Water Resource Publication

Dam Emergency Action Plans

OPP-WRP-DM-EAP:(5)-2021

Introduction

This document has been created to supplement, not replace, the Pennsylvania Department of Environmental Protection (PaDEP) Emergency Action Plans (EAP) for University Owned dams in the vicinity of the University Park Campus. Dam operators are required to have a full copy of the EAP on site. Engineering Services also maintains paper copies of each EAP in the files of room 113 of the Office of Physical Plant Building (OPP). Additionally, the EAPs are contained digitally on the OPP server at:

https://www.opp.psu.edu/penn-state-owned-dams

The dams covered in this document and the current designated responsible University operators are:

1. Bathgate Dam – Supervisor Trades of the Wastewater Treatment Plant, currently Garry Beck
2. Airport Dam 1A – Director of the University Park Airport, currently Bryan Rodgers
3. Airport Dam 4A – Director of the University Park Airport, currently Bryan Rodgers
4. Shavers Creek Dam – Supervisor Stone Valley Recreation Area, currently Cynthia Rabbers

EAPs are a formal document that identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to minimize property damage and loss of life. It contains procedures and information to assist the dam owner in issuing early warning and notification messages to responsible downstream emergency management authorities of the emergency situation. It also contains inundation maps to show the emergency management authorities the critical areas for action in case of an emergency.

The University operators will commence surveillance of conditions at the dam site when:

1. Severe thunderstorms, heavy rains with local flood warnings, tropical storms and hurricanes, or heavy rains with frozen ground and/or snow cover are occurring,
2. The National Weather Service issues a flash flood watch or warning and conditions warrant,
3. Any abnormal or questionable conditions as identified in Section III.D.1 of the EAP.

This document contains information to assist in determining:

1. Early Warning Notifications,
2. Warning and Evacuation Notifications,
3. Termination of Surveillance.

This document includes:

1. General location maps,
2. Cross sections that include elevation triggers,
3. Photographs of field staff gages.

This document has information based on the following EAPs:

1. Bathgate Dam – April 2018
2. Airport Dam 1A – January 2019
3. Airport Dam 4A – January 2019
4. Shavers Creek Dam – Revised July 2010, In review by PaDEP

Operator Requirements

The following information is from PaDEP's online document 3140-FS-DEP1901.pdf

The dam owner's responsibilities are:

1. Operation - Quarterly inspections of the dam by the owner or operator with a written, dated log of conditions.

2. Maintenance - Cutting vegetation on embankments and within 10 feet of the downstream toe of the dam, checking the dam's appurtenances and operating valves, and performing timely repairs when needed.

3. Annual dam inspection (of a "high-hazard" dam) - Annual inspection by an experienced registered, professional engineer, including a field review of the downstream inundation map. This Owner's Annual Inspection Report must be submitted to DEP by December 31 every year.

4. Developing an EAP, with assistance by an engineer, local emergency personnel and county emergency management office. Develop an acceptable EAP and update it every five years. When complete, the EAP will be reviewed by PEMA before being approved by DEP.

5. Review and update EAP. Every five years a dam owner must thoroughly review and update the EAP as needed. This includes revising the inundation map, obtaining new concurrence signatures, and submitting the revised plan to DEP for review and approval.

Actions by the Operator During Warning Elevations

The language in each EAP varies slightly based on when the EAP was approved; and therefore, the operator should always review and follow their specific EAP. However, the below are considered actions each operator should understand.

Early Warning Notifications – When the water surface elevation reaches the designated elevation of the Early Warning Notification, the applicable County 911/Emergency Communications will be notified and 24-hr around the clock surveillance by the operator is required.

Warning and Evacuation Notifications – When the water surface elevation reaches the designated elevation of the Warning and Evacuation Notifications, the applicable County 911/Emergency Communications will be notified.

Warning and evacuation of the public must commence upon notification by the operator, or a designated representative, of a potential or imminent failure of the dam. Emergency responders should initiate action in accordance with plan outline and any existing internal organizational recommended operating guidelines, and existing municipal or county operation plans.

Termination of Surveillance – Upon termination of 24-hour surveillance of dam site conditions, the dam owner shall notify the applicable County 911/Emergency Communications.

THE OPERATOR SHOULD MAINTAIN RECORDS OF ALL WARNING NOTIFICATIONS INCLUDING INSPECTION LOGS.

Bathgate Dam

The Bathgate Dam is located in College Township, Centre County. The dam is a Size Category "C", Hazard Potential Category "1" dam.

Access to the dam's staff gage is via a gravel road with gate as shown on Figure 1.

