THE AUTOMATION
OF THE
COURTLAND CANAL

Funding Opportunity Announcement No. BOR-DO-21-F001

WaterSMART Grants: Water and Energy Efficiency Grants for Fiscal Year 2021

APPLICANT:

KANSAS BOSTWICK IRRIGATION DISTRICT

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COURTLAND, KS 66939

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Date: September 1st, 2020

Applicant Name: Kansas Bostwick Irrigation District

City: Courtland

County: Republic

State: Kansas

Through the activities outlined in this application, Kansas Bostwick Irrigation District (KBID) plans to automate and convert the entire 34.8 mile length of the Courtland Canal into a SCADA equipped system for automated flow control with the retro-fitting of existing radial gates and the installation of fine tuning FlumeGates. This project would complement an already awarded WaterSMART Grant for the automation of the headgates at the Superior-Courtland Diversion Dam and allow for continuity between the two automation projects. This upgrade would allow for the capture of all water arriving at the diversion dam, with none lost to by-passed flows. Any excess water captured, above and beyond the need for irrigation demand could then be transported to Lovewell reservoir for storage. While the project to automate the headgates alone is beneficial, limitations would still have to remain in place simply because the remaining entirety of the Courtland Canal and its respective gates are presently operated manually and only adjusted once per day. If the headgates were automated, with the rest of the Courtland Canal still being operated manually, it would limit the amount of excess water available for capture to avoid running the Courtland Canal above Designed Water Surface, ballooning bays and potentially over topping the canal in certain areas if more water was forced down the canal without subsequent manual adjustments. The automation of the remaining radial gate and check structures along the Courtland Canal would remove this limitation. Based on data provided by the Bureau of Reclamation during the typical irrigation season date of June 1st to September 30th each year, from 2008 through 2018, 46,184 Acre-feet was lost to spills or "by-pass" over the Superior-Courtland Diversion Dam. This results in a yearly average of 4,199 Acre-feet remaining uncaptured. By "banking" this extra water, traditionally lost to by-pass throughout a typical season, it would potentially allow for less water to be released from the upstream reservoir, Harlan County Lake, each season, simply for the purpose of keeping Lovewell at a level

required for making irrigation releases, as is currently done. Irrigators within both KBID and Bostwick Irrigation District-Nebraska (NBID) would realize benefits from this project by allowing for nearly instantaneous headgate and radial gate changes twenty-four hours a day to changing streamflow and therefore maintain the Courtland Canal at Designed Water Surface constantly. There is also the potential for downstream users along the Republican River in KS to benefit from this project in future years. If this creates a situation in which more "Kansas" water is available to KS users in Harlan County Reservoir each year, above and beyond the needs of KBID, it could lead to the possibility of acquiring a Warren Act contract for portions of Harlan County Reservoir's water supply that could be released to these downstream users.

This project accomplishes one of the specific goals outlined in the FOA through the implementation of Supervisory Control and Data Acquisition and Automation (SCADA).

