Water Conservation Project

Funding Opportunity No. R13SF80003

WaterSMART: Water and Energy Efficiency Grants for FY 2013

Fiscal Year 2013

by

The Bostwick Irrigation District
In Nebraska

Michael D. Delka, Manager
P.O. Box 446
Red Cloud, Nebraska
Phone: (402) 746-3424
Fax: (402) 746-3424
E-mail: bostwick@gpcom.net

Water Conservation Project

Bostwick Irrigation District in Nebraska

TABLE OF CONTENTS

SF-424	page 1 - 4
Assurance Form	page 5 - 6
Title Page	page 7
Table of Contents	page 8
Technical Proposal & Evaluation Criteria	
Executive Summary	page 9 - 10
Background Data	page 10 - 11
Technical Project Description	page 11 - 12
Evaluation Criteria	page 12 - 26
Performance Measures	page 26 - 30
Environmental & Cultural Compliance	page 30 - 31
Required Permits or Approvals	page 31
Official Resolution	page 32
Project Budget	
Funding Plan & Letter of Commitment	page 33 - 34
Budget Proposal Format	page 35 - 36
Budget Narrative	page 36 - 45
Budget Form (SF-424C)	page 46
Water Appropriations	page 47
Statement of Net Assets	page 48
Environmental Clearance Letter	page 49
Support	
JEO Optimization Review cover	page 50
Engineering Data Cover	page 51
Project Location Maps	page 52 - 56
Engineering Data – FC 6.8	page 57 – 58
Engineering Data – FC 27.9	page 59 - 66
Engineering Data – FC 37.7	page 67 - 68
Engineering Data – CC 4.3	page 69
Engineering Data – CC 6.3	page 70
Engineering Data – NC 2.2	page 71
Engineering Data – NC 2.7	page 72 - 73
Engineering Data – NC 2.7 – 0.2	page 74
Engineering Data – NC 3.2	page 75
Project Diagrams	page 76-77
Price Estimate for Overrun Gate & Actuator	page 78

Technical Proposal and Evaluation Criteria

(1) Technical Proposal: Executive Summary

Date: December 18, 2012

Applicant Name:	Bostwick Irrigation District in Nebraska
City, County, State:	Red Cloud, Webster County, Nebraska
Contact:	Michael D. Delka
Title:	Manager
Address:	P.O. Box 446, Red Cloud, Nebraska 68970
Phone:	(402) 746-3424
E-mail:	bostwick@gpcom.net
Project Name:	Water Conservation Project

- **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.**

  This project is being submitted under Task Area A, B, C and D.
  Approximately 6.8 miles of open ditch canal lateral will be converted to buried pipe to conserve approximately 1,520 acre-feet of water normally lost to seepage and evaporation. The estimated amount of water to be better managed will be 2,893 (12" delivery to 1,373 acres + 1,520 loss) acre-feet. . Included in this conversion is the installation of propeller meters to more accurately measure water deliveries. The average annual water supply of the District is approximately 50,000 acre-feet. Currently, the District has 10 check structures with automation on the Franklin Canal (which is approximately 50 miles long). These sights are solar powered and the gates are on one bay. Two locations (17.2 and 28.6) have overshot gates in the adjacent bays which should allow for flow measurement and gate adjustment. The gate proposed in this grant application is to be installed at check structure that has multiple bays and controls in place. This meets the goal of Task A from the RFP to save water and improve water management. The Project meets the goal of Task Area B (B) by eliminating one or more farm pumps currently used to pump water and using solar power to operate the new gate. The conversion of the open ditch will allow for the accumulation of head pressure which should eliminate the need for pumping. The Project meets the goal of Task Area C (C) from the RFP by saving water and increasing available supplies which will enhance the habitat around the Harlan County Reservoir. The reservoir is along a migratory route and has had recorded visits by Whooping Cranes. The Project meets the goal of Task D from the RFP to enhance the potential of water banks and markets by increasing available supplies. The water saved will be stored in the Harlan County Reservoir to supplement the District's supply during dry years and/or marketed for Basin compliance to the Republican River Compact. In 2012 the Board was approached by the Lower Republican Natural Resources District for a potential water sale/lease (currently awaiting follow up). In 2006 the District marketed the use of 10,118 acre-feet of storage and the natural flows of the Republican River to the State of Nebraska for Compact compliance. In 2007, the District marketed 12,500 acre-feet of storage and the natural flows of the Republican River to the State of Nebraska. Any water that exceeds storage ability would be passed to downstream users and have the potential of being marketed by programs run out of the Milford Reservoir, which is downstream in Kansas. The proposed Water Conservation Project consists of replacing 6.8 miles of open ditch with buried pipe, and installation of a gate and a control board to expand the District's canal automation.

The project will focus on Franklin Canal Laterals 6.8, 27.9 and 37.7, Courtland Canal Laterals 4.3 and 6.3, and Naponee Canal Laterals 2.2, 2.7 and 3.2.
The project will increase the probability of District survival in times of water shortage and help to address and enhance public safety. The conserved water will be stored in the Harlan County Dam and reservoir upstream of the project on the Republican River. The conserved water can then be used by the District and the Kansas Bostwick Irrigation District #2 to meet its minimum requirements during drought years, and will increase the potential of water marketing.
The State of Nebraska signed an agreement with our District for the use of the District water supply in 2006 and in 2007. Most of the future scenarios of the Republican River Compact water model indicate future depletions to the river which may demand the potential of water leasing for the State to consistently achieve compact compliance. When the conserved water exceeds the storage capacity of the Harlan County Reservoir, the excess water would be passed to downstream users, and have the potential of being marketed by programs run out of the Milford Reservoir downstream in Kansas.

- **State the length of time and estimated completion date for the project.**

The project should be completed within two years. The following timeline is anticipated.

Project Schedule;

January 2013	Submit Grant
January 2013	Verify environmental and cultural clearance
March 2013	Grant is announced
April 2013	Begin construction with District funds until agreement is signed
April 2013	Sign grant agreement as soon as possible
April 2013	Order materials and start construction as quickly as can be approved and allowed by the Bureau of Reclamation for federal portion
May 2013	Install gate, actuators and control boards
May 2013	Begin construction on Franklin Laterals
September 2013	Water season ends
September 2013	Focus resources on construction effort
October 2013	Start construction on remaining Laterals working from west to east
March 2015	Complete construction and draft final report

(2) Technical Proposal: Background Data

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

Please refer to the maps on pages 52 - 56 for the geographic location and direction from the nearest town. The laterals are located in Franklin, Webster and Nuckolls Counties in Nebraska.

- **As applicable, describe the source of water supply, the water rights involved, current water uses (i.e., 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.**
- **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 (i.e., 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.**

The source of the District water supply is the Harlan County Reservoir and the natural flow of the Republican River. A page with all of the District's water rights can be found on page 51.

The primary use of the District water supply is agricultural and the District has approximately 230 water users. The current water demand is dependent on the amount of rainfall during the growing season but, a normal year would require about 12 acre-inches per acre of applied water. The future water demands will be impacted by supply, markets, improved water efficiency of crops, weather, etc… The near term demands for an "average" crop year should be approximately 10 acre-inches per acre. The inflows into the Harlan County Reservoir have depleted over 80% since the development of the District.

The main identified contributors to the depletions have been well development, on-farm conservation practices and no-till farming. The primary crops grown in the District are corn and soybeans. The District currently services 22,455 acres. The water delivery system is an open ditch and canal system constructed in the 1950's. Since the District includes approximately 90 miles of main canals and 90 miles of laterals the battle to continuously improve the efficiency has been a formidable challenge. Most of the deliveries are measured with weirs and Armco gates. The District has a System Optimization Review that will help in the project selection. Some of the improvements include gate automation on 10 sites of the Franklin Canal, many water users have converted to center pivots, where water measurement has been difficult, flow meters have been installed and approximately 47 miles of open laterals have been converted to buried pipe.

- **If the application includes renewable energy or energy efficiency elements, describe existing energy sources and current energy uses.**
  The conversion of the laterals from open ditch to buried pipe will eliminate the use of several pumps currently being used by irrigators. The gate automation portion of the proposal will have solar power as its primary energy source with battery backups.
- **Identify any past working relationships with Reclamation. This should include the date(s), description of prior relationships with Reclamation, and a description of the projects(s).**
  The District is a Reclamation project and has made major strides in conservation by partnering with the Bureau of Reclamation through the small grant programs and three Water 2025 grants (2005-$300,000, 2006-$100,000, 2009-$300,000, 2010-$247,500, 2011- $250,000 and 2012 - 300,000). Most of the prior projects were for buried pipe and meters. Recently the District received a Water 2025 system optimization grant to automate the Franklin Canal headgate and eight check structures and a grant to develop a system optimization review. To date the District has converted approximately 47 miles of open ditch to buried pipe.

(3) Technical Proposal: 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.

The pipe portion of the project is based on the engineering and study conducted by Reclamation in 1984 and adapted to current demand and capacities. The project will commence after the appropriate environmental and cultural clearances are performed by Reclamation. To start the actual project the first step will be to haul the equipment to the project site. Next, we will remove the existing turnouts and any drops or check structures that will complicate the placement of the pipe. Any fences will be removed. A short piece of pipe will be cemented into the end of the lateral turnout transition so the existing lateral turnout gate may be utilized and the cement on the interior of the main canal will remain in place and the trash rack will be fabricated to fit the structure. An air vent tee and air vent will be installed at the beginning of the project to avoid potential air locks and facilitate the filling of the pipe. The ditch will now be profiled for grade using a laser transit and the pipe will be laid on the grade. The project will follow the existing titled ground and easements. Elbows and fittings will be installed as necessary to align with curves

and field turnouts. Main line valves will be installed as necessary to help maximize adequate delivery pressures in the upper reaches of the lateral. Farm turnouts will be installed by using a tee fitting from the main line that will reduce to the 10" turnout pipe size which is the standard district turnout pipe size. Elbows may be utilized to transition to the ground surface as necessary. An adapter which converts from PVC to a 10" steel flange will be installed so a meter tube with an air vent and straightening vanes can be installed. After the meter tube, a valve will be bolted to the meter tube to assure a full tube and accurate measurement. A 10" flange that adapts to the farmers needs is bolted on the farm side of the valve for the farmer's convenience. Siphons located on the lateral will be addressed in one of two methods depending on the circumstances. The preferred method of dealing with a siphon is to remove the inlet and outlet of the siphon and shove the pipe through the siphon. This will avoid digging through railroads and roads. If conditions do not allow for the inlet or outlet removal without a public risk or a project benefit the pipe will be cemented into the inlet and outlet of the siphon with an air vent tee placed at both ends and an open pipe of a maximum height of 6' installed as an open air vent. Reclamation has requested a maximum six foot of operating head be used on existing siphons. The District is evaluating the use of flexible pipe for use in siphons for retaining head pressure and possible ease of installation. The last direct operation to be performed on the project will be to cover the pipe. This will be done with the excavator, backhoe, dump trucks, motor grader and loaders as needed to move, haul and spread dirt.

