



USACE Dam Safety Facts for Blue Marsh Dam and Dike C (28 Apr 2016)

U.S. ARMY CORPS OF ENGINEERS

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Project Location and Description: Blue Marsh Dam was designed and built by the U.S. Army Corps of Engineers (USACE) and completed in 1978. USACE operates the Blue Marsh Dam for flood damage reduction, low flow augmentation, water quality and recreation.



The main components of the project are an earthen embankment section, which serves as the main water barrier composed of compacted earth; gates that allow controlled water flow out of the dam; and an additional ungated spillway, which is a segment of the structure used to provide additional release of water from the dam during major flood events. The earthen dam is 1,775 feet long, 98 feet high, and top of the dam is 30 feet wide. The elevation of the top of the embankment is 331.3 feet ¹. The foundation is made up of rock. The ungated spillway is an excavated, chute-type channel located on the reservoir rim south of the dam. The spillway crest is a reinforced concrete weir 300 feet wide, 30 feet long with a crest elevation of 306.3 feet ¹. The spillway can pass up to 786,577 gallons per second (105,150 cubic feet per second) or approximately the volume of an Olympic size swimming pool each second. The outlet works consist of an intake channel, a control tower and a 500-foot long conduit discharging into a stilling basin. There are also earthfill dikes constructed along three natural saddles where the elevation was lower than the dam crest height. The Bernville Protective Works, an appurtenant structure to Blue Marsh Dam, is located approximately 8.7 river miles upstream from Blue Marsh Dam. The protective works consists of a main levee, a flanking levee, a pump station, and two detention dams. The system provides protection to the Borough of Bernville during periods of high lake levels. A separate fact sheet was prepared for the Bernville Levee due to its completely separate consequence area. In addition, a separate fact sheet was also prepared for saddle Dikes A and B, which have a slightly different consequence area from the main dam and saddle Dike C.

During the fall and winter months, when excessive rainfall is likely, the lake is kept at a lower level (referred to as winter pool). Should heavy rains occur, surface water runoff is stored in the lake until the swollen streams and rivers below the dam recede and can handle the release of stored water without damage to lives, property or the environment. Sometimes water must be released to protect the dam's integrity even though streams and rivers may have already reached or exceeded their capacity.

Benefits associated with Blue Marsh Dam: This dam has provided \$2.4 million in annual flood damage reduction since placed into service. Annual recreational benefits to the area are \$6.9 million.

Risks associated with all dams: Dams reduce but do not eliminate the risk of economic and environmental damages and loss of life from flood events. When a flood exceeds the reservoir's storage capacity, large amounts of water may have to be released that could cause damaging flooding downstream. A fully-functioning dam could be overtopped when a rare, large flood occurs, or a dam could breach because of a deficiency, both of which pose risk of property damage and life loss. This means there will always be flood risk that has to be managed. To manage these risks USACE has a routine program that inspects and monitors its dams regularly. USACE implements short and long term actions, on a prioritized basis, when unacceptable risks are found at any of its dams.

Risk associated with Blue Marsh Dam and Dike C: Based upon the most recent risk assessment of Blue Marsh Dam and Dike C in 2014, USACE considers these structures to be moderate risk dams among its more than 700 dams

¹ North American Vertical Datum of 1988 (or NAVD88)

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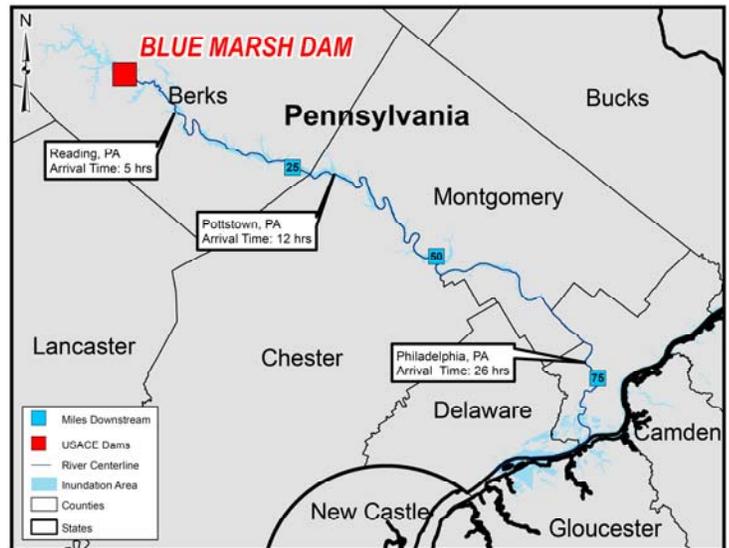
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primarily due to the relatively high level of downstream consequences during very high reservoir levels associated with an extreme flood. USACE plans to implement interim risk reduction measures and/or long term risk reduction measures to reduce this risk.

What residents should know: Dams do not eliminate all flood risk so it is important that residents downstream from the dam are aware of the potential consequences should the dam (or Dike C) breach, not perform as intended; or experience major spillway/gated outlet flows. The moderate risk in Reading, Pottstown, Phoenixville, Norristown, Philadelphia and Chester in Pennsylvania; and the related consequences farther downstream warrant increased efforts on the part of USACE, local emergency management officials and residents to heighten awareness of the potential flood risk associated with the structures.



Map inundation area displayed is a rare flood event and breach.
 Map Disclaimer: Actual areas flooded and flood arrival times will depend on specific flooding and failure conditions and may differ from the areas shown on the map.

The primary areas impacted should the dam (or Dike C) breach with a full reservoir during a rare flood event; or experience major spillway/outlet works flows are shown in the map. The potential for loss of life is highest *within a couple of miles of the dam with the loss of life concerns decreasing substantially beyond 60 miles downstream of the dam*. Advanced warning of problems and events plays a major role in protecting life and property. See the map for a general indication of flooding with a rare flood event and breach.

Public Awareness: Dams are designed to pass large amounts of water on a regular basis and this means there will always be flood risk that has to be managed (see facts below).

Recommendations for Residents	Blue Marsh Dam Facts
<ul style="list-style-type: none"> • Living with flood risk reduction infrastructure comes with risk—know your risk. • Living with flood risk reduction infrastructure is a shared responsibility—know your role. • Know your risk, know your role and take action to reduce your risk. • Listen for and follow instructions from local emergency management officials. • Strongly consider purchasing flood insurance. • Contact your elected local, county and state officials to make sound flood risk management decisions in your area. 	<p>Estimated consequences with rare flood event and breach of the main dam:</p> <ul style="list-style-type: none"> • Population at risk: ~9,800 • Structures at risk: 2,700 • Land and property at risk: \$651 million <p>Estimated consequences with rare flood event and no breach:</p> <ul style="list-style-type: none"> • Population at risk: ~2,500 • Structures at risk: No data available • Land and property at risk: \$84.9 million <p>Damages prevented to date: \$88.3 million (1978-2014) National Inventory of Dams # PA00921</p>

Residents should listen to and follow instructions from local authorities. For more information, please contact the USACE Philadelphia District Public Affairs Office at 215-656-6500 or the District Emergency Management Office at (215) 656-6756.

For additional information about dam safety and living with dams, please visit <http://www.usace.army.mil/Missions/CivilWorks/DamSafetyProgram.aspx> and http://www.damsafety.org/media/Documents/DownloadableDocuments/LivingWithDams_ASDSO2012.pdf