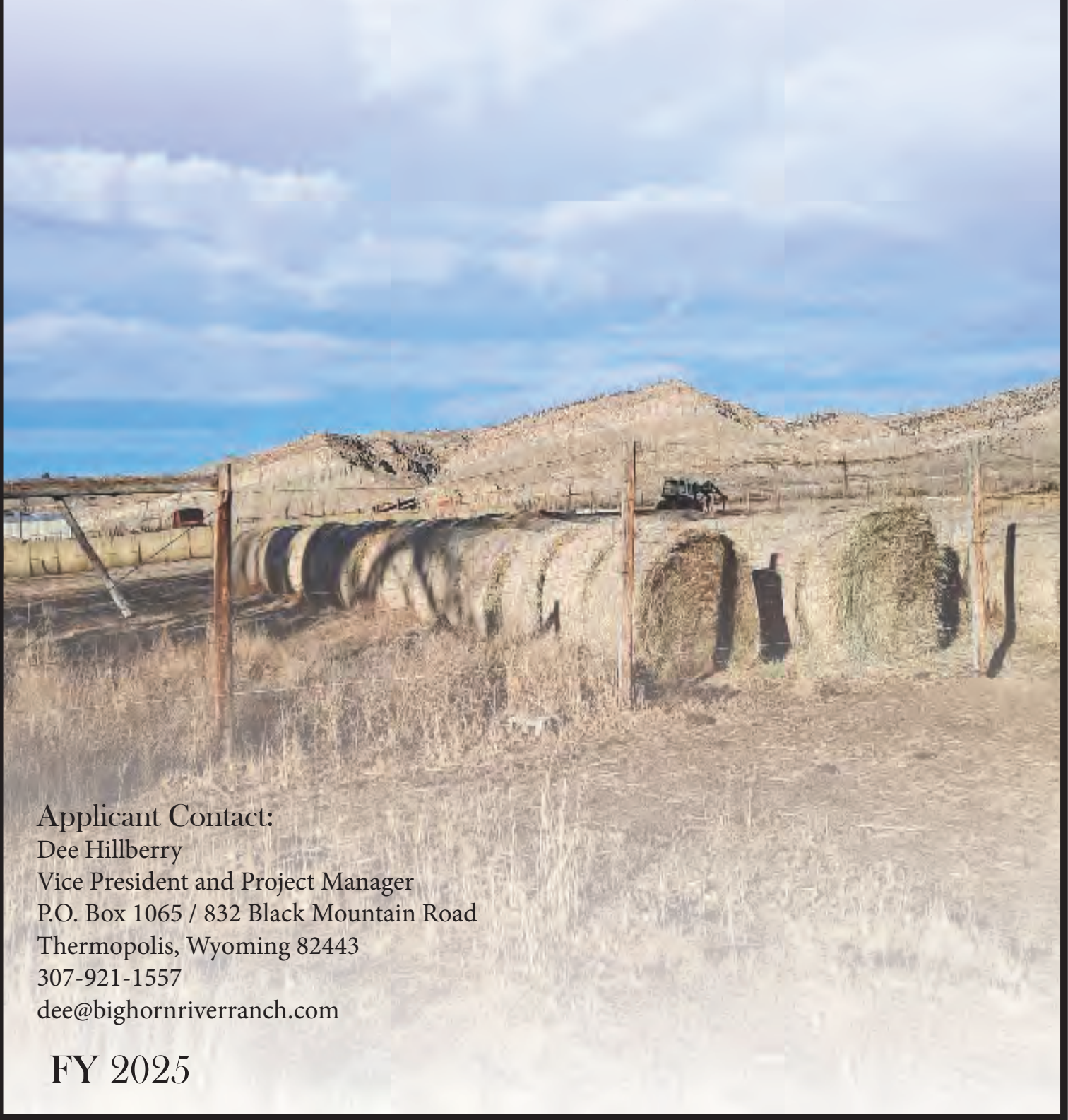




Bureau of Reclamation WaterSMART Program
Water and Energy Efficiency Grants for FY 2024 and 2025 - R24AS00052

Kirby Ditch Irrigation District

Kirby Ditch Lower Reach Piping Project - Phase II



Applicant Contact:

Dee Hillberry
Vice President and Project Manager
P.O. Box 1065 / 832 Black Mountain Road
Thermopolis, Wyoming 82443
307-921-1557
dee@bighornriverranch.com

FY 2025

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Technical Proposal and Evaluation Criteria

Executive Summary

Applicant Info

Date: November 13, 2024

Applicant Name: Kirby Ditch Irrigation District (KDID)

City, County, State: Thermopolis, Hot Springs County, Wyoming

Project Manager:

Dee Hillberry

Kirby Ditch Irrigation District

307-921-1557

dee@bighornriverranch.com

Applicant Category: Category A

Project Funding Request: \$1,912,500 *Total Project Cost:* \$3,825,000

Funding Group: Group II

Project Summary

A one-paragraph project summary that provides the location of the project, a brief description of the work that will be carried out, any partners involved, expected benefits, and how those benefits relate to the water management issues you plan to address.

Over many years, Kirby Ditch Irrigation District (KDID) has worked to improve and upgrade its system to reduce water losses, increase system efficiency, and provide reliable irrigation water to large acreage users. The Kirby Ditch Lower Reach Piping Project – Phase II project will convert approximately 1.3 miles (6,870 feet and completing 2.56 miles) of open earth canal in the lower reach of the Kirby Ditch to a buried PVC pipeline. Water is lost throughout this section of the canal due to seepage, evapotranspiration, and spills. Once completed, significant water losses will be conserved, **saving approximately 1,095 acre-feet of water each year**. This improvement will allow for the implementation of measurement devices at each turnout to more accurately measure diversion rates. Additionally, as part of this project, three groundwater solar wells will be implemented to water livestock, improve on-farm efficiencies, and offset greenhouse gas emissions. The wells exist. However, the pumping energy required will transition from gas generators to renewable solar energy. In addition, a solar panel array will be installed to power a screen brush motor at the inlet screening device prior to water entering the pipeline. In total, this project will **generate approximately 17,770 kWh annually of renewable solar energy**. It is anticipated that water savings will benefit the Big Horn River and the Boysen Reservoir (A Reclamation facility), as well as ensure reliable water delivery in the lower reaches of the ditch. This pipeline will deliver irrigation water to seven water users (10 deliveries), impacting up to 870 acres of agriculture and livestock. KDID is located about 10 miles north of Thermopolis, Wyoming. The District has had support from the Wyoming Water Development Commission (WWDC) through State grant funding for past projects. Nearly 50% match funding has previously been committed by WWDC for this project and is currently available for use.

Length of Time and Estimated Completion Date

*State the length of time and estimated completion date for the proposed project. **Note: proposed projects should not have an estimated construction start date that is prior to December 31, 2024.***

Assuming a notice of funding award and agreement finalization occurs in October 2025, KDID anticipates a construction completion date of no later than March 31, 2026, and final reports and project closeout no later than December 31, 2026, which falls within the funding opportunity requirements. Significant design & cultural compliance work has already been completed for this project, and it is estimated to be at approximately 80 percent design. Environmental and cultural assessment has already been completed, as it was originally part of a larger project on this same stretch of ditch, though an update may be required. The Project Manual and Bid Documents will be finalized in October 2025, allowing for bidding and contract award in November 2025. Mobilization and construction will occur from December 2025 through March 2026. Final reports and project closeout wrap-up in December 2026 after a full season of operation.

Federal Facility

Whether or not the project is located on a Federal facility.

This project is not directly located on a federal facility. However, KDID's main diversion out of the Big Horn River is located approximately 24 miles downstream of Boysen Reservoir, which is a federal facility operated by the United States Bureau of Reclamation (USBR). KDID can obtain a temporary contract (if needed) from the USBR to purchase water out of the reservoir. This option is utilized when natural flows are insufficient to supply water for which the District has water rights. The ditch directly benefits from a federal facility.

Project Location

Provide detailed information on the proposed project location or project area including a map showing the specific geographic location. For example, {project name} is located in {state and county} approximately {distance} miles {direction, e.g., northeast} of {nearest town}. The project latitude is {###°##'N} and longitude is {###°##'W}.

The Kirby Ditch Lower Reach Piping Project – Phase II is in Hot Springs County, Wyoming, approximately 10 miles northeast of Thermopolis. The project start point latitude is 43°46'6.42"N, and the longitude is 108°08'19.94" W. See **Attachment A – Project Location and Detail Map**.

Project Description

Provide a more comprehensive description of the technical aspects of your project, including the work to be accomplished and the approach to complete the work. This description should provide detailed information about the project including materials and equipment and the work to be conducted to complete the project. This section provides an opportunity for the applicant to provide a clear description of the technical nature of the project and to address any aspect of the project that reviewers may need additional information to understand.

Background

The Kirby Ditch is owned and operated by the Kirby Ditch Irrigation District (KDID). Water is supplied through a diversion on the Big Horn River, approximately one mile north of Thermopolis, Wyoming. The ditch was originally constructed in 1904 and is approximately 10 miles long. Water for the ditch is diverted from the nearby Big Horn

River. While the ditch has primarily been an unlined earthen ditch, over several years, portions have been piped, and other improvements have been made to reduce seepage and ensure the continued operation of critical structural components. KDID has historically irrigated 3,200 acres of farm and ranch land.

This project was originally intended to be completed as one large project. However, due to increased costs, the District chose to divide the project into two phases in order to improve the feasibility of completion. This has equipped KDID with nearly completed planning and design documents for this project, as a lot of items were taken care of during Phase I. This includes completed environmental and cultural assessments. This project will complete Phase II of that project. Phase I has already been completed.

Water reliability at the lower reach of Kirby Ditch has been an ongoing problem for lower reach water users. Without adequate "carrier" water in the ditch, irrigators are rarely delivered the quantity of water they require. Conversion to a pipe system will reduce losses along 2.56 miles of the ditch and support these water users in being able to run a successful operation without concern. Not only will the seepage losses be eliminated, but less water will be diverted as the "carrier" water will no longer be needed to reach the bottom end where a large portion of irrigable lands are located. Less water waste is especially important during periods of limited water supplies and drought conditions, especially in one of the hotter/drier climates that exist in Wyoming. During times of limited water, KDID must supplement its supply with purchases of water stored in Boysen Reservoir from the Bureau of Reclamation. This need will be reduced. Less water diverted means less expense for KDID and also supports a more resilient and reliable water supply for all in the region.

Project

This proposed project will replace the open ditch of the lower reach of the Kirby Ditch with a Polyvinyl Chloride (PVC) pipeline. It will deliver water to landowners at the end of the canal, impacting 870 acres, and allow up to 25 cfs to be delivered via the pipeline. Once Phase II is completed, approximately 2.56 miles (including Phase I) of open ditch will have been converted. This Phase will install 7,300 feet of pipe (thirty-six, thirty, twenty-four, and fifteen-inch), ten field turnout assemblies and associated appurtenance, and fittings. The pipeline will then be buried with a minimum of 36 inches of cover to a grade specified by the final design. Air-vac valves, drains, fittings, and all other appurtenances will be installed at predetermined locations to ensure proper operation of the pipeline.

A screen and spill structure is another element of this project. It will be installed at the beginning of the pipeline (Enderly Spill) and serves two purposes. The first is to eliminate fish entrainment in the lower reaches of the ditch. The screen will block fish from entering this portion of the ditch and return them to the river through bypass flows. Secondly, the screen will sufficiently clean the water, facilitating conversion from the existing flood irrigation application methods to sprinklers. This structure will use a cone screening device to meet these needs. The screen is equipped with a motor-powered brush that runs the entirety of the irrigation season (190 days/24 hours per day). Solar panels will be used to power and operate the motorized brush.

Measurement devices will be added at each turnout, allowing KDID to accurately measure diversion rates. At this time, none of the turnouts are measured.

Through implementing a pressurized pipeline and measurement devices, landowners will have the opportunity to modernize their operations.

The design for this project is estimated to be 80 percent completed. As mentioned, KDID has available funds, totaling to nearly 50 percent of project costs. These funds are in the form of a grant from the Wyoming Water Development Commission and are to be used for this specific pipeline project.

