

WaterSMART Grants: Small-Scale Water Efficiency Projects

Fiscal Year 2017

Funding Opportunity Announcement No. BOR-DO-17-F011

Riverdale Canal Bypass Pipeline for Water Savings and Efficiency



Applicant:

Riverdale Canal Company
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Preston, ID 83263

Project Manager:

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January 10, 2017

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Technical Proposal

Executive Summary

Date: 1/10/2017

Applicant: RIVERDALE CANAL COMPANY

City/Co/State: Preston, Franklin, Idaho

Project Manager: Lyla Dettmer

Project Description:

This project will decommission 9,000 feet of earthen canal; bypassing it with 2,200 feet of pipe to reduce water losses an estimated 2cfs or 500 Acre Feet (AF) seasonally. The project is guided by the Riverdale Canal Company Water Management and Conservation Plan completed in 2016.

The assessment identified a problematic reach of the canal where it traversed steep hillsides with clay composition that periodically resulted in large amounts of water loss by seepage and landslides destructive to the canal. The option to install a pipeline to bypass this reach was selected as measure that would address multiple goals of the Riverdale Irrigation Company. This project is the priority measure selected by board of directors during the planning process. The funding provided by this opportunity will help the Riverdale Canal Company with the costs of pipe material, contractual construction and administrative tasks needed to implement the project.

Timeline: 2 Years from award, estimated completion date March 31, 2019

Federal Facility: Project is not located on a Federal Facility

Background Data

Riverdale Canal Company operates a conveyance system approximately 10 miles northeast of Preston, Idaho (See Attached map). The canal delivers 5.87 cubic feet per second (CFS) of irrigation water to 31 shareholders. Water is delivered via canals, ditches and pipelines. The main conveyance system travels 12 miles through open canal, resulting in major losses due to seepage, evaporation, and canal breaks. The system does not have any water storage capabilities.

The Riverdale Canal Company has a service area of 625 acres. Within this area, the typical crops grown are alfalfa and small grains. Irrigation typically occurs between May 1st and October 1st.

The main system inflow is the diversion of 5.87 CFS from Mink Creek as defined by IDWR Water Right No. 13-7748, see details in Table 1 below.

IDWR Water Rights

WATER RIGHT NO.	PRIORITY DATE	SOURCE	TRIBUTARY	BENEFICIAL USE	FROM DATE	TO DATE	DIVERSION RATE
13-7748	05/01/1888	Mink Creek	Bear River	Irrigation	04/20	09/30	5.87 CFS

(Table 1. Water Rights associated with Riverdale Canal Company (Idaho Department of Water Resources))

There are 31 shareholders that have rights to water from the main canal, almost all of which is used for agricultural crop irrigation with small quantities used for lawn sprinklers. The crop area irrigated annually, on average, is an estimated 625 acres. The crops grown are either alfalfa or small grain crops.

The Annual System Budget identifies the available water and major losses (Table 2). The major system outflows are accounted for by the evapotranspiration of the crops grown, conveyance seepage/canal breaks, and return flow to the Bear River. Return flow to the Bear River is water diverted under the decreed water right but is conveyed without being used. This situation occurs when irrigation ceases during rainfall events or harvest and there is a lag time between shutting the diversion head gates.

Annual System Budget

Average Annual Inflow		Average Annual Outflow	
Description	Volume (AF)	Description	Volume (AF)
Diverted from Mink Creek	1,895	Seepage (40%)	757.8
		Crop ET, Percolation, Runoff	888.7
		Return Flow to Bear River	248.5
Total (AF)	1,895	Total (AF)	1,895

(Table 2. Annual system budget indicates system inflows and major losses/outflows from RCC Water Management and Conservation Plan.)

