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RECLAMATION

Managing Water in the West

WaterSMART: Water and Energy Efficiency Grants for FY 2013

Funding Group 1

Rio Grande Regional Water Authority

Surge Valve Collaborative for On-Farm Water Conservation in the Lower Rio Grande Valley

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RGRWA
RIO GRANDE REGIONAL WATER AUTHORITY

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I. TECHNICAL PROPOSAL

A. Executive Summary

This WaterSMART grant application is submitted 17 January 2013 by the Rio Grande Regional Water Authority (RGRWA), with offices at 301 W. Railroad, Weslaco, TX 78596, Hidalgo County, Texas. The RGRWA is a regional entity established under state law to supplement the services, regulatory powers, and authority of irrigation districts, water supply corporations, counties, municipalities, and other political subdivisions within its borders. Its permissible functions range from agricultural water conservation to desalination, and from municipal water supply to wastewater treatment.

The RGRWA proposes to use WaterSMART grant funds for a "Surge Valve Collaborative" aimed at promoting in its jurisdiction the use of highly efficient surge valves in irrigated agriculture by (1) training willing producers in proper use of the devices and (2) heavily subsidizing the cost. The project will leverage WaterSMART and RGRWA financial resources with cost-shares from cooperating producers and in-kind technical assistance from the Texas Project for Ag Water Efficiency. The principal goals of the Collaborative are to conserve and use water more efficiently and thereby prevent water-related crisis and/or conflict. A number of secondary benefits also will be achieved, including increasing the use of renewable energy, improving energy efficiency, providing additional in-stream flows to protect endangered and threatened species, and support regional water marketing. Collaborative activities will be initiated upon notice of award and completed by 31 December 2014.

Water savings will NOT be used to increase total irrigated acreage or to otherwise increase consumptive use of water in agricultural operations.

Here are details in summary:

The award-winning Texas Project for Ag Water Efficiency – an ongoing 10-year agricultural water conservation demonstration initiative in the Lower Rio Grande Valley funded by the Texas Water Development Board – has found that using surge valves in furrow irrigation (a common irrigation method in the region) realizes **proven water savings of 22 percent to 58 percent across a variety of crops: seed corn, cotton, and sugarcane.**

These impressive results were chronicled by four Texas AWE demonstrations involving three different cooperators:

Table I-1. Texas Project for Ag Water Efficiency: On-Farm Demonstration Results for Surge vs. Furrow Irrigation

Crop (Date)	Volume of Water Used/Acre (in acre-inches)		Savings with Surge	Demonstration Report (all reports available at www.TexasAWE.org)
	Furrow	Surge		
Sugarcane (2005)	30.68	14.64	58%	Impact of Volumetric Water Pricing for Sugarcane Comparing Furrow vs. Surge Irrigation in the Lower Rio Grande Valley, FARM Assistance Focus 2006-4, Dec. 2006
Cotton (2005)	19.53	13.48	31%	Impact of Volumetric Water Pricing for Cotton Comparing Furrow vs. Surge Irrigation in the Lower Rio Grande Valley, FARM Assistance Focus 2006-3, Dec. 2006
Seed Corn (2007)	23.95	17.31	28%	Impact of Volumetric Water Pricing for Seed Corn Comparing Surge vs. Furrow Irrigation in the Lower Rio Grande Valley, FARM Assistance Focus 2007-7, Oct. 2007
Cotton (2010)	18	14	22%	Furrow vs. Surge Irrigation in Cotton Assuming Restricted Water Availability in the Lower Rio Grande Valley, FARM Assistance Focus 2011-2, March 2011

As part of the process that produced the 2011 Regional Water Plan, Texas Water Development Board economists calculated the acreage and water use of irrigated crops in the planning area. Some 27 percent of the total amount of water used for all irrigation is consumed by cotton and sugarcane, two crops where surge valves have produced demonstrated water savings. According to TWDB, 59,000 acres in the region are planted in cotton and 42,000 acres in sugarcane.

- In sugarcane, the Texas AWE studies referred to above found that surge valves produced 58 percent savings in water consumption. If all 42,000 acres of sugarcane fields in the region were irrigated using this method, water savings would amount to 82,360 AF/yr.
- In cotton, savings of 22 percent were realized in one study and 31 percent in the other. Using surge valves for all 59,000 irrigated acres of cotton would produce water savings in the range of 24,420 – 34,410 AF/yr.

For these two crops alone, then, surge valve technology could save about 107,000 to 117,000 AF/yr in the region, an amount equal to about 40 percent of current municipal demand.

However, a price tag of $1,800 to $2,000 per surge valve renders this equipment economically unfeasible for most producers, given the current low cost of water. As noted in the March 2011 FARM Assistance Focus 2011-2 report:

> *"Although surge offers the opportunity to conserve irrigation water in cotton and other field crops, the incentive for producers to switch to the new technology is minimal under current water delivery methods and water pricing levels. Demonstration results indicate that incentives to invest and adopt surge irrigation would begin with volumetric pricing and almost a doubling in water price . . . In drought or other high water demand situations where the availability of water is restricted or limited, economic forces will ration supplies through higher prices and water will likely be metered. Water use efficiency will then become more crucial in controlling water cost."*

The RGRWA Surge Valve Collaborative aims to jump-start the economic incentive to use surge technology by providing surge valves to up to 32 willing cooperating producers and training them in how to use the equipment for maximum irrigation efficiency.

We plan a series of three training sessions to ensure customized attention and ample opportunity for hands-on experience with the equipment prior to use. We also will take in-field measurements of water usage using available meters from area irrigation districts; perform detailed analyses of a 20 percent sample of cooperators; and collect follow-up data on field experience and common issues and problems.

Each participating producer will be eligible for two valves. This should allow irrigation of up to 100 acres at a time (depending on the infrastructure of irrigation district serving the producer). Each producer will pay an initial out-of-pocket fee of $350 per surge valve, with $50 per valve refunded for participation in a follow-up meeting. Two participants from each training group (a 20 percent sample) also will be selected for in-field follow-up evaluation by Texas A&M specialists.

All training and follow-up will be provided as an in-kind match by the Harlingen Irrigation District (which manages Texas AWE) and its partners in the project from Texas A&M and Agricultural Extension offices.

Public outreach on the Collaborative and support for the final report on the project will be tasked to WaterPR, another Texas AWE partner, as an additional in-kind match for the grant.

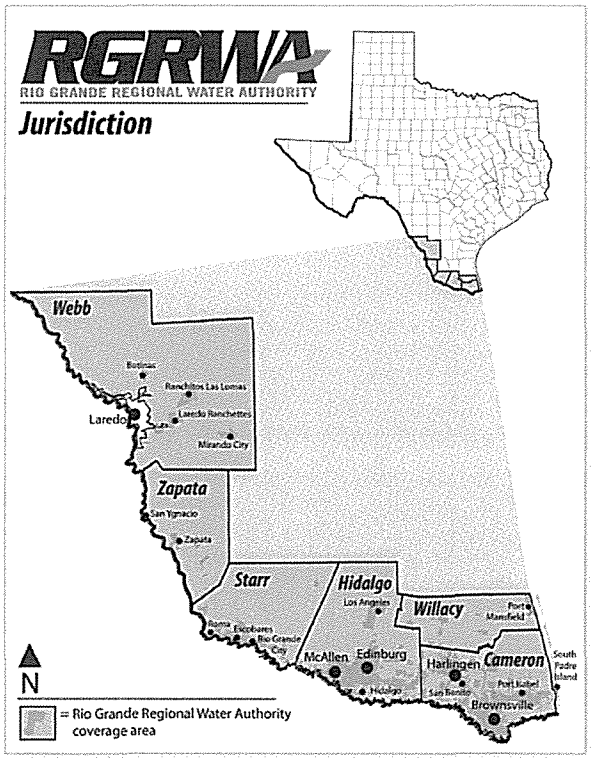
State of Texas funding for the Texas Project for Ag Water Efficiency ends December 31, 2014. All activities for the proposed Collaborative will be completed by that date. Because of the shortened timeframe, we request that certain planning activities required for the Collaborative be allowed in advance of the October 2013 funding date. The activities include planning for outreach and developing outreach materials development as well as soliciting firm cost proposals for the equipment. These advance efforts will permit the Collaborative to begin recruiting participants immediately upon funding.

