

# RECLAMATION

*Managing Water in the West*

## **Box Butte Dam: Safety of Dams Corrective Action**

**Mirage Flats Unit, Pick-Sloan Missouri Basin Project, Nebraska**

**Finding of No Significant Impact (FONSI)**



## **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.

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## Introduction

The United States Department of the Interior (Department or DOI), Bureau of Reclamation (Reclamation) is responsible for ensuring that its facilities do not present unreasonable risks to the public, public safety, property and/or the environment. Reclamation determined that safety deficiencies exist at Box Butte Dam and Reservoir, a component of Reclamation's Mirage Flats Unit of the Pick-Sloan Missouri Basin Program.

Box Butte Dam and Reservoir is located in along the Niobrara River in Dawes County, Nebraska, approximately 10 miles north of Hemingford, Nebraska and 23 miles southwest of Chadron, Nebraska. Box Butte Dam is an earth and gravel embankment with a controlled irrigation outlet works and two uncontrolled spillways. The dam's crest length is 5,508 feet with a structural height of 87 feet above the original river bed. The top of the irrigation pool is 4,007 feet above mean sea level. The primary purpose of Box Butte Dam and Reservoir is to provide irrigation benefits, along with additional recreation and fish and wildlife benefits. Reclamation has transferred the operation and maintenance responsibility of the Mirage Flats Unit to the Mirage Flats Irrigation District (MFID).

Based upon extensive monitoring and evaluations beginning in 1979, Box Butte Dam has been classified as a moderate to high risk (Level 3 under Reclamation's Dam Safety Rating system) facility. This classification indicates that Box Butte Dam has potential dam safety deficiencies with significant risks or probabilities of dam failure. If this situation is not addressed, continued seepage and sediment transportation could lead to dam failure by internal erosion.

In cases of a moderate to high risk classification, Reclamation must determine whether it is appropriate to proceed with actions that either better define the dam safety risks or take actions to directly reduce the dam safety risk (Reclamation 2011a). Reclamation determined that "additional studies are unlikely to reduce the risk estimates," and thus, Reclamation should proceed with actions to directly reduce the dam safety risk (Reclamation 2013b and 2015b).

In accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969, Reclamation prepared the *Box Butte Dam: Safety of Dams Corrective Action Environmental Analysis* (EA), dated February 2016, to evaluate the effects of undertaking corrective actions to reduce safety risks at Box Butte Dam as part of Reclamation's Dam Safety Program.

## Coordination

Public scoping activities for the proposed project began in earnest on July 28<sup>th</sup>, 2015, when Reclamation hosted an informational public meeting in Alliance, Nebraska. Reclamation also developed a project website to inform the public about the proposed project and environmental documents, provide updates about public involvement opportunities, and provide an online comment forum.

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Reclamation invited public review and comment on the Draft EA between January 15<sup>th</sup> and February 12<sup>th</sup>, 2016. Reclamation received a total of 63 comments on the Draft EA. In general, public comments focused on socioeconomic impacts, recreation impacts, lost fish and wildlife benefits, increased erosion, and expressed support for one or more project alternatives. The comments received on the Draft EA were considered and addressed during preparation of the Final EA.

In addition to public involvement, Reclamation consulted with various Federal, State, and local government agencies during the preparation of this EA, including:

- Nebraska Game and Parks Commission (NGPC)
- Nebraska State Historic Preservation Office (SHPO)
- National Park Service
- U.S. Fish and Wildlife Service
- Nebraska Department of Environmental Quality

## Purpose and Need for the Project

The need for corrective action at Box Butte Dam arises from Reclamation's duty to ensure that Reclamation dams do not present unreasonable risks to people, property, and the environment. Currently, the risk of dam failure due to persistent seepage issues at Box Butte Dam is at an unsatisfactory level. Corrective actions are needed to reduce the risk of dam failure to satisfactory levels according to Reclamation's SOD program guidance.