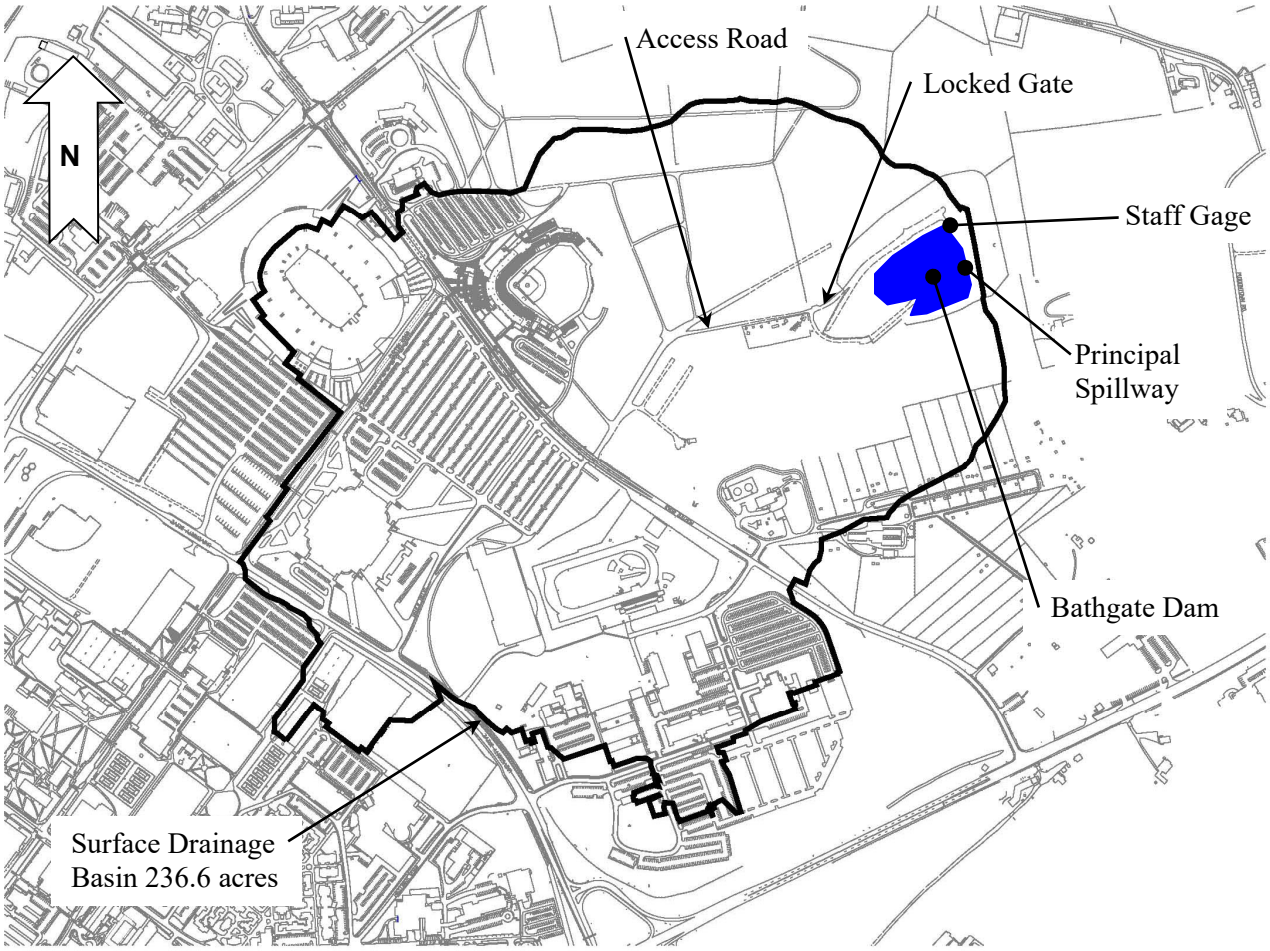

Figure 1. The Bathgate Dam Location Map

The Bathgate EAP has established the following elevations (refer to Figure 2 and 3):

1. **Early Warning Notifications** – When the water surface elevation reaches 6.5 feet below the dam top of bank (elevation 1003.0), which is the depth of the grass lined emergency spillway. The staff gage at elevation 1003 will read "3.0".

2. **Warning and Evacuation Notifications** – When the water surface elevation reaches 4.9 feet below the dam top of bank (elevation 1004.6). The staff gage at elevation 1004.6 will read "4.6".

3. **Termination of Surveillance** – When the water surface elevation reaches 7 feet below the dam top of bank (elevation 1002.5), which is when flow has stopped going over the grass lined emergency spillway. The staff gage at elevation 1002.5 will read "2.5".

Note, all these elevations are significantly over the crest of the concrete principal spillway.

