, the enclosed site visit memo includes several repair, maintenance, and monitoring items that as a dam owner you are required by law to perform. Completion of these required items will improve the safety and overall condition of the dam. The Chief must approve any plans for modifications or repairs to any dam. Following approval of the engineered plans, all necessary repairs must be implemented by the owner under the supervision of a registered professional engineer. A copy of the laws and administrative rules for dam safety is available on the division's web site at <http://water.ohiodnr.gov/safety/dam-safety> or by request.

All dam owners are required to have an Emergency Action Plan (EAP) and an Operation, Maintenance and Inspection Manual (OMI). An approved EAP results in a 10% reduction in the annual fee. For your information, we have enclosed guidelines for preparing an OMI and an EAP.

Your cooperation in improving the overall condition of this dam is appreciated. Please contact our office at 614/265-6731 if you have any questions.

Sincerely,



Matthew J. Hook, P.E.
Program Manager
Dam Safety Program
Division of Water Resources

Enclosures



SITE VISIT MEMORANDUM

Project Name: Camp Spelman Lake Dam Date of Visit: 5-29-19
File Number: 1112-071 County: Portage
Site Conditions: 75 Degrees, Raining
Inspectors: Matthew Hook, P.E., Program Manager
Ryan Heskett, E.I., Project Engineer
Josh Garland, Construction Inspector

Introduction:

The Division was made aware of a potentially jurisdictional dam in Portage County. This site visit was made to inventory and survey the structure and assess the potential for downstream hazard.

Observations:

Upstream Slope: The upstream slope was covered with brush and saplings making visual inspection difficult. It appeared that the slope gradient was approximately 3H:1V.

Crest: The crest was measured at 195 feet long. The crest was found to have a satisfactory grass cover. However, the vertical alignment of the crest varies by 1-2 feet.

Downstream Slope: The downstream slope was covered with brush and mature trees making visual inspection difficult. It appeared that the slope gradient was approximately 3H:1V.

Principal Spillway: The principal spillway was found to be a pipe and riser system. The riser was a 24-inch square concrete box riser and the outlet pipe was found to be 90-ft of 12-inch-diameter PVC pipe. The riser included a trashrack with flat bars laying directly on the orifice. An anti-vortex device was not found. Some debris was building up on the trashrack. A visual inspection of the interiors of the pipe and riser were unable to be made due to flow through the system. The spillway outlet did not have an erosion control structure; however, little erosion was found.

Emergency Spillway: The emergency spillway was found to be a two-stage open channel with the first stage being 10-ft-wide at elevation 1084.5 and the second stage being an additional 75-ft-wide at elevation 1085.8. The side slopes were estimated at 4H:1V. Brush was found at the channel inlet and mature trees were located throughout the channel. It appears that the channel discharges in the direction of some homes located on Westlake Blvd.

Lake Drain: A lake drain was not found during this site visit.

Downstream Hazard Assessment: The downstream hazard was visually assessed and was found to include two houses located on the west side of Westlake Blvd. and Westlake Blvd. itself.

Discussion:

Both owners were present during this visit. It was discussed that the dam embankment sits on the Park

Districts property and the spillways are located on the Sommers property. This was verified using the online parcel maps for Portage County.

Based on the survey of the dam, aerial mapping, and topographic information, the dam is 22.9 ft. tall (Class IV) with a top of dam storage volume of 166 acre-ft. (Class III). The potential downstream hazard includes two homes that could experience structural failure and/or loss of life (Class I). Therefore, the classification of Camp Spelman Lake Dam is Class I.

Hydrologic and Hydraulic modeling was completed to assess the flood capacity of Camp Spelman Lake Dam. The modeling concluded that while the dam experiences a very small and very brief amount of overtopping, failure from an overtopping event would be unlikely. Therefore, Camp Spelman Lake Dam is considered to pass its design storm. However, the modeling also shows that the emergency spillway flows more often than allowed by Ohio Administrative Code 1501:21-13-04 (F).

Conclusions:

Camp Spelman Lake Dam was found to be a Class I dam and as such is subject to the requirements of Ohio Revised Code Chapter 1521 and Ohio Administrative Code Chapter 1501:21.

While several required remedial measures are included below, the first periodic inspection for Camp Spelman is currently scheduled for Spring of 2021. The inspection will include a more detailed assessment of the dam and its appurtenances.

