

## **D.2.2.2.1. Title Page**

### **Main Canal and Lateral 17.6 Rehabilitation Project**

**Project Location: Rosebud County, Montana**

#### **BUREAU OF RECLAMATION**

#### **WaterSMART GRANT APPLICATION**

**Water and Energy Efficiency Grants for Fiscal Year 2024**

**Funding Opportunity Announcement No. R24AS00052**

#### **Applicant:**

Yellowstone Irrigation District

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**Congressional District of Applicant: MT-002**

**Congressional Districts of Project Area: MT-002**

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## D.2.2.2 TECHNICAL PROPOSAL CONTENT

### D.2.2.2.3 EXECUTIVE SUMMARY

The executive summary should include:

- The date, applicant name, city, county, and state

**Date:** November 13, 2024

**Applicant Name:** Yellowstone Irrigation District

**Address:** PO Box 169, Hysham, MT 59038, Treasure County, MT

- Please indicate whether you are a Category A applicant or a Category B applicant. If you are a Category B applicant, please briefly explain how you are acting in partnership with a Category A partner. Note: If you are a Category B applicant, you must include a letter from the Category A partner confirming that they are partnering with you and agree to the submittal and content of the proposal. See Section C.1. Eligible Applicants.

The Yellowstone Irrigation District is a Category A Applicant, as an Irrigation District.

- 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. Note: This information will be used to create a summary of your project for our website if the project is selected for funding. For example, see the following description of a project selected for funding in FY 2023:

Example: The East Columbia Basin Irrigation District, near Othello, will convert 24,483 feet of earthen canals to polyvinyl chloride pipelines to address seepage and evapotranspiration losses. The project is expected to result in annual water savings of 290 acre-feet, which will be used to offset existing groundwater pumping in an area with significant aquifer depletion and to enhance flows in the Columbia River.

The Yellowstone Irrigation District (YID), located near Hysham, MT, plans to enhance its Main Canal by lining 5,042-feet with a geocomposite liner and converting 2,600 linear feet of the Lateral 17.6 canal into 21-inch diameter plastic irrigation pipe (PIP). The Main Canal spans 28.8 miles and delivers irrigation water to 13,121 acres between Hysham and Forsyth, 7,034 of which are directly impacted by the proposed improvements. Lateral 17.6, which serves around 427 acres of cropland, starts about 0.2 miles east of the Rosebud-Treasure County line and includes open ditches, both earthen and concrete-lined, as well as existing piped sections, before ultimately discharging into the Yellowstone River. These projects will significantly enhance YID's water management and conservation efforts, with anticipated annual water savings of 1,009 acre-feet total with approximately 869 acre-feet from the Main Canal lining and 140 acre-feet from the Lateral 17.6

conversion. These savings will bolster the region's resilience to drought conditions and enable YID to meet the water needs of system users during peak demand periods. Treasure and Rosebud Counties are experiencing abnormally dry to moderate drought conditions, as noted by the U.S. Drought Monitor. Project partners include local water users and the Montana Department of Natural Resources Renewable Resource Grant program (MT DNRC RRG).

- State the length of time and estimated completion date for the proposed project (month/year).

Proposed Construction Start Date: 9/2027

Proposed Construction End Date: 4/2028

Project Duration: 14 months

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

The YID is not located on a Federal facility.

#### **D.2.2.2.4 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 Project is located approximately 12 miles east of Hysham, MT, with the Main Canal portion occurring in Sections 9 and 16, Township 6 North, Range 38 East at an approximate latitude and longitude of 46.265289°N and 106.987897°W, Rosebud County, MT. The Lateral 17.6 portion of the project is located roughly 0.8 mile west, upstream, of the Main Canal project in Section 8, Township 6 North, Range 38 East at an approximately latitude and longitude of 46.282439°N and 107.004092°W, Rosebud County, MT. Exhibit 1 provides a general location map of the Main Canal and Lateral 17.6 Rehabilitation Project. The YID diverts water to the Main Canal from the Yellowstone River, and then conveys it to YID users via a series of headgates and laterals. Lateral 17.6 is one of the ditches supplied by YID and provides water for approximately 427 acres of prime cropland. The Main Canal reach is proposed at the approximate midpoint of the overall system, and directly benefits roughly 7,034 acres or 53.6% of the YID system. In total, the project affects the water supply for 7,461 acres of farmland each season, which is roughly 57% of the YID irrigation system.

#### **D.2.2.2.5 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.

*Please do not include your project schedule and milestones here; that information is requested in response to the Readiness to Proceed criterion described in Section E.1.5.2. In addition, please avoid discussion of the benefits of the project, which are also requested in response to evaluation criteria described in Section E.1. This section is solely intended to provide an understanding of the technical aspects of the project.*

*Note, if the work you are requesting funding for is a phase of a larger project, please only describe the work that is reflected in the budget and exclude description of other activities or components of the overall project.*

The YID oversees water delivery across 13,121 acres in Treasure and Rosebud Counties, utilizing over 30 miles of gravity-flow conveyances that divert water from the Yellowstone River, located three miles west of Hysham, Montana. Established in 1909, the district has a long history of irrigation development, with the diversion from the Yellowstone River completed in 1932. The diversion point's geographic coordinates are approximately 46.282011° N latitude and -107.301173° W longitude. The Main Canal runs along the Yellowstone River valley margin between Hysham and Forsyth, predominantly as an open ditch that traverses soils with varying porosity and stability. The irrigation laterals, which distribute water to individual users, largely consist of unlined ditches. The irrigated lands under YID's management significantly contribute to the local and regional economy, generating over \$15 million in annual revenue. The YID has identified the project as a critical component of the irrigation system. The Main Canal serves as the backbone of this system, and the proposed 5,042-foot lining reach directly impacts over half of the 13,121 acres serviced by the YID by enhancing management efficiency and water conservation capabilities. Lateral 17.6, a primary lateral branching off the Main Canal, encompasses over a mile of canal and serves 427 acres. The project aims to improve water delivery efficiency and conservation via conversion of 2,600 linear feet of Lateral 17.6, thereby delivering significant resource benefits to the YID, the local community, the region, and the state.

**Main Canal Rehabilitation:** The Main Canal is currently deteriorating, hindering its capacity to adequately serve irrigators. Key issues such as seepage, bank slumping, and salinity have impacted operations. YID estimates that approximately 45 acres of previously productive farmland have been lost due to saturated soils and salinity from seepage. The losses not only reduce irrigation efficiency but also elevates O&M costs for YID. The 5.75-mile reach from Sanders Hill to Reservation Creek has been identified as a high-priority area for canal rehabilitation due to significant seepage losses. As part of a collaborative effort, the DNRC performed a seepage study of the main canal. The findings corroborate YID's observations regarding seepage and water delivery challenges. Results indicate an average loss of 3 cubic feet per second (cfs) per mile from east of Sanders Hill to the Reservation Creek Road crossing. The measurements show that the 2021 flow rate through the project area along the Main Canal at flow gauge YID8 (east of Sanders Hill) was 115.2 cfs and the flow rate at flow gauge YID9 (at Reservation Creek Road crossing) was 78.6 cfs. With 30.6 cfs of water use in this area, the 2021 study shows a seepage loss of 6 cfs, or 5.2 percent of total flow, of the water diverted through the 5.75-mile section. The 2023 DNRC data indicates an even bigger seepage loss throughout the project area, as the 2023

flow rate at flow gauge YID8 (east of Sanders Hill) was 125.9 cfs and the flow rate at flow gauge YID9 (at Reservation Creek Road crossing) was 99.4 cfs. With 9.4 cfs of water use in this area, the 2023 study shows a seepage loss of 17.1 cfs, or 13.6 percent of total flow, of the water diverted through the 5.75-mile section. The project is strategically positioned adjacent to the 45 acres of farmland that have been lost due to saturation and salinity, ultimately aiming to restore this land to productive use. In total, rehabilitation of the identified 5,042-foot stretch of the Main Canal will conserve 869 acre-feet of water annually through the mitigation of seepage losses.

**Lateral 17.6 Rehabilitation:** The YID system has numerous laterals diverting water from the Main Canal to individual users. However, due to a lack of personnel to monitor water demand and adjust headgates, these laterals frequently divert excess water even during periods of inactivity. This inefficiency results in an estimated 70% of the water diverted to the laterals being wasted back to the Yellowstone River, amounting to approximately 20,000 acre-feet annually. The excess irrigation water undergoes physical and chemical alterations as it travels through the system, leading to the concentration of salts, nutrients, sediment, and chemicals in the return flows. This poses risks to water quality during irrigation season when river baseflows are low. The YID is committed to enhancing its water delivery efficiency while strategically assessing project needs to maximize the impact of limited financial resources. As a result, YID engaged professional consultants to prioritize lateral conversions based on cost-effectiveness and resource benefits. Seven laterals were evaluated, with Lateral 17.6 emerging as the most cost-effective, projected to conserve 140 acre-feet of water annually through elimination of seepage losses, and significantly improve irrigation delivery efficiency by minimizing waste flows to the Yellowstone River, by providing 2,980 acre-feet of water annually that can be utilized in downstream portions of the YID system. These portions of the YID system are underserved as the YID struggles to convey sufficient flows east of Sanders Hill due to delivery transport losses. The water conservation and improved delivery efficiency for Lateral 17.6 will be completed at an estimated cost of \$86 per acre-foot. The large quantity of water that will be conserved or more efficiently utilized will be realized through decreased diversions at the Lateral 17.6 headgate, which in turn also reduces O&M costs.

#### UNDERLYING AND POTENTIAL CAUSES

The challenges faced by the YID with the project stem from several underlying factors that contribute to inefficiencies:

1. **Aging Infrastructure:** The YID main canal, constructed in 1909, is experiencing significant deterioration. This aging infrastructure is prone to issues such as seepage and bank slumping, leading to substantial water loss.
2. **Soil Characteristics:** The canals traverse soils with variable porosity and stability, which exacerbates seepage problems. These conditions compromise the canal's structural integrity and hinder effective water delivery.

3. **Operational Limitations:** The YID lacks sufficient operational resources to continuously monitor and adjust headgates according to changing water demands. This results in a static flow rate, causing excess water to be diverted even when it is not needed for irrigation.
4. **High Return Flows:** Approximately 70% of the water diverted to the laterals is returned to the Yellowstone River. This inefficient use of water not only reduces available in-stream baseflows but also leads to poor water quality due to increased sediment, nutrients, and chemical loads in the return flows.
5. **Water Quality Concerns:** The return flows are often of lower quality, adversely affected by exposure to contaminants during conveyance. Increased temperatures and concentration of salts and nutrients further degrade the water quality before it re-enters the river.
6. **Increased Agricultural Demand:** Growing agricultural demand places additional stress on the existing system. The inability to meet this demand effectively can lead to reduced crop production and economic losses for local farmers.
7. **Environmental Factors:** External factors, such as climate variability and changes in precipitation patterns, can further complicate water management efforts, impacting both water availability and quality.

Addressing these underlying causes is essential for improving the efficiency and sustainability of the YID irrigation system.

### Problems and Needs

The project reach along the Main Canal consists of a 5,042-foot section that delivers water diverted from the Yellowstone River to users along the Main Canal, and directly impacts water delivery to 7,034 acres of irrigated land downstream of the project area. This acreage impacted by the project makes up over 50% of the YID delivery system, so impacts of the project are vast and widespread. The project is necessary due to the excessive seepage losses within the system, which results in water delivery and management inefficiencies of both the water resource and maintenance of the system. Based on discussions with YID staff and verified through flow readings, transport losses are significant in the area and YID has difficulty supplying water to irrigated acreage east of Sanders Hill, which is where the project is located. Seepage losses are the primary contributor to transport losses, and based on the NRCS Web Soil Survey, soils in the project area are predominantly silty clays and loams. The DNRC Seepage Study of the YID system utilized 11 different measurement stations along the main canal. The study indicates a loss of 3 cfs per mile in the main canal from east of Sanders Hill to the Reservation Creek Road crossing. Therefore, implementing the rehabilitation project on the 5,042-foot section of the YID Main Canal will conserve 869 acre-feet (283.2 million gallons) of surface water per year. Seepage losses require the YID staff to divert buffer flows through the Main Canal, and the increased flows result in erosion and canal decay that has caused breaches and failures. The project will decrease seepage losses and

improve canal resilience to breaches and failures, thus reducing O&M costs for this canal reach by up to 62% or \$1,150 annually. These savings can be spent focusing on improvements to other portions of the canal that have been historically neglected. The project also provides water quality preservation, the re-development of 45 acres of irrigable land that historically not been farmed due to saturation and salinity issues, increases in crop production across the more than 7,000 acres impacted by the project, and provides public health and safety benefits to YID staff and local residents through the decrease in chances of breaches.

The project also encompasses Lateral 17.6, a critical lateral to the YID delivery system. Similar to the main canal, Lateral 17.6 is primarily an open channel that struggles with efficient water delivery to users due to seepage losses. As a result of these challenges, the YID staff are required to divert excess water, which results in significant wasted return flows to the Yellowstone River. The proposed pipeline conversion of 2,600 linear feet of Lateral 17.6, will allow a pressurized system that supplies water to users on an as-needed basis, improving the efficiency of the system to be in line with the Administrative Rules of Montana (ARM) water use standards, which for the area is estimated at 2.9 acre-feet per acre. Currently, Lateral 17.6 is operated with the diversion headgate wide open, and while users utilize the 2.9 acre-feet per acre, it is estimated that only 30% of the water being diverted to Lateral 17.6 is consumed, via irrigation or transport losses. With 70% of the water being wasted back to the Yellowstone, the water resource is not be efficiently utilized or delivered. The project will conserve approximately 140 acre-feet of water annually through elimination of seepage losses, and improve the water use efficiency of 2,980 acre-feet of water that has historically been wasted back to the Yellowstone River through a closed pipeline system. The efficiency savings will allow 2,980 acre-feet to either be left in the river or put to beneficial use by historically underserved downstream acreage. The project provides enhanced water user autonomy, decreasing the need for YID staff to allocate resources for flow regulation. Management resources could be reallocated to other portions of the system that historically are neglected. The project also preserves water quality and habitat through the elimination of discharge to the Yellowstone River (outside of winterization) by maintaining instream flows during summer when irrigation withdrawals typically deplete the river.

### **Specific Activities that will be Accomplished**

**Design/Permitting/Construction Oversight:** The YID will contract with a licensed Professional Engineer to complete the design of the Main Canal and Lateral 17.6 Rehabilitation Project. The Engineer will be responsible for the design of the project, which will include, but is not limited to hydraulics, geotechnical analysis, construction phasing, details, etc. The Engineer will work with regulatory agencies to complete environmental permitting and compliance activities (as necessary). The Engineer will provide a final plan set and specifications for the proposed project to facilitate construction. The Engineer will also provide advisory services during construction of the project to assure proper installation in accordance with the design plans and specifications.

The main canal rehabilitation consists of stripping all vegetation from the canal banks and canal bottom, reshaping the canal prism to the desired dimensions, and installing a geocomposite liner. Typical geocomposite liners consist of 8-ounce polypropylene nonwoven geotextile fabrics bonded to both the top and bottom of a 20-mil polyethylene geomembrane. After the project reach has been stripped of organic material, the channel would be reshaped to include an average 12-foot bottom width and 1H:1V side slopes to provide canal stability. Then the geocomposite liner would be installed. To ensure that one (1) foot of freeboard remains above the canal's high-water line, the liner would extend to a height of 6 feet above the canal bottom. Following liner installation, a minimum of 6 inches of gravel ballast material would be placed on the liner bottom to protect against damage from livestock and wildlife traffic, to secure the liner in place, and to prevent the liner from floating due to air becoming trapped under the liner. The geocomposite liner product will be screened based on factors such as puncture strength, ease of installation, and eco-friendly composition. The 8-ounce nonwoven geotextiles bonded to the top and bottom of the geomembrane provides additional puncture strength. The existing 5,042-foot stretch of canal currently consists of open channel, earthen bottom prone to seepage and breaching. The proposal would increase irrigation efficiency and ensure an adequate and sustained supply of water for the 7,034 acres of farmland east of the project, as well as minimize or eliminate seepage within the project extents. The project will also significantly improve the YID's ability to efficiently deliver water east of Sanders Hill, which has proven as a challenge historically. An overview and detail of the Main Canal Rehabilitation are shown on Exhibits 2 and 3, respectively.