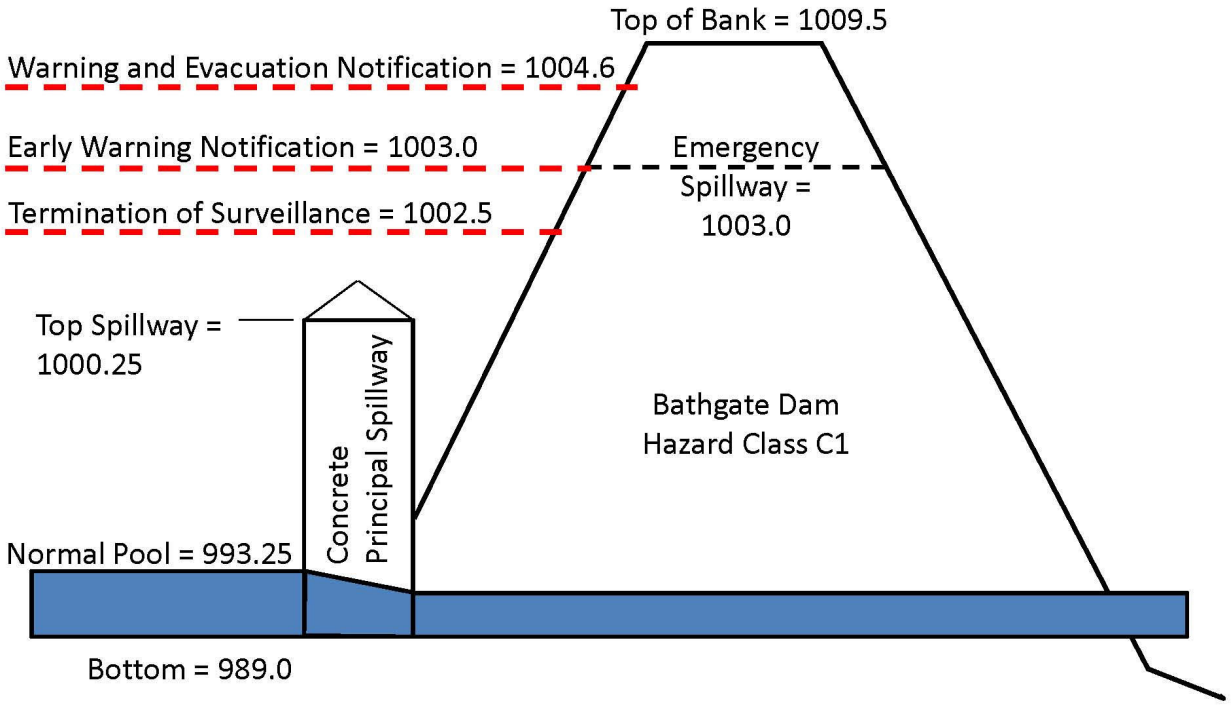

Figure 2. Bathgate Dam Water Surface Notification Elevations

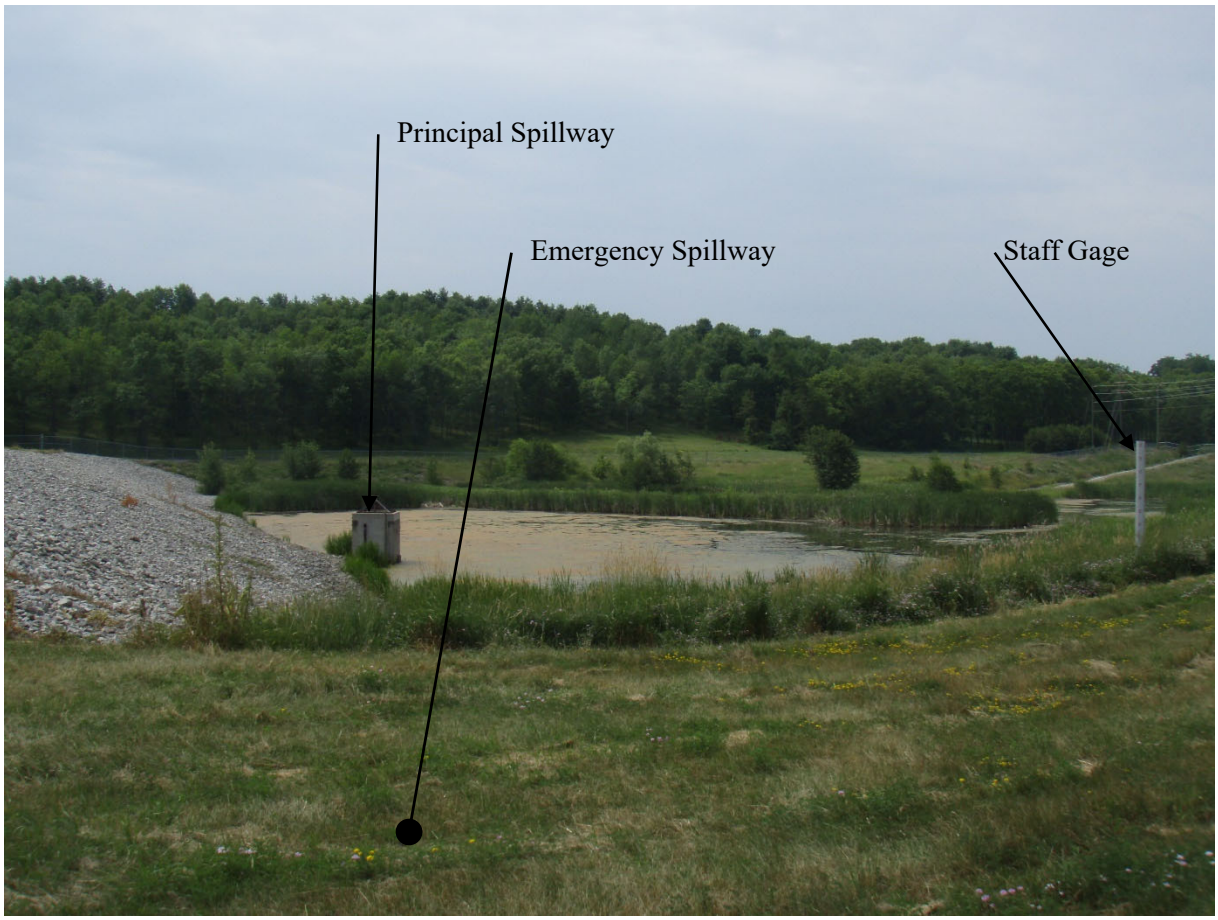

Figure 3. Photograph Showing Staff Gage, Emergency Spillway, and Principal Spillway from North Access Road

Airport Dam 1A

The Airport Dam 1A is located in Benner Township, Centre County. The dam is a Size Category "C", Hazard Potential Category "1" dam.

