

Maryland Dam Safety Update



Maryland
Department of
the Environment

Issue 2, November 2017



Dams provide many benefits for Maryland's citizens; however, dams can also be a great threat to the safety and well being of downstream property and people if they are not properly constructed or maintained. Maryland has been assuring the safety of dams since 1934.

Dam Owner Education Workshop: "Dam Failures and Lessons Learned" and "Public Safety Around Dams"

The Maryland Department of the Environment (Department) hosted an educational workshop on Thursday, November 2, 2017. The workshop was modeled after the Association of State Dam Safety Officials "Dam Failures and Lessons Learned" seminar.

The workshop, attended by nearly 200 engineers, dam owners, dam operators and local regulators provided a basic introduction to common failure modes for most types of dams and levees. Presentations also included topics such as conditions that can lead to these failure modes, approaches to responding to dam and levee incidents to avert failures, and

defensive design details or modifications for dams and levees to increase their resistance to various failure modes.

The event concluded with a presentation on public safety around dams. Each year, dozens of lives are lost at dams on U.S. streams and rivers, many at low-head dams, also known as run-of-river dams or "drowning machines." These structures, generally less than 15 feet high, can create backflow currents and turbulence capable of producing disorientation, hypothermia, exhaustion, and brutal battering. The forces combine to create a practically inescapable circular

trap for even the strongest, life jacket-clad swimmer.

The Department thanks the efforts of the presenter, Mr. Paul Schweiger, PE, a recognized dam safety expert with Gannett Fleming and manager of the Dams and Hydraulics Section in Camp Hill, Pennsylvania

Members of the dam community are encouraged to take advantage of training opportunities such as this to maintain awareness and build skills to ensure the continued safe operation of dams in the state. Dam Safety staff are available to provide technical assistance or guidance for your dam. Contact our staff individually by email, call 410-537-3538, or visit our web page at: mde.maryland.gov/damsafety

Inside this issue

- 2 Reminder: Emergency Action Plans and Tabletop Exercises
- 4 Know your National Weather Service Point of Contact



Reminder: Emergency Action Plans and Tabletop Exercises

Beginning in 2017, Maryland law (Annotated Code of Maryland, Environment Article, Section 5-503.1) requires owners of High and Significant Hazard potential dams to submit an Emergency Action Plan (EAP) to the Dam Safety Division for review on an annual basis. Owners who did not meet the August 1 deadline for submission of their draft EAP are reminded to submit this as soon as possible. Beginning in 2018, the EAP submission date moves to May 1. Dam owners must also participate in an EAP tabletop exercise with local first responders, emergency management personnel, and Dam Safety staff once every five (5) years. The following lists provide helpful tips for EAP updates and tabletop exercises.

EAP Updates

- Once per year, call all contacts listed in the EAP to verify that phone numbers and persons in the specified position are current.
- When contacting “Record Holders” of the EAP, ask whether the individual knows where their copy is kept. If they are missing a copy, offer to send a replacement file.
- Contact the vendors in the “locally available resources” section and confirm they can provide the necessary products/services in an emergency. Consider creating a contract or purchase order to help speed purchase in an emergency.
- Review the downstream danger reach for new development that may change the hazard potential. Review the dam break analysis; if it is old (10-20+ years) consider updating.

(Continued on page 3)