The Lateral 17.6 rehabilitation consists of converting the existing 2,600 feet of concrete and earth canal to pipe. The pipe will begin with a relocated screening structure at the main canal and connect to the existing pipe at the entrance near Old Highway 10. The new pipe will be 21-inch diameter and will be buried within the existing lateral alignment. Existing piped crossings of Howard Valley Road, a railroad, and Old Highway 10 are nearing the end of their useful life and will also be replaced, or slip lined as part of the project. The existing terminal structure will be modified to hold pressure within the pipe during irrigation season and have a means to drain the pipe for winterization. The project proposal is to complete the pipe conversion of the entire 2,600 feet of open channel lateral. Lateral 17.6 is currently an open channel system that is prone to seepage and delivery inefficiencies where 70% of the water is wasted back to the Yellowstone River, and only 30% is utilized for irrigation or lost through conveyance (seepage and evapotranspiration). The proposed conversion would provide water users with autonomy via pressurizing the system to divert water on demand and return flows to the Yellowstone would only occur during winterization, thus significantly improving delivery efficiency through mitigation of waste flows, conservation of water quantities historically lost to seepage, and decreasing O&M costs for YID personnel.

**Construction:** The YID will contract with a licensed General Contractor to complete the construction of the Main Canal and Lateral 17.6 Rehabilitation Project. The Contractor will be responsible for the purchase of all materials and supplies, providing equipment, material testing, coordinating with subcontractors as

necessary, and providing the workforce to complete the project according to the plans and specifications. The Contractor will work with the selected Engineer throughout the project. The Contractor will mark up the drawings during construction and provide a set of as-built drawings to the Engineer at the completion of the construction. The contractor will be hired following the State of Montana procurement procedures. The main component of the project is installation of the geocomposite liner within the Main Canal, and installation of the 21-inch pipe within Lateral 17.6. Secondary components include canal shaping, grading, backfill, and re-vegetation. These items would be the general bid items that would be publicly bid on to select the lowest qualified bid from a Contractor.

#### **D.2.2.2.6 EVALUATION CRITERIA**

##### **E.1 EVALUATION CRITERIA**

##### **E.1.1 Evaluation Criterion A—Quantifiable Water Savings (25 points)**

*Up to 25 points may be awarded for this criterion. This criterion prioritizes projects that will conserve water and improve water use efficiency, supporting the goals of E.O. 14008. Points will be allocated based on the quantifiable water savings expected as a result of the project. Points will be allocated to give greater consideration to projects that are expected to result in more significant water savings.*

The rehabilitation of the Main Canal is projected to yield significant water savings by mitigating seepage losses. The DNRC seepage study shows an average of 3 cubic feet per second per mile, which results in an estimated loss of 869 acre-feet of water annually within the 5,042-foot project reach. By implementing a geocomposite liner along the 5,042-foot section of the main canal, seepage losses are eliminated, in turn preventing water loss and improving overall irrigation efficiency. This project also aims to restore 45 acres of previously unproductive land affected by saturation and salinity. The 869 acre-feet in savings will contribute to more sustainable water management practices in the region. The project is anticipated to generate approximately \$515,631 in additional revenue because of the increased water delivery efficiency. By conserving water and improving efficiency, this project will enhance the district's ability to withstand periods of drought, ensuring that farmers have reliable access to water even during challenging climatic conditions.

The Lateral 17.6 rehabilitation addresses inefficiencies in water delivery and significantly reduce waste within the YID system. While the entire YID system of laterals currently wastes about 20,000 acre-feet of water annually due to excess diversion, the Lateral 17.6 project aims to address approximately 15% of the overall system waste (2,980 acre-feet) and conserve the Lateral 17.6 seepage losses (140 acre-feet). The proposed project would conserve 140 acre-feet of historic seepage losses through the conversion of 2,600 feet of open channel to a pressurized pipeline system. This conversion will allow for precise water delivery based on actual demand and in accordance the ARM Water Use Standard of 2.9 acre-feet-per acre, resulting in the elimination of waste flows. Additionally, by improving irrigation efficiency and eliminating the historical waste flows to the Yellowstone River which are estimated at

70% of diverted water to Lateral 17.6 (2,980 acre-feet annually), the project will help maintain water quality in the Yellowstone River, supporting overall ecological health.

The project represents a strategic investment in water conservation, irrigation delivery efficiency, and drought resiliency. With projected annual water savings of 869 acre-feet from the Main Canal and 140 acre-feet from Lateral 17.6, improved delivery efficiency of 2,980 acre-feet, and along with the anticipated increase of \$515,631 in annual revenue from the project, these initiatives will not only enhance water use efficiency but also strengthen the district's capacity to manage water resources sustainably in alignment with E.O. 14008.

### **1) 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.

*Please include a specific quantifiable water savings estimate; do not include a range of potential water savings.*

The project will conserve approximately 869 acre-feet of water annually by implementing a geocomposite liner along a 5,042-foot section of the main canal east of Sanders Hill. This liner will effectively seal the canal, preventing significant seepage losses resulting from porous base soils. By enhancing the canal's structural integrity, this project will provide a more efficient delivery of water. In addition, the Lateral 17.6 rehabilitation portion will conserve 140 acre-feet of water per year in seepage through the conversion of 2,600 feet of open canal to a pressurized pipeline system. This modernization will allow for precise water delivery based on actual demand in-line with the 2.9 acre-feet per acre water use standard outlined in MT ARM, thereby reducing excess diversion waste (2,980 acre-feet) and conserving seepage losses (140 acre-feet). Together, these targeted rehabilitation efforts will provide 1,009 acre-feet per year of conserved water and improve delivery and management efficiency of 2,980 acre-feet per year, thereby contributing to improved water and system management and sustainability within the YID.

### **2) Describe current losses:**

Please explain where the water that will be conserved is currently going and how it is being used. Consider the following:

- a. Explain where current losses are going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground)?

The current inefficiencies in the YID system result in substantial water losses, primarily through seepage, spills, and wasted flows that ultimately end up in the Yellowstone River. In the Main Canal, significant seepage occurs due to its aging infrastructure and unlined sections across landscape with porous underlying soils. According to the MT DNRC Seepage Study, the canal experiences an average loss of approximately 3 cubic feet per second (cfs) per mile. This translates to an estimated loss of 869 acre-feet of water annually along the identified 5,042-foot proposed rehabilitation reach of the main canal. This seepage allows water to infiltrate the surrounding soils,

diminishing the amount available for irrigation and contributing to increased salinity levels that negatively affect adjacent agricultural land. The seeped water becomes unavailable for productive use, representing a critical resource loss. Additionally, breaches along the Main Canal exacerbate water loss issues. These breaches, which can occur due to bank slumping or erosion, often lead to water spilling out of the canal and into the surrounding environment. This unregulated outflow contributes to the already significant seepage losses, further reducing the volume of water that reaches the intended agricultural fields. The average loss from breaches and spills can lead to several acre-feet of water being wasted, compounding the overall inefficiency of the system.

In Lateral 17.6, the problem is compounded by both seepage losses and excess diversions as a result of system inefficiencies. Based on a seepage rate of 3 cfs per mile within the project area and Lateral 17.6 having 820 feet of unlined canal, approximately 140 acre-feet of water is lost to seepage each irrigation season. Additionally, 2,980 acre-feet of water is wasted annually due to the inability to adjust flow rates to match actual irrigation needs. The MT ARM for water use standards identifies the area as needing approximately 2.9 acre-feet of water per acre of land. However, the system delivery inefficiencies are resulting in approximately 70% of diverted water to be wasted to the Yellowstone River, and only 30% being utilized in accordance with the water use ARM or lost to delivery inefficiencies (seepage). Additionally, the water diverted from the Yellowstone takes roughly 7 days to traverse through the YID system, which provides negative impacts in both flow quantity and habitat within the Yellowstone River, particularly during low flow periods. This return flow not only represents a significant management inefficiency of the water resource, but also introduces a high concentration of salts, nutrients, and sediments, negatively impacting the Yellowstone River water quality.

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?

The YID estimates that current losses within water delivery system primarily result from seepage and inefficient water management in the Main Canal and Lateral 17.6. Seepage losses are not able to be utilized by others within the system. Approximately 70% of the water diverted to the lateral is wasted, leading to substantial return flows into the Yellowstone River. These excess return flows are undergoing physical and chemical changes as both surface and groundwater, which contribute to increased sediment, nutrients, and contaminants, thereby degrading water quality before re-entering the Yellowstone River.

- b. 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?

The project primarily represents inefficiencies in water delivery and management and does not yield significant positive outcomes. While seepage from canals may create some localized wetland areas, the benefits are minimal and overshadowed by negative impacts. The seepage losses and return waste flows can provide temporary habitat for certain wildlife, but the salinity and contaminants present in the discharge compromise the quality of both habitat and water. Additionally, any potential nutrient input to adjacent soils is negated by the adverse effects of increased salinity and pollution, which can harm plant health and agricultural productivity. Though there is potential for groundwater recharge from seepage, the impaired quality of this water limits its future usability for agricultural purposes. Overall, these losses contribute more to ecological and agricultural degradation than they provide meaningful benefits, highlighting the need for the project.

### **3) Describe the support/documentation of estimated water savings:**

Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations. Note: projects that do not provide sufficient supporting detail/calculations may not receive credit under this section. Please be sure to consider the questions associated with your project type (listed below) when determining the estimated water savings, along with the necessary support needed for a full review of your proposal.

*In addition, note that the use of visual observations alone to calculate water savings, without additional documentation/data, are not sufficient to receive credit under this section. Further, the water savings must be the result of reducing or eliminating a current, ongoing loss, not the result of an expected future loss.*

The project will provide up to 1,009 acre-feet of water conservation annually that is historically lost to canal seepage, with 869 acre-feet and 140 acre-feet coming from the main canal and lateral 17.6 portions, respectively. Additionally, the delivery inefficiencies within Lateral 17.6 result in 70% of the flows diverted being wasted to the Yellowstone River. Utilizing the water supply rate of Lateral 17.6, which is based on a value of 0.0325 cfs per acre over the 427 acres served and includes both crop need and conveyance/on-farm inefficiency losses, 4,220 acre-feet of water is being diverted annually. The MT ARM for water use standards, Section 36.12.115, identifies that approximately 2.9 acre-feet per acre is needed for the climactic region and farm type. As a result, only 1,240 acre-feet per year is necessary to meet crop demand. The system inefficiency is based on the water supply rate for the Lateral, 4,220 acre-feet, minus the crop demand, 1,240 acre-feet, resulting in approximately 2,980 acre-feet being wasted annually. The water losses are current, ongoing losses in the form of excess buffer flows diverted at the Lateral 17.6 headgate due to operational inefficiencies and seepage losses. Similarly, the Main Canal losses are due to significant seepage stemming from porous soils within the project area. As a result of seepage, inefficient diversion methods are utilized by YID personnel to divert excess water through both the Main Canal and Lateral 17.6 system in an effort to meet irrigation demands while also combatting seepage losses. This practice is extremely inefficient and results in return flows from the YID system to the Yellowstone River. The 5.75-mile reach from Sanders Hill to Reservation Creek has been identified as a high-priority area for rehabilitation

due to significant seepage losses. Based on conversations with the YID, these seepage losses result in significant challenges for YID staff to supply water to system users downstream of Sanders Hill, which is where the project is located. As part of a collaborative effort, the DNRC conducted a seepage study in 2021 and 2023. The findings corroborate YID's observations regarding seepage and water delivery challenges. Results indicate an average loss of 3 cubic feet per second (cfs) per mile from east of Sanders Hill to the Reservation Creek Road crossing. A seepage measurement on September 13, 2021, recorded a loss of 6.0 cfs (5.2%), while two years later, the loss increased to 17.1 cfs (13.6%). The proposed Main Canal portion of the project is 5,042 linear feet. The 869 acre-feet conserved annually from the Main Canal portion of the project was estimated based on the seepage study loss rate and a 153-day irrigation season.

Lateral 17.6 conservation volumes are based on the same DNRC seepage study along the unlined section of the lateral, 820 feet. Utilizing the conservative rate of 3 cfs per mile from the DNRC seepage study over the 820-foot unlined reach of the lateral, 140 acre-feet is lost to seepage over the 153-day irrigation season. Additionally, Lateral 17.6 has extremely high return flows due to inefficient management practices and delivery inefficiencies. The water conservation estimate from the proposed project is based on water lost to seepage. However, the system inefficiencies and waste flows are notable and based on water supply rate of a priority lateral minus crop demand using estimations from the MT ARM related to water use standards such that calculations are specific to the climatic conditions of the area. Based on these values, it is estimated that 4,220 acre-feet of water is supplied, demand is 1,240 acre-feet, and as a result, 2,980 acre-feet of water is wasted back to the Yellowstone River on an annual basis under current conditions. This waste flow is not included as a conservation benefit of the project but identifies the significant inefficiency of the Lateral 17.6 delivery system when comparing water supply rates for MT ARM water right use standards of 2.9 acre-feet per acre demand. The project provides delivery efficiency improvements to Lateral 17.6 and mitigates the waste flows of the lateral to zero throughout the irrigation season and minor waste for winterization of the proposed pipeline system. The historic waste flows would become available for being left in the Yellowstone River or put to beneficial use to the downstream acreage of Lateral 17.6, which as previously noted, is historically underserved due to conveyance losses such as seepage. Supporting details and calculations are provided in subsequent sections of this grant application.

**4) Please address the following questions according to the type of infrastructure improvement you are proposing for funding.**

See Appendix A: *Benefit Quantification and Performance Measure Guidance* for additional guidance on quantifying water savings.

(1) **Canal Lining/Piping:** Canal lining/piping projects can provide water savings when irrigation delivery systems experience significant losses due to canal seepage. Applicants proposing lining/piping projects should address:

- a. 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 proposed project will provide up to a total of 1,009 acre-feet of water conservation benefit annually over the next 30 years, with 869 acre-feet from the main canal lining portion of the project, and 140 acre-feet from the lateral conversion. The water losses are current, ongoing losses in the form of significant seepage losses as a result of increased buffer flows and highly porous soils. The YID has noted historic difficulties with supplying sufficient water to system users east of Sanders Hill, which is where the project is located. As a result, the YID diverts excess buffer flows through the delivery system to try and offset system inefficiencies. The combination of porous soils and excess buffer flows result in 3 cfs per mile being lost to seepage within the project area according to the DNRC Seepage Study. The excess buffer flows diverted at the Lateral 17.6 headgate due to O&M inefficiencies result in 2,980 acre-feet per year being wasted to the Yellowstone River. This volume will not be conserved by the proposed project but would be available for beneficial use or remain in the river through the improved delivery efficiency in line with the MT ARM water use standards. The water savings from seepage losses will occur via the installation of a geocomposite liner along the Main Canal and conversion to a pressurized pipeline system within Lateral 17.6, which in total conserves 1,009 acre-feet annually. The pressurized pipeline system will provide an on-demand water supply with minimal waste flows to the Yellowstone, allowing for improved on-farm efficiency and better management of the water resource.

#### Water Savings Estimate for YID Main Canal:

The YID's current operations require additional buffer flows within the Main Canal to combat seepage losses in an effort to meet the varying demands of users, particularly those irrigators east of Sanders Hill that are historically underserved due to these conveyance losses. The YID system operates on average 153-day irrigation season, which is standard for the area and region. In 2021 and 2023, the MT DNRC conducted a seepage study for the YID system by utilizing 11 different measurement stations along the YID Main Canal. Results from the study indicated a loss of 3 cubic feet per section (cfs) per mile in the YID canal east of Sanders Hill to the Reservation Creek Road crossing, which is the project location. The seepage study is included in Appendix A for reference. Based on this seepage loss value, a 153-day irrigation season, and the 5,042-foot identified reach, it is estimated that 869 acre-feet of water is lost annually to canal leakage. This calculation for water conservation is as follows:

$$\left(\frac{3 \text{ ft}^3/\text{sec}}{1 \text{ mile}}\right) * \left(\frac{1 \text{ mile}}{5,280 \text{ feet}}\right) * (5,042 \text{ feet}) * \left(86,400 \frac{\text{sec}}{\text{day}}\right) * \left(\frac{1 \text{ ac} - \text{ft}}{43,560 \text{ ft}^3}\right) * (153 \text{ days}) =$$

**869 ac – ft**

As a result of the proposed project, seepage in the 5,042-foot stretch of the Main Canal will be eliminated, conserving up to 869 ac-ft of water annually that can remain in the Yellowstone River or put to beneficial use. The conservation benefits will continue annually throughout the anticipated 30-year design life of the project and the conservation savings will be measured, recorded, and summarized as water records by YID staff annually.