The Riverdale Canal Company is directly connected to the only reclamation project in the Idaho Bear River Watershed, the Preston-Riverdale-Mink Creek Irrigation Company Bench project. The Preston Bench project was authorized by the 80th Congress June 15, 1948 (62 Stat.442). This generated Preston Bench Project contract no IIR-1520 dated August 31, 1948 and contract NO 4-07-40-R0070 dated September 27, 1994. In 1996, the Preston-Riverdale-Mink Creek Irrigation Company split into two companies each retaining their water rights. The Preston Mink Creek Irrigation Company operated as the administrator for both companies regarding Reclamation responsibilities. The Riverdale Canal Company is the other entity from the original Reclamation project. (Linenberger)

In March of 2016 a Water Management and Conservation Plan was completed for the Riverdale Canal Company through the Bureau of Reclamation “Water Conservation Field Services Program FY 2013”, Agreement #R13AP40014.

Project Description

Early in 2016 a Water Management and Conservation Plan was completed for the Riverdale Canal Company. The plan identified problems, alternatives and goals to address the problems. The assessment identified a problematic reach of the canal where it traversed steep hillsides with clay composition that frequently results in large amounts of water loss by seepage and landslides destructive to the canal. The option to install a pipeline to bypass this reach was selected as a measure that would address multiple goals of the Riverdale Canal Company.

The proposed project will replace 9,000 feet of canal with 2,200 feet of High Density Polyethylene (HDPE) pipe. The pipeline will allow for a “shortcut” across the Bear Creek drainage that has required the canal to divert a lengthy distance to maintain grade. This reach of canal experiences frequent slides due to steep slopes and soil types resulting in major water losses during critical irrigation times.

By implementing this project the Riverdale Canal Company will eliminate water losses that have been observed to be as much as 2 CFS, 500 AF seasonally, as well as high maintenance costs required by frequent landslides and canal breaks. As a result, the company will be taking a large step as to following their established plan for better conservation and management of water.

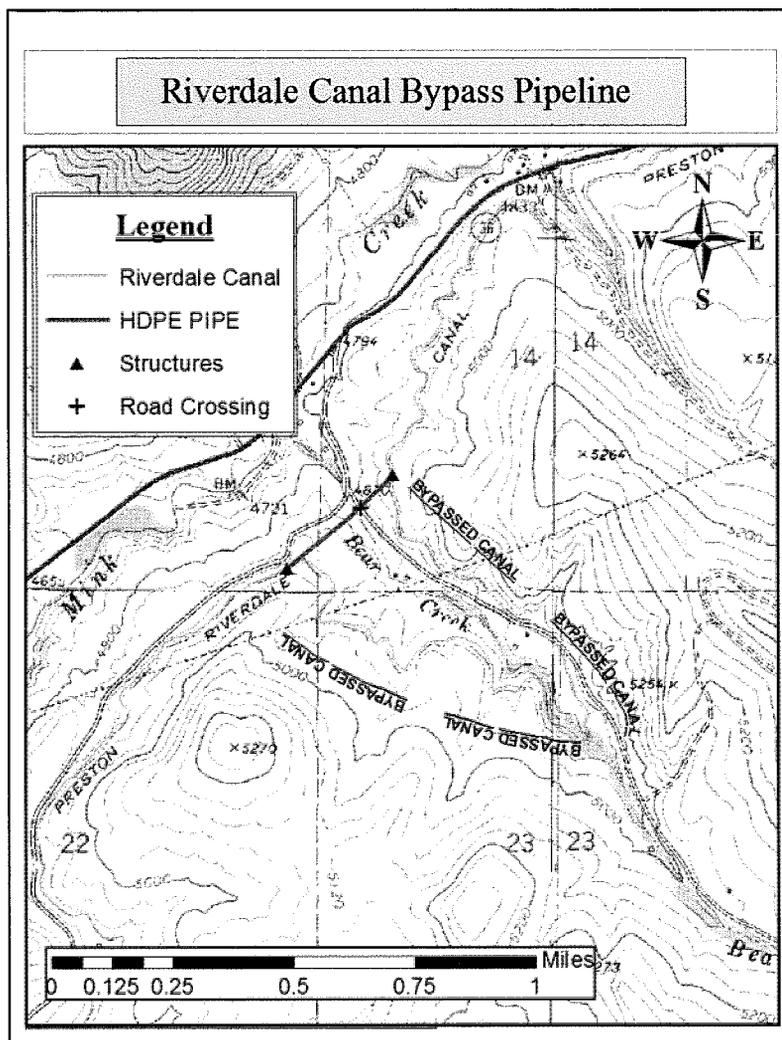


Figure 1. Map of project area shows targeted canal system reach and pipeline location.

