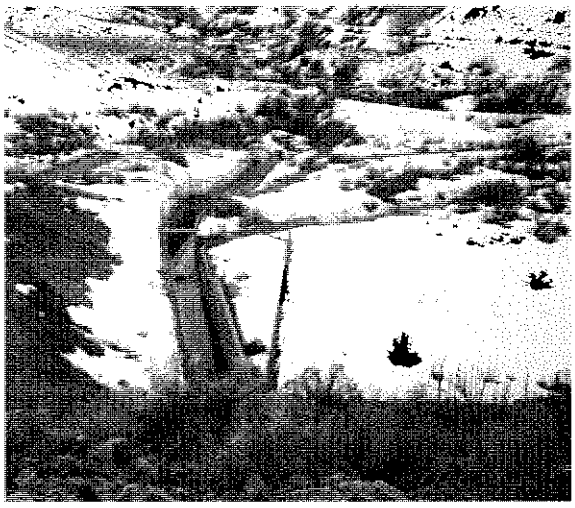

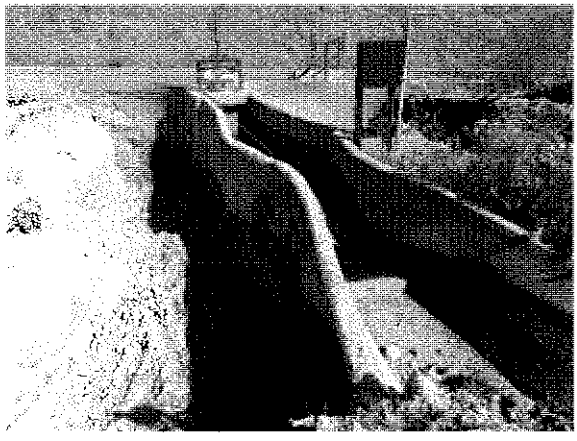

Newton Water Users Association DAM PIPING AND PIPELINE PRESSURIZATION PROJECT

WaterSMART: Water and Energy Efficiency Grants for FY2016 No. R16-FOA-DO-004

APPLICANT:
NEWTON WATER USERS ASSOCIATION
Val Jay Rigby, President
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Newton, Utah 84327
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rigbyranch@comcast.net

PROJECT MANAGER:
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'Original'

Table of Contents

Table of Figures

Tables

Executive Summary

The executive summary should include:

- *The date, applicant name, city, county, and state*
- *A one paragraph project summary that specifies the work proposed, including how project funds will be used to accomplish specific project activities and briefly identifies how the proposed project contributes to accomplishing the goals of this FOA (see Section III.B. Eligible Projects)*
- *State the length of time and estimated completion date for the project*
- *Whether or not the project is located on a Federal facility*

Date: January 15, 2016
Applicant: Newton Water Users Association
Address: P.O. Box 81
City: Newton **County:** Cache **State:** Utah
Contact: Scott Archibald Sunrise Engineering sarchibald@sunrise-eng.com or Val Jay Rigby, President Newton Water Users Association 435.563.9293 rigbyranch@comcast.net

Project Summary

The purpose of this project is to pressurize the irrigation pipe network that starts near the toe of the dam by piping the last open pipe section through the dam. By eliminating this open channel section the Newton Reservoir and the irrigation pipeline will be connected with pipes, creating a pressurized irrigation system and enable the Newton Water Users Association (NWUA or Association) the ability to conserve and more efficiently manage the available water in Newton Reservoir. The significant benefits to this project are as follows:

- Provide pressurized water to the majority of the shareholders.
- Better manage 5,500 acre-feet. (100%) of the delivered water.
- Average water savings equal 1860 acre-feet per year equally (34%)
- Conserve energy by using the available head pressure created by connecting the piping system to the Newton Reservoir. This will reduce the power demands of the 15 pumps by an average of 2,480 kW-hr per day (33%).
- Reduce costs required to operate and maintain the system by eliminating the need to drive to the reservoir multiple times a day to manage the head gate and rationing of the water usage between shareholders.

For the past two years Newton Water Users has partnered with Bureau of Reclamation (BOR) in preparing the design of the pipe through the dam, environmental work, completing risk analysis and value engineering studies. In order to pressurize the pipeline and connect the irrigation pipelines to the dam the follow tasks need to be complete.

• BOR design, value engineering & risk analysis		$ 320,000
• BOR oversight and inspection		$ 150,000
• Project Bidding & Administration		$ 50,000
• Construction Estimate		$1,250,000
	Total	$1,770,000

The Association is seeking $708,000 (40%) from Reclamation through this program. The total project cost is estimated to cost $1.77M. The Association has secured a $600,000 dollar loan at 1.1% interest from Utah Division of Water Resources and can obtain additional funds from them if the grant is provided.

Scott Winterton, a Chief Design Group employee at the Provo Area Office, is BOR's main contact with the Association.

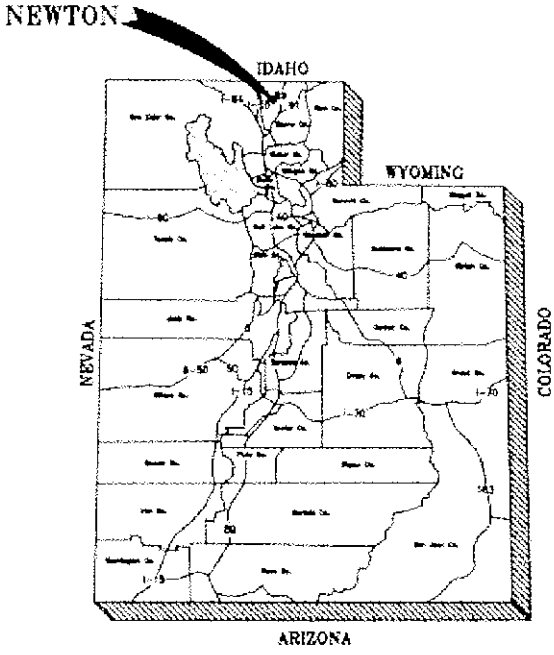
The project interacts with Federal facilities, Newton Dam & Reservoir, BOR is required to complete the design and construction oversight of the pipeline thru the dam. The construction of the project is anticipated to occur over a period of 6 months. During the 6 month period, the project will connect the pipeline through the dam making a pressurized and fully operational system. It is estimated that the project will be completed by May of 2017.

Background Data

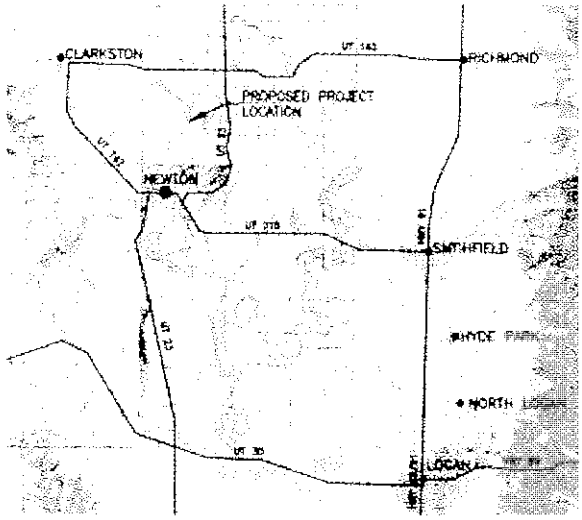
Provide a map of the area showing the geographic location (include the State, county, and direction from nearest town).

The project is located approximately 2 miles north of the Town of Newton, Utah (see Figure 1). In 1941, the Bureau of Reclamation (BOR) teamed with the NWUA and completed the construction of the Newton project in 1948. The Newton project has been a great resource to the Association and to the community. The dam, reservoir, and canals were constructed to replace the original structure constructed in 1874. The dam, reservoir, and canal system is known to BOR as the Newton Project and is identified as Project #292. Additional information concerning the dam, reservoir, and canal history can be reviewed on the BOR website (http://www.usbr.gov/projects/).

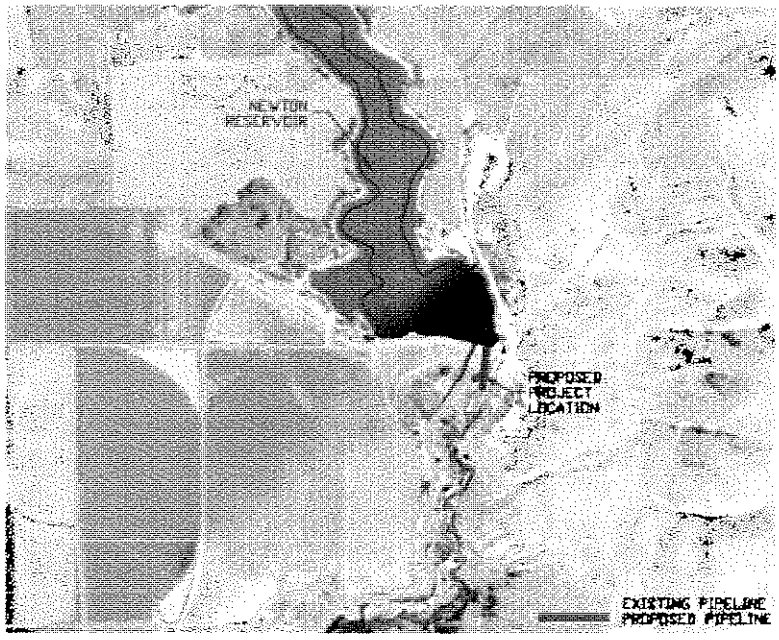
AREA MAP



VICINITY MAP



LOCATION MAP



SUNRISE ENGINEERING 90 SOUTH MAIN STREET SMITHFIELD, UTAH 84335 TEL 435.563.3734	SUNRISE ENGINEERING	LOCATION AND AREA MAP

Figure 1 - Project Location

Applicant's Water Supply

As applicable, describe the source of water supply, the water rights involved, current water uses (e.g., agricultural, municipal, domestic, or industrial), the number of water users served, and the current and projected water demand. Also, identify potential shortfalls in water supply. If water is primarily used for irrigation, describe major crops and total acres served.

Clarkston Creek provides source water for Newton Reservoir. Water from the reservoir is conveyed into the piped system through an intake structure located in the dam.

Water Rights

The water rights involved in this project are listed under supplemental group number 628291, or water right numbers 25-3082, 25-3515, and 25-6870. These water rights have an agricultural beneficial use designation. A summary of NWUA's water rights are below.