The automation portion of this project will be conducted in conjunction with some help from Reclamation. None of this aid is considered as a match for the grant. The current 10 sights with solar powered automation were coordinated with Tom Gill of Reclamation. Tom Gill will help install and program circuit boards and do any necessary integration with the current installations. The gate will be a similar design to several already installed and operated. The District will buy or manufacture the gates and will do the installation of the gates and the actuators. This process will require removing any unnecessary framework and modifying the cat walk and stop log guides to facilitate the gate and mount the actuators. The actuators will then be wired to the control panel.

(4) Technical Proposal: Evaluation Criteria

Evaluation Criterion A: Water Conservation (32 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 No. A.1—Water Conservation:

Subcriterion No. 1(a)—Quantifiable Water Savings:

Up to 20 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 when determining the estimated water savings, along with the necessary support needed for a full review of your proposal.

The amount of water conserved by the conversion of 6.8 miles of open ditch to buried pipe would be approximately 1,520 acre-feet. This number reflects an average of early and late season loss rates for a 100 day irrigation season and does not include benefits from better management, reduced operational waste, reduced canal loading and better measurement. The total annual water conservation total for the project is estimated to be 1,520 acre-feet of water.

Conservation			CFS	(100 days)
Lateral	Early Loss	Late Loss	Average	Season
FC 6.8	1.2	0.6	0.9	90
FC 27.9	2.1	1.5	1.8	180
FC 37.7	1.1	0.7	0.9	90
CC 4.3	1.2	0.8	1	100
CC6.3	1.1	0.9	1	100
NC 2.2	0.5	0.5	0.5	50
NC 2.7	1.6	0.6	1.1	110
NC 3.2	0.5	0.3	0.4	40
Total				760

760 cfs x 2 a-f/cfs = 1520 acre-feet loss

- **What is the applicant's average annual acre-feet of water supply?**
  The total average annual water supply is approximately 50,000 acre-feet (this was a number obtained from the Bureau).
- **Where is that water currently going (i.e., back to the stream, spilled at the end of the ditch, seeping into the ground, etc.)**
  The water is used for irrigation and is either absorbed into the ground, spilled at the end of the ditch or runs out of the end of the field and eventually ends up in the Republican River except for the water in the laterals that is lost due to evaporation and/or seepage.
- **Where will the conserved water go?**
  The water conserved will be retained in the Harlan County Reservoir to maintain higher lake levels and assure better water supplies in the future. In the event the lake is not able to store the water it will be released and will enhance the existing river flows that will benefit the associated flora and fauna.

(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:

- **How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.**
  The amount of water conserved by the conversion of 6.8 miles of open ditch to buried pipe would be approximately 1,520 acre-feet. This number reflects an average of early and late season loss rates for a 100 day irrigation season and does not include benefits from better management, reduced operational waste, reduced canal loading and better measurement. The total annual water conservation total for the project is estimated to be 1,520 acre-feet of water.
- **How have average annual canal seepage losses been determined? Have ponding and/or inflow/outflow tests been conducted to determine seepage rates under varying conditions? If so, please provide detailed descriptions of testing methods and all results. If not, please provide an explanation of the method(s) used to calculate seepage losses. All estimates should be supported with multiple sets of data/measurements from representative sections of Canals.**
  The average annual lateral seepage losses were determined by using average lateral operations as quantified by ditch riders, water masters and field superintendents in average operating conditions.

Conservation

	Cubic Feet per Second			
Lateral	**Early Loss**	**Late Loss**	**Average**	**Season (100 days)**
FC 6.8	1.2	0.6	0.9	90.0
FC 27.9	2.1	1.5	1.8	180.0
FC 37.7	1.1	0.7	0.9	90.0
CC 4.3	1.2	0.8	1.0	100.0
CC 6.3	1.1	0.9	1.0	100.0
NC 2.2	0.5	0.5	0.5	50.0
NC 2.7 (incl 0.2)	1.6	0.6	1.1	110.0
NC 3.2	0.5	0.3	0.4	40.0
Total				**760 cfs**

760 cfs x 2 acre-feet/cfs = 1520 acre-feet loss

- **What are the expected post-project seepage/leakage losses and how were these estimates determined? (e.g., can data specific to the type of material being used in the project be provided?).**
  The post-project seepage losses should be approximately 0%. Converting an open ditch to buried pipe using 80 psi PVC should eliminate seepage and improve operational control. Previous conversions have yielded similar results.
- **What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and for each section of canal included in the project?**
  The anticipated annual transit loss reductions from the conversion of open ditch to buried pipe should be the estimated seepage loss (1520 acre-feet) and the reductions from increased management opportunities which are difficult to quantify.
- **How will actual canal loss seepage reductions be verified?**
  The actual canal loss seepage reductions can be easily verified by measuring the diversions to a lateral and the delivery from the lateral. Similar projects in the past have yielded an approximate 100% delivery rate of water diverted into an enclosed lateral.
- **Include a detailed description of the materials being used.**
  The pipe and fittings to be used will be 80 psi PVC and will vary from 10" to 18" diameters depending on the needed flow capacity.

(2) **Municipal Metering**: Not applicable.

(3) **Irrigation Flow Measurement**:

- **How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.**
  The average annual water savings estimates were determined using average operational loss criteria obtained from ditch riders, water masters and the field superintendent. The amount of water conserved by the conversion of 6.8 miles of open ditch to buried pipe would be approximately 1,520 acre-feet. This number reflects a current average of early and late season loss rates for a 100 day irrigation season and does not include benefits from better management, reduced operational waste, reduced canal loading and better measurement. The total annual water conservation total for the project is estimated to be 1,520 acre-feet of water.

- **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?**
  All delivery points are currently being measured by Armco gates and/or weirs. These are accurate for spot checking flows but will not account for real time canal fluctuations that will vary flows over weirs or through gates. The enclosed system using impeller meters should allow for accurate measurements throughout a 24 hour period.
- **Provide detailed descriptions of all proposed flow measurement devices, including accuracy and the basis for the accuracy.**
  The proposed measurement device is a ten inch reverse flow McCrometer meter with over run bearings in a meter tube with straightening vanes. The accuracy of the meter is +/- 2%. The accuracy was based on industry standards and verified on a flow bench.
- **How will actual water savings be verified upon completion of the project?**
  The water savings verification is inherent in the project. Converting from open ditch to buried pipe will eliminate seepage, evaporation and operational waste as projected because it will now be an enclosed system.

(4) SCADA and Automation:

- **How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.**
  The annual water savings for installing a gate, actuators and control board was not estimated as the piping component was due to the inexperience of the District with automation. It is not disputed the installation will offer canal measurement, control and management not currently available to the District. The District is excited about the project potential since the canal is the largest canal (approximately 49 miles and an initial capacity of 230 cfs) in our system and delivers water to approximately 11,250 acres of the District's 22,455 acres. This will maximize the conservation potential but the District does not feel comfortable quantifying the conservation at this time.
- **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.**
  Operational losses vary year to year depending on demand, supply, timing of rainfall and other factors. For the past three years the annual water report indicated operational spills varied from 15% to 18% for the Franklin Canal. The water supply of the District is approximately 50,000 acre-feet when the dam is full. Since the Franklin Canal services approximately 50% of the District acres it could be assumed the amount of water impacted by this project would be 25,000 acre-feet.
- **Will annual farm delivery volumes be reduced by more efficient and timely deliveries and if so, how has this reduction been estimated?**
  The farm delivery volumes are dictated by on-farm practices (gated pipe, pivots), rainfall, farm management irrigation philosophy, type of crop, heat and other effects. However, with better delivery and management ability the District should be able to reduce diversion requirements to deliver the farm volumes and previous similar projects indirectly encourage the installation of center pivots.
- **Will canal seepage be reduced through improved system management? If so, what is the estimated amount and how was it calculated?**
  The canal seepage is more a function of the operational water surface for irrigation deliveries than an association of volume passing through the system. The piping portion of this project will

reduce lateral seepage because of enclosure. The automation will allow for more efficient management and timing.

- **How will actual water savings be verified upon completion of the project?**
  The piping portion of this project will be immediately verified when water diverted down a lateral has 100% delivery. The automation will be difficult to isolate a quantifiable savings due to the impacts of the piping projects, on-farm changes, weather, cropping, etc…

(5) **Groundwater Recharge**: Not applicable.

(6) **Landscape Irrigation Measures**: Not applicable.

(7) **High-Efficiency Indoor Appliances and Fixtures**: Not applicable.

(8) **Other Project Types Not Listed Above**: Not applicable.

AND/OR

Subcriterion No. A.1(b)—Improved Water Management:

Up to 5 points may be awarded if the proposal will improve water management through measurement, automation, advanced water measurement systems,or through implementation of a renewable energy project, or through other approaches where water savings are not quantifiable.

This proposal consists of two components which are converting 6.8 miles of open ditch to buried pipe and installing an automation gate at a check station. The automation will allow for better management but will be the most difficult to quantify.

- **Describe the amount of water better managed.**
  For projects that improve water management but which may not result in measurable water savings, state the amount of water expected to be better managed, in acre-feet per year and as a percentage of the average annual water supply. (The average annual water supply is the amount actually diverted, pumped, or released from storage, on average, each year. This does not refer to the applicant's total water right or potential water supply.) Please use the following formula:
  The average annual water supply diverted for the past 4 years for the District was 31,929 acre-feet, the Franklin Canal was 21,712 acre-feet, the Naponee Canal was 1,238 acre-feet and the Courtland Canal was 558 acre-feet.

$$\frac{\text{Estimated Amount of Water Better Managed}}{\text{Average Annual Water Supply}} \quad \frac{(21{,}712 + 1{,}238 + 558 = 23{,}508)}{(31{,}929 = 73.6\%)}$$

Subcriterion No. 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 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:

$$\frac{\text{Estimated Amount of Water Conserved}}{\text{Average Annual Water Supply}} \quad \frac{(1{,}520)}{(31{,}929) = 4.8\%}$$

Subcriterion No. A.3—Reasonableness of Costs:

*Up to **4 additional 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 (or better managed), and the expected life of the improvement. Use the following calculation:

$$\frac{\text{Total Project Cost}}{\text{(Acre-Feet Conserved, or Better Managed x Improvement Life)}}$$

$$\frac{\$691,711.31}{(1,520 + 23,508) \times 50} = \$0.55/\text{acre-feet/yr.}$$

Failure to include this required calculation will result in no score for this section.

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.).
The industry expected life for PVC pipe (as stated by company representative) is from 50 to 100 years. The lesser number was used as a conservative measure. No conservation was quantified for the automation so no life expectancy was stated.

Evaluation 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.*

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

No new renewable energy projects are being installed with this project. However, the automation portion of the project will be powered by existing solar charged batteries.

AND/OR

Subcriterion No. 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.

