LOWER YELLOWSTONE PROJECT, LOWER YELLOWSTONE DIVERSION DAM
Intake vicinity
Dawson County
Montana

HAER MT-141-A
HAER MT-141-A

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
INTERMOUNTAIN REGIONAL OFFICE
National Park Service
U.S. Department of the Interior
12795 West Alameda Parkway
Denver, CO 80228

HISTORIC AMERICAN ENGINEERING RECORD

LOWER YELLOWSTONE PROJECT, LOWER YELLOWSTONE DIVERSION DAM

HAER No. MT-141-A

Location:	On the Yellowstone River, approximately eighteen miles downstream of Glendive, Montana. USGS Quadrangle: Intake, MT (1991) Township 18 North, Range 56 East, Section 36 Dawson County, Montana
Dates of Construction:	1905–1910
Engineer:	U.S. Reclamation Service
Present Owner:	U.S. Department of the Interior, Bureau of Reclamation
Present Use:	Irrigation, municipal water supply, recreation
Significance:	In 2000, the Lower Yellowstone Diversion Dam and Dike (24DW443/MT-141A) were determined to be part of a complex of sites directly related to the Lower Yellowstone Irrigation Project that constituted a National Register-eligible historic district significant for its association with the broad pattern of federal reclamation efforts in the early twentieth century and the agricultural development of the Lower Yellowstone Valley.
Historian:	Jason Marmor, September 2010; Kathleen Corbett, February 2011
Project Information:	This documentation was produced in order to mitigate adverse effects to important elements of the historic Lower Yellowstone Irrigation Project, as determined through consultations between Reclamation, the Corps of Engineers, and the State Historic Preservation Officer (SHPO) of Montana in compliance with Section 106 of the National Historic Preservation Act (as amended), and the associated implementing regulations codified in Title 36 of the Code of Federal Regulations, Part 800. A Memorandum of Agreement (MOA) was developed between Reclamation, the Corps of Engineers, the Montana SHPO, and the Lower Yellowstone Irrigation Project Board of Control. This MOA specified that Historic American Engineering Record (HAER) documentation be made as a permanent record of the Lower Yellowstone Project complex as a whole (HAER No.

MT-141), as well as for certain significant features subject to impacts from the federal undertaking:

HAER MT-141-A
Lower Yellowstone Project, Lower Yellowstone Diversion Dam

HAER MT-141-B
Lower Yellowstone Project, Headworks

HAER MT-141-C
Lower Yellowstone Project, Cable System

HAER MT-141-D
Lower Yellowstone Project, Gate Tender's Residence

HAER MT-141-E
Lower Yellowstone Project, Garage

HAER MT-141-F
Lower Yellowstone Project, Privy

The documentation was prepared in accordance with the National Parks Service's "Manual for Editing HABS/HAER Documentation" including the "Addendum" to that report which covers documentation requirements for HAER complexes. Large-format black-and-white photographs were processed and prepared in accordance with guidelines outlined in the National Park Service's "Photographic Specifications for HABS/HAER."

This documentation for the Lower Yellowstone Project Diversion Dam and Associated Dike (MT-141-A) includes the following:1) four archival-quality, large-format photographs and negatives of the dam, and two of the dike; 2) an index to photographs; 3) a written narrative describing the character-defining attributes of the dam and dike.

NARRATIVE

The Lower Yellowstone Diversion Dam (24DW443, F1) and Associated Dike (24DW443, F2) are located on the Yellowstone River approximately eighteen miles below (downstream of) Glendive, Montana. These two features consist of a timber-crib dam and a rock-lined earthen dike, which extends off the dam's southern abutment. The dam and dike function to contain and divert water for the Lower Yellowstone Project.

The Lower Yellowstone Diversion Dam measures 700′ in length, extending on its north end from the headworks for the Main Canal, in a southerly direction to a concrete abutment on its south end. The earthen dike is approximately 1,000′ in length, and extends in a southwesterly direction from the southern abutment of the dam across Joe Island, a low terrace remnant on the Yellowstone River. The Lower Yellowstone Diversion Dam has a structural height of 12′-0″, with a hydraulic height extending approximately 4′ above the water line. The crest of the dam is at 1,981′ above sea level.[1]

The Lower Yellowstone Diversion Dam is a timber-crib rock-filled overflow weir. Initially developed for use in placer mining in California, this type of dam was later built to serve irrigation and other land reclamation activities in the northwestern United States, and was preferred in the early years of the twentieth century because it was more easily constructed in running water than were concrete or masonry dams.[2] Unlike other contemporaneous crib weirs, which had vertical upstream faces, the Lower Yellowstone Diversion Dam has a 3:1 slope on its upstream side, which allows for ice to move more easily across the top of the dam in winter. The dam's downstream side has an ogee-shaped spillway tapering into a wide, rock-lined apron.