B. Background Data

About the RGRWA

The Rio Grande Regional Water Authority was created by the 78th Legislature in 2003 as a conservation and reclamation district with broad powers, rights, privileges, and responsibilities under the Texas Constitution. Its purpose is to supplement—not replace—the services, regulatory powers, and authority of irrigation districts, water supply corporations, counties, municipalities, and other political subdivisions within its borders.

Its permissible functions range from agricultural water conservation to desalination, and from municipal water supply to wastewater treatment. It also is authorized to assist in the delivery of water from the Rio Grande and certifies water rights held inside its boundaries. The RGRWA covers six counties in the Middle and Lower Rio Grande Valley: Willacy, Cameron, Hidalgo, Starr, Zapata, and Webb (excluding the City of Laredo). Its members include 29 municipalities, 25 irrigation districts, 9 water supply corporations, and 10 other water supply entities.



The RGRWA is not a water provider and thus has no water delivery system.

Irrigation districts in the region use a variety of energy sources for pumping: diesel, electricity, and natural gas are the most common.

The RGRWA is currently working with the Bureau of Reclamation on a basin study to evaluate the impacts of climate variability and change on water supply imbalances within an eight county region along the U.S./Mexico border in south Texas that forms the Rio Grande Regional Water Planning Group (also known as Region M). The counties include those that also fall within the jurisdiction of the RGRWA, plus Jim Hogg and Maverick. The basin study began in the fall of 2011 and is expected to be completed by fall 2013.

The RGRWA and Region M overlap in terms of major centers of population and economic activity, and their water demand and supply track closely.

Regional Water Supplies & Demand

"The Rio Grande is the source of water for almost all water users in this region: practically all of the surface water available to and used within the region is from the Rio Grande. Nearly all of the dependable surface water supply is from the combined yield of the Amistad and Falcon International Reservoirs, the two major reservoirs on the Rio Grande. Most of the inflow to this reservoir system comes from the Rio Conchos in the State of Chihuahua, Mexico, and the Pecos River in Texas. The estimated firm yield of the reservoir system (i.e., the amount of water available in the drought of record) for the U.S was approximately 1.01 million acre-feet per year.

"This represents more than 94 percent of the total amount of water presently available to the region from all sources (e.g., groundwater, reuse, Rio Grande tributaries, and other local sources). Over time, however, the total dependable water supply from the Rio Grande is projected to decrease significantly, largely as a consequence of reduced conservation storage capacity due to sedimentation of the Amistad/Falcon Reservoir System. Between the years 2010-2060, the firm yield of the reservoir system is projected to decrease by nearly 32,500 acre-feet (approximately 3 percent)."

– 2011 Rio Grande Regional Water Plan

Between 2010 and 2060, irrigation demand is projected to decline substantially as urbanization encroaches on agricultural lands. Nevertheless, **the significant imbalance between water supplies and water demand is expected to increase substantially, rising from a deficit of 368,356 AF/yr in 2010 to a deficit of 592,085 AF/yr in 2060.**

Table I-2. Regional Water Demands vs. Supplies

Water Use	Water Demand (AF/year)		Water Supplies (AF/year)	
	2010	2060	2010	2060
Irrigation	1,163,634	981,748	757,168	724,724
Municipal	288,323	646,006	323,884	331,118
All other uses	30,975	54,166	33,524	33,993
TOTAL	1,482,932	1,681,920	1,114,576	1,089,835

Source: 2011 Rio Grande Regional Water Plan

Irrigated Agriculture

> *"Because of the manner in which available supplies from the Amistad/Falcon Reservoir System are managed and allocated, the impact of declining supplies will be borne directly by irrigation and mining water users. Under the water rights system for the middle and lower Rio Grande, domestic-municipal-industrial (DMI) water rights have a very high degree of reliability. A DMI reserve of 225,000 acre-feet is continually maintained in the reservoir system. By comparison, irrigation and mining water rights are residual users of stored water from the reservoirs. . . . Since municipal water has the highest priority in the Amistad/Falcon system, irrigation water is in a constant state of shortage."*
>
> *– 2011 Rio Grande Regional Water Plan*

Irrigation has been the largest user of water supplies in the region dating back to the founding some 100 years ago of the first irrigation districts in the Valley, which spurred development in the region.

Currently, irrigation consumes just over 78 percent of surface water supplies in the region, according to the 2011 Rio Grande Regional Water Plan. Municipal use accounts for just under 20 percent.

By 2060, municipal water demand will double, consuming 39.3 percent of supplies. Irrigation demand is projected to drop to 57.5 percent, due in large part to a rapidly increasing population that will further drive urbanization of agricultural lands, especially in Cameron and Hidalgo counties.

These two counties have the highest percentage of water rights associated with the entire Amistad/Falcon system. Cameron County currently accounts for more than 31 percent of total demand for irrigation water, Hidalgo County for more than 50 percent.

The 11 irrigation districts that operate in Cameron County pumped 553,910 acre-feet of Rio Grande water in 2010. The 16 districts that operate in Hidalgo County pumped 697,522 AF. In contrast, the lone district in Willacy County pumped 75,212 AF.

Each irrigation district supports and maintains its own respective conveyance infrastructure, composed of varying miles of open canals, lined canals, and pipelines. The districts vary considerably in terms of infrastructure improvements that promote water efficiency and conservation. According to the 2011 Regional Water Plan, on average "there is approximately 15.2 miles of open canal for each mile of pipeline."

As part of the process that produced the 2011 Regional Water Plan, Texas Water Development Board economists calculated the acreage and water use of irrigated crops in the planning area. Some 27 percent of the total amount of water used for all irrigation is consumed by cotton and sugarcane, two crops where surge valves have produced demonstrated water savings.

Table I-3. Summary of Irrigated Crop Acreage and Water Demand for the Rio Grande Regional Water Planning Area (acreage 2003-2007)

Sector	Acres (1000s)	Distribution of acres	Water use (1000s of AF)	Distribution of water use
Oilseeds	4	1%	5	1%
Grains	143	31%	253	27%
Vegetable and melons	73	16%	120	13%
Tree Nuts	7	1%	18	2%
Fruits	13	3%	34	4%
Cotton	59	13%	111	12%
Sugarcane	42	9%	142	15%
All other crops	120	26%	252	27%
Total	**459**	**100%**	**937**	**100%**

Source: Water demand figures are 5-year average (2003-2007) of the TWDB's annual Irrigation Water Use Estimates. Statistics for irrigated crop acreage are based upon annual survey data collected by the TWDB and the Farm Service Agency. Values do not include acreage or water use for the TWDB categories classified by the Farm Services Agency as "failed acres," "golf course" or "waste water."

Source: 2011 Rio Grande Regional Water Plan

- In sugarcane, the Texas AWE studies referred to above found that surge valves produced 58 percent savings in water consumption. If all 42,000 acres of sugarcane fields in the region were irrigated using this method, water savings would amount to 82,360 AF/yr.

- In cotton, savings of 22 percent were realized in one study and 31 percent in the other. Using surge valves for all 59,000 irrigated acres of cotton would produce water savings in the range of 24,420 – 34,410 AF/yr.

For these two crops alone, then, surge valve technology could save about 107,000 to 117,000 AF/yr in the region, an amount equal to about 40 percent of current municipal demand.

These data make a compelling case for regional investment in this tried and true technology.