Access to the dam's staff gage is via a gravel road with gate as shown on Figure 4.

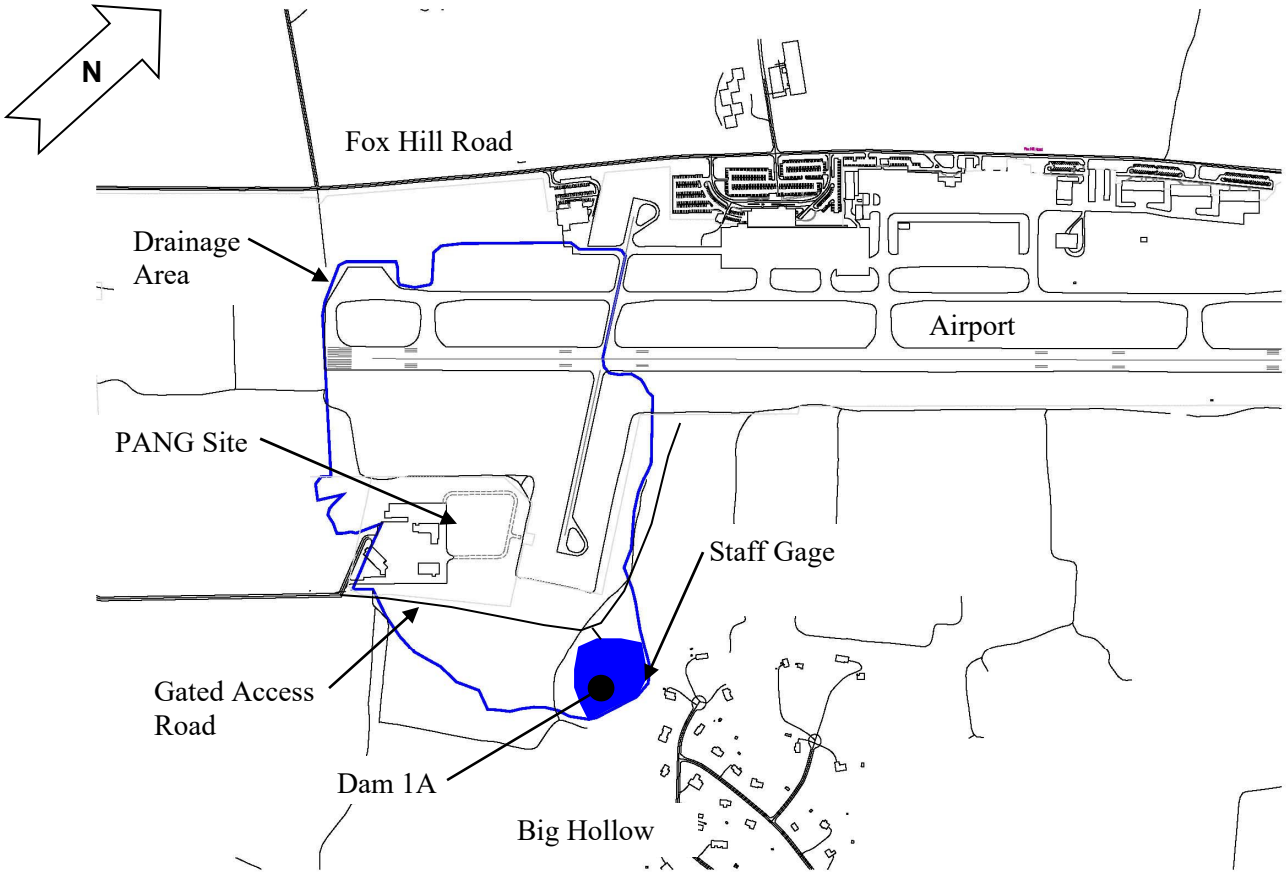

Figure 4. The Airport Dam 1A Location Map

The Airport Dam 1A EAP has established the following elevations (refer to Figure 5 and 6):

4. **Early Warning Notification** – When the water surface elevation reaches 7.0 feet below the dam top of bank (elevation 1148.0). The staff gage at elevation 1048.0 will read "48.0".

5. **Warning and Evacuation Notifications** – When the water surface elevation reaches 4.0 feet below the dam top of bank (elevation 1051.0). The staff gage at elevation 1051.0 will read "51.0".

6. **Termination of Surveillance** – When the water has fallen 7.5 feet below the dam top of bank (elevation 1047.5), and all National Weather Service flash flood watches and warnings have expired. The staff gage at elevation 1047.5will read "47.5".

Note, all these elevations are significantly over the crest of the concrete principal spillway.

