

# 2022 WATER DEVELOPMENT PROGRAM RECOMMENDATION

## AGRICULTURAL WATER PROJECTS

**Project Name:** Little Wind River Storage Study, Phase II

**Program:** Dam and Reservoir

**Project Type:** Multipurpose

**County:** Fremont

**Sponsor:** Eastern Shoshone/Northern Arapahoe Tribes

**WWDO Recommendation:** Level II, Phase II

**Proposed Budget:** \$150,000

### **Basis for the Funding Recommendation:**

The Tribes have requested additional funding to complete Level II, Phase II field work on the preferred reservoir site. Should the additional investigation on the site prove favorable, the project could be recommended for Level II, Phase III permitting and final design.

**Project Manager:** Jason Mead

## **I. PROJECT DESCRIPTION**

Irrigation shortages have long been documented in the Wind River Basin upstream of Boysen Reservoir. In a 1965 report, prepared by Bishop and Spurlock, it was concluded that the system hydrology was incapable of meeting the entire irrigation demand in the upper Wind River Basin (the Big Wind and Little Wind River drainages above Boysen Reservoir). These shortages could be offset by constructing dam and reservoir projects in both drainages that would store spring runoff which could then be used by irrigators in either the Little Wind and/or Big Wind River drainage. These shortages were reaffirmed by Short Elliot Hendrickson Inc. (SEH) in the "Upper Wind River Storage Project – Level I Study", which was prepared for the Wyoming Water Development Commission in 2001.

During the 2014 Budget Session, the Eastern Shoshone and Northern Arapaho Tribes (Sponsor) applied for, and received, funding to conduct a Level II, Phase I Storage Feasibility Study that would build on the 2001 Level I study. The Phase I study analyzed irrigation water shortages and water availability to store under a present day water right as well as alternatives for constructing new or enlarging existing dams and reservoirs to offset documented irrigation shortages. Constructing new, or enlarging existing storage, will require issuance of a permit to appropriate water from the Wyoming State Engineer's Office and must take into consideration the implications related to the Big Horn General Adjudication.

Building off of previously completed work and additional data collected under the study, approximately 40 different storage alternatives were analyzed against one another. Taking into consideration criteria such as hydrology, technical feasibility, environmental impacts, estimated costs, and Tribal concurrence, the alternatives were screened. Alternatives were ranked by score and top alternatives were analyzed in greater detail.

In summary, based on the Level II, Phase I investigation, it was concluded that seasonal irrigation water shortages in the Little Wind River watershed exist, additional water is available for a new storage appropriation, and storage alternatives are feasible. Further analysis was then recommended to refine project knowledge.

During the 2017 General Session, the Sponsor applied for, and received, funding to continue to analyze the feasibility of the development of additional surface water storage under a Level II, Phase II Study. The current Phase II analysis being conducted originally included the following key components:

- Hydrologic Model Refinement
- Alternatives Analysis Refinement
- Geological/Geotechnical Analysis and Site Visits
- Environmental and Aquatic Resources Investigation

- Cultural Resource Analysis
- Economic Analysis Refinement

However, much greater effort than anticipated was put into the hydrologic model refinement, as it is the foundation for the purpose and need for storage. As a result, field work associated with geological/geotechnical analysis, environmental and aquatic resources, and cultural resources had to be postponed until additional funding could be appropriated.

The overarching objective of the Phase II analysis is to continue to develop project knowledge by leveraging past and current work to develop a preferred alternative for recommendation for a Level II, Phase III (permitting and final design) funding request.

**1. Existing and Prior Legislation:**

<u>Project</u>	<u>Level</u>	<u>Chapter</u>	<u>Session</u>	<u>Account</u>	<u>Appropriation</u>	<u>Reversion Year</u>
Upper Wind River Storage	I	36	2000	III	\$ 200,000	2002
Little Wind River Storage, Phase I	II	74	2014	III	\$ 350,000	2017
Little Wind River Storage, Phase II	II	65	2017	III	\$ 475,000	2020

**2. Describe the location of the project:**

Little Wind River drainage in Fremont County, WY.

**3. Summarize the request:**

Additional funding to complete field work associated with geological/geotechnical analysis, environmental and aquatic resources, and cultural resources on the preferred Little Wind River storage site. The additional work could help confirm the feasibility of the site.

**4. Summarize the reasons for the request:**

The overarching objective of the Phase II analysis is to continue to develop project knowledge by leveraging past and current work to develop a preferred alternative for recommendation for a Level II, Phase III (permitting and final design) funding request.