This project will have an additional component implementing the conversion to three solar ground-water wells in collaboration with two KDID water users. Many farmers utilize wells on their agricultural lands to supply water for livestock purposes. These wells require submersible water pumps (15 gpm) to access this water source. Gas generators are currently being used to operate these pumps and will be replaced by solar stations. This improvement will provide several benefits and efficiencies to these individuals. Gasoline will no longer be required for the generators to operate the pumps to ensure that these animals have access to a water source. Another benefit includes the reduction in miles traveled to refuel the generators, saving farmers both time and money, and reducing emissions. Where this has already been implemented, this set up provides stock water for 230 cow/calf pairs year-round. This project will support the solar transition of three wells. See *Figure 1: Project Location and Detail Map*.

See **Attachment B – Project Plans/Specifications**

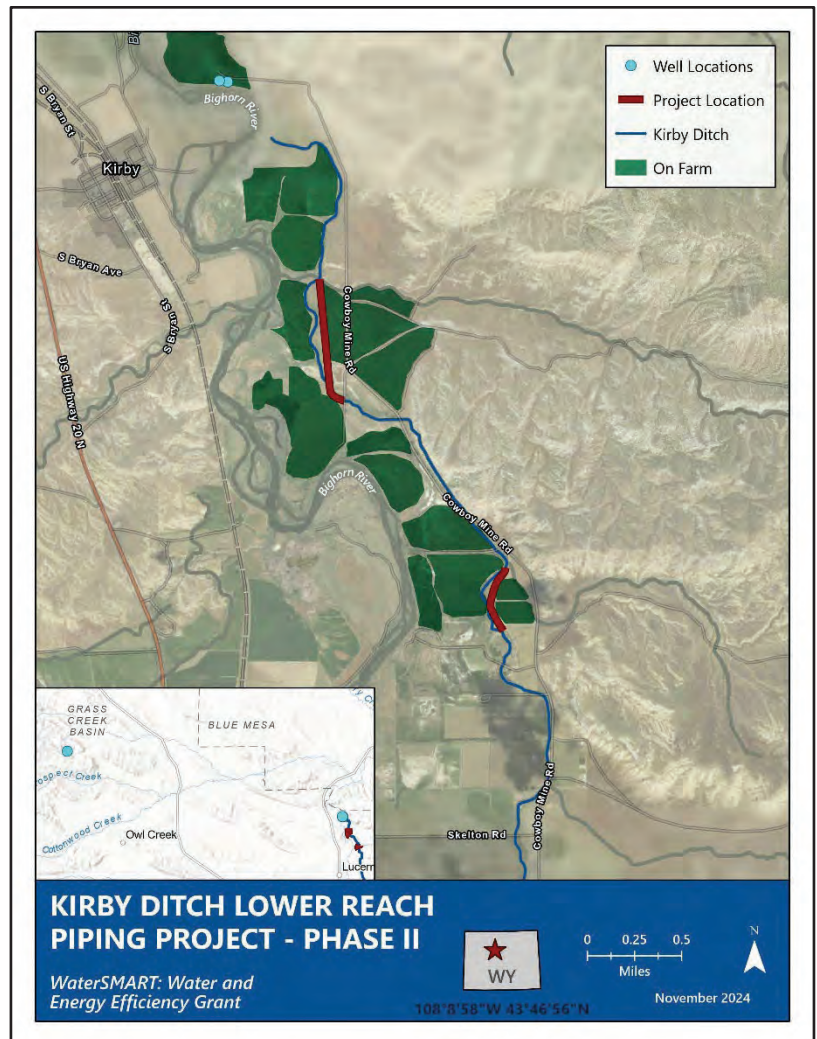


Figure 1: Project Location and Detail Map

Evaluation Criteria

Evaluation Criterion A – Quantifiable Water Savings (25 Points)

- *Describe the amount of estimated water savings: For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project.*

This project is anticipated to **save 1,095 acre-feet of water each year** as a direct result of piping a portion of what is currently an open ditch and by eliminating the spill at Freeman Draw.

- *Describe current losses: Please explain where the water that will be conserved is currently going and how it is being used. Consider the following:*
 - o *Explain where current losses are going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground)?*

As is common with open ditches, water is being lost through seepage and evapotranspiration. Additionally, there are two areas in the project area where spills occur. These areas are the Enderly Spill (pipeline inlet) and the Freeman Draw spill at the lower end. As a result of the project, spill flows at Enderly Spill are expected to be reduced, while spill flows at Freeman Draw will be eliminated. Once implemented, this project will eliminate losses from seepage, evaporation, and spills, allowing this resource to be utilized as intended.

- o *If known, please explain how current losses are being used. For example, are current losses returning to the system for use by others? Are current losses entering an impaired groundwater table becoming unsuitable for future use?*

Current seepage and evapotranspiration losses either enter the groundwater table or are lost to the atmosphere. They do not return to the system and are not available for use. Water that returns to groundwater is assumed to return to the river eventually. It is difficult to determine to what extent and how quickly this water ends up as surface water. The water that is spilled at both spillways does make it back to the Big Horn River. However, with the Freeman Draw spill eliminated, more water is left stored higher in the system with directly benefits the Boysen Reservoir, a Reclamation facility.

- o *Are there any known benefits associated with where the current losses are going? For example, is seepage water providing additional habitat for fish or animal species?*

There are no known ecological benefits related to the water loss within the project area. This pipeline project will conserve water resources, putting them toward their intended use, and support sustainable agricultural processes.

- *Describe the support/documentation of estimated water savings. Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations.*

The conveyance loss estimates are taken from the Final Report for the Kirby Ditch Conservation Program Level II study completed by Anderson Consulting Engineers, Inc. for the Wyoming Water Development Commission in 2010. In addition, to open ditch conveyance losses, operation spill water at Freeman Draw will be eliminated and therefore conserved as water savings post-project. The methodology used is detailed in the report and summarized below. See **Attachment C – Level II Study (Anderson Consulting)**

The ditch was separated into various reaches based on seepage indicators such as the presence of vegetation, input from ditch representatives, changes in the vegetation along the ditch, presence of fractured and jointed bedrock in the ditch bottom and banks, and review of color infrared aerial photographs. The types and quantity of farm turnouts and gaging locations were then evaluated, and eight seepage reaches were selected for investigation. The lowest reach investigated in the system is representative of the project area. The uppermost portion of Phase II is within this reach. The conveyance loss is calculated by subtracting the outflow at the bottom of the reach from the inflows (such as ditch flow, precipitation, and surface runoff). As many inflow variables as possible were eliminated prior to measuring the water in the ditch. Results for all the measured reaches varied from nearly 0 percent (or slight gains) to 12.5 percent. Reach 8 (project area) was estimated at 5.7 percent.

Kirby Ditch has a yearly usage of 17,681 acre-feet, which equates to 1,008 acre-feet of conveyance loss per year for the entire system. For the reach within Phases I and II, the losses are approximately **340 acre-feet** based on an average flow rate of 16 cfs through the irrigation season. Ditch seepage losses were calculated using a water budget approach. This approach relied on measuring the ditch discharge upstream and downstream of the reach.

Operational spills at the tail-end wasteway were 1,520 acre-feet for the 2008 irrigation season (approximately 4 cfs over the 190-day irrigation season, Anderson Study). This spill, along with Freeman Draw, operate identically. Spill flows range anywhere from 2-5 cfs depending on storm events, types of crops being raised, etc. By nature, Freeman Draw is unaffected due to changes in operations, making it a continuous spill throughout the entire season. 2 cfs spilled over the course of an irrigation season (190 days) equates to approximately **755 acre-feet** of water savings.

- *Please address the following questions according to the type of infrastructure improvement you are proposing for funding:*

(1) Canal Lining/Piping

- *How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.*

The water savings will be equal to the amount of water that is currently lost through seepage and evaporation. As previously described, the annual water savings is estimated to be 1,095 acre-feet. The open canal will be replaced with pressure-rated PVC, which is common in most municipal treated water systems. These materials were chosen because they reduce leakage to nearly zero. It is assumed the water savings will be nearly 100% of the current estimated water loss.

The secondary benefit of piping irrigation laterals is that it increases the efficiency of the operation. The spill at Freeman Draw will no longer be used except to drain the pipeline and continuous spilling will be eliminated. In addition, the pipeline will have measurement at every turnout, resulting in the ability to more closely monitor water use and improve the information available to the operators to make decisions.

- *How have average annual canal seepage losses been determined? Have ponding and/or inflow/outflow tests been conducted to determine seepage rates under varying conditions? If so, please provide detailed descriptions of testing methods and all results. If not, please provide an explanation of the method(s) used to calculate seepage losses. All estimates should be supported with multiple sets of data/measurements from representative sections of canals.*

Anderson Engineering conducted a seepage study on 8 reaches of Kirby Ditch in late-season 2007 and mid-season 2008. Results of the seepage study shed light on the potential location and magnitude of those losses. Ditch seepage losses within each reach were estimated using a water budget approach. The approach relies on measuring the ditch discharge upstream and downstream of the reach suspected of losing water to seepage. The purpose of the seepage study was to identify and evaluate areas of significant water loss. Ditch representatives indicated they suspected several specific reaches that lost water due to seepage. This task of the project consisted of the development of a water budget to evaluate the location and magnitude of those losses. Results of the seepage study shed light on potential improvement measures (i.e., lining or pipeline projects) as well as becoming a component of subsequent operational efficiency analyses. The following is an excerpt from that study (in blue text). See **Attachment C – Level II Study (Anderson Consulting)**, sections/pages 3.1 – 3.4.

The Kirby Ditch was segmented into specific reaches based upon various seepage indicators. Seepage indicators used to determine the reaches included:

- *Input from ditch representatives.*
- *The presence of phreatic vegetation and wetlands along the ditches.*
- *Changes in the health and vigor of existing vegetation along the ditches.*
- *Presence of fractured and jointed bedrock in ditch beds and banks. and*
- *Review of color infrared aerial photographs (2003).*

Other factors which entered into the process included the quantity and type of farm turnouts (FTO's) and gaging locations which facilitate accuracy and repeatability. Given this information, eight seepage reaches were initially selected for investigation (Figure 6).

It must be recognized that all ditches lose water to seepage to a certain degree. The purpose of the seepage investigation was to identify locations where seepage appears to be significant and where tangible benefits could be gained if seepage losses were mitigated. Ditch seepage losses (and gains) within each reach were estimated using a water budget approach. This approach relies on measuring the ditch discharge upstream and downstream of the reach suspected of losing water to seepage. A sketch of the water budget approach concept is presented in Figure 7.

Reach inflow components include ditch inflow at the upstream end of a reach, surface runoff, and precipitation. Reach outflow components include ditch outflow at the downstream end of reach, diversions at farm turnouts, operational waste, evaporation, and seepage. Each of the components of the water budget was estimated as follows:

- *Reach Inflow/Outflow:* Reach inflow and outflow can be directly measured using standard stream gaging methods described by the United States Geological Survey (Buchanon, T.J., and W.P. Somers, 1969).
- *Precipitation:* All seepage investigation field work took place during dry periods. There was no precipitation to measure.
- *Surface Runoff:* Return flows from upslope irrigation or surface inflows are noted. Although they are more difficult and often impossible to measure directly, observation of their locations allowed subjective corrections to the water budget equation. Where quantification of irrigation returns was possible, they were measured. No surface runoff was noted during the field investigation.
- *Diversions:* Each farm turnout within a reach was observed to determine whether it was open or closed. At those which were open, the amount diverted was estimated in a similar manner to reach inflow/outflow measurement. Farm ditch cross-sectional area and velocity were measured, and the diversion calculated. At those farm turnouts utilizing pumps, pump data were observed or obtained from ditch representatives and diversion amounts tabulated. A limited number of pump turnouts were in operation during the study.
- *Operational Waste:* Amounts spilled at wasteways were estimated based upon the depth of water flowing over the check boards and the width of the structure. Standard weir equations were utilized.
- *Evaporation:* Based upon pan evaporation data collected at Boysen Dam (the nearest site for which data are available) and the average water surface area within the ditch, evaporation was estimated to be approximately 40 acre-feet per year (April through October or 214 days). This value translates to approximately 0.18 acre-feet per day or less than 0.1 cfs. Consequently, evaporative losses were deemed insignificant.

