

Taum Sauk Dam Failure

December 15th, 2005

Overview

Overtopping water at the AmerenUE's Taum Sauk Upper Storage Facility caused a massive dam failure during the pre-dawn hours of December 14th, 2005. More than a billion gallons of water rushed down Profit Mountain and overwhelmed the east fork of the Black River and the lower ground of Johnson's Shut-Ins State Park. It swept the park superintendent's home and family at least a quarter-mile away and caused damage to several vehicles that were swept from Highway N into an adjacent field. According to local calculations, the flow of the water at the time would have been nearly 150,000 cubic feet per second, which is the equivalent of the Mississippi River flowing at 7 feet in St. Louis. Fortunately, the lower reservoir captured most of the overflow water, limiting the effects of the dam break down stream.

Shortly after the dam break, authorities notified the National Weather Service, and flash flood warnings were issued for locations in the path of the flood waters. Some residents were alerted through NOAA Weather Radio All Hazards and headed for higher ground.

The National Weather Service sent down an assessment team, and according to their observations, the water level was at least 20 feet high as the wall of flood water passed through Johnson's Shut-Ins State Park. Fortunately, it was the middle of December and no campers were using the Missouri State Park. Several injuries were reported, which included the park superintendent's family, but miraculously, no fatalities occurred from this dam break.



USGS-UMR Assessment:

"The events of early Wednesday morning near Lesterville, Missouri were not nearly the scope of destruction resulting from the past hurricane season; nevertheless, a tragedy and certainly one of local significance. On the morning of December 14, sometime after 5:00 am the Taum Sauk Upper Reservoir failed, allowing nearly 1.5 billion gallons of water to careen down a small creek on the northwest side of Profit Mountain towards the Black River valley and Johnson Shut-Ins State Park. The mechanism for failure is under investigation, but what can be determined from distant observation is that water spilled over the sides of the impoundment possibly causing erosion of the outer embankment. This may have weakened one segment of the structure to the point of catastrophic failure.

"A team of USGS and UMR scientists and engineers from the Natural Hazard Mitigation Institute visited the site on December 15th to conduct a forensic analysis of the failure and to map the affected area. While the power company that owned the impoundment would not allow most of the team access to the location of the failure, the team did obtain permission to access the affected area down gradient through Johnson's Shut-Ins State Park. What the team saw brought back memories of their recent work in New Orleans and the Louisiana Peninsula.

"The destruction at the site was incredible. All of the trees in the path of the flowing water were stripped off the earth's surface. What remained were large rocks and exposed bedrock surfaces. The flowing water removed soil from the valley floor, and created large scour holes. The large flowing debris piles created by downed trees came to rest throughout the park and up against the downstream side of the highway N bridge over the Black River. The USGS stream gage located on that bridge was damaged by the debris flow about the time the water moved through providing an approximate time of when this event unfolded. While the Johnson's Shut-Ins State Park received the most damage, private property located northwest of the Park became a debris field for trees and the Park Superintendent's home destroyed by the flowing water.

"Most of the team had limited access to the site, but they were able to collect high water data from the perimeter of the State Park and the lower flow path below the breach. One member of our team accompanied a Missouri Department of Natural Resources team that visited the breach site with Federal Energy Regulatory Commission and AmerenUE personnel. Our data will be used with other data that will be collected by various agencies and the power company in the future to analyze the failure and its impacts.

"As a service to the public, images collected during this preliminary investigation have been posted at a reduced resolution on this site. All images shown here were taken by our team who had obtained permission from the land owners, the Missouri Department of Natural Resources and AmerenUE to enter the affected area. Permission was granted so our team could do engineering and scientific studies to help learn and analyze the extent of the damage and how to mitigate future disasters. Much of the data our team collects is time sensitive and perishable; therefore, the need for field data collection is very soon after an event occurs.

"Due to safety concerns, both the Missouri Department of Natural Resources and AmerenUE have closed the area to the public. Only individuals with official capacity and working in the interest of science and remediation will be allowed, by permission, to enter the site. The USGS Mid-Continent Geographic Science Center and the University of Missouri Natural Hazard Mitigation Institute ask that you observe the closure requirement and satisfy your curiosity by continuing to visit this web site. Our goal is to place images and maps on this site as they become available. "

Emitt C. Witt III, P.H.
Director, Mid-Continent Geographic Science Center

Flooding Photos



Flooding Photos



Flooding Photos



Flooding Photos



Before



After

Any questions regarding this event review should be address to w-lsx.webmaster@noaa.gov