



USACE Dam Safety Facts for Bull Shoals Dam (07 Feb 2014)

U.S. ARMY CORPS OF ENGINEERS

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Project Location and Description: Bull Shoals Dam was designed and built by the U.S. Army Corps of Engineers (USACE) and completed in 1951, USACE operates Bull Shoals Dam for flood damage reduction, municipal and industrial water supply, hydropower, minimum flow, and recreation.



The main components of the project are a concrete dam section, which serves as the main water barrier; a concrete gated spillway, a segment of the structure used to provide additional controlled release of water from the dam during major flood events; and hydropower facilities. The concrete dam is 2,256 feet long, 261 feet high, and the top is 40 feet wide. The elevation of the top of the dam is 711.4 feet¹. The foundation is made up of rock. The spillway is a concrete gravity structure that is 680 feet wide with an elevation of 667.4 feet¹. The spillway can pass up to 3,740,000 gallons per second (500,000 cubic feet per second) or approximately five and a half times the volume of an Olympic size swimming pool each second. The hydropower facilities contain eight generating units that have a capacity to generate 755.5 megawatts per year.

Lake level is dependent on rainfall and the consumptive authorized use of the conservation storage. Power production is the larger of these authorized purposes. After a prolonged period of below normal rainfall, the pool level will generally fall several feet into the conservation pool due to power generation. During a period of heavy rainfall, the lake will rise as floodwaters are held 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. In extreme conditions, water may need to be released to protect the dam's integrity even though streams and rivers may have already reached or exceeded their capacity.

Benefits associated with Bull Shoals Dam: This dam has provided \$8.9 million in annual flood damage reduction since placed into service. Bull Shoals Lake provides 8,690 acre-feet (ac-ft)² of water to the Marion County Water District (MCRWD). The annual water supply benefits gained from Bull Shoals Lake amount to nearly \$2.1 million. Bull Shoals Dam has provided \$68 million in annual hydropower benefits since placed into service. Annual recreational benefits to the area are \$18.2 million.

Risks associated with dams in general: 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 Bull Shoals Dam: Based upon the most recent risk assessment of Bull Shoals Dam in 2014, USACE considers this dam to be a moderate - risk dam among its more than 700 dams because of the risks associated

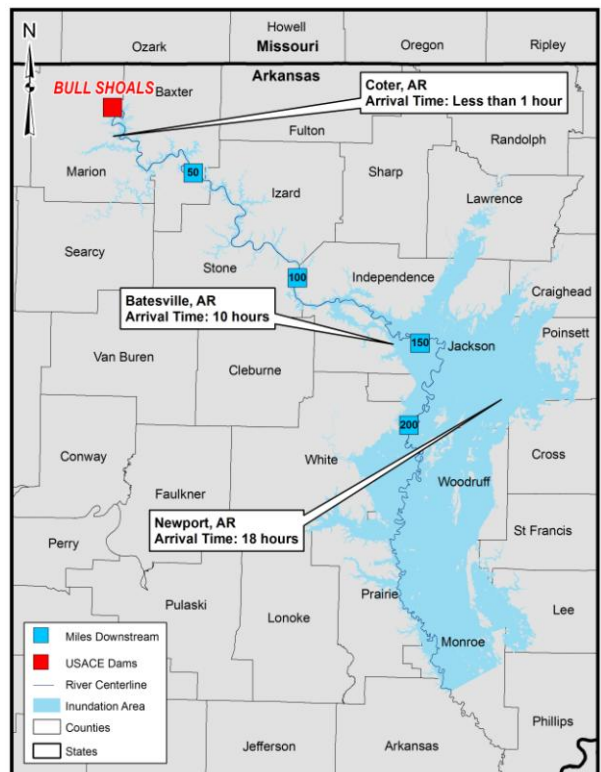
¹ Mean Sea Level (MSL) is the same as North American Vertical Datum 1988 (or NAVD88)

² One acre-foot is equal to 1/2 Olympic-size swimming pool

with overtopping the reservoir rim approximately 7,000 feet northwest of the dam and potential instability of the dam during very rare flood events and seismic events. USACE will develop and implement interim risk-reduction measures and/or long-term measures to reduce this risk based on the 2014 risk assessment.

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 breach, not perform as intended; or experience major spillway/gated outlet flows. The moderate risk in Batesville and Newport, AR and the related consequences further 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 dam.

The primary areas impacted should the dam 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 lowest within 15 miles of the dam with the loss of life concerns increasing substantially beyond 15 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.



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

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	Bull Shoals 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:</p> <ul style="list-style-type: none"> Population at risk: 28,400 Structures at risk: 19,000 Land and property at risk: \$1.1 billion <p>Estimated consequences with rare flood event and no breach:</p> <ul style="list-style-type: none"> Population at risk: No data available Structures at risk: No data available <p>Land and property at risk: No data available Damages prevented to date: \$45.5 million (2005-2009) National Inventory of Dams # AR00160</p>

Residents should listen to and follow instructions from local authorities. For more information, please contact USACE Little Rock district office using the information on this fact sheet. You can also contact your local emergency management office:

Baxter County Office of Emergency Management at 870-481-6252
 Marion County Office of Emergency Management at 870-449-5800