The dam is supported by a series of round timber piles, which are braced together by stringers. It is filled with approximately twenty-three thousand cubic yards of locally quarried rock and soil, which is contained by layers of wooden sheet piling on the upstream side and steel sheet piles on the downstream side. These sheet steel piles were put in place following the destruction of the original wooden sheet piles by ice in the winter of 1911–12. The wood sheet piles consist of 10″ x 10″ Douglas fir timbers and 3″ x 4″ lumber. The wood deck of the dam is overlain by 1″ x 4″ steel bars spaced several feet apart and oriented at right angles to the dam axis. This material provides necessary stability against the hydraulic forces that could overturn, slide, or otherwise compromise the dam. The downstream side of the dam has a wide rock apron lining the riverbed, in order to mitigate the erosive effect of the water spilling over the top of the dam.

Much of the decking on the dam was replaced in the early 1970s by the Lower Yellowstone Irrigation District. At that time deteriorating wooden members were

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[1] Water and Power Resources Service, *Project Data: Lower Yellowstone Project*. (Washington, D.C.: U.S. Department of the Interior, Water and Power Resources Service, 1983), p. 3.
[2] B.A. Etcheverry, *Irrigation Practice and Engineering*, Vol. III (New York: McGraw Hill Book Company, Inc., 1915), p. 44.

replaced with a combination of wood and metal strapping. It should be noted that this did not compromise the dam's design, form, or massing, and the dam's historic physical integrity was not impacted by this activity.[3]

At the south end of the dam is a concrete abutment, which backs onto the river bank on what is known as "Joe Island." This abutment is 20′-0″ in height from its base to its top, and it is buttressed and backfilled. The top is roughly flush with the embankment on the south side of the river, at 1,992′ above sea level.

A rock-lined dike extends from the south side of the south abutment in a straight southwesterly direction for approximately 400′. Originally measuring approximately 1000′, this dike was constructed along with the original Lower Yellowstone Diversion Dam because this part of the island became inundated by floodwaters in the spring, and the dike was needed to protect the dam's southern abutment from the effects of this inundation. It is approximately 1,992′ above sea level at its crest.

The north end of the Lower Yellowstone Diversion Dam is joined to the Main Canal Headworks (MT-141-B). The purpose of the dam is to divert water into the Main Canal, the entry for which is on the north end of the dam, with headworks sitting roughly perpendicular to the dam. A Cable System (MT-141-C) is in place at either end of the dam.

BIBLIOGRAPHY

Etcheverry, B. A.
1915 *Irrigation Practice and Engineering,* Vol. III. New York: McGraw Hill Book Company, Inc.

Kordecki, Cynthia, Mary McCormick, Carrie F. Jackson, and Jennifer Bales
2000 *Lower Yellowstone Project, 1996 and 1997 Cultural Resources Inventory, Dawson and Richland Counties, Montana, and McKenzie County, North Dakota*. Prepared by the University of North Dakota Department of Anthropology, Grand Forks, ND, and Renewable Technologies Inc., Butte, MT. Report submitted to the U.S. Bureau of Reclamation, Montana Area Office, Billings, April 2000.

[3] Cynthia Kordecki et al, *Lower Yellowstone Project, 1996 and 1997 Cultural Resources Inventory, Dawson and Richland Counties, Montana, and McKenzie County, North Dakota* (University of North Dakota Department of Anthropology, Grand Forks, ND, and Renewable Technologies Inc., Butte, MT for the U.S. Bureau of Reclamation, Montana Area Office, Billings, 2000), p. 5.1.

Water and Power Resources Service
1983 *Project Data: Lower Yellowstone Project*. Washington, D.C.: U.S. Department of the Interior, Water and Power Resources Service.