Surge Valve Technology

A report to the **U.S. Bureau of Reclamation on a 1993 "Cooperative Agreement for Surge Irrigation Research and Development Program, Grand Valley Unit"** explains how surge valves work:

> *"Surge irrigation has been recognized for a number of years for its ability to enhance irrigation water advance across a field. The principle involves a valve operated by a motorized controller which switches the irrigation water from one side of the field to the other at prescribed times. The first application advances down a short portion of one side of the set before the water is switched over to the alternate side to advance the water the same distance. It is powered by a solar collector attached to a battery and is relatively maintenance free. The number of cycles of alternating the water from one side to the other is dependent upon the soil type, length of irrigation run and the amount of water available for the irrigation. After the initial alternating times (called 'out times') the cycles are decreased in length of time to soaking, or cutback times. At this point, the field should be wetted through to the end and excess water runoff ('tailwater') should be minimized.*
>
> *"Several theories exist as to why surge irrigation works. The most accepted version is that the water may continue to penetrate the soil even after the irrigation water is removed from it; this may result in some soil "sealing" by breaking of some capillary flow and less penetration when the next "surge" of water is applied. Thus, the water may travel further down the furrow with less water applied than if the water had been applied continuously. As a result, vastly improved irrigation efficiencies have been realized by many irrigators and the conclusions have been published in several journals."*
>
> – *Report on the Colorado River Salinity Control Program*

"Surge irrigation uses valves at regular intervals in the irrigation line to divert water flow first in one direction, then the other, directing water into only half the furrows at any one time. Such intermittent quick shots of water seem to seal the soil, with each subsequent shot infiltrating less."

– *Irrigation in Sugar Cane in Texas*,

Nov. 2004, Texas Cooperative Extension

C. Technical Project Description

The RGRWA is applying for $77,000 in Bureau of Reclamation cost-share funding to purchase surge valves for distribution to willing cooperators within its jurisdiction.

The use of surge valves in Valley crops has been studied extensively over the past eight years by Texas A&M crop specialists and farm economists working with the Texas Project for Ag Water Efficiency. Texas AWE is managed by Harlingen Irrigation District with funding from the Texas Water Development Board. (More information at www.TexasAWE.org.)

Because of its leadership in water conservation and efficiency, including Texas AWE, the Harlingen Irrigation District was been honored with the Texas 2011 Environmental Excellence Award in Agriculture and cited as one of nine global "Good Practice" projects included in a report presented to the 2012 World Economic Forum in Davos, Switzerland. Texas AWE also was highlighted as a "case study" for water supply in the 2012 *Environmental, Economic and Health Status of Water Resources in the U.S.-Mexico Border Region*, the 15th annual report on environmental infrastructure needs within the U.S. states contiguous to Mexico issued by the Good Neighbor Environmental Board.

In four different demonstration studies, researchers found that the use of surge valves in irrigation resulted in significant savings in water used, ranging 22 percent up to 58 percent.

Table I-4. Texas Project for Ag Water Efficiency: On-Farm Demonstration Results for Surge vs. Furrow Irrigation

Crop (Date)	Volume of Water Used/Acre (in acre-inches)		Savings with Surge	Demonstration Report (all reports available at www.TexasAWE.org)
	Furrow	Surge		
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Cotton (2010)	18	14	22%	Furrow vs. Surge Irrigation in Cotton Assuming Restricted Water Availability in the Lower Rio Grande Valley, FARM Assistance Focus 2011-2, March 2011

Texas AWE researchers currently are gathering data from another on-farm demonstration of surge technology that calculates not only inflows but also run-off. Preliminary data indicate that surge has significantly less run-off, such that the water savings in this area could eclipse the savings in application.

The Surge Valve Collaborative will leverage a variety of resources to draw down Reclamation funds in order to implement a simple yet highly effective tool for much needed on-farm water conservation.

The RGRWA itself will contribute $19,000 in cost-sharing funds to purchase surge valves. Additionally, as the contracting agency with overall responsibility for project administration and reporting, the Authority will provide in-kind services to help match Reclamation's investment. Appendix A includes (1) the official resolution dated 9 January 2013 from the Rio Grande Regional Water Authority authorizing submission of the proposal and agreeing to all terms stipulated in the FOA and (2) certification of sufficient funds for the project.

The Texas Project for Ag Water Efficiency, which is funded by the Texas Water Development Board, will allocate its resources to provide day-to-day project management, hands-on training on the equipment at its Rio Grande Center for Ag Water Efficiency, in-field analyses, follow-up assessments, and public outreach efforts to recruit cooperators. Texas AWE is focused on supporting advancements in on-farm water conservation and in-district operations, and its objectives and authorized tasks dovetail perfectly with this proposed Collaborative. Indeed, Texas AWE data on the water savings that can be achieved by using surge valves served as the inspiration for this proposal. Appendix B includes the required letter for commitment for the Collaborative from the Texas Project for Ag Water Efficiency.

Texas AWE in-kind services will be provided by Harlingen Irrigation District (HID), Texas A&M researchers (TAMU), and WaterPR (WPR), a communications consulting firm specializing in water issues and projects. All services from these partnering entities will be compensated through Texas AWE funding; no other funding source will be involved.

The cooperating producers will also buy-in to the Collaborative by paying $350 for each surge valve they receive after completing a training session. As an incentive to share their results, producers will be rebated $50 per surge valve when they return for a scheduled group follow-up discussion of any issues and refresher in equipment use and maintenance. Twenty percent of cooperators will be scheduled for more extensive in-field follow-up and evaluation to assess results.

The proposed budget for the Collaborative seeks to purchase 64 surge valves for distribution to 32 producers.

We envision a series of three training sessions to ensure customized attention and ample opportunity for hands-on experience with the equipment prior to use. We also will collect follow-up data on field experience and common issues and problems.

The following table provides an overview of key activities and milestones. Regularly recurring reporting tasks will be added based on grant contract requirements.

Table I-5. Overview of Collaborative Activities & Milestones

Date	Activity/Milestone	Responsible Party
June 2013	Notice of award.	BOR
September 2013	Commence developing outreach/recruiting materials and strategies.	WaterPR
	Review existing surge valve training materials and modify, as needed.	HID & TAMU
	Solicit cost proposals for surge valves.	RGRWA
Oct 2013	Finalize grant award with BOR, set up recordkeeping and reporting procedures, contract for surge valve purchases.	RGRWA
	Execute outreach plan to solicit cooperators, e.g., media releases, direct mail, handouts through irrigation districts, extension agents, commodity groups.	WaterPR
	Develop agreement forms for cooperators, handle logistics for conducting training at the Rio Grande Center for Ag Water Efficiency.	HID
Nov 2013	Plan and conduct training sessions, secure cooperator agreements, distribute surge valves; report on results.	HID, TAMU
March - May 2014	Plan and conduct in-field assessments with sample 20 percent of cooperators; report on results.	TAMU
Sept 2014	Plan and conduct follow-up meetings with cooperators, distribute rebates; report on results.	HID & TAMU
Oct-Nov 2014	Synthesis all interim reports, develop and submit final report.	RGRWA & WaterPR

We propose a total budget of $155,200, with a Bureau of Reclamation grant in the amount of $77,500, matched by a total of $77,700 in cash and in-kind contributions. No federal funding is involved in any of the matching contributions.

Based on an average price of $1,800 per surge valve, we propose to purchase a maximum of 64 surge valves for a total price of $115,200. These cash expenditures will be met by the BOR grant and contributions from RGRWA and cooperating producers (who will pay a final cost of $300 per surge valve).

Table I-6. Collaborative Cost-Sharing

Partnering Entities & Contributions		Cash	In-Kind Services	Services to be Rendered
U.S. Bureau of Reclamation WaterSMART grant		$77,500		
Federal Contribution		**$77,500**		
Rio Grande Regional Water Authority		$19,276	$ 4,224	project oversight, contract management, cash management, reporting
Cooperators		$19,200		
Texas Project for Ag Water Efficiency	Harlingen Irrigation District		$18,655	logistical coordination for training & follow-up, integration of Collaborative activities into Texas AWE project, use of Texas AWE training facilities
	Texas A&M researchers		$11,250	training & follow-up activities, both in-field and in classroom, report writing
	WaterPR		$5,095	create recruiting material & campaign, develop & execute outreach activities
Subtotals		**$38,476**	**$39,224**	
Total Match		**$77,700**		

D. Evaluation Criteria

Evaluation Criterion A: Water Conservation (28 points)

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

Subcriterion No. A.1.—Water Conservation

The Surge Valve Collaborative proposed in this application will produce significant quantifiable and sustained water savings. These are identified below.