- **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?**
  The proposed project will reduce the pumping requirements in two ways. On Franklin Canal Lateral 37.7 a propane powered pump will be eliminated when the open ditch is enclosed because the head pressure in the pipe will eliminate the need for pumping. This is a private user pump and the District has no information on use or costs.

- **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.**
  All energy savings estimates originate from the current points of diversion.

- **Does the calculation include the energy required to treat the water?**
  No.
- **Will the project result in reduced vehicle miles driven, in turn reducing carbon emissions? Please provide supporting details and calculations.**
  Yes. The number of vehicle miles driven and man hours of labor will be reduced. The District does not have detailed exact information due to weather, vegetation and demand variance on a year to year basis. Similar projects result in reductions due to elimination of flushing laterals cleaning check structures, turnouts and siphon inlets. Because of these savings the District has been able to eliminate two full time ditch rider positions and converted one full time position to part time as well as reduce the vehicle fleet by two pickups. It is anticipated this project will contribute to these reductions.

- **Describe any renewable energy components that will result in minimal energy savings/production (e.g., installing small-scale solar as part of a SCADA system).**
  The automation portion of the proposal will be a part of existing solar charged batteries system. This eliminates the need for power from other sources.

Evaluation 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.*

I am not aware of any endangered species in the project area. However, the benefits of potential increases in water conserved in storage in the Harlan County Reservoir will be expanded habitat for migratory species. The Whooping Crane has been documented to randomly use the lake and river during migration.

Evaluation Criterion D: Water Marketing (12 points)

*Up to **12 points** may be awarded for projects that propose water marketing elements, with maximum points for projects that establish 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.*

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

There is no current plan or market to sell conserved water to a new entity or use. Water has been marketed in the past to the State of Nebraska and the Natural Resource Districts. The District has been approached by the Lower Republican Natural Resource District for the potential sale/lease of approximately 5,000 acre-feet of water but nothing has been finalized at this time. This may occur again in the future when assurances are needed for compact compliance.

Evaluation Criterion E: Other Contributions to Water Supply Sustainability

*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 how the project relates to a **WaterSMART Basin Study**, how the project could expedite future **on-farm improvements**, or 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 the numbered sections below.*

(1) Points may be awarded for projects that address an adaptation strategy identified in a WaterSMART Basin Study.

Proposals that thoroughly discuss how a project is addressing an adapatation strategy identified in a Basin Study (i.e., 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:

- **Describe in detail the adaptation strategy that will be implemented through this WaterSMART Grant project. Identify the specific WaterSMART Basin Study where this adaptation strategy was developed. Describe the water supply or water management issue that this adaptation strategy will address.**
- **Provide a detailed explanation of how the proposed WaterSMART Grant project would help implement the adaptation strategy identified in the Basin Study.**
- **Fully describe any other benefits to water supply sustainability that are not described elsewhere in your proposal that will result from this WaterSMART Grant project, for example, if the project will result in further collaboration among Basin Study partners, or demonstrate a new or innovative approach, among other benefits.**

  This project and similar projects will be vital to water management and sustainability in the future. WaterSmart funded a basin study in 2012 but it is not complete and precise steps have not been identified. Currently, because of the demand of the 2012 irrigation season and the reduced inflows to the Reservoirs, the Nebraska Department of Natural Resources has issued a "compact call" on the basin. This means it is their intent to close down diversions from streams and by pass inflows to Reservoirs in 2013. It is our belief if as little as $3 million would have been invested in our project several years ago the "compact call" would not have been necessary.

(2) Points may be awarded for projects that will help to expedite future on-farm irrigation improvements, including future on farm improvements that may be eligible for NRCS funding.

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

  This project has no direct on-farm improvements at this time. If recent trends are can be applied it can be projected that several of the fields serviced by the laterals will be considered in the future as irrigators realize the increase in reliable and consistent service. Water users serviced by open ditch laterals often have service variations due to canal fluctuations. Canal fluctuations have a minimal effect on buried pipe. In 2011 the District had over 12 pivot requests. Several of those pivots were NRCS cost share but District notice was given after approval. Until approval, the improvements are speculative.

- **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.**

  Several major on-farm improvements have resulted from similar past projects and will be anticipated as a result of this project. The first improvement is that the enclosed lateral will offer better and more consistent service which will allow the irrigator to more consistently irrigate their crop. Another benefit to the farm is the head pressure of the pipe which allows for better water management and less manpower requirements. The biggest on-farm change occurs when the decision is made to transition to a center pivot from gated pipe. The buried lateral encourages this by reducing concerns about canal fluctuations creating the possibility of ruining a pump by running dry and providing the potential of the pump self priming due to head pressure. The head pressure also reduces the horsepower and energy requirements of the pump for the pivot thus reducing costs.

- **Provide a detailed explanation of how the proposed WaterSMART Grant project would help to expedite such on-farm efficiency improvements.**
  The WaterSMART Grant project will expedite the on-farm improvements by increasing potential water supply in dry years through increased management and system efficiency and by offering those effected farms the benefit of buried pipe. The buried lateral encourages the transition to center pivot by reducing concerns about canal fluctuations creating the possibility of ruining a pump by running dry and providing the potential of the pump self priming due to head pressure. The head pressure also reduces the horsepower and energy requirements of the pump for the pivot thus reducing costs. The costs are further reduced by decreasing the amount of open ditch exposure to the effects of trash from wind, animals, etc… This helps reduce screening requirements, cleaning time and costs. The reduced over head help make the improvements more cost effective.

- **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.**
  It is difficult to isolate on-farm conservation associated to this project because they are not the main focus of this project. Past piping projects have seen several trends associated with the farms. The potential for center pivots discussed earlier reduces the amount of water necessary for irrigation if that transition occurs. Another trend is that with the increase of available head pressure from the pipe the farm is able to utilize larger volumes of water to irrigate a field in less time. This allows a farm to better keep up with crop demands to produce higher yields. However, this has produced a slight increase in water delivery.

- **Projects that include significant on-farm irrigation improvements should demonstrate the eligibility, commitment, and number or percentage of shareholders who plan to participate in any available NRCS funding programs. Applicants should provide letters of intent from farmers/ranchers in the affected project areas.**
  No direct inclusion of on-farm benefits have been included or committed to in this proposal that are directly tied to NRCS funding programs.

- **Describe the extent to which this project complements an existing or newly awarded AWEP project.**
  The only AWEP program known in the project area is an acreage retirement program through the Lower Republican Natural Resources District.

(3) Points may be awarded for projects that include *other benefits* to water supply sustainability.

Projects that do not address a need/adapatation strategy identified in a Basin Study or do not help expedite future on-farm irrigation improvements, may receive maximum points under this criterion by thoroughly explaining additional project benefits. 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 address a specific concern? For example:**

  i. **Will the project address water supply shortages due to climate variability and/or heightened competition for finite water supplies (e.g. population growth or drought)? Is the river, aquifer or other source of supply over-allocated?**

This project will increase conservation and management opportunities in the Republican River Basin. Because the river and basin are over-allocated a moratorium exists on both ground water and surface water. The basin is the center of an on-going conflict between Kansas, Nebraska and Colorado over the waters of the Republican River. The issue is now returning to the Supreme Court and a special master is anticipated to make a decision soon. This project has the ability to make water available to address a variety of concerns. Most of the concerns are tied to a heightened competition for a finite resource. A primary District concern is the depleted inflows into the Harlan County Reservoir caused by well development and conservation practices such as dams and terraces. The project will help meet the compliance needs to the Republican River Compact (as demonstrated in 2006 and 2007), it has the ability to market water to other users (Natural Resource Districts) and it should make more water available in the basin. In 2008 the Upper Republican Natural Resource District purchased water from districts in the upper basin. As their supplies diminish they will have to look down stream. The Republican River Compact has established thresholds and triggers for the basin based on the amount of storage in the Harlan County Reservoir. A water short year is determined when the amount of supply storage is less than 119,000 acre-feet. This project should assist in achieving increased storage through reduced use. Any storage that is held over is split annually with the Kansas Bostwick Irrigation District #2 and potentially benefits their patrons as well. Any water crossing the state line in the canal or river has a percentage credited back to upstream states (Nebraska, Kansas and Colorado) which will increase the amount all of the States are allocated for use. The conserved water will also benefit recreation, flora and fauna in the basin.

ii. **Will the project market water to other users? If so, what is the significance of this (e.g., does this help stretch water supplies in a water short basin)?**
The project will increase marketing potential, but the individual project conservation will not be marketed separately.

iii. **Will the project make additional water available for Indian tribes?**
No.

iv. **Will the project help to address an issue that could potentially result in an interruption to the water supply if unresolved? (e.g., will the project benefit an endangered species by maintaining an adequate water supply)?**
The State of Kansas is currently taking compact issues with Nebraska and Colorado back to the Supreme Court for a decision. If they are successful more restrictions and marketing may be necessary for compliance with the compact. This project will help promote higher lake levels which should reduce the probability of "water short" years and the associated conflicts between users and states.

v. **Will the project generally make more water available in the water basin where the proposed work is located?**
It is the intent of the project to make more water available for current users, compact compliance, future users, flora, fauna, recreation and water markets.

- **Does the project promote and encourage collaboration among parties?**
The project is a coordinated effort with the District and the Bureau and will have positive impacts to the state and other water users. This water conservation project is meant to increase the available surface water supply through improved delivery system efficiency. This increased supply will be beneficial to the water users in the District, recreation at the Harlan County Lake (higher potential lake levels), recreation in the river (longer potential water season which increases canoeing, tubing, fishing and other opportunities), riparian vegetation, Kansas Bostwick

Irrigation District (potential carryover storage), other basin water users (increased allocations caused by increased state line flows) and the citizens of all compact states by increasing the potential of compliance and reducing the potential of conflict. Any larger storage volumes will benefit to all migratory species including the Whooping Crane. A major benefit will be the potential for increased releases from the Harlan County Reservoir into the Republican River. In 2004 and 2005 due to the drought conditions and weather the Republican River dried up at Riverton, Red Cloud and at Hardy. The lack of reservoir releases was a major contributing factor to this condition. The reduced or no flows caused fish kills and stress to associated wildlife in the middle of summer when nature is trying to raise its young. The fish kills occurred not only due to the water volume but also due to the increased temperature and low oxygen content associated with it. Fish were also impacted by low flows by river pumpers without sufficient screening for their pumps. During low flows the pump sites create small pockets in the river where fish tend to congregate and are subjected to increased injury potential when the pumps are operated. When the river dried up it forced animals, birds and other species to travel away from the river to seek water. This travel makes them more susceptible to predation and conflict with man. The reduced water availability also creates a concentration of wildlife near the remaining water sources. This concentration more readily promotes the spread of disease and inter-species conflicts. The water quality due to stagnation was also a problem. The low water flows created a secondary problem of vegetative growth in the river channel. The reduced flows created a secondary problem of vegetative growth in the river channel. The reduced flows are encouraging a transition from traditional plant species to more drought resistant varieties. The Natural Resource Districts have received funding to clear the river channel and spray some invasive species in the river channels to reduce water consumption and channel congestion. The public safety issues of converting open ditches to buried pipe would be a benefit as well.