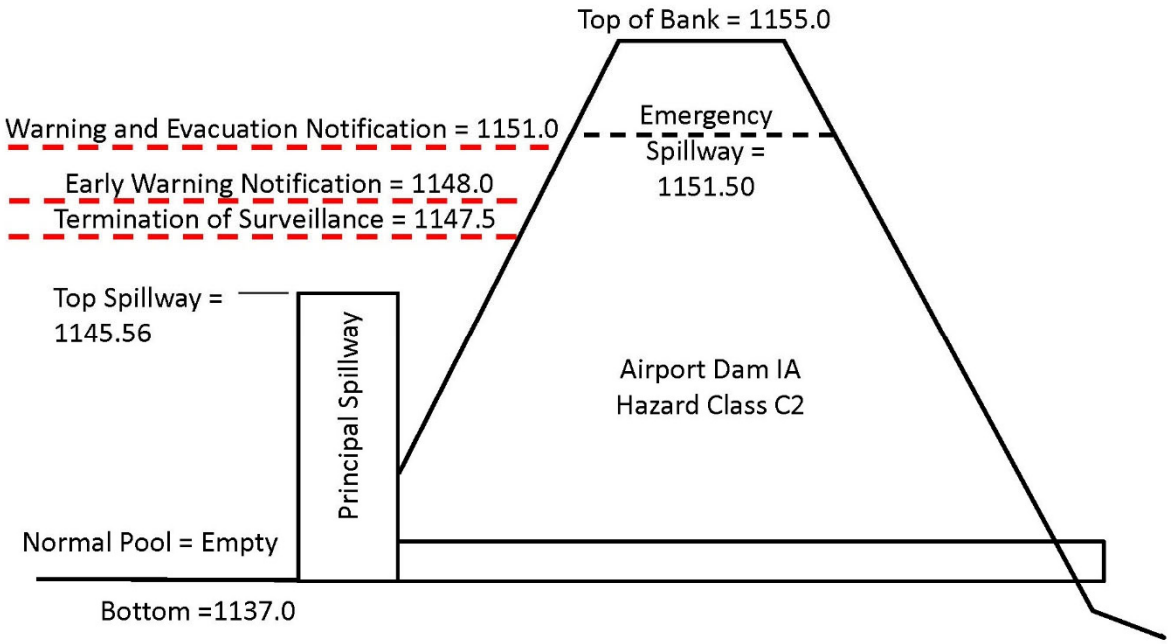

Figure 5. Airport Dam 1A Water Surface Notification Elevations

Figure 6. Photograph Showing Staff Gage, Emergency Spillway, and Principal Spillway Looking South

Airport Dam 4A

The Airport Dam 4A is located in Benner Township, Centre County. The dam is a Size Category "C", Hazard Potential Category "3" dam.

Access to the dam's staff gage is via a gravel road with gate as shown on Figure 7.