Subcriterion No. A.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.

Depending on the exact mix of crops represented in the project, **the Surge Valve Collaborative expects to produce water savings ranging from a low of 1,326 AF/yr to a high of 4,745 AF/yr.** The calculations below are based on results of the Texas AWE demonstrations referenced above. Surge valves produce the lowest – but still significant – volume of water savings in cotton and the highest in sugarcane.

Cotton:

- 32 cooperators on 100 acres each = 3,200 acres total.
- Furrow irrigation in cotton uses on average 18.77 acre-inches per acre.
- 3,200 acres x 18.77 acre-inches = 60,064 acre-inches, or 5,005 AF.
- Surge irrigation in cotton uses on average 26.5 percent less water than furrow.
- 5,005 AF x 26.5% = 1,326 AF of water saved.

Sugarcane:

- 32 cooperators on 100 acres each = 3,200 acres total.
- Furrow irrigation in sugarcane uses on average 30.68 acre-inches per acre.
- 3,200 acres x 30.68 acre-inches = 98,176 acre-inches, or 8,181 AF.
- Surge irrigation in sugarcane uses 58 percent less water than furrow.
- 8,181 AF x 58% = 4,745 AF of water saved.

Additional Information:

- According to economic studies developed by the Texas Water Development Board for the 2011 Rio Grande Regional Water Plan (referenced above), sugarcane in the region uses some 252,000 AF/yr while irrigated cotton uses 111,000 AF/yr.
- Excess water in furrow irrigation is typically lost to seepage and/or spilled at the end of the ditch.
- Water conserved through surge irrigation is water that can be applied to other crops or made available to other uses, such as municipal.
- The Surge Valve Collaborative intends to use surge valves and controllers manufactured by P&R Surge Systems, Inc., the same company that provided the valves used in the 1993 BOR salinity study cited above. All controllers have cast aluminum housings containing a microprocessor, motor, rechargeable battery, and solar panel, which makes them energy self-sufficient. The panel is designed such that four hours of peak sunlight provide sufficient charge for 24 hours of operation.

Additional Information For Alternative Projects Not Listed In The Evaluation Criteria:

- Estimates of average annual water savings through surge irrigation have been developed by the Texas Project for Ag Water Efficiency in four demonstration projects involving three cooperating producers. Results of those projects are cited above, with links to on-line versions.
- Surge technology has been used for a number of years, with demonstrated success. In recent years, due to ongoing drought in South Texas, this technology has received more attention. It is listed as an efficient technology for achieving "optimum furrow water velocity" in *Irrigation of Sugarcane in South Texas* (cited and linked above), which provides this description:

  > *"For uniform distribution and minimal waste, water should flow down the furrow as quickly as possible. As it flows down the furrow, water leaches into and through the soil; the longer water must flow to push to the far end of a field, the more infiltration and the more loss occur. Therefore, so that water will move more quickly, producers should irrigate the fewest possible number of rows at one time, based on the available head. Then when the first rows are finished, the next set of rows can be started, and so on. Such an irrigation strategy requires careful attention. Sometimes, irrigators run large numbers of rows simultaneously, so the water will take longer to reach the other end of the field, allowing irrigation to left unattended for long periods (often overnight).*

"Surge irrigation uses valves at regular intervals in the irrigation line to divert water flow first in one direction, then the other, directing water into only half the furrows at any one time. Such intermittent quick shots of water seem to seal the soil, with each subsequent shot infiltrating less. While the mechanism of this effect is not known, the benefits of surge irrigation have been proved and are widely accepted."

- Actual water savings will be verified upon completion of the project through a number of means, including in-field assessments with 20 percent of cooperating producers and follow-up sessions with all producers applying for the $50 rebate on their initial $350 payment per surge valve.
- Each cooperator will be encouraged to use a meter with the surge valve and report the metered amounts per irrigation. This information will be compared to the average irrigation amounts for the crop planted as determined by the irrigation district's historical records. In addition, 20 percent of the cooperators will be **required** to use a meter and the metered amounts will be monitored and recorded by Texas AWE personnel and compared to historical data. An analysis will be conducted by Texas AWE and the data will be provided to the RGRWA for inclusion in the final grant report.

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 (i.e., including all facilities managed by the applicant) that will be conserved directly as a result of the project.*

Surge valves have proven to create water savings of 20 percent to 50 percent across a range of crops. At this point, we are unsure of what crops producers cooperating in the Collaborative will be growing, but for purposes of estimating savings we will assume the valves will be used on 2,100 acres of cotton and 1,100 acres of sugarcane. This represents approximately .03 percent of the total cotton acres and .025 percent of the total sugarcane acres across the region.

- The average water requirement for an acre of cotton is 35 inches in the Rio Grande Valley. Assuming 20 percent of that requirement will come from rainfall, the required irrigation amount for cotton is 28 inches. A savings of 20 percent from the surge valve would yield a net savings per acre of 5.6 acre-inches or 11,760 acre-inches (about 1,000 AF) on the 2,100 acres of cotton involved.

- The average water requirement for sugarcane is 77.5 inches. Assuming 25 percent of this requirement will come from rain, the average irrigation requirement is 58 inches. A savings of 30 percent from the surge valve will yield a net savings per acre of 58 acre-inches or 63,800 acre-inches (about 5,300 AF) on those 1,100 acres of sugarcane in the project.

The surge valves will be placed with cooperators farming in various irrigation districts so that more districts can participate in the new technology and assist in demonstrating the technology over a wider area. Across the Rio Grande Valley, the average water use for cotton is 111,000 AF/yr and for sugarcane 142,000 AF/yr. While this project alone would produce an estimated water savings of .01 percent on cotton and .03 percent on sugarcane across the whole region, the expanded use from successfully demonstrating this technology could yield an average savings of over 11,000 AF in cotton and over 20,000 AF in sugarcane if only 50 percent of the growers in the region implemented the technology.

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.*

The cost of the equipment for the Surge Valve Collaborative is projected at $115,200.

Water savings are projected to range from 1,326 AF/yr to 4,745 AF/yr.

According to the Texas Water Conservation Advisory Council's *Water Conservation Best Management Practices Guide 2004* (p. 239) surge valves have an expected life of between 5 and 15 years.

The Texas State Soil and Water Conservation Board in its 2011 List of Accepted Practices and Expected Life also provides a minimum life span of 5 years for surge valves.

In the 1993 Colorado River Salinity Control Program funded in part by Reclamation (see above), surge valves were assigned a 15-year life by the U.S. Department of Agriculture.

- $115,200 / (1,326 AF/yr x 15 yrs) = $5.79/AF HIGH SIDE
- $115,200 / (4,745 AF/yr x 15 yrs) = $1.62/AF LOW SIDE

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.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.*

The Surge Valve Collaborative will not implement a renewable energy project but will increase energy efficiency by significantly reducing the volumes of water to be pumped. Actual energy savings cannot be projected at this point due to the fact that participating growers are likely to be served by several different irrigation districts, all with their own efficiencies vis-à-vis water delivery.

In addition, the Collaborative plans to use a surge valve that uses solar energy panels for power. The valves will be powered 100 percent by this renewable energy source and will require no other source of power for its operation.

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

The Rio Grande plays a major role in the regional ecosystem. According to tallies maintained by the Texas Parks & Wildlife Department, some 19 species in Cameron County are listed by the Federal Government as endangered or threatened or are under consideration for listing. These include five species of reptiles (all turtles), five of birds, four mammals, two fish, two plants, and one mollusk.

The Surge Valve Collaborative would not directly impact these species; however, the benefits that would result from the project could indirectly benefit these and other species. Less water on agricultural fields would leave more water in the river as flow that would enhance downstream vegetation and wildlife habitat and spawning grounds.

Additional water in the river also would benefit migratory birds.