Seepage losses are the only component of the water budget which cannot be measured or estimated directly. The loss was estimated for each reach as the difference between all inflows and outflows. To reduce the likelihood of an erroneous measurement or inaccuracies in the data obtained during this task, several steps were taken and are summarized below:

- *Discharge measurements were made at each seepage site by first gaging the upstream limit of the reach followed by gaging at the downstream limit. This convention was employed in an effort to measure the same "bucket of water" as it passes each location. Consequently, potential errors related to changes in diversions and turnouts are reduced.*
- *Each measurement was repeated to increase reliability of the data.*
- *All cross sections were gaged by wading the ditch.*
- *Each reach was walked prior to gaging to observe the presence of ditch inflow (surface runoff, springs, etc.) and/or outflow (turnouts, wasteways, etc.).*
- *What are the expected post-project seepage/leakage losses and how were these estimates determined (e.g., can data specific to the type of material being used in the project be provided)?*

Seepage loss will be eliminated as the ditch will be replaced with PVC pipe. These materials are designed and tested to eliminate nearly 100% of leakage. The post-project losses are expected to be zero.

- *What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and for each section of canal included in the project?*

There will be 2.56 miles of ditch replaced with PVC pipe. The total conservation amount is calculated to be 340 acre-feet per irrigation season, resulting in 134 acre-feet per mile each year.

- *How will actual canal loss seepage reductions be verified?*

To verify a reduction in water loss, the flow will be measured at the inlet and outlet of the pipeline while considering any farm turnouts in use at that time. Any losses of the magnitudes seen in the water loss study will be obvious with the pressures in the pipeline expected as they will surface and be visible above ground. Once the pipeline is installed and pressure tested, the loss will be negligible.

- *Include a detailed description of the materials being used.*

Final Design Plans require that the ditch be replaced with PVC pipe ranging in size from 36-inches to 15-inches for the mainline. A concrete inlet screening/check/spill structure and concrete outlet structure will be incorporated into the system, along with air-vac valves, drains, and other appurtenances as needed. The pipe will be SDR 51 PIP and C900 (80 psi) PVC. Turnouts will consist of a combination of AWWA C900 pipe, resilient seated gate valves, and electromagnetic flow meters.

(3) Irrigation Flow Measurement

Irrigation flow measurement improvements can provide water savings when improved measurement accuracy results in reduced spills and over-deliveries to irrigators. Applicants proposing municipal metering projects should address:

- *How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.*

The annual water savings estimates were determined based on the seepage loss and spill measurements from the Anderson Consulting Engineers, Inc. study referenced above. Based on replacing the open ditch with a pipeline, 100% of the losses estimated will be saved. The improvements in operation due to increased control and management capabilities realized with a pipeline have not been factored into estimated savings. There will be significant water savings gained through more efficient operations. However, they are not counted towards the estimated savings. These savings are discussed within the On-Farm Irrigation Improvement section.

- *Have current operational losses been determined? If water savings are based on a reduction of spills, please provide support for the amount of water currently being lost to spills.*

Currently, there are two operational spills within the stretch of the proposed improvements, one at each end. Tighter control of the flow rates at the diversions will reduce the amount of water required to be spilled. In addition, under normal conditions, operational spills at the lower Freeman Draw spill will be eliminated. Some of this spilled water will likely be staged to spill at the upstream spill, but ultimately the District will likely turn the main diversion down with this spill eliminated. Post-project completion, 2 cfs (755 acre-feet) will be saved as a result of eliminating the Freeman Draw Spillway (described above).

- *Are flows currently measured at proposed sites and if so, what is the accuracy of existing devices? How has the existing measurement accuracy been established?*

The current system does not have any measurement structures in place. Measurements taken have been by spot measurements in the open channel.

- *Provide detailed descriptions of all proposed flow measurement devices, including accuracy and the basis for the accuracy.*

Improvements have been designed to receive Electromagnetic Flow Meters at most farm delivery locations. This meter specifies an accuracy of $\pm 0.40\%$ based on Faraday's Law of Induction and can measure potable, reclaimed, and groundwater. No outside power is required as they are equipped with internal lithium batteries and a life span of up to 20 years.

- *Will annual farm delivery volumes be reduced by more efficient and timely deliveries? If so, how has this reduction been estimated?*

Based on the design of a pressure pipeline, delivery times will be almost instantaneous to the users. Their flows will be regulated by KDID personnel to ensure proper adjudications, which in turn limits waste. In addition, inadvertent diversions, which commonly occur when the ditch flows fluctuate, will no longer be possible post-project. While it is expected that water savings in this aspect will also be significant, no credit was taken for these savings.

- *How will actual water savings be verified upon completion of the project?*

Water savings will be easily quantifiable when comparing record diversion flows to post-project-completion diversion flows.

Evaluation Criterion B – Renewable Energy (20 Points)

Subcriterion No. B.1: Implementing Renewable Energy Projects Related to Water Management and Delivery

Describe the amount of energy capacity. For projects that implement renewable energy systems, state the estimated amount of capacity (in kilowatts) of the system. Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate.

This project will implement three groundwater solar well setups to operate pumps that provide stock water. Wells are existing and will have their own solar station capable of producing, **individually, 20 kWh per day**, and **totaling 60 kWh per day** for the three well setups. Over the course of the year, these solar stations/wells will produce approximately **16,425 kWh** (assuming 75% efficiency).

$$20 \text{ kWh/station} * 3 \text{ stations} = 60 \text{ kWh capacity/day}$$

In addition to the renewable energy generation mentioned above, there will also be a screening structure at the top end (Enderly Spill) prior to water entering in the pipeline. It is proposed to utilize a cone screening device to screen sediment, aquatic growth and other debris from entering the pipeline. The screen is equipped with a motor-powered brush that runs the entirety of the irrigation season (190 days/24 hours per day). Instead of electrical power, this screen will be supplied via a solar array and battery storage system. The array is capable of producing 0.82 kW of power, totaling **5 kW per day**, and amounting to **1,345 kWh** per year (assuming peak sun hours for the state of Wyoming is 6 hours per day and 75% system efficiency).

$$0.82 \text{ kW/solar array} * 6 \text{ hours/day} = 5 \text{ kWh capacity/day}$$

Renewable energy generated from the solar wells (solar stations) and screening structure (solar array) will total **65 kWh per day**.

$$60 \text{ kWh} + 5 \text{ kWh} = 65 \text{ kWh capacity}$$

Describe the amount of energy generated. For projects that implement renewable energy systems, state the estimated amount of energy that the system will generate (in kilowatt hours per year). Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate. Please explain how the power generated as a result of this project will be used, including any existing or planned agreements and infrastructure.

The project will install three solar stations (groundwater wells) and one solar array (screening structure). Combined, it is anticipated to generate **65 kWh/day**. Wyoming has peak sun hours between 5.50 and 6.81 hours per day, with an average of 6. The solar stations will be operated year-round (365 days), and the solar array will be used during the irrigation season but will produce and store power throughout the year. System efficiency is estimated at 75%. With these assumptions, it is estimated that **17,770 kWh per year** of solar renewable energy will be generated. This energy will be used to power well pumps and a screening structure.

Solar station: $60 \text{ kWh (over three stations)} * 0.75 * 365 \text{ days} = 16,425 \text{ kWh per year}$

Solar array: $0.82 \text{ kW} * 0.75 * 6 \text{ hrs/day} * 365 \text{ days} = 1,345 \text{ kWh per year}$

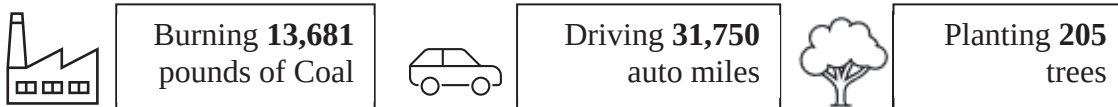
Total: $16,425 \text{ kWh} + 1,345 \text{ kWh} = 17,770 \text{ kWh annually}$

Describe any other benefits of the renewable energy project: Please describe and provide sufficient detail on any additional benefits expected to result from the renewable energy project, including:

- How the system will combat/offset the impacts of climate change, including an expected reduction in greenhouse gas emissions

The proposed solar improvements provide significant environmental, economic, and social benefits beyond powering wells/water pumps and a screening structure. Its ability to generate clean energy is estimated to **offset approximately 27,368 pounds of Carbon Dioxide (CO₂)** each year, and 605,425 pounds of CO₂ over the estimated life of these solar systems. The EPA's Greenhouse Gas Equivalencies Calculator shows that this offset is equivalent to –

Per year:



Over the useful life of 25 years:



- *Expected environmental benefits of the renewable energy system*

Climate change poses one of the most pressing environmental challenges of our time. To address this crisis, we must both slow its progression and adapt to its inevitable impacts. Investing in renewable energy sources can significantly benefit communities and the planet. Even incremental changes, when sustained over time, can contribute to a healthier environment. Reducing greenhouse gas emissions is expected to benefit the environment by lowering temperatures. This can significantly impact the severity of drought conditions, the level of snowpack, and agricultural yield.

- *Any expected reduction in the use of energy currently supplied through a Reclamation project*

Reclamation generates hydropower at Boysen Dam through releases from Boysen Reservoir. While the project is expected to reduce the need to purchase water to supplement irrigation flows for KDID water users, Boysen Reservoir will likely empty its active storage annually. It is not anticipated that the proposed project will impact hydropower at Boysen Dam.

- *Anticipated benefits to other sectors/entities*

Another benefit that will be realized is the reduction of employee hours required to perform ditch cleaning and weed/vegetation maintenance (via chemicals or burning) along the ditch that will be piped. These efforts demand significant manpower. Once completed, the saved hours can be better allocated towards making operational and efficiency improvements along the system.

- *Expected water needs, if any, of the system*

No additional water will be required to operate the solar systems proposed in Phase II.

Subcriterion No. B.2: Increasing Energy Efficiency in Water Management

Describe any energy efficiencies that are expected to result from implementation of the water conservation or water efficiency project (e.g., reduced pumping).

- *If quantifiable energy savings is expected to result from the project, please provide sufficient details and supporting calculations. If quantifying energy savings, please state the estimated amount in kilowatt hours per year.*

Quantifiable energy savings are realized at the bottom end of the system, where most of the large-scale farming occurs. This is due to positive pipe pressure through the conservation of energy (elevation drop) within the proposed closed pressure system. The table below is an estimated summary of the energy savings due to the reduction of pumping power required.

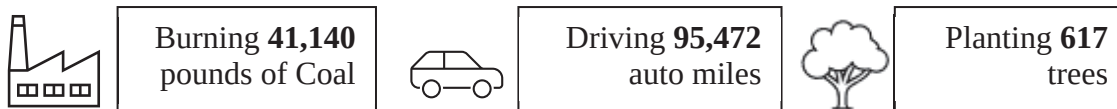
Turnout	Acres	Pipeline Pressure (psi, Post Project)	Pressure (FT)	Power Savings (kW)	kWh (Savings/Season)
Service Point #8	120	8.30	19.16	3.97	6,851
Service Point #9	25	9.70	22.40	0.97	1,668
Service Point #10	140	13.90	32.09	7.75	13,386
Service Point #13-14	140	9.87	22.78	5.50	9,501
Service Point End	350	9.15	21.13	12.75	22,029
Total Savings					53,435

Flowrate is based on the number of water right acreage as well as State of Wyoming water law (1 cfs/70 ac). The time (hours) required is based on the flowrate, acreage, and depth (consumptive irrigation requirement) relative to the locally grown crops.

- *How will the energy efficiency improvement combat/offset the impacts of climate change, including an expected reduction in greenhouse gas emissions.*

The benefits of these improvements will be incremental in combating/offsetting the impacts of climate change. Eliminating the maintenance requirements of an open ditch will overall make the system more efficient. Track hoes and heavy equipment required for ditch cleaning will not be required, chemicals for weed control will no longer be used, and the need to burn vegetation periodically will not be necessary. These activities can demand significant manpower and the burning of fossil fuels. Additionally, the reduction in pumping has significant energy savings.