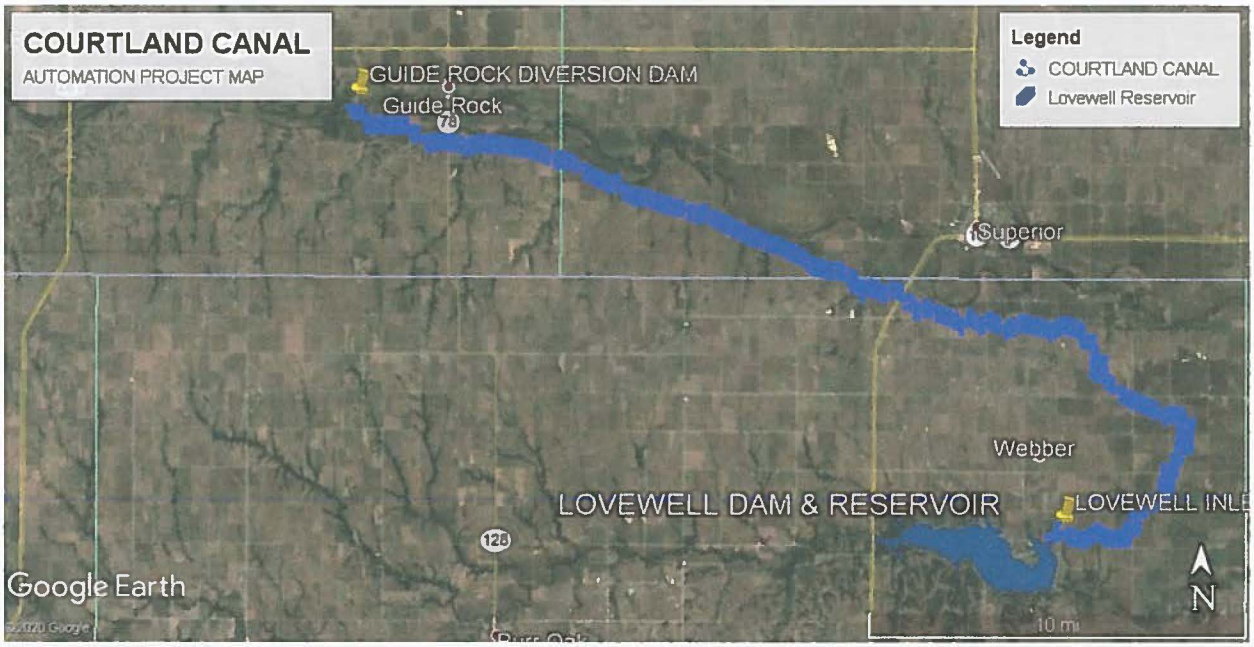
If successful through this application, the project will begin as soon as possible following the 2021 irrigation season, and will be completed, at the very latest, by the end of September 2022.

The proposed project takes place within the boundaries of NBID and KBID which are both Bureau of Reclamation Irrigation Districts.

Following consultation with irrigation districts in Nebraska and seeing similar automation projects already in operation, such as Frenchman-Cambridge Irrigation District's canal automation projects, KBID is confident in the water savings and technological upgrades these types of projects would bring to KBID's operations.

Project Location

The project would automate the entire 34.8 mile length of the Courtland Canal from Superior-Courtland Diversion Dam on the Republican River, approximately 2.3 miles west of Guide Rock, NE, to the inlet of Lovewell Reservoir approximately 2.1 miles south of Webber, KS. The latitude and longitude of the Courtland Canal headgates is 40.0675° N, 98.773° W. The latitude and longitude of the inlet to Lovewell Reservoir is 39.9059° N, 98.0263° W.



Technical Project Description

The original design of the Courtland Canal allowed for a maximum flow capacity of 750 cubic-feet per second. However, with efficiency improvements made by the district, along with many farmers installing center-pivot sprinkler application methods fed by the Courtland Canal, max flow simply for irrigation needs rarely reaches the 400 cfs amount any longer. Therefore, the design assumption of 500 cfs for Network Control implementation and general flow capacities of 600 cfs for each structure would allow for a straight delivery of 600 cfs from Harlan County Reservoir to Lovewell Reservoir, if needed.

The project would entail the automation of ten radial gates and check structures over the entire 34.8 mile length of the Courtland Canal.

KBID has been considering this project for many years and over that time has consulted with Rubicon Water to develop the technical data within this application.

The implimentation of Rubicon's Network Control solution and Total Channel Control (TCC) software would upgrade the existing canal infrastructure with the installation (or retrofitting of) automated flow regulating gates, a data-radio network, and a SCADA system within a remote monitoring and management platform.

The Courtland Canal was orginally built with twelve radial gate/check structures, however, two of them (3.6 & 7.2), have not been used in decades and have been mothballed in a wide-open setting. Over the first decade or so of normal

operations it was determined these two radial gate check locations were unneeded.

Of the remaining ten gates that will become automated structures, one of them (19.3), is simply a radial gate structure with a relief siphon. The other nine structures consist of one center radial gate with three additional check-log overpour bays on either side of the radial gate.

All of the radial gates are of identical dimensions and measure 10' X 12'. All ten operating radial gate check structures will be automated as described below.

The radial gates at the check structures will be retained and be retro-fitted with remote-controlled acuaters.

Additionally, for every radial gate and check structure, with the exception of the 19.3 location, a pair of Rubicon FlumeGates will also be installed on either side of the center radial gate in the area where the check-log overpour bays currently exist. FlumeGates are combination overshot flow measurment and control gates used in check structures to regulate flow.

