

# Chapter 1 - Need for Proposed Action and Background

## 1.1 Introduction

This document is an environmental assessment (EA) of the proposal to modify A.V. Watkins Dam under the Safety of Dams (SOD) Act of 1978 (Public Law 95-578, as amended). The proposed SOD modifications would correct safety deficiencies of the dam without affecting the purpose or benefits of the dam. Specifically, the embankment and foundation of the dam need to be repaired. The repairs are needed to restore the reservoir to full function and to incorporate state-of-the-art defensive measures of controlling seepage within the foundation and embankment.

On November 13, 2006, emergency remedial actions were taken at A.V. Watkins Dam when it was discovered that a foundation seepage erosion failure mode was in progress. There was a high probability of failure of the dam which could have resulted in the uncontrolled release of the reservoir and which could have resulted in loss of life. It is now critical to the Weber Basin Project that A.V. Watkins Dam be permanently repaired to allow the reservoir to fill to full capacity and restore the Weber Basin Project benefits.

The dam is located in Box Elder County, Utah. The Willard Bay State Park is located adjacent to the reservoir created by A.V. Watkins Dam. The park is managed by the Utah Division of Parks and Recreation (State Parks) which maintains several campgrounds, boat docks and ramps, entrance stations, and other associated buildings, and infrastructure. Modifications to State Parks facilities would not be needed.

This EA analyzes the potential impacts of the proposed SOD modifications. If potentially significant impacts to the human environment are identified, a Notice of Intent to prepare a draft environmental impact statement (EIS) would be published in the *Federal Register* and an EIS would be prepared. If no significant impacts are identified, Reclamation would issue a Finding of No Significant Impact (FONSI). The FONSI would include the decision to proceed with a selected alternative.

### 1.1.1 Safety of Dams (SOD) Program Overview

In keeping with the mission to ensure that Reclamation dams do not present unacceptable risks to people, property, and the environment, Reclamation's Dam Safety Program was officially implemented in 1978. The modifications proposed for A.V. Watkins Dam are authorized by the Reclamation Safety of Dams Act of

1978 (Public Law 95-578) and the Reclamation Safety of Dams Act Amendments of 1984 (Public Law 98-404), 2000 (Public Law 106-377), 2001 (Public Law 107-117), and 2004 (Public Law 108-439). Together, these are referred to as the Safety of Dams Act.

Dams must be operated and maintained in a safe manner. Safe operation is ensured through safety inspections, analyses utilizing current technologies, and designs and corrective actions taken if needed based on current engineering practices.

The primary emphasis of the Safety Evaluation of Existing Dams (SEED) Program, a subtask under the SOD Program, is to perform site evaluations and to identify potential safety deficiencies of Reclamation and other Interior Bureau's dams. The basic objective is to identify dams which pose an increased threat to the public and to quickly complete the related analyses in order to expedite corrective action decisions and safeguard the public and associated resources.

The SOD Program focuses on evaluation of Reclamation dams and implementing actions to resolve safety concerns. Under this program, Reclamation completes studies and identifies and accomplishes needed corrective actions for Reclamation dams. The selected course of action relies on assessments of risks and liabilities with environmental and public involvement issues incorporated into the decision making process.

### **1.1.2 SOD NEPA Compliance Requirements**

As required by Section 5 of the Reclamation Safety of Dams Act, this EA must be completed and submitted to Congress, along with a technical report and other supporting information, in order to obtain authorization to proceed with the proposed SOD modifications. The information and analyses in the EA, including the description of the proposed SOD modifications and alternatives, represent the best available information at this stage of the SOD process for A.V. Watkins Dam. Further analysis after Congressional approval, but prior to or in the early stages of project initiation, may result in a need to modify the alternative selected for implementation. Project changes that are not specifically analyzed in this EA will be documented in the administrative record. Major changes, for which additional environmental analysis is appropriate, would be analyzed in a supplement to this EA. This supplement would be made available to the public upon request. If a FONSI is completed, it would be modified if warranted by project changes and would also be made available to the public upon request.

## **1.2 Background**

Willard Reservoir is an off-channel storage facility located 12 miles northwest of Ogden, Utah, in Box Elder County (Appendix 1, Map 1). The extreme southern portion of the project extends into Weber County. Construction of this U-shaped zoned earthfill dam was started in 1958 and completed in 1964. It is primarily

founded on lacustrine deposits of sand, silt, and clay. Prior to construction, a drainage canal was excavated downstream and parallel to the proposed embankment alignment to lower the groundwater table in the vicinity of the dam and facilitate embankment construction. The canal or South Drain as it is referred to, continues to collect local groundwater and transports it under the Willard Intake Canal through a siphon, and discharges it into the Great Salt Lake.

The reservoir is fed by the Willard Canal, which receives water through the Slaterville Diversion Dam located on the Weber River, approximately 8 miles south of the reservoir. Water is returned from Willard Reservoir to Weber River as needed over the same route (Willard Canal), facilitated by two pumping plants. The dam and reservoir are features of the Weber Basin Project and provides irrigation and municipal and industrial (M&I) water to heavily populated and industrialized lands east of the Great Salt Lake. The Weber Basin Project benefits include irrigation, M&I water, fish and wildlife, and flood control. The Weber Basin Water Conservancy District (District) assumed responsibility for repayment of construction costs, delivery of water, and general operation of the Weber Basin Project pursuant to a 1952 repayment contract between Reclamation and the District. Reclamation transferred, by contract, to the District full responsibility for operating and maintaining the dam on April 10, 1969.