#### Water Savings Estimate for YID Lateral 17.6:

Lateral 17.6 operates with buffer flows to combat seepage losses in addition to lacking sufficient O&M capacity to monitor headgates. As a result, headgates for all laterals, including Lateral 17.6, are left open at high-rate water delivery to ensure downstream users have adequate water supply, even during times that irrigation is not occurring. Lateral 17.6 contributes to the water conservation with the proposed project as the conversion to a pressurized pipeline will combat seepage losses and provide significant alternative use options of historically wasted flows. The Lateral 17.6 headgate is located within the area of the DNRC seepage study, included in Appendix A, and indicates a seepage loss in the main canal of 3 cfs per mile. This rate was applied to the 820 feet of the lateral that is unlined, resulting in 140 acre-ft of water being lost due to seepage each irrigation season. A summary of this conservation calculation is as follows:

$$\left(\frac{3 \text{ ft}^3/\text{sec}}{1 \text{ mile}}\right) * \left(\frac{1 \text{ mile}}{5,280 \text{ feet}}\right) * (820 \text{ feet}) * \left(86,400 \frac{\text{sec}}{\text{day}}\right) * \left(\frac{1 \text{ ac} - \text{ft}}{43,560 \text{ ft}^3}\right) * (153 \text{ days}) =$$

**140 ac – ft**

The proposed project will eliminate seepage in the 820-foot existing unlined Lateral 17.6 reach, thus conserving up to 140 ac-ft of water annually.

Additionally, the proposed project will eliminate the current procedure of operating Lateral 17.6 at a high-water supply rate continuously with the headgate left wide open as a pressurized pipeline system will be “user operated.” A pressurized lateral system will allow users to open and close their supply lines as necessary, and flows will not be wasted from the Lateral 17.6 pipeline outside of winterization. The YID Water Right, 42KJ 208946-00, allows for a maximum flow rate of 420 cfs and maximum acreage of 9,386 acres. Based on the maximum acreage allowed for the YID, the 2.9 acre-feet per acre MT ARM water use standard, and a 153-day irrigation season, the theoretical crop demand for the YID water right is 89.7 cfs per irrigation season day. Meanwhile, Lateral 17.6 is utilizing a water supply rate of 13.9 cfs (0.0325 cfs per acre over 427 acres) to provide sufficient water for crop demand and overcome conveyance losses and on-farm inefficiencies. With Lateral 17.6 comprised of 427 acres served, and the YID system providing

water delivery for 13,121 acres, Lateral 17.6 is serving 3.3% of the land, but utilizing 15.5% of the water right crop demand (13.9 cfs versus 89.7 cfs). This inefficiency is impacting the YID ability to efficiently deliver water to all users served by YID. To estimate the project benefit, a simple supply versus demand requirement analysis was conducted using agricultural data from the YID and MT ARM related to water use standards. The required water supply rate of the priority lateral is 13.9 cfs, or 4,220 acre-feet over an irrigation season for the 427 acres served by Lateral 17.6. This calculation is based on a value of 0.0325 cfs per acre, which includes 0.025 cfs per acres to meet crop needs and 0.0075 cfs for conveyance losses and on-farm inefficiencies. The estimated crop need was determined using a standard value of 2.9 acre-ft per acre, which was sourced from Section 36.12.115 of the MT ARM related to water use standards. This value is specific to the climatic conditions of the area and an averaged value to account for a variety of irrigation ditch types. The calculated crop demand for the 427 acres served by Lateral 17.6 is 1,240 acre-ft per year. Because the proposed project will reduce the amount of water diverted from the main canal to only what is necessary to meet crop demand, the difference between water supply and crop demand is equal to the amount of water available for alternative use, such as being left in the river or put to beneficial use downstream of the project. Below is a summary of calculations for wasted flows from Lateral 17.6 to the Yellowstone River.

**Supply Rate:**

$$\left( \frac{0.0325 \frac{ft^3}{sec}}{ac} \right) * (427 ac) = \left( 13.9 \frac{ft^3}{sec} \right) * \left( \frac{86,400 sec}{1 day} \right) * \left( \frac{1 ac - ft}{43,560 ft^3} \right) * (153 days)$$

$$= 4,220 ac - ft$$

**Crop Demand:**

$$\left( 2.9 \frac{ac - ft}{ac} \right) * (427 ac) = 1,240 ac - ft$$

**Annual Water Waste:**

$$\text{Supply Rate} - \text{Crop Demand} = (4,220 ac - ft) - (1,240 ac - ft)$$

$$= 2,980 ac - ft$$

The project will result in mitigation of seepage in the 820-foot reach of Lateral 17.6, which will conserve up to 140 ac-ft of water annually and will continue annually throughout the 30-year project design life. Conservation savings will be measured, recorded, and summarized as water records by YID staff annually. Additionally, the proposed project will minimize waste flows to the Yellowstone River by implementation of the pipeline operating as an on-demand system. This optimization will result in another 2,980 ac-ft of water available for beneficial use or left in the Yellowstone River annually.

- b. 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.

Please see the explanation above in 1a.

- c. 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)?

The expected post-project seepage losses for both the Main Canal and Lateral 17.6 Rehabilitation Project are zero. For the Main Canal, a geocomposite liner, which consists of 8-ounce non-woven geotextile fabrics bonded to both the top and bottom of a 20-mil polyethylene geomembrane, will be installed along the entirety of the canal with 1-foot of freeboard from the high-water mark. A properly installed polyethylene liner should have zero seepage/leakage losses. In a conscious effort to ensure seepage/leakage losses are mitigated, the YID is committed to actively monitoring canal flow rates and meticulously maintaining records. Upon project completion, the YID staff will verify leakage quantities are meeting the expected results. The canal lining will result in conservation of 869 acre-feet each year. The expected post-project seepage losses for Lateral 17.6 is also zero. Implementation of the pipeline conversion would eliminate seepage and evapotranspiration losses through the existing lateral. The plastic irrigation pipe (PIP) will have watertight joints, be buried, and properly compacted. The impermeable pipe installation would result in the conservation of 140 acre-feet each year through elimination of seepage losses and improve resource management efficiency of 2,980 acre-feet per year historically wasted to the Yellowstone River.

- d. 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?

The proposed project involves installing 5,042-feet of geocomposite liner along the Main Canal, and 2,600 linear feet of conversion on Lateral 17.6 to a closed pipeline system. The geocomposite liner is anticipated to conserve 869 acre-feet of water, while the lateral conversion is expected to conserve 140 acre-feet, both through elimination of seepage losses. For purposes of annual transit loss calculations, the total project length, which encompasses the main canal and lateral 17.6 rehabilitations, is 5,862 linear feet with an expected conservation value of 1,009 acre-feet. Therefore, the anticipated annual transit loss reduction is 909 acre-feet per mile for the project. The project will provide significant resource management efficiency improvements through mitigation of historic waste flows from Lateral 17.6. 2,980 acre-feet is wasted annually to the Yellowstone, and while not included in conservation,

provides a significant quantity of water that can be put to beneficial use by downstream irrigators.

e. How will actual canal loss seepage reductions be verified?

To verify seepage loss in the Main Canal, hydraulic monitoring will be conducted at several points along the 5,042-foot project reach. Flow meters will be utilized at the inflow point, the midpoint, and the outflow point to measure flow rates. These measurements will allow the YID to assess seepage losses throughout the project area. Additionally, flow rates from laterals within the project will be monitored and taken into consideration to quantify losses accurately. For Lateral 17.6, the pressurized pipeline will feature pressure-tight gaskets and materials designed for pressurized applications, ensuring an air-tight system with no leaks, and thus eliminating the potential for seepage. Verification will include checking the buried pipeline for signs of leakage, ensuring that users maintain sufficient operating pressures, and keeping detailed records of water usage, which would indicate that seepage losses are also absent.

f. Include a detailed description of the materials being used.

The rehabilitation of the Main Canal and Lateral 17.6 will utilize a variety of materials designed to enhance efficiency and sustainability. For the Main Canal, a geocomposite liner will be installed, consisting of 8-ounce polypropylene nonwoven geotextile fabrics bonded to a 20-mil polyethylene geomembrane. This liner will create a water-tight barrier to minimize seepage, while the geotextile provides puncture resistance against livestock and wildlife traffic. The liner will be installed after the canal has been stripped of organic material and reshaped for stability, extending 6 feet above the canal bottom to provide 1-foot freeboard above the high-water line. To secure the liner in place and protect it from floating due to trapped air, a minimum of 6 inches of gravel ballast will be placed on top. The canal's reshaping will involve the use of excavated earth and concrete materials, which will be compacted to enhance the canal's structural integrity.

For Lateral 17.6, a new pipeline made from 21-inch diameter PIP or a similarly durable material will be installed. This pressurized pipeline will replace the existing open channel, enabling efficient, on-demand water delivery while eliminating seepage losses. Additionally, the screening structure will be relocated to facilitate the transition from the canal to the pipeline and prevent debris from entering the system. Existing piped crossings, such as those over Howard Valley Road and railroads, will either be replaced or slip-lined to maintain functionality and structural integrity. Clean, compactable soil or gravel will be used as backfill for the pipeline trench. A native seeding mix of grasses and vegetation will be employed for re-vegetation along the canal banks post-construction, helping stabilize the soil, reduce erosion, and enhance habitat restoration. This comprehensive approach to materials and

construction practices aims to improve the irrigation system's overall efficiency while minimizing environmental impacts.

(2) **Municipal Metering:** Municipal metering projects can provide water savings when individual user meters are installed where none exist to allow for unit or tiered pricing and when existing individual user meters are replaced with advanced metering infrastructure (AMI) meters. To receive credit for water savings for a municipal metering project, an applicant must provide a detailed description of the method used to estimate savings, including references to documented savings from similar previously implemented projects. Applicants proposing municipal metering projects should address the following:

- a. 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.

N/A

- b. How have current system losses and/or the potential for reductions in water use by individual users been determined?

N/A

- c. For installing end-user water service meters, e.g., for a residential or commercial building unit, refer to studies in the region or in the applicant's service area that are relevant to water use patterns and the potential for reducing such use. In the absence of such studies, please explain in detail how expected water use reductions have been estimated and the basis for the estimations.

N/A

- d. What types (manufacturer and model) of devices will be installed and what quantity of each?

N/A

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

N/A

(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:

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

N/A

- b. 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.

N/A

- c. 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?

N/A

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

N/A

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

N/A

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

N/A

**(4) Turf Removal:** Applicants proposing turf removal projects should address:

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

N/A

- b. What is the total surface area of turf to be removed and what is the estimated average annual turf consumptive use rate per unit area?

N/A

- c. Was historical water consumption data evaluated to estimate average annual turf consumptive use per unit area? If so, did the evaluation include a weather adjustment component?

N/A

- d. Will site audits be performed before applicants are accepted into the program?

N/A

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

N/A

**(5) Smart Irrigation Controllers, Controllers with Rain Sensor Shutoff, Drip Irrigation, and High-Efficiency Nozzles:** Applicants proposing smart irrigation controllers, controllers with rain sensor shutoff, drip irrigation, or high-efficiency nozzle projects should address:

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

N/A

- b. Was historical water consumption data evaluated to estimate the percent reduction in water demand per unit area of irrigated landscape? If so, did the evaluation include a weather adjustment component?

N/A

- c. What types (manufacturer and model) of devices will be installed and what quantity of each?

N/A

- d. Will the devices be installed through a rebate or direct-install program?

N/A

- e. Will site audits be performed before and after installation?

N/A

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

N/A

(6) **High-Efficiency Indoor Appliances and Fixtures:** Installing high- efficiency indoor appliances and fixtures can provide water savings for municipal water entities where there is significant potential for replacing existing non-efficient indoor appliances and fixtures. Applicants proposing high-efficiency indoor appliance and fixtures projects should address:

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

N/A

- b. What types (clothes washers, shower heads, etc.) of appliances and fixtures will be installed and what quantity of each?

N/A

- c. Have studies been conducted to verify the existence of non-efficient appliances and fixtures? Provide published water savings rates for each of these devices and reference the source for each of the device savings rates.

N/A

- d. Will the devices be installed through rebate or direct-install programs?

N/A

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

N/A

(7) **Commercial Cooling Systems:** Cooling towers are components of many refrigeration systems with many applications. They dissipate heat to the atmosphere through the evaporative process and are common in manufacturing processes where cooling is required. They are also used for cooling large commercial buildings. Cooling tower structures vary in size, design, and efficiency. Regardless, all cooling towers consume large volumes of water and energy.

Open-circuit or direct contact are the most common types of cooling towers. Water is supplied to the tower after gathering heat and then released in the upper tower levels. A fan near the base of the tower creates upward airflow. Closed-circuit towers are more efficient and closed-circuit towers with adiabatic cooling are more efficient yet.

Water and energy savings can be achieved by replacing or retrofitting older low efficiency cooling towers. Applicants proposing cooling system projects should address:

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

N/A

- b. Was historical water consumption data evaluated to estimate the percent reduction in water demand?

N/A

- c. Specify type (manufacturer and model) of cooling tower system to be installed and/or provide a detailed description of the system retrofit plan.

N/A

Note that an agreement will not be awarded for an improvement to conserve irrigation water unless the applicant agrees to the terms of Public Law 111-11 § 9504(a)(3)(B) (see Section F.2.7. *Requirements for Agricultural Operations under P.L. 111-11 §9504(a)(3)(B)*).

The YID understands and will agree to the terms of Section 9504(a)(3)(B) of Public Law 111-11.

### **E.1.2 Evaluation Criterion B—Renewable Energy (20 points)**

*Up to 20 points may be awarded based on the extent to which the project increases the use of renewable energy or otherwise results in increased energy efficiency and reduced greenhouse gas emissions.*

*For projects that include constructing or installing renewable energy components, please respond to Subcriterion No. B.1: Implementing Renewable Energy Projects Related to Water Management and Delivery. If the project does not implement a renewable energy project but will increase energy efficiency, please respond to Subcriterion No. B.2. Increasing Energy Efficiency in Water Management. If the project has separate components that will result in both implementing a renewable energy project and increasing energy efficiency, an applicant may respond to both.*

*Note: an applicant may receive points under both Subcriteria No.B.1 and B.2 if the project consists of an energy efficiency component separate from the renewable energy component of the project. However, an applicant may receive no more than 20 points total under both Subcriteria No. B.1 and B.2.*

#### **E.1.2.1 Subcriterion No. B.1: Implementing Renewable Energy Projects Related to Water Management and Delivery**

*Up to 20 points may be awarded for projects that include constructing or installing renewable energy components (e.g., hydroelectric units, solar-electric facilities, wind energy systems, or facilities that otherwise enable the use of renewable energy). Projects such as small-scale solar resulting in minimal energy savings or production will be considered under Subcriterion No. B.2.*

**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.

N/A

**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.

N/A

**Describe the status of a mothballed hydropower plant.** For projects that are bringing mothballed hydropower capacity back online, please describe the following:

- Clearly describe the work that will be accomplished through the WaterSMART Grant. Note: normal OM&R activities are not eligible for funding. The work being proposed must be an investment.

N/A

- Provide information about the capacity (in kilowatts) of the existing hydro system and the expected capacity once it is brought back on-line.

N/A

- Provide information about the duration that the hydro system has been offline and the reasons why it has been mothballed. Please include any regulatory reporting or filings (e.g., FERC filings) or other documentation regarding the system.

N/A

**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

See answer to E.1.2.2 below.

