

Tin Cup Dam Repair - August 30, 2003  
Summary of the Situation, Proposed Work and Means of Access,  
How to Comment and How to Get More Information

### **Introduction**

The Bitterroot National Forest plans to authorize Tin Cup County Water and/or Sewer District (TCCWSD) immediate motorized access and use of motorized equipment within the Selway-Bitterroot Wilderness to make emergency repairs on their Tin Cup dam. The Forest will also identify requirements TCCWSD will need to meet to provide reasonable protections for national forest resources.

Tin Cup Dam is an earthen and rock embankment dam located at the headwaters of Tin Cup Creek, approximately 14 miles southwest of Darby, Montana and 12 miles from the nearest access road. The dam and lake are on the Bitterroot National Forest within the Selway-Bitterroot Wilderness. Access to the site is normally via Forest Service Trail #96.

The dam is owned and operated by the Tin Cup County Water and/or Sewer District. TCCWSD is authorized to maintain and operate the facility through a special use permit, although the water district has applied for additional rights. Records indicate that the dam was originally built by 1906.

### **Current Situation**

On July 9, 2003, TCCWSD representatives discovered and reported evidence of a minor overtopping event in a notched portion of Tin Cup dam as well as a sinkhole on the downstream side of the notch. The event was confirmed with a site visit by Forest Service engineers the following week. Subsequent analysis of the dam indicates the spillway is not able to evacuate water from the reservoir quickly enough to ensure the Tin Cup dam is not overtopped at the current notch elevation. Calculations indicate a 10-20% chance of the dam overtopping in any given year during high spring flows.

In the event the reservoir water level reaches the overtopped area again in 2004, there is an unacceptably high probability of failure as water overtops and erodes the dam. The existing sinkhole could progressively erode into the dam and cause a failure.

On August 27, 2003, TCCWSD's board of directors formally notified the Forest Service of its intent to access Tin Cup Dam to complete emergency stabilization of the dam structure.

### **Consequences of a Dam Failure**

There is no imminent danger of dam failure now. However, if the dam is not repaired, it could fail during spring runoff. Homes and buildings in the town of Darby and some of the outlying areas, as well as Highway 93 near the creek, could be flooded. Consequences could include loss of life, economic loss to residents and property owners, and damage to public and private natural and economic resources. Environmental damage could include loss of the threatened bull trout and its habitat in and along Tin Cup Creek.

### **Tin Cup County Water and/or Sewer District Planned Repairs**

TCCWSD presented their engineering repair plans to the Forest Service on August 27, 2003. The Forest Service has tentatively agreed to the plan but is continuing to review the proposal and work with TCCWSD and its engineers to refine the design.

As proposed, TCCWSD will raise the low area of the dam approximately 6 feet on the reservoir side of the notch. The top of this berm will be 10 feet wide. By increasing the elevation of notch, the existing spillway capacity will also be increased to meet dam safety design criteria. Material to construct the berm will be removed from the top of the dam on both sides of the notch. To protect these materials

from erosion and internal piping, a double-textured membrane, or impermeable liner protected by soil and filter fabric will be installed on the face of the newly constructed berm. The berm will then be protected with a rock shell, or riprap from wave and debris action. Some additional rock material may be required from the vicinity along the entrance of the spillway channel to armor the face of the berm.

The proposed repairs also includes removing an estimated 4 to 6 feet diameter area of buttress rock from over the sinkhole area to investigate the situation. The problem is suspected to be a localized area of erosion, and the plan is to fill and compact the hole with appropriate materials, such as a mix of bentonite and soil.

Depending on time and weather conditions at this high elevation site, two lesser priority work items will be completed. First, rocks will be removed in restricted areas within the existing spillway channel. Some areas of the spillway channel may also be widened, particularly where flows are restricted. The overall objective is to smooth and clear obstructions from the spillway to increase the flow capacity.

Second, a more effective log boom may be constructed. This log boom would include an anchor buried in the reservoir. The log boom would essentially outline a triangular shape in front of the spillway to deflect debris to areas away from the spillway and the outlet works.

### **Motorized Equipment and Means of Access**

It is believed, at minimum, that the following equipment will be needed by TCCWSD to assure the repairs can properly and safely be accomplished in the limited time available. A medium sized excavator (capable of removing and placing the existing buttress rock), a compactor for the material placed within the berm, an electric impact drill, generator, water pump, light stand and misc. tools.

Most of the equipment would be carried to the dam with a medium lift helicopter. The excavator is too large for these helicopters to carry. TCCWSD is exploring whether a specialized type of excavator, often referred to as a "spider-hoe", is available and able to travel up the trail to the dam. This type of excavator is often used in restoration work because of its ability to literally "walk" over difficult terrain with minimal impacts and without needing to excavate a trail or road. If the equipment is not available or cannot feasibly negotiate the trail to the dam, then a heavy lift helicopter will be needed to transport an excavator to and from the dam.

### **How to Comment**

The Bitterroot National Forest is inviting comments on the proposed work. In particular we are interested in specific ideas or information you believe should be considered about this authorization, its potential effects on people and the environment, or reasonable mitigations that you think might help limit those effects. Due to the urgency involved, work may begin as soon as September 10. If you would like to respond, please do so immediately to Pete Zimmerman at:

**Email** - [r1\\_bitterroot\\_comments@fs.fed.us](mailto:r1_bitterroot_comments@fs.fed.us), **Fax** to 406-363-7106,

### **Address Letters to:**

Forest Supervisor, Bitterroot National Forest,  
Attention Pete Zimmerman  
1801 N. 1<sup>st</sup>. St., Hamilton, MT 59840

**or call** Pete Zimmerman at 406-363-7100.

**For Further Information:** Additional information will be posted and updated on the Bitterroot National Forest's Internet web-site at: <http://www.fs.fed.us/r1/bitterroot/planning/tincup.htm>.