We project that the Collaborative will save between 1,300 and 4,700 AF of water per year, just from our small group of 32 cooperators. As surface water supplies continue to decline and news about this technology spreads, we anticipate more producers will turn to surge valves as an easy-to-implement and efficient water management and conservation tool. The potential for savings is great: if all sugarcane and cotton irrigators in the region, for example, implemented the technology, the savings would total more than 107,000 AF/yr.

Evaluation Criterion D: Water Marketing (12 points)

The Lower Rio Grande Valley has an active water market. Irrigation districts regularly sell "wet water" to one another and to municipalities in the region. Districts also sell water rights to municipalities as spreading urbanization in the area requires conversion of agricultural water to municipal water.

The RGRWA has been tasked by the Texas Legislature to track water sales as the basis for establishing the price of converting water rights from agricultural to municipal use. The Authority also maintains on its website information on water transfers as a service to its constituents. The goal of these various services is to support the regional system of ensuring that water is directed to the highest need.

Given the ominous situation facing the region, water conserved through the Surge Valve Collaborative assuredly will reach new markets.

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

The Surge Valve Collaborative will contribute to achieving a more sustainable water supply in the region by promoting water conservation and efficiency in the area's biggest water-using segment: on-farm conservation. The Collaborative is directly related to the Reclamation-funded Lower Rio Grande Basin Study now being conducted and will expedite future on-farm improvements.

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

The Collaborative directly addresses an adaptation strategy identified in the Lower Rio Grande Basin Study: on-farm water conservation. The Basin Study is evaluating the impacts of climate variability and change on water supply imbalances within the eight-county region known as the Rio Grande Regional Water Planning Area (Region M). Like the regional water planning effort, the Basin Study has concluded that "there is an urgent need to address a current and projected water supply deficit within the Lower Rio Grande Basin of Texas, which is one of the fastest growing areas of in the United States."

The significant imbalance between water supplies and water demand is expected to increase substantially, rising from a deficit of 368,356 AF/yr in 2010 to a deficit of 592,085 AF/yr in 2060.

The reasons for the deficit are several. The Rio Grande is the sole source for almost all water users in the region, including those in Mexico, which has regularly failed to release prescribed flows from the Rio Conchos. At the same time, the region is experiencing significant and regularly reoccurring drought and other impacts of climate change.

The Study has reviewed the water management strategies included with the Region M regional water plan and concluded that "all the strategies represent the full range of reasonable alternatives that could be formulated to meet future water supply needs in the area." (Task 4 Draft Report) On-farm water conservation is one of those strategies.

On-farm water conservation offers several benefits to all water users drawing from the Rio Grande. It:

- reduces dependency on the Rio Grande;
- preserves both existing water rights and downstream flows for irrigation/push water/environmental reasons;
- ensures compatibility with regulations, policies, and environmental law; and
- can be implemented at a reasonable cost.

In the Rio Grande Regional Water Plan, on-farm water conservation and irrigation conveyance system improvements offer the largest opportunities for water conservation at the lowest price. The following table of Water Management Strategies from the plan highlights the vast savings that can achieved by funding improvements to agricultural water use. The municipal strategies, in contrast, have much larger price tags for significantly less water.

Table I-7. 2011 Rio Grande Regional Water Plan: Water Management Strategies

Strategy	Total Capital Cost (in millions)	Water Supplies Per Decade (in AF/year)					
		2010	2020	2030	2040	2050	2060
Municipal Water Management Strategies							
Acquisition of Water Rights Through Purchase	$631.1	9,611	19,461	41,602	70,944	110,913	151,237
Brackish Desalination	$263.6	38,364	44,627	48,309	54,472	66,696	71,700
Non-Potable Reuse	$173.8	2,417	9,444	12,378	20,137	29,810	46,382
Advanced Water Conservation	$22.6	2,917	6,339	11,986	16,512	24,867	32,793
Groundwater Development	$27.6	3,772	8,572	17,139	20,492	22,284	24,520
Brownsville Weir and Reservoir	$98.4	20,643	20,643	20,643	20,643	20,643	23,643
Acquisition of Water Rights Through Urbanization	$56.2	299	3433	6,467	9,496	12,868	16,406
Seawater Desalination	$185.9	125	125	143	6,049	6,421	7,902
Acquisition of Water Through Contract	$16.3	312	738	1,665	2,352	3,198	4,671
Potable Reuse	$7.5	1,120	1,120	1,120	1,120	1,120	1,120
Resaca Restoration	$52.0	877	877	877	877	877	877
Banco Morales Reservoir	$25.8	238	238	238	238	238	238
Elsa Improved Structure	$8.3	105	105	105	105	105	105
Laredo Low Water Weir	$294.4	0	0	0	0	0	0
Subtotal	**$1,863.4**	**80,800**	**115,722**	**162,672**	**223,437**	**300,040**	**381,594**
Irrigation Management Strategies							
On-Farm Water Conservation	$194.4	36,528	73,085	109,614	146,144	182,698	219,228
Irrigation Conveyance System Conservation	$130.8	91,160	182,313	191,435	200,551	209,667	218,783
Subtotal	**$325.2**	**127,688**	**255,398**	**301,049**	**346,695**	**392,365**	**438,011**

Source: 2011 Rio Grande Regional Water Plan

The plan estimates, for example, that brackish groundwater desalination will cost $263.6 million to produce 71,700 AF/yr by 2060. **Irrigation system conveyance improvements would cost less than half as much ($130.8 million) to produce more than three times as much water (218,783 AF/yr).**

On-farm water conservation would produce even more savings – 219,228 AF/yr by 2060 – at a slightly higher cost of $194.4 million.

Given the very real, documented pressures on agricultural water supplies and the dramatic savings in water that can be realized from improvements to this sector, it makes sense to invest in strategies aimed at farm and district operations.

As emphasized elsewhere in this application, surge valve technology is a proven water-conserving device that has been repeatedly shown as highly effective in various region-specific on-farm demonstrations conducted by Texas AWE. The larger scale efforts of the Collaborative will reach more producers, in turn generating heightened awareness of this technology that could lead to another grant application to continue the work and/or new ventures with other governmental agencies, including the Natural Resources Conservation Service.

*(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.*

According to Texas Water Development Board economic evaluations (see chart below), the Rio Grande Regional Water Planning Area contains 459,000 acres of irrigated crops. Surge valves can produce significant savings in water consumption in most of these crops, including:

- 143,00 acres of grains;
- 73,000 acres of melons and vegetables;
- 59,000 acres of cotton; and
- 42,000 acres of sugarcane.

The larger scale demonstrations afforded by the Surge Valve Collaborative would serve to heighten awareness of the technology and its benefits and enhance further opportunities for even broader application.

Table I-8. Summary of Irrigated Crop Acreage and Water Demand for the Rio Grande Regional Water Planning Area (acreage 2003-2007)

Sector	Acres (1000s)	Distribution of acres	Water use (1000s of AF)	Distribution of water use
Oilseeds	4	1%	5	1%
Grains	143	31%	253	27%
Vegetable and melons	73	16%	120	13%
Tree Nuts	7	1%	18	2%
Fruits	13	3%	34	4%
Cotton	59	13%	111	12%
Sugarcane	42	9%	142	15%
All other crops	120	26%	252	27%
Total	**459**	**100%**	**937**	**100%**

Source: Water demand figures are 5-year average (2003-2007) of the TWDB's annual Irrigation Water Use Estimates. Statistics for irrigated crop acreage are based upon annual survey data collected by the TWDB and the Farm Service Agency. Values do not include acreage or water use for the TWDB categories classified by the Farm Services Agency as "failed acres," "golf course" or "waste water."

If surge valve technology were adopted ONLY in sugarcane and cotton, about 107,000 to 117,000 acre-feet of water per year could be saved in the region. This amount equals about 40 percent of current municipal demand.

- In sugarcane, the Texas AWE studies referred to above found that surge valves produced 58 percent savings in water consumption. If all 42,000 acres of sugarcane fields in the region were irrigated using this method, water savings would amount to 82,360 AF/yr.
- In cotton, savings of 22 percent were realized in one study and 31 percent in the other. Using surge valves for all 59,000 irrigated acres of cotton would produce water savings in the range of 24,420 – 34,410 AF/yr.