i. **Is there widespread support for the project?**
The dire need for conservation of water to assist the state to meet its obligations under the Republican River Compact is demonstrated by the inclusion of water marketing in the past and being included in the Integrated Water Management Plans of the Natural Resource Districts to address future needs.

ii. **What is the significance of the collaboration/support?**
The willingness of Reclamation to support these types of projects emphasizes their need and urgency. Direct project benefits were calculated by taking an average of historical losses (early and late season) and multiplying by an one hundred day delivery season (7.6 cfs x 100 days x 2 acre-feet/cfs = 1,520 acre-feet /season).
This number reflects a current average loss rate of 7.6 cfs for a 100 day irrigation season and does not include benefits from better management, reduced operational waste, reduced canal loading and better measurement. The total annual water conservation total for the project is estimated to be 1520 acre-feet of water.
An economic impact analysis conducted in 1993 estimated that every foot of lake elevation loss to the Harlan County Reservoir would result in 16,520 fewer visitor days per year. This meant annual losses of $771,820 in direct tourist expenditures, $1,223,595 in direct and indirect economic activity, $450,243 in household income, and 33.5 full time jobs for each foot of lake elevation. At the top of the conservation pool (1945.7 msl) 1,520 acre-feet would be approximately .12 feet of elevation. At elevation 1927 msl 1,520 acre-feet would be approximately .22 acre-feet of elevation. This would mean the value of the increased elevation to recreation would be from $293,479 to $538,045. The agreement reached with the state in 2007 was based on an economic study that placed the value of water to the crop

at $55 per acre-inch. The value of 1,520 acre-feet at $55 per acre-inch ($660/acre-foot) would be approximately $1,032,200 to the crops per year.

iii. **Will the project help to prevent a water-related crisis or conflict?**
The project will definitely be a tool to be utilized to assist the State of Nebraska and the basin Natural Resource Districts to meet their obligations under the Republican River Compact. The more water that is available will mean reduced restrictions will be necessary to maintain compact compliance. This will reduce the burden faced by water users, state governments, the court system and the Federal Government. A "water short" year is designated when the storage water for irrigation falls below 119,000 acre-feet. This project should reduce the probability of the designation by reducing the amount of water to be released for irrigation.

iv. **Is there frequently tension or litigation over water in the basin?**
Yes.

v. **Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?**
Yes. This project demonstrates how positive conservation impacts supply. As our District improves and becomes more efficient it encourages other basin districts and those districts in other basins to promote conservation projects. As our District becomes fully converted to an enclosed system it will reduce the competition for funds and other projects may be funded.

- **Will the project increase awareness of water and/or energy conservation and efficiency efforts?**
Yes. The District water users are very supportive of the success of this and previous projects and strongly encourage them to other users and users in other basins.

i. **Will the project serve as an example of water and/or energy conservation and efficiency within a community?**
Yes. The District water users strongly support these projects and many water users lobby the District to consider their lateral for current or future projects. The District receives requests every year for cost share by some users if they help the District bury part of a lateral to or through their fields.

ii. **Will the project increase the capability of future water conservation or energy efficiency efforts for use by others?**
Yes. The project encourages on-farm water efficiency and reduces the need for pumping and serves as an example to other districts.

iii. **Does the project integrate water and energy components?**
Yes. The project integrates water conservation through piping and automation. The project integrates energy by the automation and the secondary on-farm reduced pumping.

Evaluation Criterion F: Implementation and Results (10 points)

*Up to **10 points** may be awarded for the following:*

Subcriterion No. 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, or other planning efforts done to determine the priority of this project in relation to other potential projects.
In March 2011 a System Optimization Review was completed on the District. The SOR evaluated a variety of options for the District including piping, automation and the variable frequency drives.

(2) Identify and describe any engineering or design work performed specifically in support of the proposed project.
In 1984 the Bureau of Reclamation did a R&B study of converting the District from open ditch to buried pipe. This study is the foundation for the piping portion of the project and adapted to current acres served and flow requirements. The automation is an expansion of work by Reclamation employee Tom Gill. Tom will assist in integrating the new automation into the current system. Tom's efforts are not a part of any District cost share and are not considered a cost to the project.

(3) 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).
The District is not aware of any state or regional water plan. The Natural Resource Districts do have Integrated Water Plans that encourage conservation and try to avoid a "Water Short" compact year. The Integrated Management Plans (IMP) identify several options for compact compliance including acreage retirement, water purchase/leasing, augmentation and allocation reductions. This project will be an asset to those plans.

Subcriterion No. 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).***

Project Schedule:

January 2013	Submit Grant
January 2013	Verify environmental and cultural clearance
March 2013	Grant is announced
April 2013	Begin construction utilizing available District as soon as possible
April 2013	Sign grant agreement as soon as possible
April 2013	Order materials and start construction as quickly as can be approved and allowed by the Bureau of Reclamation for federal portion
May 2013	Install gate, actuators and control boards
May 2013	Begin construction on Franklin Laterals
September 2013	Water season ends
September 2013	Focus resources on construction effort
October 2013	Start construction on remaining Laterals working from west to east
March 2015	Complete construction and draft final report

The laterals that are part of this project have been requested for NEPA and cultural clearance. This proposal also contains a District cost share which should allow the District to start the project using the District funds. This is important so benefits may be seen for the coming season if delays in grant announcements, agreements or non-funding occur. The project readiness is also demonstrated by the District's willingness to start the project using the District funds prior to funding being announced. The completion of the project will rely on the funding but if the project is not funded a valve will be installed where the District funds deplete and partial benefits will be realized.

- **Please explain any permits that will be required, along with the process for obtaining such permits.**
  This project will need Bureau approval to proceed. The approval will require environmental and cultural approvals. The District has requested the Bureau to conduct the necessary procedures to obtain the approvals. The District will contact the Diggers Hot Line prior to construction to identify potential utilities or other obstacles prior to construction. A permit will also be necessary from the Nebraska Department of Roads when addressing siphons under highways.

Subcriterion No. 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. "FY2012 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. Quantification of 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.

Historically and currently the District does not divert water prior to demand so conservation can be maximized. The performance measure for the project will be an average historic loss rate (inflow-outflow) compared to the completed project. It should be noted the enclosed system will have a near 100% delivery rate and that is the motivation for the project. The actual conservation may be adjusted in the final report by the actual length (more or less) of the irrigation season. The automation component will be difficult to isolate benefits because of the one sight installation and the impacts of the other project components (buried pipe).

Evaluation Criterion G: Additional Non-Federal Funding

*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.*

Non-Federal Funding	**$391,711.31**	
Total Project Cost	**$691,711.31**	**= 56.6%**

Evaluation Criterion H: Connection to Reclamation Project Activities

*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?
The Bostwick Irrigation District in Nebraska is a Reclamation project that serves 22,455 acres with project water. Downstream is the Kansas Bostwick Irrigation District #2 which shares a water supply with our District and is also a Reclamation project. Upstream of our District is the Frenchman-Cambridge Irrigation District which is a Reclamation project.

(2) Does the applicant receive Reclamation project water?
Yes. The source of the District water supply is the Harlan County Reservoir and the natural flow of the Republican River. The District is a Reclamation Project. The storage and storage use rights of the Harlan County Reservoir are held in name of the Bureau.

(3) Is the project on Reclamation project lands or involving Reclamation facilities?
Yes, our District is a Bureau of Reclamation project. The District has a water service and repayment contract with Reclamation for the proposed project facilities.

(4) Is the project in the same basin as a Reclamation project or activity?
Reclamation projects upstream include the Frenchman-Cambridge Irrigation District, the Frenchman Valley Irrigation District, Hitchcock and Red Willow Irrigation District and the Almena Irrigation District. Downstream is the Kansas Bostwick Irrigation District #2 which shares a water supply with our District and is also a Reclamation project. Any water conserved in our District could also benefit the Kansas Bostwick system and the 42,000 acres they serve.

(5) **Will the proposed work contribute water to a basin where a Reclamation project is located?**
Yes. The proposed project can contribute water to the basin in a variety of ways. The conserved water will increase the potential supply of the Bostwick Irrigation District in Nebraska and the Kansas Bostwick Irrigation District #2. The increase in supply will also mean more water will potentially cross the state line which will increase the allocation to Kansas, Colorado and Nebraska under the Republican River Compact.

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.

Performance Measure No. A.: Projects with Quantifiable Water Savings

The performance measures included below are examples that may be helpful in estimating pre-project benefits and to verify post-project water savings for projects that are expected to result in quantifiable and sustained water savings or improved water management.

Performance Measure No. A.1.—Canal Lining/Piping

Canal lining or piping projects are implemented to decrease canal seepage and evaporation.

The following information may be helpful in estimating the pre-project benefits and to verify the post-project benefits of canal lining and piping:

Pre-project estimations of baseline data:

To calculate potential water savings, physical measurements of seepage losses are necessary. Two testing procedures which can be used are listed below:

- **Inflow/outflow testing: Measure water flowing in and out of the canal reach. At least two tests, one early and one late season, are suggested since seepage rates vary significantly during the irrigation season. Multiple years of data are also suggested.**

The inflow/outflows were determined by using historic diversion and delivery information.

Conservation

	Cubic Feet per Second			
Lateral	**Early Loss**	**Late Loss**	**Average**	**Season (100 days)**
FC 6.8	1.2	0.6	0.9	90.0
FC 27.9	2.1	1.5	1.8	180.0
FC 37.7	1.1	0.7	0.9	90.0
CC 4.3	1.2	0.8	1.0	100.0
CC 6.3	1.1	0.9	1.0	100.0
NC 2.2	0.5	0.5	0.5	50.0
NC 2.7 (incl 0.2)	1.6	0.6	1.1	110.0
NC 3.2	0.5	0.3	0.4	40.0
Total				**760cfs**

760 cfs x 2 acre-feet/cfs = 1520 acre-feet loss

If ponding or inflow/outflow tests cannot be performed, document the estimated historical seepage and evaporation rates for the canal reach based on soils/geology conditions, flow rates, weather information and historical knowledge. A discussion should be included on why ponding or inflow/outflow tests cannot be performed.

Post-project methods for quantifying the benefits of canal lining or piping projects:

- **Using tests listed above, compare pre-project and post-project test results to calculate water savings. For canal lining projects, evaporation should be calculated based on weather data and then subtracted from the total loss measured by testing.**

- **If ponding or inflow/outflow tests cannot be performed, benefits can be calculated by comparing the estimated historical seepage and evaporation rates for the canal reach to the post project seepage and evaporation (documentation of proposed method of measuring or estimating post-project seepage and evaporation should be provided).**

Since the project is an entire enclosure the annual benefits may be calculated by taking the average daily loses and multiplying by the number of days operated in the season.