Evaluation Criteria

Describe how your project is supported by an existing planning effort.

In March 2016 a Water Management and Conservation Plan (WMCP) was completed for the Riverdale Canal Company through the Bureau of Reclamation “Water Conservation Field Services Program Fiscal Year 2013”, Agreement #R13AP40014. This plan identified issues within the conveyance system, defined the company’s goals, and proposed measures that would address them. The following are issues and goals from the Riverdale WMCP.

Issue 1. The existing canal’s large surface area and soil types result in an estimated 40% water loss through seepage, evaporation and canal breaks.

Goal 1. Reduce total seepage and evaporation losses in the canal by at least 50% within the next 10 years.

Issue 2. Methods used to measure water delivery and actual use is inaccurate and contributes to system inefficiency.

Goal 2. Monitor and manage water delivery and actual use by implementing accurate measuring devices and monitoring program to maximize water use efficiency during the irrigation season.

Issue 3. The existing canal poses risks to future development in the area with canal breaks and high groundwater table supplied by seepage.

Goal 3. Reduce the risks and groundwater problems associated with the current canal.

The proposed project will be a large step in reaching Goal 1 and Goal 3 from the above. The pipeline will eliminate approximately 15% of the total length of canal (59,700 feet) using only 2,200 feet of pipeline. The reduction in open canal will contribute to the total reduction in risks of life and property damages due to canal breaks as well as the large amounts of water lost due to evaporation and seepage.

Multiple candidate measures were provided in the existing plan including piping sections of the canal, using a hydroelectric generator as penstock for the pipeline, and using Polyacrylamide to address seepage issues. These measures were either cost prohibitive or insufficiently addressed the defined goals. This project addressed multiple goals in a cost effective manner.

Describe the expected benefits and outcomes of implementing the proposed project.

The applicant’s water supply delivery system is approximately 12 miles of unlined canal. The canal has offered a relatively low cost delivery system with the exception of continuous maintenance. By implementing the proposed project overall system efficiency will be increased by decreasing canal maintenance costs and water losses.

Supply reliability is dependent on the canal’s ability to convey water over long distances until taken by water users. Canal breaks during the irrigation season impacts shareholders by reducing crop yields when irrigation demands are not being met. The proposed project will improve reliability of the conveyance system by bypassing a section of canal that frequently experiences breaks and seepage losses.

The project scope involves a system that expands through the Upper Mink Creek and Station Creek sub-basins and will have an impact in both. Any water saved in this system and is in excess of shareholder use is returned to the Bear River for downstream use.

Positive impacts to local agriculture economies will be expected as the project will increase water reliability to farmers served by the Riverdale Canal, helping maintain better crop yields and economic stability.

Describe the implementation plan for the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.

Major Tasks	Milestones	Responsibility	Date
Project Management	Financial Assistance Review	BOR, RCC, FSWCD	1-3 months after award
	RCC Budget Adjustment	RCC	Fall 2017
	Agreements w/ Partners	RCC	Fall 2017
	Easements	RCC	Fall 2017
	Reporting & Coordination	FSWCD	As required
Environmental Compliance		BOR, FSWCD, RCC	Prior to Construction
Engineering	Preliminary Screening	RCC	Completed
	Survey	RCC	Fall 2017
	Design	Engineer	Winter 2017
	Permits	RCC	Fall 2017
	Construction Inspections	FSWCD, RCC	During Installation
Construction	Procurement	RCC	Summer 2018
	Installation	RCC	Fall 2018
	Testing	RCC	Upon Completion
Finalization	Performance Measures	RCC, FSWCD	Winter 2018
	Project acceptance	RCC	Spring 2019
	Final Report	FSWCD, RCC	90 days after grant end

A permit will be required for installing the project pipeline across E. Bear Creek Road. Permit will be obtained by contacting Franklin County Road Department.