WR#	Priority	Irrigated Acre	Ac-Ft
25-3515	1869	1,363.62	5,454.48
25-3082	1938	1,066.06	4,264.24
25-6870	1987	1,108.60	4,434.4
	Totals:	3,657.77	14,153.12

Water Shortfalls

Depending on the snowpack and annual precipitation, NWUA has the right to more water and could use more than typically reaches the reservoir. NWUA must conservatively allocate and monitor the amount of water to each user on the system in order to provide water for the 150 day growing season.

The agricultural lands are irrigated by sprinkling which allows for harvests of alfalfa, corn, and a variety of grain crops. A large portion of this harvested agricultural land supports local dairy operations. Water conserved by connecting the piped system and Newton Reservoir will help the farms provide adequate water supplies to crops during the entire growing season, thus producing a higher quality of crops.

Water Users and Number of Users Served

The Association is made up of 202 shareholders who hold 4,640 shares of water. Additionally, the Newton Fire Department accesses irrigation lines as needed.

Describe Water Delivery System

In addition, describe the applicant's water delivery system as appropriate. For agricultural systems, please include the miles of canals, miles of laterals, and existing irrigation improvements (e.g., type, miles, and acres). For municipal systems, please include the number of connections and/or number of water users served and any other relevant information describing the system.

HDPE pipe is installed starting at the toe of the dam and running throughout the system. The system consists of the following features:

- Control gate and piping through Newton Dam
- 6.6 miles of 6" to 48" HDPE pipe
- 2 siphons
- 34 individual connections

In addition to the portion of the system operated by the Association, the shareholders operate and maintain the following irrigation features at their own expense.

- 15 individual electrical pump stations
- 2 individual propane pump stations
- Over 20 piped lateral lines totaling approximately 21 miles
- Numerous pivot, wheel, and hand sprinkler lines

Energy Efficiency

If the application includes renewable energy or energy efficiency elements, describe existing energy sources and current energy uses.

As mentioned above, there are 15 individual electrical pump stations and two individual propane pump stations located along the main canals. Optimum operation of pivot and wheel sprinkler irrigation system suggests that users maintain pressures of 45-50 psi. Electric motors operating pumps maintain this pressure to the sprinklers. Connecting the piped system to Newton Reservoir will provide additional head pressure to pumps, thus reducing the booster pump pressure required to maintain 45-50 psi. Elevation data indicates that there will be 45 to 115 feet of head available (15-50 psi) from the piped system depending on where the pump is located in relationship to the dam. It was calculated that 33% energy savings can be realized for the electrical pump stations with the minimum available pressure from the height at the reservoir of 15 psi. These savings come through reduced horsepower requirements.

Past Relationship with Reclamation

Identify any past working relationships with Reclamation. This should include the date(s), description of prior relationships with Reclamation, and a description of the project(s).

Since 1941 NWUA has worked with Reclamation on the construction of the Newton reservoir, dam, and canal system. The completion of that project has benefited the members of the Association for 74 years.

Technical Project Description

The technical project description should describe the work in detail, including specific activities that will be accomplished as a result of this project. This description shall have sufficient detail to permit a comprehensive evaluation of the proposal.

Irrigation water is currently conveyed through an **open channel outlet structure** that was built through Newton Dam into the reservoir. BOR's design team in Denver and Provo are currently designing the new pipeline through the dam that will connect the dam/reservoir directly to the pipe distribution network. However, until the pipeline is completed through the dam, each time the water users turn sprinklers off or power goes out there will be a reduction in the flow of water in the pipeline and not in the control gate from the reservoir. With limit storage in the distilling basin, water will overflow from the system and be lost.

Typically sprinkler lines are moved twice a day. This makes it very difficult for the water master to release from the reservoir the correct amount and keep the pipeline at full capacity while water is being turned on and off at random times throughout the day. The head gates in the dam are difficult to open and close due to the large size, age of the gates, and hand operation. If the water is overflowing out of the pipeline it would take approximately 30 minutes to an hour before the water master could drive to the dam and shut the head gates.

Connecting the pipeline to the reservoir will pressurize the irrigation system giving water users approximately 40 more feet of head, help the NWUA manage the 100% of the water, and conserve water that is needed to water the crops instead of the water overflowing into the creek.

On average the water users convey approximately 40 cubic feet per second or 18,000 gallons per minute of water flowing out of the reservoir to water crops throughout the day. For every 30 minutes of water that overflows to the creek, on average 12.34 acre-feet of water is lost. At worst case scenario, if the head gates were opened up and water was being used at maximum capacity of 80 cubic feet per second, 24.78 acre-feet per 30 minutes of time, would be lost to the creek.

Evaluation Criteria

Eval Criterion A: Water Conservation (28 points)

Up to 28 points may be awarded for a proposal that will conserve water and improve efficiency. Points will be allocated to give consideration to projects that are expected to result in significant water savings.

Subcriterion A.1: Quantifiable Water Savings

Up to 24 points may be allocated based on the quantifiable water savings expected as a result of the project.
Describe the amount of water saved. 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 provide sufficient detail supporting how the estimate was determined, including all supporting calculations. 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 (please note, the following is not an exclusive list of eligible project types. If your proposed project does not align with any of the projects listed below, please be sure to provide support for the estimated project benefits, including all supporting calculations and assumptions made).

In addition, all applicants should be sure to address the following:

- *What is the applicant's average annual acre-feet of water supply?*
- *Where is the water that will be conserved currently going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground, etc.)?*
- *Where will the conserved water go?*

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

A.1.(1) **Canal Lining/Piping**

It has been calculated that the average **water savings for this project will be 1,860 acre-feet per year.** The annual water consumption used by the Association is entirely dependent on the amount of run-off storage available each year within Newton Reservoir. According to BOR records, the annual discharge ranges between 3,815-8,570 acre-feet, with an average of approximately 5,500 acre-feet.

The small portion of the system between the dam and the irrigation piped system operates as a non-pressurized open channel canal, because the system has not been tied into the reservoir creating a pressurized system. The system will be difficult to manage because NWUA will need to try and keep the pipeline full at all times without overflowing the water. For the irrigation pipeline to work efficiently the pipeline needs to be at full capacity. The water users use approximately 18,000 gallons per minute during the day while watering crops. If the irrigation pipeline is full when water users shut off their sprinklers or there is a power bump that shuts pumps off, the system will potentially

overflow 18,000 gallons per minute of water. It is essential that the irrigation system is connected to the reservoir for the system to become pressurized and work properly. At the conclusion of this project the system will be pressurized and the Association will be able to conserve and manage 100% of the water in Newton Reservoir.

Without the connection to the reservoir the irrigation system is susceptible to losing between 18,000 gallons per minute to 35,900 gallons per minute when the water is shut off to move the sprinkler lines and the control gate remains open. Water users change water every 12 hours, or twice a day. It takes the water master 1 to 1.5 hours to travel to the dam where the head gates are located and close the head gates. When there is a flow of 40 cubic feet second and the water is overflowing for 1 to 1.5 hours the NWUA will lose between 992 acre-feet per year to 1488 acre-feet per year.

1 hour $(40\ cfs\ x\ 60\frac{sec}{min}\ x\ 60\frac{min}{hr}\ x\ 300\frac{hr}{yr}\ x\frac{1\ ac-ft}{43{,}560\ ft^3} = 992\frac{ac-ft}{yr}$

1.5 hours $(40\ cfs\ x\ 60\frac{sec}{min}\ x\ 60\frac{min}{hr}\ x\ 450\frac{hr}{yr}\ x\frac{1\ ac-ft}{43{,}560\ ft^3} = 1488\frac{ac-ft}{yr}$

When there is a flow of 80 cubic feet second and the water is overflowing for 1 to 1.5 hours the NWUA will lose between 1983 acre-feet per year to 2975 acre-feet per year.

1 hour $(80\ cfs\ x\ 60\frac{sec}{min}\ x\ 60\frac{min}{hr}\ x\ 300\frac{hr}{yr}\ x\frac{1\ ac-ft}{43{,}560\ ft^3} = 1983\frac{ac-ft}{yr}$

1.5 hours $(80\ cfs\ x\ 60\frac{sec}{min}\ x\ 60\frac{min}{hr}\ x\ 450\frac{hr}{yr}\ x\frac{1\ ac-ft}{43{,}560\ ft^3} = 2975\frac{ac-ft}{yr}$

The average water savings per year is:

$$\frac{992\frac{ac-ft}{yr} + 1488\frac{ac-ft}{yr} + 1983\frac{ac-ft}{yr} + 2975\frac{ac-ft}{yr}}{4} = 1860\frac{acre-feet}{year}$$

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

Technical Pro Features of the proposed project

- 36" & 48" Butterfly valves and concrete vaults
- (1) 30" Sleeve Orifice and concrete vault
- F&I Probe Magnetic Flowmeter and concrete manhole
- Stainless steel transition piece at the gate tower
- 36" HDPE pipe grouted in place in the dam with PVC drains lines
- 48" HDPE pipe
- 6" HDPE vent hose

A.1.(2) **Irrigation Flow Measurement**

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

As mentioned above the average water savings is 1860 acre-feet per year.

Currently there is no meter to provide an accurate measurement of water coming from the reservoir. Design of a flow meter is currently being performed by the Bureau of Reclamation (BOR) to be installed at the toe of the dam. The meter will allow NWUA to calculate the amount of water coming out of the reservoir. When the system is pressurized by connecting the pipeline system to the reservoir the NWUA will be able to use all the flow meters in conjunction to determine if there are any leaks in the system, the amount of water being used, and manage the use of the water for the shareholders.

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.*

The small portion of the system between the dam and the irrigation piped system operates as a non-pressurized open channel canal, because the system has not been tied into the reservoir creating a pressurized system. The system will be difficult to manage because NWUA will need to try and keep the pipeline full at all times without overflowing the water. For the irrigation pipeline to work efficiently the pipeline needs to be at full capacity. The Water Users use between 18,000 gallons per minute and 36,000 gallons per minute (79.55 acre-feet per day to 159.1 acre-feet per day) during the day while watering crops. If the irrigation pipeline is full when water users shut off their sprinklers or there is a power bump that shuts pumps off, the system will potentially overflow 18,000 gallons per minute of water. It is essential that the irrigation system is connected to the reservoir for the system to become pressurized and work properly. At the conclusion of this project the system will be pressurized and the Association will be able to conserve and manage 100% of the water in Newton Reservoir.

