



USACE Dam Safety Facts for Rathbun Dam

Project location and description: Rathbun Dam was designed and built by the U.S. Army Corps of Engineers, Kansas City District and completed in 1969. USACE operates Rathbun Dam for flood control, water supply, recreation, fish and wildlife management, water quality, and navigation.



Rathbun Dam is comprised of two separate embankments, the main embankment and the Buck Branch embankment; outlet works gates and control tower that allow controlled water flow out of the dam; and an ungated spillway, which is a segment of the structure used to provide additional release of water from the dam during major flood events. Both embankments serve as the main water barrier and are composed of compacted earth. The 8,160-foot long and 100-foot high main embankment was constructed across the Chariton River and the 1,960-foot long and 76-foot high Buck Branch embankment was constructed across Buck Branch creek. A connecting channel located within 1300 feet of the main embankment and within 900 feet of the Buck Branch embankment serves to create a single reservoir. The elevation of the top of the embankment is 946.10 feet¹. The foundation is made up of rock, sand, and soil. The ungated spillway is 500 feet wide with a crest elevation of 926.0 feet¹. The spillway can pass up to 336,600 gallons per second (45,000 cubic feet per second) or approximately half the volume of an Olympic size swimming pool each second.

During normal operations, the lake is kept at a relatively consistent level (referred to as conservation pool). Should heavy rains occur in the spring or at any other time, 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 Rathbun Dam: This dam has provided \$7.5 million in average annual flood damage reduction since placed into service. The dam provides 368,859 acre-feet² of flood control storage, and the annual water supply benefit is about \$1.4 million. Annual recreational benefits to the area are about \$3.7 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.

¹ North American Vertical Datum 1988 (or NAVD 88)

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

Risk associated with Rathbun Dam: Based upon the most recent risk assessment in 2018, USACE considers this dam to be a low risk dam among its more than 700 dams based on concerns associated with abutment seepage. USACE manages this risk by conducting routine monitoring and evaluation.

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 or outlet works flows.

The primary areas impacted should the dam breach with a full reservoir during a rare flood event or experience major spillway or outlet works flows 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.

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	Rathbun 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 to 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: ~570 • Structures at risk: 402 • Land and property at risk: \$39.1 million <p>Estimated consequences with rare flood event and no breach:</p> <ul style="list-style-type: none"> • Population at risk: ~160 • Structures at risk: No data available • Land and Property at risk: \$10.3 million <p>Damages prevented: \$288 million (1968-2016) National Inventory of Dams (NID) No.: IA00016</p>

Residents should listen to and follow instructions from local authorities. For more information, please contact the USACE Kansas City District office at (816) 426-6320.

For additional information about dam safety and living with dams, please visit:
www.usace.army.mil/Missions/Civil-Works/Dam-SafetyProgram/
www.damsafety.org/