At each of these locations the concept is that the large center radial gates will be automatically and remotely controlled for infrequent system adjustment, with precision high duty-cycle regulation of flow performed by the FlumeGates to either side of the center radial gate. The FlumeGates will act as "trimming gates" to allow the required tolerances of level and flow setpoints to be achieved.

Rubicon will supply, deliver and install all of the needed items, including the material required to retrofit and automate the existing radial gates, the FlumeGates, walkways and operating platforms, and all related hardware.

KBID will provide an excavator and a telehandler as lifting equipment for the installation of the FlumeGates and other hardware. There may also be some minor concrete work required to faciiltate proper installations. KBID will supply the manpower and capital needed to complete the minor concrete work and to operate the machines in assisting Rubicon with the installation as a portion of KBID's in-kind contribution to this project. These figures are shown within the budget proposal found later in this application.

The spreadsheet below itemizes the Courtland Canal structures and their respective alterations for the project.

Courtland Canal Radial-Gate/Check Structures		
Location Site	Bay	Gate
2.5 Check	2	Flume Gate - FGB-1180-1804
	4	Existing Radial Gate - Add Acuation
	6	Flume Gate - FGB-1180-1804
3.6 Check	N/A	(Unused)
6.3 Check	2	Flume Gate - FGB-1180-1804
	4	Existing Radial Gate - Add Acuation
	6	Flume Gate - FGB-1180-1804
7.2 Check	N/A	(Unused)
9.2 Check	2	Flume Gate - FGB-1180-1804
	4	Existing Radial Gate - Add Acuation
	6	Flume Gate - FGB-1180-1804
10.5 Check	2	Flume Gate - FGB-1180-1804
	4	Existing Radial Gate - Add Acuation
	6	Flume Gate - FGB-1180-1804
12.5 Check	2	Flume Gate - FGB-1180-1804
	4	Existing Radial Gate - Add Acuation
	6	Flume Gate - FGB-1180-1804
14.0 Check	2	Flume Gate - FGB-1180-1804
	4	Existing Radial Gate - Add Acuation
	6	Flume Gate - FGB-1180-1804
19.3 Check	N/A	Existing Radial Gate - Add Acuation
27.0 Check	2	Flume Gate - FGB-1180-1804
	4	Existing Radial Gate - Add Acuation
	6	Flume Gate - FGB-1180-1804
29.9 Check	2	Flume Gate - FGB-1180-1804
	4	Existing Radial Gate - Add Acuation
	6	Flume Gate - FGB-1180-1804
33.0 Check	2	Flume Gate - FGB-1180-1804
	4	Existing Radial Gate - Add Acuation
	6	Flume Gate - FGB-1180-1804

A radio telemetry system will be installed to communicate with the automated structures, and a SCADA server will be installed at the district office. For the Radio Network and Network Control Server installation, Rubicon will provide eleven 450MHz data radios and antennas which will be required to connect each device to the SCADA system allowing for operation in Rubicon's Network Control. One network Radio Base State will also be installed and rigged at the KBID headquarters in Courtland along with all corresponding components and communications database software and server.

The telemetry connection to the main canal check structures would require the following hardware:

Hardware	Quantity	Price	Total
MDS SD4 450MHz licensed radios installed at regulator sites – including radio, co-ax cable, antenna and bracket	11	$ 1,850	$ 20,350
Radio Base Station – MDS SD4P located in district office cabinet, including collinear antenna and cable, and Rigging Labor	1	$ 13,350	$ 13,350
100' Repeater Tower - includes radios, power supply*	2	$ 80,000	$ 160,000
Motorola MDLC-TCP/IP Communications Gateway	1	$ 7,200	$ 7,200
Dell PowerEdge Database and Application Server with backup tape media, UPS, firewall, switch, console, and industrial rack enclosure	1	$ 16,500	$ 16,500
Oracle Database Software License	1	$ 12,000	$ 12,000
First Year's Oracle Database Software Maintenance Plan	1	$ 2,400	$ 2,400
Rubicon SCADAConnect Base Software License	1	$ 15,000	$ 15,000
SCADAConnect Site Licenses (unlimited tags)	11	$ 600	$ 6,600
First Year's SCADAConnect Software Maintenance Plan	1	$ 4,320	$ 4,320
Central Software Installation and Build Labor	1	$ 12,600	$ 12,600

Rubicon's initial desktop survey has noted that two repeater towers will be needed for communication between the gates throughout the system.