- **Results can be verified using a ratio of historical diversion-delivery rates if adequate data exists. This type of verification should also include a comparison of historical canal efficiencies and current canal efficiencies. For example, if an irrigation district needs to divert 6 acre-feet of water to deliver 2 acre-feet of water to a field through an unlined or unpiped canal, this would be a 33-percent efficiency ([100%-(2 acre-feet/6 acre-feet *100)]=33% efficiency). If after lining or piping the canal, the irrigation district only needs to divert 4 acre-feet of water to deliver the 2 acre-feet; this would be a 17-percent improvement in efficiency ([100%-(2 acre-feet/4 acre-feet *100)]=50% efficiency).**
- **Record reduction in water purchases by shareholders and compare to historical water purchases. Use of this method would require consideration and explanation of other potential reasons for decreased water purchases.**

Performance Measure No. A.2.—Measuring Devices

Good water management requires accurate and timely water measurement at appropriate locations throughout a conveyance system. This includes irrigation delivery systems and municipal distribution systems.

Measuring Devices: b. Irrigation Metering

Installing measuring devices may include, but is not limited to, the following:

- Flow meters (current or acoustic)
- Weirs
- Flumes
- Meter gates
- Submerged orifices
- Potential benefits from improved irrigation delivery system measurement include:
- Quantification of system losses between measurement locations
- Quantification of wasteway flows
- Accurate billing of customers for the actual amount of water delivered
- Facilitation of accurate and equitable distribution of water within a district
- Allow for implementation of future system improvements such as seepage reduction, remote flow monitoring and canal operation automation projects

The following performance measures may be helpful in estimating the pre-project benefits and to verify the post-project benefits of improved irrigation delivery system measurement:

Pre-project estimations of baseline data:

- **Pre-project flows are difficult to estimate without a measuring device in place. However, the applicant may be able to use data from measurement devices located elsewhere in the delivery system (if available). Otherwise, the applicant may have to rely on other historical data and/or estimates based on soils/geology, flow data, and weather data.**

  Pre-project measurement was inaccurate due to canal fluctuations caused by loading, deliveries and weather impacting canal levels that influenced weirs and Armco gates. With the enclosed system, this problem should be eliminated although no conservation and quantification was estimated for this funding.

Post-project methods for quantifying the benefits of projects to install measuring devices:

- **Compare post-project water measurement (deliveries or consumption) data to pre-project water uses**
- **Compare pre-project and post-project consumptive use by crop via remote-sensing information—taking into account cropping patterns, irrigation methods, crop rotations, climatic variables, etc.**
- **Survey users to determine utility of the devices for decision making**
- **Document the benefits of any rate structure changes made possible by the installation of measuring devices (e.g., if districts that convert from nonmetered to metered are able to convert from billing water users at a flat rate to billing for actual water use using a volumetric or tiered water pricing structure)**

  Although meters are included in this project, no conservation quantification is claimed so no pre or post project comparison will be necessary. However, historically users who have been on similar projects do appreciate knowing applications to make management decisions. It has been the District policy that if a user on a meter has a pivot gets stuck, a motor shut down or the diversion stop the 24 hour period is billed because we cannot remove the water from the system without sufficient notice. The totalizer will reflect the actual delivery but not the billing. The meter is to establish the accurate delivery rate.

Performance Measure No. A.4.—Automation

Proposals may include system automaton projects aimed at preventing spillage from canals, or drainage capture/reuse projects focused on intercepting spills and redirecting them to drains, canals, or reregulation reservoirs for reuse.

The automation segment of this proposal will have conservation benefits although none were claimed. The automation advances were incremental and not stand alone thus making quantification credit difficult. This is especially true when in conjunction with piping projects. It is the intent of the District to continue to expand the automation to help achieve better management and reduce operational waste. The District currently is capable of the mechanical needs of the automation maintenance and is trying to develop the ability to meet the programming needs in-house.

Performance Measure No. B.: Projects with Quantifiable Energy Savings

The performance measures included below are examples that may be helpful in estimating pre-project benefits and post-project energy savings for projects that are expected to increase the use of renewable energy sources in the management and delivery of water and/or are upgrading existing water management facilities resulting in quantifiable and sustained energy savings.

Although energy will be saved by powering the automation with solar charged batteries and the piping eliminating at least one irrigation pump, no quantifiable energy savings are claimed with this application.

Performance Measure No. C.: Projects that Benefit Endangered Species and/or Critical Habitat

For projects that benefit federally listed species (threatened or endangered), federally recognized candidate species, or designated critical habitat that are affected by a Reclamation facility, the applicant should consider the following:

- **How their projects will address designated critical habitats, including acres covered, species present, and how the water savings or transfers are expected to benefit the habitat(s)**

- **Unavoidable negative impacts to endangered, threatened, or candidate species and/or the critical habitat(s)**
  Although the area is beneficially used by the migratory habits of Whooping Cranes and Bald Eagles it is not considered a critical habitat.

Performance Measure No. D.: Projects that Establish a Water Market

Water marketing is the temporary or long-term transfer of the right to use water from one user to another, by sale, lease, or other form of exchange, as allowed under State laws. Water marketing is a method of moving water supplies to areas of greatest financial value and can be a useful mechanism to increase the beneficial use of existing water supplies. Depending on the State laws, there are various methods in which a seller can make water available for transfer. Examples include:

This project does not establish a water market but will enhance the opportunity for marketing by increasing the potential available supply. Water has been marketed in the past and a current dialog is being held with the Lower Republican Natural Resources District. This market is currently on an as-needed basis to balance consumption for the Republican River Compact compliance. The water marketed has been part of the project water supply and has been restricted by Reclamation to be used for project purposes. This means the water marketed to the State or NRD's for compact compliance must be available for use by the Kansas Bostwick Irrigation District #2 (also a Reclamation project).

Environmental and Cultural Resources Compliance

To allow Reclamation to assess the probable environmental 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.4 "Budget Proposal," under the discussion of "Environmental and Regulatory Compliance Costs," and in Section VIII.B., "Overview of Environmental Compliance Requirements."

Note: applicants proposing a Funding Group II project must address the environmental compliance questions for their entire project, not just the first one-year phase.

(1) Will the project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earthdisturbing 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 project will have a minimal impact on the surrounding environment. The temporary disturbing of the soil caused by profiling or trenching will be as minimal as the silt removal or reshaping of historic O&M. Because the future O&M will not require such activities or the use of herbicides the environment should have a stronger natural stability. It is the intent of the District to keep all soil movement to the minimum necessary to assure a timely project completion.

(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?

No.

(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,

I am not aware of any wetlands or other surface water in the project area.

(4) When was the water delivery system constructed?
The project delivery system was constructed in the late 1940's and early 1950's.

(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.
It is the intent of the project to replace open ditch laterals and associated features and structures built in the late 1940's-early 1950's with buried pipe.

(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.
None of the project has a listing in the Historic Places Registry.

(7) Are there any known archeological sites in the proposed project area?
No sites are known at this time.

(8) Will the project have a disproportionately high and adverse effect on low income or minority populations?
No.

(9) Will the project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?
No.

(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 project should reduce the impacts and spread of non-native invasive species by eliminating the open ditches ditch banks and any inadvertent watering that may have occurred.

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 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 chare. 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 or Approvals

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

This project will need Bureau approval to proceed. This approval will require environmental and cultural approvals. The District has requested the Bureau to conduct the necessary procedures to obtain the approvals. The District will contact the Diggers Hot Line prior to construction to identify potential utilities or other obstacles prior to construction. The District will obtain a permit from the State Department of Roads when addressing siphons under highways.

Bostwick Irrigation District in Nebraska

P.O. Box 446, Red Cloud, Nebraska 68970
Phone/Fax (402) 746-3424

RESOLUTION FOR CHALLENGE GRANT PROGRAM: WaterSMART Water and Energy Efficiency Grants for FY2013

December 4, 2012

WHEREAS, the Bostwick Irrigation District in Nebraska is a legally organized irrigation district in the State of Nebraska, and

WHEREAS, the District promotes, supports and encourages water conservation, and

WHEREAS, the District has suffered through a drought that allowed no irrigation in 2004, 2005, 2006 and 2007, and

WHEREAS, the District urgently needs system improvements to maximize the utilization of a limited water supply and help sustain the viability of the project.

THEREFORE, BE IT RESOLVED that the Board of Directors of the Bostwick Irrigation District in Nebraska agrees and authorizes that:

1. The Board has reviewed and supports the application proposal to the WaterSMART: Water and Energy Efficiency Grants program;
2. The Board authorizes the District Manager, Michael Don Delka, the legal authority to enter into the WaterSMART: Water and Energy Efficiency Grants agreement;
3. The Bostwick Irrigation District in Nebraska is capable of providing the in-kind services and matching obligations, and
4. If selected for a Challenge Grant, the applicant will work with Reclamation to meet established deadlines for entering into a cooperative agreement.

DATED: Dec. 4, 2012

Walter Knehans, President

ATTEST:

James Miller, Secretary

"Water is Life"

Project Budget

The project budget includes: (1) Funding Plan and Letters of Commitment, (2) Budget Proposal, (3) Budget Narrative and (4) Budget Form.

Funding Plan and Letters of Commitment

Describe how the non-Reclamation share of project costs will be obtained. Reclamation will use this information in making a determination of financial capability. Project funding provided by a source other than the applicant shall be supported with letters of commitment from these additional sources. This is a mandatory requirement. Letters of commitment shall identify the following elements:

(1) The amount of funding commitment
The District will commit $391,711.31 to this project. Most of the commitment will be in-kind contributions of labor, management and equipment. The District will commit to the balance of the project funding needed. This amount is estimated to be $125,817.20 (691,711.31 total- 300,000 Reclamation – 265,894.11 labor and equipment).

(2) The date the funds will be available to the applicant
The District has the funds currently available to start the project and will utilize the District funds to start the project until funding can be found to finish the project.

(3) Any time constraints on the availability of funds
No.

(4) Any other contingencies associated with the funding commitment
No.

Commitment letters from third party funding sources should be submitted with your project application. If commitment letters are not available at the time of the application submission, please provide a timeline for submission of all commitment letters. Cost share funding from sources outside the applicant's organization (e.g., loans or state grants), should be secured and available to the applicant prior to award. Reclamation may approve an award prior to an applicant securing non-Federal cost-share funds if Reclamation determines that there is sufficient evidence and likelihood that the non-Federal funds will be available to the applicant by the start of the project.

The funding plan must include all project costs, as follows:

(1) How you will make your contribution to the cost share requirement, such as monetary and/or in-kind contributions and source funds contributed by the applicant (e.g., reserve account, tax revenue, and/or assessments).
The District is funded through annual water user assessments. The District plans to utilize some of the annual District O&M funds (which should be reduced after project completion) and to utilize reserve funds (other than contractual reserve funds) accumulated from efficient District operations. The in-kind labor and equipment will be performed by District employees.