Required Remedial Measures:

Engineer Repairs and Investigations

The owner must retain the services of a registered professional engineer to address the following items. Plans, specifications, investigative reports, and other supporting documentation, as necessary, must be submitted to the Division of Water Resources for review and approval prior to construction. The owner must complete these items and implement all engineered plans for improvement within 5 years unless otherwise stated. Please refer to the fact sheets included in the Dam Safety Fact Sheet Booklet for additional information.

1. This dam must have a dam failure inundation study and map included in an Emergency Action Plan (EAP) in accordance with OAC Rule 1501:21-21-04. A registered professional engineer must prepare the inundation map and Section IV (Emergency Detection, Evaluation, and Classification) of the EAP. It is recommended that your engineer contact the Division of Water Resources prior to undertaking the engineering study for the inundation map. The inundation study and supporting calculations, including computer modeling, must be submitted to the Division of Water Resources for review and approval. See the Owner Dam Safety Program section of this report for additional information.
2. Every dam shall have a spillway system which will safely operate during the design flood without endangering the safety of the dam in accordance with OAC Rule 1501:21-13-03 and OAC Rule 1501:21-13-04 (F). Investigate the frequency of flow and the alignment of the emergency spillway and, as necessary, prepare plans and specifications for repairs. See the "Open Channel Spillways (Earth and Rock)" fact sheet for additional information.
3. This dam must have a device to permit draining of the reservoir within a reasonable period of time in accordance with OAC Rule 1501:21-13-06. Prepare plans and specifications for the installation of such a device. See the "Lake Drains" fact sheet for additional information.

4. The embankment crest alignment must be uniform. Investigate the variable vertical alignment of the crest and, as necessary, prepare plans and specifications for the correction of any problems.

Owner Repairs and Monitoring

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

1. Remove the trees and brush from the upstream slope, downstream slope, and emergency spillway. Seed all disturbed areas to establish a proper grass cover. See the "Trees and Brush" fact sheet for additional information.
2. Replace the trashrack with an acceptable device and install an anti-vortex device at the inlet of the principal spillway. See the "Design and Maintenance of Trashracks" fact sheet for additional information.
3. Prepare an Emergency Action Plan (EAP) and submit for approval. A registered professional engineer must prepare a dam failure inundation map and Section IV (Emergency Detection, Evaluation, and Classification) of the EAP. Guidelines for the preparation of this document can be found online at: <http://water.ohiodnr.gov/safety/dam-safety#ADD>. The fillable EAP is not appropriate for Camp Spelman Lake Dam because of its Class I designation.
4. Prepare an Operation, Maintenance, and Inspection Manual (OMI) and submit for approval. Guidelines for the preparation of this document can be found online at: <http://water.ohiodnr.gov/safety/dam-safety#ADD>.
5. Monitor the erosion at the principal spillway outlet. See the "Open Channel Spillways (Earth and Rock)" fact sheet for additional information. Please note that engineered repairs may be needed if this problem worsens.

