



EMERGENCY ACTION PLAN

WESTTOWN LAKE DAM PADEP DAM FILE NUMBER 15-029

LOCATED ACROSS HICKMAN RUN
TOWNSHIP OF WESTTOWN
CHESTER COUNTY, PENNSYLVANIA

PREPARED FOR:

WESTTOWN SCHOOL
WESTTOWN ROAD, P.O. BOX 1799
WESTTOWN, PA 19395

EMERGENCY ACTION PLAN

SURVEILLANCE, WARNING AND EVACUATION PROCEDURES

WESTTOWN LAKE DAM DEP NUMBER D15-029

**LOCATED ACROSS HICKMAN RUN
IN WESTTOWN TOWNSHIP, CHESTER COUNTY**

LATITUDE: 39°57'01" LONGITUDE: 75°32'42"

**SIZE CATEGORY "C"
HAZARD POTENTIAL CATEGORY "3"**

OPERATED BY: MARK DEL NEGRO
THE WESTTOWN SCHOOL
ADDRESS: 975 WESTTOWN ROAD
WESTTOWN, PA 19382
TELEPHONE: **BUSINESS:** (610) 399-7624
HOME: (302) 998-5605
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OWNED BY: THE WESTTOWN SCHOOL
c/o VICTORIA JUEDES
ADDRESS: 975 WESTTOWN ROAD
WEST CHESTER, PA 19382
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DATE: November 21, 2018

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PROMULGATION AND CONCURRENCE

We, the undersigned, on date indicated, have reviewed the requested support activity in the Emergency Action Plan for the Westtown Lake Dam. Our support action will be executed in accordance with existing recommended operating guidelines and existing municipal or county emergency operation plans.



VICTORIA JUEDES, DAM OWNER

7/16/19
DATE



MARK DEL NEGRO, OPERATOR

7/25/19
DATE

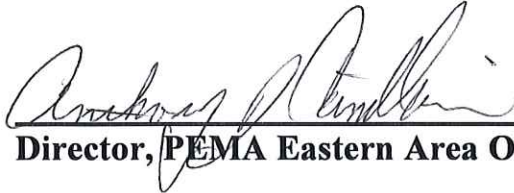


DIRECTOR, DEPARTMENT OF EMERGENCY
SERVICES, CHESTER COUNTY

8/02/19
DATE

PEMA AND DEP ACKNOWLEDGMENTS


The Pennsylvania Emergency Management Agency has reviewed the WESTTOWN LAKE DAM (D15-029) Emergency Action Plan for appropriate content.



Director, PEMA Eastern Area Office

Sept. 23, 2019
DATE

The Department of Environmental Protection, Division of Dam Safety, has reviewed the WESTTOWN LAKE DAM (D15-029) Emergency Action Plan for appropriate content.



Chief, Division of Dam Safety

10/3/2019
DATE

I. PURPOSE AND SCOPE

- A. To safeguard the lives as well as to reduce property damage of the citizens living within the dam's potential downstream flood or inundation area.
- B. To provide for effective dam surveillance, prompt notification to local emergency management agencies, citizen warning and evacuation response, when required.
- C. To identify emergency actions to be taken by the dam owner/operator, public officials, emergency personnel, and to outline response actions in the event of a potential or imminent failure of the dam.

II. SITUATION

- A. The dam is a 19-foot high, 700-foot long earthen embankment dam, maintaining a normal pool elevation of 274.2. The normal pool volume is 43.7 ac-ft. The dam has a primary spillway which is an 11 feet by 10 feet tower connected to a 4 feet by 6 feet box culvert. As well as an auxiliary spillway which is an 80 feet wide with a 24 feet breadth concrete step at elevation 275.5 feet. The capacity of the impoundment prior to flow over the auxiliary spillway is 67.2 ac-ft. The maximum pool capacity for the impoundment is 143.68 ac-ft. prior to overtopping the embankment (elevation 279.0).
- B. The Westtown Lake Dam is located approximately 3.4 miles southeast from the center of the Borough of West Chester, PA. To travel to the Westtown Lake Dam from the center of West Chester, one would take East Market Street (PA-3 East) eastward for approximately 0.8 miles, turn right onto Westtown Road, and follow Westtown Road for approximately 3.2 miles, after which the Westtown Lake Dam would be on the left-hand side of the Westtown Road. For more directions from other locations, refer to the Location Map (*Attachment C*).
- C. The inundation area starts at the exit channel that crosses under Westtown Road and drains southwest along East Branch of Chester Creek extending approximately 4,000 feet downstream of the crossing. This area will impact the forested riparian zones only with the exception of an area that overtops approximately 1,000 feet of Westtown Road located 1,700 feet north of the intersection with E. Street Road intersection. Refer to the Inundation Map (*Attachment A*).
- D. The inundation area resulting from a sudden dam failure is bordered on the north and east by Westtown Road and lies along the East Branch Chester Creek. Refer to the Inundation Map (*Attachment A*).
- E. Within the inundation area, the residential development will not be impacted. The impacts will be the portions of Westtown Road and utilities that located within Westtown Road. The sewer treatment facility will not be impacted by the inundation area.