- Expected environmental benefits of the renewable energy system

The project is expected to provide significant environmental benefits. The project will eliminate water loss through seepage, leading to more efficient water delivery and lower energy consumption for irrigation operations. This efficiency will not only reduce operational costs for water users but also contribute to a decrease in greenhouse gas emissions associated with water management. The project will eliminate seepage and/or evaporation losses, helping to conserve vital water resources, which is critical in regions facing water scarcity and bolstering drought resiliency. Improved management practices will also prevent pollutants, such as nutrients and sediments, from entering local waterways in waste flows, thereby enhancing water quality. Additionally, water temperature in canal and lateral tends to be higher than the in-stream river flows, which can negatively impact aquatic ecosystems

and habitat. By reducing excess return flows, the projects will help maintain cooler temperatures in the river, benefiting aquatic habitats and contributing to local biodiversity. Water users draw water from laterals using pumps to provide enough pressure to push water from the lateral through their irrigation system. An open channel system does not maintain any pressure or energy and requires maximum pumping effort. The proposed project will conserve energy by providing a closed pipeline system that provides pressure at each individual turnout. This pressure will reduce pumping demand and save energy and costs to water users. 89 acres served by Lateral 17.6 are currently irrigated by pumping water through a pivot sprinkler system. A pressurized lateral would provide 6.5 psi of head at the turnout, reducing required pumping power by 6.5 horsepower. This energy savings equates to 5,280 kilowatt-hours over each irrigation season. Using a cost per kilowatt-hour of \$0.12, the total cost savings over each growing season is estimated at \$633 upon completion of the entire lateral conversion. The energy savings provided by the project will increase as additional acres are converted from flood irrigation to sprinkler irrigation; and based on YID and professional experience with similar projects, system users are more likely to transition to more efficient irrigation methods, such as sprinkler irrigation, when the option is readily available. The efficiency gained from this conversion will further contribute to a decrease in greenhouse gas emissions, aligning with sustainability goals in agriculture.

The project proximity to the Yellowstone River is expected to provide preservation benefits for local wildlife species, particularly aquatic and terrestrial fauna. The improved water management practices will preserve the quality and quantity of water in the Yellowstone River. By mitigating seepage, more water will be conserved in the system, leading to a more stable flow in the river. This is crucial for native fish species such as the Yellowstone Cutthroat Trout and Mountain Whitefish, as stable flows help maintain suitable habitats for spawning and feeding. Additionally, enhanced water quality will reduce pollutants and sediments that can harm fish populations and other aquatic organisms. For terrestrial wildlife, the project will contribute to healthier ecosystems along the riverbanks by improving the health of the surrounding vegetation, which serves as habitat for various bird species like Bald Eagles and Osprey.

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

See answer to E.1.2.2 below.

- Anticipated benefits to other sectors/entities.

### Economic Benefits:

The project directly benefits 7,461 acres of agricultural land, which makes up 57% of the acreage served by the YID system. As a result, positive impacts

from the project will be widespread. Crops grown on the 7,461 acres consist of sugar beets, corn, malt barley, hay, and wheat. Economically, the project is anticipated to bring 45 acres of land that have historically been unfarmable due to saturation and salinity back into wheat production. The improved management capabilities and water conservation from the project is expected to increase crop production by 10%, which produces an additional \$515,631 in annual revenue. This additional revenue over a 20-year design life, at a 4.5% interest rate, provides an additional \$6.71 million dollars generated as a direct result of the project. Additionally, water users on Lateral 17.6 will directly benefit from reduced pumping costs. The pressurized lateral will reduce required pumping power, improving energy efficiencies in the irrigation system. It is estimated that upon completion of the 2,600 feet of lateral to pipeline conversion, water users will save \$633 per year. Conversations with the YID indicate that the crops grown throughout the YID service area are distributed state- and region-wide, therefore impacting a wide range of people within the State of Montana and beyond. The proposed project will have a far-reaching positive impact on the citizens of Montana. Increases in crop production will have a direct impact on a statewide basis, as the crops produced are used throughout the State and contribute to the local and state tax bases from increased revenues.

#### Public Welfare Benefits:

Rehabilitating the irrigation laterals will also allow the YID to run the main canal at a reduced flow rate during much of the year, reducing canal seepage, as well as the likelihood of a breach. A canal breach would risk public health and safety for those traveling on Old Highway 10, the associated frontage road, and the BNSF railroad which run parallel to and are just downgradient from the YID main canal throughout most of the YID boundary. There are also many residences below the canal, which could flood due to a canal breach. A canal breach also results in a significant economic impact. It is estimated that a 10-day shut down in 2015 reduced yields and impacted the ag economy by 10%. Local taxes generated from the district are estimated near \$150,000 for Rosebud and Treasure Counties. The \$80,000 in local taxes for Treasure County are especially important as they account over 16% of the annual local tax revenue from land for the county. Taxes from non-irrigated tillable land and grazing land are a fraction of the revenue generated from irrigated lands. Failure of the system, even if only even temporary, has a significant, lasting impact to the local economy. Short-term economic benefits will occur via short-term work, trucking, and supply purchases that will be required for the project's construction.

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

N/A

AND/OR

### E.1.2.2 Subcriterion No. B.2: Increasing Energy Efficiency in Water Management

Up to 6 points may be awarded for projects that address energy demands and reduce greenhouse gas emissions by retrofitting equipment to increase energy efficiency and/or through water conservation improvements that result in reduced pumping or diversions.

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.

Water users draw water from laterals using pumps to provide enough pressure to push water from the lateral through their irrigation system. An open channel system does not maintain any pressure or energy and requires maximum pumping effort. The project will conserve energy by providing a closed pipeline system that maintains energy and provides pressure at each turnout. This pressure will reduce pumping demand and save energy/costs to water users. Currently, 89 acres served by Lateral 17.6 are irrigated by pumping water through a pivot sprinkler system. A pressurized lateral would provide 6.5 psi of head at the turnout, reducing required pumping power by 6.5 horsepower. This energy savings equates to 5,280 kilowatt-hours annually. Using a cost per kilowatt-hour of \$0.12, the total cost savings over each growing season is estimated at \$633. The energy savings provided by the project will increase as additional acres are converted from flood irrigation to sprinkler irrigation; and based on YID and professional experience with similar projects, system users are more likely to transition to more efficient irrigation methods, such as sprinkler irrigation, when the option is readily available.

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

The energy efficiency improvements resulting from the rehabilitation of Lateral 17.6 will play a crucial role in combating and offsetting the impacts of climate change through several mechanisms. By converting the open channel system to a pressurized pipeline, the project will significantly reduce the energy required for irrigation, saving approximately 5,280 kilowatt-hours annually. This energy consumption reduction directly lowers overall energy demand, contributing to a decrease in greenhouse gas emissions. By minimizing the need for pumps, which typically rely on fossil fuels, the project helps reduce emissions associated with energy production, thus lowering the carbon footprint of agricultural practices in the region. Additionally, the enhanced efficiency of the irrigation system will lead to fewer trips and vehicle travel for YID staff. This decrease in travel not only lowers operational costs but also contributes to reductions in vehicle emissions, further offsetting the project's environmental impact. Improved irrigation efficiency also leads to better water management practices, which can mitigate the effects of

climate variability. Efficient use of water resources supports agricultural resilience, allowing crops to thrive even during periods of drought or changing precipitation patterns. Improved irrigation efficiency and seepage mitigation leads to healthier waterways and ecosystems by reducing nutrient and pollutant runoff. As irrigation practices improve, healthier vegetative cover can develop in surrounding areas. Plant growth naturally sequesters carbon dioxide from the atmosphere, contributing to the reduction of greenhouse gases while improving soil health and enhancing biodiversity. The project will not only reduce greenhouse gas emissions but also promote sustainable agricultural practices, enhance local resilience to climate change, decrease vehicle travel and carbon dioxide emissions, and support carbon sequestration through improved vegetative cover.

- 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?

Water users draw water from Lateral 17.6 using pumps to generate enough pressure to move water through their irrigation system. An open channel system does not maintain pressure or energy, requiring maximum pumping effort. The proposed project will conserve energy by implementing a closed pipeline system that retains energy and provides consistent pressure at each turnout. While the project does not eliminate the need for pumps entirely, it significantly decreases pumping requirements by reducing the necessary power by 6.5 horsepower. The size of the existing pumps in use is unknown, but their existing capacity requirement exceeds the expected reduction. 89 acres served by Lateral 17.6 are irrigated using pivot sprinkler systems that rely on pumping. The project will deliver 6.5 psi of head at the turnout, which translates to decreased power demand. This energy savings results in around 5,280 kilowatt-hours saved annually. As more acres transition from flood irrigation to sprinkler irrigation, the energy savings from this project will continue to grow, further benefiting water users and enhancing the overall efficiency of the irrigation system.

- 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.

Energy savings are based on power savings over the course of the irrigation season for the 89 acres served by Lateral 17.6 that currently pump water through a pivot irrigation system from the lateral turnout for the acreage.

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

N/A

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

YID staff currently travels the route between the Main Canal and Lateral 17.6 Rehabilitation project an average of once per day during the irrigation season to verify sufficient flows exist within the Main Canal, as well as verify there are no maintenance demands as a result of the seepage concerns. The YID staff travel from Hysham, MT, which is a 30-mile roundtrip route over gravel or dirt roads that takes roughly 2 hours to complete when accounting for on-site time. The 2-hour O&M visit to the project reaches occurs an average of once per day over the 153-day irrigation season and approximately 1 time per week during the remaining 212-day off-season. The proposed rehabilitation project would reduce the number of trips to approximately five (5) trips per week during the irrigation season and one (1) trip every other week during the offseason. The proposed Main Canal and Lateral 17.6 Rehabilitation Project will significantly reduce the YID's carbon footprint through a decrease in vehicle miles driven. Staff make approximately 183 trips per year to monitor flow and assess canal conditions. With the proposed improvements, this will drop to about 124 trips annually. Given that each trip entails a 30-mile round trip, this reduction results in a savings of 1,770 miles per year. Utilizing the Environmental Protection Agency's estimate of 404 grams of CO<sub>2</sub> emitted per mile for an average passenger vehicle, the project is projected to lower the YID's carbon footprint by approximately 715,080 grams of CO<sub>2</sub>, or 0.72 metric tons, each year. This environmental benefit is expected to persist over the 30+ year design life of the project.

- 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).

The Lateral 17.6 portion of the rehabilitation project will result in decreased pump demand for 89 acres of farmland due to a pressurized pipeline system. This decreases power demand by 5,280 kilowatt-hours annually. It is anticipated that power energy savings will increase as more acreage is converted from flood irrigation to sprinkler irrigation.

### E.1.3 Evaluation Criterion C—Other Project Benefits (15 points)

Up to 15 points may be awarded under this criterion. This criterion prioritizes projects that address a specific water and/or energy concern(s), including enhancing drought resilience and sustainability, addressing the current and future impacts of climate change, and providing ecological benefits.

**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:

The proposed conversion of the 2,600-foot section of Lateral 17.6 to a closed pipeline, along with the lining of the 5,042-foot section of the Main Canal, is projected to provide a significant water savings of 1,009 acre-feet per year. This water conservation will enhance the YID's ability to provide water during

peak irrigation demands and drought conditions, while also augmenting flows to the Yellowstone River. The water savings will directly benefit the 7,034 acres served by the Main Canal and the 427 acres serviced by Lateral 17.6. Notably, the project will enable 45 acres adjacent to the Main Canal, currently left unfarmed due to saturation and salinity issues, to be reintroduced into agricultural production. The 7,461 acres collectively served by the rehabilitation project will experience enhanced irrigation and management efficiency. Converting Lateral 17.6 to a pressurized pipeline will increase water volumes, reduce waste return flows (2,980 acre-feet), and improve pressure head, allowing for better regulation of water delivery. This change, alongside the lining of the Main Canal, will mitigate seepage losses and saturation issues, ultimately improving water management and delivery capabilities of the YID. With these enhancements, it is estimated that crop production across the 7,461 acres would increase by up to 10%. This boost in agricultural production will result from enhanced management efficiency, particularly during challenging climate conditions or peak irrigation seasons. The conserved water will serve as a vital resource during water-shortage years, ensuring reliable delivery to system users. The project will optimize water delivery efficiency, increase crop production, bolster revenue for agricultural users and the region, and enhance resilience against varying climate conditions.

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

The area served by the YID and the project is increasingly affected by drought conditions, which have become more pronounced in recent years. Recent irrigation seasons have highlighted challenges associated with insufficient water availability due to below-average snowfall and reduced rainfall. These factors have intensified competition for limited water resources, especially during peak demand periods when agricultural irrigation needs are at their highest and available flows are typically at their lowest. The existing water delivery system is already under strain from aging infrastructure and inefficiencies. Significant seepage losses from the Main Canal and Lateral 17.6, in addition to significant waste return flows to the Yellowstone, exacerbate water scarcity, meaning that much of the water diverted from the Yellowstone River fails to reach its intended agricultural use. This inefficiency leads to the underutilization of irrigated acreage, compounding the challenges farmers face during drought conditions. One of the prominent features of climate change, as documented in the 2017 Montana Climate Assessment, is the shortening of winter months and earlier runoff. As winter conditions shift, river flows tend to decline earlier in the year, leading to decreased water availability during the critical summer months of July, August, and September. This pattern increases the likelihood of water rationing within irrigation districts as river flows drop off, creating significant challenges for agricultural producers relying on consistent water supplies. As climate

change progresses, the risk of more severe droughts and prolonged dry spells is expected to rise. These conditions threaten the stability of local agriculture and the livelihoods of farmers dependent on irrigation. The reliance on snowpack as a primary water source adds an additional layer of risk; diminished snowpack can lead to reduced stream flows in spring and summer, the key months for irrigation. In response to these challenges, YID has prioritized irrigation efficiency as a primary defense against drought and climate change. By focusing on improving the efficiency of their water delivery system, YID aims to ensure that more water is available to users, thereby reducing the impacts of water rationing. While it is acknowledged that water rationing may not be completely avoidable, the projected water savings from the proposed rehabilitation projects will result in less frequent and less severe rationing, supporting agricultural productivity and resilience in the face of changing climate conditions. The combination of existing inefficiencies, recent drought conditions, and the anticipated impacts of climate change underscores the urgent need for infrastructure improvements and enhanced water management strategies. The project aims to mitigate these challenges, ensuring a more reliable and sustainable water supply for agricultural use in the future.

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

Yes, see response immediately above.

- 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).

One of the prominent features of climate change that we have noticed and that has been scientifically proven is that as climate change continues to occur, winter months are shortened, and runoff tends to occur earlier than it did in the previous decade (documented in the 2017 Montana Climate Assessment <https://montanaclimate.org/chapter/water>). When this happens, river flows fall off earlier than previously and water rationing within irrigation districts becomes more prevalent as river flows drop off going into the hotter summer months of July, August, and September.

The impacts to water supply availability due to climate change has been documented in the 2017 Montana Climate Assessment, which is located <https://montanaclimate.org/chapter/water>. Based on this report, there are several major findings that include:

- Montana's snowpack has declined over the observational record, since the 1930s.
- Continued warming temperatures will reduce snowpack at mid and low elevations.

- Historical observations show a shift toward earlier snowmelt and an earlier peak in spring runoff.
  - Earlier onset of snowmelt and spring runoff will reduce late-summer water availability.
  - Multi-year and decadal-scale droughts have been and will continue to be a natural feature of Montana's climate.
  - Changes in snowpack and runoff timing will likely increase the frequency and duration of drought during late summer and early fall.
- 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.

The proposed project incorporates both green and sustainable infrastructure aimed at enhancing community climate resilience. By significantly improving water management practices, the project is designed to save precious water resources that are crucial in mitigating the impacts of downstream water rationing and addressing the needs of underserved acres during peak demand periods in late summer when river levels are typically lowest. The YID delivery system must operate as efficiently as possible to combat ongoing challenges related to water rationing and reduced crop production. By enhancing the efficiency of the irrigation system through the proposed rehabilitation of the Main Canal and Lateral 17.6, the project will help reduce interruptions in water delivery to the producers served by the system. This improved infrastructure not only aims to conserve water but also promotes sustainable agricultural practices, ensuring that local farmers can maintain productivity even in the face of climate variability. The integration of the proposed project will bolster community resilience, supporting the long-term viability of agriculture in the region through reduction of interruptions of water delivery to the producers served by the system.

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

The YID has prioritized irrigation efficiency as its primary defense against drought and climate change. By enhancing the efficiency of the YID system, more water will be available to users, which can significantly reduce the impacts of water rationing caused by drought and the challenges of delivering water effectively to downstream users. While it is unlikely that water rationing can be entirely eliminated, increasing water savings will lead to a reduction in the frequency and severity of rationing measures. The proposed project is designed to consistently save water, thereby ensuring that more water remains available for downstream YID users. This is particularly important for protecting against rationing during periods of drought or when climate change exacerbates water scarcity.

- 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?