If the technology were extended to other crops, including seed corn where Texas AWE has demonstrated water savings of 28 percent, the amount of water conserved would be even higher.

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

The Surge Valve Collaborative will also help address competition for finite water supplies due to drought that is exacerbating an already over-allocated river. In addition, because the project is sponsored by the Rio Grande Regional Water Authority – which includes 53 members ranging from irrigation districts to municipalities – it will promote and encourage collaboration among the parties competing for supplies. Planning efforts to establish the Collaborative already have created new synergies among major players focused on water issues in the region: the RGRWA, the Texas Project for Ag Water Efficiency and its partners (including Texas A&M components), and the Rio Grande Water District Managers Association, and the potential will be even further enhanced with the involvement of the U.S. Bureau of Reclamation

This Collaborative will be the first non-planning project undertaken by the Authority, i.e., a project that will result in actual enhancements to the regional water supply. As such, it will also set a precedent for regional partnerships, serve as an example of leadership in water conservation, and lead the way for future water conservation improvements.

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.*

The Surge Valve Collaborative will directly promote on-farm water conservation. As such, it related specifically to the Rio Grande Regional Water Plan and to the Rio Grande Basin Study currently being undertaken by Reclamation and the RGRWA, both of which reference on-farm conservation as a water management strategy for the region.

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 explain any permits that will be required, along with the process for obtaining such permits.

The Surge Valve Collaborative can commence immediately upon contract signing. A detailed plan of action, detailed below, has been developed. All the partnering entities that will be involved in the project have substantial experience in performing their tasks. The Texas Project for Ag Water Efficiency already has performed almost identical work under its Texas Water Development Board grant.

Project activities will take place on existing agricultural fields; it does not involve any new construction or other ground-breaking activities and thus no permits are required.

The following table provides an overview of key activities and milestones. Regularly recurring reporting tasks will be added based on grant contract requirements.

Table I-9. Overview of Collaborative Activities & Milestones

Date	Activity/Milestone	Responsible Party
June 2013	Notice of award.	BOR
September 2013	Commence developing outreach/recruiting materials and strategies.	WaterPR
	Review existing surge valve training materials and modify, as needed.	HID & TAMU
	Solicit cost proposals for surge valves.	RGRWA
Oct 2013	Finalize grant award with BOR, set up recordkeeping and reporting procedures, contract for surge valve purchases.	RGRWA
	Execute outreach plan to solicit cooperators, e.g., media releases, direct mail, handouts through irrigation districts, extension agents, commodity groups.	WaterPR
	Develop agreement forms for cooperators, handle logistics for conducting training at the Rio Grande Center for Ag Water Efficiency.	HID
Nov 2013	Plan and conduct training sessions, secure cooperator agreements, distribute surge valves; report on results.	HID, TAMU
March - May 2014	Plan and conduct in-field assessments with sample 20 percent of cooperators; report on results.	TAMU
Sept 2014	Plan and conduct follow-up meetings with cooperators, distribute rebates; report on results.	HID & TAMU
Oct-Nov 2014	Synthesis all interim reports, develop and submit final report.	RGRWA & WaterPR

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.

Actual water savings will be verified upon completion of the project through a number of means, including in-field assessments with 20 percent of cooperating producers and follow-up sessions with all producers applying for the $50 rebate on their initial $350 payment per surge valve.

Each cooperator will be encouraged to use a meter with the surge valve and report the metered amounts per irrigation. This information will be compared to the average irrigation amounts for the crop planted as determined by the irrigation district's historical records. In addition, 20 percent of the cooperators will be required to use a meter and the metered amounts will be monitored and recorded by Texas AWE personnel and compared to historical data. An analysis will be conducted by Texas AWE and the data provided to the RGRWA for inclusion in the final grant report.

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

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

The total cost of the Surge Valve Collaborative is $155,200, including non-Federal funding of $77,700 in cash and in-kind contributions to more than match the requested Bureau of Reclamation grant in the amount of $77,500.

The percentage of non-Federal funding provided equals 50.1 percent.

$$\frac{\$77,500 \text{ (Non-Federal Funding)}}{\$155,500 \text{ (Total Project Cost)}}$$

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

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

(1) How is the proposed project connected to Reclamation project activities?

The project incorporates objectives of the Rio Grande Basin Study currently being funded by Reclamation and the RGRWA.

The project also will benefit irrigation districts throughout the Lower Rio Grande Valley, many of which participate in Reclamation activities related to improving district efficiencies through infrastructure improvements.

(2) Does the applicant receive Reclamation project water?

No.

(3) Is the project on Reclamation project lands or involving Reclamation facilities?

No.

(4) Is the project in the same basin as a Reclamation project or activity?

Yes. The project is located within the Rio Grande Basin, the subject of an ongoing basin study being funded by Reclamation as well as numerous irrigation district infrastructure improvement projects.

(5) Will the proposed work contribute water to a basin where a Reclamation project is located?

Yes, by conserving water previously lost to seepage or run-off, the project will enhance water supplies in the basin.

II. PERFORMANCE MEASURES

The Texas Project for Ag Water Efficiency has performed and analyzed four different on-farm demonstrations of surge valve technology. Researchers from the Texas AWE project will quantify water consumption and water use through metering.

All 32 cooperators in the Collaborative will be encouraged to use a meter with their surge valves and report the metered amounts per irrigation. This information will be compared to the average irrigation amounts for the crop planted as determined by the irrigation district's historical records. Furthermore, a sample 20 percent of the cooperators will be **required** to use a meter and the metered amounts will be monitored and recorded by Texas AWE personnel and compared to historical data. All results will be analyzed by Texas AWE and the data – complete with an interpretation of results – will be provided to RGRWA for inclusion in the final grant report.

All meters will be calibrated by Texas AWE at its Rio Grande Center for Ag Water Efficiency, the only facility in Texas offering this service. Calibration will ensure that measurements for all cooperators are standardized and that the results are accurate.

III. ENVIRONMENTAL & CULTURAL RESOURCES COMPLIANCE

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

The Surge Valve Collaborative will not negatively impact the surrounding environment. The surge valve will serve as an adjunct to ongoing irrigation. Its use could benefit the environment by reducing tail water and lowering overall consumption of water in the region. In addition, by reducing demand on the Rio Grande, the project could benefit habit for endangered and threatened species.

(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 species or designated critical habitat would be negatively affected by the project, since it will be pursued on land already in use for agricultural production.

More importantly, the benefits that would result from the project could indirectly benefit wildlife, including endangered and threatened species. Less water on agricultural fields would leave more water in the river as flow that would enhance downstream vegetation and wildlife habitat and spawning grounds. According to tallies maintained by the Texas Parks & Wildlife Department, some 19 species in Cameron County are listed by the Federal Government as endangered or threatened or are under consideration for listing. These include five species of reptiles (all turtles), five of birds, four mammals, two fish, two plants, and one mollusk.

Additional water in the river also would benefit migratory birds.

We project that the Collaborative will save between 1,300 and 4,700 AF of water per year, just from our small group of 32 cooperators. As surface water supplies continue to decline and news about this technology spreads, we anticipate more producers will turn to surge valves as an easy-to-implement and efficient water management and conservation tool. The potential for savings is great: if all sugarcane and cotton irrigators in the region, for example, implemented the technology, the savings would total more than 107,000 AF/yr.

(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.

The project will not negatively impact any wetlands or other surface waters that could potentially fall under CWA jurisdiction as "waters of the United States." In fact, by leaving water in the Rio Grande, the project will enhance flow and thus downstream vegetation and wildlife.

(4) When was the water delivery system constructed?

The irrigation districts that deliver irrigation water to farms covered by this project range in age from 75 to 100 years.

(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.

The project will not result in modifications to any features of an irrigation system.

(6) Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places?

No.

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

The project area will encompass only farmland currently under production.

(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?

No.

IV. REQUIRED PERMITS OR APPROVALS

No permits or approvals from any regulatory agency are necessary for this project.

V. LETTERS OF PROJECT SUPPORT

Appendix C contains letters of support from major regional entities involved in water issues, including:

- Lower Rio Grande Valley Water District Managers Association; and
- Lower Rio Grande Valley Development Council.

