

# RECLAMATION

*Managing Water in the West*

## **TSAILE DAM Safety of Dams Rehabilitation Project Apache County, Arizona**



### **Scoping Information and Opportunity to Comment**



**U.S. Department of the Interior  
Bureau of Reclamation  
Phoenix Area Office**

**March 2011**



## **Mission Statements**

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

The mission of the Bureau of Indian Affairs is to enhance the quality of life, to promote economic opportunity, and to carry out the responsibility to protect and improve the trust assets of American Indians, Indian tribes, and Alaska Natives. Included in that mission is the responsibility to protect, to the extent practical, people who reside in or who otherwise occupy the floodplain downstream from BIA dams.

The mission of the National Park Service is to conserve the scenery, the natural and historic objects, and the wildlife in United States' national parks, and to provide for the public's enjoyment of these features in a manner that



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## **Safety of Dams Rehabilitation Project**

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## **Introduction**

The Bureau of Reclamation, in cooperation with the Bureau of Indian Affairs (BIA), National Park Service (NPS), U.S. Fish and Wildlife Service, and Navajo Nation Department of Water Resources is preparing an Environmental Assessment (EA) on a proposal to correct Safety of Dams (SOD) deficiencies at Tsaile Dam on the Navajo Indian Reservation, Apache County, Arizona. Correction of SOD deficiencies would involve modifying the outlet works, bolstering the downstream embankment with a stability berm, and improving pedestrian access across the spillway. Construction would require that the reservoir be drained and inflows from Tsaile Creek bypassed around the dam with temporary pumps. Repair of Tsaile Dam is scheduled to begin in April 2012.

The purpose of this scoping document is to inform interested and affected parties of the pending action and to solicit comments on the potential environmental impacts of the proposal.

## **Background**

Tsaile Dam is situated inside the northeastern boundary of Canyon de Chelly National Monument, approximately 60 miles north of Window Rock, Arizona (Figure 1). The dam, which is located on Tsaile Creek, intercepts runoff from a 60-square-mile watershed, originating in the Chuska Mountains. Releases from the outlet works and spillway enter the head of Canyon del Muerto, approximately 3,700 feet downstream of the dam. Construction of the Tsaile Dam was completed in 1964 to provide opportunities for recreation and irrigation. Similar in many respects to other major dams on the Navajo Nation, Tsaile Dam consists of a rip rap armored earthen embankment, uncontrolled spillway, and gated outlet works.

Recreation functions at Tsaile Reservoir are administered by the Navajo Nation Fish and Wildlife Department. Recreational opportunities include dispersed picnicking, camping, fishing, and sightseeing. There are no constructed facilities for picnicking and camping. The reservoir is managed as a nonnative put-and-take trout fishery.

Dam operations are performed by the Navajo Nation Department of Water Resources (SOD Program). Because of safety concerns, the reservoir is currently restricted to a maximum operating elevation of 7,023 feet above mean sea level (msl), or 6 feet below the spillway invert elevation of 7,029.4 feet above msl. Under normal operating conditions, runoff from snowmelt and monsoon storms is allowed to fill the reservoir to the spillway crest elevation.

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Two Navajo Chapters encompass the action area for the project. Tsaile Dam and Reservoir are located within the Tsaile/Wheatfields Chapter. The Canyon del Muerto segment of Tsaile Creek is located within the Chinle Chapter.

## **Purpose and Need**

The purpose of the proposed action is to correct verified SOD deficiencies that could jeopardize the structural integrity of Tsaile Dam. Corrective action is needed to preserve the recreation and irrigation values for which the reservoir was originally authorized and to reduce the probability of embankment failure and associated risk to the public from continued impoundment of water behind Tsaile Dam.

Catastrophic failure of Tsaile Dam, with the water level at the embankment crest, would threaten residents and tourists throughout the entire length of Canyon del Muerto within Canyon de Chelly National Monument. Flooding would also affect low-lying areas near Chinle. The NPS estimates there are 40 to 75 occupied dwellings (about 90 residents) in the monument's canyons on a seasonal basis. In addition, as many as 3,400 tourists may enter the canyons in some months. Rapid evacuation of canyon residents and tourists during a catastrophic failure of Tsaile Dam would be problematic.

The following verified SOD deficiencies are described in greater detail in an issue evaluation (IE) study prepared by Reclamation. The IE identified dam safety deficiencies with respect to normal operations, seismic events, and flood conditions.