Permits for crossing Bear Creek will be acquired by submitting a Joint Application to IDWR and Army Corp of Engineers.

Previously there has been surveying and preliminary pipe sizing calculations performed in support of this project.

No new policies or administrative actions will be required to implement the proposed project.

How is the proposed project connected to a Reclamation project or activity?

Riverdale Canal Company has a direct tie to the Bureau of Reclamation. Prior to 1996, the canal was part of the Preston-Riverdale-Mink Creek Canal Company that participated in multiple Bureau projects. In 1996 the company's split into the Riverdale Canal Company and Preston-Mink Creek Canal Company now known as Consolidated Irrigation Company.

Environmental and Cultural Resources Compliance

- No negative impacts to the surrounding environment are expected. Project excavation will occur in existing canal and tilled agricultural fields. The proposed project pipeline will cross Bear Creek, an intermittent stream. A joint permit (Army Corp of Engineers and IDWR) will be filed before any work is conducted near the stream. Mitigation measures will be used during material staging, equipment operation and construction to reduce any impact to water quality. All excavated areas will be properly replaced and revegetated to its original state.
- Using NRCS Threatened and Endangered species GIS data sets, no species or critical habitat were identified in the project area.
- Using NRCS wetland data, no wetlands are present inside the project boundaries. Bear Creek is an intermittent stream that may be categorized as a Water of the United States. The pipeline will cross over Bear Creek. No negative impacts are anticipated. Necessary precautions will be taken to comply with all permits and reduce any impacts of project construction.
- The water delivery system construction began in 1889 and was completed in 1899. (Linenberger)
- The proposed project will not modify or construct on any existing features of the current irrigation system.
- No historic buildings or structures have been identified for registering with the NRHP. Using the National Park Service's National Register of Historic Places GIS dataset no places were located near the project area.
- No known archeological sites are in the proposed project area.
- No effect on low income or minority populations are anticipated.
- No impact on tribal lands or sacred sites will be had by this project.
- The proposed project will not enhance noxious or non-native invasive species presence in the area. Plant species spread will be decreased because a large section of open canal will be abandoned, weeds in this section will no longer be conveyed down the canal. All excavated and disturbed areas will be revegetated so that the area will be less susceptible to weed invasion.

Required Permits or Approvals

It is the responsibility of the irrigation companies to negotiate and obtain the necessary easements. These are only necessary when an existing historical right of way is not available. Additional easement will be needed and the landowners have been approached. All of the cropland easements are owned by shareholders of the irrigation company. They wish to implement this project to improve water delivery efficiency of their system.

Permits for county road crossing will be acquired from the Franklin County Road Department prior to construction.

Bear Creek is an intermittent stream that may qualify as a Water of the U.S that the pipeline will cross over. No adverse impacts on the stream are expected by the project. Permits from the Army Corp of Engineers and Idaho Department of Water Resources will be acquired during engineering design and their permit instructions followed during implementation.

Official Resolution

See Attached Resolution from Riverdale Canal Company.

Project Budget

Funding Plan and Letters of Commitment

Non-Federal share of project costs will be the responsibility of Riverdale Canal Company. The canal company will acquire funding by raising the company's assessment.

Idaho Soil & Water Conservation Commission has the ability to contribute in-kind funding with engineering staff for project design. Engineering staff time is allocated on an annual basis and cannot commit staff time at this moment. Historically requests for engineering staff time have been approved.

If the in-kind contribution from ISWCC is not available or RCC chooses a different contract engineer, the Riverdale Canal Company will cover the associated costs by shareholder assessment.

Please see attached official resolution for Riverdale Canal Company's commitment to funding.

Table 1.—Summary of Non-Federal and Federal Funding Sources

FUNDING SOURCES	AMOUNT
Non Federal Entities	
1. *Riverdale Canal Company (In-kind & Cash)	\$61,068.96
2. *Idaho Soil & Water Conservation Commission- (Pending)	\$10,682.79
3.	
Non-Federal Subtotal	\$71,751.75
Other Federal Entities	

Supplies & Materials

Office Supplies is required for periodic reporting and final reports as well as design booklets and bid packets made for competitive bid process.