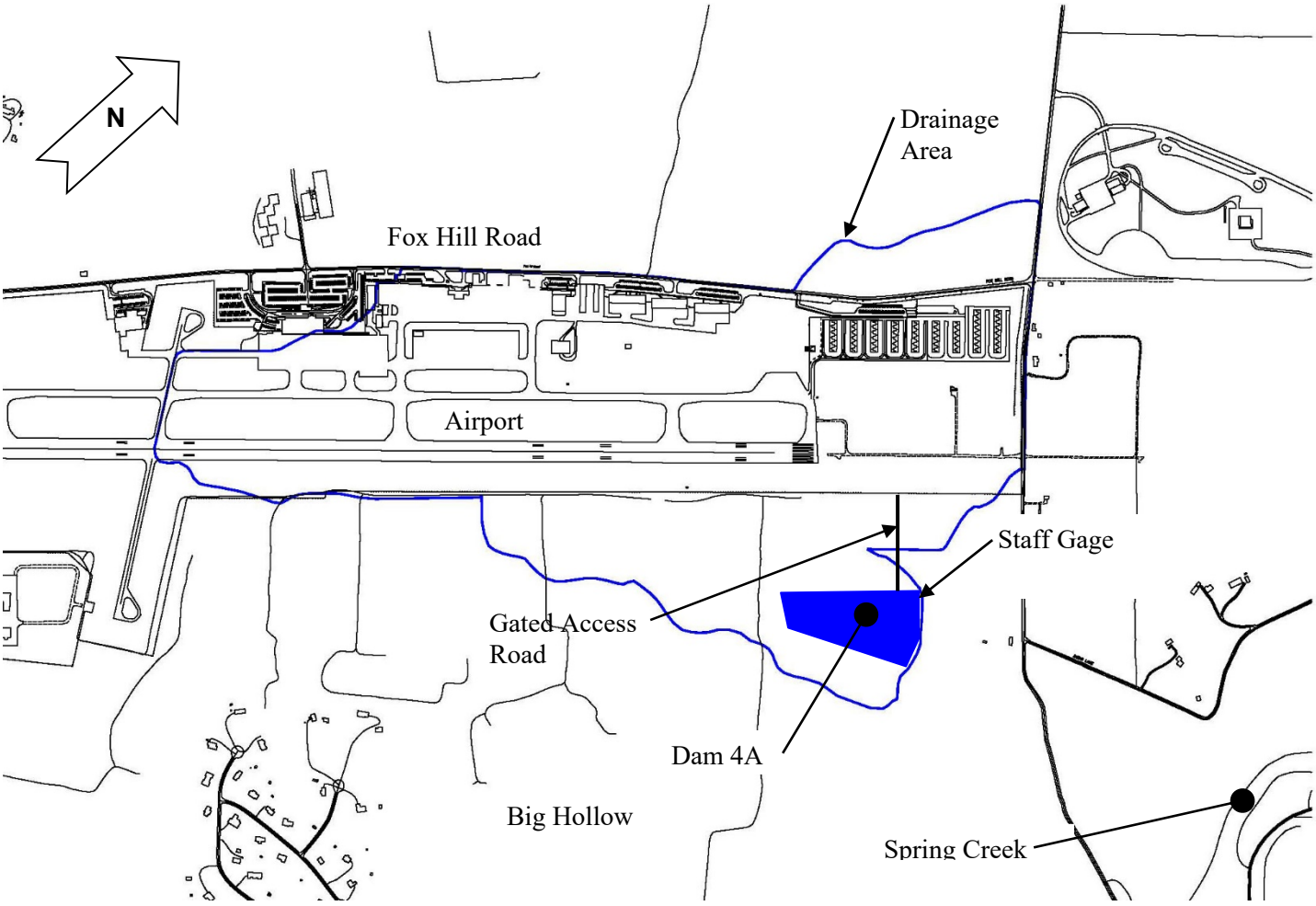

Figure 7. The Airport Dam 4A Location Map

The Airport Dam 4A EAP has established the following elevations (refer to Figure 8 and 9):

7. **Early Warning Notification** – When the water surface elevation reaches 6.0 feet below the dam top of bank (elevation 1129.0), which is the depth of water 2 feet below the grate of the upper spillway. The staff gage at elevation 1029.0 will read "29.0".

8. **Warning and Evacuation Notifications** – When the water surface elevation reaches 3.0 feet below the dam top of bank (elevation 1132.0). The staff gage at elevation 1032.0 will read "32.0".

9. **Termination of Surveillance** – When the water has fallen 6.5 feet below the dam top of bank (elevation 1128.5), and all National Weather Service flash flood watches or warnings have expired. The staff gage at elevation 1128.5 will read "28.5".

Note, all these elevations are significantly over the lower concrete spillway, but in the middle or above the upper spillway.