III. CONCEPT OF OPERATIONS

A. SURVEILLANCE – NORMAL CONDITIONS - (DAM OWNER OR OPERATOR)

- 1. The dam operator, owner or engineer will conduct an on-site visual inspection of the dam, the dam's spillway(s), control systems, and the toe area below the dam at a minimum of once every three months. Any abnormal or questionable

conditions should be immediately brought to the attention of the owner's engineer and the Division of Dam Safety of DEP.

B. SURVEILLANCE – UNUSUAL EVENT CONDITIONS (DAM WATCH)

1. The dam operator, owner or designee should commence surveillance of conditions at the dam site when:
 - a. Severe thunderstorms, heavy rains with local flood warnings, tropical storms and hurricanes, or heavy rains with frozen ground and/or snow cover are occurring.
 - b. The National Weather Service issues a flash flood watch or warning and conditions warrant.
 - c. Any abnormal or questionable conditions as identified in Section III.D.1.

C. EARLY WARNING NOTIFICATION

1. The dam operator, owner or designee is responsible for determining the dam's threat potential. The following conditions constitute a dam early warning notification to the Chester County 911 Center and require 24-hour around-the-clock surveillance.
 - a. The water level in the impoundment area has reached the threshold level of 1.0 feet below the top of the dam and is rising, or
 - b. Following the occurrence of an earthquake in the general region of the dam.
2. Early warning notification will be relayed from the Chester County 911 Center to the Chester County DES, the PEMA – Commonwealth Watch and Warning Center (CWWC), and all applicable emergency responders and designated government officials and agencies. Refer to Section IV.B. for additional notifications.

D. WARNING NOTIFICATION

1. The dam operator, dam owner or designee is responsible for determining the dam's threat potential. The following conditions constitute a dam emergency requiring warning notification to the Chester County 911 Center.
 - a. The depth of flow in the auxiliary spillway has reached a depth of 3 feet. (Staff gage on the spillway might be needed), and
 - b. The water level in the impoundment area has reached the threshold level of 0.50 feet below the top the dam, or
 - c. Imminent failure of this dam might be indicated by observance of one or more of the following conditions at the dam site:
 - i. The lake or pond level is at or near the top of the dam and water is flowing, or about to flow, over the top of the dam.
 - ii. The outlet tower and associated piping or spillway is damaged, or clogged with debris or ice, which is resulting in a rapid rise in the lake or pond level.

- iii. The primary or auxiliary spillway is experiencing heavy flows which are causing severe erosion to the spillway or the dam embankment.
 - iv. Any structural movement or failure of the concrete tower, auxiliary spillway or the spillway abutment walls.
 - v. Any sloughing or sliding of the embankment upstream or downstream slope. Also, earth slides in the spillway channel, either upstream or downstream of the dam's crest, which could impede the flow in the spillway.
 - vi. Subsidence, sinkholes or cracks found in any part of the dam's embankment or abutting slopes.
 - vii. Any new discharge of water is observed through the dam's embankment or abutting slopes, adjacent to any conduit outlets, or under the dam, which appears as a boil along the downstream toe. Should such a discharge occur and the water is cloudy or muddy in color, then a very serious problem exists.
2. Warning notification will be relayed from the Chester County 911 Center to the Chester County DES, the PEMA – Commonwealth Watch and Warning Center (CWWC), all applicable emergency responders and designated government officials and agencies. Refer to Section IV.B. for additional notifications.
 3. Emergency management officials will accomplish the needed actions, which are explained in this EAP, in accordance with their existing recommended operating guidelines and existing municipal or county emergency operation plans.
 4. Warning of the public must commence upon notification by the dam operator, owner or designee, of a potential or imminent failure of the dam. Emergency responders should initiate action in accordance with the plan outline and any existing internal organizational recommended operating guidelines, and existing municipal or county operation plans.

E. TERMINATION OF SURVEILLANCE AND NOTIFICATIONS

1. The dam operator, owner or designee may terminate 24 -hour surveillance of dam site conditions when:
 - a. All National Weather Service flash flood watches or warnings have expired, **and**
 - b. Heavy rains have ended and the water level in the lake has dropped 1.5 feet below the top of the dam and is receding.
 - c. After a personal inspection of the dam site has been conducted by a knowledgeable professional engineer following an earthquake, overtopping of the dam or an evacuation of the inundation area as a result of this EAP, or other serious problems resulting in a notification of a dam site emergency and the Department concurs with the results of the inspection.
2. Upon termination of 24 hour surveillance of dam site conditions, the dam operator, owner or designee shall notify the Chester County 911 Center.
3. Termination of notifications will be relayed from the Chester County 911 Center to the Chester County DES, the PEMA – Commonwealth Watch and Warning

Center (CWWC), all applicable emergency responders and designated government officials and agencies. Refer to Section IV.B. for additional notifications.

IV. RESPONSIBILITIES AND DUTIES - EMERGENCY RESPONSE

A. *DAM OWNER OR DAM OPERATOR (DAM SITE EMERGENCY)*

1. The dam operator, owner or designee will provide for 24-hour on-site dam surveillance and monitoring as required in Section III.C.1. and initiate early warning notification to the Chester County 911 Center.
2. When the situation meets the criteria under the warning notification guidelines, presented in Section III.D.1, indicating a failure of the dam is possible or a significant threat condition is developing, the dam operator, owner or designee will initiate warning notification to the Chester County 911 Center.