As noted in the table above, there is an estimated energy savings of **53,435 kWh** due to reduced pumping as a result of this project. These savings will offset approximately **82,297 pounds of CO₂ per irrigation season** (EPA – Greenhouse Gas Equivalencies Calculator). Hot Springs County is directly experiencing the impacts of climate change. Temperatures in Wyoming have risen by 2.5 degrees, impacting snowpack and streamflow and increasing the risk of wildfire. Drought has been a threat for many years. Decreasing the amount of greenhouse gasses produced positively contributes to local and regional efforts to combat climate change. Offsetting **82,297** pounds of CO₂ is equivalent to, per year:



- *If the project will result in reduced pumping, please describe the current pumping requirements and the types of pumps (e.g., size) currently being used. How would the proposed project impact the current pumping requirements and energy usage?*

As discussed above, the proposed project will result in a reduction of pumping requirements, directly translating to overall energy savings. Benefits in pumping costs will also be realized through greatly reduced labor in maintaining screens ahead of individual pumps. Once the project is complete, the screening will take place at the inlet pipe, eliminating the need for each farmer to have a separate screen at each turnout that needs to be maintained. It will also eliminate the possibility of weeds, debris, etc., that enter the ditch during windstorms and stormwater runoff.

- *Please indicate whether your energy savings estimate originates from the point of diversion or whether the estimate is based upon an alternate site of origin.*

Yes, the energy savings will originate from the point of diversion (Enderly Spill) for this project. Approximately 27 vertical feet of elevation change are gained from the point of diversion to the delivery point of the last user on this ditch. The majority of the 27 feet will be conserved within the pressure pipeline resulting from this project.

- Does the calculation include any energy required to treat the water, if applicable?

As mentioned above, the inlet screen solar array is capable of producing 0.82 kW of power, totaling **5 kW per day**, and amounting to **1,345 kWh** per year (assuming peak sun hours for the state of Wyoming is 6 hours per day and 75 percent system efficiency).

$$0.82 \text{ kW/solar array} * 6 \text{ hours/day} = 5 \text{ kWh capacity/day}$$

- Will the project result in reduced vehicle miles driven, in turn reducing greenhouse gas emissions? Please provide supporting details and calculations.

The proposed project will reduce the miles driven as well as greenhouse gas emissions from an operation and maintenance standpoint and the attention an open ditch requires. With a closed pipeline system, greenhouse gas emissions will be eliminated from not having to annually clean the ditch with heavy machinery, as well as the need for ditch rider travel to alternate water, clean on-farm intakes, etc. See the table below for an outline of anticipated savings.

Ditch Rider Travel				
Trips/day	Miles/trip	Days/season	Miles/Season	Gal/season
2	6.44	198	2,550	142
Ditch Cleaning Gallons				
Times/season	Days/clean	Hours/day	Gals/hour	Gal (Diesel)/season
1	5	10	3.5	175
Total Gallons per Season				317

This data is based on multiple discussions with District personnel. **These savings are equivalent to a reduction in 6,211 pounds of CO₂.**

In addition to the savings from annual ditch cleanings and ditch rider travel; weed spraying, fencing, and other maintenance activities required to operate an open ditch will be eliminated. Typically, weeds are burned in the spring to eliminate the issues associated with debris during startup. Trying to estimate CO₂ emissions based on the burning of this ditch would not be practical due to the number of variables. Overall, these greenhouse gas emissions, which are currently required for the daily/yearly operation and maintenance with the existing ditch, would be eliminated.

- Describe any renewable energy components that will result in minimal energy savings/production (e.g., installing small-scale solar as part of a SCADA system).

While the District does not currently have a SCADA system in place, the proposed electromagnetic flow meters will provide a foundation to expand toward a system that will ultimately lead to energy savings and production. As more projects are completed and a SCADA system is eventually put in place, the turnouts can be incorporated into it.

Evaluation Criterion C – Other Project Benefits (15 Points)

Resilience and Sustainability Benefits:

Will the project address a specific water and/or energy sustainability concern? Please address the following:

- Explain and provide detail of the specific issue(s) in the area that is impacting water resilience and sustainability. Consider the following:

- Describe recent, existing, or potential drought or water scarcity conditions in the project area.

Since 2000, Hot Springs County, Wyoming, has experienced more years with drought conditions than without. In 2020, the Interim Director of the Wyoming Water Resources Data System and State Climate Office noted extreme drought in Hot Springs County. High winds and temperatures contributed to rapid drying and depletion of soil moisture. The Director also noted that the agriculture industry would be the most impacted (See **Attachment I, 1 – Reference Materials, [Most Of Wyoming Is In A Drought | Wyoming Public Media](#)**). While the winter of 2023 brought much needed snow and moisture, it did not resolve long-term issues related to drought in the region. The US Drought Monitor is showing that 2024 has already experienced moderate to severe drought conditions for Hot Springs County.

- Is the project in an area that is experiencing, or recently experienced, drought or water scarcity?

Yes, the project area is in an area that has historic and current drought conditions. Information from the US Drought Monitor shows that Hot Springs County currently has a drought designation. In the last twenty-four years, approximately sixteen of them (67 percent) have had some level of drought designation (from abnormally dry to extreme drought) (see *Figure 2: Hot Springs County, Drought Conditions 2000-2024* below).

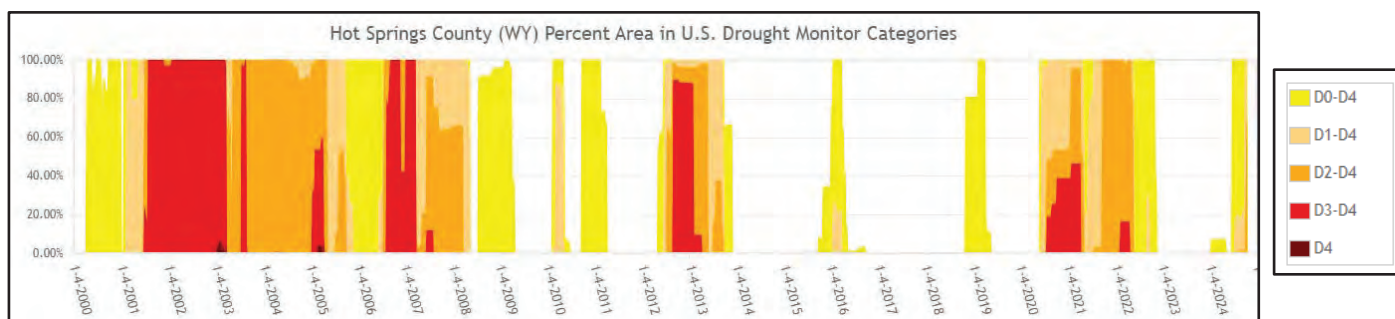


Figure 2: Hot Springs County, Drought Conditions 2000-2024

Drought.gov shows that in September 2024, 100 percent of people in Hot Springs County were affected by drought. Additionally, 10,002 acres of hay, 12,374 cattle, and 7,300 sheep are in drought.

- Describe any projected increases to the severity or duration of drought or water scarcity in the project area. Provide support for your response (e.g., reference a recent climate informed analysis, if available).

Temperatures in Wyoming have risen about 2.5 degrees Fahrenheit since the beginning of the 20th century (See **Attachment I, 2 – Reference Materials, [Wyoming | State Climate Summaries 2022](#)**). This warming has been observed in all seasons. The University of Wyoming has published a climate-informed analysis, The Wyoming Climate Atlas, which projects a significant increase in average temperatures in the coming decades. Warmer temperatures strongly correlate with lower precipitation and, therefore, increased risk of persistent drought.

Snow accumulation in the mountains is critical for water resources in Hot Springs County and throughout Wyoming. As the snow slowly melts, it feeds the state's rivers and reservoirs. Temperature and precipitation are critical components of snowpack. As temperatures have risen, snow is melting earlier, affecting the timing and availability of water. Changes in snowpack affect agriculture, recreation, and wildlife. The EPA has documented the influence of climate change on snowpack in the Western US (see *Figure 3: EPA - Changes in Snowpack Season* below). Stream flows have dropped by 15 percent due to higher temperatures. Dry soils soak up the snowmelt before it has a chance to reach a river or reservoir. Brad Udall, a water and climate researcher at Colorado State University, stated "Winters with 90 percent of snowpack have led to only 50 percent spring runoff because thirsty soil acts like a sponge." (See **Attachment I, 3 – Reference Materials**, [Why heavy winter rain and snow won't be enough to pull the West out of a megadrought | Wyoming Public Media](#)).

KDID relies on the Big Horn River to deliver irrigation water to its users. When needed, they may also purchase water stored in Boysen Reservoir. As rivers and reservoirs are impacted by increasing temperatures and declining snowpack, these water sources are at risk. Less snowpack and warmer spring temperatures will cause the snowpack that is present to melt earlier in the season. The timing of runoff could be the most critical effect. Stream flows will increase over the winter months when the water cannot be used for irrigation and be reduced during the growing season. Efforts to conserve water and improve water management will support KDID to continue to provide irrigation water to agricultural users and benefit all who rely on these water sources.

- *Explain and provide detail of the specific issue(s) in the area that is impacting energy sustainability, such as reliance on fossil fuels, pollution, or interruptions in service.*

For many communities, the biggest impact on energy sustainability is infrastructure based on the use of and access to fossil fuels. Gasoline for vehicles and coal for power plants are ingrained in the way of life and business. Fossil fuels have been the foundation of energy for decades. However, to be more energy efficient and mitigate climate change, many entities have taken it upon themselves to implement sources of renewable energy that can be utilized instead of fossil fuels.

- *Please describe how the project will directly address the concern(s) stated above.*

Through improving the efficiency of its system, KDID will be better positioned to responsibly respond during times of drought and water scarcity. Eliminating water losses in its system supports a more reliable and resilient water supply. It allows the District to draw less water (leaving it in the Big Horn River and Boysen Reservoir) benefiting other water users in the watershed, while also providing a reliable irrigation water for its water users. As droughts have

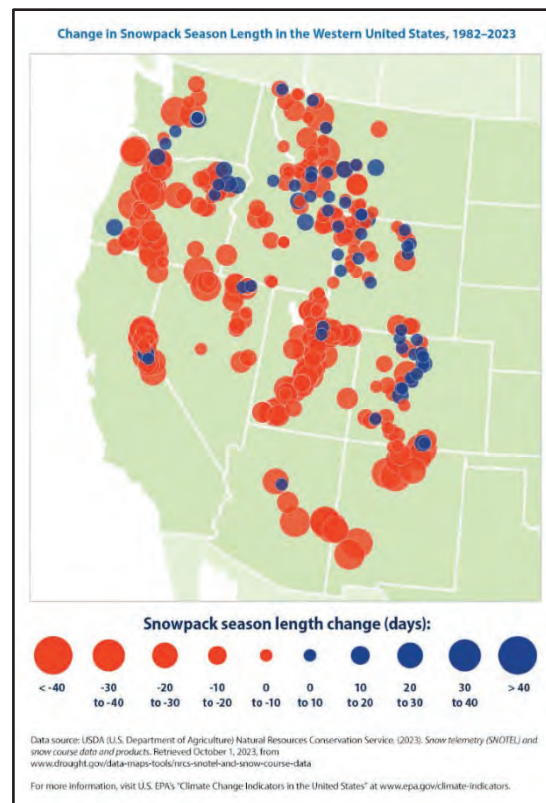


Figure 3: EPA – Changes in Snowpack Season

become systemic in the Western US, those who use and rely on these critical water sources benefit when agricultural systems are improved.

This project also directly addresses issues related to reliance on fossil fuels. KDID staff will drive fewer miles to operate and maintain and open ditch. Ditch riders will no longer be needed on this portion of the system, eliminating 2,550 miles driven each irrigation season and the associated emissions. Heavy machinery will no longer be use for ditch cleaning. Implementing solar stations to replace gasoline fueled generators directly reduces the quantity of fuel needed to operate those generators, as well as to fuel vehicles to access them. Through these improvements, the District will reduce its greenhouse gas footprint.

- *Will the project directly result in more efficient management of the water supply? For example, will the project provide greater flexibility to water managers, resulting in a more efficient use of water supplies?*

This proposed project will offer significant benefits and flexibility to all water users on this portion of the ditch. It will be the next step KDID is taking to improve its system. As more losses are eliminated, the overall system will operate more efficiently and allow the District to deliver more precise amounts of water on demand and without waste.