- *Potential for internal erosion associated with the damaged corrugated metal pipe (CMP) outlet works.* Inspection of the outlet works conduit concluded that joints were separated, a section of the crown was ruptured, and leaks were present. In addition, transverse cracks caused by collapse of the conduit were detected in adjacent embankment materials. Internal erosion of embankment soils caused by piping of material into, and along the exterior of, the CMP is a potential failure mode. Operation of the CMP also could initiate internal erosion of the embankment by water flowing out of the ruptured and separated joints.
- *Liquefaction of foundation soils.* It was determined in the IE that the embankment could liquefy during a seismic event resulting in collapse of the upstream and/or downstream portion of the embankment and subsequent loss of freeboard.
- *Flood effects.* Higher surface water levels resulting from flood flows into the reservoir could increase internal erosion of the embankment and result in failure of the dam.
- *Inadequate access to the dam during spillway discharges.* The main access route to the dam passes through the spillway. This route cannot be used when the

spillway is active. Other access routes exist but are located on dirt roads that are often impassible during or immediately following major storm events. As a precautionary measure the reservoir has been partially drawn down and the outlet works placed out of service until corrective action can be implemented. Temporary siphons have been installed to regulate reservoir levels and provide controlled releases to Tsaile Creek below the dam.

## **Proposed Action**

The BIA and the Navajo SOD Program, working in conjunction with Reclamation, propose the following actions:

- Slipline the existing outlet works with a double-walled HDPE pipe.
- Replace the intake structure.
- Construct a stability berm along the downstream slope of the embankment.
- Install new sand and gravel filtration and toe drain systems.
- Install a concrete stilling basin at the outlet portal of the outlet works.
- Construct a pedestrian bridge across the spillway to improve routine and emergency access to the dam for Navajo Nation Department of Water Resources personnel.

Tsaile Reservoir would be gradually dewatered for 5 months prior to construction and totally drained for 20 months to facilitate anticipated repairs. A temporary 6-foot high earthen cofferdam would be installed around the intake structure to ensure that snowmelt and storm inflows from Tsaile Creek do not inundate the work area. During construction, stream flow into the dewatered reservoir would be pumped over the dam and discharged into Tsaile Creek. The cofferdam would be breached or removed following construction.

## **Alternatives to the Proposed Action**

Section 102(2)(E) of the National Environmental Policy Act (NEPA) requires that no action must be considered as an alternative in an environmental review whenever there are unresolved conflicts about the proposed action with respect to alternative uses of available resources. A description of “no action” is also customarily used in an EA to provide the baseline for comparison of environmental effects of the action alternatives to existing conditions.

In addition to no action and the proposed action, other alternatives to meet the purpose and need will be considered during scoping.

## **DECISION FRAMEWORK**

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Reclamation prepared the engineering designs for the proposed project and is the lead Federal agency responsible for determining whether the proposal will have a significant effect on the human environment. In addition, Reclamation is responsible for managing the construction phase of the project. The Navajo Nation and BIA must decide whether to implement the proposed action, another action alternative, or take no action.

## **Preliminary Issues**

In accordance with Department of the Interior NEPA regulations at 43 CFR 46.300, Reclamation has determined that an EA is the appropriate level of NEPA compliance to evaluate the potential environmental consequences of the proposed project. NEPA applies to Federal actions; therefore, the first step in determining the scope of the EA is to identify key issues related to the effect of the proposed Federal action on the existing environment. During this initial scoping phase, Reclamation is soliciting input from all interested persons, organizations, and agencies to help identify key environmental issues to be addressed in the EA.

We anticipate the following issues will be analyzed in the EA:

- effects to biological resources, including special status species
- effects to cultural resources
- effects to water resources
- effects to land use
- effects to soils and downstream erosion
- effects to public safety
- effects to access within Canyon del Muerto

## **How to Comment and Timeframe**

Following a 30-day scoping period, Reclamation will prepare an EA to evaluate the potential environmental consequences of the proposed project. For your comments to be fully considered in the EA, they should be submitted by April 26, 2011. Please include your full name, your address, and the project title (Tsaile SOD Project), with your comments. Submit comments to Mr. John McGlothlen, Bureau of Reclamation, 6150 West Thunderbird Road, Glendale, Arizona 85306. Facsimiles may be sent to Mr. McGlothlen at 623-773-6486. Hand-delivered comments may be submitted to the above address, Monday through Friday, between 7:30 a.m. and 4:00 p.m., excluding Federal holidays. E-mail comments may be submitted to [jmcglothlen@usbr.gov](mailto:jmcglothlen@usbr.gov).