(2) Describe any in-kind costs incurred before the anticipated project start date that you seek to include as project costs. Include:

(a) What project expenses have been incurred
The District plans to include and project associated costs incurred prior to start of construction such as engineering, environmental clearances, cultural clearances, etc… It is also the intent of the District to expend the District funds committed as part of the match to start the project as soon as the start of construction is viable. This expenditure may grow if the funding announcement and signed agreement are delayed.

(b) How they benefitted the project

The in-kind costs incurred before the anticipated grant funding will allow for the project to be completed sooner and the benefits to be realized sooner. Delays associated with cultural clearances will not be an issue if the process can start as soon as possible. By utilizing District funds to start the project, will allow any delays and/or problems to be identified prior to the grant announcement and give assurance any designated milestones may be achieved.

(c) The amount of the expense

The amount of the expense will be dependent on many factors. The weather and environmental clearances will be the dominant initial delays to project start and progress. The District is committed to a potential cost of $125,817.20 plus equipment and labor to start the project.

(d) The date of cost incurrence

The date of cost incurrence should be the spring of 2013 except for those laterals that have completed NEPA compliance.

(3) Provide the identity and amount of funding to be provided by funding partners, as well as the required letters of commitment.

The current funding partners are $300,000 from WaterSMART and $391,711.31 from the Bostwick Irrigation District in Nebraska.

(4) Describe any funding requested or received from other Federal partners. Note: Other sources of Federal funding may not be counted towards your 50 percent cost share unless otherwise allowed by statute.

No other Federal partners are involved at this time.

(5) Describe any pending funding requests that have not yet been approved, and explain how the project will be affected if such funding is denied.

No other Federal partners are involved at this time.

Please include the following chart (table 1) to summarize your non-Federal and other Federal funding sources. Denote in-kind contributions with an asterisk (*). Please ensure that the total Federal funding (Reclamation and all other Federal sources) does not exceed 50 percent of the total estimated project cost.

Table 1. Summary of non-Federal and Federal funding sources.

Funding Sources	Funding Amount
Non-Federal Entities	
1. Bostwick Irrigation District in Nebraska	$391,711.31
1.	
2.	
Non-Federal Subtotal:	$391,711.31
Other Federal Entities	
1.	
2.	
3.	
Other Federal Subtotal:	
Requested Reclamation Funding:	$300,000.00
Total Project Funding:	$691,711.31

Budget Proposal

The project budget shall include detailed information on the categories listed below and must clearly identify all project costs. Unit costs shall be provided for all budget items including the cost of work to be provided by contractors. Additionally, applicants shall include a narrative description of the items included in the project budget, including the value of in-kind contributions of goods and services provided to complete the project. It is strongly advised that applicants use the budget proposal format shown below on tables 3 and 4 or a similar format that provides this information.

Table 3. Funding Sources.

Funding Sources	Percent of Total Project Cost	Total Cost by Source
Recipient Funding	56.74%	$ 391,711.31
Reclamation Funding	43.26%	$ 300,000.00
Other Federal Funding	0%	$ 0.00
Totals	**100%**	**$ 691,711.31**

Budget Item Description	Computation		Recipient Funding	Reclamation Funding	Total Cost
	$/Unit And Unit	Quantity			
Salaries and Wages					
Ditchriders	14.75	5483.7	80,884.58	0	80,884.58
Ofc. Manager	19.67	128.7	2,531.53	0	2,531.53
Manager	24.84	140.7	3494.99	0	3,494.99
Fringe Benefits					
Ditchriders	8.48	5483.7	46501.78	0	46,501.78
Ofc. Manager	8.80	128.7	1132.56	0	1,132.56
Manager	6.69	140.7	941.28	0	941.28
Travel (incl. in equip. & labor)	0	0	0	0	0
Equipment					
Excavator JD 120 (work)	33.3	828.9	27602.37	0	27602.37
Excavator JD 120 (standby)	7.23	200	1446.00	0	1446.00
Excavator JD 690 (work)	49	200	9800	0	9800.00
Excavator JD 690 (standby)	11.33	828.9	9391.44	0	9391.44
Backhoe JD 410 (work)	19.96	120	2395.20	0	2395.20
Backhoe JD 410 (standby)	2.93	908.9	2663.08	0	2663.08
Backhoe JD 610 (work)	38.54	120	4624.80	0	4624.80
Backhoe JD 610 (standby)	7.14	908.9	6489.55	0	6489.55
Maintainer (work)	46.96	200	9392.00	0	9392.00
Maintainer (standby)	10.37	828.9	8595.69	0	8595.69
Loader A-62 (work)	39.46	60	2367.60	0	2367.60
Loader A-62 (standby)	7.23	838.9	6065.25	0	6065.25
Loader Cat 941 (work)	36.15	40	1446.00	0	1446.00
Loader Cat 941 (standby)	6.45	200	1290.00	0	1290.00
Loader Cat 941 (work)	36.15	50	1807.50	0	1807.50
Loader Cat 941 (standby)	6.45	200	1290.00	0	1290.00

Dump Truck (work)	43.23	100	4323.00	0	4323.00
Dump Truck (standby)	5.28	178.4	941.90	0	941.90
Dump Truck (work)	43.23	100	4323.00	0	4323.00
Dump Truck (standby)	5.28	178.4	941.90	0	941.90
Pickup (work)	12.33	129	1590.57	0	1590.57
Pickup (standby)	1.14	899.9	1025.89	0	1025.89
Pickup (work)	12.33	129	1590.57	0	1590.57
Pickup (standby)	1.14	899.9	1025.89	0	1025.89
Pickup (work)	12.33	129	1590.57	0	1590.57
Pickup (standby)	1.14	899.9	1025.89	0	1025.89
Haul Truck(work)	45.92	66	3030.72	0	3030.72
Haul Truck(standby)	4.42	962.9	4256.02	0	4256.02
Lowboy Trailer (work)	7.85	66	518.10	0	518.10
Lowboy Trailer (standby)	2.24	962.9	2156.90	0	2156.90
Misc. (torch, generator, etc.)	10	540	5400.00	0	5400.00
Supplies and Materials					
10" PVC	3.93	5845	0	22971	22971.00
12" PVC	5.61	10831	0	60672	60672.00
15" PVC	8.78	11567	0	101558	101558.00
18" PVC	13.14	7648	0	100495	100495.00
Turnouts	1971	29	42945.00	14304	57249.00
Fittings	0	217	25662.19	0	25662.19
Trash Racks	400	8	3200.00	0	3200.00
Automation Actuators	1410	1	1410.00	0	1410.00
Gate	600	1	600.00	0	600.00
Environmental & Regulatory	12000	1	12000.00	0	12000.00
Engineering	20000	1	20000.00	0	20000.00
Misc. & Contingency	20000	1	20000.00	0	20000.00
Total			**391,711.31**	**300,000.00**	**691,711.31**

Budget Narrative

Submission of a budget narrative is mandatory. An award will not be made to any applicant who fails to fully disclose this information. The budget narrative provides a discussion of, or explanation for, items included in the budget proposal. Include the value of in-kind contributions of goods and services and sources of funds provided to complete the project. The types of information to describe in the narrative include, but are not limited, to those listed in the following subsections.

The project consists of three major components. Those components are materials, labor and equipment. An itemized breakdown of these costs is included. The wages of the manager and office manager are not separated as indirect costs because of the direct nature of the project. Their time is essential for material and labor coordination as well as other necessary functions of the project. Other items of the budget are the environmental compliance and engineering. The environmental compliance for some of the project has been completed and the remainder will be requested of Reclamation and the amount was an estimate based on previous similar projects. The engineering costs are an estimate based on previous similar grant projects and the District will obtain specific costs if the grant is awarded. It is the intent of the District to pay the costs of the environmental clearance and any needed engineering. Any variance from these estimates will be the liability of the District.

Salaries and Wages

Indicate program manager and other key personnel by name and title. Other personnel may be indicated by title alone. For all positions, indicate salaries and wages, estimated hours or percent of time, and rate of compensation proposed. The labor rates should identify the direct labor rate separate from the fringe rate or fringe cost for each category. All labor estimates, including any proposed subcontractors, shall be allocated to specific tasks as outlined in the recipient's technical project description. Labor rates and proposed hours shall be displayed for each task. Clearly identify any proposed salary increases and the effective date.

Generally, salaries of administrative and/or clerical personnel will be included as a portion of the stated indirect costs. If these salaries can be adequately documented as direct costs, they should be included in this section; however, a justification should be included in the budget narrative.

		Direct	Fringe	Total
Program Manager	Mike Delka	51667	13915	65582
Office Manager	Tracy Smith	40914	18034	58948
Ditch Riders	Frank Clyde	30680	17639	48319
	Cody Wyatt	30680	17639	48319
	Darin Saathoff	30680	17639	48319
	Chris Goebel	30680	17639	48319
	Mike McCartney	30680	17639	48319
	Dave Nolan	30680	17639	48319
	Neil Thomsen	30680	17639	48319

Direct wages include base wage, Social Security costs and Medicare. Fringe costs include health insurance, life insurance and retirement costs. No wage increases are anticipated at this time.

Labor Costs	Ditchrider	Ofc. Manager	Manager
Wage (avg.)	28503	38000	48000
Health Ins.	16362	16683	11888
Life Ins.	105	105	105
Retirement 4%	1173	1520	1920
Soc. Sec. 6.2%	1767	2356	2976
Medicare 1.45%	408	551	696
Total	**$ 48318**	**$ 59215**	**$ 65585**
$/hour	$ 23.23	$ 28.47	$ 31.53

Total Project Length = 128.7 days

Manager = 1 hour/day + quarterly and final report = 128.7 +10 + 2 = 140.7 hours

140.7 hours x 31.53/hour = $4,436.27

Office Manager = 1 hour/day = 128.7 hours

128.7 hours x 28.47/hour = $3,664.09

Total Administration = $4,436.27 + $3,664.09 = $8,100.36

Labor to lay pipe

Pipe Size	Ft./day	Total Ft.	Days
10"	1000	5845	5.8
12"	750	10831	14.4
15"	500	11567	23.1
18"	300	7648	25.5
		Total Days	68.8

(550.40 hours)

6 men x 8 hours/day x $23.23/hour x 68.8 days = **$76,714.75**

Labor to prepare site

35,891 ft./ 300 ft./hour = 119.6 hours

119.6 hours x 3 men x $23.23/hr. = **$8,334.92**

Labor to cover and shape ground

35,891 ft. / 100 ft./hr. = 358.9 hours

358.9 hrs. x $23.23/hr. x 5 men = **$41,686.24**

Labor to build & Install Gate & Actuators for Automation

Install - 3 men x 4 hours = 12 hours

Build - 2 men x 8 hours = 16 hours

Automation Labor = 28 hours x $23.23/hr = **$650.44**

TOTAL

Administration	Lay Pipe	Prepare Site	Cover Pipe	Automation	Total Labor
8,100.36	76,714.75	8,334.92	41,686.24	650.44	$135,486.71

Fringe Benefits

Indicate rates/amounts, what costs are included in this category, and the basis of the rate computations. Indicate whether these rates are used for application purposes only or whether they are fixed or provisional rates for billing purposes. Federally approved rate agreements are acceptable for compliance with this item.