The Rio Grande Regional Water Planning Group has committed to authorizing a letter of support at its next meeting, scheduled for 6 February 2013. That letter of support will be immediately forwarded to the Bureau of Reclamation.

VI. OFFICIAL RESOLUTION

Appendix A includes the official resolution from the Rio Grande Regional Water Authority authorizing submission of the proposal and agreeing to all terms stipulated in the FOA.

VII. PROJECT BUDGET

A. Funding Plan & Letters of Commitment

The Surge Valve Collaborative will leverage a variety of resources to drawn down Reclamation funds in order to implement a simple yet highly effective tool for much needed on-farm water conservation.

The total budget amounts to $155,200, which includes a Bureau of Reclamation grant in the amount of $77,500, matched by a total of $77,700 in cash and in-kind contributions, as follows:

- The RGRWA will contribute $19,276 in cost-sharing funds to purchase surge valves. Additionally, as the contracting agency with overall responsibility for project administration and reporting, the Authority will provide $4,224 in in-kind services to help match Reclamation's investment. These services will include project oversight, contract management, financial administration, and reporting.
- Cooperating producers will pay a final price $300 for each surge valve, generating $19,200. Payment will be required prior to receipt of the surge valve.
- The Texas Project for Ag Water Efficiency will provide in-kind services amounting to $35,000 for project coordination, training and analysis, and communications and outreach.

A letter of commitment from the Texas Project for Ag Water Efficiency, signed by project manager Tom McLemore, is included as Appendix B.

No federal funding is involved in any of the matching contributions. The percentage of non-federal funding provided equals 50.1 percent.

Additional required details on the funding plan are as follows:

- The RGRWA cash contribution will come from current reserves in its bank account.
- We seek to include as project costs certain outreach tasks (described previously in this application) that would allow us to immediately begin recruiting cooperators upon award announcement. No activities will take place prior to that point. Those in-kind services are estimated at approximately $6,500 for Texas AWE.
- No other funding partners will be involved.
- No funding has been requested or received from other Federal partners.
- There are no pending funding requests.

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

Funding Sources	Funding Amount
Non-Federal Entities	
1. Rio Grande Regional Water Authority (cash)	$19,276
2. Rio Grande Water Authority (in-kind)*	4,224*
3. Participating cooperators	19,200
4. Texas Project for Ag Water Efficiency*	35,000*
Non-Federal Subtotal:	***$77,700***
Other Federal Entities	
NONE	
Other Federal Subtotal:	***$0***
Requested Reclamation Funding:	**$77,500**
Total Project Funding:	**$155,200**

*In-kind contributions

B. Budget Proposal

Following are required charts showing the sources of funding and the detailed budget proposal.

Table VII-2. Funding Sources

Funding Sources	Percent of Total Project Cost	Total Cost by Source
Recipient Funding	51.1%	$77,700
Reclamation Funding	49.9%	$77,500
Other Federal Funding	0%	
Totals	**100%**	**$155,200**

The Surge Valve Collaborative includes four major tasks:

- Project administration & reporting - The Rio Grande Regional Water Authority will provide oversight for the Collaborative, manage the contract and all financial and reporting requirements.
- Project coordination - Harlingen Irrigation District will coordinate and assist on all in-kind services provided through the Texas Project for Ag Water Efficiency and its contractors and training facilities.
- Training & analysis - Texas A&M researchers will provide training services in the classroom and the field and collect and analyze data.
- Communications - WaterPR will create all recruiting material and develop and execute outreach activities and edit all analyses.

Table VII-3. Collaborative Budget

Professional Services & Expenses By Task				
	Rate	Unit	Subtotal	Total
1: Project Administration & Reporting				
RGRWA Executive Director				
Salary	$80/hour	42	$3,360	
Fringe			$455	
Travel	0.55/mile	400 miles	$220	
Supplies & postage			$189	
				$4,224
2: Project Coordination				
Texas AWE Project Manager	$38/hour	300	$11,400	
Texas AWE Technician	$35/hour	125	$4,375	
Texas AWE training facility	$25/hour	80	$2,000	
Travel	0.55/mile	1600 miles	$880	
				$18,655
3: Training & Analysis				
Texas A&M PHD	$150/hour	75	$11,250	**$11,250**
4: Communications				
WaterPR Project Director	$95/hour	32	$3,040	
WaterPR Creative Director	$95/hour	10	$950	
WaterPR Graphic Designer	$95/hour	4	$380	
WaterPR Contract Manager	$75/hour	5	$375	
Air travel	$250	1	$250	
Hotel	$100	1	$100	
				$5,095
Equipment				
Surge Valves	$1,800	64	$115,200	**$115,200**
Environmental Compliance	0.5%	$155,200	$776	**$776**
GRAND TOTAL				**$155,200**

C. Budget Narrative

All components of the grant will be managed by RGRWA Executive Director Joe A. Barrera III. Mr. Barrera retired in December 2012 as General Manager of the Brownsville Irrigation District, a post he had held since 1994. Mr. Barrera also served as Secretary-Treasurer for the RGRWA since its inception in 2003. Previously, he held the same position for the Lower Rio Grande Authority, which was merged into the RGRWA, and for the Lower Rio Grande Valley Water District Managers Association. He is a member of the Texas Irrigation Council and a board member of the Texas Water Conservation Association.

Tom McLemore, Texas AWE project manager for the Harlingen Irrigation District, will serve as coordinator for in-kind services provided by Texas AWE partners.

Both Mr. Barrera and Mr. McLemore have extensive experience in managing Reclamation WaterSMART grants.

All salaries of personnel providing services to the Collaborative under the aegis of Texas AWE are based on a per hour charge that includes fringe.

RGRWA fringe benefits are calculated as follows:

- Social Security: 7.25%
- Medicare: 1.45%
- Worker's Compensation: 4.85%

RGRWA salary expenses include the costs of complying with reporting requirements.

Travel expenses include (1) mileage for Collaborative partners to travel to training and in-field assessment sites and (2) one roundtrip air ticket plus one night's accommodation for WaterPR project director to conduct media outreach on the Collaborative.

Equipment costs are for 64 12-inch surge valves.

Supply costs for RGRWA include routine office supplies required for project management and reporting.

Environmental and regulatory compliance is budgeted at 0.5 percent of total project costs, or $776. This ratio is lower than the suggested amount because the Surge Valve Collaborative will not involve any kind of activity that will generate the need for environmental compliance. All activities will take place on established, cultivated farmland. No other lands will be disturbed and no construction activity will take place within this project.

D. Budget Form SF-424A

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 06/30/2014

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. WaterSMART: Water and Energy Efficiency Grants for FY 2013	15.057	$	$	$ 77,500	$ 77,700	$ 155,200
2.						
3.						
4.						
5. Totals		$	$	$ 77,500	$ 77,700	$ 155,200

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY (1)	(2)	(3)	(4)	Total (5)
a. Personnel	$ 35,130	$	$	$	$ 35,130
b. Fringe Benefits	455				455
c. Travel	1,450				1,450
d. Equipment	115,200				115,200
e. Supplies	189				189
f. Contractual	0				0
g. Construction	0				0
h. Other	2,776				2,776
i. Total Direct Charges (sum of 6a-6h)	155,200				$ 155,200
j. Indirect Charges	0				$ 0
k. TOTALS (sum of 6i and 6j)	$ 155,200	$	$	$	$ 155,200
7. Program Income	$	$	$	$	$

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8.	$ 23,500	$	$ 54,200	$ 77,700
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	$ 23,500	$	$ 54,200	$ 77,700

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 77,500	$ 77,500	$ Ø	$ Ø	$ Ø
14. Non-Federal	$ 19,276	19,276			
15. TOTAL (sum of lines 13 and 14)	$ 96,776	$ 96,776	$	$	$

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS) (b)First	(c) Second	(d) Third	(e) Fourth
16.	$ Ø	$	$	$
17.				
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	$	$	$	$