Undertaking corrective actions will serve the following purposes:

1. Downgrading of the Box Butte Dam DSPR from a DSPR 3 (Moderate to High Priority) to DSPR 4 (Low to Moderate Priority) or DSPR 5 (Low Priority). This downgraded DSPR will indicate reduction of risk of dam failure to a satisfactory level that will not indicate a pressing need for action (Reclamation 2011a; Reclamation 2015b).
2. Continue to meet the primary purposes of Box Butte Dam, including delivery of irrigation water in accordance with the terms and conditions of Contract No. 1-07-70-W0031, *Contract between the United States and the Mirage Flats Irrigation District Related to the Mirage Flats Project*, as amended.
3. Continue to provide fish, wildlife, and recreation benefits by maintaining a minimum reservoir water surface elevation of 3,979 feet, in accordance with the *Agreement between the United States, the Nebraska Game and Parks Commission, and the Mirage Flats Irrigation District to Raise the Minimum Reservoir Level in Box Butte Reservoir*, as amended.

## **Summary of the Proposed Action**

The Proposed Action will remove the existing toe drain system and replace it with a new two-stage filter and drainage system. The new toe drain will be larger than the existing drain, using a 12-inch to 24-inch diameter drain pipe with perforations, and backfilled with a two-stage filter and drain envelope. The new drains will be installed along the entire toe of the dam. Sediment collection structures and weirs for measuring discharge will be installed in order to monitor seepage and material transport. The Proposed Action does not include any of the sub-alternatives, such as the construction of a seepage berm or vertical drainage trench, which were described in the Final EA.

The main work area, including staging and stockpiling areas, will extend 100 feet downstream of the dam and encompass 61.5 acres. Access to the main work area will be directly from Box Butte State Recreation Area Road and two new temporary access roads running east from Table Center Road. The temporary access roads will be roughly 100 feet wide and will be abandoned following completion of construction. Borrow areas will be located on the left and right abutments. The borrow areas measure 27.6 acres. An estimated 76,000 cubic yards of earthfill material will be excavated and processed for use. An existing power line near the spillway will be realigned onto the road crossing the crest of the dam.

Construction of the Proposed Action is expected to begin in the summer of 2017 and conclude by the fall of 2018. All project activities will occur on Federal lands, primarily within Reclamation's operations and maintenance area on the downstream side of Box Butte Dam. The total cost of the Proposed Action is estimated to be 9.8 million.

During construction, the reservoir will be temporarily restricted to an elevation of 3,985 feet. The MFID will likely draw down the reservoir pool to an elevation of 3,979 feet by the end of the irrigation season (early September). Normal fall and early winter inflows will be stored, likely filling the reservoir pool to an elevation of 3,985 feet (mid- to late- December). Depending on the amount of seepage through the dam and reservoir water levels during the construction period, releases through Box Butte Dam may be required to maintain an elevation of 3,985 feet in order to limit seepage in the construction area.

## **Summary of Environmental Impacts**

The effects of implementing the Proposed Action have been analyzed and are summarized below:

### **Climate Conditions**

Emissions of greenhouse gases will occur, primarily as a result of construction equipment operation. While the Proposed Action will result in the minor release of emissions, these releases will not occur at a level which will impact local or regional climate. No significant impacts to climate are expected as a result of the project. The Proposed Action will provide

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greater ability to respond to future climate variability, such as changes in water availability and demands.

### **Soil Resources**

The Proposed Action will have minimal impacts on soils in the project area. Disturbance and compaction of soils is almost certain to occur during construction activities, although, for the most part, these activities will occur in soils which were disturbed during initial construction of Box Butte Dam and Reservoir. Required reservoir elevation restrictions will result in increased exposure of soils. Disturbed and exposed soils are more susceptible to erosion, especially during precipitation events.

Typical conservation measures, such as erosion control structures, reuse of topsoil, and seeding and mulching, will minimize these potential impacts. With the implementation of such measures, the effects to soil resources are expected to be insignificant.