B. *CHESTER COUNTY 911 CENTER*

1. The Chester County 911 Center will notify:
 - a. Chester County DES
 - b. PEMA – Commonwealth Watch and Warning Center (CWWC)
 - c. Westtown-East Goshen Regional Police Department
 - d. Goshen Fire Company
 - e. Good Fellowship Ambulance Company

C. *CHESTER COUNTY DES*

1. The Chester County DES will contact the following personnel and agencies:
 - a. National Weather Service
 - b. Westtown Township EMA
 - c. Media - Warning and/or Evacuation (Activate EAS). Refer to Attachment E
 - d. Chester County EOC staff, as necessary
 - e. American Red Cross – Southeastern Pennsylvania Chapter (when mass care or family assistance is required). Coordinate sheltering per ESF 6 of County EOP.
 - f. Chester County elected officials
 - g. West Chester Area School District
 - h. Pennsylvania Emergency Management Agency (PEMA)
 - i. PennDOT Maintenance District 6-2
 - j. Westtown School Sewer Plant
2. The Chester County DES will ascertain and report to PEMA any unmet needs.
3. The Westtown Township/CCDES will initiate Damage Assessment and Recovery procedures as the situation requires.

D. LOCAL MUNICIPAL EMAs

WESTTOWN TOWNSHIP EMA

1. Advise facilities with special needs individuals as outlined in the Emergency Operations Plan (EOP) and identified by the Hazard Vulnerability Analysis (areas impacted due to a dam failure and indicated on the Inundation Map).
2. Notify municipal elected officials and municipal services (water, sewer, etc.).
3. Keep the County DES apprised of the situation.
4. Coordinate the evacuation (where appropriate).
5. Provide damage reporting to the Chester County DES.

E. FIRE DEPARTMENTS

GOSHEN FIRE COMPANY

1. Provide citizen notification and route alerting to advise residents living within their jurisdiction (See Inundation Map - Attachment A).
2. Assist in evacuation.
3. Assist police and EMS, as requested.
4. Provide communications support if feasible and requested.

F. POLICE SERVICES

WESTTOWN-EAST GOSHEN REGIONAL POLICE DEPARTMENT

1. Dispatch radio vehicle to dam site in order to provide alternate communications link to Chester County 911 Center.
2. Assist evacuation traffic flow and establish traffic control points (TCP) at pre-designated locations (See Inundation Map – Attachment A and Traffic Control Points – Attachment B).
3. Prevent unauthorized entry and provide security of evacuated areas.
4. Provide assistance with route alerting, if requested.

G. EMERGENCY MEDICAL SERVICES (EMS)

GOOD FELLOWSHIP AMBULANCE COMPANY

1. Provide evacuation transportation assistance and coordinate with designated fire services agencies for transportation of persons with disabilities and any special needs.
2. Assist fire and police departments as requested.
3. Provide EMS support to any mass care center as requested.

H. AMERICAN RED CROSS or Volunteer Organization Active in Disasters (VOAD)

SOUTHEASTERN PENNSYLVANIA CHAPTER (If requested by Chester County DES)

1. Identify and activate an appropriate shelter, as necessary.
2. Support and maintain operations of the reception center.

3. Maintain communications with County DES, local EMA and reception center.

I. PENNSYLVANIA DEPARTMENT OF TRANSPORTATION (PennDOT)

1. Provide services, signs, barricades and guidance on roads and bridges affecting the evacuation and recovery.

V. ADMINISTRATION AND LOGISTICS – NOT REQUIRED

VI. AUTHORITY AND REFERENCES

A. AUTHORITY

1. The Dam Safety and Encroachments Act (32 P.S. Sections 693.1-693.27), May 16, 1985.
2. The Pennsylvania Code - Title 25, Chapter 105 Dam Safety and Waterways Management, Section 105.63 and 105.134.
3. Emergency Management Services Code, 35 Pa C.S. Section 7101 et seq., as amended.

B. REFERENCES

1. Guidelines for Developing an Emergency Action Plan for Hazard Category 1, 2, & 3 Dams. Prepared by the Department of Environmental Protection, Water Management, Bureau of Waterways Engineering, Division of Dam Safety and the Pennsylvania Emergency Management Agency, January 2009.
1. Inspection, Maintenance and Operation of Dams in Pennsylvania. Prepared by the Department of Environmental Protection, Water Management, Bureau of Waterways Engineering, Division of Dam Safety, February 2009.
3. Chester County Emergency Operations Plan.

VII. DEFINITIONS

- A. **ABUTMENT** - The part of the valley's hillside against which the dam abuts. Right and left abutments are those on respective sides of the dam as an observer looks downstream.
- B. **AFFECTED COUNTIES/MUNICIPALITIES** – Those jurisdictions within Pennsylvania or adjoining states that, according to the inundation map, may experience flooding as a result of a failure of the dam.
- C. **BOIL** - A disturbance in the surface layer of soil caused by water escaping under pressure from behind a water-retaining structure such as a dam or a levee. The boil may be accompanied by deposition of soil particles (usually sand or silt) in the form of a ring (miniature volcano) around the area where the water escapes.
- D. **BREACH** - An opening or a breakthrough of a dam sometimes caused by rapid erosion of a section of earth embankment by water.
- E. **CONDUIT** - A pipe used to convey water through or around or under a dam.