HDPE Pipe 24" DR-32.5 estimated \$20.91 per foot with 2,100 feet required. Calculated from price cost in previous project for 24" DR-21 pipe costing \$31.72 per ft, this pipe weighs 36.1 lbs per foot = \$0.88 per pound. 24" DR-32.5 weighs 23.762 lbs per foot. Applying the 88 cent cost per pound to the 24" DR-32.5 weight, the unit cost per foot is equal to \$20.91.

Appurtenances cost is calculated at 10% of the pipe material cost. This 10% is derived from the 2017 NRCS Practice 430 Scenario List.

All purchases such as pipe, fittings, and valves will be procured using a competitive bid process.

Contractual

This budget was compiled by our technical staff. Using NRCS Idaho 2017 Equip Cost lists, online pricing, and past bids.

Construction Contractor A will complete the following items:

Trenching- cost includes equipment and labor. Cost derived from NRCS 2017 Equip Scenario for HDPE Pipe greater than 10 inches dia.

Fusing- Pipe fusing cost includes equipment and labor and is derived from online at HDPE.com/fusion/fusion_cost_guidline.

Mobilization of small equipment- cost derived from NRCS 2017 Equip Scenario

Mobilization of medium equipment- cost derived from NRCS 2017 Equip Scenario

Road Crossing- Pipeline will cross a gravel county road (E. Bear Creek Rd). A past bid for gravel road crossing of 12" PVC pipeline cased in 5/16 steel pipe was estimated at \$3,000. We estimate that the pipe size of 24" will double this cost to \$6,000.

Stream Bore Crossing- Pipeline must traverse across Bear Creek, we anticipate the Army Corp of Engineers would like to bore underneath with the pipe. A previous bid for a 12" pipe crossing under a state highway for \$12,000 was doubled to account for larger pipe size of 24".

Inlet Structure- Required to transition from open canal to 24" HDPE pipe was estimated using the BOR Commonly Used Drawings document and found a structure for 24" pipe. Cost of the structure was determined using NRCS Equip Cost List item Structure for Water Control "miscellaneous structure, Medium".

Outlet Structure- Cost determined using same method as above "inlet structure".

Contractor B will complete the following:

Engineering Design- Includes surveying and design. This work will be contributed as In-Kind.

The installation using public works contractors will also be selected using sealed competitive bids.

Environmental and Regulatory Compliance

This budget item includes 2% of Total Direct Costs for environmental and regulatory compliance.

Other

This project will have an annual financial review done by an independent auditor in accordance with the generally accepted government auditing standards covering financial audit and Idaho State. The total audit cost is divided and shared among the number of ongoing projects.

Reporting- Includes periodic and final reports as required completed by Project Manager.

Indirect

Indirect cost calculated using the Modified Total Direct Cost (MTDC) method which includes 10% of all direct salaries and wages, applicable fringe benefits, materials and supplies, services, travel, and up to the first \$25,000 of each sub award.

References

Idaho Department of Water Resources. *Water Right and Adjudication Search*. n.d. Web. 5 January 2017.