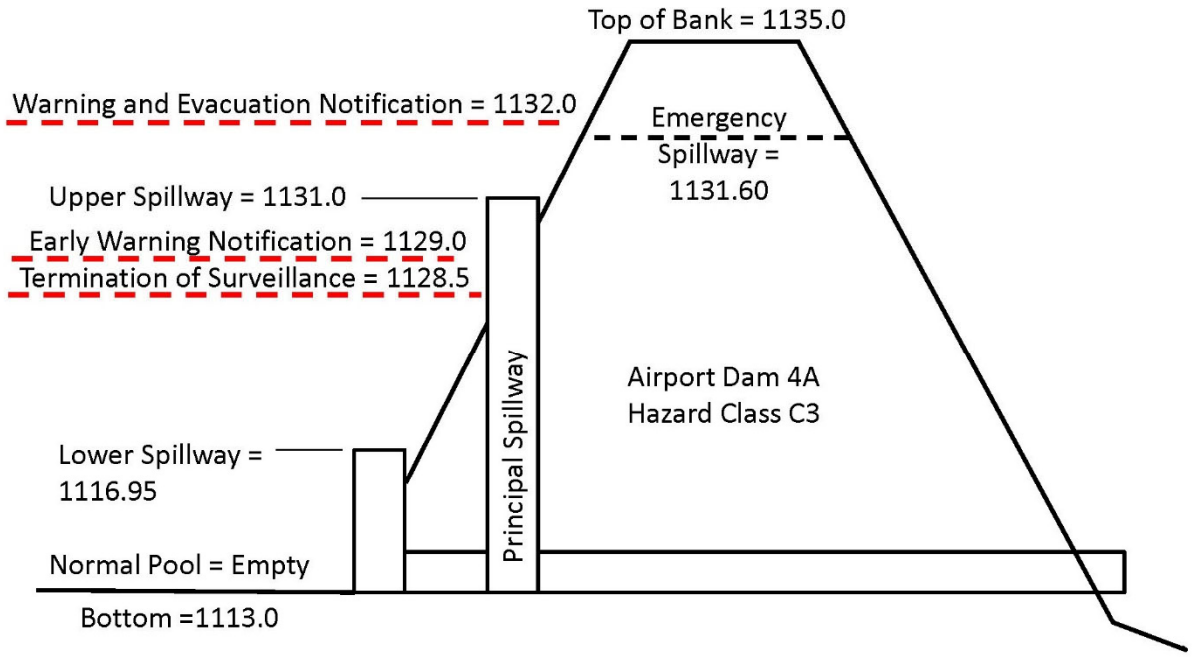

Figure 8. Airport Dam 4A Water Surface Notification Elevations

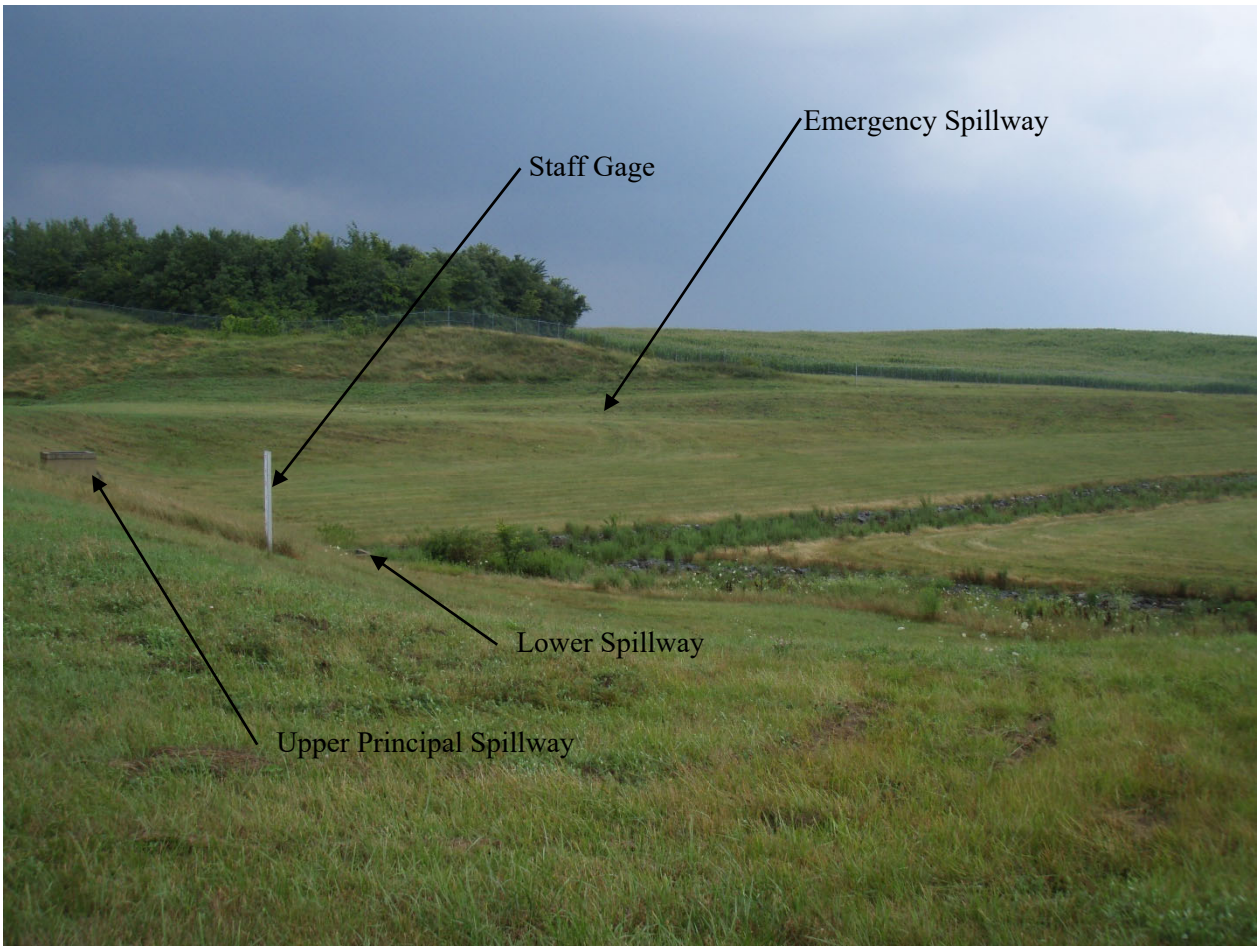

Figure 9. Photograph Showing Staff Gage, Emergency Spillway, and Principal Spillway Looking South from Gate

Shavers Creek Dam

The Shavers Creek Dam is located in Barree Township, Huntingdon County. The dam is a Size Category "B", Hazard Potential Category "1" dam.

Access to the dam's staff gage is via a paved and gravel road as shown on Figure 10.