### **Cultural Resources, Indian Trust Assets, and Paleontological Resources**

Reclamation determined that the Proposed Action was unlikely to impact any cultural resources listed on the NRHP or eligible for such a listing; the Nebraska SHPO was consulted and concurred with Reclamation's determination and recommended that no further archeological surveys are necessary (SHPO 2015). There are no known ITAs in the project area.

Although prior construction activities in the project location make it unlikely that previously undisturbed resources will be impacted by the Proposed Action, because this alternative includes soil-disturbing activities, there is potential for encountering unknown cultural or paleontological materials during construction actions. If unknown cultural or paleontological resources were discovered during construction activities, construction will be halted until Reclamation's Nebraska-Kansas Area Office archeologist is notified and appropriate consultations are completed.

No significant impacts to cultural resources, ITAs, or paleontological resources are expected as a result of the Proposed Action.

### **Water Resources**

The main work area and temporary site access overlap with 0.6 acres of wetland and will result in unavoidable impacts to these wetlands. Additionally, various project activities (vegetation clearing, topsoil stripping, excavation from borrow areas, construction of temporary haul routes, temporary dewatering of surface waters) could result in the introduction of pollutants (sediment) into stormwater runoff.

The Proposed Action will not contribute to Section 303(d) sources of contamination in either Box Butte Reservoir or the Niobrara River downstream of the dam (pH, pathogens, or mercury). The Proposed Action will have a negligible effect on the free-flowing condition, water quality,

and scenic, recreational, fish and wildlife, and paleontological values of the Niobrara National Scenic River (National Park Service 2015).

Potential sedimentation impacts will be minimized or eliminated through the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which will outline measures to control water discharge, runoff, erosion, and sediment discharge. Sediment control measures may include silt fences, fiber rolls certified as weed-free, sediment traps, and other sediment filters as needed to protect waters, drainages and wetlands. Additionally, due to the potential for introduction of pollutants into waters of the U.S. and the unavoidable impacts to wetlands, Clean Water Act (CWA) permitting and mitigation is required prior to undertaking the Proposed Action.

Through compliance with the CWA application and permit process and implementation of the SWPPP, impacts to water resources as a result of the Proposed Action will be insignificant.

### **Air Quality**

The Proposed Action will result in temporary, intermittent releases of emission from sources such as operation of on-site construction equipment and fugitive dust. Air quality impacts will vary from day-to-day and will decrease with distance from the project site.

Conservation measures including road watering, implementing speed limits, and general equipment maintenance will be utilized as needed to control these emissions. Implementation of the Proposed Action will not result in a measureable or significant impact to air quality.

### **Land Use and Vegetation**

Vegetation will be cleared from transportation, staging, borrow, and construction areas below Box Butte Dam. In general, construction impacts will be limited to areas surround existing structures and with previous disturbance. Existing vegetation in these areas is primarily smooth brome (invasive), Canada thistle (invasive), and various wetland sedges. The project area is located within the Upper Niobrara River Biologically Unique Landscape, which supports several mixed-grass prairie and alkaline meadow communities. After completion of the project, all disturbed areas, including temporary staging and stockpiling areas, borrow areas, haul roads, and main work areas, will be re-contoured as necessary and revegetated with a Reclamation-approved seed mix. There are no plants listed as threatened or endangered under the Endangered Species Act (ESA) present within the project area.

Bare soils, such as lands exposed during reservoir elevation restrictions or during construction activities, present an ideal growing environment for noxious weeds. Any such newly infested areas will be inundated as soon as the reservoir restriction is lifted. In order to limit the potential for introduction or future spread of noxious or invasive species, all vehicles and equipment will be properly inspected and cleaned, in accordance with Reclamation's *Inspection and Cleaning Manual for Equipment and Vehicles to Prevent the Spread of Invasive Species* (DiVittorio 2012).

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The Proposed Action is expected to have insignificant impacts to vegetation and no impacts to land use.