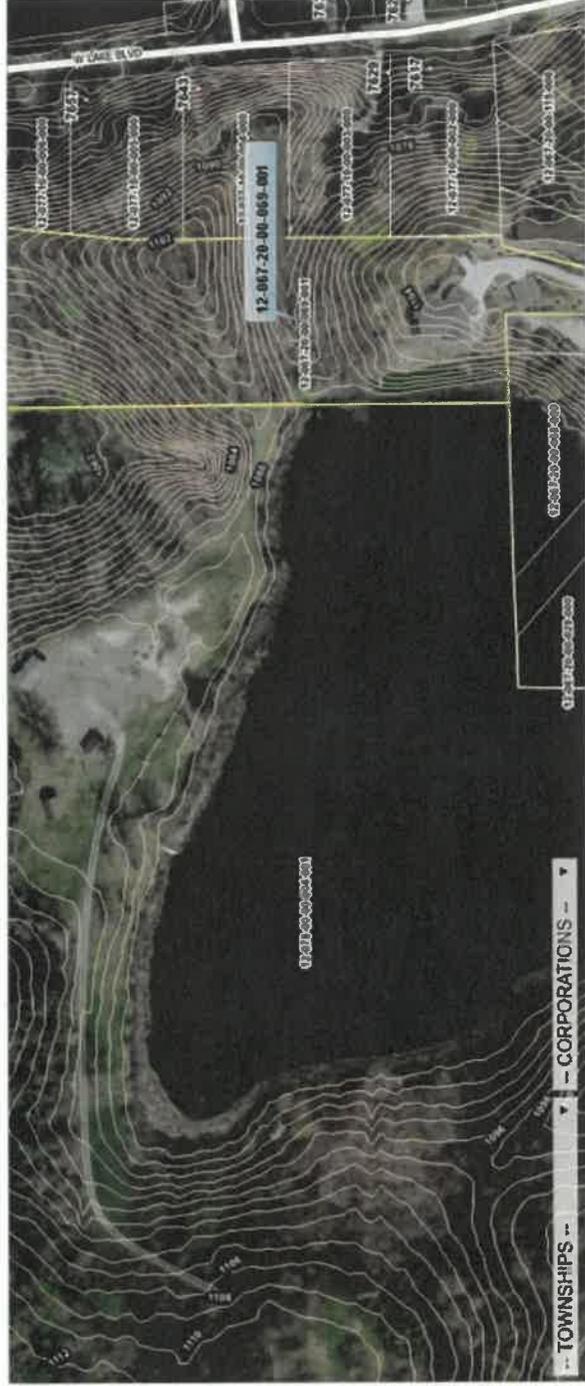


Inspector's Signature

12/2/2019
Date

Map

Addresses
 Parcels
 Acreage 100
 Acreage 150
 Acreage 200
 Dimensions 100
 Dimensions 150
 Dimensions 200
 Landmarks
 NPDES
 Neighborhoods
 2007 Sales
 2008 Sales
 2009 Sales
 2010 Sales



Selection

Parcel Number	Owner Name
12-007-20-00-000-001	SOMMERS ARDEN F & MARTHA R (J&S)
12-078-00-00-004-001	PORTAGE PARK DISTRICT

2 feature(s) selected

Camp Spelman Lake Dam
File Number: 1112-071, Portage County
May 29, 2019



Trees and brush along the upstream slope.



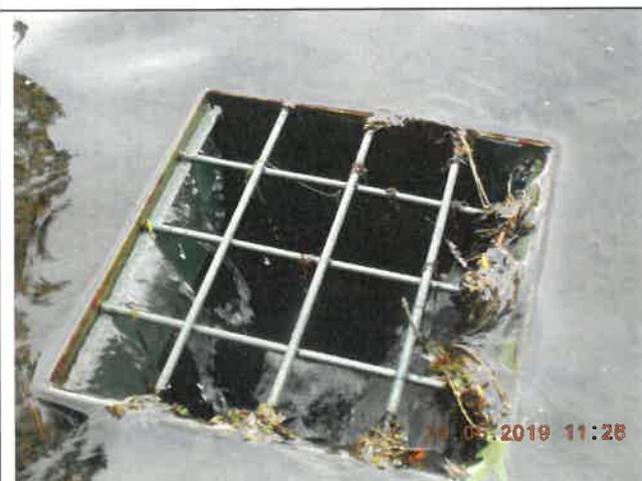
View of the dam crest from the left abutment. Note the dense trees and brush on upstream and downstream slopes.



View of the upstream slope and crest from the right abutment. Again notice the trees and brush on the slopes.



View of the principal spillway riser.



Close-up of the principal spillway trashrack. Note the debris collection of the flat bars.



View of the principal spillway outlet.

Camp Spelman Lake Dam
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Another view of the principal spillway outlet.



View of the emergency spillway. Note the trees and brush at the inlet.

Dam Inventory Sheet

Name: CAMP SPELMAN LAKE DAM

File No: 1112-071

Reservoir:

National #:

Permit No.:

Class (Ht-Vol): I

(IV - III)

Owner Information

Owner: Multiple Owners - 1112-071

Owner Type: Private

Address:

Multi-Dams: -

Parcel No.:

City:

State:

Zip:

Contact: Christine Craycroft

Phone No.: 330-297-7728

Location Information

County: Portage

Latitude Deg.: 41

Min.: 11

Sec.: 55

Township: Franklin

Longitude Deg.: 81

Min.: 21

Sec.: 0

Stream: Tributary To Cuyahoga River

USGS Quad.: Kent

USGS Basin No.: 04110002

Design/Construction Information

Designed By:

Constructed By:

Completed:

Plan Available:

At:

Failure/Incident/Breach:

Structure Information

Purpose: Recreation

Type of Impound.: Dam And Spillway

Type of Structure: Earthfill

Drainage Area (sq. miles): 0.18

or (acres): 115

Embankment Data

Length (ft): 195

Upstream Slope: 3H:1V

Height (ft): 22.9

Downstream Slope: 3H:1V

Top Width (ft): 12

Volume of Fill (cub. yds.):