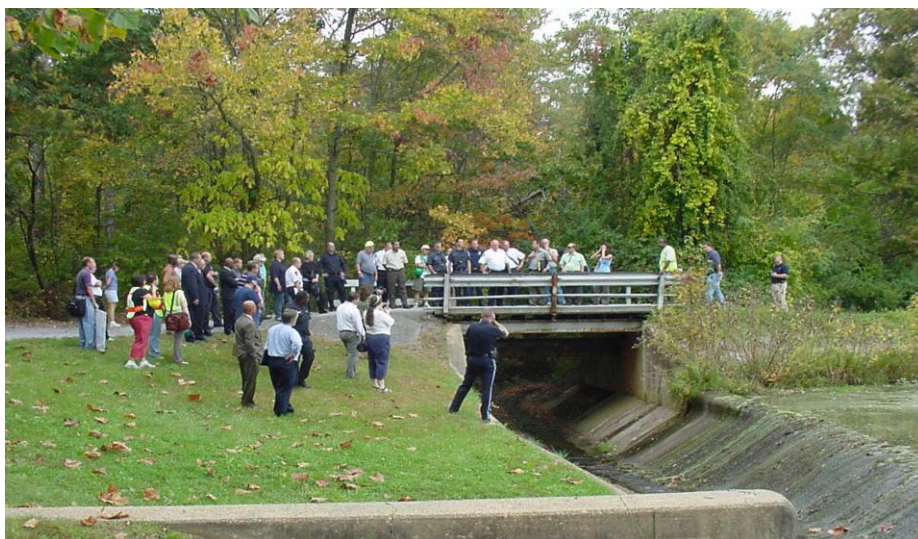


Predicting Dam Breach Flows

A number of methods are available to predict the peak flow from a dam breach. Selecting the proper method depends on the size of the dam/reservoir, the failure mode, and the level of analysis (i.e., screening versus advanced/detailed analysis). For most small dam (“378” ponds) breach analyses obtaining a peak discharge from the National Weather Service (NWS) Simple Dam Break Equation may be adequate. The Dam Safety Division typically recommends the NWS equation over the NRCS equation found in NRCS-MD Code 378 because it takes into account the volume and surface area of the pond, often resulting in a lesser peak discharge.

If initial analyses suggest that the dam may be a Significant or High Hazard, a more detailed analysis must be completed using a parametric and/or physically based model with a breach flow hydrograph such as those available in HEC-RAS, HEC-1, HEC-HMS, etc.

Additional guidance for proper selection and use of dam break breach flow predictor equations is available at our website. Contact Scott Bass scott.bass@maryland.gov for more information



Dam Safety Training Opportunities

MDE Dam Safety Owner
Education Workshop
November 2 Baltimore, MD

AEG DC-MD-VA Chapter
Meeting
November 16. Frederick, MD

ASDSO Webinar: Advances in
Geologic Data Collection and 3D
Modeling
November 14 damsafety.org

Dam Owner Academy Webinar:
Emergency Intervention
Toolbox
November 28 damsafety.org

ASDSO Webinar: Intro to
Addressing Inadequate
Conveyance Capacity
December 12 damsafety.org

Montgomery County EAP
Tabletop Exercise
January 23, 2018, Location TBD

ASCE Seminar: Dam Breach
Analysis Using HEC-RAS
Feb. 7-9 Tampa, FL

39th Annual Short Course:
Grouting Fundamentals and
Current Practice
Feb. 12-16 Austin, TX

National Dam Safety Program
Technical Seminar No. 25
Feb. 21-22 EMI Emmitsburg, MD

USSD 2018 Conference and
Exhibition
April 30-May 4 Miami, FL

ASDSO Dam Safety 2017
Northeast Regional Conference
June 4-6 Lancaster, PA



(From page 2)

EAP Tabletop Exercises

- Consider scenarios for role playing that are realistic for the dam in question. The Dam Safety Division can provide advice on realistic emergency scenarios.
- Consider scenarios other than hurricanes. These events typically provide a long warning time, giving the false sense that there is ample time to prepare for an incident.
- Invite persons responsible for disaster recovery to the exercise to understand their needs and how the recovery process will integrate with the response.
- Offer to meet at the dam before the exercise to educate attendees on the components of the dam. Travel along the danger reach (if possible) when heading back to the meeting location.
- Dam owners, operators and engineers are encouraged to become familiar with the National Incident Management System (NIMS), Incident Command System (ICS) framework to “speak the same language” as responders. Be sure to debrief after the scenario – what went well, what trouble areas may arise, does everyone understand their role and the roles of others.
- Remember that reducing the time gaps between realizing a problem exists, determining the appropriate response, notifying the proper personnel and responding to the incident can help save lives. Look for opportunities to reduce the time gaps during the exercise.

Know Your National Weather Service Point of Contact

The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the protection of life and property and enhancement of the national economy.

These tools can be particularly useful for dam owners; from accurate hurricane tracking, to precipitation forecasts, to river flood forecasts. The NWS can also provide flash flood warnings and watches and non-weather emergency messages to the public in the event of a dam incident or failure. In some cases, the NWS can even provide simplified dam break flood modeling during an emergency using current and

forecast weather conditions.

Accordingly, the NWS should be a part of a dam Emergency Action Plan, and should be notified during Level 2 or 3 events. During those notifications, be prepared to inform the representative of what is happening so they can issue the proper warnings to the correct population.

NWS contacts for each county are provided below.