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: $155,200

22. Indirect Charges: Ø

23. Remarks:

APPENDIX A:
Documentation for Rio Grande Regional Water Authority

1. Official resolution authorizing submission of the proposal and agreeing to all terms stipulated in the FOA

2. Statement showing cost-sharing capability

RESOLUTION

2013 - 01

WHEREAS, The Rio Grande Regional Water Authority (RGRWA) is the Regional Water Authority serving the six (6) counties of Cameron, Hidalgo, Starr, Webb, Willacy, and Zapata, and;

WHEREAS, continued drought conditions in the Lower Rio Grande Valley threaten surface water supplies in the region, and;

WHEREAS, irrigated agriculture is the largest user of water from the Rio Grande which continues to be the primary water supply source supporting the regional economy, and;

WHEREAS, ongoing research into on-farm irrigation technologies conducted by the Texas Project for Ag Water Efficiency has found that the use of surge valves can substantially reduce the amount of water used in irrigating a variety of crops, and;

WHEREAS, the U.S. Bureau of Reclamation's Water SMART program is soliciting applications to help fund projects that will produce demonstrable and sustainable savings in on –farm water use, and;

WHEREAS, the RGRWA is tasked by law to serve as a catalyst for identifying and developing solutions to regional water issues, and;

WHEREAS, the RGRWA has both the desire and the financial capabilities to cost-share a WaterSMART project focused on implementing surge technology on regional farms, including specific in-kind contributions, and;

WHEREAS, the Texas Project for Ag Water Efficiency has committed to providing a substantial in-kind contribution to such a project.

NOW THEREFORE BE IT RESOLVED, that the RGRWA authorizes the submission of an application seeking WaterSMART financial assistance for a "Surge Valve Collaboration" and further authorizes the Executive Director to execute necessary legal and financial documents related to the receipt of WaterSMART financial assistance and be the "Central Point of Contact" with the U.S. Bureau of Reclamation for program implementation.

Approved at a regularly scheduled RGRWA Board of Directors meeting held this 9th, day of January, 2013.

Jim Darling, President

Lower Rio Grande Valley Development Council

January 14, 2013

M. Michelle Maher
Financial Assistance Services
U.S. Bureau of Reclamation
Mail Code: 84-27850
Denver, CO 80225

Dear Ms. Maher:

As fiscal agent for the Rio Grande Regional Water Authority (RGRWA), I certify that the RGRWA has sufficient financial resources to cover cost of equipment required by the Surge Valve Collaborative for which it seeks funding under the U.S. Bureau of Reclamation WaterSMART Water and Energy Grants for FY 2013 (Funding Opportunity Announcement No. R13SF8003).

The cost of the 64 surge valves anticipated by the application totals $115,200. After covering all initial costs of the equipment, the RGRWA will be reimbursed $77,500 by Reclamation and $19,200 by cooperating producers, expending a total of $18,500 for its cost-share portion for the surge valves.

If there are any questions or if any additional verification to this correspondence is required, please advise.

Sincerely,

Kenneth N. Jones, Jr.
Executive Director

cc: Joe A. Barrera, III, RGRWA Executive Director
Commissioner Jim Darling, RGRWA President

MAIN OFFICE * 301 W. Railroad.* Weslaco, TX * 78596 * TEL: (956) 682-3481* FAX: (956) 631-4670
TTY FOR HEARING IMPAIRED: 1-800-735-2989
WEBSITE: www.lrgvdc.org

APPENDIX B:
Letter of Commitment from the Texas Project for Ag Water Efficiency

TEXAS PROJECT FOR
AG WATER EFFICIENCY

From river to farm.

c/o Harlingen Irrigation District
301 E. Pierce Avenue
Harlingen, Texas 78550
956.423.7015

January 9, 2013

Joe Barrera III, Executive Director
Rio Grande Regional Water Authority
301 W. Railroad, Weslaco, TX 78596

Re: Letter of Commitment for WaterSMART grant application

The Texas Project for Ag Water Efficiency (Texas AWE) is a ten-year project managed by the Harlingen Irrigation District and funded by the Texas Water Development Board. The primary goal of this project is to demonstrate and evaluate water conservation techniques in the Rio Grande Valley. Texas AWE has successfully demonstrated the efficiency and economic viability of surge valves on multiple crops within the Harlingen Irrigation District and is committed to expanding the use of surge valves by supporting the Rio Grande Regional Water Authority (RGRWA) in its application for funding for the Surge Valve Collaborative through the U.S. Bureau of Reclamation's WaterSMART program.

Texas AWE has contracts with Texas AgriLife Extension and WaterPR to study and promote water conservation techniques. Texas AWE and its contractors will commit time and resources in the form of IN-KIND services to the RGRWA in support the Surge Valve Collaborative. The value of the in-kind services is defined in the table below.

Texas AWE Salaries based on a per hour charge including fringe					
Harlingen Irrigation Dist	Rate	Hours			logistical coordination for training and follow-up, integration of Collaborative activities into Texas AWE project, use of Texas AWE training facilities
Project Manager	38	300	11,400		
Technician	35	125	4,375		
Training facility	25	80	2,000		
Travel	0.55	1600	880		
Sub Total				18,655	
Texas A&M*					training and follow-up activities, both in-field and in classroom, report writing
PHD	150	75		11,250	
WaterPR*					creation of all recruiting material, development and execution of outreach activities
Project Director	95	38	3,610		
Project Director	95	4	380		
Graphic Designer	95	4	380		
Contract Manager	75	5	375		
Travel			350	5,095	
Total				$35,000	

Texas AWE looks forward to working with the RGRWA on this important project that will go far to promoting sustainable water supplies for our region.

Sincerely,

Thomas E McLemore
Texas AWE Project Manager

APPENDIX C:
Letters of Support for the Surge Valve Collaborative

1. Lower Rio Grande Valley Water District Managers Association

2. Lower Rio Grande Valley Development Council

LOWER RIO GRANDE VALLEY
WATER DISTRICT MANAGERS' ASSOCIATION

January 10, 2013

Mr. Jim Darling, President
Rio Grande Regional Water Authority
c/o Lower Rio Grande Valley Development Council
301 W. Railroad
Weslaco, TX 78596

Re: Letter of Support for U.S. Bureau of Reclamation WaterSmart grant

Dear Mr. Darling,

On behalf of the Lower Rio Grande Valley Water District Managers' Association, I offer this letter in support of the Rio Grande Regional Water Authority proposal being submitted to the U.S. Bureau of Reclamation for assistance in funding the "Surge Valve Collaborative" that will put water-saving irrigation technology to work in and for the Valley.

We applaud the Authority's vision in leveraging the necessary resources to act on proven on-farm demonstrations and your leadership in turning good ideas into even better reality for a region facing short water supplies. This effort is crucial to protecting the economic viability of our agricultural sector while safeguarding critical water supplies.

Thank you for submitting this proposal to the U.S. Bureau of Reclamation and for your ongoing efforts on behalf of all water users in the Lower Rio Grande Valley.

Sincerely,

Wayne Halbert
President, LRGVWDMA

Lower Rio Grande Valley Development Council

January 4, 2013

Commissioner Jim Darling
President
Rio Grande Regional Water Authority
301 W. Railroad St.
Weslaco, TX 78596

Dear Commissioner Darling:

On Behalf of the Lower Rio Grande Valley Development Council (LRGVDC) I offer this letter of support regarding the Rio Grande Regional Water Authority (RGRWA) proposal submitted to the U.S. Bureau of Reclamation for assistance in funding the "Surge Valve Collaborative" that will put water-saving irrigation technology to work in the Rio Grande Valley. This important effort is consistent with and supportive of the Regional Strategic Plan prepared by the LRGVDC as well as the TWDB approved water supply plan prepared by the Rio Grande Regional Water Planning Group (Region M).

We commend the RGRWA's efforts and vision in leveraging resources to act on implementation of proven on-farm demonstrations that will result in conserving our dwindling water supplies.

Thank you for the opportunity to submit this letter of support and for the continued regional efforts of the RGRWA.

Sincerely,

Kenneth N. Jones, Jr.
Executive Director