Without the connection to the reservoir the irrigation system is susceptible to losing between 18,000 gallons per minute to 35,900 gallons per minute when the water is shut off to move the sprinkler lines and the control gate remains open. Water users change water every 12 hours, or twice a day. It takes the water master 1 to 1.5 hours to travel to the dam where the head gates are located and close the head gates. When there is a flow of 40 cubic feet second the water is overflowing for 2 to 3 hours per day, the NWUA will lose between 992 acre-feet per year to 1488 acre-feet per year.

2 hours/day $(40\ cfs\ x\ 60\frac{sec}{min}\ x\ 60\frac{min}{hr}\ x\ 300\frac{hr}{yr}\ x\frac{1\ ac-ft}{43{,}560\ ft^3} = 992\frac{ac-ft}{yr}$

3 hours/day $(40\ cfs\ x\ 60\frac{sec}{min}\ x\ 60\frac{min}{hr}\ x\ 450\frac{hr}{yr}\ x\frac{1\ ac-ft}{43{,}560\ ft^3} = 1488\frac{ac-ft}{yr}$

When there is a flow of 80 cubic feet second the water is overflowing for 2 to 3 hours per day the NWUA will lose between 1983 acre-feet per year to 2975 acre-feet per year.

2 hours/day $(80\ cfs\ x\ 60\frac{sec}{min}\ x\ 60\frac{min}{hr}\ x\ 300\frac{hr}{yr}\ x\frac{1\ ac-ft}{43{,}560\ ft^3} = 1983\frac{ac-ft}{yr}$

3 hours/day $(80\ cfs\ x\ 60\frac{sec}{min}\ x\ 60\frac{min}{hr}\ x\ 450\frac{hr}{yr}\ x\frac{1\ ac-ft}{43{,}560\ ft^3} = 2975\frac{ac-ft}{yr}$

The average water savings per year is:

$$\frac{992\frac{ac-ft}{yr} + 1488\frac{ac-ft}{yr} + 1983\frac{ac-ft}{yr} + 2975\frac{ac-ft}{yr}}{4} = 1860\frac{acre-feet}{year}$$

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?*

No, BOR is designing a magnetic flow meter to be installed as part of the project.

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

Project proposes to install an F&I Probe Magnetic Flowmeter

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

No volume will be reduced with the project. Delivery times will be increase.

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

At the conclusion of this project the system will be pressurized and the Association will be able to conserve and manage 100% of the water in Newton Reservoir. There will be no spilling of the water over the spillway to the creek.

A.1.(3) **SCADA and Automation**

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

Total average water supply from Newton Reservoir is 5,500 acre-feet per year. It is projected that an average of approximately 1860 acre-feet of water could be lost depending on how much water is flowing into the pipeline and how much water is being used.

$$\frac{1{,}860\,\frac{ac-ft}{yr}}{5{,}500\,\frac{ac-ft}{yr}} = 34\%\ water\ savings$$

Automation of the system will be greatly improved by connecting the piped system to the reservoir. The water delivery system will be hydraulically automated, eliminating overflows and spills. A SCADA metering system will be connected on the diversion immediately below the dam. This will assist BOR and NWUA in monitoring the flows being released from the reservoir into the piping network. Water savings will be compared with previous year's data.

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.*

Without the connection to the reservoir the irrigation system is susceptible to spills between 18,000 gallons per minute & 35,900 gallons per minute when the water is shut off to move the sprinkler lines and the control gate in the dam remains open. Water users change water every 12 hours, or twice a day. It takes the water master 1 to 1.5 hours to travel to the dam and close the head gates. On average there is a flow of 40 cubic feet per second. When the water is spilling at 40 cubic feet per second, for 2 to 3 hours per day, the NWUA will lose between 992 acre-feet per year & 1488 acre-feet per year.

2 hours/day $(40\ cfs\ x\ 60\frac{sec}{min}\ x\ 60\frac{min}{hr}\ x\ 300\frac{hr}{yr}\ x\frac{1\ ac-ft}{43{,}560\ ft^3} = 992\frac{ac-ft}{yr}$

3 hours/day $(40\ cfs\ x\ 60\frac{sec}{min}\ x\ 60\frac{min}{hr}\ x\ 450\frac{hr}{yr}\ x\frac{1\ ac-ft}{43{,}560\ ft^3} = 1488\frac{ac-ft}{yr}$

When the flow of 80 cubic feet per second is spilling for 2 to 3 hours per day the NWUA will lose between 1983 acre-feet per year & 2975 acre-feet per year.

2 hours/day $(80\ cfs\ x\ 60\frac{sec}{min}\ x\ 60\frac{min}{hr}\ x\ 300\frac{hr}{yr}\ x\frac{1\ ac-ft}{43{,}560\ ft^3} = 1983\frac{ac-ft}{yr}$

3 hours/day $(80\ cfs\ x\ 60\frac{sec}{min}\ x\ 60\frac{min}{hr}\ x\ 450\frac{hr}{yr}\ x\frac{1\ ac-ft}{43{,}560\ ft^3} = 2975\frac{ac-ft}{yr}$

The average water savings per year is:

$$\frac{992\,\frac{ac-ft}{yr} + 1488\,\frac{ac-ft}{yr} + 1983\,\frac{ac-ft}{yr} + 2975\,\frac{ac-ft}{yr}}{4} = 1860\,\frac{acre-feet}{year}$$

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

There are no anticipated reductions of delivery volumes when the project is complete.

d. *Will canal seepage be reduced through improved system management? If so, what is the estimated amount and how was it calculated?*

The system management will be greatly improved when the pipeline is connected to the reservoir and becomes pressurized. Automation will occur immediately when the hydraulics control the system and spills are eliminated. (See calculations above in part b).

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

The Association will monitor water meters and inspect the closed pipeline system for leaks.

Subcriterion A.2: **Percentage of Total Supply**

Up to 4 additional points may be allocated based on the percentage of the applicant's total average water supply (i.e., including all facilities managed by the applicant) that will be conserved directly as a result of the project.
Provide the percentage of total water supply conserved: State the applicant's total average annual water supply in acre-feet. Please use the following formula:

As indicated previously, total average water supply from Newton Reservoir is 5,500 acre-feet per year. It is projected that an average of approximately 1,860 acre-feet of water could be lost.

$$\frac{1{,}860\,\frac{ac-ft}{yr}}{5{,}500\,\frac{ac-ft}{yr}} = 34\%\ water\ savings$$

Eval Criterion B: Energy-Water Nexus (16 points)

Up to 16 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.
For projects that include construction or installation of 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. However, an applicant may receive no more than 16 points total under both Subcriteria No. B.1 and B.2.

Subcriterion B.1: Implementing Renewable Energy Projects Related to Water Management and Delivery

Up to 16 points may be awarded for projects that include construction or installation of 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 below.

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.

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.

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:

- *Expected environmental benefits of the renewable energy system*
- *Any expected reduction in the use of energy currently supplied through a Reclamation project*
- *Anticipated beneficiaries, other than the applicant, of the renewable energy system*
- *Expected water needs of the renewable energy system*

The NWUA has performed a cursory feasibility investigation of installing hydropower units in the irrigation conveyance system. Net metering would be the most cost efficient option for tying the system into the electrical grid. However, since NWUA does not own the pumps on the system, it uses a negligible amount of power and the credit for electricity generated could not be applied to the majority of power used by the system. Other options for selling power back to the power company would be cost prohibitive. Due to the lack of benefit to the NWUA, no renewable energy projects will be pursued as part of the proposed project.

Subcriterion B.2: Increasing Energy Efficiency in Water Management

If the project is not implementing a renewable energy component, as described in Subcriterion No. B.1 above, up to 4 points may be awarded for projects that address energy demands 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 management project (e.g., reduced pumping).

- *Please provide sufficient detail supporting the calculation of any energy savings expected to result from water conservation improvements. If quantifiable energy savings are expected to result from water conservation improvements, please provide sufficient details and supporting calculations. If quantifying energy savings, please state the estimated amount in kilowatt hours per year.*

The estimated energy savings is **248,000 kW-hr per year**. The energy efficiency savings equals **33 percent**. At $0.07 per kW-hr, the water users in the NWUA using electrical pump stations will save approximately $3,500 per month, or $17,300 per year. Over the 100-year life of the project, an energy savings of $1,700,000 could be realized, neglecting inflation and power cost increases.

Currently, there are 15 electrical pump stations along the piped system that are operated approximately 100 days over the five month irrigation season. The users endeavor to maintain 45 to 50 psi in their irrigation pivots and wheel lines. According to site elevation data, in the piped system there will be an average available pressure of 15 psi to the each users.

Users will reduce motor sizes or install variable frequency drives after the project is complete to reduce power usage. Initial calculations indicate that the 15 electrical pumps currently consume approximately 7,430 kW-hr per day when they are operating. With the proposed improvements, the daily power consumption will reduce to approximately 4,950 kW-hr per day. This results in a net power savings of 2,480 kW-hr per day, 248,000 kW-hr per year based on the 100 days of pumping per year. As a percentage the savings equals 33 percent.

$$\frac{2{,}480\,\frac{kW-hr}{day}}{7{,}430\,\frac{kW-hr}{day}} = 33\%\ savings$$

- *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?*

Pump Size	#
5 hp pump	1
10 hp pump	1
20 hp pump	3
30 hp pump	5
40 hp pump	1
50 hp pump	4

The pumps that are used throughout the irrigation system are centrifugal pumps and are currently designed to pump from the canal with 0 available pressure. When connected to the dam, the range of pressure available to the users is 5 to 45 psi. On average 15 psi will be added.

The proposed project will eliminate 2 of the current electric pumps and will allow for the reduction in size of the remaining pumps. New pump efficiency curves haven't been completed on all pumps. One of the calculations that is complete has one of the 50hp electric pumps being reduced to a 4hp electric and another 30hp reduced to a 6hp.

- *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 estimated at the point of diversion.

- *Does the calculation include the energy required to treat the water?*

There is no energy requirement proposed to clean or treat the water for this project. The Utah Fish and Wildlife service is enhancing the bar rack at the intake structure to keep fish in the reservoir.