Once the telemetry system is in place, the Network Control system will be configured and tuned.

Evaluation Criteria

E.1.1. Evaluation Criterion A—Quantifiable Water Savings (30 points)

This project will conserve water and increase efficiencies by modernizing KBID's existing infrastructure. The main benefit of this particular automation is the elimination of operational spills lost downstream to the Republican River and allowing that water to be captured and moved downstream into Lovewell Reservoir. However, once Rubicon's Total Channel Control (TCC) is implemented KBID will also be able to identify locations of higher than normal leakage and seepage that can later be remedied with canal lining improvements in specific locations.

The estimation for water available to be conserved through this project is based on the Bureau of Reclamation's hydromet data of "average daily by-pass" numbers at the Superior-Courtland Diversion Dam, over the last eleven years (2008 through 2018). The eleven-year data-set total was 46,184 Acre-feet as seen in the spreadsheet below.

Operational Spills at the Superior-Courtland Diversion Dam (in CFS)				
Sourced from Bureau of Reclamation Hydromet Data June 1st - September 30th				
Data including Precip/Flood Events			Data w/ Precip/Flood Events removed	
Year	Total By-Pass		Year	Total By-Pass
2008	21,769		2008	1,330
2009	7,391		2009	3,393
2010	21,265		2010	895
2011	20,111		2011	978
2012	2,697		2012	2,008
2013	4,120		2013	1,904
2014	2,665		2014	1,399
2015	7,460		2015	3,090
2016	6,477		2016	3,282
2017	9,403		2017	2,744
2018	3,540		2018	2,069
Total	106,899		Total	23,092
Yearly Average	9,718		Yearly Average	2,099
Yearly Average In Acre-Feet	19,436		Yearly Average In Acre-Feet	4,199

This project is conservatively expected to save an estimated 4,199 Acre-feet of water per year.

To verify the results of water savings following this project KBID will compare the total water captured annually at the Superior-Courtland Diversion to the average annual historical by-pass gauge readings. With the by-pass readings expected to remain at zero, or nearly zero almost constantly, KBID will easily be able to acquired the data to verify the water savings resulting from this project. Additionally, the precision flow measurement provided by the automation at each structure will allow KBID to determine locations of excessive leakage and seepage by providing real-time continuous pondage test information. This information will allow for targeted canal lining improvements to further increase

the Courtland Canal's efficiency. Additional benefits will be realized by KBID through a decreased need for canal operators traveling dusty patrol roads on a daily basis resulting in better air quality and less fuel consumption and wear and tear on pickups.

E.1.2. Evaluation Criterion B—Water Supply Reliability (18 points)

All of the above questions within Evaluation Criterion B are answered within the discussion below.

The specific water reliability concern that will be addressed through this project is and will be the ability for KBID to more efficiently capture flows at the Superior-Courland Diversion Dam. It will result in more water being left in Harlan County Reservoir year in and year out. It will limit or potentially completely eliminate late season releases from Harlan County Reservoir, above and beyond irrigation demand, to simply keep the downstream lake, Lovewell Reservoir, at an elevation required to deliver water to users downstream of Lovewell. With the ability to capture excess flows at the Superior-Courtland Diversion Dam and safely transport them the entire length of the Courtland Canal to Lovewell Reservoir throughout a normal irrigation season, the expectation of inflated late-season releases from Harlan County Reservoir is virtually eliminated as the excess flows captured should more than make up for this currently required operational criteria. This aspect of the project and the resulting impact on an increased upstream water supply will be extremely beneficial when shortages occur due to drought conditions in the basin.

By conserving and saving the water in the upstream reservoir, concerns of water supply reliability will be positively impacted. More water will remain in Harlan County later into each summer and Lovewell should experience the same result with the capture of all overages at the Superior-Courtland Diversion Dam.

As stated earlier in this application and conservatively-speaking, KBID expects to capture, on average, an extra 4,491 Acre-feet of water per year that will be transported and stored in Lovewell Reservoir. Oftentimes, following a typical irrigation season, the natural flows of the Republican River are captured and transported to Lovewell for several months in order to re-fill Lovewell to an elevation required to ensure it fills to capacity for the following irrigation season.