- F. **CONTROL TOWER** - A structure in the dam or reservoir used to control withdraw of water from the reservoir through pipes or culverts.
- G. **CREST OF DAM** - The crown of an overflow section of the dam. In the United States, the term "crest of dam" is often used when "top of dam" is intended. To avoid confusion, the terms **crest of spillway** and **top of dam** should be used for referring to the overflow section and dam proper, respectively.
- H. **CULVERT** - (a) A drain or waterway structure built transversely under a road, railway, or embankment. A culvert usually comprises a pipe or a covered channel of box section. (b) A gallery or waterway constructed through any type of dam, which is normally dry but is used occasionally for discharging water; hence the terms scour culvert, drawoff culvert and spillway culvert.
- I. **DAM** - A barrier built across a watercourse for impounding or diverting the flow of water.
- J. **DAM FAILURE** - The uncontrolled release of a dam's impounded water. It is recognized that there are degrees of failure. Any malfunction or abnormality, outside the design assumptions and parameters, which adversely affect a dam's primary function of impounding water is properly considered a failure. Minor malfunctions or abnormalities can result in a sudden failure of a dam.
- K. **DAM OWNER** – For the purposes of this document, this means Mrs. Victoria Juedes of the Westtown School.
- L. **DAM OPERERATOR**– For the purposes of this document, this means Mr. Mark Del Negro of the Westtown School.
- M. **DESIGNEE** – For the purposes of this document, this means Mr. Mark Del Negro of the Westtown School.
- N. **EARTH DAM (EARTHFILL DAM)** - An embankment dam in which more than 50% of the total volume is formed of compacted fine-grained earth.
- O. **EMBANKMENT** - Fill material, usually earth or rock, placed with sloping sides.
- P. **EMERGENCY** - A condition of serious nature which develops unexpectedly and endangers the structural integrity of a dam or endangers downstream property and human life. An emergency requires immediate action.
- Q. **EAP** – Emergency Action Plan - 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 of the critical areas for action in case of an emergency.
- R. **EOP** – Emergency Operations Plan - “The document . . . which describes the hazards, vulnerabilities, emergency management situations and assumptions that affect the municipality, the concept of operations during an emergency, and the various roles and assignments of the elected officials, emergency management coordinator and other emergency response personnel, whether paid or volunteer.” (From PEMA Directive D2007-1). The EOP includes checklists for known critical facilities, special facilities, critical personnel, hearing impaired residents, non-English speaking residents, residents requiring ambulance assistance, etc., as identified by local emergency management officials.
- S. **FACE** - With reference to a structure, the external surface that limits the structure, e.g., the face of a wall or dam.
- T. **FAILURE** - An incident resulting in the uncontrolled release of water from an operating dam. See “Dam Failure”.
- U. **FOUNDATION OF DAM** - The natural material on which the dam structure is placed.

- V. **GROIN** - That area along the contact (or intersection) of the face of a dam with the abutment.
- W. **HAZARD** - A situation which creates the potential for adverse consequences such as loss of life, property damage, and adverse social and environmental impacts. Impacts may be for a defined area downstream of a dam from flood-waters released through spillways and outlet works of the dam or waters released by partial or complete failure of the dam. This could include an area upstream of the dam from effects of backwater flooding or effects of landslides around the reservoir perimeter.
- X. **INUNDATION AREA** - The downstream area that would be flooded or otherwise affected by the failure of a dam or large flows. This area can be subject to a fast moving flood wave, 20 to 50 MPH is common, with a height of 1 foot to tens of feet.
- Y. **INUNDATION MAP** - A map delineating the area that would probably be flooded in the event of a dam failure. This map must be prepared by a registered professional engineer.
- Z. **NOTIFICATION** - To promptly inform appropriate individuals or emergency agency about an emergency condition so they can initiate appropriate actions.
- AA. **NORMAL WATER LEVEL (NORMAL WATER POOL)** - For reservoir with a fixed overflow spillway crest, it is the lowest level of that crest.
- BB. **OPERATOR** - The person or position in a company or organization, who is responsible for a dam's operation and surveillance.
- CC. **OUTLET** - A constructed opening through which water can be safely discharged for a particular purpose from a reservoir.
- DD. **OWNER** - Any person, authority or agency that manages a dam or reservoir.
- EE. **SAP** - Public Safety Answering Point - an agency in the United States, typically county or city controlled, responsible for answering 9-1-1 calls for emergency assistance from police, fire, and ambulance services.
- FF. **SEEPAGE** - The movement of water that might occur through the dam, its foundation or its abutments. Small amounts of clear water seepage is normal. Increase in the amount of water flow or change in color is a concern for a dam's safety.
- GG. **SLIDE** - The movement of a mass of earth down a slope. In embankments and abutments, this involves the separation of a portion of the slope from the surrounding materials.
- HH. **SPILLWAY** - A structure over or through which flows are discharged. If the flow is controlled by gates, it is considered a controlled spillway; if the elevation of the spillway crest is the only control, it is considered an uncontrolled spillway.
- II. **SPILLWAY CHANNEL** - A channel conveying water from the spillway crest to the river downstream.
- JJ. **TOE OF DAM** - The junction of the downstream face of a dam with the ground surface. Also referred to as downstream toe. For an embankment dam, the junction of the upstream face with ground surface is called the upstream toe.
- KK. **TOP OF DAM** - The elevation of the uppermost surface of a dam, usually a road or walkway, excluding any parapet wall, railings, etc.
- LL. **TRAFFIC CONTROL POINT (TCP)** - Manned or unmanned posts established at critical road junctions for the purpose of controlling or limiting traffic. TCPs are used to control evacuation movement and also limit entry into the inundation area when an emergency situation requires it.
- MM. **VOAD** - Voluntary Organizations Active in Disasters - collaboration of diverse organizations and citizens trained to meet community needs in the wake of a large-scale disaster.