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

At the completion of this project we anticipate a **93% fuel savings**. Currently, a person drives 10 miles round trip 3-4 times a day. That is 280 miles per week. After the completion of the project it is anticipated that the water master will drive to the reservoir twice a week. This will result in a savings of 260 miles per week.

Fuel Savings Calculation: 260 miles per week/ 280 miles per week = 93% fuel savings
Carbon Emissions Savings: A similar 93% reduction in CO2 emissions will be realized.

The project includes an F & I Probe Magnetic Flowmeter with a NEMA 4x receiver/transmitter metering system which will reduce the time, fuel, energy, and money spent to have a person drive to the reservoir 3-4 times a day during the irrigation season. Thus a major savings in fuel consumption and CO2 pollutions will be realized by this project.

Eval Criterion C: Benefits to Endangered Species (12 points)

Up to 12 points may be awarded for projects that will benefit federally recognized candidate species or up to 12 points may be awarded for projects expected to accelerate the recovery of threatened or endangered species, or addressing designated critical habitat. Note: proposals for water efficiency projects that simply state that a species in the basin will benefit from water savings (i.e., without a commitment to dedicate water savings for instream flows) shall receive minimal consideration under this criterion.

For projects that will directly benefit federally-recognized candidate species, please include the following elements:

- *What is the relationship of the species to water supply?*

Clarkston Creek is a tributary of the Bear River. Bear River terminates at the Great Salt Lake. Prior to entering the Great Salt Lake, diversions are made to the Bear River Migratory Bird Refuge operated by the U.S. Fish and Wildlife Service. Historically, the refuge has had some difficulty in diverting the necessary water supply to maintain a healthy ecosystem, sometimes resulting in outbreaks and disease. By increasing water inflows in the Bear River, additional supplies would be available to those species that rely on the bird refuge. There are 2 species of birds that are listed on the federally endangered species act, which are the Yellow-billed Cuckoo (threatened), and the Greater sage-grouse (candidate).

- *What is the extent to which the proposed project would reduce the likelihood of listing or would otherwise improve the status of the species?*

The increased water supply would directly lead to an improved habitat for the candidate species and reduce likelihood of disease at the bird refuge.

For projects that will directly accelerate the recovery of threatened or endangered species or address designated critical habitats, please include the following elements:

1. *How is the species adversely affected by a Reclamation project?*
2. *Is the species subject to a recovery plan or conservation plan under the ESA?*
3. *What is the extent to which the proposed project would reduce the likelihood of listing or would otherwise improve the status of the species?*

Eval Criterion D: Water Marketing (12 points)

Up to 12 points may be awarded for projects that propose developing a new water market. Note: Water marketing does not include an entity selling conserved water to an existing customer. This criterion is intended for the situation where an entity that is conserving water uses water marketing to make the conserved water available to meet other existing water supply needs or uses outside of the entity's geographic service area.

Briefly describe any water marketing elements included in the proposed project. Include the following elements:

- *Estimated amount of water to be marketed*

The estimated amount of water to be marketed is 1,860 acre-feet of water.

- *A detailed description of the mechanism through which water will be marketed (e.g., individual sale, contribution to an existing market, the creation of a new water market, or construction of a recharge facility)*

Pressurizing the irrigation system, a new water market will be created with the possibility of leasing water to Newton Town. Currently there are 260 culinary water connections in the Town of Newton. Approximately 60% (156 connections) irrigate with secondary water from the NWUA. Leased water would serve additional connections that currently do not have shares in the irrigation company. Eliminating the need of outdoor usage from the culinary system will significantly help the stressed water system in the town. The town would be responsible for expanding its distribution system.

- *Number of users, types of water use, etc. in the water market*

There are 202 shareholders in the NWUA.

- *A description of any legal issues pertaining to water marketing (e.g., restrictions under Reclamation law or contracts, individual project authorities, or State water laws)*

Water is currently being used to irrigate within the town boundaries. We do not anticipate any legal issues expanding the water market within the Town of Newton

- *Estimated duration of the water market*

Estimated duration of the water market is 100 years.

Eval Criterion E: Other Contributions to Water Supply Sustainability (14 points)

Up to 14 points may be awarded for projects expected to contribute to a more sustainable water supply. This criterion is intended to provide an opportunity for the applicant to explain 1) how the project relates to a completed WaterSMART Basin Study; 2) how the project could expedite future on-farm improvements; and/or 3) how the project will provide other benefits to water supply sustainability within the basin. An applicant may receive the maximum 14 points under this criterion based on discussion of one or more of these subcriteria.

Subcriterion E.1: Addressing Adaptation Strategies in a WaterSMART Basin Study

Up to 14 points may be awarded for projects that address an adaptation strategy identified in a completed WaterSMART Basin Study.

Proposals that provide a detailed description of how a project is addressing an adaptation strategy specifically identified in a completed Basin Study (e.g., a strategy to mitigate the impacts of water shortages resulting from climate change, drought, increased demands, or other causes) may receive maximum points under this criterion. Applicants should provide as much

detail as possible about the relationship of the proposed project to the adaptation strategy identified in the Basin Study, including, but not limited to, the following:

- *Identify the specific WaterSMART Basin Study where this adaptation strategy was developed. Describe in detail the adaptation strategy that will be implemented through this WaterSMART Grant project and how the proposed WaterSMART Grant project would help implement the adaptation strategy.*
- *Describe how the adaptation strategy and proposed WaterSMART Grant project will address the imbalance between water supply and demand identified by the Basin Study.*
- *Identify the applicant's level of involvement in the Basin Study (e.g., cost-share partner, participating stakeholder, etc.).*
- *Describe whether the project will result in further collaboration among Basin Study partners.*

Through the WaterSMART Basin Study Program, Reclamation is working with State and local partners, as well as other stakeholders, to comprehensively evaluate the ability to meet future water demands within a river basin. The Basin Studies allow Reclamation and its partners to evaluate potential impacts of climate change to water resources within a particular river basin, and to identify adaptation strategies to address those impacts. For more information on Basin Studies, please visit: <www.usbr.gov/WaterSMART/bsp>.

The proposed project is not located within an area identified in any WaterSMART Basin Study. However the Bear River Basin is an important river basin that is included in both the Utah and Idaho State Planes.

Subcriterion E.2: **Expediting Future On-Farm Irrigation Improvements**

Up to 14 points may be awarded for projects that describe in detail how they will directly expedite future on-farm irrigation improvements, including future on-farm improvements that may be eligible for NRCS funding.

Note: Scoring under this sub-criterion is based on an overall assessment of the extent to which the WaterSMART Grant project will facilitate future on-farm improvements. Applicants should describe any proposal made to NRCS, or any plans to seek funding from NRCS in the future, and how an NRCS-funded activity would complement the WaterSMART Grant project. Applicants may receive maximum points under this sub-criterion by addressing the types of information described in the bullet points below. Applicants are not required to have assurances of NRCS funding 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 funding if necessary.

If the proposed projects will help expedite future on-farm improvements please address the following:

- *Include a detailed listing of the fields and acreage that may be improved in the future.*

- *Describe in detail the on-farm improvements that can be made as a result of this project. Include discussion of any planned or ongoing efforts by farmers/ranchers that receive water from the applicant.*
- *Provide a detailed explanation of how the proposed WaterSMART Grant project would help to expedite such on-farm efficiency improvements.*
- *Fully describe the on-farm water conservation or water use efficiency benefits that would result from the enabled on-farm component of this project. 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.*
- *Projects that include significant on-farm irrigation improvements should demonstrate the eligibility, commitment, and number or percentage of farmers/ranchers who plan to participate in any available NRCS funding programs. Applicants should provide letters of intent from farmers/ranchers in the affected project areas.*
- *Describe the extent to which this project complements an existing NRCS funded project or a project that either has been submitted or will be submitted to NRCS for funding.*

Note: On-farm water conservation improvements that complement the water delivery improvement projects selected through this FOA may be considered for NRCS funding and technical assistance in FY 2016 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 <www.nrcs.usda.gov> for further contact information in your area.

Currently, 5 irrigators have applications into NRCS, for EQIP funding. Applications A thru E as shown on map are to convert wheel/hand lines to pivot irrigation systems. Application F is to install buried pipe to provide for pressurized sprinkler irrigation. Total acreage that will be converted is 335 acres. Figure 2 below identifies the pivot irrigation locations. In the figure location A is Curtis Larsen's 65 acres; B is D&S Dairy's 120 acres; C is Jack Larsen's 44 acres; D is Terry Griffin's 45 acres; E is Kim Haws' 40 acres; F is Gordon Jenkins 15 acres and G is Jack Larsen's 32 acres. It is anticipated that additional pivot locations will be available in the future.

The potential on-farm savings for the 356 acres listed above that have current NRCS applications could be greater than **106.8 acre feet per year**. Calculation assumptions are: 356 acres X 1.5 acre feet = 534 acre feet per year
534 acre feet per year x 20% = 106.8 acre feet savings per year.

NRCS calculates a 20% water savings when wheel/hand lines are converted to pivot irrigation. This project has expedited on farm improvements.

The WaterSMART Grant project would assist and expedite future on-farm irrigation improvements that could be covered under the EQIP or AWEP programs of the NRCS. These improvements include switching out pumps for variable speed motors and smaller horsepower motors and installing pivots.

The water saved from connecting the piped system to the reservoir will give farmers more water without the possibility of overflowing and make it more feasible for them to make on-farm improvements. It is expected that all pumps will have from 15 PSI to 35 PSI which will save electrical pump costs and horse power requirements.
See Appendix E for letters of intent from farmers.