One important characteristic of a pipeline over an open ditch is the elimination of travel time and delays in delivery. In an open ditch, a farmer can order water, and it may take hours or even days for increased system flows at the diversion point to make their way to a field turnout at the bottom. Due to this, operational spills are necessary and built into the system. By spilling water most of the time, the flows are staged and ready for delivery. Open ditches are most efficient when the flow is kept as constant as possible. Pipelines eliminate these issues as it is designed for full pipe flow. Operational spills are not required as a pipeline provides water on demand. When a valve opens on the pipeline, there is an instantaneous increase in flow. A water order that used to take hours to days to execute is accomplished instantly.

Bank erosion is another problem resulting from flow fluctuations. A sudden drop in flow and its corresponding drop in flow depth can cause the water to flow quickly from the saturated banks. The flow and the differential pressure caused by the drop in water level can cause banks to collapse, requiring cleaning and reshaping to keep the ditch operational. Once constructed, the pipeline will also eliminate this issue.

The ability for the managers to observe diversion rates and have faster control of diversion rates gives them the flexibility to make changes and will reduce or eliminate the need for operational spills. Additionally, this project will add meters to turnouts, which allows for precise delivery of water and the ability to reduce and manage over-allocation.

- *Please address where any conserved water as a result of the project will go and how it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address shortages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.*
 - *Indicate the quantity of conserved water that will be used for the intended purpose(s).*

This project is anticipated to save 1,095 acre-feet of water each year as a direct result of piping a portion of the Kirby Canal. KDID will be able to make adjustments in real-time to eliminate operational spills and the need to use "carrier" water to ensure water can make it to the end of the

ditch. This allows for better management of the water diverted from the Big Horn River benefitting the local area and others downstream. More water will remain in the river. It will also reduce the need for KDID to purchase water stored in Boysen Reservoir from the Bureau of Reclamation, allowing this water to benefit others. The primary intended use for this water is agriculture, preservation of water sources, and ecological benefits to the Big Horn River.

- *Provide a description of the mechanism that will be used, if necessary, to put the conserved water to the intended use.*

Once completed, the pipeline will allow KDID to divert less water from the Big Horn River, allowing more water to remain in the river. It will reduce water loss in the project area and save water for agricultural needs – its primary intended use. There are no special administrative mechanisms needed to ensure the water is delivered as planned.

- *Will the project assist States and water users in complying with interstate compacts?*

The additional water that will be able to remain in the Big Horn River and Boysen Reservoir will support the Yellowstone River Compact. This reduces conflict over these water sources and will benefit others downstream, including water users in Montana.

- *Will the project help to prevent a water-related crisis or conflict? Is there frequently tension or litigation over water in the basin?*

Users currently rotate water, especially during times when it is scarce. This can create friction points between water users. Better system efficiency and water management flexibility resulting from this project will reduce the potential for conflict. As previously stated, the affected water users will no longer have to share water post-project completion.

Ecological Benefits:

In addition to the separate WaterSMART Environmental Water Resources Projects NOFO, this NOFO places a priority on projects that result in ecological benefits, through this section and other sections above, consistent with the SECURE Water Act. Please provide information regarding how the project will provide ecosystem benefits, including the following:

- *Will the project benefit species (e.g., federally threatened or endangered, a federally recognized candidate species, a state listed species, or a species of particular recreational, or economic importance)? Please describe the relationship of the species to the water supply, and whether the species is adversely affected by a Reclamation project or is subject to a recovery plan or conservation plan under the Endangered Species Act (ESA).*

The Big Horn River provides ecological benefits. Commonly found species in this area include deer, burbot, mountain whitefish, stonecat, pheasant, sandhill crane, and turkey. This area is known as a trophy fishery for brown trout, rainbow trout, and Snake River cutthroat. It is also in the historical range for the Canada Lynx, which is listed as threatened under the ESA.

While this project primarily benefits agricultural users, it will also support aquatic species and riparian habitats along the Big Horn River by reducing diversion flows for irrigation. More water will stay in the river and Boysen Reservoir to the benefit of all who use and rely upon it.

Unfortunately, erosion that occurs as a result of ditch operations has an impact on the river. Eliminating the operational spills at Freeman Draw and reducing spills at Enderly Spill will improve erosion in these channels. Many dry channels that become irrigation wasteways can

begin to erode when subjected to continuous or increased flows from spill water. This project will reduce the sediment loads into the Big Horn River, which is impaired by bacteria that can be carried into the river via runoff and sediment transport.

The additional flows and reduced sedimentation that will result from this project will have a positive effect on watershed health. These benefits include:

- Adequate vegetation and habitat for wildlife and fish
 - Improved water quality
 - Increased likelihood of water temperatures meeting the needs of a cold-water fishery
 - A balanced ecosystem that supports fish populations and reduces the risk of algae blooms
 - Improved water distribution
- *Will water remain in the system for longer periods of time? If so, provide details on current/future durations and any expected resulting benefits (e.g., maintaining water temperatures or water levels, recreational benefits, etc.).*

Yes, eliminating and reducing spills will result in KDID diverting less water, allowing it to stay in the Big Horn River. This "saved water" is estimated at 1,095 acre-feet annually, spread throughout the irrigation season. The benefits include:

- **More consistent and higher water levels:** this can improve habitat for fish and other aquatic life, benefiting recreational activities like fishing and kayaking.
- **Stabilized water temperatures:** steady water flow can help maintain cooler temperatures ideal for sensitive fish species.
- **Reduced demand and conflict:** more water will stay in both the Big Horn River and Boysen Reservoir while water reliability for agricultural users will be increased. This project helps KDID meet its water delivery obligations, potentially avoiding conflicts with other water users.

- *Will the proposed project reduce the likelihood of a species listing or otherwise improve the species status?*

No, this project will not directly reduce the likelihood of a species listing. However, it will allow for more water in the river and reservoir, which are critical water sources for aquatic and other wildlife in the area.

- *Please describe any other ecosystem benefits as a direct result of the project.*

None other benefits than those discussed above are anticipated.

Climate Change:

E.O. 14008 emphasizes the need to prioritize and take robust actions to reduce climate pollution; increase resilience to the impacts of climate change; protect public health; and conserve our lands, waters, oceans, and biodiversity.

- *Describe how the project addresses climate change and increases resiliency. For example, does the project help communities adapt to bolster drought resilience?*

As noted above, Hot Springs County has been impacted for many years by drought conditions exacerbated by climate change. Improvements in managing agricultural water will provide a more resilient and sustainable water supply for future years. Piping what is currently an open ditch will eliminate losses due to evapotranspiration. It will also eliminate losses due to seepage

through the bottom of the ditch. While some operational spills will still be necessary (at Enderly Spill), the quantity will be reduced by the improvement in efficiency. Additionally, the inclusion of meters in this project allows KDID to measure delivery flows to water users, and inadvertent diversions will be reduced or non-existent. More data will be available for making decisions and minimizing water losses.

Improvements in managing agricultural water will provide a more resilient, sustainable, and reliable water supply. Water will be used more efficiently, allowing more water to stay in the river and reservoir, as well as providing the needed water for agriculture. KDID and the agricultural community will be able to respond to the effects of climate change through the conservation of water, keeping more water in storage (the reservoir), and being able to better meet the needs and demands for that water in the region. As more water stays in the reservoir, water supplies become more stable and reliable. Users benefit from a resilient system and will have access to reliable water for their crops.

Additionally, reducing the quantity of and need to use gasoline to fuel vehicles, heavy machinery, and pumps through implementing solar systems and eliminating ditch maintenance will reduce greenhouse gas emissions.

- *Does the project seek to improve ecological resiliency to climate change?*

This project primarily aims to improve water management and efficiency in agriculture; however, having reliable and stable water supplies is critical when providing water services. It is anticipated that by using only the water necessary for agricultural needs, eliminating/reducing spills, and over-allocation, more water will remain in the Big Horn River and Boysen Reservoir. As such, the species and habitats that depend on these water sources will be more ecologically resilient to climate change.

- *Does the proposed project seek to reduce or mitigate climate pollutions such as air or water pollution?*

Enclosing the ditch benefits pollution in several ways by eliminating disturbance from heavy equipment during cleaning and maintenance activities. It will also reduce the need for weed control along the alignment once the native vegetation becomes reestablished.

The biggest potential for reduction of pollution is due to the elimination of spill flows at Freeman Draw and a reduction of spill flows at the Enderly Spill. Baseflows in these two channels that do not have constant pre-irrigation flow have caused some channel instability and, consequently, continue to contribute to sediment loading in the Big Horn River.

Solar power systems that will be implemented as part of this project will reduce greenhouse gas emissions and air pollution as vehicle miles driven will be reduced, and gasoline to operate motors for water pumps will be eliminated on three wells. Heavy machinery will not be needed for ditch cleaning, also reducing emissions.

- *Does the proposed project include green or sustainable infrastructure to improve community climate resilience?*

Yes, this project will utilize three solar stations to operate groundwater well pumps and one solar array to operate a screening structure. Altogether, these will generate 65 kWh/day of renewable

energy and 17,770 kWh annually. KDID and supporting landowners will be able to reduce their environmental impact during the irrigation season and throughout the year.

- *Does the proposed project contribute to climate change resiliency in other ways not described above?*

This project aids in climate resiliency by making it easier for agriculture producers to convert to more efficient irrigation practices. As mentioned, the current methods of application are predominantly flood irrigation. Conversion to sprinkler irrigation will significantly reduce water use in this area, and we expect many irrigators to take advantage of the positive pipeline pressure by installing sprinkler systems.

Evaluation Criterion D—Disadvantaged Communities, Insular Areas, and Tribal Benefits (15 points)

Disadvantaged Communities

- *If applicable, describe how the proposed project will serve or benefit a disadvantaged community, identified using the tool. For example, will the project improve public health and safety by addressing water quality, add new water supplies, provide economic growth opportunities, or provide other benefits in a disadvantaged community?*

Hot Springs County, where the KDID system is located, is documented as partially disadvantaged (tract number 56017967900) due to a Federally Recognized Tribe within the census tract (see *Figure 4: CEJST - Disadvantaged Census Tract, Hot Springs County*). The Wind River Reservation is located immediately south of the project area and within the Wind/Big Horn River drainage, the source of KDID's water.

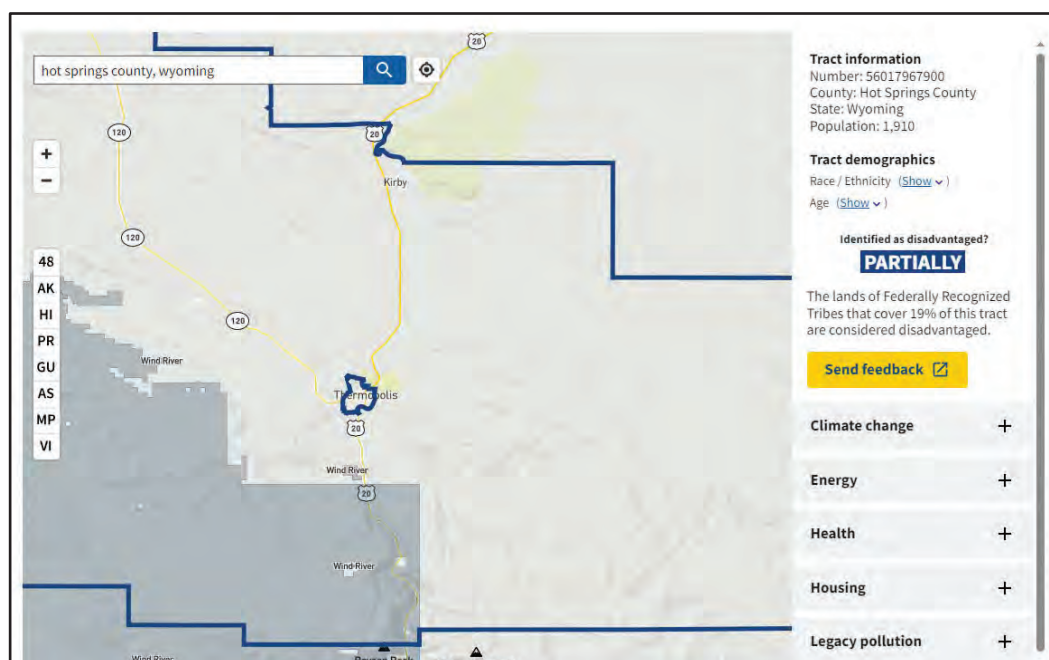


Figure 2: CEJST – Disadvantaged Census Tract, Hot Springs County

While this project will not directly benefit the Tribe, it is anticipated that it will create a more stable water supply in the basin. Increased efficiency in one part of the basin supports the resiliency, sustainability, and water supply in the rest of the basin.