In recent years, drought conditions and climate change have had a significant impact on the users within the YID system. Water rationing and the underserving of the acres at the downstream end of the Main Canal and Lateral 17.6 project is commonality, as water demands continue to increase due to increased heat index and warmer weather conditions while the water availability continues to decrease due to climate change which continues to result in earlier runoff and longer periods of low-flow conditions in the river. The YID has turned its focus to making its system more efficient to be able to reduce the impact of water rationing and make more water available to downstream users by not wasting or losing water in the system.

The proposed pipeline conversion of the 2,600-foot length of Lateral 17.6 and proposed lining of the 5,042-foot length of the Main Canal would conserve water through the elimination of seepage losses or irrigation water flowing through the open canals with underlying porous soils. Additionally, the project would conserve flows by mitigating the historical management practice of leaving the Lateral 17.6 diversion headgate fully open throughout the irrigation season in an effort to meet varying irrigation demands. This historic practice results in significant return flows that are wasted into the Yellowstone River with degrade, sediment-laden quality of water. The proposed project would minimize waste flows by providing a pressurized system that only diverts the necessary water based on real-time demand, with the only return flows being at the end of the year for winterization of the system. As a result of the seepage losses and historical management practices, the YID has historically had to divert extra water from the Yellowstone as the water losses, both seepage and waste, had to be accounted for. The YID operators would release additional flows into the Main Canal and Lateral 17.6 to ensure users had adequate water, even though this practice results in the wasting of additional water at the end of the system. The proposed improvements will provide the YID with the infrastructure to properly manage the water resource and be able to make decisions on where the 1,009 acre-feet of conserved water from seepage losses and 2,980 acre-feet from delivery efficiency improvements will go (left in Yellowstone River or put to beneficial use).

The proposed project will significantly benefit the YID's management of the irrigation water delivery network through decreased operation and maintenance tasks, debris removal, and trying to offset for the seepage losses. The additional management demands require unnecessary trips to the project area (Lateral 17.6 headgate and Main Canal) and the experienced YID ditch riders spend approximately 5.5 additional hours per week on the operation of the Main Canal and Lateral 17.6 project area. The time that ditch riders would save through the implementation of the project would allow the YID to put

these resources to use on other areas of YID's delivery system to improve the water delivery efficiency of the entire system.

The O&M burden does not include breaches of the system, which have become a repetitive issue for the YID staff. Breaches in the canal is a significant concern for the YID, and frequent breaches not only disrupt the delivery of water but also require immediate and often costly repairs, diverting valuable resources and personnel away from other critical maintenance tasks. Each incident necessitates a rapid response to prevent further damage and ensure that water reaches the agricultural users depending on it, leading to increased labor costs and material expenses. Moreover, the ongoing risk of breaches creates a constant strain on YID staff, who must monitor the system more closely, further complicating their workload during the already demanding irrigation season. By rehabilitating the Main Canal and Lateral 17.6, thereby reducing the likelihood of breaches, the proposed project will decrease the risk of realizing this O&M burden, allowing YID to focus on long-term improvements and to better serve its water users.

- 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.

The proposed project will provide water conservation and management efficiency benefits that will allow more water to remain in the Yellowstone River. The rehabilitation project will provide more efficient water delivery, meaning that less water will need to be diverted from the Yellowstone River. This reduction in diversions will help maintain more stable river flows, especially during critical periods when water levels are typically lower. This is particularly important for maintaining ecological health, supporting aquatic habitats, and ensuring that local communities and ecosystems benefit from stable river conditions. The conserved and efficiently managed water will also be instrumental in addressing potential shortages that could impact irrigation deliveries. By increasing the efficiency of the irrigation system, YID can ensure that water is available when and where it is needed most, thus minimizing the risk of crop stress due to insufficient water supply.

- Indicate the quantity of conserved water that will be used for the intended purpose(s).

The estimated quantity of additional supply the project will provide is 3,302 acre-feet of water per year as an average annual benefit to the YID over the next 30 years. Of this total benefit, 1,009 acre-feet is conserved water through the elimination of seepage losses, and 2,980 acre-feet is water historically wasted due to delivery inefficiencies. Based on flow measurements performed by the MT DNRC seepage study, the seepage rate through the porous soils of the canals in the area is 3 cfs per mile.

Between the 5,042-foot section of the Main Canal and 2,600-foot section of Lateral 17.6, 322 acre-feet of water are lost annually to leakage over the course of the 153-day irrigation season. Furthermore, due to limited management resources and varying irrigation demands throughout the irrigation season, the YID is forced to leave the Lateral 17.6 headgate fully open throughout the irrigation season. Because of this practice, it is estimated based on crop demands for the 427 acres served by Lateral 17.6 utilizing values from Montana ARM water use standards, that 2,980 acre-feet of water is wasted as return flows to the Yellowstone each irrigation season. In total between leakage and waste flows, the project will provide for 3,302 acre-feet of water annually based on a 153-day irrigation season to be used for its intended purpose. The installation of a closed pipeline system for Lateral 17.6 and lining the 5,042-foot section of the Main Canal will allow the YID to deliver water more efficiently to the downstream users of YID water delivery system. The volume of conserved water and efficiency saved water will either be left in the Yellowstone River or re-allocated for beneficial use to help combat other YID delivery system inefficiencies not addressed by the proposed project.

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

The installation of a closed pipeline system, canal lining system, and YID staff are the key mechanisms that the YID will utilize to leave the conserved water in the Yellowstone River or utilize the conserved water to alleviate water demands further downstream in the YID water delivery system. The lining also allows for the currently non-irrigated 45 acres at the downstream end of the Main Canal section of the project to receive adequate water and suitable land for crop production. The YID staff are key to putting the conserved water to the intended use as they will consistently be monitoring flows within the delivery system and can make real-time adjustments to diversions such that water be left in the Yellowstone River or put to beneficial use.

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

The Main Canal and Lateral 17.6 Rehabilitation Project will assist the YID and its water users, in complying with interstate compacts by improving water delivery efficiency and reducing excess diversions from the Yellowstone River. The project will help ensure that water allocations align with the requirements set forth in existing agreements. The conservation of approximately 3,302 acre-feet of water will facilitate better management of water resources while also supporting ecological health and maintaining river flow levels. Furthermore, by enhancing the reliability of water delivery for agricultural use, the project can contribute to more consistent compliance with compact stipulations regarding water usage, thereby minimizing the risk of disputes with neighboring states over water rights and allocations. The

improvements will promote cooperative water management and sustainability, benefiting both the local agricultural community and regional water governance.

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

The water users within the YID system downstream of the proposed project are currently not being served their water allotment due to the inability to convey it due to the severe seepage and conveyance losses. While there is currently no litigation over these underserved acres, as drought conditions continue to worsen litigation could be used against the YID to mitigate these adverse effects. Furthermore, the 45-acres that are currently unfarmable due to saturation and salinity issues because of seepage from the Main Canal, would be put back into production. Like the underserved acres, there is currently no litigation on this area of land not being farmable because of the canal leakage, but it could be used to offset any losses for the landowner in the future. The proposed project will eliminate the seepage and conveyance losses, provide users of Lateral 17.6 sufficient water throughout the irrigation season by creating an efficient pressurized pipeline delivery system, and allow the YID to optimize water allotments to the downstream users and help prevent any future water-related conflicts.

**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 Project is expected to benefit several species, including those that are federally threatened or endangered, as well as species of recreational or economic importance. Improved water management resulting from the project will enhance the overall health of the Yellowstone River ecosystem, which is critical habitat for various species, including federally listed species such as the pallid sturgeon and the Yellowstone cutthroat trout. These species rely on stable and adequate river flows for spawning, rearing, and overall habitat quality. The project reduces excess diversions from the river and improve irrigation efficiency, which helps to maintain more consistent and natural flow patterns in the Yellowstone River. This is especially important during low-flow periods, which can negatively impact fish populations and habitat. Additionally, the conservation of approximately 1,009 acre-feet of

water will support ecological health by ensuring that adequate water remains in the river, thus benefiting species that are sensitive to changes in water quality and quantity. Furthermore, the rehabilitation project will decrease waste flows from Lateral 17.6, which are mixed with farming chemicals and sediment. While the rehabilitation project does not directly impact species that are adversely affected by existing Reclamation projects, it aligns with broader recovery and conservation goals outlined in recovery plans under the ESA for the species mentioned. By promoting sustainable water management practices, preserving river health, and preserving aquatic habitat, the project will contribute positively to the recovery efforts for these species and enhance the ecological integrity of the Yellowstone River system.

- 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.).

The project provides a unique opportunity to conserve seepage losses through the canal due to the porous underlying soils. The YID is required to supply more water to the Main Canal and Lateral 17.6 because they do not have the ability to supply the exact amount of water that is needed in addition to accounting for the seepage losses. Thus, more water is diverted from the Yellowstone River than is necessary to fulfill the demand. When this happens, water is either lost to evaporation and seepage or put to use, and the remaining water is discharged back to the river with higher temperatures and laden with nutrients and sediment. The project will minimize discharges back to the river by being able to supply the exact amount of water to downstream users more efficiently without having to account for seepage losses or heavily rely on YID staff to adjust diversion flows.

The rehabilitation project will contribute to water remaining in the system for longer periods. Improving delivery efficiency and reducing excess diversions from the Yellowstone River will help maintain more stable flow levels in the river throughout the irrigation season. Currently, water levels can fluctuate significantly due to inefficient water management practices, leading to extra diversions that negatively impact aquatic habitats and recreational opportunities. The project will provide 1,009 acre-feet of water conservation through mitigation of seepage losses and 2,980 acre-feet through enhanced delivery efficiency. Allowing for more consistent river water levels, particularly during critical low-flow periods. Maintaining water in the system for extended durations will have several beneficial outcomes. First, it helps stabilize water temperatures, which is crucial for the health of fish species like the Yellowstone cutthroat trout, as extreme temperature fluctuations can be detrimental to their spawning and growth. Additionally, more consistent water levels will enhance recreational opportunities such as fishing, kayaking, and other water-based activities, benefiting local communities and economies that rely on outdoor recreation. Overall, by ensuring that water remains in the system longer, the project will not only support ecological health but also

promote social and economic benefits through improved recreational access and experiences.

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

N/A

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

The project will yield substantial ecosystem benefits while improving water quality in the Yellowstone River. More stable water levels and reducing flow fluctuations will create more favorable conditions for aquatic and riparian habitats, which are crucial for species like the Yellowstone cutthroat trout that rely on stable environments for spawning and rearing. Nutrient standards for many of Montana's rivers and streams are documented by MDEQ and expressed as total ammonia nitrogen in DEQ-7 that is dependent on river pH. Phosphorous is identified under ARM 17-30.637(1)(e) as to "create condition which produce undesirable aquatic life". Nutrient pollution from agricultural runoff, particularly nitrogen and phosphorus introduced through fertilizers and chemicals used for weed and moss management, often leads to high concentrations of these pollutants entering the irrigation system and subsequently discharging into the river. The project reduces sediment and nutrient loading, which can cause undesirable aquatic life and contribute to toxic conditions for fish and wildlife due to warmer water temperatures and harmful algal blooms. The proposed rehabilitation project provides YID with greater control overflows within the Main Canal and Lateral 17.6, allowing for the conveyance of only necessary flows and significantly minimizing waste flows to the Yellowstone River. This leads to a reduction in sediment, nitrogen, phosphorus, and chemicals, effectively enhancing spawning habitat and overall aquatic health.

Improved management of water will also have positive effects on riparian habitats adjacent to the river. These areas are essential for providing shade, stabilizing banks, and supporting a diverse range of plant and animal species. The project will promote healthier riparian zones by contributing to more consistent water levels that can sustain vegetation, which in turn creates a more complex habitat structure for wildlife. The presence of robust riparian vegetation can reduce erosion, improve water quality by filtering pollutants, and provide critical habitat for a variety of species, including migratory birds and small mammals. Moreover, maintaining more consistent flows will support natural floodplain dynamics, allowing for the periodic flooding of adjacent wetlands and riparian areas that are vital for diverse plant and animal species. This improvement can lead to increased biodiversity within the ecosystem, contributing to resilience and stability. Healthy wetlands and riparian zones will also play a critical role in carbon sequestration, further mitigating the impacts of climate change.

Note: Projects that are intended to improve streamflows or aquatic habit, and that are requesting \$500,000 or more in Federal funding, must include information about plans to monitor the benefits of the project. Please describe the plan to monitor improved streamflows or aquatic habit benefits over a five-year period once the project has been completed. Provide detail on the steps to be taken to carry out the plan.

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?

The Project directly addresses climate change and enhances community resiliency by improving water management efficiency and conserving vital resources in the face of increasing variability in precipitation and prolonged drought conditions. By lining the Main Canal and converting Lateral 17.6 to a pressurized pipeline system, the project is expected to conserve approximately 1,009 acre-feet of water annually from elimination of historic seepage losses and 2,980 acre-feet of water through improved management capabilities mitigating historic waste flows. This conservation and delivery efficiency is crucial for adapting to climate change, as it reduces reliance on excess diversions from the Yellowstone River during dry spells, ensuring that agricultural users can maintain irrigation during limited water supplies. With respect to agricultural production in the southwest Montana area, climate change has caused winter periods to shorten which results in spring runoff occurring earlier than previous decades. These changes are documented in the 2017 Montana Climate Assessment (link: <https://montanacclimate.org>). With earlier runoffs, river flows peak and then diminish earlier in the season and often result in water-short periods during the later summer months when peak irrigation demands occur. In addition to water availability, the project promotes better water quality, which supports healthy ecosystems and the species that depend on them, contributing to ecological resilience. By stabilizing water flows and enhancing the health of riparian zones, the project will help buffer against erosion and provide critical habitat for diverse wildlife, thereby fostering biodiversity and ecological stability. Overall, the project not only bolsters drought resilience for local communities but also creates a sustainable water management system that can better withstand the challenges posed by climate change.

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

The project reduces diversions from the Yellowstone River during non-peak irrigation demand and allow the conserved water to remain in the Yellowstone River or be put to beneficial use. The installation of a pipeline and liner within the main canal and lateral section will eliminate the seepage losses and greatly reduce waste flows to the Yellowstone by Lateral 17.6, resulting in the conservation of 1,009 acre-feet each year historically due to seepage

losses, and 2,980 acre-feet of water historically wasted. This conserved and available water will remain in the Yellowstone River or be used at underserved acreage. Recent drought impacts of reduced snowpack, earlier spring runoff, and warmer temperatures have caused the YID to be unable to meet irrigation demands in the later parts of the season, which often leads to water rationing and crop strain, in turn decreasing crop production. The additional water availability within the water delivery system can be utilized to combat the adverse impacts of climate change that is affecting agricultural production for the YID water users. Enhanced management efficiency and reducing nutrient loading into the Yellowstone result in the project contributing to healthier aquatic and riparian ecosystems. Improved water quality will support diverse plant and animal species. By stabilizing water levels and enhancing the health of riparian zones, the project helps maintain critical habitats that are essential for wildlife, particularly during periods of environmental stress. This increased habitat stability allows ecosystems to better withstand the impacts of climate variability, such as altered precipitation patterns and extreme weather events.

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

The project seeks to reduce and mitigate climate pollutants in four primary ways. By enhancing the efficiency of water delivery and minimizing nutrient runoff, the project reduces the discharge of sediment, nitrogen, and phosphorus into the Yellowstone River. Improved management capabilities and delivery efficiency will limit the volume of polluted return flows entering the river, thereby enhancing water quality and supporting healthier aquatic ecosystems. Second, the project promotes the growth of native vegetation along riparian zones, which plays a crucial role in filtering pollutants and stabilizing banks to reduce erosion. This vegetative cover also contributes to carbon sequestration. Third, the project addresses air pollution by decreasing the vehicle emissions associated with YID staff operations. The number of O&M trips is expected to decrease with the improved infrastructure, leading to a decrease in travel demands and in turn decreasing YID vehicle emissions. Lastly, the conversion to a pressurized pipeline system decreases the pumping power requirements for users. Decreased energy consumption lowers operational costs for farmers and minimizes the carbon footprint related to water delivery. As agricultural users transition from flood irrigation to more efficient sprinkler systems, even greater reductions in energy demand are anticipated as a direct result of the proposed project.