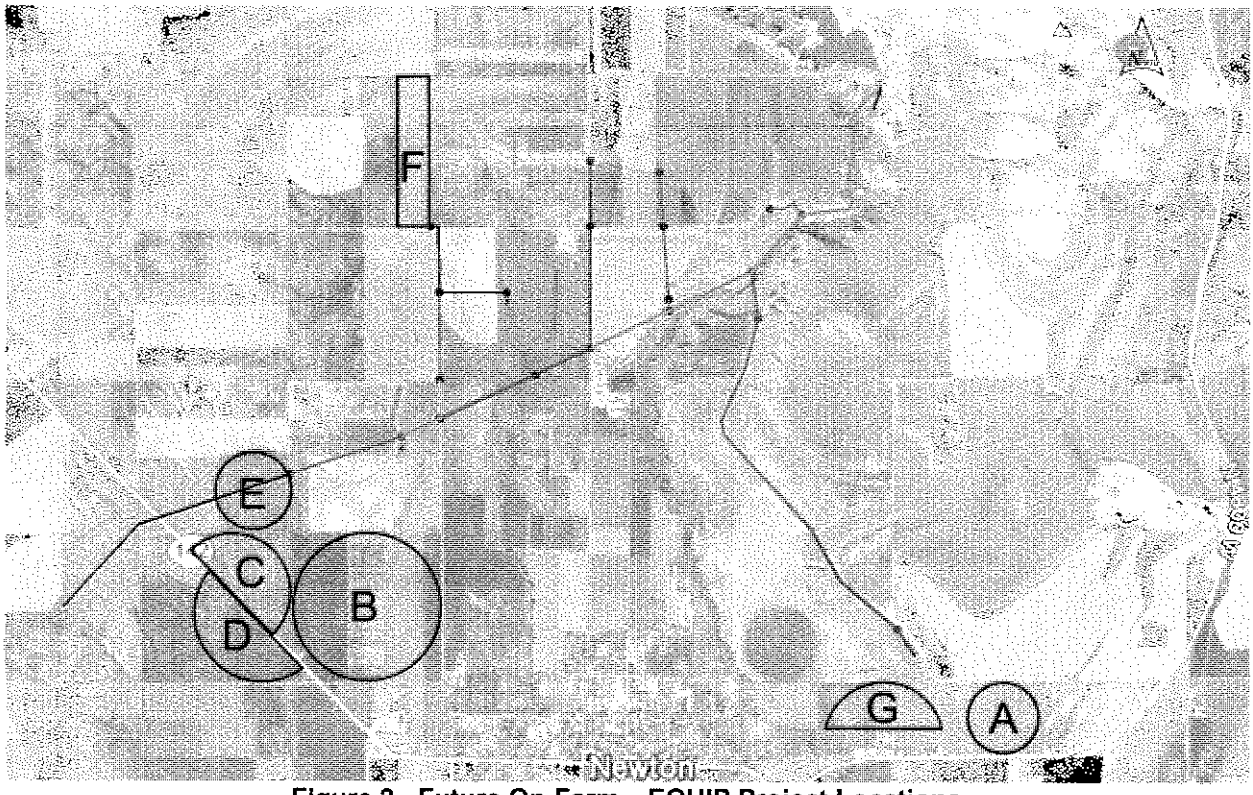


Figure 2 - Future On-Farm – EQUIP Project Locations

Subcriterion E.3: **Other Water Supply Sustainability Benefits**

Up 14 points may be awarded for projects that include other benefits to water supply sustainability.

Projects may receive up to 14 points under this sub-criterion by thoroughly explaining additional project benefits, not already described above. Please provide sufficient explanation of the additional expected project benefits and their significance. Additional project benefits may include, but are not limited to, the following:

- *Will the project make water available to alleviate water supply shortages resulting from drought?*
  - *Explain in detail the existing or recent drought conditions in the project area.*
  - *Describe the impacts that are occurring now or are expected to occur as a result of drought conditions.*
  - *Describe the severity and duration of drought conditions in the project area.*

- *Describe how the water source that is the focus of this project (river, aquifer, or other source of supply) is impacted by drought.*
- *Provide a detailed explanation of how the proposed WaterSMART Grant project will improve the reliability of water supplies during times of drought.*

For projects that will help build resiliency to drought through increased flexibility and improved water management, but do not include significant water savings, please consider Reclamation's WaterSMART Drought Response Program. Through the WaterSMART Drought Response Program, Reclamation is working with non-Federal partners to create Drought Contingency Plans and on-the-ground Drought Resiliency Projects to help provide water managers with greater flexibility during periods of drought. For more information on the Drought Response Program, please visit: <www.usbr.gov/drought/>.

Over the last five years the reservoir has filled at the following percentages:

Year	Percentage %
2010	90%
2011	98%
2012	99%
2013	53%
2014	55%
2015	48%
January 15, 2016	10 %

Outlined below are five (5) water supply sustainability benefits that the project will accomplish:

1. Conserving water longer throughout the year will provide Newton Reservoir with more water longer into the year, thus increasing the recreation days per year on Newton Reservoir. Fishing, boating, and water sports are enjoyed on Newton Reservoir.

2. Reducing operation and maintenance costs by eliminating the need to drive to the reservoir and manually open/close the gate valves multiple times per day.

3. Increase an average of 15 pounds of pressurize in the irrigation system

4. Reducing noxious weeds spread throughout the system.

5. Open canals are a safety hazard. Enclosing the canal will increase safety.

- *Will the project make water available to address a specific concern? For example:*
  - *Will the project directly address a heightened competition for finite water supplies and over-allocation (e.g., population growth)?*

- *Describe how the water source that is the focus of this project (river, aquifer, or other source of supply) is impacted by climate variation.*
- *Will the project help to address an issue that could potentially result in an interruption to the water supply if unresolved?*

The project will directly address a heightened competition between water users for the finite water supplies. The amount of precipitation received during the year determines how much water is available for irrigation. With consecutive years of drought, coupled with the arid, desert climate, the users understand the importance of efficiently using their resources to maintain irrigation supply and conveyance for the entire growing season. Flows in springs that feed Clarkston Creek have been reduced by 50% during the drought. The NWUA allocates the available water each year according to the amount of water in the reservoir.

- *Will the project make additional water available for Indian tribes?*

There will be no additional water for Indian tribes.

- *Will the project make water available for rural or economically disadvantaged communities?*

This project will make additional water available to the Town of Newton and surrounding areas, which is a low to moderate income community in Utah.

- *Does the project promote and encourage collaboration among parties?*
  - *Is there widespread support for the project?*
  - *What is the significance of the collaboration/support?*
  - *Will the project help to prevent a water-related crisis or conflict?*
  - *Is there frequently tension or litigation over water in the basin?*
  - *Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?*

There is wide spread support for this project. This project will support local farmers and the Town of Newton by relieving the culinary drinking systems. The culinary water sources for the Town are critically limited due to the drought. There is frequent tension and litigation over water in the basin. According to the Utah State Engineer all of the surface and ground water in the basin is allocated creating a litigious environment. Additional on-farm enhancements are anticipated. For example: Hand and wheel lines being converted to center pivot irrigation, reduction in pump sizes, and variable frequency drives.

- *Will the project increase awareness of water and/or energy conservation and efficiency efforts?*
  - *Will the project serve as an example of water and/or energy conservation and efficiency within a community?*

- *Will the project increase the capability of future water conservation or energy efficiency efforts for use by others?*
- *Does the project integrate water and energy components?*

This project will serve as an example of water and energy conservation and efficiency within a community. It is anticipated that future water conservation and energy efficiency will occur by the elimination of a diesel pump which services 140 acres. This project integrates both water and energy components.

Eval Criterion F: Implementation and Results (10 points)

Up to 10 points may be awarded for these subcriteria.

***Subcriterion F.1:* Project Planning**

Points may be awarded for proposals with planning efforts that provide support for the proposed project.

Does the project have a Water Conservation Plan, System Optimization Review (SOR), and/or district or geographic area drought contingency plans in place? Does the project relate/have a nexus to an adaptation strategy developed as part of a WaterSMART Basin Study)? Please self-certify, or provide copies of these plans where appropriate to verify that such a plan is in place.

Provide the following information regarding project planning:

1. *Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, Basin Study, drought contingency plan, or other planning efforts done to determine the priority of this project in relation to other potential projects.*
2. *Describe how the project conforms to and meets the goals of any applicable planning efforts, and identify any aspect of the project that implements a feature of an existing water plan(s).*

NWUA has a water conservation plan. This plan is on file with the Utah Division of Water Resources. The plan can be provided to Reclamation upon request.

***Subcriterion F.2:* Readiness to Proceed**

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

Describe the implementation plan of 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. (Please note, under no circumstances may an applicant begin any ground-disturbing activities—including grading, clearing, and other preliminary activities—on a project

before environmental compliance is complete and Reclamation explicitly authorizes work to proceed).

Please explain any permits that will be required, along with the process for obtaining such permits. Identify and describe any engineering or design work performed specifically in support of the proposed project.

The NWUA has been very busy. The project detailed engineering design is currently being accomplished by BOR (Denver & Provo Offices), the NEPA permit process has been completed, and all other local permits have been obtained. Coordination with BOR has been ongoing throughout 2014-2016. Monthly meetings have been held to update the progress of the project. Scott Winterton, in Reclamation's Provo office has been coordinating these efforts. NWUA has finalized contracts with Reclamation so the design work through the dam can be completed.

NWUA has $600,000 dollars secured for this project. These funds are committed through Utah Division of Water Resources and their own contribution. Once the 2016 irrigation season is completed, construction would begin at the toe of the dam. Work will continue until winter weather stops the progress. During the spring of 2017, construction activities will commence until the project is completed in the spring of 2017. Please refer to the schedules below.

Schedule – Year 1

Milestone/Task	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17
BOR Finalize Project Design thru Dam	■	■	■	■	■	■											
WaterSMART Committal of Funds						■											
Bid Project							■	■									
Award									■								
Construction										■	■	■	■	■	■		

Subcriterion F.3: **Performance Measures**

Points may be awarded based on the description and development of performance measures to quantify actual project benefits upon completion of the project.

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, marketed, or better managed, or energy saved). For more information calculating performance measure, see Section VIII.A.1. FY2016 WaterSMART Water and Energy Efficiency Grants: Performance Measures.

Note: All WaterSMART Grant 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 WaterSMART Grant 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 WaterSMART Grants.

Flow measurement records will be used to compare diversion flows to the NWUA's system before and after project completion. Water measurement tests will be conducted in the summer of 2016 to measure the amount of water lost due to spills.

After project completion, meter readings will be recorded and losses will be calculated within the conveyance system. The post-project losses will be compared with the pre-project losses to verify increased efficiency in the delivery of water to users in the NWUA.

Subcriterion F.4: **Reasonableness of Cost**

Points may be awarded based on the reasonableness of the cost for the benefits gained.

Please include information related to the total project cost, annual acre-feet conserved, energy capacity, or other project benefits and the expected life of the improvement(s).

For all projects involving physical improvements, specify the expected life of the improvement in number of years and provide support for the expectation (e.g., manufacturer's guarantee, industry accepted life-expectancy, description of corrosion mitigation for ferrous pipe and fittings, etc.). Failure to provide this information may result in a reduced score for this section.