**II. WWDC ELIGIBILITY CONSIDERATIONS**

1. Is the Sponsor a public entity? Tribe

A. If not, is the recommendation for a Level I study or Level I or II study for a dam and reservoir project?

N/A

2. Project Priority According to WWDO Criteria: Acct III - Priority 4: LII Feasibility Studies

(Use Attachment III of the operating criteria.)

3. Will the project serve at least 1,000 water righted acres? Yes

A. Number of Acres: The number of acres potentially served is dependent on the yield and capacity of the preferred storage project.

4. Is the sponsor eligible for funding from other state or federal programs? Yes

A. If so, what are they? The Tribes are eligible to receive funding from the Bureau of Indian Affairs.

5. Is the Sponsor currently served by a regionalized water supply system (specify)? Or will the Sponsor consider regional solutions to the purpose and needs of its water supply system?

N/A

6. Can the project be delayed or staged? Yes

A. Should it be? No

### III. PERTINENT INFORMATION

#### 1. Existing Water Supply System

##### A. Description of Direct Flow Supply

- (1) Direct Flow Diversion Right (CFS): N/A
- (2) Direct Flow Source (Name of River, Stream, etc.): Little Wind River and tributaries
- (3) Type of Diversion (Headgate, Pump, etc.): The majority of diversions in the Big and Little Wind drainages are gravity operated headgates.
- (4) Water Transmission System (Canal, Pipeline, etc.): The majority of conveyance systems within the drainages consist of open and unlined canals and ditches.

##### B. Description of Stored Water Supply

- (1) Name(s) of Storage Facility (Reservoir): Ray Lake and Washakie Reservoir
- (2) Location: Southeast of Fort Washakie and Southwest of Fort Washakie, respectively.
- (3) Amount of Stored Water Right (Acre-Feet): 6,980 acre-feet (note: There isn't a state issued water right for the facility.) Washakie Reservoir = 7,940 acre-feet.
- (4) Is any of the stored supply obtained from a federal facility? Yes
  - a. Percent of Total Supply from Federal Facility: 100%
  - b. Amount of Stored Supply from Federal Facility (Acre-Feet): 14,920 acre-feet
  - c. Name(s) of Federal Facility: Ray Lake and Washakie Reservoir

##### C. Description of Groundwater Supply

- (1) Number of Wells: N/A
- (2) Primary Supply Aquifer(s) or Formation(s): N/A
- (3) Total Average Production Yield of All Wells (GPM): N/A

##### D. Water Rights

- (1) For the water source supply (or supplies) described above, does the Sponsor possess valid and/or adjudicated water rights?

As part of the Big Horn General Adjudication, the Tribes were awarded a volumetric quantity of 499,862 acre-feet of water, with an 1868 priority date, subject to terms and conditions contained in a Judgment Decree issued September 23, 1992 by Judge Hartman of Washakie County District Court and in two Wyoming Supreme Court decisions reported in the Big Horn I and Big Horn III legal cases. The specific breakdown of the Tribes' award is as follows:

	<u>ACRES</u>	<u>ACRE-FEET/YEAR</u>
Historic	54,216	290,490
Future Projects	<u>53,760</u>	<u>209,372</u>
Total	107,976	499,862

##### E. System Capacity

- (1) Maximum Capacity of the Water Supply System (Acre-Feet per Day or CFS): N/A
- (2) Increased Capacity Needed (If Known) (Acre-Feet per Day or CFS): TBD

##### F. Water Usage

- (1) Estimate of Total Water Provided by the System Annually (Acre-Feet per Year): According to the average standard duty of water, as outlined in the Big Horn General Adjudication cases, the total system is capable of providing 290,490 acre-feet per year.

(2) Average Day Demand (Acre-Feet per Day or CFS): 1,899 acre-feet (based on standard duty of water for acres historically irrigated).

(3) Maximum Day Demand (Acre-Feet per Day or CFS): N/A

## 2. Existing Service Area and On-Farm Information

### A. Service Area Information

(1) How many total acres are in the district? There are 107,976 acres of water righted acres on the reservation including both historic uses and the futures award.

(2) How many acres are assessed? 40,468

(3) How many acres are irrigated? The tribes were awarded rights for 107,976 acres (including Futures projects) through the Big Horn Adjudication; however, it is unclear how many of those are currently under production.