The wages and fringe benefits listed are a combination of actual costs and averages. The costs of health insurance are an average because the of the various ages, sex, marital status, and the exact number of hours of each ditchrider may vary depending on vacations, sickness, family issues, etc… The cost of life insurance should be a direct cost as is the 4% retirement match.

Travel

Include purpose of trip, destination, number of persons traveling, length of stay, and all travel costs including airfare (basis for rate used), per diem, lodging, and miscellaneous travel expenses. For local travel, include mileage and rate of compensation.

The only travel anticipated to be associated with this project is the transportation to and from the project site. This travel is included as vehicle time in the equipment costs and personnel time for the labor costs.

Equipment

Itemize costs of all equipment having a value of over $500 and include information as to the need for this equipment, as well as how the equipment was priced if being purchased for the agreement. If equipment is being rented, specify the number of hours and the hourly rate. Local rental rates are only accepted for equipment actually being rented or leased for the project. If equipment currently owned by the applicant is proposed for use under the proposed project, and the cost to use that equipment is being included in the budget as in-kind cost share, provide the rates and hours for each piece of equipment owned and budgeted.

All of the anticipated equipment to be used is currently owned by the District. The following table should give a summary estimate of the equipment and time needed.

Total project length – 550.4 (lay pipe) + 119.6 (site prep) + 358.9(cover) = 1028.9 hours

Equipment Expense

	(hours)	(hours)	(hours)		($/hour)	($)
Machine	**Site Prep.**	**Lay Pipe**	**Cover Pipe**	**Total Hrs.**	**Rate**	**Cost**
Excavator Cat 211	0	0	0	0	18.96	$ 0.00
Excavator JD 120	119.6	550.4	158.9	828.9	33.30	$ 27,602.37
Excavator JD 690	0	0	200	200	49.00	$ 9,800.00
Backhoe JD 410	50	20	50	120	19.96	$ 2,395.20
Backhoe JD 610	50	20	50	120	38.54	$ 4,624.80
Maintainer	0	0	200	200	46.96	$ 9,392.00
Loader Ford A-62	0	20	40	60	39.46	$ 2,367.60
Loader Cat 941	0	20	20	40	36.15	$ 1,446.00
Loader Cat 941	0	30	20	50	36.15	$ 1,807.50
Dump Truck	10	0	90	100	43.23	$ 4,323.00
Dump Truck	10	0	90	100	43.23	$ 4,323.00
Pickup	15	69	45	129	12.33	$ 1,590.57
Pickup	15	69	45	129	12.33	$ 1,590.57
Pickup	15	69	45	129	12.33	$ 1,590.57
Haul Truck	44	0	22	66	45.92	$ 3,030.72
Lowboy Trailer	44	0	22	66	7.85	$ 518.10
					Total	**$ 76,402.00**

Machine	Total Hrs.	Hrs. Used	Standby Hrs	Rate($/hr)	Cost ($)
Excavator Cat 211	1028.9	0	0	4.12	$0.00
Excavator JD 120	1028.9	828.9	200	7.23	$1446.00
Excavator JD 690	1028.9	200	828.9	11.33	$9,391.44
Backhoe JD 410	1028.9	120	908.9	2.93	$2,663.08
Backhoe JD 610	1028.9	120	908.9	7.14	$6,489.55
Maintainer	1028.9	200	828.9	10.37	$8,595.69
Loader Ford A-62	1028.9	190	838.9	7.23	$6,065.25
Loader Cat 941	1028.9	40	200	6.45	$1,290.00
Loader Cat 941	1028.9	50	200	6.45	$1,290.00
Dump Truck	1028.9	100	178.4	5.28	$941.90
Dump Truck	1028.9	100	178.4	5.28	$941.90
Pickup	1028.9	129	899.9	1.14	$1,025.89
Pickup	1028.9	129	899.9	1.14	$1,025.89
Pickup	1028.9	129	899.9	1.14	$1,025.89
Haul Truck	1028.9	66	962.9	4.42	$4,256.02
Lowboy Trailer	1028.9	66	962.9	2.24	$2,156.90
				Total	**$48,605.40**

Total Equipment Costs = 76,402.00(work)+48,605.40(standby)+5400.00(misc.) = $130,407.40

These should be ownership rates developed by the recipient for each piece of equipment. If these rates are not available, *the U.S. Army Corp of Engineer's recommended equipment rates for the region are acceptable*.

Machine	Cat #	Number	Standby Rate
JD120 Excavator	312	H25CA021	**7.23**
Cat211 Excavator	305	H25CA036	**4.12**
JD690D Excavator	M-318	H30CA005	**11.33**
36" bucket		H25WN00	**0.60**
JD 610 Backhoe	446	L50CA004	**7.14**
JD 410 Backhoe	416	L50CA001	**2.93**
1997GMCDumpTr		T50XX032	**5.28**
Haul Truck		T50XX029	**4.42**
Lowboy Trailer		T45EA006	**2.24**
Pickup		T50XX004	**1.14**
Cat 12E Grader	120	G15CA001	**10.37**
Ford A-62 Loader	924	L40CA022	**7.23**
Cat 941 Loader	939	L35CA013	**6.45**

Machine	Cat #	Number	Deprec.	FCCM	Owner Rate	Overage Adjust.	Adj. Own Rate	Fuel	FOG	Tire Wear	Tire Repair	Repair
JD 120 Excavator	312	H25CA021	11.82	1.32	13.14	0.90	11.83	8.88	1.3	0	0	11.29
Cat 211 Excavator	305	H25CA036	6.80	0.72	7.52	0.90	6.77	4.97	0.73	0	0	6.49
JD690DExcavator	M-318	H30CA005	18.62	2.02	20.64	0.84	17.34	14.93	2.06	1.62	0.24	12.81
36" Bucket		H25WN00	1.40	0.08	1.48	0	1.48	0	0	0	0	1.08
JD 610 Backhoe	446	L50CA004	11.26	1.51	12.77	0.90	11.49	9.00	3.89	1.47	0.22	12.47
JD 410 Backhoe	416	L50CA001	4.6	0.63	5.23	0.90	4.71	6.38	2.76	0.86	0.13	5.12
1997 GMC Dump Truck		T50XX032	8.21	1.17	9.38	0.81	7.60	24.87	2.90	0.62	0.09	7.15
Haul Truck		T50XX029	6.86	0.99	7.85	0.81	6.36	29.09	3.39	0.94	0.14	6.00
Lowboy Trailer		T45EA006	3.65	0.41	4.06	0.84	3.41	0	0.50	1.58	0.23	2.13
Pickup		T50XX004	1.9	0.19	2.09	0	2.09	7.24	0.84	0.31	0.05	1.80
Cat 12E Grader	120	G15CA001	15.15	2.79	17.94	0.79	14.17	13.65	1.93	0.98	0.14	16.09
Ford A-62 Loader	924	L40CA022	11.59	1.43	13.02	0.89	11.59	13.53	1.47	1.64	0.024	11.21
Cat 941 Loader	939	L35CA013	10.45	1.22	11.67	0.85	9.92	10.43	1.03	0	0	14.77

Materials & Supplies

Itemize supplies by major category, unit price, quantity, and purpose, such as whether the items are needed for office use, research, or construction. Identify how these costs were estimated (i.e., quotes, past experience, engineering estimates or other methodology).
The materials to be used for the project were priced by obtaining current list pricing from vendors. The actual costs may change by construction start date.

Lateral	10" PVC	12" PVC	15" PVC	18" PVC	Turnouts
FC 6.8	724	3470	0	0	3
FC 27.9	595	3370	1708	4527	9
FC 37.7	1525	930	1433	0	2
CC 4.3	1941	0	2400	0	3
CC 6.3	1060	0	1719	449	4
NC 2.2	0	1293	0	1570	2
NC 2.7	0	705	2669	1102	3
NC 2.7 – 0.2	0	0	1113	0	1
NC 3.2	0	1063	525	0	2
Total	5845	10831	11567	7648	29
Price	$3.93/ft	$5.61/ft	$8.78/ft	$13.14/ft	$1,971 ea.
Cost	$22,971	$60,762	$101,558	$100,495	$57,159
			Pipe Total	**$285,786**	

Total Length 35891 feet (6.8 miles)

Turnouts

10" meter tube	$280.00
10" reverse meter	$1,050.00
10" valve	$325.00
10" adapter	$120.00
Air/Vacuum valve	$196.00
Turnout Total	$1,971.00

Pipe	$285,786.00
Turnouts	$57,159.00
Fittings	$25,662.19
Trash Racks ($400 each)	$3,200.00
Environmental & Regulatory	$12,000.00
Administration	$8100.36
Engineering	$20,000.00
Misc. & Contingency	$20,000.00
Non-Installation Total	**$431,907.55**

The miscellaneous will include lumber, plywood, concrete, glue, cleaner and any other non-itemized materials.

Fittings	FC 6.8	FC 27.9	FC 37.7	CC 4.3	CC 6.3	NC 2.2	NC 2.7	NC 2.7 – 0.2	NC 3.2	Total	Cost	Total
10"x10"	1	1	1	0	1	1	1	1	2	9	24.70	$222.30
10"-22	5	1	1	0	2	1	2	2	0	14	54.59	$764.26
10"-45	3	1	1	0	2	1	2	2	0	12	66.32	$795.84
10x10x3	2	1	0	0	0	0	0	0	0	3	69.81	$209.43
10x10x10	0	0	0	0	0	0	0	0	0	0	135.92	$0.00
12"x12"	1	1	0	0	0	0	0	0	0	2	51.84	$103.68
12"-10"	1	1	1	0	0	1	1	0	1	6	65.25	$391.50
12"-22	4	4	2	0	0	0	1	0	4	15	77.38	$1160.70
12"-45	4	4	2	0	0	0	2	0	4	16	95.36	$1525.76
12x12x10	2	1	0	0	0	0	0	0	0	3	112.64	$337.92
12x12x4	3	4	1	0	0	0	0	0	4	12	161.73	$1940.76
4"-3"	3	9	0	1	2	1	1	2	6	25	13.30	$332.50
15"-10"	0	0	0	1	1	0	0	1	0	3	72.36	$217.80
15"-12"	0	1	1	0	0	1	1	0	1	5	83.31	$416.55
15"-22	0	4	2	0	2	0	4	1	2	15	120.24	$1803.60
15"-45	0	4	2	0	2	0	4	1	2	15	150.66	$2259.90
15x15x4	0	3	3	1	1	0	0	2	2	12	168.64	$2023.68
15x15x10	0	4	1	2	1	0	1	1	1	11	239.81	$2637.91
18"-15"	0	1	0	0	1	1	2	0	0	5	151.80	$759.00
18"-22	0	6	0	0	1	2	2	0	0	5	206.64	$2273.04
18"-45	0	4	0	0	1	2	2	0	0	9	246.05	$2214.45
18x18x10	0	1	0	0	2	1	0	0	0	4	349.01	$1396.04
18x18x4	0	2	0	0	1	1	1	0	0	5	308.24	$1541.20
18X18X18	0	0	0	0	0	1	0	0	0	1	335.14	335.14
21"-45	0	0	0	0	0	0	0	0	0	0	398.11	$0.00
21"-18"	0	0	0	0	0	0	0	0	0	0	211.80	$0.00
21x21x10	0	0	0	0	0	0	0	0	0	0	500.40	$0.00
21x21x4	0	0	0	0	0	0	0	0	0	0	414.69	$0.00
												$25,662.19

Contractual

Identify all work that will be accomplished by subrecipients, consultants, or contractors, including a breakdown of all tasks to be completed, and a detailed budget estimate of time, rates, supplies, and materials that will be required for each task. If a subrecipient, consultant, or contractor is proposed and approved at time of award, no other approvals will be required. Any changes or additions will require a request for approval. Identify how the budgeted costs for subrecipients, consultants, or contractors were determined to be fair and reasonable.