The total project cost is estimated to be $1.77 million, including finalization of BOR design, construction inspection, bidding and project administration and construction. A 100-year life expectancy is available on HDPE Pipe. The proposed improvements are anticipated to have a useful life of 100 years. This funding application request is for $708,000 from Reclamation to leverage $1.77 million from the Association's members. There is approximately 1,860 acre-feet of water that will be conserved, not to mention that the total 5,500 acre-feet will be better managed.

$$\frac{Total\ Cost}{Annual\ Acre\ Feet\ X\ Improved\ Life}$$

$$\frac{\$1{,}770{,}000}{5{,}500\ Acre\ Feet\ X\ 100\ Years} = \$3.22\ per\ Acre\ Foot - Year$$

Eval Criterion G: Additional Non-Federal Funding (4 points)

Up to 4 points may be awarded to proposals that provide non-Federal funding in excess of 50 percent of the project costs. State the percentage of non-Federal funding provided.

$$\frac{Non-Federal\ Funding}{Total\ Project\ Cost}$$

The Association will provide 60% of the fund for this project, which equals $1,062,000. The Association has $600,000 in place from a loan with the Utah Board of Water Resources. The additional $462,000 will be secured through increased share-holder assessments or an additional loan through the Utah Board of Water Resources. In order to obtain the additional loan the design of the project needs to be completed by BOR.

$$\frac{\$1,062,000}{\$1,770,000} = 60\%$$

Eval Criterion H: Connection to Reclamation Project Activities (4 points)

Up to 4 points may be awarded if the proposed project is in a basin with connections to Reclamation project activities. No points will be awarded for proposals without connection to a Reclamation project or Reclamation activity.

1. *How is the proposed project connected to Reclamation project activities?*
2. *Does the applicant receive Reclamation project water?*
3. *Is the project on Reclamation project lands or involving Reclamation facilities?*
4. *Is the project in the same basin as a Reclamation project or activity?*
5. *Will the proposed work contribute water to a basin where a Reclamation project is located?*
6. *Will the project help Reclamation meet trust responsibilities to Tribes?*

The Newton Reservoir is a Reclamation Project. As previously noted, the Bureau of Reclamation (BOR) has maintained ownership of Newton Dam and Reservoir. The reservoir has been the topic of multiple studies and projects. Among these are studies from the EPA, Bureau of Reclamation, Utah State University, and other Federal and State Government entities. The BOR owns 66% of the shoreline adjacent to Newton Reservoir and monitors the inflow and outflow waters. Water from the project is received from Newton Reservoir. BOR owns water rights used by the NWUA. Furthermore, there are other BOR projects in the area including Cache County and Preston.

Performance Measures

All WaterSMART Grant applicants are required to propose a method (or "performance measure") of quantifying the actual benefits of their project once it is completed. Actual benefits are defined as water actually conserved, marketed, or better managed, as a direct result of the project. A provision will be included in all assistance agreements with WaterSMART Grant

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. Quantifying project benefits is an important means to determine the relative effectiveness of various water management efforts, as well as the overall effectiveness of WaterSMART Grants.

Environmental and Cultural Resources Compliance

To allow Reclamation to assess the probable environmental and cultural resources impacts and costs associated with each application, all applicants must respond to 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. Additional information about environmental compliance is provided in Section IV.D.9. Project Budget under the discussion of "Environmental and Regulatory Compliance Costs," and in Section VIII.B. Overview of Environmental and Cultural Resources Compliance Requirements.

Note: Applicants proposing a Funding Group II project must address the environmental and cultural resources compliance questions for their entire project, not just the first 1-year phase.

If you have any questions, please contact your regional or area Reclamation office (see <www.usbr.gov/main/offices.html>) with questions regarding ESA compliance issues. You may also contact Mr. Josh German at 303-445-2839 or jgerman@usbr.gov, for further information.

1. *Will the 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 Newton Water Users have hired historical and cultural inventory experts to review the project and document their results. These results have been summarized and the NEPA documents submitted to Bureau of Reclamation, Provo Utah Office.

2. *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 construction will take place during the non-irrigation periods, late fall and early spring. The effects on wildlife are anticipated to be very minor.

3. *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 project may have.*

There are no wetlands within the project boundaries.

4. *When was the water delivery system constructed?*

The delivery system was constructed by the BOR in conjunction with the dam in 1948.

5. *Will the 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.*

6. *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 Newton Dam and Newton Reservoir are listed on the National Registry. There are no other historical features know within the project boundaries

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

There are no known archeological sites within the proposed project area.

8. *Will the project have a disproportionately high and adverse effect on low income or minority populations?*

It is anticipated that the only financial effects will be to those currently owning shares or purchasing shares in the future. There are no known disproportionately high and adverse effects on low income or minority populations.

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

The project will not affect any tribal lands.

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

The enclosure of the canal at the toe of the dam will eliminate the spread of noxious weeds.

Note, if mitigation is required to lessen environmental impacts, the applicant may, at Reclamation's discretion, be required to report on progress and completion of these commitments. Reclamation will coordinate with the applicant to establish reporting requirements and intervals accordingly.

Under no circumstances may an applicant begin any ground-disturbing activities (including staging, grading, clearing, and other preliminary activities) on a project before environmental

compliance is complete and Reclamation explicitly authorizes work to proceed. This pertains to all components of the proposed project, including those that are part of the applicant's non-Federal cost share. Reclamation will provide a successful applicant with information once environmental compliance is complete. An applicant that proceeds before environmental compliance is complete may risk forfeiting Reclamation funding under this FOA.

Required Permits and Approvals

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

Applicants proposing renewable energy components to Federal facilities should note that some power projects may require FERC permitting or a Reclamation Lease of Power Privilege. To complete a renewable energy project within the time frame required of this FOA, it is recommended that an applicant has commenced the necessary permitting process prior to applying. To discuss questions related to projects that propose renewable energy development, please contact Mr. Josh German at 303-445-2839 or jgerman@usbr.gov.

Note that improvements to Federal facilities that are implemented through any project awarded funding through this FOA 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 Section III.H.1. 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.

Since BOR is the responsible for the design of the project, their approval will come with the finalization of the design. Meetings have been held with BOR (Provo and Denver Offices) on a monthly basis to discuss design and cost estimates.

Official Resolution

Include an official resolution adopted by the applicant'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 WaterSMART Grant financial assistance, verifying:

- *The identity of the official with legal authority to enter into agreement*
- *The board of directors, governing body, or appropriate official who has reviewed and supports the application submitted*
- *The capability of the applicant to provide the amount of funding and/or in-kind contributions specified in the funding plan*

GARY R. HERBERT
Governor
SPENCER J. COX
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director
Division of Water Resources
ERIC L. MILLIS
Division Director

January 8, 2015

Val Jay Rigby, President
Newton Water Users Association
PO Box 81
Newton, UT 84327

RE: Letter of Support Newton Water Users Association

Dear Mr Rigby:

The Utah Board of Water Resources is very supportive of your plans to pipe your association's current ditch system. Piping open canal systems typically saves up to one-third of the water available; for a system irrigating 3,400 acres with eight miles of open ditch, this savings would be significant.

Additionally, on August 14, 2014 the Board of Water Resources committed funds for up to $3,060,000 of the total cost of the project which is $3,600,000, with payments of $187,000 per year for 20 years at 2% interest.

Sincerely,

Russell Hadley

Russell Hadley, P.E.
Water Resources Engineer

1594 West North Temple, Suite 310, PO Box 146201, Salt Lake City, UT 84114-6201
telephone (801) 538-7230 • facsimile (801) 538-7279 • TTY (801) 538-7458 • www.water.utah.gov

Appendix A – Official Resolution

Official Resolution

The President of the Association is Val Jay Rigby, and he will be the legal authority on the project.

RESOLUTION

NO. 01-2016

AUTHORIZING THE PRESIDENT OF THE NEWTON WATER USERS ASSOCIATION TO APPLY FOR A CONTRIBUTION GRANT FROM THE U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION, FOR THE RENOVATION AND ENCLOSURE OF THE NEWTON EAST AND WEST CANALS

WHEREAS, the U.S. Department of the Interior, Bureau of Reclamation, provides a funding opportunity as part of the WaterSMART: Water and Energy Efficiency Grants for FY 2016; and,

WHEREAS, the Newton Water Users Association, (the "Association") of Newton, Utah deems it necessary to apply to the Department of the Interior, Bureau of Reclamation, for funding through a cost sharing grant not to exceed $708,000 for construction to connect the HDPE pipeline and Newton Reservoir. The project will increase water delivery efficiency and provide more efficient means of irrigation to the users within the Association; and,

WHEREAS, in accordance with the rules and regulations of the WaterSMART: Water and Energy Efficiency Grant, the Association is required to adopt a resolution to accompany such application;

NOW, THEREFORE BE IT RESOLVED BY THE NEWTON WATER USERS ASSOCIATION, OF NEWTON, UTAH, THAT:

1. The Newton Water Users Association authorizes Val Jay Rigby, President Newton Water Users Association, to apply for and accept grant funding in the amount not to exceed $708,000 for the connection of the HDPE pipeline and Newton Reservoir as described above.
2. The Association in addition to President Val Jay Rigby have reviewed and are in support of the application submitted to the Bureau of Reclamation for the above stated grant opportunity.
3. The Association agrees that funds to match the cost share of $1,770,000 can be available through in kind contributions, reserve funds and a loan from Utah Division of Water Resources.
4. If the applicant is selected for award, the Association will work with the U.S. Department of the Interior, Bureau of Reclamation, to meet established deadlines for entering into a cooperative agreement.

Adopted this 18th day of January 2016.

ATTEST:

By: _____ Val Jay Rigby, President

By: _____ Steve Griffin, Vice President

By: _____ Kelly H. Griffin, Member

By: _____ Clair D. Christiansen, Member

By: _____ Joseph G. Larsen, Member

By: _____ Kim Haws, Member

By: _____ Van Jenkins, Member

The following is a list of the Newton Water Users Associations board members.