Some of the challenges for residents in this partially disadvantaged tract include:

- Low Income, 64th percentile (just shy of the 65th percentile threshold)
- Heart Disease, 96th percentile (above the 90th percentile threshold)

- Diabetes, 77th percentile
- Low Median Income, 70th percentile
- Poverty, 61st percentile
- Energy Costs, 68th percentile
- Transportation Barriers, 77th percentile

Agriculture provides residents with economic opportunities. This sector provides jobs and supports other adjacent businesses in the region. The Census Bureau documents that 15.4 percent of the employed population in Hot Springs County work in agriculture, forestry, fishing and hunting, and mining industry. This industry ranks second for the percentage of employees (see *Figure 5: Census Bureau Industries for Hot Springs County*). Agriculture brings in millions of dollars of economic benefit to the county. The proposed project supports disadvantaged communities by supporting agriculture to continue operating in this region. When farmers and ranchers have a reliable and resilient water supply, they can confidently contribute to the local economy through job access and opportunities.

The agricultural industry also supports other businesses. Workers in restaurants, stores, parks, and other sectors depend on a robust local economy and the tourism that outdoor recreational activities bring in through fishing and hunting.

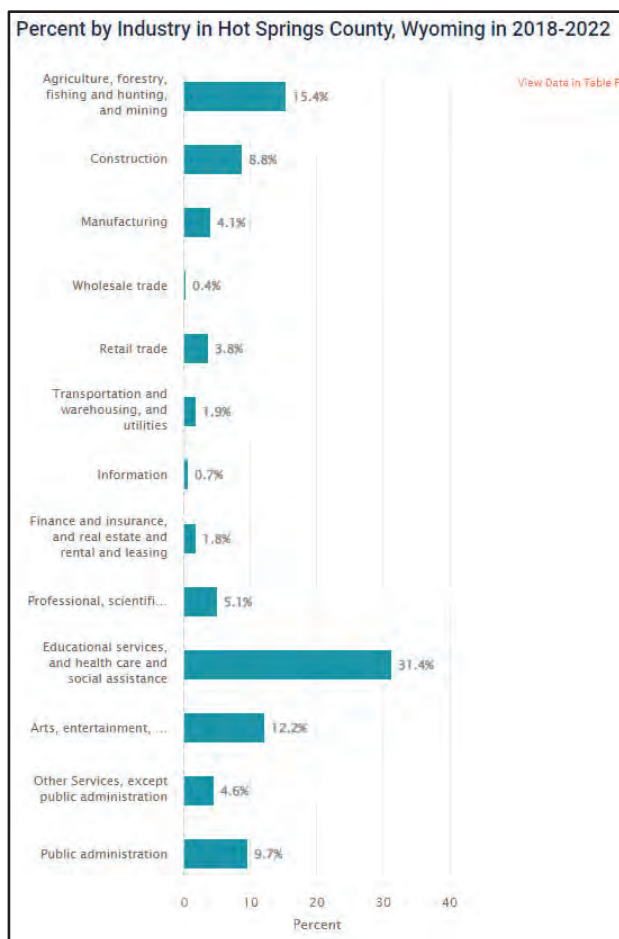


Figure 5: Census Bureau Industries for Hot Springs County

Tribal Benefits

The Department is committed to strengthening tribal sovereignty and the fulfillment of Federal Tribal trust responsibilities. The President's memorandum, Tribal Consultation and Strengthening Nation-to-Nation Relationships, asserts the importance of honoring the Federal Government's commitments to Tribal nations. Address the following, if applicable:

- *Does the proposed project directly serve and/or benefit a Tribe? Will the project increase water supply sustainability for an Indian Tribe? Will the project provide renewable energy for an Indian Tribe?*

This project does not directly benefit a Tribe. However, Wyoming's only reservation is located within the Wind/Big Horn Basin. Water savings within the basin benefit the entire basin by increasing supplies and providing better water management.

- *Does the proposed project support Tribal led conservation and restoration priorities, and/or incorporate or benefit indigenous traditional knowledge and practices?*

N/A

- Does the proposed project directly support tribal resilience to climate change and drought impacts or provide other Tribal benefits such as improved public health and safety through water quality improvements, new water supplies, increased renewable energy, or economic growth opportunities? Does the proposed project support Reclamation's Tribal trust responsibilities or a Reclamation activity with a Tribe?

N/A

Evaluation Criterion E—Complementing On-Farm Irrigation Improvements (8 points)

If the proposed project will complement an on-farm improvement eligible for NRCS assistance, please address the following:

- Describe any planned or ongoing projects by farmers/ranchers that receive water from the applicant to improve on-farm efficiencies.
 - Provide a detailed description of the on-farm efficiency improvements.

Planned on-farm efficiency improvements include the elimination of flood irrigation techniques, which are still heavily used, and implementing sprinkler irrigation. Sprinkler irrigation will take advantage of the pressure created (conservation of energy) as a result of piping the lateral. Not only will the positive pressure reduce the carbon footprint through reducing pump energy consumption, but it will also reduce the associated pumping costs to individual users. Currently all water users on this section of project (seven) have expressed significant interest to KDID to apply for on-farm improvements through the NRCS – EQIP program to transition towards a sprinkler setup. The following is a list of those who have applied or have intentions of applying.

Landowner	Acreage	Plan to Apply for NRCS - EQIP
Brian Strampe	51	Yes
Axtell Ranch, LLC	196	Yes
Justin Reed	250	Yes

- Have the farmers requested technical or financial assistance from NRCS for the on-farm efficiency projects, or do they plan to in the future?

The local NRCS office representative was a guest at the annual meeting of KDID. They spoke to the members about available programs and the options available for landowners. Many irrigators on the lower end still use dirt-ditch flood irrigation and have shown interest in increasing their on-farm irrigation efficiency by converting to pivot irrigation methods. As mentioned, the interested large-acreage participants are as listed above.

- If available, provide documentation that the on-farm projects are eligible for NRCS assistance, that such assistance has or will be requested, and the number or percentage of farms that plan to participate in available NRCS programs.

See **Attachment D – On-Farm Signature Page**

- Applicants should provide letters of intent from farmers/ranchers in the affected project areas.

See **Attachment D – On-Farm Signature Page**

- Describe how the proposed WaterSMART project would complement any ongoing or planned on-farm improvement.
 - Will the proposed WaterSMART project directly facilitate the on-farm improvement? If so, how? For example, installation of a pressurized pipe through WaterSMART can help support efficient on-farm irrigation practices, such as drip-irrigation.

Farmers along this stretch are particularly interested in upgrading their current system. The increased water availability this project will provide through a pressurized pipe will aid conversion to pivot sprinkler-irrigation methods. The farmers will apply for funding once Kirby Ditch Lower Reach Phases 1 and II have been converted to pipe, allowing them to have increased pressure at their diversion point.

OR

- Will the proposed WaterSMART project complement the on-farm project by maximizing efficiency in the area? If so, how?

Yes. As discussed above, the pipeline conversion will maximize available pressures to the greatest extent possible based on existing topography (elevation drop) along this stretch of conversion.

- Describe the on-farm water conservation or water use efficiency benefits that are expected to result from any on-farm work.
 - Estimate the potential on-farm water savings that could result in acre-feet per year. Include support or backup documentation for any calculations or assumptions.

The final report for the Kirby Ditch Conservation Program Level II Study by Anderson Consulting Engineers submitted to the Wyoming Water Development Commission contained estimates for the water savings if the District's application profile went from its current configuration of 56 percent flood irrigation (at the time of the study) to 90 percent sprinkler and 10 percent gated pipe. The study used a combined efficiency of 73.5 percent if the lands in the District were changed to 90 percent sprinkler (combination of pivot and side roll) and 10 percent gated pipe. The estimated savings at the headgate was estimated to be 4,406 acre-ft. The District supplies water to 2,564 acres of irrigated land. Using the conclusions of the Level II Study, the savings on a per-acre basis are 1.7 acre-ft per acre. The area served by this project is approximately 585 acres, with more acres planned to be put into production as a result of this project. Most of those acres are flood irrigated, rather than the 56 percent for the entire District used in the study. However, applying the data from the study results in an additional water savings of **1,165 acre-feet** due to on-farm efficiency improvements. Actual savings for this section of the ditch are anticipated to be greater due to the higher percentage of flood irrigation compared to the District as a whole. See the results below:

Water Conserved from On-Farm Improvements

Existing Acreage Served by Project	585	Ac
Annual Volume Delivered to Project Users	6,299	Ac-Ft
Existing Irrigation Efficiency (Anderson Study Weighted)	55%	
Proposed Irrigation Efficiency (Anderson Study Weighted)	73.5%	
Existing vs. Proposed Efficiency	18.5%	
Water Savings Due to On-Farm Improvements (5,168 x 18.5%)	1,165	Ac-Ft

- *Please provide a map of your water service area boundaries. If your project is selected for funding under this NOFO, this information will help NRCS identify the irrigated lands that may be approved for NRCS funding and technical assistance to complement funded WaterSMART projects.*

See **Attachment A – Project Location and Detail Map**

Evaluation Criterion F—Readiness to Proceed (8 points)

Points may be awarded based upon the extent to which the proposed project is capable of commencing upon entering into a financial assistance agreement. Note: If your project is selected, responses provided in this section will be used to develop the scope of work that will be included in the financial assistance agreement.

Applications that include a detailed project implementation plan (e.g., estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates) will receive the most points under this criterion.

- *Identify and provide a summary description of the major tasks necessary to complete the project. Note: Do not repeat the more detailed technical project description provided in Section D.2.2.2 Application Content. This section should focus on a summary of the major tasks to be accomplished as part of the project.*

As discussed briefly above, the design plans are nearly complete (estimated at 80 percent). The project was ready to bid as a single project. However, supply chain issues and the effects of COVID significantly affected materials prices, causing the project to be split into two phases. Some minor work is needed to complete the plans for Phase II. For bidding purposes, the project manual needs to be finalized. Outstanding tasks are listed below:

- Review/Revise & minor design modifications to the final plan set documents to reflect Phase II work only.
- Full review & modifications of horizontal and vertical alignments.
- Summaries & Quantities for Phase II items.
- Confirmation of environmental and cultural compliance.
- Generate current construction estimate.
- Compile specifications and project manual for bidding purposes.
- Bid the project, select contractor, and oversee construction activities.

- *Describe any permits that will be required, along with the process for obtaining such permits.*

An Army Corps permit will be required. All State and private easements have been secured as a part of the previous design work done for Phase I. Cultural surveys were completed for the entire project. Wetlands delineation fieldwork has been completed for the entire project. However, a separate report will be required based on that fieldwork for Phase II. Private and State of Wyoming easements have been acquired for all lands necessary for the completion of the project.

- *Identify and describe any engineering or design work performed specifically in support of the proposed project.*

As mentioned above, the project construction plans are estimated at 80 percent complete. They need to be revised to remove the work completed as part of Phase I. The project manual, contract, and bid documents will be prepared for Phase II.

- *Describe any new policies or administrative actions required to implement the project.*

No new policies or administrative actions will be required. Operational procedures will likely change upon project implementation.

- Describe the current design status of the project. If additional design work is required prior to construction, describe the planned process and timeline for completing the design work.

Wyoming Water Development Commission (WWDC) has awarded KDID \$1,882,500 for this project (see **Attachment E – Funding Commitment**). Once the USBR award is confirmed and the agreement is in place, the final project design and bid documents will have already been completed as pre-award costs; therefore, the project will be ready to bid. Design tasks prior to construction are listed above and will take place as pre-award costs. Upon notice of award (May 2025), KDID will start the process of having the final design completed and ready for bid for construction. See below for an in-depth estimated schedule.