(4) What is the annual water delivery assessed (acre-feet per acre)? The actual water delivery in acre-feet per acre is not known, but the duty of water for the Tribes' award for historical acreage is approximately 5.36 acre-feet/acre.

(5) How many individual land owners receive water? This figure is unclear due to the highly fractionated ownership of Tribal Allotted Lands.

### B. On-Farm Information

(1) What is the normal irrigation season (e.g., May 1 – Sept. 30)? May 1 – September 30

(2) What type(s) of on-farm irrigation water applications is used (e.g., center pivot, side roll, flood, etc.)? Surface irrigation is most common, but center-pivots, wheel-lines, and gated pipe are also utilized.

(3) Briefly describe the main crops and cropping patterns:

The agriculture in the area is similar to the region and is primarily involved in native and alfalfa hay production, and a smaller number of acres are devoted to producing some small grain and row crops.

(4) Describe the water measuring devices currently in use:

The Tribes use flumes to measure flows at major diversions.

(5) Percentage of Farm Turnouts with Measuring Devices: N/A

(6) Are water deliveries recorded? Water is measured to each project, including Ray Canal, Coolidge, Subagency, Johnstown, and Lefthand.

(7) Estimated System Water Losses (Percentage): Overall efficiency of the Wind River irrigation system is estimated at 40%

(8) What water conservation measures are employed by the Sponsor?

Various irrigation system modernization and rehabilitation projects are under way.

## 3. Financial Information

The Federal Government (BIA) operates the irrigation works in trust for the Tribes. Historically, funding for construction projects has been divided between the state and federal government. Funding for studies has been provided by the state.

### A. District Financing

(1) Is the assessment based on acres, acre-feet delivered, acre-feet of storage, or other (specify)?

The assessment is based on acres.

(2) How is voting authority delegated to water users (e.g., shares, individuals, number of acres, etc.)?

Water users in the Wind River Irrigation Project have no voting capability.

(3) What is the per-unit amount of the current assessment? \$25 per acre

(4) Is there is a basic service charge or first acre assessment in addition to assessments? If so, specify amount:

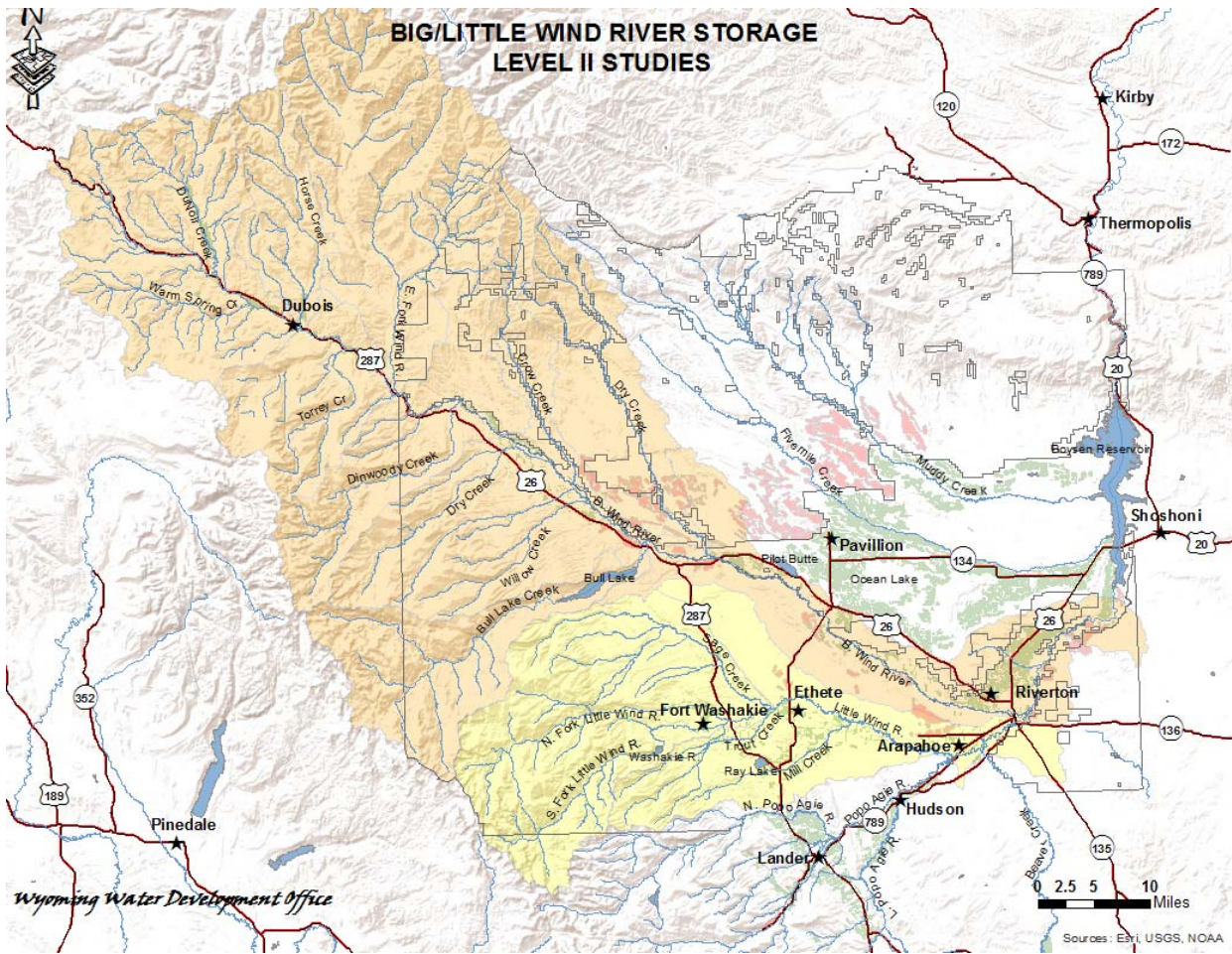
There are no additional charges that the Office is aware of.