Val Jay Rigby..... President
Steve Griffin..... Vice President
Kelly Griffin..... Member
Clair Christiansen..... Member
Val Jay Rigby..... Member
Kim Haws..... Member
Van Jenkins..... Member

Appendix B: Letters of Support

CACHE COUNTY
CORPORATION

M. LYNN LEMON
COUNTY EXECUTIVE/SURVEYOR

199 N. MAIN
LOGAN, UTAH 84321
TEL 435-755-1850
FAX 435-755-1981

November 27, 2012

Newton Water Users Association
Joseph G. Larsen, President
5397 West 7200 North
P.O. Box 94
Newton, UT 84327

Re: Newton Water Users Association – Pipe Existing Open Canal

Dear Mr. Larsen:

This letter is in support of your project to pipe the existing open Newton Canal. Cache County feels this is a worthy project for the future efficient and wise use of that water.

Sincerely,

M. Lynn Lemon
Cache County Executive

NEWTON TOWN CORPORATION

51 South Center
P.O. Box 146
Newton, UT 84327
(435)563-9283

Mayor
Clair D. Christiansen

Council Members:
Matt Hansen
Kathryn Rigby
Matt Phillips
Jed Woodward

January 15, 2016

On behalf of the town of Newton, I would like to add my support for the water project being proposed by the Newton Water Users Association.

With our limited water supply it's very important we use that water efficiently and wisely. We have about 260 homes in town that we provide culinary water to. Probably close to 40 years ago the Newton Town Sprinkling Company was formed by a forward thinking town board that took out all the open ditches in town and put in a pressurized secondary water system. If this system were not in place, the town literally would not be able to furnish enough water for outside use, our growth would have stopped long ago. We currently have over 200 lots in town that could be developed, but our limited water supply is the limiting factor.

We really believe if we could join with the Newton Water Users Association and help put a system in place that would do away with the open ditches and pressurize the whole system, there would be a tremendous advantage in our ability to stretch the limited water we now have. The effieiency and water we would gain thru this system would really help us in our desire to provide enough water for our residents. Some of our neighboring towns do not have a secondary system and they regularly have to limit outside watering.

We have a town square and a soccer field which really add great value to our quality of living and overall satisfaction for our residents all of which are dependent on us being able to provide those facilities.

Our 260 residential lots use approximately 325-350 shares of those allotted from our reservoir and it is part of the life blood for our community. Every enhancement and improvement to stretch our limited water supply is of utmost value to the residents of Newton.

Sincerely,

Clair Christiansen
Mayor, Newton Town

Newton Town Planning and Zoning Commission

Gene Dayley, Julie Wickham, Mike Peterson, Bruce Erickson, and Helen Rigby, Chairperson
Newton Town Hall
PO Box 146
Newton, Utah 84327
May 11, 2010

Newton Water Users Association
Joseph G. Larsen, President
5397 W 7200 N
PO Box 94
Newton, Utah 84327

Dear Mr. Larsen;

The Newton Town Planning Commission supports the proposal by Newton Water Users Association to pipe the existing open canal.

Current zoning and building regulations in our community require that a new residence built on a lot within the town must have one share of secondary water before a building permit will be issued. This was enacted in an effort to discourage use of culinary water to water lawns and landscapes. Newton Town has a limited supply of culinary water, and we need our citizens to use secondary water for any outside watering needs so that we will have adequate drinking water in the summer.

At the present time the out-dated canal system cannot deliver enough secondary water to Newton Town and still deliver the needed water to canal users. We support the efforts to upgrade an inadequate system that loses one-third of its water supply. With that one-third restored, one share of water would take care of the outside watering needs of a town lot.

If we can provide further information or assistance, please feel free to contact me or other members of the planning commission.

Sincerely,

Helen P. Rigby

Helen P. Rigby, Chairperson
Newton Town Planning and Zoning Commission

NEWTON FIRE DEPARTMENT
51 South Center
Newton, Utah 84327

To Whom It May Concern:

In the area served by the Newton Water User's Association irrigation system there are many residential properties, as well as farm buildings and feed storage areas. The Newton Fire Department is responsible for fire suppression for these occupancies.

These areas do not have fire hydrants. Our fire suppression vehicles carry equipment that allows us to access the irrigation water system. We have used the irrigation water system as a water supply source on past incidents, drafting from the canals or directly connecting to the pressurized risers.

During the months when the irrigation system is in use, our ability to access the system for fire suppression purposes is a valuable recourse. If a fire occurs in one of the occupancies within the area it serves, it allows us to have a water supply source closer to the fire.

We support the Newton Water User's Association proposal. We hope that this added benefit of seasonal fire suppresion to the community will be considered when the proposal is being reviewed.

Sincerely:

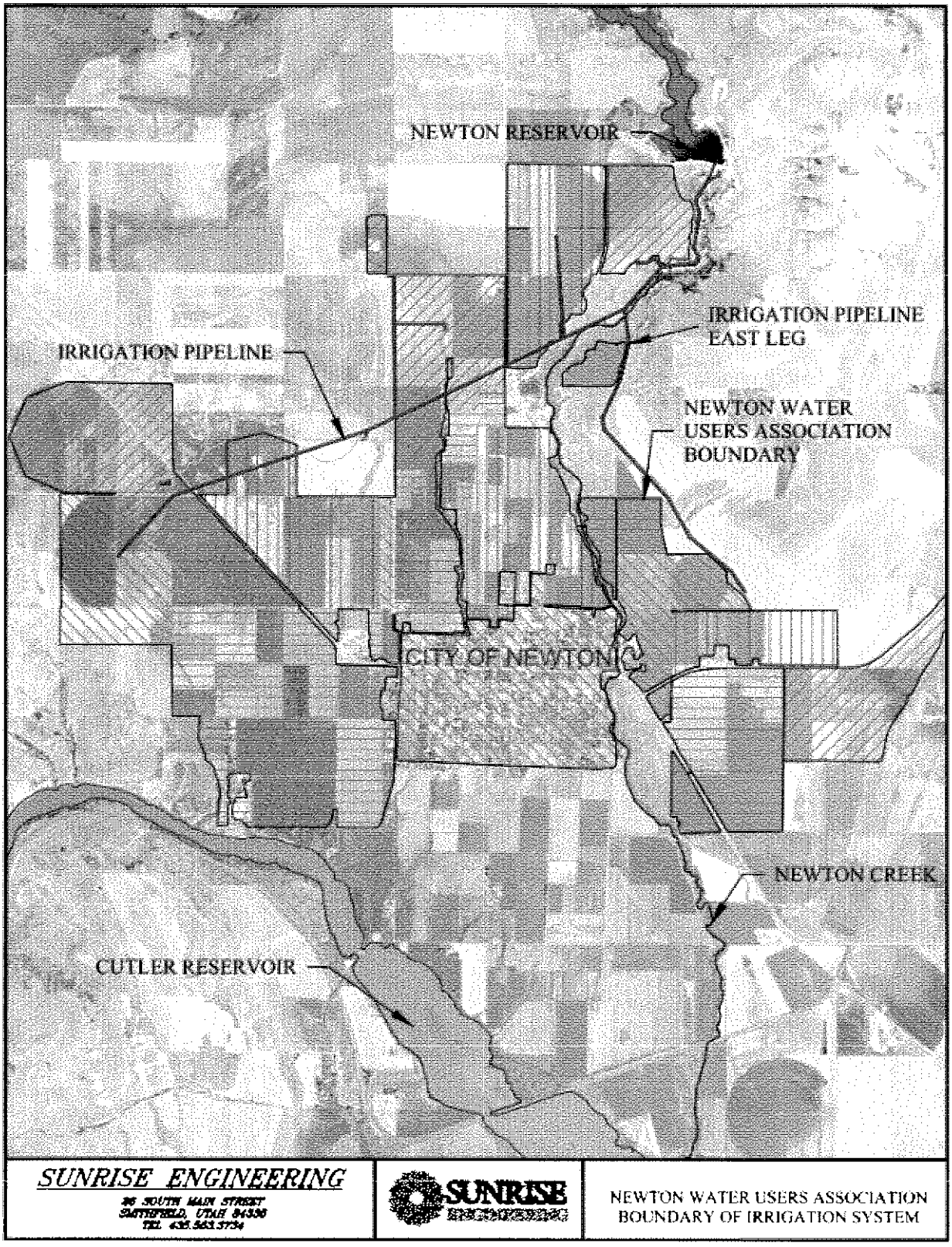
Gregory M. Jorgensen
Fire Chief
Newton Fire Department

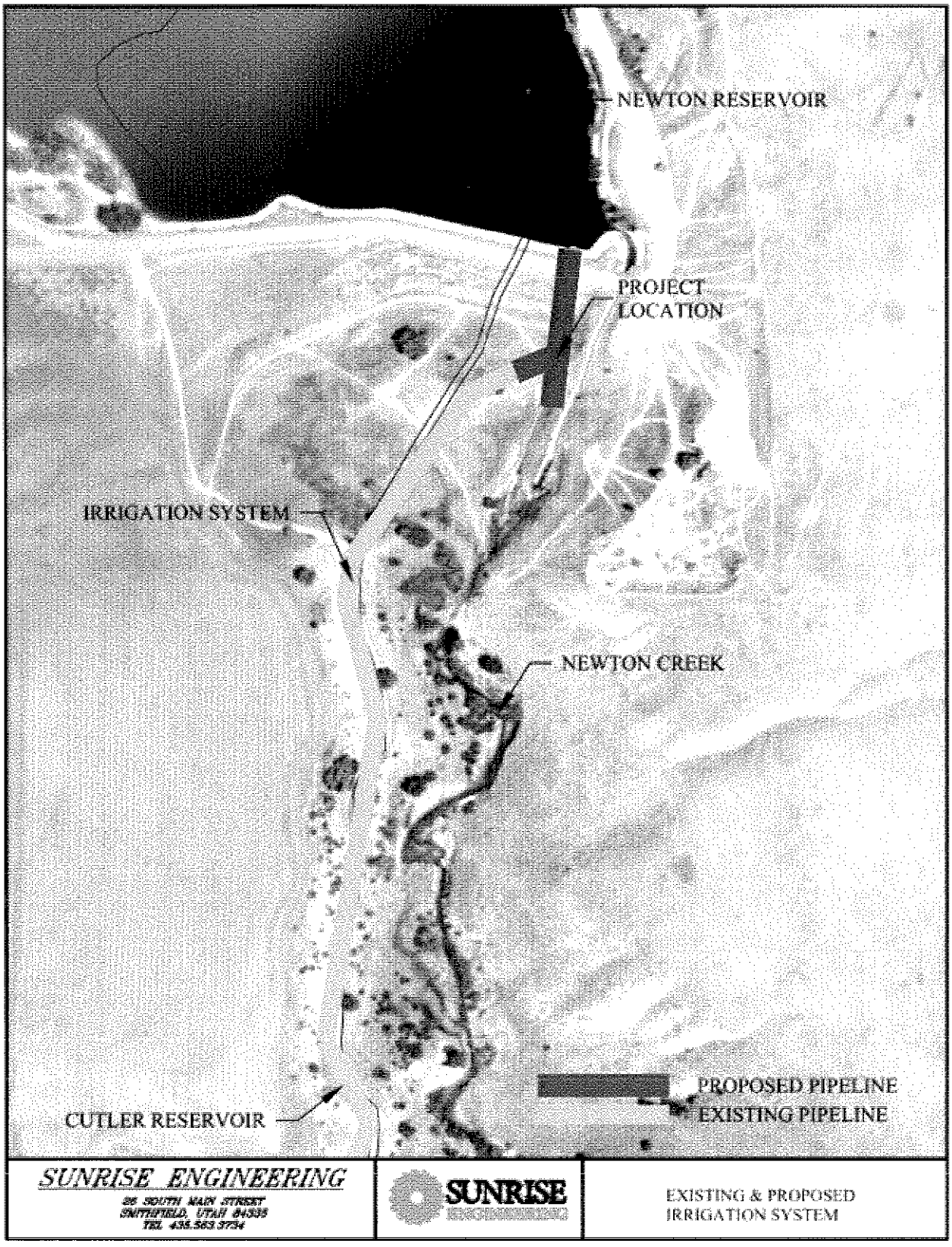
Greg R. Fabricius
Assistant Fire Chief
Newton Fire Department