With an expected savings of 4,491 Acre-feet, this "re-filling" time for Lovewell will be greatly reduced, thereby allowing for the natural flows to continue downstream of the Superior-Courtland Diversion Dam and made available to all downstream users on the Republican River including other agricultural and municipal users.

Recreationalists, including outdoorsmen and canoers, will also benefit from the increase to natural flows below the Superior-Courtland Diversion Dam due to diminished late season diversions.

Recreationalist, including outdoorsmen, pleasure boaters and water-skiers at both Harlan County Reservoir and Lovewell Reservoir will also benefit as both lakes will remain at higher elevations later into each summer when the lakes typically, and under current conditions, experience significant draw-down due to releases made for irrigation.

This project has the potential to benefit multiple sectors, facets and species of the environment, well into the future, reliant on steady flows on the Republican River and downstream locations. With less diversion volumes from the Republican River by KBID, increased flows will be available to downstream tributaries on the Republican River including areas along the Kaw River where certain State Threatened and Federally Endangered species such as the Topeka Shiner minnow exists.

The project also may have some very beneficial long-term results for other Kansas users of Republican River water downstream of the Kansas-Nebraska state line. Groundwater depletions and overuse by upstream users within the Republican River Basin significantly impacted not only KBID's available water supply, but all Kansas users of Republican River water in previous years. For many years the Republican River Basin remained embroiled in controversy over groundwater depletion of river flows; so much so that the matter ended up in litigation at the United States Supreme Court. As a result of the 2015 United States Supreme Court Settlement concerning the Republican River, in the case of The State of Kansas, Plaintiff v. The State of Nebraska and The State of Colorado, the Court ordered that the State of Kansas be awarded a settlement amount of $5.5 million from the State of Nebraska, for Nebraska's overuse of compact flows. The ruling also ordered the upstream states to comply with the compact by ensuring that the State of Kansas is supplied with its prescribed apportionment of Republican River flows going forward. While KBID is the most upstream and the most significantly impacted user of Republican River flows in Kansas, there still remains many downstream users of this water. As KBID has become more efficient over the years through other conservation projects such as the piping of laterals and the lining of main canals, the district has made huge strides in becoming able to operate off of lesser water supply. When taking projects like this one into consideration, along with all past improvements to the district's efficiency measures, there is the possibility that the State of Kansas will have access to more water than needed at certain times in the future to simply meet the needs of the district on an annual basis. Therefore, any "excess" water apportioned for the State of Kansas could be available to downstream users. As KBID is the only Kansas agent with the ability to contract

water supply with the Bureau of Reclamation, the possibility exists for KBID to acquire a Warren Act contract to hold this "excess" water in Harlan County Reservoir. Then, should circumstances present themselves that KBID's full allotment and needs are met, the excess water held under the Warren Act contract could be brokered to users downstream of KBID within the state of KS. While the majority of use downstream of KBID would be other agricultural water users, the City of Clay Center, KS relies on flows of the Republican River which ultimately impact the city's ability to provide water to their citizens.

This project also will benefit a larger initiative to address water reliability. In October of 2013, then Kansas Governor, Sam Brownback, issued a call to action for his Administration to develop a 50-year Vision for the Future of Water in Kansas. The Mission Statement of the Vision is to "*Provide Kansans with the framework, policy and tools, developed in concert with stakeholders, to manage, secure and protect a reliable, long term statewide water supply while balancing conservation with economic growth.*" A project like the one outlined in this application falls directly in line with the 50-year Vision. In fact, KBID's pipeline burial projects have been highlighted during the Kansas Governor's Annual Conference on the Future or Water in Kansas on multiple occasions.

A project like this one most certainly will benefit the rural communities in and around the Kansas Bostwick Irrigation District. KBID has portions of its district that are located in both Republic County, Kansas and Jewell County, Kansas. To understand just how rural these areas are one can look at the total populations of each county. The total population of Jewell County is 2,970 and that of Republic County is 4,725. The majority of the economy in each county is driven by agriculture and is strengthened through the irrigation that is provided by KBID. Water saving projects like this one ensure the continued viability of the district and enable it to continue to provide irrigation to local farmers, even during times of limited supply, who then in turn, help drive the local economy.

With many water users within the basin, this project certainly promotes and encourages collaboration among multiple parties and will help increase the reliability for all water users within the Republican River Basin.