By law, the names and addresses of those providing comments are available for public review. However, individuals may request that their name and/or address be withheld from the record. These requests will be honored to the extent allowable by law. If you

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wish your name and/or address withheld, you must state this prominently at the beginning of your comment letter. All comments from organizations or businesses will be available for public inspection in their entirety.

For additional information, please contact Mr. McGlothlen at the address above, by telephone at 623-773-6256, or by e-mail.



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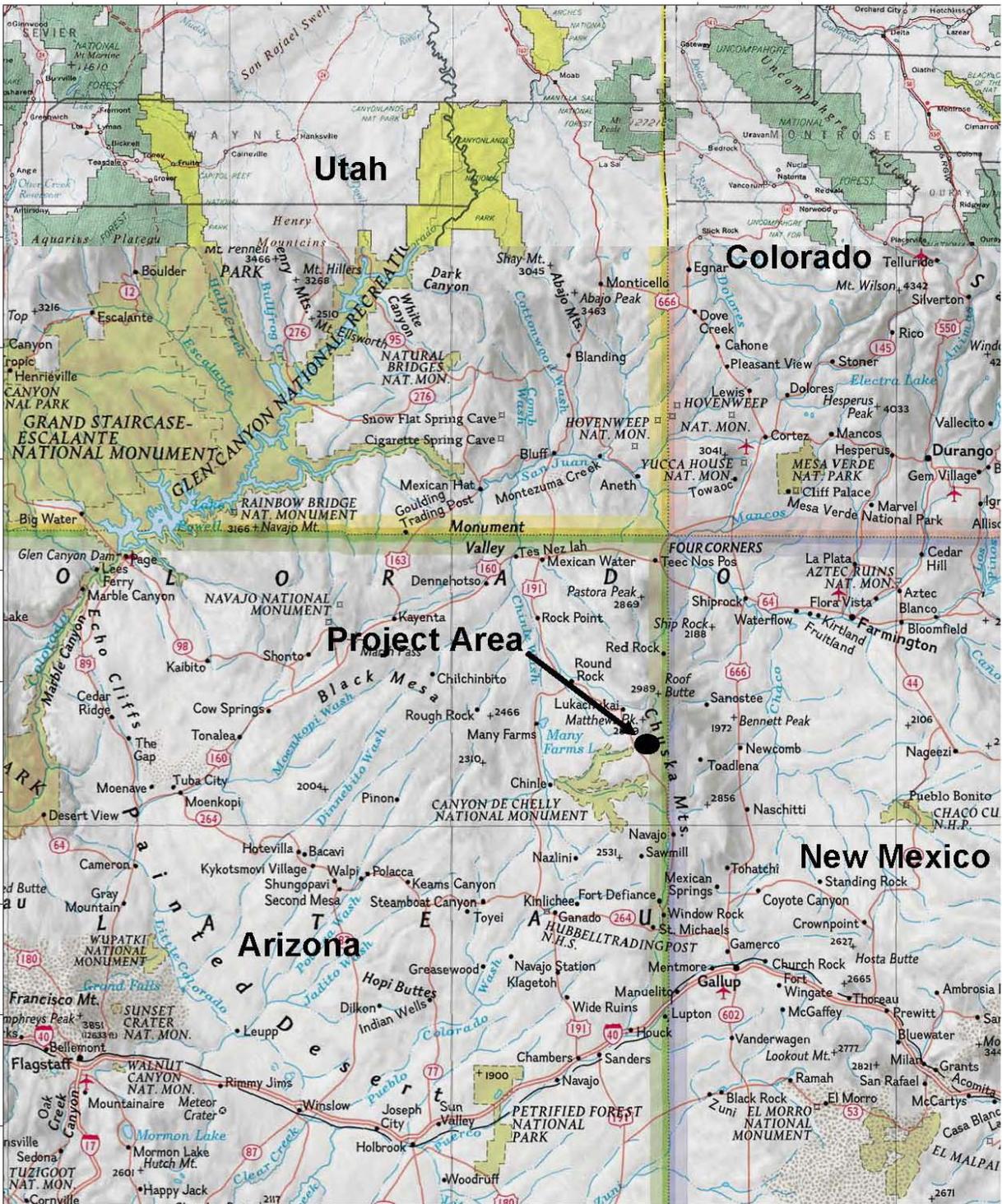


Figure 1. Project area map.