Curtis W. Larsen
Assistant Fire Chief
Newton Fire Department

P.O. BOX 346
NEWTON, UT 84327
PH. 435.563.9283

Appendix C: Supplementary Information and Maps


NEWTON RESERVOIR
IRRIGATION PIPELINE
EAST LEG
IRRIGATION PIPELINE
NEWTON WATER
USERS ASSOCIATION
BOUNDARY
CITY OF NEWTON
NEWTON CREEK
CUTLER RESERVOIR
SUNRISE ENGINEERING
86 SOUTH MAIN STREET
SMITHFIELD, UTAH 84335
TEL 435.563.3734
SUNRISE
NEWTON WATER USERS ASSOCIATION
BOUNDARY OF IRRIGATION SYSTEM


NEWTON RESERVOIR
PROJECT LOCATION
IRRIGATION SYSTEM
NEWTON CREEK
PROPOSED PIPELINE
EXISTING PIPELINE
CUTLER RESERVOIR
SUNRISE ENGINEERING
25 SOUTH MAIN STREET
SMITHFIELD, UTAH 84335
TEL 435.563.3734
SUNRISE
EXISTING & PROPOSED
IRRIGATION SYSTEM

Newton Water Users Pumping and Power Savings Estimates

Power Cost	0.07	/kW-hr
Pump Efficiency	80%	
Electrical Efficiency	90%	
Overall Efficiency	72.0%	

Power Savings per Month (20 days)		49,534.40 kW-hr
Power Savings per Year (100 days)		247,672.00 kW-hr
Cost Savings per Month (20 days)	$	3,467.41
Cost Savings per Year (100 days)	$	17,337.04
Cost Savings Over Project Life (50 years)	$	866,852

Location	Approximate Elevation	Estimated Pressure (psi)
Dam Minimum Level	4754	0
East Ditch Head	4744	4.3
East Ditch 1/2 Way Down	4719	15.3
East Pond	4718	15.6
West Ditch Head	4734	8.7
West Ditch Near 8600 N 200 W	4715	16.9
West Middle Pond	4710	19.1
West Pond	4703	22.1

Existing Pumps

	Pump Horsepower	kW	Running Time hrs/day	kW-hr/day	Cost/day	Water Horsepower	Upstream Pressure (psi)	Target Pressure Increase (psi)	Target Head (ft)	Target Flow (cfs)
1	30	22.38	24	537.12	$ 37.60	21.6	0	45	103.86	1.83
2	30	22.38	24	537.12	$ 37.60	21.6	0	45	103.86	1.83
3	30	22.38	24	537.12	$ 37.60	21.6	0	45	103.86	1.83
4	40	29.84	24	716.16	$ 50.13	28.8	0	45	103.86	2.44
5	40	29.84	24	716.16	$ 50.13	28.8	0	45	103.86	2.44
6	50	37.5	24	895.20	$ 62.66	36	0	45	103.86	3.05
7	30	22.38	24	537.12	$ 37.60	21.6	0	45	103.86	1.83
8	20	14.92	24	358.08	$ 25.07	14.4	0	45	103.86	1.22
9	25	18.65	24	447.60	$ 31.33	18	0	45	103.86	1.53
10	30	22.38	24	537.12	$ 37.60	21.6	0	45	103.86	1.83
11	30	22.38	24	537.12	$ 37.60	21.6	0	45	103.86	1.83
12	30	22.38	24	537.12	$ 37.60	21.6	0	45	103.86	1.83
13	30	22.38	24	537.12	$ 37.60	21.6	0	45	103.86	1.83
			Total	7,430.16	$ 520.11					

Proposed Pumps

	Target Flow (cfs)	Target Pressure (psi)	Upstream Pressure (psi)	Target Pressure Increase (psi)	Target Head Increase (ft)	Required Water Horsepower	Required Pump Horsepower	kW	Running Time hrs/day	kW-hr/day	Cost/day	Power Savings (kW-hr/day)	Cost Savings/day
1	1.83	45	15	30	69.24	14.4	20.00	14.92	24	358.08	$ 25.07	179.04	$ 12.53
2	1.83	45	15	30	69.24	14.4	20.00	14.92	24	358.08	$ 25.07	179.04	$ 12.53
3	1.83	45	15	30	69.24	14.4	20.00	14.92	24	358.08	$ 25.07	179.04	$ 12.53
4	2.44	45	15	30	69.24	19.2	26.67	19.89	24	477.44	$ 33.42	238.72	$ 16.71
5	2.44	45	15	30	69.24	19.2	26.67	19.89	24	477.44	$ 33.42	238.72	$ 16.71
6	3.05	45	15	30	69.24	24	33.33	24.87	24	596.80	$ 41.78	298.40	$ 20.89
7	1.83	45	15	30	69.24	14.4	20.00	14.92	24	358.08	$ 25.07	179.04	$ 12.53
8	1.22	45	15	30	69.24	9.6	13.33	9.95	24	238.72	$ 16.71	119.36	$ 8.36
9	1.53	45	15	30	69.24	12	16.67	12.43	24	298.40	$ 20.89	149.20	$ 10.44
10	1.83	45	15	30	69.24	14.4	20.00	14.92	24	358.08	$ 25.07	179.04	$ 12.53
11	1.83	45	15	30	69.24	14.4	20.00	14.92	24	358.08	$ 25.07	179.04	$ 12.53
12	1.83	45	15	30	69.24	14.4	20.00	14.92	24	358.08	$ 25.07	179.04	$ 12.53
13	1.83	45	15	30	69.24	14.4	20.00	14.92	24	358.08	$ 25.07	179.04	$ 12.53
									Total	4,953.44	$ 346.74	2,476.72	$ 173.37

SUNRISE ENGINEERING

Appendix D – Opinion of Probable Cost

SUNRISE
ENGINEERING

January 19, 2016

Val Jay Rigby
President Newton Water Users
PO Box 81
Newton, Utah 84327

Dear Val Jay,

As you have requested, Sunrise Engineering proposes to provide engineering support by bidding plans and specifications design by BOR, for the completion of the piping through the dam and assist with administrating the project.

With the information known about the project todate, we estimate the fee to complete this work to be $50,000.

If you need any other information please feel free to contact me.

Sincerely,
Sunrise Engineering, Inc.

Scott Archibald, PE
Project Engineer

Appendix E – Letters of Intent

January 14, 2016

To Whom it May Concern:

The reasons I want to put in a center pivot is as follows:

Watering 60 acres
Ease of irrigation
Better water distribution, resulting in better crops & WATER SAVINGS
Applied for a grant from the NRCS Equip Program
Minimal help moving hand lines

This land has previously has been watered by a 2 block wheel line, a 2 block hand line and a 1 block hand line.

Joe & Joy Larsen Family Farm
Joseph B Larsen

1/12/2016

Farm E Kim Haws 40 acres

We currently have a submitted application with NRCS for Equip funding for a center pivot.

The completion of the Newton Water Users pipeline into the Dam will benefit us by:

1. Having a pressurized line would allow us to operate the pivot with a substantial smaller pump. Replacing an existing 50 horsepower pump with a small 4 horsepower booster pump would Save a substantial amount of electricity usage.
2. Water savings from a pipeline and pivot will allow for a far greater use of a limited supply of water. Reducing water loss before it is delivered to our farm and a more efficient use of applying the water through a pivot will help us to stretch our water usage farther into the growing season allowing us to improve our yields because we often run out of water before crops are fully developed.

A pressurized system that is economically feasible is very import to our faming efforts.

Sincerely,

Kim Haws

Newton water user

Hi I am Stephen Griffin a dairy farmer and Newton water user. Growing feed for 400+ milk cows and 400+ plus heifers is always the biggest challenge for us each year. I am excited about our water project. I know that it will save water!! It will help us use what little water we always seem to have more efficiently. It will lower pump hp needs and electricity demand. We are also putting in pivots to help use the water efficiently. We continue to make improvements on our farm that will help make us sustainable into the future. Your help is greatly appreciated to make this project the best it can be.

Thanks

Stephen Griffin

This is JP Larsen and sons LLC and I am David Larsen. JP Larsen and sons operates about 450 acres and 125 cow dairy with young stock on a family owned and operated farm. We are excited for the new water user project for the benefits it will bring our operation.

We have 48 acres farm under newton water and have put a pivot on it to reduce the Horsepower that it will need to get the ground watered. We are in hopes of getting more water with no pumping costs at all. We have been using a 50 Horsepower pump with 3 blocks of wheeline and hand line.

We also have 50 acres of ground that we have put a pivot on with the NRCS program. The Pivot will water 33 acres of the farm and the rest we will use irrigation pods so as to not use the 20 horsepower pump any more.

David larsen