### **Wildlife Resources**

The Proposed Action will have temporary effects to wildlife. Increased human activity and construction noise will likely result in temporary impacts to wildlife such as displacement, nest abandonment, decreased reproductive rates, or other behavioral or stress responses. Species displaced from the construction zone will likely find suitable habitat in the adjacent Wildlife Management Area. Removal of vegetation will result in temporary habitat destruction. After construction, Reclamation's reseeding efforts will return the habitat value of the project area to the same or better condition as pre-construction. Box Butte Reservoir will continue to provide habitat for shorebirds and waterfowl. Pre-construction surveys, timing restrictions, and other conservation measures are included in the Proposed Action to minimize or avoid adverse impacts to wildlife species and their habitat areas (including nesting locations).

None of the impacts described above are expected to have population level impacts. No significant impacts to wildlife resources are expected as a result of this action.

#### *Threatened and Endangered Wildlife Species*

There will be no effect to the whooping crane, black-footed ferret, or northern long-eared bat, as these species are not known to inhabit the project area.

### **Fisheries**

Fisheries impacts as a result of the Proposed Action will likely include a temporary decrease in food and habitat availability, as well as concentration of fish into a smaller area, and potential increases in predation and fish loss through the outlet works as a result of temporary drawdowns in reservoir elevation. After construction, the temporary elevation restriction will be lifted and fisheries are expected to return to preexisting levels.

One of the temporary access routes will require crossing the Niobrara River downstream of the dam. Through consultation with the NGPC, the proposed stream crossing has been designed to be fish-friendly, with a no-slope culvert and countersunk to allow natural substrate to settle to the bottom of the culvert, all of which will avoid the creation of an elevation barrier to fish movement.

No significant impacts to fisheries are anticipated as a result of the Proposed Action.

### **Recreation**

The anticipated construction schedule indicates that one recreation season may be affected by the Proposed Action, although impacts will not be significant.

Access over Box Butte Dam will be closed to the public for the duration of construction (expected duration is 13 months), with the exception of obtaining access to a single private residence located on the left dam abutment and NGPC management activities. Temporary and/or intermittent closures of the main entrance road (Box Butte State Recreation Area Road) will occur during intensive construction periods.

All recreation facilities, including day use areas, picnic shelters, campgrounds, and boat ramps, will remain open for use during construction. Reservoir drawdowns may render some boat ramps unusable, but fishing and boating access will still be available by launching boats from the shoreline. The WMA will remain open to the public, although the southern areas will be accessible via boat only. Overall noise levels are expected to increase for the duration of the project, which may disrupt the enjoyment of quiet spaces.

### **Economic and Social Factors**

The Proposed Action will result in no impacts to the overall socioeconomics of the region, nor will it result in disproportionate impacts to minority or low income populations. Recreation, fish and wildlife, and irrigation water supply will likely see a temporary decline in conditions, but there is no estimated long-term economic loss in benefits, as conditions are expected to fully rebound after construction is completed.

### **Cumulative Impacts**

Chapter 3 (pg. 13) of the Final EA included analysis of cumulative effects or impacts from past, present, and reasonably foreseeable future actions. It was concluded that the Proposed Action will not result in any adverse significant impacts to the environment, and therefore will not result in significant cumulative impacts.

## **Finding**

Based on the analysis of the environmental impacts and the effectiveness of the conservation measures in the Proposed Action, as described in the Final EA and in the preceding sections of this document, Reclamation has determined that the Proposed Action will not have significant or highly uncertain impacts on the quality of the human environment (40 CFR 1508.27).

Consequently, Reclamation has prepared this Finding of No Significant Impacts and will not prepare an Environmental Impact Statement.

## **Decision**

Reclamation has selected the Proposed Action for implementation. Environmental Commitments (Chapter 4, pg. 33) contained in the Final EA are incorporated into this decision.

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The conservation measures are reasonable, appropriate, and based on recommendations commonly used for resource protection.

This concludes Reclamation's decision to implement the Proposed Action for the *Box Butte Dam: Safety of Dams Corrective Action* project and implementation of this Federal action may proceed.

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Date