



# USACE Dam Safety Facts for Tuttle Creek Dam

U.S. ARMY CORPS OF ENGINEERS

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**Project Location and Description:** Tuttle Creek Dam was designed and built by the U.S. Army Corps of Engineers, Kansas City District and completed in 1962. USACE operates Tuttle Creek Dam for flood damage reduction, municipal and industrial water supply, navigation support, fish and wildlife 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 a gated 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 7,487 feet long, 157 feet high, and top of the dam is 50 feet wide. The elevation of the top of the embankment is 1159.4 feet <sup>1</sup>. The foundation is made up of a generally impervious core of shale and limestone with rockfill on the upstream side, with a sand filter with shale and limestone on the downstream side. The spillway is a concrete gravity structure extending across the Big Blue River channel. The spillway is 720 feet wide with a crest elevation of 1,116.4 feet <sup>1</sup>, and can pass up to 4.3 million gallons per second (578,300 cubic feet per second) or approximately six and a half times 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 Tuttle Creek Dam:** This dam has provided \$62.2 million in average annual flood damage reduction since placed into service. Tuttle Creek Dam provides 50,000 acre-feet (ac-ft) <sup>2</sup> of water to a number of communities downstream of the dam. The annual water supply benefits gained from Tuttle Creek Dam amount to nearly \$11.9 million. Annual recreational benefits to the area are \$2.7 million. Tuttle Creek Dam contributes to the overall flow for navigation on the Missouri River, with annual benefits of \$3.3 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.

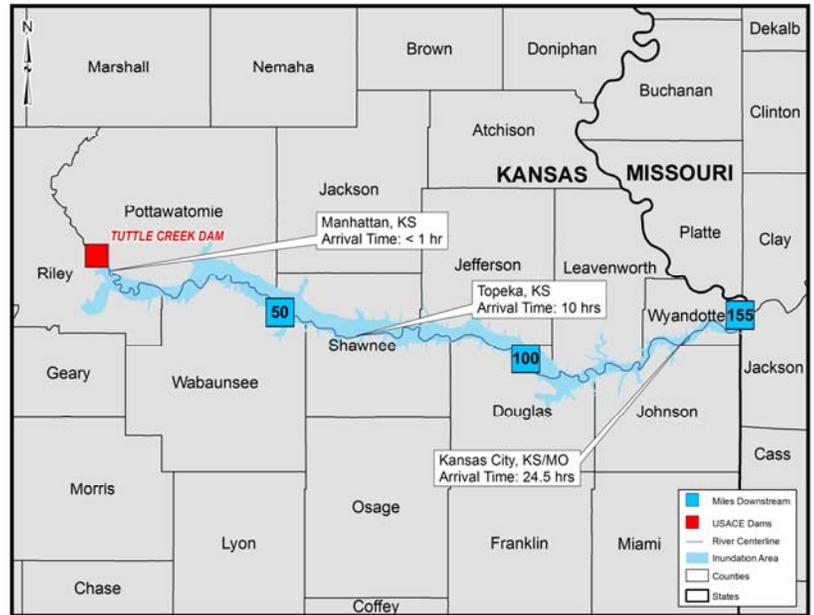
**Risk associated with Tuttle Creek Dam:** Based upon the most recent risk assessment of Tuttle Creek Dam in 2011, USACE considers this dam to be a low risk dam among its more than 700 dams because of the risk associated with seismic failure and spillway erosion.

<sup>1</sup> Mean Sea Level is the same as North American Vertical Datum 1988 (or NAVD88)

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

**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 high risk in Manhattan, Topeka, Lawrence, Shawnee and Merriam in Kansas; Kansas City in Missouri; 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 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 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.



Map inundation area displayed is the 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.

**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	Tuttle Creek Dam Facts
<ul style="list-style-type: none"> <li>• Living with flood risk reduction infrastructure comes with risk—know your risk.</li> <li>• Living with flood risk reduction infrastructure is a shared responsibility—know your role.</li> <li>• Know your risk, know your role and take action to reduce your risk.</li> <li>• Listen for and follow instructions from local emergency management officials.</li> <li>• Strongly consider purchasing flood insurance.</li> <li>• Contact your elected local, county and state officials to make sound flood risk management decisions in your area.</li> </ul>	<p><b>Estimated consequences with rare flood event and breach:</b></p> <ul style="list-style-type: none"> <li>• Population at risk: ~58,600</li> <li>• Structures at risk: 27,198</li> <li>• Land and property at risk: \$5.8 billion</li> </ul> <p><b>Estimated consequences with rare flood event and no breach:</b></p> <ul style="list-style-type: none"> <li>• Population at risk: No data available</li> <li>• Structures at risk: No data available</li> <li>• Land and property at risk: No data available</li> </ul> <p>Damages prevented to date: \$2.8 billion (1962-2008) National Inventory of Dams # KS00012</p>

Residents should listen to and follow instructions from local authorities. For more information, please contact 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/](http://www.usace.army.mil/Missions/Civil-Works/Dam-SafetyProgram/)  
[www.damsafety.org/](http://www.damsafety.org/)