County	24/7 <u>Emergency</u> Phone Number	Primary Point of Contact	Business Hours / Non- Emergency Phone Number	Address
Garrett ¹	415-262-1591	NWS Pittsburgh Joe Palko Joseph.Palko@noaa.gov	415-262-1591	192 Shafer Road Moon Township, PA 15108
Allegany, Baltimore, Baltimore City, Calvert, Carroll, Charles, Frederick, Harford, Howard, Montgomery, Prince George's, St. Mary's Washington	1-800-253-7091 Ask for Decision Support Meteorologist	NWS Balt/Washington ³ Jason Elliott jason.elliott@noaa.gov	703-996-2234	43858 Weather Service Road Sterling, VA 20166
Caroline, Cecil, Kent, Talbot Queen Anne's	Contact Dam Safety Division ²	NWS Mount Holly ³ Raymond Krzdlo raymond.kruzdlo@noaa.gov	609-261-6605 ext 234	732 Woodland Road Mount Holly, NJ 08060
Dorchester, Somerset, Wicomico, Worcester	1-800-737-8624 or 757-899-2415	NWS Wakefield Eric Seymour eric.seymour@noaa.gov	757-899-6401	10009 General Mahone Highway Wakefield, VA 23888

1. Savage River Dam and Jennings Randolph Dam contact NWS Balt/Washington
2. This phone number is not for public distribution. To obtain the number for your EAP, please contact the Dam Safety Division.
3. Conowingo Dam contact both NWS Mount Holly and NWS Balt/Washington

ASDSO Launches “Dam Owner Academy” Webinar Series

The Association of State Dam Safety Officials (ASDSO) is a national non-profit association dedicated to the improvement of dam safety. ASDSO strives to improve the condition and safety of dams through education, support for state dam safety programs, and fostering a unified dam safety community. ASDSO membership offers a number of benefits including timely news alerts, technical training opportunities, and the ability to provide input on national and state level policies and legislation. All dam owners, operators and engineers should consider membership in ASDSO.

To support the ASDSO mission, the organization recently launched a new series of educational webinars, 12 in all, on a variety of important topics. The first webinar will be held on November 28, 2017 at noon.

This webinar will introduce and encourage the use of the Dam Owner Emergency Intervention Toolbox that was developed in 2016. The Dam Emergency Intervention Toolbox is currently available as an interactive electronic PDF document and contains the recommended procedures to prepare for, identify, and respond to emergency conditions at embankment dams.

Five takeaways attendees will receive from this course:

- Awareness of the importance of emergency intervention at dams.
- Instructions for obtaining the Dam Owner Emergency Intervention Toolbox.
- Knowledge of the Dam Emergency Intervention Toolbox contents.
- Suggestions for incorporation of the Dam Emergency Intervention Toolbox into existing dam safety documents and/or programs.
- Detailed understanding of how to use the Dam Owner Emergency Intervention Toolbox to prepare for and respond to emergency situations at dams.

To register for this free webinar or learn more, visit www.DamSafety.org/DamOwnerAcademyEIT



Dam Headache?

As dams age, their maintenance needs can increase, hazard creep can require expensive upgrades, or they are simply no longer needed. Dam ownership can also expose oneself to liability resulting from dam failure or loss of life/injuries caused at the dam.

If any of these factors sound familiar, removal of your dam may be worth considering. Did you know that removing your dam can help restore fish passage and habitat, improve water quality, and reduce your costs? Dams can negatively impact water temperature, water flow, and the natural movement of sediment. In many instances, dams prevent migratory fish from reaching their spawning grounds and have contributed to the decline in fish populations.

The Maryland Department of Natural Resources (DNR) Fish Passage Program may be able to help you remove your dam. A wide variety of federal and non-profit grants and loans can be used for dam removal, and DNR can help coordinate funding to pay for dam removal projects.

If you would like to learn more about dam removal options, please contact Jim Thompson, Maryland Fish Passage Coordinator, at 410.260.8269 or jim.thompson@maryland.gov



Small Pond Retrofit Projects: Breach Analysis and Hazard Classification Guidance

A large number of entities within Maryland are investigating stormwater BMP retrofit projects to enhance stormwater pollution control in accordance with Maryland's NPDES Municipal Separate Storm Sewer System (MS4) permits. Based on a review of permit applications, modifications of small ponds/dams with the addition of forebays, additional wet storage volume, or modifications to outlet structures appear to be increasingly common retrofit projects.

During the permit review process, the Department requires that the applicant confirm the hazard classification of the structure. The Dam Safety Division provides guidance on our webpage for a simplified dam breach analysis for small ponds and dams (i.e., those with no more than 15 feet in height and storage volumes less than 20 acre-feet). This guidance is currently being updated and expanded to provide clear expectations and processes, with the goal of aiding in faster review times by Department reviewers and consistency in the effort required by the engineering community.

Please stay tuned as the new guidance is completed. A one-day training seminar on dam breach analysis and hazard classification is planned for Spring 2018.

mde.maryland.gov/DamSafety

