



# USACE Dam Safety Facts for Harlan County Dam

U.S. ARMY CORPS OF ENGINEERS

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**Project Location and Description:** Harlan County Dam was designed and built by the U.S. Army Corps of Engineers, Kansas City District and completed in 1952. USACE operates Harlan County Dam for flood control, irrigation, recreation, and fish and wildlife.



The main components of the project are an earthen embankment section, which serves as the main water barrier composed of compacted earth; a concrete gated spillway structure; and outlet works. The earthen dam is 11,830 feet long, 107 feet high, and top of the dam is 30 feet wide. The elevation of the top of the embankment is 1,982.8 feet <sup>1</sup>. The foundation is made up of rock and soil. The concrete spillway has 18 tainter gates, and is 856 feet wide with a crest elevation of 1,944.3 feet <sup>1</sup>. The spillway can pass up to 3,590,400 gallons per second (480,000 cubic feet per second) or approximately five and a half times the volume of an Olympic size swimming pool each second. The outlet works consist of nine slide gates with a maximum discharge of 20,970 cubic feet per 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 Harlan County Dam:** This dam has provided \$3.6 million in annual flood damage reduction since placed into service. Harlan County Dam provides 150,000 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 Harlan County Dam amount to nearly \$2.8 million. Harlan County Dam provides irrigation water to approximately 100,000 ac-ft <sup>2</sup> for cropland on a yearly basis. Annual recreational benefits to the area are \$2.8 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.

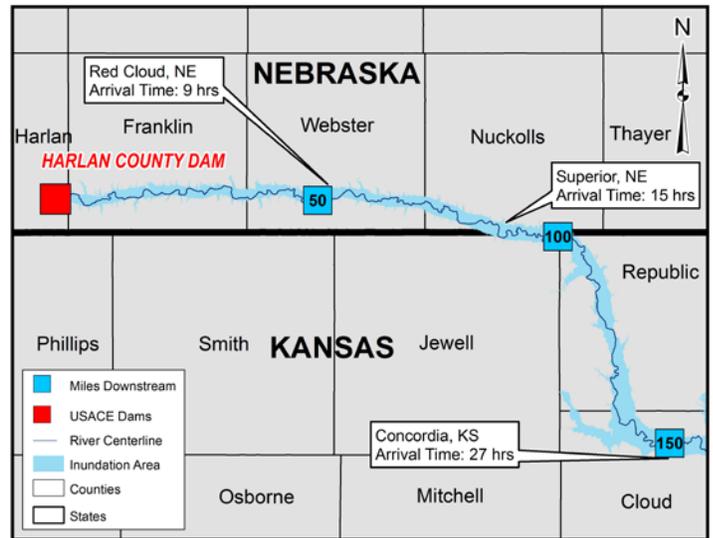
**Risk associated with Harlan County Dam:** Based upon the most recent risk assessment of Harlan County Dam in 2015, USACE considers this dam to be a moderate risk dam among its more than 700 dams and recommends fixing deficiencies associated with the Tainter gates, sliding of the stilling basin sill, and further evaluate probable maximum flood. USACE has implemented interim risk reduction measures and/or long term risk reduction measures to reduce this risk. In 2018, the Tainter gates were rehabilitated and repaired to correct structural deficiencies.

<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 Red Cloud and Superior in Nebraska; and Concordia in Kansas; 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	Harlan County 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: ~2,500</li> <li>• Structures at risk: 2,008</li> <li>• Land and property at risk: \$147 million</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: ~0</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: \$218 million (1952-2010)            National Inventory of Dams # NE01066</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/)