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

The project includes both green and sustainable infrastructure designed to enhance community climate resilience. By saving precious water, the project will mitigate the impacts of downstream water rationing and address the

negative effects on underserved acres. The more efficient use of water within the Yellowstone Irrigation District (YID) delivery system not only conserves this vital resource but also reduces waste, leading to lower amounts of sediment and nutrients transported back to the Yellowstone River.

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

The project is part of a larger planned project by the YID to modernize their irrigation system and make it more efficient to address the sustainability of the water supply. The more water that can be saved within the system will allow the YID to reduce and minimize the overall impact of drought conditions throughout the Yellowstone River Basin. The project provides water via conservation that can be used for agriculture, downstream use, environmental uses such as the preservation of fish and wildlife habitat, and to facilitate recreation and navigation in Yellowstone River and upstream tributaries.

#### **E.1.4 Evaluation Criterion D—Disadvantaged Communities, Insular Areas, and Tribal Benefits (15 points)**

Up to 15 points may be awarded based on the extent that the project demonstrates support for the Biden-Harris Administration’s priorities, including E.O. 14008: *Tackling the Climate Crisis at Home and Abroad* and the President’s memorandum, *Tribal Consultation and Strengthening Nation-to-Nation Relationships*.

Please address only those priorities that are applicable to your project. It is not necessary to address priorities that are not applicable to your project. A project will not necessarily receive more points simply because multiple priorities are addressed. Points will be allocated based on the degree to which the project supports one or more of the priorities listed, and whether the connection to the priority(ies) is well supported in the application.

##### **E.1.4.1 Subcriterion D.1. Disadvantaged Communities**

E.O. 14008 affirms the advancement of environmental justice for all through the development and funding of programs to invest in disadvantaged communities. This criterion, which is used to identify projects that advance the Justice 40 Initiative, includes all Federally recognized Tribes and Tribal entities, and any disadvantaged communities in insular areas (American Samoa, Guam, the Northern Mariana Islands, or the Virgin Islands) identified pursuant to the following criteria.

- Please use the White House Council on Environmental Quality’s interactive Climate and Economic Justice Screening Tool (CEJST), available online at [Explore the map - Climate & Economic Justice Screening Tool \(screeningtool.geoplatform.gov/en/#17.59/36.63278/-105.181329\)](https://www.ejstool.gov/en/#17.59/36.63278/-105.181329) to identify any disadvantaged communities that will benefit from your project. The CEJST developed by the White House Council on Environmental Quality is a geospatial mapping tool that utilizes publicly available, nationally consistent data sets related to climate change, the environment, health, and economic opportunity to identify disadvantaged communities. In addition to identifying specific census tracts that are disadvantaged, the CEJST includes the lands of Federally recognized Tribes as disadvantaged communities. In addition, regardless of whether a Federally recognized Tribe has land, all Federally recognized

Tribal entities are considered disadvantaged communities for the purposes of the Justice40 Initiative.<sup>2</sup>

**Identified Disadvantaged Community: Number: 30087000200 - Rosebud County**

- 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?

The project is located upstream of the disadvantaged community. With the project location in relation to the community, the water conserved by the project will make more water available to the community. The Yellowstone River is a highly regulated basin and is considered a state navigable waterway within the Montana. The project will provide up to 10.6 cfs (1,009 acre-ft per from seepage losses and 2,980 acre-ft from elimination of historic waste flows) of available flows for alternative use, such as at times being left in the Yellowstone River, providing an opportunity for the downstream community members to benefit from water availability in the Yellowstone River. The project will also benefit the community by improving water quality, increased agricultural production, and promoting economic growth. By addressing the inefficiencies in the water delivery system, the project will help provide a more reliable and clean water supply for local farmers, many of whom are from economically vulnerable backgrounds. Improved water access is crucial for sustaining agricultural livelihoods, which are often the primary source of income for these communities. The reduction of waste flows laden with sediment and nutrients into the Yellowstone River will enhance water quality, directly impacting public health and safety. Cleaner water reduces the risk of waterborne diseases and supports healthier ecosystems, which are vital for both community well-being and recreational activities. The project also restores previously unproductive farmland affected by saturation and salinity issues, further expanding the agricultural capacity of the area. An increase in arable land leads to greater food production and economic stability for local farmers.

**E.1.4.2 Subcriterion D.2. 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?  
N/A
- 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

### **E.1.5 Evaluation Criterion E—Complementing On-Farm Irrigation Improvements (8 points)**

*Up to 8 points may be awarded for projects that describe in detail how they will complement on-farm irrigation improvements eligible for NRCS financial or technical assistance.*

Note: Scoring under this criterion is based on an overall assessment of the extent to which the WaterSMART Grant project will complement ongoing or future on-farm improvements. Applicants should describe any proposal made to NRCS, or any plans to seek assistance from NRCS in the future, and how an NRCS-assisted activity would complement the WaterSMART Grant project. Financial assistance through EQIP is the most commonly used program by which NRCS helps producers implement improvements to irrigation systems, but NRCS does have additional technical or financial assistance programs that may be available. Applicants may receive maximum points under this criterion by providing the information described in the bullet points below. *Applicants are not required to have assurances of NRCS assistance by the application deadline to be awarded the maximum number of points under this sub-criterion.* Reclamation may contact applicants during the review process to gather additional information about pending applications for NRCS assistance if necessary.

**Note: On-farm improvements themselves are not eligible activities for funding under this NOFO. This criterion is intended to focus on how the WaterSMART Grant project will complement ongoing or future on-farm improvements. NRCS will have a separate application process for the on-farm components of selected projects that may be undertaken in the future, separate of the WaterSMART Grant project.**

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.

The Project directly impacts 7,461 acres of land served by the YID system. Much of this land is underserved, particularly during peak demand season. The installation of a closed pipeline provides pressurized flows which are more conducive to the installation of a center pivot with pumped water. The pressurized flows provide more efficient pumping and reduced energy consumption. In addition, the State of Montana and the Federal Government have developed multiple programs for the promotion of renewable resource conservation on a more producer-focused level. These

programs target projects in which a need is demonstrated, including the demonstration of an increase in citizen and resource benefits. The Montana NRCS EQIP program is an example of one of these programs and provides cost share money for projects that increase resource conservation (although now changed to be implemented through Targeted Implementation Plans (TIP)). The YID has had a TIP funded through the Environmental Quality Incentives Program for focusing on Organic Matter improvements through the implementation of sprinkler systems from 2021 through 2025 on the 4.921 North Lateral. Additionally, a TIP through the same program was funded for focusing on eliminating a small ditch and pumping plan to promote water use from the YID main canal directly. The YID is familiar and willing to pursue these types of funds alongside water users for on-farm efficiencies. The additional water saved by the proposed conversion and lining project will further promote efforts by YID users to seek assistance from the NRCS (and other funding sources) for on-farm improvements.

- 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 area's farmers typically request technical and financial assistance from the NRCS for their on-farm efficiency projects. The local NRCS either performs the technical assistance with in-house staff or utilizes Technical Service Providers. We are not aware of any request for technical or financial assistance from the NRCS at the present time, but the YID users remain open to potential support through NRCS programs.

- 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.

No documentation was available from the local NRCS regarding on-farm projects within the YID service area that are eligible for NRCS assistance. We are not aware of any request for technical or financial assistance from the NRCS at the present time, but the YID users remain open to potential support through NRCS programs.

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

None available at this time.

- 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, installing a pressurized pipe through WaterSMART can help support efficient on-farm irrigation practices, such as drip-irrigation.

The conversion to a closed pipeline system will provide pressurized flows for the 2,600-foot section of the project and could directly facilitate on-farm improvements such as center pivots. The pressurized flow in the pipeline would allow for more efficient pumping operations from reduced pressure head requirements and result in less energy being required to run the pump. The installation of lining 5,042-foot section of the Main Canal and conversion to a closed pipeline system of Lateral 17.6 will help prevent water shortages for the 7,461 acres downstream of the project served by the YID. The project will conserve 1,009 acre-feet per year from seepage losses and provide alternative flexibility for 2,980 acre-feet per year through improved delivery efficiency elimination of waste flows. The conservation and additional flow availability provides the reduction of excess buffer flows diverted from the Yellowstone River to overcome YID system inefficiencies. The project will serve to support efficient on-farm practices such as center pivot irrigation.

OR

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

The pipeline conversion and lining rehabilitation project will maximize efficiency in this area by conserving 1,009 acre-feet per year of seepage losses and 2,980 acre-feet per year in available water historically wasted to the Yellowstone, provide an increase to water delivery efficiency, and provide pressured water delivery to facilitate on-farm efficiency.

- 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.

A conservative estimate of energy conservation indicates the proposed improvements will reduce pump electricity demand by 14% for on-farm systems. Converting the existing lateral to a pipeline and providing enough flow to pressurize the pipeline will increase pressure head to approximately 6.5 psi, which will improve existing and future pump performance along the pipeline. Pumping demand will decrease because of reduced suction head at the pump. The current condition requires existing pumps to use suction pressure to lift water out of the lateral and into a pipeline to feed sprinkler irrigation systems. If the suction lift is eliminated and the pressure head is increased to 6.5 psi, then the pump needs less suction pressure to force water out of the sprinkler lines. For example, a typical center pivot needs to run at approximately 45 psi. The relative head differential for the existing pump requirement is to deliver  $45 \text{ psi} + 2 \text{ psi}$  (the elevation of the suction lift) = 47 psi. The future condition with the pipeline will only have a pump requirement of 45 psi -

6.5 psi = 38.5 psi. The project would provide more opportunities for landowners to incorporate on-farm water conservation and/or water use efficiency projects.

- 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.

A map depicting the YID water service area boundary is included as Exhibit 1.

*Note: On-farm water conservation improvements that complement the water delivery improvement projects selected through this NOFO may be considered for NRCS funding and technical assistance to the extent that such assistance is available. For more information, including application deadlines and a description of available funding, please contact your local NRCS office. See the NRCS website for office contact information, <http://www.nrcs.usda.gov/conservation-basics/conservation-by-state/state-offices>.*

#### **E.1.6 Evaluation Criterion F - Readiness to Proceed (8 points)**

*Up to 8 points may be awarded for this criterion.*

*Points may be awarded based upon the extent to which the proposed project is capable of proceeding upon entering into a financial assistance agreement. Please 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: please 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.

The project will consist of the following tasks:

- Planning/Contracting - The project will require a planning level effort to coordinate activities for the project up-front following award and contracting with Reclamation.
- Site Survey - The Main Canal (5,042-foot) and Lateral 17.6 (2,600-foot) will need the existing irrigation canal and associated structures located to have topographic survey performed. It is anticipated that all work will occur within the existing canal footprint and no additional easements or associated documents will be required.
- Design - The proposed pipeline conversion and canal lining will need to be designed. The pipeline will need to be designed to reflect the proper alignment and grade, hydraulic profile, and size requirements. The canal will need to be designed to reflect demolition location of any existing

lining infrastructure, hydraulic analysis, and grading of the canal. A single set of plans and specifications will be developed and submitted to YID and Reclamation for approval.

- **Permitting** - The necessary permits will need to be obtained to facilitate construction of the project. A copy of the permit documents will be submitted to YID and Reclamation. Permitting will include environmental and cultural resource compliance.
- **Construction** - The project will be publicly advertised, and a General Contractor will be hired to perform all construction work. The Contractor will be responsible for securing the materials, equipment, and labor necessary for completing the project according to the plans and specifications.
- **Construction Administration** - An Engineer will be needed to provide construction administration, inspection of the work, and ensure compliance with the plans and specifications. Photos, submittal approvals, daily logs and other construction information will be saved and compiled throughout the project.
- **As-Built Documentation** - An Engineer will be needed to perform an as-built verification of the new pipeline and liner. A construction completion report will be submitted to YID and Reclamation.
- **Construction and Grant Close-Out** - The YID or the consultant will be required to ensure that all the requirements of the construction and WaterSMART grant have been completed and submitted to Reclamation for approval.
- Describe any permits that will be required, along with the process for obtaining such permits.

All permits listed require the YID or General Contractor to work with each permitting agency to determine whether a formal permit is needed for the construction of the project. The YID will follow up on the following list of permits, should any be required, if the grant is awarded. If needed, the following permits may be obtained with assistance from the engineer during the design process:

**404 Permit** - The Army Corps of Engineers (USACE) requires a permit for any activity that will result in the discharge or placement of dredged or fill material into waters of the United States, including wetlands. Consultation will be performed, but the activities proposed herein are likely exempt as stated in CRF 323.4(a)3. A Montana joint application form will need to be filled out and submitted to the USACE for a determination.

**318 Authorization** - The Short-Term Water Quality Standard for Turbidity requires a permit for any construction activities that will cause temporary violations of state surface water quality standards for turbidity. Since no water will be in the lateral at the time of construction, no turbidity permit will be required.

**Storm Water Discharge General Permit** - State Storm Water Rules require a storm water discharge permit under the requirements of the 2018 General Permit for any construction project over one acre in total disturbance that discharges into State waters. A Notice of Intent form and Stormwater Pollution Prevention Plan Form along with all attachments and supplements will need to be submitted to the Montana Department of Environmental Quality.

**Montana Sage Grouse Habitat Conservation Program** - The program's role is to implement Montana's Sage Grouse Conservation Strategy including the conservation, restoration, and mitigation of changes to sage grouse habitat because of development. Montana has a website <https://sagegrouse.mt.gov/ProgramMap> that will need to be consulted prior to construction activities. The current map shows that there are no Sage Grouse Habitat within the project area.

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

The project will require the assistance of an engineer for the design of the new pipeline and liner systems. A site visit/topographic survey to inspect and take measurements of the existing irrigation canals, proposed pipeline route, and liner location/extents will need to be completed, followed by the design of the proposed pipeline and liner (including hydraulics, geometric layout, connection details, earthwork grading, road crossings, structure details if necessary, and details, etc.), followed by the development of plans and specifications for the proposed Main Canal and Lateral 17.6 Rehabilitation Project.

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

N/A

- 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.

The design of the project has not been started. The design will be completed upon successful award of the WaterSmart grant. The timeline for completing the design work is shown in the section below from January 2026 through September 2026.

- 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?

**Table 1. Project Schedule**

| Activity                                         | Date(s)                 |
|--------------------------------------------------|-------------------------|
| WaterSmart Grant Due Date                        | Nov 13, 2024            |
| Evaluate Grant Applications -- BOR               | Nov 13, 2024 - May 2025 |
| Grant Award                                      | May 2025                |
| Contract Execution                               | May 2025 - Oct 2025     |
| Project Initiation                               | Nov 2025                |
| Project Kickoff Meeting                          | Dec 2025                |
| Project Site Survey                              | Jan 2026                |
| Project Design                                   | Jan 2026 - Sep 2026     |
| Environmental/Cultural Resource Compliance       | Mar 2026 - Sep 2026     |
| YID and Reclamation Plans Review                 | Sep 2026 - Dec 2026     |
| Final Plans & Specifications                     | Jan 2027 - Feb 2027     |
| General Contractor Advertisement and Contracting | Mar 2027 - Apr 2027     |
| Begin Construction                               | Sep 2027                |
| Mid-Point Construction (50%)                     | Dec 2027                |
| End Construction (100%)                          | Apr 2028                |
| Construction Administration                      | Sep 2027 - Apr 2028     |
| Construction Closeout                            | Apr 2028                |
| As-Built Verification                            | May 2028                |
| Construction Completion Report                   | May 2027                |
| Grant Closeout                                   | Jun 2028                |
| Project Completion                               | Jun 2028                |

#### **E.1.7 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:

The YID manager attends and actively participates in training seminars, courses, and conferences such as Montana Water Resources Association (MWRA), Montana Association of Dams and Canal Systems (MADCS), the US BOR Montana Area Office's Dam Operator Trainings, and watershed symposiums throughout Montana where they collaborate and share information. The YID is committed to sharing the success and implementation of this project with other districts and water user associations throughout the region to assist them in their planning and water delivery efforts.

- 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 YID Board, its water users, the Yellowstone River Conservation District Council (YRCDC), and Custer County Conservation District (CCCD) have all shown support for this project and identified the project in the Strategic/

Long-Range Plan completed in July 2024. The YID Board will make financial, procurement, and contracting decisions as well as provide overall management of the project. The YRCDC, CCCD, and local water users have been consulted on the project and will continue to be consulted throughout the project.

- What is the significance of the collaboration/support?

