



US Army Corps of Engineers®

HISTORY:

Pine Creek Dam was authorized by the Flood Control Act of 1958 for the purposes of flood control, water supply, water quality, fish and wildlife, and recreation. The dam is located on the Little River about five miles northeast of Wright City, Oklahoma. Construction began in February 1963. The project became operational in June 1969 and reached conservation elevation of 438 feet in January 1970.

TYPE OF STRUCTURE:

The structure is an impervious earth-filled dam, 7,712 feet long that rises 124 feet above the streambed. Total length of the dam, dike and spillway is 22,470 feet. The ungated, saddle spillway is based on firm rock at the right abutment, with a design capacity of 246,600 cubic feet per second. Channel capacity below the dam is 8,000 cubic feet per second.

LAKE DATA:

FEATURE	ELEVATION (feet above sea level)
Top of Dam	509
Maximum Pool	503
Spillway Crest	480
Top of Conservation Pool	438
Top of Inactive Pool	414

BENEFITS:

Flood Control: Pine Creek Dam has the capacity to store 412,000 acre-feet of flood waters between elevations 438 to 480 feet, and a total of 968,210 acre-feet at a maximum pool level of 503. For Fiscal Year 2011, Pine Creek prevented \$747,900 in flood damages. A total of \$66,167,100 in flood damages have been prevented during the history of the project through 2011.

Water Supply: International Paper has the right to 40.85 percent of storage between 414.00 and 443.50. Other entities have uncontracted surface water rights in Little River below Pine Creek Dam, including City of Valliant, Weyerhaeuser, H-Five Inc., Idabel PWA, and McCurtain County RWD #1. Approximately 47 cfs is necessary to meet existing water supply contract requirements.

Water Quality: Conservation pool includes 21,160 acre-feet for water quality control, which requires a minimum of 18 cfs.

Recreation and Fish and Wildlife: 199,400 people visited Pine Creek in 2011 for recreation. The Corps operates six parks on the lake. There are no marinas or other privately

operated concessions on the lake. The Oklahoma Department of Wildlife Conservation has a license to 10,280 acres of land and water to use as a state Game Management Area.

ISSUES:

Seepage at Pine Creek Dam was first noted in the 1970s. The Corps has grouted twice to address this issue and has continued to monitor the seepage. After the 2009 record high water event, a depression developed on the upstream slope of the embankment.

Routine inspection and studies noted suspected voids in the fill material surrounding the conduit, so further monitoring and more vigorous investigations were made. Non-toxic dye tests were performed to trace the movement of waters through the dam. Dye was detected at monitoring points within the embankment. (Flow of water through the dam is normal but is much faster than expected.) Recommendations resulted in the need to bring the lake five feet below top of the conservation pool at elevation 433 while further investigations and interim risk reduction measures are completed. Potential impacts are being assessed and mitigated to the maximum extent possible, while also pursuing opportunities for improvements while the lake is lower than normal.

CURRENT STATUS:

All interim risk reduction measures have been completed. After the gates were replaced, inspection inside the conduit revealed deteriorating joint repair and new joint seepage. Additional observations of abnormal instrumentation results have led to the decision to maintain the current pool restriction.

FUTURE ACTIONS:

A dam safety modification study is currently being performed to determine or update the baseline risk estimate and identify, evaluate, justify, and recommend long-term risk reduction remedial measures.

Permanent actions to fully address dam safety concerns could take three to five years depending on appropriated funds availability. These actions should ensure full project performance for many future decades.

With the pool lowered to 433 feet, the remaining conservation storage can meet the combined water quality and water supply release of 65 cubic feet per second (cfs) even through the drought of record. In June of this year, after meeting with International Paper, U. S. Fish and Wildlife Service, and Oklahoma Water Resources Board, Tulsa District reduced the release to 55 cfs in order to conserve water during the current drought.

Q 1 When will the lake level return to normal?

Evidence of deteriorating joint repair and new seepage through joints as well as abnormal instrumentation results have led to the decision to extend the current pool restriction of 433 feet through July 2013 and possibly through the end of construction of a permanent risk reduction measure.

Q 2 Will releases meet downstream requirements for water quality and water supply?