VII. EXERCISE AND TRAINING

The dam owner or designee will advise and cooperate with the Chester County DES of any exercises scheduled, and coordinate with the Chester County DES to exercise all or portions of this EAP as part of the county's all-hazard exercise program schedule.

IX. PLAN MAINTENANCE AND DISTRIBUTION

- A. This EAP will be reviewed every five years by the owner or the owner's engineer. During the five year review:
1. The owner or the owner's engineer will conduct an on-site review of the flood (inundation) area for any increase in downstream development and revise the Inundation Map, if needed.
 2. The owner's engineer will review and revise surveillance conditions as needed.
 3. The owner will coordinate with Chester County DES if population increase or development within the inundation area could affect the emergency response requirements. If so, a new or revised plan must be developed.
 4. The owner will meet with and obtain concurrence from the Chester County DES.
 5. The owner will submit 6 copies at a minimum of the revised plan to DEP for review and approval.
- B. A copy of the approved EAP will be distributed by the dam owner to those emergency response agencies listed in Section IV.
1. Chester County 911 Center
 2. Chester County DES
 3. Westtown Township EMA
 4. Goshen Fire Company
 5. Westtown-East Goshen Regional Police Department
 6. Good Fellowship Ambulance Company
 7. American Red Cross
 8. Pennsylvania Department of transportation (PennDOT)
- C. DEP, Division of Dam Safety will distribute a copy of the approved EAP to:
1. PEMA's Area Office,
 2. The affected county Emergency Management Agency(s) and PSAP/911 Center(s),
 3. The National Weather Service, and
 4. The DEP's Regional Office.
- D. Within 60 days, the dam owner will submit a letter certifying distribution of the approved EAP and posting of NOTICE(s) to the DEP, Division of Dam Safety.

ATTACHMENTS:

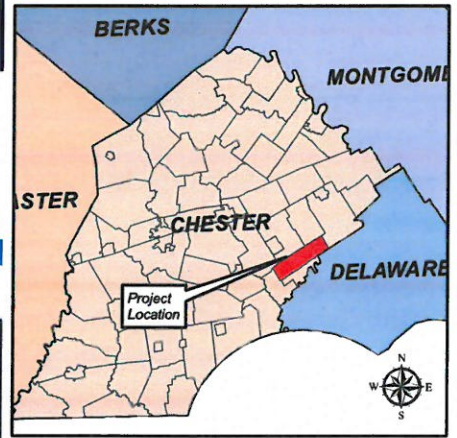
- ATTACHMENT A:*** INUNDATION MAP
- ATTACHMENT B:*** TRAFFIC CONTROL POINTS
- ATTACHMENT C:*** LOCATION MAP
- ATTACHMENT D:*** TELEPHONE ROSTER
- ATTACHMENT E:*** MEDIA ANNOUNCEMENT

ATTACHMENT A:
INUNDATION MAP

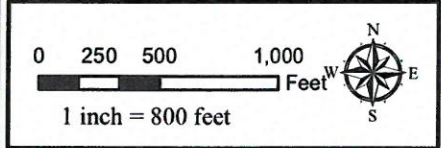
File: P:\0695\Projects\0695001\GIS\MXD\Report\Figures\USGS_Quad.mxd Jul 10, 2006 10:47:39 AM, Copyright Princeton Hydro, LLC.



PENNSYLVANIA COUNTY MAP



PRINCETON HYDRO, LLC.
1108 OLD YORK ROAD
P.O. BOX 720
RINGOES, NJ 08551



- SOURCES:
1. Municipal boundary as obtained from Chester County GIS Department in digital format.
 2. Color aerial photographs as exported from Terrain Navigator Pro software.
 3. Horizontal Datum is NAD83 State Plan PA South, (FIPS 3702), feet.
 4. Vertical Datum is NAVD 88, feet.