No contractual work is anticipated at this time.

Environmental and Regulatory Compliance Costs

Applicants must include a line item in their budget to cover environmental compliance costs. "Environmental compliance costs" refer to costs incurred by Reclamation or the recipient in complying with environmental regulations applicable to a WaterSMART Grant, including costs associated with any required documentation of environmental compliance, analyses, permits, or approvals. Applicable Federal environmental laws could include NEPA, ESA, NHPA, and the Clean Water Act, and other regulations depending on the project. Such costs may include, but are not limited to:

- **The cost incurred by Reclamation to determine the level of environmental compliance required for the project**
- **The cost incurred by Reclamation, the recipient, or a consultant to prepare any necessary environmental compliance documents or reports**
- **The cost incurred by Reclamation to review any environmental compliance documents prepared by a consultant**
- **The cost incurred by the recipient in acquiring any required approvals or permits, or in implementing any required mitigation measures**

The amount of the line item should be based on the actual expected environmental compliance costs for the project. However, the minimum amount budgeted for environmental compliance should be equal to at least 1-2 percent of the total project costs. If the amount budgeted is less than 1-2 percent of the total project costs, you must include a compelling explanation of why less than 1-2 percent was budgeted.

How environmental compliance activities will be performed (e.g., by Reclamation, the applicant, or a consultant) and how the environmental compliance funds will be spent, will be determined pursuant to subsequent agreement between Reclamation and the applicant. If any portion of the funds budgeted for environmental compliance is not required for compliance activities, such funds may be reallocated to the project, if appropriate.

It is anticipated Reclamation will conduct the environmental compliance. Some of the compliance has been completed previously. A letter was written to Reclamation to request compliance for the remaining project and to verify the status of compliance but $12,000 as part of the District match was included. An Environmental Clearance Letter from the Bureau is shown on page 49.

Reporting

Recipients are required to report on the status of their project on a regular basis. Failure to comply with reporting requirements may result in the recipient being removed from consideration for funding under future funding opportunities. Include a line item for reporting costs (including final project and evaluation costs). Please see Section VI.C. for information on types and frequency of reports required.

The status reports and submission of costs was included as part of the manager and office manager estimated costs associated with the project. The administrative costs were estimates based on previous similar grants. It is the desire of the District to complete the project as soon as possible and minimize the reporting function.

Other

Any other expenses not included in the above categories shall be listed in this category, along with a description of the item and what it will be used for. No profit or fee will be allowed.

The miscellaneous and contingency was used for small items such as lumber, plywood, concrete, glue, cleaner, welding rod, wire and any other non-itemized materials used for the project.

Indirect Costs

Show the proposed rate, cost base, and proposed amount for allowable indirect costs based on the applicable OMB circular cost principles (see Section III.E., "Cost Sharing Requirement") for the recipient's organization

Contingency Costs

All proposed contingency line-items must be supported by a rationale. Further, in most cases, contingency cost estimates at are limited to 10 percent of projected construction costs.

The District estimated contingency costs to be $20,000. This is less than 10% but should be adequate for the project. This is part of the District cost share.

Total Cost

Indicate total amount of project costs, including the Federal and non-Federal cost-share amounts.

The total project cost is $691,711.31 with $300,000 coming from Reclamation and the balance ($391,711.31) being supplied by the District.

Budget Form

In addition to the above-described budget information, the applicant must complete an SF-424A, Budget Information—Nonconstruction Programs, or an SF-424C, Budget Information—Construction Programs.

OMB Approval No. 0348-0041

BUDGET INFORMATION - Construction Programs

NOTE: Certain Federal assistance programs require additional computations to arrive at the Federal share of

COST CLASSIFICATION	a. Total Cost	b. Costs Not Allowable	c. Total Allowable Costs
1. Administrative and legal expenses	$ 8100.00	.00	$ 8100.00
2. Land, structures, rights-of-way, appraisals, etc.	$ .00	.00	$ .00
3. Relocation expenses and payments	$ .00	.00	$ .00
4. Architectural and engineering fees	$ 20000.00	.00	$ 20000.00
5. Other architectural and engineering fees	$ .00	.00	$ .00
6. Project Environmental inspection fees	$ 12000.00	.00	$ 12000.00
7. Site work	$ 41687.00	.00	$ 41687.00
8. Demolition and removal	$ 8335.00	.00	$ 8335.00
9. Construction labor and materials	$ 451182.00	.00	$ 451182.00
10. Equipment	$ 130408.00	.00	$ 130408.00
11. Miscellaneous	$ 10000.00	.00	$ 10000.00
12. SUBTOTAL *(sum of lines 1-11)*	$ 681712.00	.00	$ 681712.00
13. Contingencies	$ 10000.00	.00	$ 10000.00
14. SUBTOTAL	$ 691712.00	.00	$ 691712.00
15. Project (program) income	$ .00	.00	$ .00
16. TOTAL PROJECT COSTS *(subtract #15 from #14)*	$ 691712.00	.00	$ 691712.00
FEDERAL FUNDING			
17. Federal assistance requested, calculate as follows: (Consult Federal agency for Federal percentage share.) Enter the resulting Federal share.	Enter eligible costs from line 16c Multiply X 43.37 %		$ 300000.00

Previous Edition Usable **Authorized for Local Reproduction** **Standard Form 424C (Rev. 7-97)**
Prescribed by OMB Circular A-102

BOSTWICK IRRIGATION DISTRICT in NEBRASKA

WATER APPROPRIATIONS

FRANKLIN CANAL			NAPONEE CANAL			FR. PUMP CANAL			COURTLAND CANAL			SUPERIOR CANAL		
PRIOR. DATE	APP.	CFS	PRIOR. DATE	APP.	CFS	PRIOR. DATE	APP.	CFS	PRIOR. DATE	APP.	CFS	PRIOR. DATE	APP.	CFS
4/3/1946	A-2691-A	35.87	2/26/1948	A-4217	10.33	4/3/1946	A-2691BR	0.08	2/26/1948	A-4222	11.95	4/3/1946	A-2691CR	39.29
4/3/1946	A-2691-BR	31.23										2/26/1948	A-4221	0.06
2/26/1948	A-4216	15.43	4/16/1954	A-6220	0.66	2/28/1948	A-4227	14.93	4/16/1954	A-6224	0.84			
4/16/1954	A-6221	1.20										4/16/1954	A-6223	1.86
11/21/1955	A-8259	1.21	4/19/1957	A-9463	1.23	4/16/1954	A-6222	1.47	10/6/1966	A-10963	1.94			
5/21/1958	A-9623	0.76										4/24/1959	A-9723	0.64
4/24/1959	A-9724	0.26	4/24/1959	A-9722	0.16	10/6/1966	A-10962	0.11	9/20/1974	A-13210	0.49			
10/6/1966	A-10964	4.13										12/30/1960	A-9875	0.70
1/23/1973	A-12796	1.47	10/6/1966	A-10965	2.41	9/10/1982	A-16150	0.33	9/10/1982	A-16149	0.70			
4/7/1976	A-14162	0.30										10/6/1966	A-10966	1.04
6/11/1979	A-15488	0.81	9/10/1982	A-16150	0.93									
5/5/1982	A-16099	1.44										5/5/1982	A-16100	1.67
TOTAL		94.11	TOTAL		15.72	TOTAL		16.92	TOTAL		15.92	TOTAL		45.26

BOSTWICK IRRIGATION DISTRICT
RED CLOUD, NEBRASKA
STATEMENT OF NET ASSETS
DECEMBER 31, 2011 AND 2010

ASSETS

	2011	2010
CURRENT ASSETS		
Cash and cash equivalents	172,267	214,890
Certificates of deposit	114,351	266,612
Deposit in escrow	1,000	1,000
Assessment receivable	359,144	326,093
Accounts receivable – water	368	220
Bureau of Reclamation grant receivable	247,500	274,350
Assessment interest receivable	131	1,889
Prepaid insurance	32,129	31,331
Total current assets	926,890	1,116,385
LAND, BUILDINGS, DISTRIBUTION SYSTEM AND EQUIPMENT		
Land and Land rights	209,703	209,703
Distribution works	3,816,469	3,449,301
Drainage system	2,610,499	2,610,499
Water supply rights	1,525,183	1,525,183
Buildings	76,286	76,286
Equipment	629,382	599,356
	8,867,522	8,470,328
Less accumulated depreciation	(605,440)	(575,842)
Net land, buildings, distribution system And equipment	8,262,082	7,894,486
RESTRICTED ASSETS		
Restricted for O & M Reserve		
Certificates of Deposit	125,691	118,810
TOTAL ASSETS	9,314,663	9,129,681

Bostwick Irrigation District in Nebraska

P.O. Box 446. Red Cloud, Nebraska 68970
Phone/Fax (402) 746-3424

December 11, 2012

Aaron Thompson
Bureau of Reclamation
Nebraska-Kansas Area Office 1706 W. Third
McCook, Nebraska 69001

Subject: Environmental and Cultural Clearance for Franklin Canal Laterals 6.8, 27.9, 37.7, Courtland Canal Laterals 4.3, 6.3 and Naponee Canal Laterals 2.2, 2.7, 3.2

Dear Mr. Thompson,

The Bostwick Irrigation District in Nebraska has submitted an application for the 2013 WaterSmart Grant program. It is the desire of this letter to request the necessary environmental and cultural clearances for the project prior to any construction. The project for the grant is to convert Franklin Canal Laterals 6.8, 27.9, 37.7, Courtland Canal Laterals 4.3, 6.3 and Naponee Canal Laterals 2.2, 2.7 and 3.2 from open ditch to buried pipe. This letter is being sent to request the Bureau to start the necessary procedures to obtain the clearances. It is not the intent of the District to deviate from the current alignment of the lateral and canal. Thank you for your assistance.

Respectfully,

Mike Delka

Mike Delka, Manager
Bostwick Irrigation District in Nebraska

"Water is Life"

COPY