

To View the Report

The Draft Environmental Assessment / Major Rehabilitation Report will be available on or about June 16, 2008, for public review at the following locations:

Tuscarawas County Library
New Philadelphia Branch
121 Fair Avenue Northwest
New Philadelphia, Ohio 44663

Tuscarawas County Library
Bolivar Branch
455 West Water Street
Bolivar, Ohio 44612

Stark County Library
Sandy Valley Branch
9754 Cleveland Avenue SE
Magnolia, Ohio 44643

U.S. Army Corps of Engineers
Muskingum Area Office
5336 State Route 800 NE
Dover, Ohio 44662

Or visit the following website:

<http://www.lrh.usace.army.mil/projects/review/>

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For project updates, and other information, visit the Corps Website at:

<http://www.lrh.usace.army.mil/projects/current/bolivarrehab>



**US Army Corps
of Engineers**
Huntington District



Bolivar Dam Rehabilitation

Bolivar Dam is located on Sandy Creek of the Tuscarawas River in Stark and Tuscarawas Counties, Ohio. Construction of the dam was completed in September 1938 as one of a system of dams in the Muskingum watershed.

The dam is a two-zoned, rolled earth fill embankment with an impervious core and founded on fine to coarse gravels. The top of the spillway section is elevation 962.

Bolivar has a history of seepage. During January 2005, the project experienced significant seepage and emergency repairs were made during that time. Recent observations and analysis has shown that Bolivar Dam has significant under-seepage issues.

In the interest of public safety and to maintain the integrity of the dam, the Corps determined major rehabilitation of the dam was necessary. The Major Rehabilitation Report is now complete and identifies deficiencies and proposed alternatives for corrective actions.



Boils occur naturally in earthen structures. They are caused by excess, positive pressure water seepage from the ground resulting from high pools. When water is clear, there is no cause for alarm. However, when the seepage moves material, a small water-tunnel is formed, and if the pressures are great enough, can move more and more material creating larger boils. If uncontrolled, these boils can increase in size, and move more foundation materials which can start the process of a catastrophic dam failure through piping and ultimately underscoring of the dam.

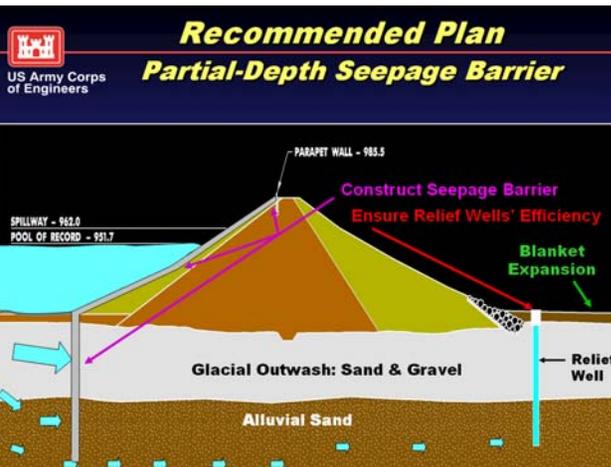
Top photo shows a typical two-inch boil at Bolivar during January 2005. Bottom photo shows a much larger 18-inch Artesian boil observed during March 2008.



Recommended Plan

The Major Rehabilitation Report for Bolivar Dam identified deficiencies and proposed alternatives for corrective actions. The recommended plan is explained in the graphic below.

The plan recommends constructing a seepage barrier to reduce the majority of underseepage (in pink), ensuring the relief well efficiency and improvements as necessary (in red), expanding the seepage berm (in green), some tree removal and constructing a downstream access road to allow for quicker access for monitoring and observation during high water events (not shown).



Bolivar is a dry dam. It allows Sandy Creek to flow freely through the dam for a significant portion of time and only retains water when necessary for flood damage reduction. Control of water is achieved by six, 7-foot wide by 15-foot tall sluices. The pool of record occurred in January 2005 and was elevation 951.65, approximately a 90-year event. Bolivar Dam is owned, operated and maintained by the U.S. Army Corps of Engineers.

Dam Safety History

The U.S. Army Corps of Engineers (USACE) conducted stability analyses of Dover and Bolivar dams using modern-day design standards with the latest information available. Current analysis for Bolivar Dam confirms significant seepage problems that may lead to dam instability at higher pool levels. Previous analysis showed the dam was safe through pool elevations up to and including 949 feet, or 54 feet on the Bolivar Dam gage. However due to several unexpected artesian-type boils that occurred at pool elevations of 935-936 feet during the March 2008 event, future safe operating elevations may be somewhat less.

The Corps of Engineers realizes the criticality of these Dover and Bolivar dams. Interim risk reduction measures for Dover Dam were completed in March 2008. Bar anchors were installed to increase the stability of the dam. These anchors increased the safe operating level from 907 to 909 feet, or 51 feet on the Dover Dam gage and increased storage capacity by more than 12 percent. Pools above these elevations do not necessarily mean imminent dam failure, but concerns for the possibility of a dam failure increase as pool elevations rise above these levels. In the history of the Dover dam, the pool upstream of the dam has reached alert elevation 900 only five times and has reached elevation 907 once.

The Corps of Engineers is committed to operating the dams within a safe range of pool elevations. To minimize the potential of the pool elevation at these dams from reaching unsafe levels, the Corps may be required to release above current downstream flood control levels. The dams will continue to provide downstream flood reduction against rainfall events similar to what has historically occurred.

Prior to completion of dam rehabilitation, it is possible that downstream water levels could be higher than those experienced during January 2005. The operation of the dams is largely dependent on amount of rainfall, ground saturation, pool elevation and other conditions at the time.

What Can You Do?

Take responsibility for your personal safety. When an extreme rain event occurs, monitor local communications and please follow all notices for evacuation as directed by your local and community officials.

The Corps of Engineers worked closely with Tuscarawas County Officials to help develop downstream inundation mapping that identify inundation areas for emergency planning purposes. The inundation mapping associates probabilities in terms of low, very low, and extremely low likelihood for the period prior to completion of the improvements to the dams.

Check to see if your property, or access roads to your property lie within designated flood easement areas or within an at-risk downstream area as shown on the local county, FEMA, or USACE maps. The flood easement for Dover and Bolivar pools are 916' and 962' respectively. If you are in or near a designated flood easement or at-risk downstream area, you may want to review your County Emergency Evacuation Plan.

Other Tips:

- Develop an evacuation plan for your family with a designated gathering place
- Practice your evacuation plan
- Identify alternate routes or means of transportation
- Secure your property by locking doors and outbuildings upon departure
- Establish a contact person or persons outside the flood area for check-in
- Purchase a weather band radio for early warning
- Consider purchasing flood insurance (strictly a personal choice)