Spillway Outlet Works Data

Lake Drain: UNKNOWN

Principal: 24-IN-SQ CONCRETE RISER W/ 12-IN-DIA PVC OUTLET

Emergency: 2 STAGE OPEN CHANNEL W/ 4:1 SS: 1ST, 10-FT-WD; 2ND, 85-FT-WD

Maximum Spillway Discharge (cfs):

Design Flood: 1.0

Flood Capacity: 1.0

Dam Reservoir Data

Elevation (ft-MSL)*

Area (acres)

Storage (acre-feet)

Top of Dam: 1088.3

37

166

Emergency Spillway: 1084.5

13

75

Principal Spillway: 1084

12.5

69

Streambed: 1065.4

*Elevations are not necessarily related to a USGS benchmark

Foundation:

Inspection Information

Inspection

Phase I:

History:

Other Visits: 5/29/2019 INV - MJH

Inspection Year:

E

Operation Information/Remarks

Emergency Action Plan: Not Approved

Format: No Plan

OMI: Not Approved

Last Entry: 11/26/2019

Emergency Action Plan (EAP) Guidelines

(Revised 9/11/2017)

Interagency Committee on Dam Safety (ICODS) Format

The 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 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
- 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 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, classification, and file number. 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 flowchart(s) 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.

Color coding can be helpful as long as the color does not obscure the text. The individuals and entities that may be included on the notification flowchart:

- Dam Owner
- Appropriate Federal, State, and Local Agencies
ODNR, Division of Water Resources office (614) 265-6731 and 24 hour emergency (614) 799-9538
- 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 officials
 - Must be relevant to emergency conditions
 - Must include the following three alert levels: Monitor, Watch, and Warning

The three classifications of dam alert statuses are listed below. The EAP should describe how each alert status applies to the particular dam. Information to assist the dam owner in

determining the appropriate emergency alert status should be developed and included in the EAP.

Monitor – A hazardous condition exists, requiring investigation and corrective action; potential for failure is being assessed; corrective measures are underway.

- Include procedures for investigation and assessment
- Include procedures for implementing interim risk reduction measures
- Notify the appropriate personnel and agencies

Watch – Potential failure situation is developing.

- Include procedures for assessing the possible mode of failure
- Include procedures for implementing corrective measures
- Notify the appropriate personnel and agencies
- Include procedures for the possible transition from a Watch to a Warning alert level

Warning – Dam failure is occurring or is imminent.

- Time to failure is impossible to determine but should be assumed to be very short
- Assume that corrective measures at the dam are not possible
- Public protective actions are required
- Notify the appropriate personnel and agencies

Section V: GENERAL RESPONSIBILITIES

The General Responsibilities section of the EAP are:

- 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 name of the EAP Coordinator must be specifically identified in the EAP. 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 periods of darkness
- Access to the 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/tailwater detectors
 - Coordination of special procedures with local authorities

Response During Periods of 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, snowmobile)
- Expected travel times
- Special instructions

Response During Weekends and Holidays

- Planned actions based on the dam operators schedule
- Special instructions

Response During Periods of 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 Systems 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.
- If possible, the base map must be the most recent aerial photograph. Roads and other structures must be clearly identifiable and labeled.
- The dam and lake area must be labeled and color-shaded.
- Three failure scenarios must be analyzed unless otherwise approved.
 - Inflow design flood must be fully documented
 - For on-stream dams, the scenarios must include a “sunny day”, 100-year (or possibly 25% PMF), and PMF base condition. Each scenario must be shown on the maps unless otherwise approved.
 - For upground reservoirs or lagoons, the scenarios must include a “sunny day” scenario that assumes the reservoir is at its normal operating level and no flooding conditions on receiving streams. The scenarios must also include a 100-year scenario that assumes the reservoir level is at the top of the dam and there is a 100-year flood occurring on the receiving stream.
 - Color or cross-hatching should be used for different scenarios.

- When developing inundation maps for Class II or III dams, the design flood of 50% or 25% of the PMF, respectively, can be used as the largest dam failure scenario.
- The maps must show peak discharge, maximum flood elevation, and travel time.
- The maps must include a legend that describes each failure scenario, a definition of travel time, scale, north arrow, and any other information depicted on the maps.
- A note must be included on the maps that explain why the study terminates at the chosen location.
- 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

Appendix A must include data on the following:

- Methodology
- Prevailing streamflow 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

Appendix C should include the following:

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

Appendix D: Approval of the EAP

The documentation included in Appendix D:

- 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