The YRCDC and CCCD works with not only other water users in the area but also shares their success stories with the other conservation districts throughout the State through the Montana Association of Conservation Districts. This information will be shared with the other conservation districts who in turn will share this information with nearly all the remaining irrigation districts and water user associations throughout the State of Montana.

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

The implementation of this project and the sharing of its benefits through the Montana Association of Dams and Canal Systems (MADCS), Montana Water Resources Association, and the Montana Association of Conservation Districts provides a large audience to share this information with, for them to learn from the project and evaluate pipeline conversion and canal lining project designs for a number of irrigation districts and water users' associations throughout Montana.

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

The project will benefit multiple sectors and users. By mitigating 1,009 acre-feet of annual seepage losses, providing 2,980 acre-feet in available water for alternative beneficial use by eliminating waste flows through the lateral the project supports the following:

1. **Agricultural Sector:** The primary beneficiaries of the proposed projects are local farmers and agricultural producers who rely on efficient, reliable water delivery for crop irrigation. The project will increase water availability by lining the Main Canal and converting Lateral 17.6 to a pressurized pipeline system, in turn reducing seepage losses. This will directly improve irrigation delivery to over 7,000 acres of farmland in the YID service area; improving crop production and yields throughout all acres and restoring 45 acres to productive farmland.
2. **Environmental Sector:** Water quality will be preserved as approximately 70% of the water diverted through Lateral 17.6 is wasted back to the Yellowstone River, carrying contaminants such as sediment, salts, and chemicals with it. The conversion to a pressurized system will eliminate these return flows, preserving water quality by reducing the temperature, nutrient, and sediment load in the river, which is particularly important during low-flow periods. Aquatic habitat will be preserved and protected

by minimizing high-temperature and sediment-laden return flows, the projects will help maintain instream flow during critical periods, thereby supporting the health of aquatic ecosystems and fish habitats in the Yellowstone River.

3. **Municipal and Industrial Users:** The project will indirectly benefit municipal and industrial users that depend on the Yellowstone River for water supply. The decrease in sediment and chemical contamination from excess irrigation runoff will help maintain the overall water quality in the Yellowstone River, benefiting municipal water treatment systems that source water from the river. The conservation of water through these projects can provide downstream users, including municipalities and industrial facilities, with more reliable and higher-quality water supplies.
4. **Recreation and Community Users:** By reducing contaminants, sediment, and high temperatures in return flows, the projects will improve the overall health of the river, making it more suitable for recreational activities such as fishing, boating, and swimming. A healthier river ecosystem can lead to increased biodiversity, which supports recreational pursuits like fishing. Clean water and a vibrant aquatic ecosystem will encourage tourism and recreational activities along the river, benefiting local economies.
5. **Public Health and Safety:** By rehabilitating the Main Canal, the risk of bank slumping and breaches is significantly reduced. This decreases the likelihood of accidents or water contamination resulting from infrastructure failure, benefiting the safety of YID staff and local communities near the canal. Additionally, more efficient water management ensures that water is delivered to irrigation users consistently, reducing the potential for water shortages that could lead to economic or health crises in the farming community.

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

Letters of support are attached as Appendix C.

#### E.1.8 Evaluation Criterion H—Nexus to Reclamation (4 points)

*Up to 4 points may be awarded if the proposed project is connected to a Reclamation project or Reclamation activity. No points will be awarded for proposals without connection to a Reclamation project or Reclamation activity.*

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

N/A

- Does the applicant have a water service, repayment, or operations and maintenance (O&M) contract with Reclamation?

The YID does not receive Reclamation project water.

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

N/A

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

N/A

- Is the applicant a Tribe?

No

#### D.2.2.2.7 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.

All Water and Energy Efficiency Grants applicants are required to propose a “performance measure” (a method of quantifying the actual benefits of their project once it is completed). A provision will be included in all assistance agreements with Water and Energy Efficiency Grants recipients describing the performance measure and requiring the recipient to quantify the actual project benefits in their final report to Reclamation upon completion of the project. If information regarding project benefits is not available immediately upon completion of the project, the financial assistance agreement may be modified to remain open until such information is available and until a Final Report is submitted. Quantifying project benefits is an important means to determine the relative effectiveness of various water management efforts, as well as the overall effectiveness of Water and Energy Efficiency Grants.

*Note: program funding may be used to install necessary equipment to monitor progress. However, program funding may not be used to measure performance after project construction is complete (these costs are considered normal operation and maintenance costs and are the responsibility of the applicant).*

A seepage study of the project area was completed as part of a larger study by the MT DNRC for the YID delivery system east of Sanders Hill from 2021 to 2023 to estimate conservation values. The YID will take measurements of the main canal at three locations; beginning, midpoint, and end of the Main Canal reach to verify the water savings post-project. YID will utilize detailed daily water records, both historic and up to date, to verify the water usage within Lateral 17.6. As the pipeline will be a closed system that only returns flows to the Yellowstone for winterization, waste flows are expected to be negligible and will serve as verification of water savings. The project is estimated to conserve 1,009 acre-feet of water through the elimination of seepage losses and provide 2,980 acre-feet in additional water availability from mitigation of historic waste flows to the Yellowstone River in the Main Canal and Lateral 17.6. There are 7,461 acres served by the YID downstream of the project, of which 45 acres are currently unfarmable due to saturation and salinity and underserved annually. Crop production on the 7,461 acres provides a performance measure on the project providing adequate water for agricultural use.

## D.2.2.4 ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

Please answer the questions from Section H.1. Environmental and Cultural Resource Considerations in this section.

It is understood that Reclamation will be the lead agency for Environmental and Cultural Resources Compliance.

### H.1. ENVIRONMENTAL AND CULTURAL RESOURCE CONSIDERATIONS

To allow Reclamation to assess the probable environmental and cultural resources impacts and costs associated with each application, all applicants should consider the following list of questions focusing on the NEPA, ESA, and NHPA requirements. Please answer the following questions to the best of your knowledge. If any question is not applicable to the project, please explain why. The application should include the answers to:

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

The proposed project will have a minimal impact on the surrounding environment. Impacts to the environment will be limited to the general proximity of the pipeline alignment and existing Main Canal extents. The disturbance footprint may extend 5 feet beyond the edge of the pipeline alignment or liner key-in location on each side to allow for removal of the existing topsoil and earthwork compaction. The work will be performed in the irrigation offseason when the irrigation canal is dry and not running water. Care will be taken to minimize impacts and limit the construction footprint wherever possible. During construction, dust may be generated but is expected to be minimal and temporary. Dust control measures will be implemented during construction that may include the use of a water truck. Noise from construction activities will be limited to daylight hours. The proposed project could potentially have a beneficial impact on fish and wildlife habitat through the conservation of water and energy and improved water quality discharges back to the Yellowstone River as described previously in this application.

- 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?

The Montana Natural Heritage Program (MNHP) website was consulted and there are 28 species of concern that have been documented in the area or have the potential to occur in the area based on habitat. The area of interest (AOI) covers the entire YID irrigated acreage extent, including portions of the Yellowstone River floodplain. The intent of the broad AOI was to capture a larger corridor encompassing wildlife migration and movement instead of

limiting the search to the immediate project vicinity. Bald Eagle and Golden Eagle habitat and nesting sites are located in the vicinity of the project within the Yellowstone River floodplain. The USFWS IPaC tool to search for endangered or threatened species potentially occurring within the project area. The monarch butterfly is an ESA candidate but does not have critical habitat in the project area. All construction disturbance will be limited to the canal and will not involve tree cutting. Therefore, eagle habitat will not be impacted by the project. Sediment BMPs will be used to manage temporary sediment disturbance during construction. The proposed canal lining project will not adversely impact the species listed on the MNHP website. All state and federal guidelines directed towards habitat conservation and renewable resources will be observed. Care will be taken to limit construction disturbance to the areas within or immediately adjacent to the existing irrigation infrastructure. Further, the proposed project is anticipated to provide wildlife habitat benefits via the preservation of stream flows within the Yellowstone River as well as improved water quality and limiting of waste flows to the river.

- 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.

The National Wetlands Inventory (NWI) website was utilized to determine whether any wetlands were present within the lands adjacent to the project location. This search indicated that the proposed project area is within the existing irrigation infrastructure footprint. Thus, the NWI identifies the lateral as a riverine wetland because of the Yellowstone River to the north. Best Management Practices (BMPs) will be implemented to prevent sediment from leaving the site. The proposed project will include all necessary permits and environmental actions to be fully compliant with all rules, regulations, and laws. Based upon the available information, no Waters of the United States are believed to be negatively impacted by the proposed project.

- When was the water delivery system constructed?

The existing canal and delivery system was constructed around 1906 by a separate ditch company, which all interests were purchased by the YID in 1909.

- 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.

The proposed project will only affect the identified portions of the existing irrigation canals that will be converted to a closed pipeline system or lined.

- 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.

The district does not have any buildings, structures, or features eligible for listing on the National Register of Historic Places that will be impacted by this project.

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

The YID is not aware of any archeological sites in the proposed project area. If any archeological sites are discovered during construction, work will be halted, and the appropriate environmental process will be followed.

- Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?

The proposed project will not have a disproportionately high and/or adverse effect on low income or minority populations.

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

The proposed project will not limit access to or ceremonial use of Indian sacred sites or result in other impacts 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?

Care will be taken to prevent the continued existence or spread of noxious weeds or non-native invasive species. During revegetation, only approved native seed mixtures will be used. The YID's weed management program will be used to control weed and non-native species once the project is complete.

### D.2.2.5 REQUIRED PERMITS OR APPROVALS

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

Note that improvements to Federal facilities that are implemented through any project awarded funding through this NOFO must comply with additional requirements. The Federal government will continue to hold title to the Federal facility and any improvement that is integral to the existing operations of that facility. Please see P.L. 111-11 §9504(a)(3)(B). Reclamation may also require additional reviews and approvals prior to award to ensure that any necessary easements, land use authorizations, or special permits can be approved consistent with the requirements of 43 CFR §429 and that the development will not impact or impair project operations or efficiency.

For each of the permits listed below, the YID will work with each permitting agency to determine whether a formal permit is needed for the construction of the proposed project. If needed, the following permits may be obtained with assistance from the engineer during the design process:

**310 Permit** - The Montana Association of Conservation Districts (MACD) requires a permit for any activity that physically alters or modifies the bed or banks of a perennially flowing stream. Consultation will be performed, but the activities proposed herein are likely exempt from this rule.

**404 Permit** - The Army Corps of Engineers (ACOE) requires a permit for any activity that will result in the discharge or placement of dredged or fill material into waters of the United States, including wetlands. Consultation will be performed, but the activities proposed herein are likely exempt as stated in CRF 323.4(a)3.

**318 Authorization** - The Short-Term Water Quality Standard for Turbidity requires a permit for any construction activities that will cause temporary violations of state surface water quality standards for turbidity. The work will be conducted in dry areas.

**Storm Water Discharge General Permit** - State Storm Water Rules require a storm water discharge permit for any construction project over one acre in total disturbance that discharges into State waters. The disturbed area for construction of the new C-Canal flow measurement weirs is anticipated to be well below this threshold.

**Montana Sage Grouse Habitat Conservation Program** - The program's role is to implement Montana's Sage Grouse Conservation Strategy including the conservation, restoration, and mitigation of changes to sage grouse habitat because of development. The project area is not located within a mapped area of concern.

## D.2.2.6 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.

Applicants must also state if the proposal submitted for consideration under this program does or does not in any way duplicate any proposal or project that has been or will be submitted for funding consideration to any other potential funding source—whether it be Federal or non-Federal. If such a circumstance exists, applicants must detail when the other duplicative proposal(s) were submitted, to whom (Agency name and Financial Assistance program), and when funding decisions are expected to be announced. If at any time a proposal is awarded funds that would be duplicative of the funding requested from Reclamation, applicants must notify the NOFO point of contact or the Program Coordinator immediately.

The YID has submitted grant applications to various grant agencies to support various portions of this project. These applications and their status are as follows:

**Montana Department of Natural Resources and Conservation Renewable Resources Grant and Loan Program Construction Grant.** The YID applied for two RRGL construction grants in the total amount of \$250,000 (\$125,000 each, no match requirement) that will go toward the proposed lining and pipeline conversion project identified in this application. This application is pending and will be awarded in May 2025.

**Bureau of Reclamation WaterSmart Water and Energy Efficiency Grant.** The YID is applying for funding under this application to support the Main Canal and Lateral 17.6 Rehabilitation Project identified in this application.

The YID will coordinate these grants, if they are all or partially funded, in a joint effort to line the 5,042-foot section of the Main Canal and convert 2,600 linear feet of Lateral 17.6 to a closed pipeline. It is not anticipated that there will be any conflicts with resources and/or funding for each project as they all will have individual matching needs that will be handled independently. The YID has reviewed the amount of work and funding that this project will take and is confident that they have the funds and the resources to complete the work.

## **D.2.2.7 CONFLICT OF INTEREST DISCLOSURE STATEMENT**

Per 2 CFR §1402.112, “Financial Assistance Interior Regulation” applicants should state in the application if any actual or potential conflict of interest exists at the time of submission. Submission of a conflict-of-interest disclosure or certification statement is mandatory prior to issue of an award.

The YID has no actual or potential conflict of interest at this time.

### **D.2.2.7.1 APPLICABILITY**

This section intends to ensure that non-Federal entities and their employees take appropriate steps to avoid conflicts of interest in their responsibilities under or with respect to Federal financial assistance agreements.

In the procurement of supplies, equipment, construction, and services by recipients and by sub recipients, the conflict-of-interest provisions in 2 CFR§200.318 apply.

The YID has no actual or potential conflict of interest at this time.

### **D.2.2.7.2 NOTIFICATION**

Non-Federal entities, including applicants for financial assistance awards, must disclose in writing any conflict of interest to the DOI awarding agency or pass- through entity in accordance with 2 CFR §200.112.

Recipients must establish internal controls that include, at a minimum, procedures to identify, disclose, and mitigate or eliminate identified conflicts of interest. The successful applicant is responsible for notifying the Financial Assistance Officer in writing of any conflicts of interest that may arise during the life of the award, including those that have been reported by sub recipients.

The YID has no actual or potential conflict of interest at this time.

### **D.2.2.7.3 RESTRICTIONS ON 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.

The YID will not use the funds for lobbying and have provided the required certifications and disclosures pursuant to 43 CFR §18 and 31 USC §1352.

### **D.2.2.7.4 REVIEW PROCEDURES**

The Financial Assistance Officer will examine each conflict-of-interest disclosure on the basis of its particular facts and the nature of the proposed grant or cooperative agreement and will determine whether a significant potential conflict exists and, if it does, develop an appropriate means for resolving it. Enforcement. Failure to resolve conflicts of interest in a manner that satisfies the government may be cause for termination of the award. Failure to make required disclosures may result in any of the remedies described in 2 CFR §200.339, Remedies for noncompliance, including suspension or debarment (see also 2 CFR §180).

The YID has no actual or potential conflict of interest at this time.

#### **D.2.2.8 UNIFORM AUDIT REPORTING STATEMENT**

All U.S. states, local governments, federally recognized Indian Tribal governments, and non-profit 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.

The YID has not submitted, or been required to submit, a Single Audit report for the most recently closed fiscal year (2023).

#### **D.2.2.9 CERTIFICATION REGARDING LOBBYING**

Applicants requesting more than \$100,000 in Federal funding must certify to the statements in 43 CFR §18, Appendix A. If this application requests more than \$100,000 in Federal funds, the authorized official's signature on the appropriate SF-424 form also represents the applicant's certification of the statements in 43 CFR § 18, Appendix A.

The YID will not use the funds for lobbying and have provided the required certifications and disclosures pursuant to 43 CFR §1, Appendix F. The YID's Commissioner Chairman, Bill Asay, has signed the appropriate SF-424 form which is included with this application.

#### **D.2.2.10 SF-LLL: DISCLOSURE OF LOBBYING ACTIVITIES (IF APPLICABLE)**

If applicable, a fully completed and signed SF-LLL: Disclosure of Lobbying Activities form is required if the applicant has made or agreed to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. This form cannot be submitted by a contractor or other entity on behalf of an applicant.

N/A

The YID has no actual or potential conflict of interest at this time.

#### **D.2.2.8 UNIFORM AUDIT REPORTING STATEMENT**

All U.S. states, local governments, federally recognized Indian Tribal governments, and non-profit 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.

The YID has not submitted, or been required to submit, a Single Audit report for the most recently closed fiscal year (2023).