100-YEAR BREACH AND NON-BREACH INUNDATION MAP

HYDROLOGIC AND HYDRAULIC ANALYSES
HYPOTHETICAL DAM BREACH AND INUNDATION ANALYSES
WESTTOWN LAKE DAM
TOWNSHIP OF WESTTOWN
CHESTER COUNTY, PENNSYLVANIA

- Legend**
- Stream Centerline
 - 100-yr Non-Breach
 - 100-yr Breach
 - TRAFFIC CONTROL POINT

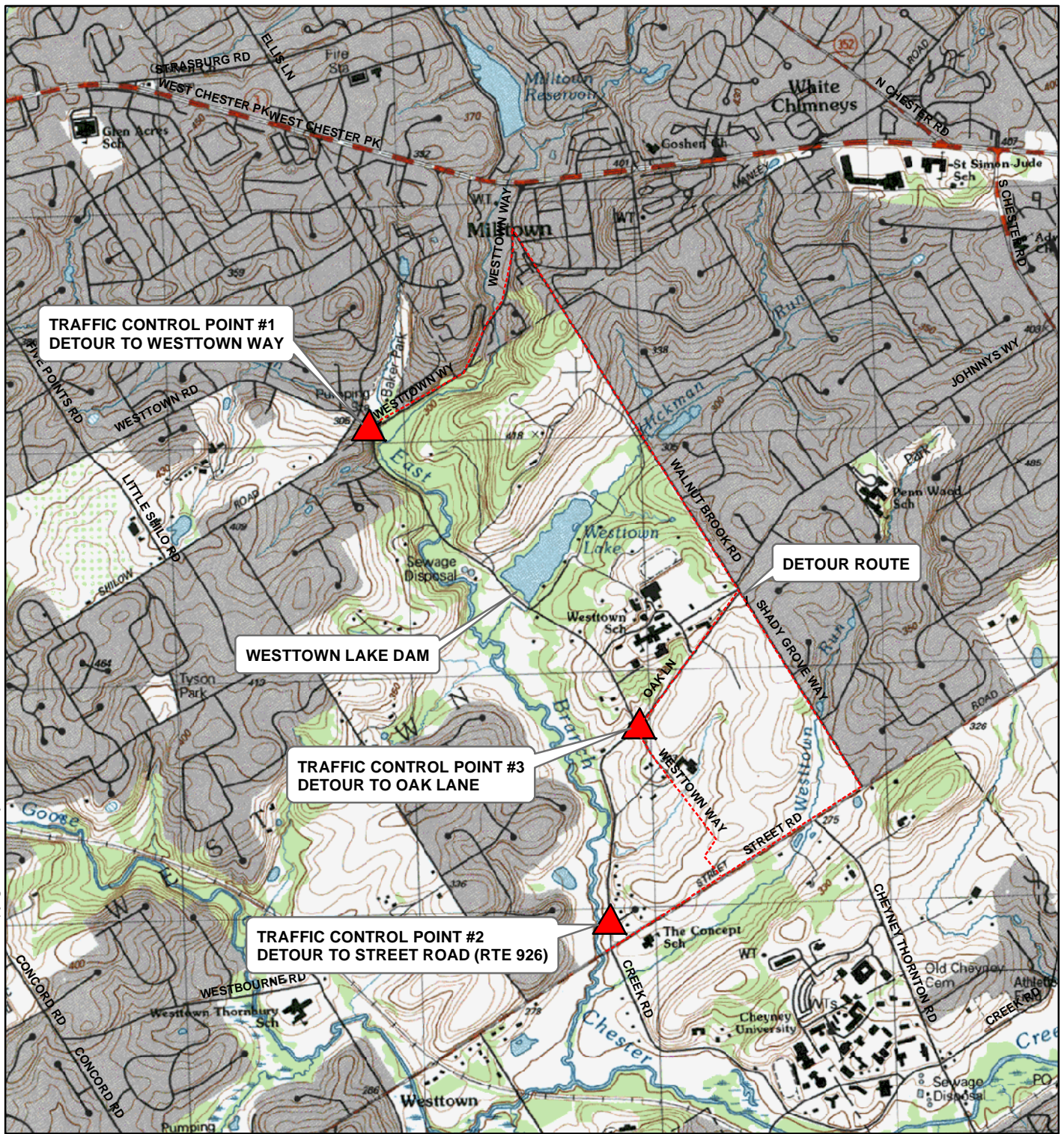
Princeton Hydro

ESTIMATED TRAVEL TIME AND MAXIMUM DEPTH

1. Sunny Day Breach
 - a. Overtopping Westtown Road immediately downstream of Westtown dam.
 - i. Maximum Depth = 2.53 feet
 - ii. Estimated Travel Time = less than 1 minute
 - b. Overtopping Westtown Road approximately 3,800 feet downstream of dam.
 - i. Maximum Depth = 0.80 feet
 - ii. Estimated Travel Time = 23.1 minutes
2. 100-Year Breach and Non-Breach
 - a. Overtopping Westtown Road immediately downstream of Westtown dam.
 - i. Maximum Depth = 2.45 feet (Non-Breach) and 3.64 feet (Breach)
 - ii. Estimated Travel Time = less than 1 minute
 - b. Overtopping Westtown Road approximately 3,800 feet downstream of dam.
 - i. Maximum Depth = 2.63 feet (Non-Breach) and 3.58 feet (Breach)
 - ii. Estimated Travel Time = 17.4 minutes (Breach and Non-Breach)
3. 0.5 PMF Breach and Non-Breach
 - a. Overtopping Westtown Road immediately downstream of Westtown dam.
 - i. Maximum Depth = 4.61 feet (Non-Breach) and 5.14 feet (Breach)
 - ii. Estimated Travel Time = less than 1 minute