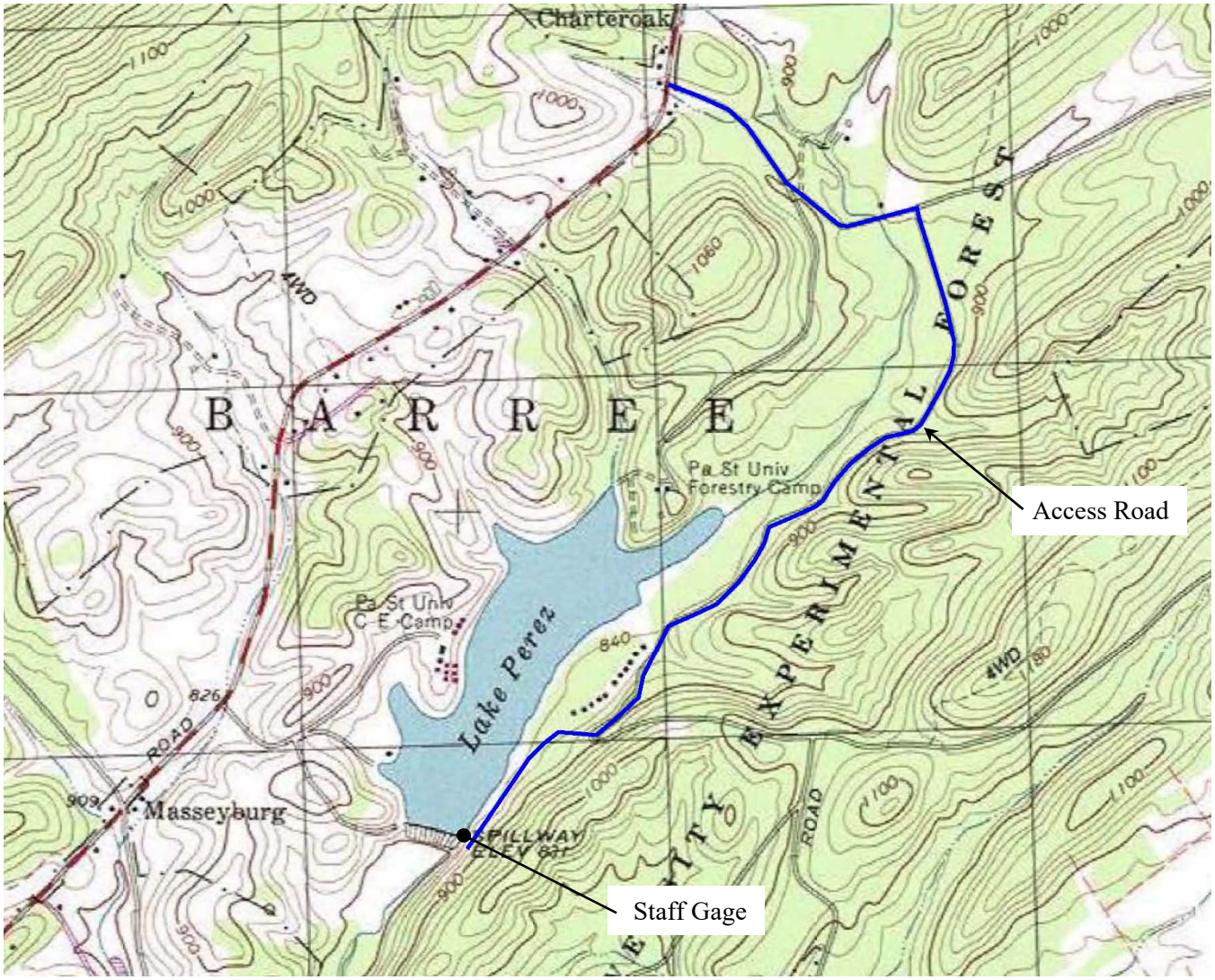

Figure 10. The Shavers Creek Dam Location Map

The Shavers Creek Dam EAP has established the following elevations (refer to Figure 11 and 12):

10. **Early Warning Notifications** – When the water surface elevation reaches 8.0 feet below the dam top of bank (elevation 834.5). The staff gage at elevation 834.5 will read "4.5".

11. **Warning and Evacuation Notifications** – When the water surface elevation reaches 3.0 feet below the dam top of bank (elevation 839.5). The staff gage at elevation 839.5 will read "9.5".

12. **Termination of Surveillance** – When the water surface elevation reaches 10 feet below the dam top of bank (elevation 832.5). The staff gage at elevation 832.5 will read "2.5".

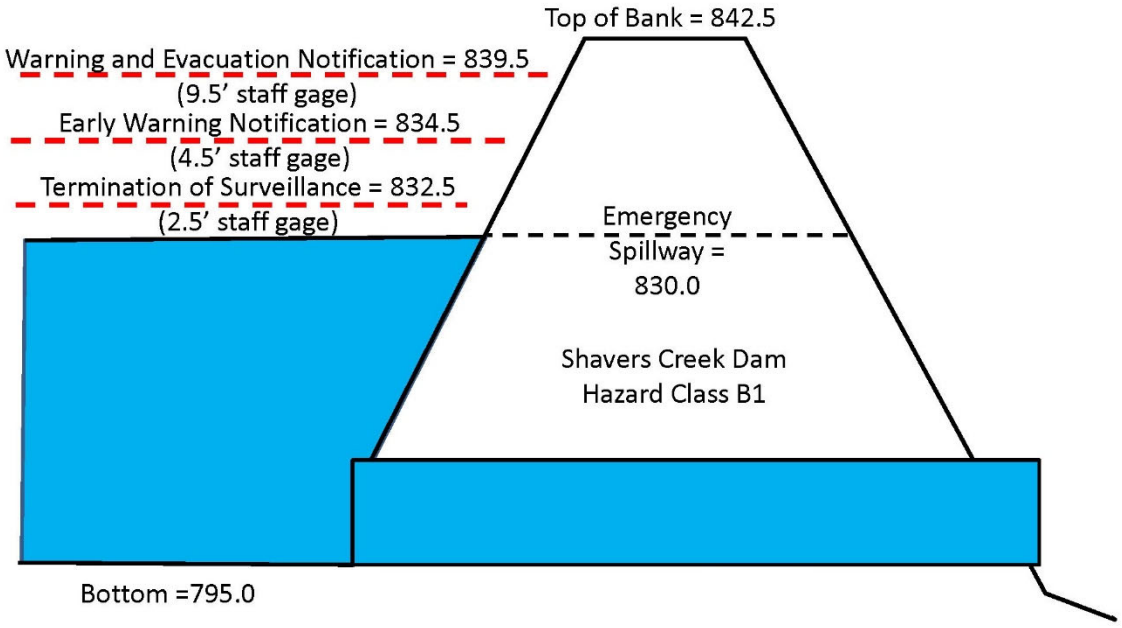

Figure 11. Shavers Creek Dam Water Surface Notification Elevations

Figure 12. Photograph Showing Staff Gage and Spillway

Publisher: Penn State University, Office of Physical Plant, Energy and Engineering Division, Engineering Services
Editor: Larry Fennessey, OPP Stormwater Engineer, Ph: (814) 863-8743, email: laf8@psu.edu