The reservoir has a total water capacity of 215,100 acre-feet (af) at a water surface elevation of 4226 feet above sea level. The active (usable) storage is 198,200 af. The minimum water surface elevation is 4205 feet. The reservoir has a surface area of 10,000 acres. A.V. Watkins Dam is an earthen structure. The dam is 36 feet high at the maximum section, has a crest length of 76,665 feet (slightly more than 14.5 miles), and contains 17,060,000 cubic yards of material. On the north end of the dam, the outlet works and overflow sill spillway are combined into one structure. The combined outlet works/spillway capacity is 1,121 cubic feet per second (cfs) at water surface elevation 4226.85 feet.

Since this is an off-channel reservoir, water is not released directly into any natural drainage. Water can be delivered back into the Willard Canal via Willard Pumping Plants No. 1 and No. 2.

On November 13, 2006, A.V. Watkins Dam nearly failed as the result of piping and internal erosion of the foundation soils at approximate dam station 639+00 (Appendix 1, Map 2). Piping of the foundation soils was occurring from beneath the dam, and the fine-grained, silty, sand soils were exiting from the dam's downstream toe and from the base of the north slope of the south drain canal.

Efforts to save the dam were successful in stopping the foundation erosion and immediately reduced the overall seepage flows. SOD modifications described in this EA would ensure long-term safety of the dam.

### 1.3 Purpose, Need, and Scope of Analysis

The purpose of the Proposed Action (SOD modifications) is to repair safety deficiencies recently discovered in A.V. Watkins Dam in a cost effective and structurally feasible manner, and to meet current safety standards without affecting the purposes of the Weber Basin Project which are: to provide water for M&I and agricultural water use, fish and wildlife, and flood control.

The modifications are needed to correct, for the long-term, previously unidentified unsafe conditions at A.V. Watkins Dam to comply with the Safety of Dams Act. Reclamation proposes to repair the dam embankment and toe drain system along the southeast side of the dam with the goal of restoring the reservoir to full operation by the spring 2010.

If the dam failed near current maximum water surface elevation, loss of life would occur (Reclamation 2007). A current restriction of the reservoir's maximum water surface elevation greatly decreases the probability of failure. Loss of life would primarily be attributed to flood waters crossing Interstate 15. Warning times could be as little as minutes if the breach occurred in the reach of the dam that runs parallel to the interstate, up to many hours after the failure if the breach occurred in areas of the dam further west. This would allow ample time to close the road to traffic.

The scope of analysis in this EA is limited to consideration of whether or not to repair the dam. This EA is being prepared because a seepage erosion failure mode was recently found in the dam's embankment. Construction activities associated with the Proposed Action would be limited to previously disturbed lands within Willard Bay State Park and the dam and reservoir's primary jurisdiction zone.

Investigations of A.V. Watkins Dam conducted under Reclamation's SOD Program, have confirmed certain safety deficiencies that could contribute to catastrophic failure of the dam. In compliance with Reclamation's SOD Program, this EA discloses and discusses recommendations to undertake corrective actions for modifying the dam. These actions would be accomplished for the following reasons:

- Reclamation is required to comply with stipulations stated in the Safety of Dams Act. This act and amendments direct the Secretary of the Interior to preserve the structural integrity of Reclamation dams by developing modifications that the Secretary determines may reasonably be required.
- A.V. Watkins Dam is at risk of failure because of safety deficiencies. Dam failure could result in an uncontrolled release of water from the reservoir which could cause loss of life and property.

- Reclamation has a contractual obligation to continue water deliveries for irrigation and M&I uses. Such deliveries are dependent upon the existence and operation of A.V. Watkins Dam.
- Failure of the dam would eliminate flood protection benefits for surrounding areas.
- Willard Reservoir provides essential fish and wildlife habitats which would be lost in the event of dam failure.
- Failure of A.V. Watkins Dam could cause significant disruption and degradation of fish and wildlife habitats located downstream from the dam. Water quality could be degraded.
- Failure of A.V. Watkins Dam would eliminate the recreational benefits associated with Willard Reservoir and Willard Bay State Park.

## **1.4 Authorizing Actions, Permits, and Licenses**

Implementation of the Proposed Action could require a number of authorizations or permits from state and Federal agencies. These are summarized below.

- A permit, covering construction associated with the Proposed Action, may be needed from the Army Corps of Engineers (USACOE), to comply with Section 404 of the Clean Water Act, as amended. Construction would occur in and near the berm of the dam. This area is highly disturbed, consisting mostly of typical upland vegetation. Several small (less than 1-acre) wetlands would be permanently impacted by this project. A wetland delineation and consultation with the USACOE would be required on these small wetland areas.
- A General Construction Storm Water Permit as a part of the Utah Pollutant Discharge Elimination System (UPDES) from the State of Utah Division of Water Quality would be required if the area of disturbance equals or exceeds 1-acre. The contractor would need to implement erosion and sediment controls according to a storm water pollution prevention plan prepared in compliance with the general permit.