(5) Is the operation of the water system self-supporting in terms of revenues offsetting costs for operation, maintenance, debt retirement, replacement funds, emergency funds, etc.?

The system is maintained by the BIA and is funded through a \$25/acre assessment. However, the irrigation works have degraded over time which required significant state and federal funding as evidenced in the ongoing rehabilitation effort.

a. If not, how is the difference subsidized?

Funding for future ongoing maintenance activities is still a concern.



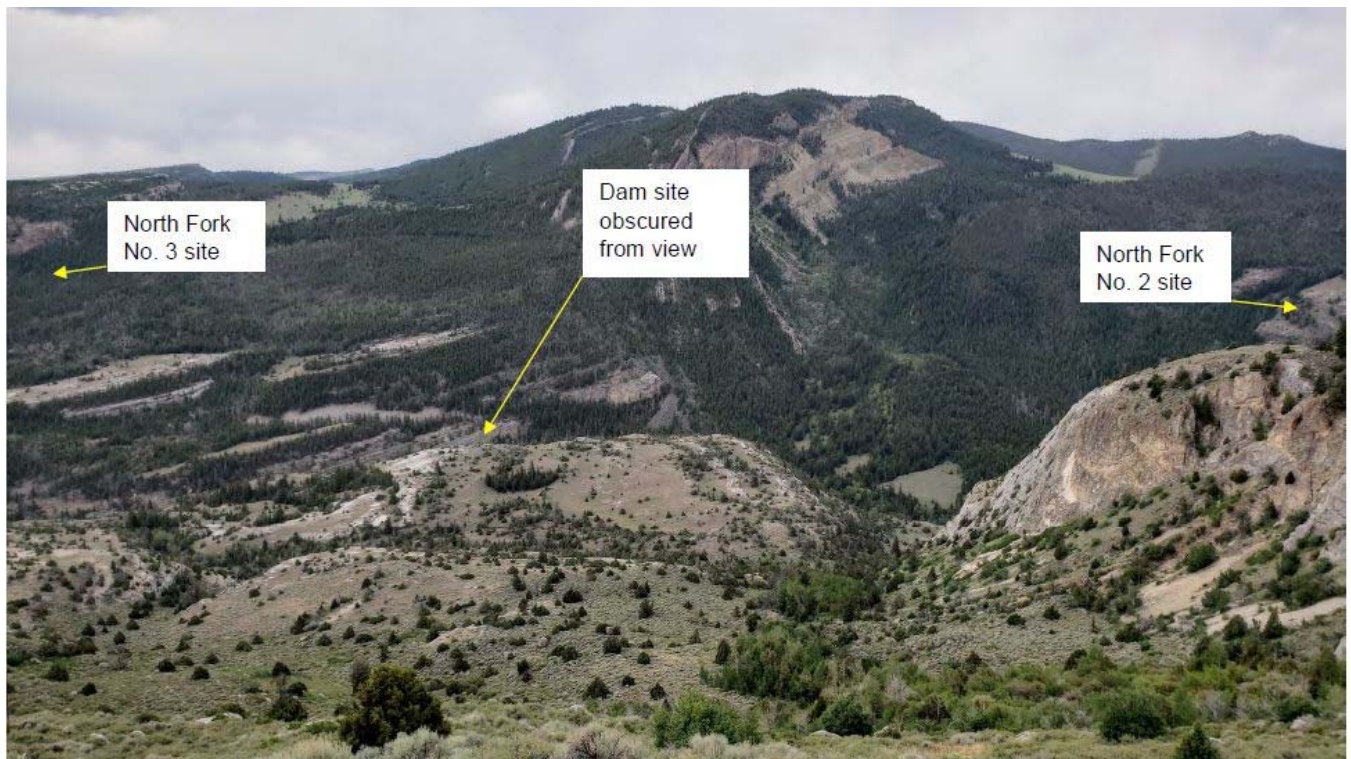
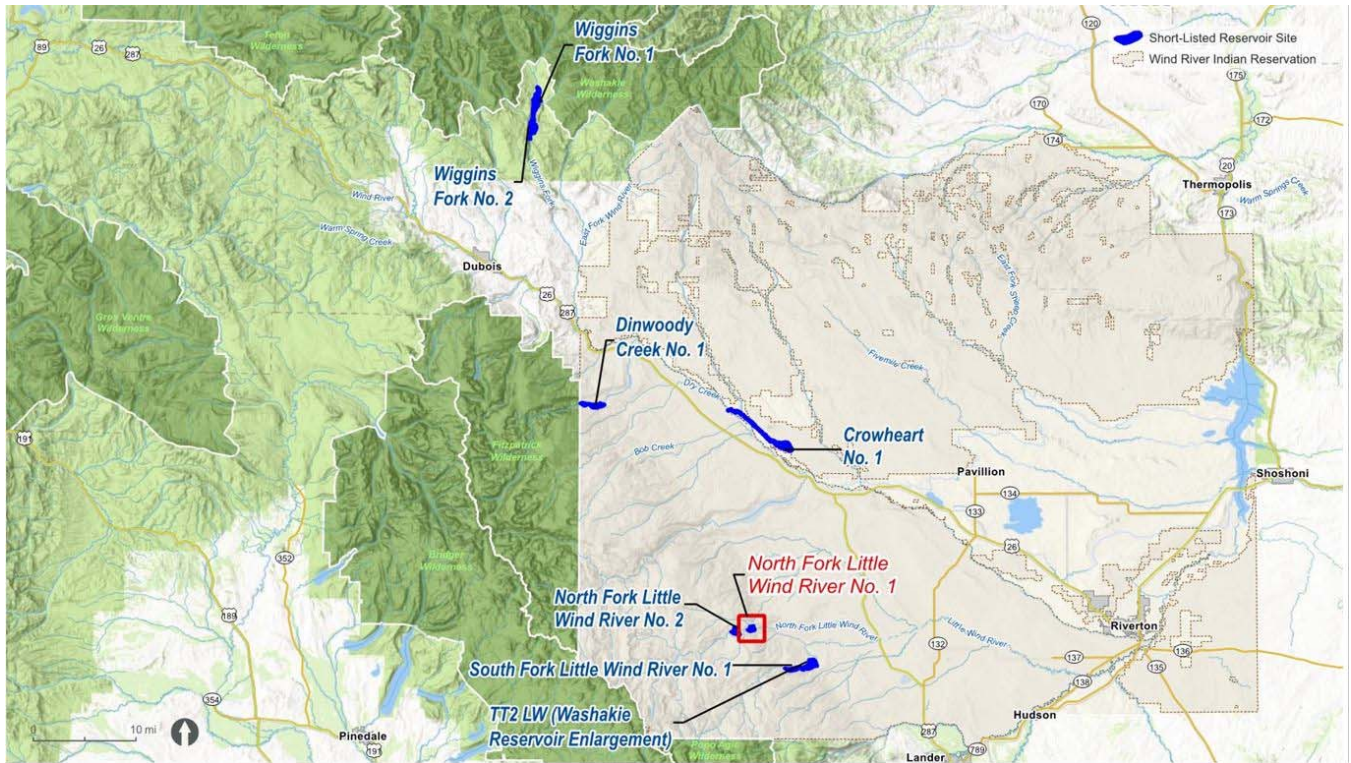


Photo 15. North Fork No. 1 site from St. Lawrence Ranger Station Road, looking south.