- Please also include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. Milestones may include, but are not limited to, the following: complete environmental and cultural compliance; mobilization; begin construction/installation; construction/installation (50% complete); and construction/installation (100% complete). Was the expected timeline for environmental and cultural compliance discussed with the local Reclamation regional or area office?

Major Tasks and Milestones	Estimated Start Date	Estimated Completion Date
80% Design Plans & Environmental Clearance (Completed)	N/A	N/A
50% Funding Match Secured from State of Wyoming (Completed)	N/A	N/A
100% Design Construction Plans (Pre-Award)	May 2025	October 2025
Final Permitting Obtained (Army Corps)	May 2025	July 2025
USBR Contract Completion	October 2025	October 2025
Project Manual/Bid Documents Completion (Pre-Award)	October 2025	October 2025
Project Advertising/Bidding/Contract Award	October 2025	November 2025
Pipeline Mobilization & Construction	December 2025	March 2026
Renewable Solar Energy Implementation	December 2025	October 2026
Final Reports & Project Closeout	March 2026	December 2026

Evaluation Criterion G—Collaboration (5 points)

Up to **5 points** may be awarded for projects that promote and encourage collaboration among parties in a way that helps increase the sustainability of the water supply.

Please describe how the project promotes and encourages collaboration. Consider the following:

- Is there widespread support for the project? Please provide specific details regarding any support and/or partners involved in the project. What is the extent of their involvement in the process?

The Kirby Ditch Irrigation District members are in full support of this proposal. KDID personnel and water users have continual discussions of ways to improve the delivery of water to the lower reach of Kirby Ditch because this is a problem area. Following the study by Sage Civil Engineering (funded by the WWDC), the members of the KDID chose to pursue the proposal of the Lower Reach Pipeline (the Kirby Ditch Rehabilitation, Level II Study, is available upon request). The impacted users have already spoken to the local NRCS staff about the possibility of on-farm improvements related to tying into the proposed pipeline. On-farm improvements will

continue to improve irrigation efficiency through the NRCS Environmental Quality Incentives Program (EQIP) and further the water savings initiated through this proposal.

- *What is the significance of the collaboration/support?*

Farmers need to trust their delivery system and must be able to count on a reliable system. In agriculture, there are constant fears that the cost of inputs such as seed, livestock, and equipment will be lost if there is not reliability in agriculture's most precious resource – water. Completing Phase II will have an enormously positive effect on the confidence of the lower reach water users when they know the system is dependable to get them the water they need. The two WWDC studies have brought all the water users of the entire length of the Kirby Ditch together to better understand the issues facing all users and produce solutions to improve the efficiency and reliability of the ditch as a whole. This project develops a partnership between the KDID, the State of Wyoming, and the Bureau of Reclamation. This partnership will allow KDID to modernize its system, increase water availability, reduce water conflict, reduce maintenance costs, and facilitate on-farm irrigation improvements.

- *Will this project increase the possibility/likelihood of future water conservation improvements by other water users?*

The completion of this project will set a precedent for other users within the District as well as other irrigation districts in the area. The benefits will not go unnoticed and motivate other users/districts to seek funding for water conservation efforts.

- *Will the project benefit multiple sectors and/or users (e.g., agriculture, municipal and industrial, environmental, recreation, or others)?*

This project will primarily benefit agricultural users. However, more efficient use of the stored water in Boysen Reservoir and more water left in the Big Horn River benefits everyone in the basin.

- *Please attach any relevant supporting documents (e.g., letters of support or memorandum of understanding).*

See **Attachment F – Letters of Support**

Evaluation Criterion H – Nexus to Reclamation (4 Points)

Describe the nexus between the proposed project and a Reclamation project or Reclamation activity. Please consider the following:

The Kirby Ditch's diversion is on the Big Horn River, which initiates out of water stored in Boysen Reservoir, a Bureau of Reclamation facility. In periods of limited water supply, KDID supplements its water supply with the purchase of water stored in Boysen Reservoir.

- *Does the applicant have a water service, repayment, or O&M contract with Reclamation?*

No.

- *If the applicant is not a Reclamation contractor, does the applicant receive Reclamation water through a Reclamation contractor or by any other contractual means?*

No.

- Will the proposed work benefit a Reclamation project area or activity?

The project benefits a reclamation project area or activity by reducing the demand on stored water in Boysen Reservoir. This will provide additional water for other users during times of scarcity.

- Is the applicant a Tribe?

No.

Performance Measures

Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project (e.g., water saved or better managed, energy generated or saved). For more information calculating performance measure, see Appendix A: Benefit Quantification and Performance Measure Guidance.

There are two main benefits to be realized from the project. The first is the elimination of conveyance losses in the reach being converted to a pipeline. A previous study estimated the conveyance loss in this area of the ditch based on two measurements over a season.

Measurement is proposed at each turnout as part of the project. Flows into the pipeline and out of the pipeline will be measured at various points throughout the season to determine the loss through the reach. To determine the improvement, this loss will then be compared with the seepage estimates completed previously.

With Freeman Draw eliminated, it is obvious to determine water savings with respect to the spill.

Budget Narrative

In the budget detail and narrative section, applicants should describe and justify requested budget items and costs. Applicants should provide details to support the SF-424A, "Object Class" categories or the SF-424C, "Cost Classification" categories. The budget narrative must clearly identify all items of cost (total estimated project cost), including those contributed as non-Federal cost share by the applicant (required and voluntary), third-party in-kind contributions, and those covered using the funding requested from Reclamation, and any requested pre-award costs. The total project cost is the sum of all allowable items of costs, including all required cost sharing and voluntary committed cost sharing, including third-party contributions necessary to complete the project. Applicants must include detailed descriptions of all cost justifications (see Reclamation's suggested format in Attachment B for more detail). Costs, including the valuation of third-party in-kind contributions, must comply with the applicable cost principles contained in [2 CFR, §200](#).

Funding Source	Amount	Funding Status
Non-Federal Entities		
1. Wyoming Water Development Commission	\$1,882,500	Awarded
2. Kirby Ditch Irrigation District (KDID)	\$30,000	District Budget & Water Users
Non-Federal Subtotal	\$1,912,500	
Requested Reclamation Funding	\$1,912,500	
Total Project Cost	\$3,825,000	

Pre-Award Cost: The budget includes pre-award costs to finalize design (100 percent), complete & compile project manual bid documents, permitting, and any updates required for environmental and cultural compliance. These tasks will not be started until after notice of award

but prior to the finalization of an agreement with USBOR. It is understood that these costs are at Kirby Ditch Irrigation District's own risk. The timing of these costs are necessary for the efficient and timely performance of the scope of work due to the need to construct this project outside of the irrigation season and keep it within the funding timeline.

See **Attachment G – Budget Detail and Narrative**.

Environmental and Cultural Resources Compliance

Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

The Bureau of Reclamation issued a Categorical Exclusion for the Kirby Ditch Lower Reach Piping Project (covering both Phases I and II). It was approved in April of 2021 and can be reviewed in **Attachment H – Categorical Exclusion**.

Temporary disturbance of the alignment will occur as part of the construction. Any disturbance will be reclaimed as part of the construction. Best management practices will be used during construction to prevent/minimize impacts to the environment.

Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?

KDID is not aware of any impacts concerning threatened or endangered species in this area.

Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "Waters of the United States?" If so, please describe and estimate any impacts the proposed project may have.

There are fringe wetlands located along the ditch banks, and construction activities will require an Army Corps Permit.

When was the water delivery system constructed?

The delivery system was originally constructed in 1904.

Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.

As part of the design activities, a cultural inventory report was prepared by Terra Alta Archaeology of Cody, WY for the entire project area when the entire project was to be constructed at once. The conclusions from that inventory were that one historic site, 48HO293, was identified as being within the project area but was not considered eligible for nomination to the National Register of Historic Places. Therefore, a determination of "No Historic Properties Affected" was recommended, and cultural resource clearance was recommended by the consultant.

Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.

Per the previous cultural resource inventory, no.

Are there any known archeological sites in the proposed project area?

Per the previous cultural resource inventory, no.

Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?
The project will not have a disproportionate effect on any environmental justice concerns.

Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?

This project will not limit access to or have an impact of any kind on Tribal Lands.

Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?

No. The project area will be reclaimed with native vegetation.

Required Permits or Approvals

Applicants must state in the application whether any permits or approvals are required and explain the plan for obtaining such permits or approvals.

All required permits will be acquired prior to construction commencement. Permits will/may be required from the Army Corps (anticipated nationwide or regional permit) and the Wyoming Department of Environmental Quality.

Overlap or Duplication of Effort Statement

Applicants must provide a statement that addresses if there is any overlap between the proposed project and any other active or anticipated proposals or projects in terms of activities, costs, or commitment of key personnel. If any overlap exists, applicants must provide a description of the overlap in their application for review.

No overlap exists between the proposed project and any other active or anticipated proposals or projects in terms of activities, costs, or commitment of key personnel.

Conflict of Interest Disclosure Statement

Conflict of Interest Disclosure Per the Financial Assistance Interior Regulation (FAIR), 2 CFR §1402.112, you must state in your application if any actual or potential conflict of interest exists at the time of submission.

No known actual or potential conflict of interest exists at the time of application. KDID is a non-Federal entity and understands its responsibility and obligation to avoid conflicts of interest concerning financial assistance agreements. The District is aware of the requirement to disclose any conflict of interest per 2 CFR §1402.112.

Uniform Audit Reporting Statement

All U.S. states, local governments, federally recognized Indian Tribal governments, and nonprofit organizations expending \$750,000 in U.S. dollars or more in Federal award funds in your organization's fiscal year must submit a Single Audit report for that year through the Federal Audit Clearinghouse's Internet Data Entry System in accordance with 2 CFR §200 subpart F.

U.S. state, local government, federally recognized Indian Tribal governments, and non-profit applicants must state if your organization was or was not required to submit a Single Audit report for the most recently closed fiscal year. If your organization was required to submit a Single Audit report for the most recently closed fiscal year, provide the Employer Identification Number (EIN) associated with that report and state if it is available through the Federal Audit Clearinghouse website.

Kirby Ditch Irrigation District has not expended more than \$750,000 in Federal award funds in the past fiscal year and has not been required to complete a Single Audit report.

Certification Regarding Lobbying

Non-Federal entities are strictly prohibited from using funds under a grant or cooperative agreement for lobbying activities and must provide the required certifications and disclosures pursuant to 43 CFR §18 and 31 USC §1352. Please see the GG Lobbying Form V1.1 Certification Regarding Lobbying.

Letters of Project Support and Letters of Partnership

Include letters from interested stakeholders supporting the proposed project.

See **Attachment F – Letters of Support**

Letters of Funding Commitment

The amount of funding commitment

\$1,882,500 has been procured by KDID from the Wyoming Water Development Commission for this project. See **Attachment E – Funding Commitment**

The date the funds will be available to the applicant.

Funds are currently available to use.

Any time constraints on the availability of funds

No.