#### **D.2.2.9 CERTIFICATION REGARDING LOBBYING**

Applicants requesting more than \$100,000 in Federal funding must certify to the statements in 43 CFR §18, Appendix A. If this application requests more than \$100,000 in Federal funds, the authorized official's signature on the appropriate SF-424 form also represents the applicant's certification of the statements in 43 CFR § 18, Appendix A.

The YID will not use the funds for lobbying and have provided the required certifications and disclosures pursuant to 43 CFR §1, Appendix F. The YID's Commissioner Chairman, Bill Asay, has signed the appropriate SF-424 form which is included with this application.

#### **D.2.2.10 SF-LLL: DISCLOSURE OF LOBBYING ACTIVITIES (IF APPLICABLE)**

If applicable, a fully completed and signed SF-LLL: Disclosure of Lobbying Activities form is required if the applicant has made or agreed to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. This form cannot be submitted by a contractor or other entity on behalf of an applicant.

N/A

### **D.2.2.11 LETTERS OF SUPPORT**

Please include letters from interested stakeholders supporting the proposed project. To ensure your proposal is accurately reviewed, please attach all letters of support/partnership letters as an appendix. Letters of support received after the application deadline for this NOFO will not be considered in evaluating your proposed project. These letters do not count within the 100-page maximum.

Letters of support for the project are included in Appendix C.

### **D.2.2.12 LETTER OF PARTNERSHIP**

Category B applicants must submit a letter from the Category A partner(s), stating that they are acting in partnership with the applicant and agree to the submittal and content of the proposal (see Section C.1. Eligible Applicants). However, if the project is selected, a Letter of Partnership must be received prior to award.

N/A

### **D.2.2.13 OFFICIAL RESOLUTION**

Include an official resolution adopted by your organization's board of directors or governing body, or, for state government entities, an official authorized to commit the applicant to the financial and legal obligations associated with receipt of a financial assistance award under this NOFO, verifying:

- The identity of the official with legal authority to enter into an agreement.
- The board of directors, governing body, or appropriate official who has reviewed and supports the application submitted.
- That your organization will work with Reclamation to meet established deadlines for entering into a grant or cooperative agreement

An official resolution meeting the requirements set forth above is mandatory. If you are unable to submit the official resolution by the application deadline because of the timing of board meetings or other justifiable reasons, the official resolution may be submitted to [shadro-fafoa@usbr.gov](mailto:shadro-fafoa@usbr.gov) up to 30 days after the application deadline. This resolution does not count within the 100-page maximum for the application.

An official resolution from the YID Board is provided in Appendix D.

# Yellowstone Irrigation District

## Resolution #2024-01

### Main Canal and Lateral 17.6 Rehabilitation Project WaterSmart Grant Application

**WHEREAS;** the Yellowstone Irrigation District has the legal authority to enter into an agreement, and intends to submit a Water Efficiency Grant to the United States Bureau of Reclamation's (USBR) WaterSMART Program in November 2024, and;

**WHEREAS;** the Yellowstone Irrigation District, located in Hysham, MT commits to assisting in the funding of, implementation of, the construction of, operation of, and to performing the future maintenance for the Main Canal and Lateral 17.6 Rehabilitation project per the stipulations of the foregoing grant application (if successful and awarded), and;

**WHEREAS;** the Yellowstone Irrigation District contributions of cash and in-kind management, labor, and equipment services for the preferred alternative of the aforementioned grant application have been estimated at up to 50% of the total projects per the budgeting calculation forms included in the WaterSMART Grant Application, and;

**WHEREAS;** the Yellowstone Irrigation District hereby appoints Bill Asay, Chairman and Dennis Kolb, Board member, both as officials with legal authority to enter into an agreement (if successful and awarded);

**THEREFORE, BE IT RESOLVED:** The Yellowstone Irrigation District Board supports the application and hereby commits to the supply of in-kind labor, management, equipment, and/or cash to satisfy the required match as stipulated in the Funding Plan of the WaterSMART Grant Application submittal for the Main Canal and Lateral 17.6 Rehabilitation project. The Yellowstone Irrigation District has budgeted for the planned capital and resource expenditures and will work with Reclamation to meet the established deadlines for entering into a grant or cooperative agreement.

#### BOARD OF DIRECTORS

#### Yellowstone Irrigation District

Signed: Bill Asay  
Bill Asay, YID Chairman - Commissioner

Date: 11/6/2024

Signed: Dennis Kolb  
Dennis Kolb, YID Commissioner

Date: November 6, 2024

Witnessed: Marlee Sears  
Marlee Sears, Secretary

Date: November 4, 2024

### **D.2.2.11 LETTERS OF SUPPORT**

Please include letters from interested stakeholders supporting the proposed project. To ensure your proposal is accurately reviewed, please attach all letters of support/partnership letters as an appendix. Letters of support received after the application deadline for this NOFO will not be considered in evaluating your proposed project. These letters do not count within the 100-page maximum.

Letters of support for the project are included in Appendix C.

### **D.2.2.12 LETTER OF PARTNERSHIP**

Category B applicants must submit a letter from the Category A partner(s), stating that they are acting in partnership with the applicant and agree to the submittal and content of the proposal (see Section C.1. Eligible Applicants). However, if the project is selected, a Letter of Partnership must be received prior to award.

N/A

### **D.2.2.13 OFFICIAL RESOLUTION**

Include an official resolution adopted by your organization's board of directors or governing body, or, for state government entities, an official authorized to commit the applicant to the financial and legal obligations associated with receipt of a financial assistance award under this NOFO, verifying:

- The identity of the official with legal authority to enter into an agreement.
- The board of directors, governing body, or appropriate official who has reviewed and supports the application submitted.
- That your organization will work with Reclamation to meet established deadlines for entering into a grant or cooperative agreement

An official resolution meeting the requirements set forth above is mandatory. If you are unable to submit the official resolution by the application deadline because of the timing of board meetings or other justifiable reasons, the official resolution may be submitted to [shadro-fafoa@usbr.gov](mailto:shadro-fafoa@usbr.gov) up to 30 days after the application deadline. This resolution does not count within the 100-page maximum for the application.

An official resolution from the YID Board is provided in Appendix D.



**YELLOWSTONE RIVER  
CONSERVATION DISTRICT COUNCIL**  
3120 Valley Drive East  
Miles City, MT 59301  
Phone: 406-232-7905, Ext 3242

♦  
Dan Rostad  
Administrator  
406-930-0594

♦  
David Pratt  
Technical Advisor

♦  
Cameron Skinner  
Conservation Specialist

**CONSERVATION DISTRICT  
COUNCIL MEMBERS**

♦  
Dr. Don Youngbauer, Chairman  
ROSEBUD COUNTY  
Phone: 406-361-1687

♦  
John Moorhouse Vice-Chairman  
AT-LARGE

♦  
CUSTER COUNTY, FISCAL AGENT  
Walter Rolf

♦  
DAWSON COUNTY  
Gene Evans

♦  
PARK COUNTY  
DeWitt Dominic

♦  
PRAIRIE COUNTY

♦  
RICHLAND COUNTY  
Shawn Conradson

♦  
STILLWATER COUNTY  
Steven Story

♦  
SWEET GRASS COUNTY  
Stuart Stenberg

♦  
TREASURE COUNTY  
Phil Fox

♦  
Yellowstone County  
Leroy Gable

♦  
McKENZIE COUNTY, ND

♦  
MEMBERS AT-LARGE  
John Moorhouse  
Craig Wagner

♦  
[yellowstonerivercouncil.org](http://yellowstonerivercouncil.org)

♦  
*"Working relationships yield a  
shared vision..."*

Thursday, November 7, 2024

**US Bureau of Reclamation – WaterSmart Program  
Grant Review Committee**

**Re: YID Main Canal and Lateral 17.6 Rehabilitation Project**

To all concerned:

The Yellowstone River Conservation District Council (YRCDC) is a grassroots, locally led organization composed of eleven Conservation Districts along the Yellowstone River, tasked with the mandate to complete the Cumulative Effects Analysis study (CEA) and develop voluntary management recommendations for the river and its riparian areas.

The Yellowstone River stretches over 680 miles and is the longest free-flowing river in the lower 48 states. The study covers the 565-mile reach of the river from Gardiner, Montana to its confluence with the Missouri River in North Dakota.

Beginning in 2004, the YRCDC entered into a cost-share agreement with the US Army Corps of Engineers and agreed upon a scientific project study plan for what is known as the Cumulative Effects Analysis (CEA), which provides the basis for the Yellowstone River recommended management practices on the river.

The Bureau of Reclamation played an important role in the development of the CEA providing staff for the Technical Advisory Committee, which played a key role in providing the scientific integrity and quality assurance for this comprehensive analysis document and management recommendations.

The YRCDC has remained committed to providing leadership, assistance, and guidance for the wise use and conservation of the Yellowstone River during this entire process and strongly supports the scientific studies on which to base management recommendations.

YRCDC's purpose is to provide local leadership, assistance, and guidance to sustain the system's natural resources and improve social, environmental and economic values along the river corridor.

In the past four years, YRCDC staff have assisted four major irrigation districts in the lower Yellowstone River corridor, to develop long-term strategic planning documents that will assist them with irrigation efficiency and water system management.

Beginning in 2021, the Yellowstone River Conservation District Council staff, worked with the Yellowstone Irrigation District's Board of Commissioners, irrigators, other users, and interested parties to assess the Yellowstone Irrigation Districts water delivery system, water rights, practices, issues, needed work and replacement, and general overall state of the YID system and area.

This strategic plan identifies the various issues, current and future challenges, opportunities, and offers recommendations to improve aging infrastructure which provide irrigation efficiency improvements and overall drought resilience.

With these goals in mind, we strongly urge your consideration to fund this project which will greatly improve water distribution systems in the YID and ensure continued irrigation water supply to valuable farm ground.

The Yellowstone Irrigation District system provides over \$15 Million every year in high value crops and pays more than \$150 Thousand in property taxes contributing to the local tax base in their communities.

Canal lining and irrigation lateral improvements are high priority recommendations outlined in the CEA study document and given the natural resource, environmental and economic benefits provided, this project is a good fit for the goals and objectives of the Bureau's Water Smart Program.

On behalf of the Yellowstone River Conservation District Council, we urge your consideration to fully fund this beneficial efficiency and resiliency project, submitted to you by the Yellowstone Irrigation District. Please feel free to contact me if you have any questions or desire more information about the Yellowstone River analysis and recommendations.

Sincerely,



Dan Rostad, Administrator

### **D.2.2.11 LETTERS OF SUPPORT**

Please include letters from interested stakeholders supporting the proposed project. To ensure your proposal is accurately reviewed, please attach all letters of support/partnership letters as an appendix. Letters of support received after the application deadline for this NOFO will not be considered in evaluating your proposed project. These letters do not count within the 100-page maximum.

Letters of support for the project are included in Appendix C.

### **D.2.2.12 LETTER OF PARTNERSHIP**

Category B applicants must submit a letter from the Category A partner(s), stating that they are acting in partnership with the applicant and agree to the submittal and content of the proposal (see Section C.1. Eligible Applicants). However, if the project is selected, a Letter of Partnership must be received prior to award.

N/A

### **D.2.2.13 OFFICIAL RESOLUTION**

Include an official resolution adopted by your organization's board of directors or governing body, or, for state government entities, an official authorized to commit the applicant to the financial and legal obligations associated with receipt of a financial assistance award under this NOFO, verifying:

- The identity of the official with legal authority to enter into an agreement.
- The board of directors, governing body, or appropriate official who has reviewed and supports the application submitted.
- That your organization will work with Reclamation to meet established deadlines for entering into a grant or cooperative agreement

An official resolution meeting the requirements set forth above is mandatory. If you are unable to submit the official resolution by the application deadline because of the timing of board meetings or other justifiable reasons, the official resolution may be submitted to [shadro-fafoa@usbr.gov](mailto:shadro-fafoa@usbr.gov) up to 30 days after the application deadline. This resolution does not count within the 100-page maximum for the application.

An official resolution from the YID Board is provided in Appendix D.

## D.2.2.14 LETTERS OF FUNDING COMMITMENT

If a project is selected for award under this funding opportunity and cost share funding is anticipated to be provided by a source other than the applicant, the third-party cost share must be supported with letters of commitment prior to award. Letters of commitment should identify the following elements:

- The amount of funding commitment

The YID has applied for \$250,000 from the RRGL program, but the application is pending at this time. Therefore, the application requests \$499,726 from WaterSmart in this grant application and shows a 50-50 applicant match of \$499,726 for a project total cost of \$999,452. Should the RRGL dollars be awarded to the YID, the applicant cost from YID will be reduced to \$249,726 and the RRGL third party contribution will be \$250,000 to meet the YID's match requirement for this WaterSmart Grant Application.

- The date the funds will be available to the applicant.

The RRGL funds, if awarded, would become available to the YID sometime after May 2025, depending on contracting with the program.

- Any time constraints on the availability of funds

The RRGL grant will need to be spent by the end of 2028, if awarded.

- Any other contingencies associated with the funding commitment.

There are no other contingencies associated with the funding commitment.

Cost-share funding from sources outside the applicant's organization (e.g., loans or State grants) should be secured and available to the applicant prior to award.

The YID has applied for two, \$125,000 grants from the Montana Department of Natural Resources and Conservation Renewable Resource Grant & Loan Program. The grant will be available mid to late 2025 and must be spent by the end of 2028 if awarded.

Reclamation will not execute a financial assistance agreement until non-Federal funding has been secured or Reclamation determines that there is enough evidence and likelihood that non-Federal funds will be available to the applicant after executing the agreement.

November 4, 2024

Bureau of Reclamation  
WaterSmart Program

**RE: Application for WaterSmart Grant Funding under Funding Opportunity No. R24AS00052 for the Main Canal and Lateral 17.6 Rehabilitation Project**

To Whom It May Concern:

The Yellowstone Irrigation District (YID) is applying for funding from the Bureau of Reclamation WaterSmart Program through Funding Opportunity Announcement No. R24AS00052, Water and Energy Efficiency Grants for Fiscal Year 2024, to make critical improvements to our water supply and distribution system. This project consists of lining a 5,042-foot stretch of the main canal approximately 0.8 mile downstream of the Lateral 17.6 headgate. Additionally, the project consists of converting 2,600 feet of Lateral 17.6 from the headgate to the north to a closed pipeline system. The project will mitigate seepage losses, improve water delivery to downstream acreage beyond Sanders Hill, while also providing improved water delivery efficiency for system users.

Although the proposed WaterSmart Grant Funding requested represents an important portion of the overall costs, at least 50% of the costs will be borne by YID through out-of-pocket expenditures or other funding sources. The YID understands that the cost of this project will exceed the available grant funds. The YID will commit the necessary funds, Montana Department of Natural Resource RRG grant, if awarded, and in-kind services in the amount of \$499,726 or more to complete the proposed project. We acknowledge that federal funding requires compliance with the Single Audit Act and any audit costs not covered by the proposed funding will be covered by the irrigation district. With this letter, YID is expressing commitment to providing the remaining matching funds and/or in-kind services as necessary to complete the proposed Main Canal and Lateral 17.6 Rehabilitation Project.

Please contact us if you have any questions or require any additional information.

Respectfully,



Dennis Kolb, Commissioner  
Yellowstone Irrigation District

ATTACHMENT A  
BUDGET DETAIL AND NARRATIVE TEMPLATE

| Summary                   |            |                                |                                    |
|---------------------------|------------|--------------------------------|------------------------------------|
| 6. Budget Object Category | Total Cost | Federal<br>Estimated<br>Amount | Non-Federal<br>Estimated<br>Amount |
| a. Personnel              | \$0        |                                |                                    |
| b. Fringe Benefits        | \$0        |                                |                                    |
| c. Travel                 | \$0        |                                |                                    |
| d. Equipment              | \$0        |                                |                                    |
| e. Supplies               | \$0        |                                |                                    |
| f. Contractual            | \$147,290  |                                |                                    |
| g. Construction           | \$852,162  |                                |                                    |
| h. Other Direct Costs     | \$0        |                                |                                    |
| i. Total Direct Costs     | \$999,452  |                                |                                    |
| i. Indirect Charges       | \$0        |                                |                                    |
| Total Costs               | \$999,452  | \$499,726                      | \$499,726                          |
| Cost Share Percentage     |            | 50%                            | 50%                                |