 - b. Overtopping Westtown Road approximately 3,800 feet downstream of dam.
 - i. Maximum Depth = 6.88 feet (Non-Breach) and 7.25 feet (Breach)
 - ii. Estimated Travel Time = 14.1 minutes (Breach and Non-Breach)
4. Full PMF Breach and Non-Breach
 - a. Overtopping Westtown Road immediately downstream of Westtown dam.
 - i. Maximum Depth = 8.73 feet (Non-Breach) and 8.95 feet (Breach)
 - ii. Estimated Travel Time = less than 1 minute
 - b. Utility Structure approximately 800 feet downstream of dam.
 - i. Maximum Depth = 4.20 feet (Non-Breach) and 4.40 feet (Breach)
 - ii. Estimated Travel Time = 5.1 minutes
 - b. Overtopping Westtown Road approximately 3,800 feet downstream of dam.
 - i. Maximum Depth = 11.41 feet (Non-Breach) and 11.58 feet (Breach)
 - ii. Estimated Travel Time = 11.7 minutes (Breach and Non-Breach)

ATTACHMENT B:
TRAFFIC CONTROL POINTS

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TRAFFIC CONTROL POINTS

HYDROLOGIC AND HYDRAULIC ANALYSES
 HYPOTHETICAL DAM BREACH AND
 INUNDATION ANALYSES
 WESTTOWN LAKE DAM
 TOWNSHIP OF WESTTOWN
 CHESTER COUNTY, PENNSYLVANIA

Legend

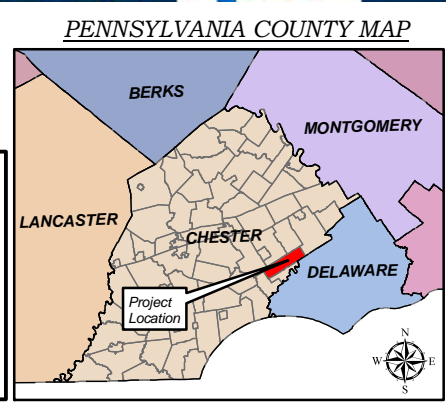
- TRAFFIC CONTROL POINTS
- DETOUR ROUTE

1 inch = 2,000 feet

PRINCETON HYDRO, LLC.
 1108 OLD YORK ROAD
 P.O. BOX 720
 RINGOES, NJ 08551

SOURCES:

- USGS Quadrangle for West Chester, PA as exported from Terrain Navigator program.