Any other contingencies associated with the funding commitment

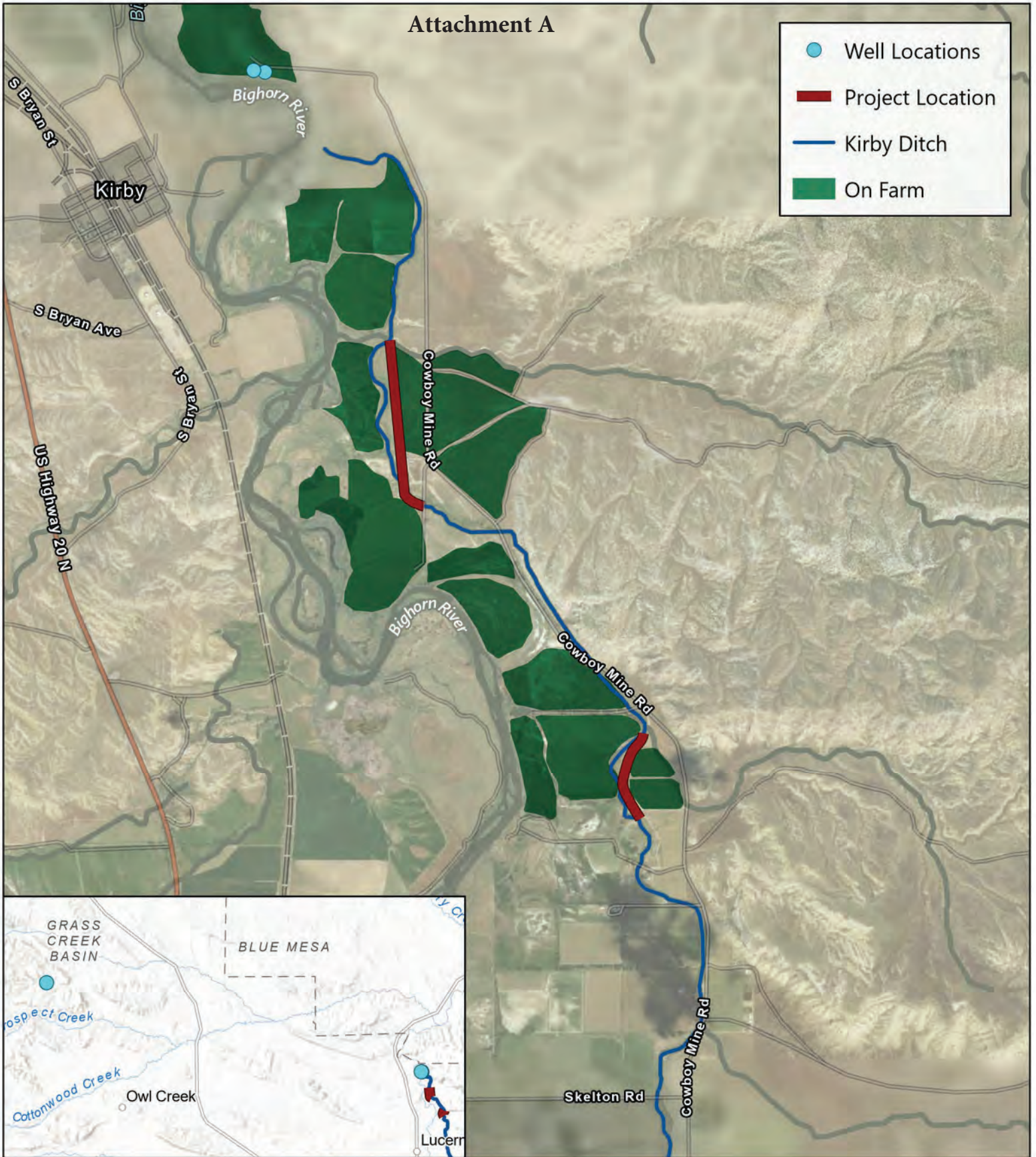
No.

ATTACHMENT G
BUDGET DETAIL AND NARRATIVE

Kirby Ditch Lower Reach Piping Project
Phase II

Summary			
6. Budget Object Category	Total Cost	Federal Estimated Amount	Non-Federal Estimated Amount
a. Personnel	\$0		
b. Fringe Benefits	\$0		
c. Travel	\$0		
d. Equipment	\$0		
e. Supplies	\$0		
f. Contractual	\$0		
g. Construction	\$3,825,000		
h. Other Direct Costs	\$0		
i. Total Direct Costs	\$3,825,000		
i. Indirect Charges	\$0		
Total Costs	\$3,825,000	\$1,912,500	\$1,912,500
Cost Share Percentage		50%	50%

Attachment A



KIRBY DITCH LOWER REACH PIPING PROJECT - PHASE II

WaterSMART: Water and
Energy Efficiency Grant



0 0.25 0.5
Miles



November 2024

108°8'58"W 43°46'56"N

October 12, 2024

United States Bureau of Reclamation

Attn: WaterSMART WEEG Application Review Committee

Subject: Support of Kirby Ditch Pipeline Project

To Whom it May Concern:

This letter will serve to support the open ditch to pipeline conversion for the Kirby Ditch Pipeline Project. This project will be very beneficial both conserving water and energy. Putting the water in a pipeline will prevent seepage, evaporation and vegetation losses. It will also greatly reduce ditch maintenance as far as cleaning and ditch rider attention. It will save energy by pressurizing the water in the pipeline naturally which could be harnessed for sprinkler irrigation systems and with the new screen in place it will be pump ready. Thank you for considering our WaterSmart application.

Sincerely,

A handwritten signature in cursive script that reads "Delbert Daniels". The signature is written in dark ink and is positioned below the word "Sincerely,".

Delbert Daniels

President, KDID

October 14, 2024

United States Bureau of Reclamation

Attn: WATERSMART WEEG Application Review Committee

Subject: Support Kirby Ditch Pipeline Project

To Whom it May Concern:

I am writing this letter in support of the completion of the pressure pipeline system on the Kirby Ditch. We implemented over two miles of pipe in the middle of the project and a syphon/spill at the end of the project with the funding that we had. Additional funding to the project would help ensure that the system would become pressurized and free from silt and debris entering the pipe. We had this project funded fully but through extreme cost increases we had to prioritize what to build with the funding we had. I can already see the benefit from putting this much canal in a pipe as the seepage and evaporation don't exist any longer. Cattails and sediment buildup won't be a maintenance issue any longer, and water delivery will be immediate upon turning a valve. We still need funding to finish the beginning of the project with headgate and screen, and the last mile of buried pipe, then the segment will be complete and running as designed. There have been a couple issues to deal with after the completion of this phase as it is not yet built as engineered because it is now a hybrid of enclosed ditch and open ditch. Many of our problems have been remedied but will be a relief when we are able to finish the project as designed and move on to other issues on our canal such as sprinklers and pivots from the pressure of this project. Thank you for the funding and assistance to this point, it is much appreciated and your dollars won't be wasted, we are a conservative district and are trying to improve the weakest points of our system.

Sincerely,

Chip Axtell
Board Member

November 13, 2024

United States Bureau of Reclamation
Attn: WaterSMART WEEG Application Review Committee

Subject: Support of Kirby Ditch Pipeline Project

To Whom it May Concern:

I am writing this letter of support for the open ditch to pipeline conversion for the Kirby Ditch Pipeline Project. The major advantage of the pipeline on our property would be that the ~20ft of differential elevation head pressure would allow me to open up ~22 acres of additional land for irrigation with no additional energy input using low head irrigation methods, or using irrigation sprinklers at reduced energy input. I currently have water rights to these additional acres and am paying KDID for those acres.

Sincerely,

A handwritten signature in cursive script, appearing to read "Brian Strampe".

Brian Strampe
Land Owner in the KDID

November 13, 2024

United States Bureau of Reclamation
Attn: WaterSMART WEEG Application Review Committee

Subject: Support of Kirby Ditch Pipeline Project

To Whom it May Concern:

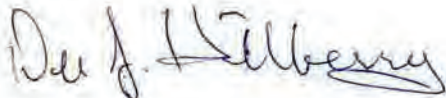
This letter will serve to support the open ditch to pipeline conversion for the Kirby Ditch Pipeline Project.

The completion of this final phase of this important project will finally allow the Kirby Ditch Irrigation District to deliver water to the entire lower segment of our Ditch in a reliable manner without the extreme water losses due to seepage and evaporation. It will also reduce an inordinate amount of canal cleaning due to silt and sand build up where sand draw runs into the ditch and fills with sand every year.

In addition, by being able to deliver clean, trash free water in a pressurized pipeline it will allow our irrigators to install Pivot Sprinkler systems which they have been wanting to do, again saving a significant amount of water and getting better crop production.

Thank you for considering our project as it will help solve the major operational problem on our canal and at the same time realize significant savings in water loss and cleaning and maintenance costs.

Sincerely,

A handwritten signature in dark ink, appearing to read "Dee J. Hillberry". The signature is fluid and cursive, with the first name "Dee" and last name "Hillberry" clearly distinguishable.

Dee J Hillberry
Project Manager & Board Member



Mr. Brandon Metzger
Sage Civil Engineering
2824 Big Horn Avenue
Cody, Wyoming 82414

October 30, 2024

RE: Letter of Support

Dear Mr. Metzger:

We look forward to working with Sage Engineering on the renewable energy components within the proposed Kirby Ditch project.

As you may know, Envigor Energy has over 25 years of experience with renewable energy, ranging from remote repeater sites to solar-powered wells to decarbonized whole-house energy stations. Currently, our company's focus is on two universal and versatile units: the Model S SolarShed™ and our ground-based Model G. Each is highly expandable, providing anywhere from 15 to 70 kilowatt-hours per day – more than enough to power a wide range of pumps without the need for fossil fuels or connection to the power grid.

Envigor's home office is situated in Hot Springs County, Wyoming (a designated HUBZone) and we also have locations in Denver and Cody. Should you have any further questions, please do not hesitate to reach out.

Best regards,

A handwritten signature in blue ink, reading "John Newkirk".

John Newkirk, CEO

JJN/mpb

Brandon Metzger

From: chip axtell <chipaxtell6@gmail.com>
Sent: Thursday, January 11, 2024 8:00 AM
To: Brandon Metzger; Dee Hillberry
Subject: KDID Phase II funding

To whom it may concern, I am sending this letter of support for the next phase of funding and construction for the Kirby Ditch Irrigation District project. I am a Commissioner on the KDID board, and also the landowner at the very end of the ditch system. This project affects my operation possibly more than any other user. The trouble we've had with ditch washouts and vegetation growth, as well as silt build up and rockslides in this system will be virtually eliminated with the buried pipe after the project is complete. maintenance should be much simpler and cheaper. This project should have been complete in one construction phase, but due to State land easement issues was delayed, then construction costs increased by nearly double. The only reason we have to ask for more funding is because the original amount wouldn't cover the increase in cost. This system is designed to be entirely in buried pipe, without the extra funds it will be a partially complete project, and the issues we set out to resolve will only be partially dealt with. I believe the KDID has a very good working group on the board that is committed to improving an irrigation system while trying to keep the cost of supplying water at a minimum to the producer, it is a forward thinking group who are wanting to leave a better system for the next generation. I think Sage civil engineers have done a great job designing our project and dealing with questions about the planning, and so far Wilson Brothers, our contractor, has been very good about communicating with everyone involved to ensure all are happy with the final system. Hopefully we can obtain funding and complete the project in the near future, thanks to all who have worked on this in some way.

Chip Axtell

January 5, 2024

Dear Sirs,

Regarding Kirby Ditch Irrigation District 2023 Phase Two Water Smart Application, I believe finishing our original project will be very beneficial to our District. As you know our original project was completely funded then the Covid lockdown caused high inflation of materials in our project, and we were forced to reduce the scope of our project to accomplish the highest priorities of the project. We are going to get huge benefits from the completed parts of the project, however being able to complete the entire project would be even more beneficial.

By tying together, the remaining sections with pipe we will conserve water, prevent erosion, and reduce maintenance on the entire lower section of our canal. We will have better control of water and less maintenance on this previously high maintenance section. This Phase would complete our original project and finish it. Even though this project is on the lower end of the canal, it benefits the entire canal by lowering maintenance and operation costs. Thank you for considering our 2023 Phase Two Water Smart Application.

Sincerely,

A handwritten signature in cursive script that reads "Delbert Daniels". The signature is written in dark ink and is positioned to the right of the word "Sincerely,".

Delbert Daniels



United States Department of the Interior



BUREAU OF RECLAMATION
Missouri Basin Region
Wyoming Area Office
P.O. Box 1630
Mills, WY 82644-1630

IN REPLY REFER TO:

WY-4302
2.1.4.17

April 9, 2021

VIA ELECTRONIC MAIL ONLY

Memorandum

To: Central Files

From: Shain Wright
Environmental Specialist

SHAIN WRIGHT
Digitally signed by SHAIN
WRIGHT
Date: 2021.04.09 10:41:43 -06'00'

Subject: Categorical Exclusion Checklist (CEC No. WY-BO-21-26) Kirby Irrigation
District - Open Canal to Buried Pipeline.

Attached is CEC No. WY-BO-21-26 for the Wyoming Area Office central files.

Attachment

cc: WY-1000 (Carlie A. Ronca), WY-1100 (Lyle Myler), WY-4000 (Mahonri Williams),
WY-4300 (Brad Cannon), WY-4301 (Denise Tugman), WY-4302 (Shain Wright)
WY-4304 (Brock Merrill), (ea w/attach)