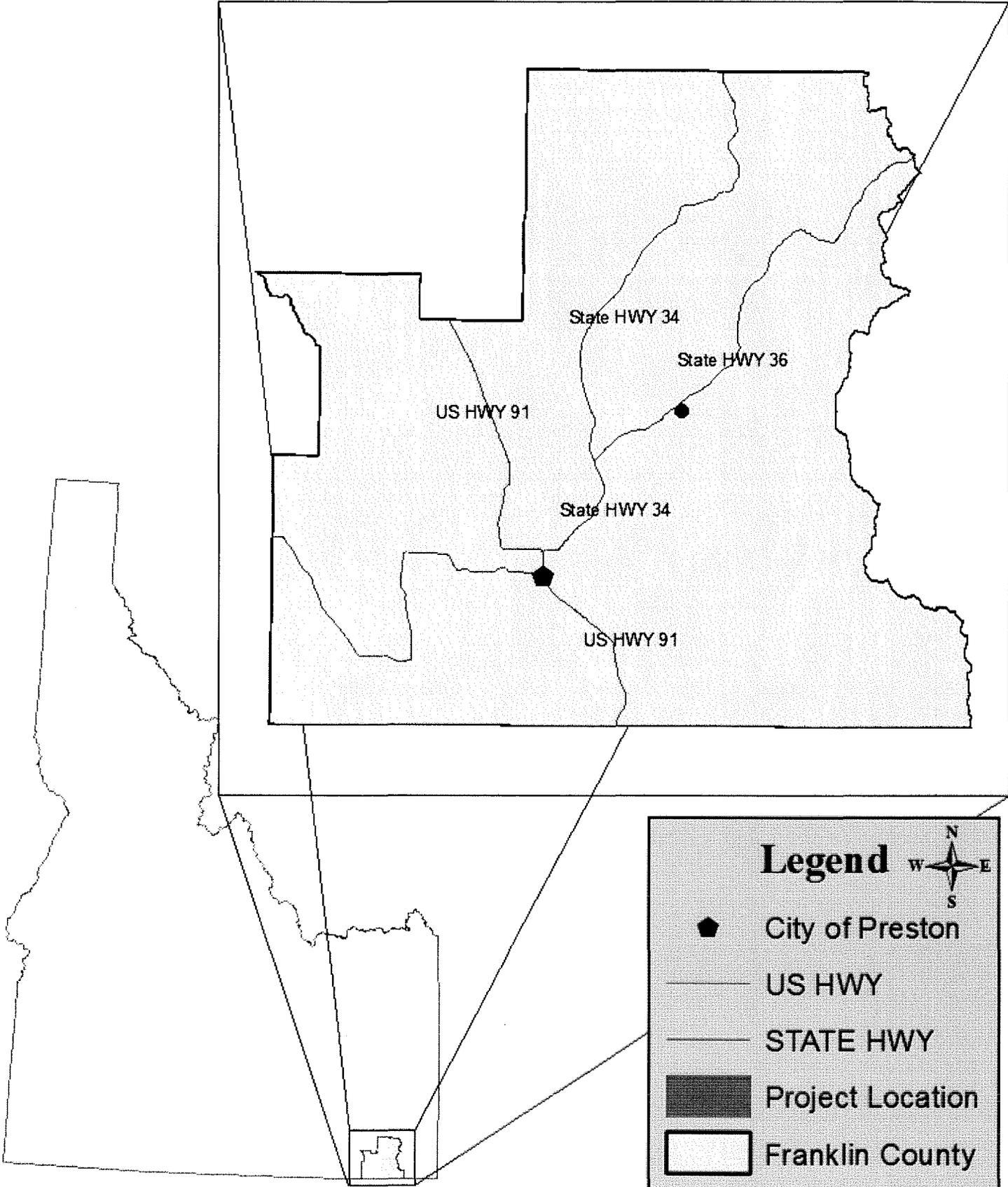
Linenberger, Toni Rae. "Preston Bench Project." 1998. Document.

Attachments

Geographic Location Map

Official Resolution- Riverdale Canal Company

Geographic Location



BOARD RESOLUTION
OF
RIVERDALE CANAL COMPANY

To the Bureau of Reclamation,

The Riverdale Canal Company (RCC) submits this letter as an official resolution, authorized by the board of directors, to commit to the financial and legal obligations associated with the receipt of WaterSMART grant funds awarded by the Bureau of Reclamation for the Riverdale Canal Bypass Pipeline for Water Savings and Efficiency project.

This project will be a significant improvement to our system's efficiency. By implementing 2,200 feet of pipeline to decommission 9,000 feet of high seepage reach of canal that experiences frequent breaks. The pipeline was identified as priority measure in our recently completed Water Management and Conservation Plan.

Thank you for considering RCC for this opportunity.



1-11-17

Robert P. Smith,
Riverdale Canal Company President