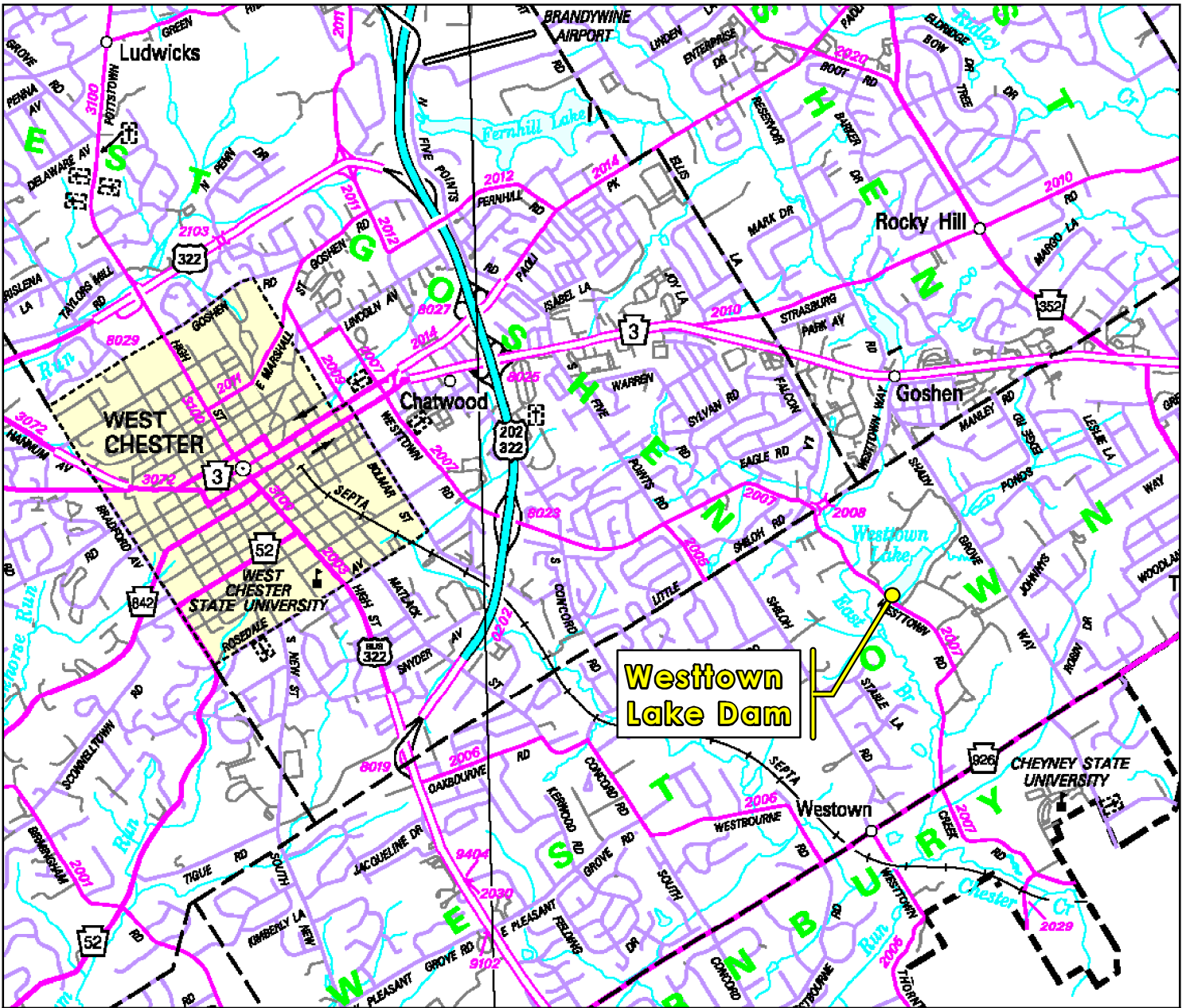


TRAFFIC CONTROL POINTS

- TCP 1:** Responsible Party: Westtown East Goshen Police Department
On Westtown Road, 300 feet northwest of the intersection of Westtown Road and Falcon Lane.
- TCP 2:** Responsible Party: Westtown East Goshen Police Department
On Westtown Road, 375 feet south of the intersection of Route 926 and S. Westtown Road.
- TCP 3:** Responsible Party: Westtown East Goshen Police Department
On Westtown Road, at intersection of Westtown Way and Oak Lane.

These Traffic Control Points are also shown on the Inundation map in Attachment A

ATTACHMENT C:
LOCATION MAP



**Westtown
Lake Dam**

The Westtown Lake Dam is located approximately 3.4 miles southeast from the center of the Borough of West Chester, PA. To travel to the Westtown Lake Dam from the center of West Chester, one would take East Market Street (PA-3 East) eastward for approximately 0.8 miles, turn right onto Westtown Road, and follow Westtown Road for approximately 3.2 miles, after which the Westtown Lake Dam would be on the left-hand side of the Westtown Road.

To travel to the Westtown Lake Dam via US-202, one would take the Westtown Road exit, just after mile marker 8.7 from US-202 North or mile marker 9.1 from US-202 South, and follow Westtown Road for approximately 2.25 miles, after which the Westtown Lake Dam would be on the left-hand side of the Westtown Road.

To travel to the Westtown Lake Dam via PA-3 (West Chester Pike), one would turn onto Westtown Way (right-hand turn from PA-3 east, left-hand turn from PA-3 west), follow Westtown Way for approximately 0.8 miles, turn left onto Westtown Road, and follow Westtown Road for approximately 0.6 miles, after which the Westtown Lake Dam would be on the left-hand side of the Westtown Road.

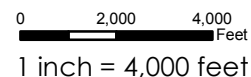
ATTACHMENT C: LOCATION MAP

WESTTOWN DAM
 WESTTOWN SCHOOL
 TOWNSHIP OF WESTTOWN
 CHESTER COUNTY, PENNSYLVANIA



PRINCETON HYDRO, LLC.
 1108 OLD YORK ROAD
 P.O. BOX 720
 RINGOES, NJ 08551
 *with offices in NJ, PA and CT

NOTES:
 1. Chester County Type 10 Map obtained from PADOT.



Map Projection: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

ATTACHMENT D:
TELEPHONE ROSTER

TELEPHONE ROSTER

	<i>NON-EMERGENCY</i>	<i>EMERGENCY</i>
DAM OWNER: VICTORIA JUEDS	(610) 399-7960	(610) 787-9231
DAM OPERATOR: MARK DEL NEGRO	(610) 399-7624	(610) 633-3765 (302) 998-5605
CHESTER COUNTY 911 CENTER	(610) 344-5000	911
CHESTER COUNTY DES	(610) 344-5000	911
DEP - SOUTHEAST REGION	(484) 250-5900	(484) 250-5900
DEP - DIVISION OF DAM SAFETY	(717) 787-8568	(717) 651-4343 (800) 541-2050 (717) 805-3057
PEMA	(717) 651-2001 (800) 424-7362	(717) 651-2001 (800) 424-7362

ATTACHMENT E:
MEDIA ANNOUNCEMENT

MEDIA ANNOUNCEMENTS

EARLY WARNING MESSAGE:

The Chester County Department of Emergency Services advises that due to conditions at the Westtown Lake Dam in Westtown Township, the public should avoid Westtown Road between Chateau Drive to the north and East Street Road, approximately 5,800 feet southeast of the dam. Stay tuned for further information.

REPEAT PERIODICALLY

INCIDENT RESOLVED - SAFE TO RETURN:

The Chester County Emergency Management Agency is advising residents of the area downstream of the Westtown Lake Dam in Westtown Township that the problem at the dam has been resolved and that residents may return to their homes.

REPEAT PERIODICALLY

NOTE: The above messages should be modified as necessary to fit the situation.