Yes. With the pool lowered to an elevation of 433 feet, the remaining conservation storage can meet the combined water quality and water supply release of 65 cubic feet per second (cfs) even through the drought of record. On June 14, 2012, after meeting with federal, state, and local stakeholders, the Pine Creek release was reduced to 55 cfs to conserve water during the current drought.

Q 3 If flows are maintained to meet downstream requirements, how much will it lower the lake level?

During the drought of record, over an approximate 2-year period, the release of 65 cfs would drop the pool to near elevation 414, top of inactive pool. From historical modeling, it appears that 28 percent of the time, the pool elevation will be at or above 433. In fact, 80 percent of the time, the pool will be above elevation 432.

Q 4 What is the plan for further lowering the lake?

The lake will continue to be operated for a top of conservation pool of 433 feet. However, when the pool approaches elevation 438, Tulsa District will utilize the low flow pipes to make releases that will continue to lower the pool to elevation 433. When the lake level is at or below 438, Tulsa District Hydrology and Hydraulics personnel will have weekly (or more frequent) coordination with the Dam Safety Officer in making decisions on what release rate to use based on antecedent soil conditions, predicted rainfall, drawdown rate and any other criteria the safety officer deems appropriate. When the lake is below 433 feet, conservation measures will be considered in order to lessen any impacts due to drought.

Q 5 When will permanent repairs be made?

A Dam Safety Modification Study began in Fiscal Year 2011 to further evaluate the issues of the dam, determine the risks of intolerable performance, and recommend repairs. Completion of this study will take approximately 2 years. Completion of the modification is expected in approximately 5 years.

Q 6 Will we still have boating and fishing access to the lake during construction and lower pool levels?

Yes. All ramps are usable down to elevation 420, however, at 433-432 elevation, the Lost Rapids and Little River North Ramp waters are inaccessible to the main body of the lake. The only usable courtesy dock is Pine Creek Cove East ramp to elevation 430. Caution is advised because lower lake levels expose hazards that were covered and hidden at higher lake levels.

Q 7 Will the dam be safe if there's a flood?

Yes, with the precautions we are taking.

Q 8 Will the current operations of the lake change?

Significant rainfall in the watershed will require flood control operations. The available channel capacity would first be made available to Pine Creek. The remaining channel capacity would be given to Broken Bow Lake and DeQueen Lake. If significant distress is observed at the dam, releases from Pine Creek may be increased regardless of any downstream flooding already occurring. Current operation limits releases from Pine Creek Lake while flooding is occurring downstream. Prior to making these releases or any flows that may add to flooding downstream, local emergency management officials will be notified.

Q 9 Are boating and skiing safe at the lower levels?

People will have to be more cautious in the upstream areas and coves, but the open areas of the lake near and around the dam (deeper areas) will be safe for skiing and boating.

Q 10 Has the fishery or access to the lake improved while the pool has been drawn down?

Yes. We extended boatramps and repaired and extended the one at Pine Creek Cove. The Oklahoma Department of Wildlife Conservation made improvements to the fish habitat on the lake, including brush piles and "spider blocks." The ODWC also planted millet on the exposed mudflats during the draw down which will improve the duck hunting and provide cover for young fry.

Q 11 How will the conservation pool restrictions impact water quality?

Water quality impacts will be dependent, in part, upon the amount and timing of rainfall. Within the reservoir, the restriction of the conservation pool could allow for the concentration of nutrients within a smaller volume of water creating favorable conditions for nuisance algae blooms impacting oxygen availability for aquatic life, and creating taste and odor problems for municipal water supply providers.

Q 12 How will the pool restrictions impact aquatic life?

Within the reservoir, pool restriction will result in an overall increase in warmer shallow water areas. This limits the amount of cooler, oxygenated water that generally occurs in deeper waters that fish and other aquatic organisms often prefer as a thermal refuge to help control body temperatures. If nuisance algae blooms become an issue within the reservoir, surface waters could experience low dissolved oxygen concentrations during overnight hours. Decreases in the amount of cooler water for refuge and large decreases in dissolved oxygen concentrations during overnight periods could create a highly stressful environment for fish and other aquatic organisms. Downstream impacts to aquatic life would result if the conservation pool elevation falls below 414 feet. Impacts could include reduced flow, increasing water temperatures within Pine Creek downstream of the dam, and lower dissolved oxygen concentrations.