Most understandably, as the Courtland Canal provides water to both KBID and Bostwick Irrigation District in Nebraska (NBID), both districts would experience a positive impact.

As stated earlier, many other users in Kansas could see very beneficial long-term benefits from this project. When the 2015 United States Supreme Court case was settled, many ideas were proposed that would potentially help downstream Kansas users and not just KBID. The Kansas Water Office (KWO) has coordinated with other agricultural users downstream of KBID to form the Lower Republican

Access District (LRAD). As projects like this one create the potential for more water to remain in the stream and/or held in upstream reservoirs, it increases the chances of viability for further beneficial uses of water like that of the LRAD.

There is widespread support for this project from other upstream users of the Republican River, including NBID, as well as other state agencies and private individuals. Letters of support for the project can be found in the appendix materials to this application.

With several irrigation districts and other water users in the upstream states of Colorado and Nebraska also relying on the flows of the Republican River, any conservation measures that can be taken in the basin, such as this automation project within KBID, have the potential to positively impact the overall circumstances. By reducing the overall demand for the precious resource of water from the Republican River Basin conservation projects like this one have the potential to help resolve future water related conflicts in the region and prevent further water-related conflicts and litigation.

E.1.3. Evaluation Criterion C—Implementing Hydropower (18 points)

Not Applicable.

E.1.4. Evaluation Criterion D—Complementing On-Farm Irrigation Improvements (10 points)

Automation projects like the one described in this application certainly compliment and incentivize on-farm irrigation improvements. Currently approximately 70% of the District is irrigated through the use of center pivots with the remaining 30% being irrigated through gated pipe. The majority of these improvements made by landowners were incentivized by the installation of previous water conserving projects by KBID. It can only be expected that a project like this one that would allow for more precise delivery amount that also maintain canal levels at Designed Water Surface would incentivize more on-farm investment in application methods.

Additionally, with the ability for downstream users on the Republican River outside of KBID to potentially have access to excess water held in a Warren Act contract, the possibility of users to potentially install new more efficient forms of irrigation through programs like EQIP through the NRCS are a definite expectation.

E.1.5. Evaluation Criterion E—Department of the Interior Priorities (10 points)

As it pertains to Department of the Interior (DOI) Priorities, this project is an opportunity to update and improve KBID's distribution system and infrastructure. Federal assistance through this funding opportunity is essential and necessary to aid KBID in its' plan to maintain continuity in the District's overall conservation efforts and to reach contracted goals for improved efficiency.

As stated earlier, controversy surrounded the Republican River Basin in the past. Forward thinking conservation projects like this one help restore trust between the various states that are part of the Republican River Compact and all of their respective users. For other users to see an entity like KBID continuing to implement water conservation measures like canal automation projects, it can only aid in strengthening the bonds of trust between all water users in the basin and encourage them to follow suit.

The modernization of KBID's infrastructure though the automation of canals throughout the District's delivery system aligns with DOI priorities that concentrate on the general modernization and construction of improved and new infrastructure.

This project will increase water supplies and storage and therefore more reliability within the basin. It applies science and technology in the best manner available currently and will certainly help the districts and the basin address future drought issues, especially in rural areas and communities.

E.1.6. Evaluation Criterion F—Implementation and Results (6 points)

E.1.6.1. Subcriterion F.1— Project Planning

KBID is the first water right holder on the Republican River in the State of Kansas. The District is obligated to conserve its supply and make valuable use of its share of the Republican River flows. At the present time, the most immediate way for KBID to conserve water is through the burial and piping of currently open canals as well as progressing with technological advances like canal automation. It is essential for KBID to be efficient with the water delivered from other states to comply with the Republican River Compact.

Along with this, KBID has a contractual commitment to the Bureau of Reclamation to improve efficiencies. Within Attachment B of Contract No. 009D6B0120 (within the appendix materials), otherwise referred to as the "District Operating Plan", under the heading Water Conservation Measures, the District is required to fund and actively pursue measures to improve efficiencies and conserve water. As KBID works to conserve its' supply, additional water users,

the general environment and related organisms will also realize auxiliary benefits of a longer lasting water supply including fish, wildlife, and recreationalists, not only at the storage reservoirs, but also at downstream locations.

Considerable improvement in efficiency has been realized with past accomplishments through the burial laterals. However, the tasks remaining, such as the ones outlined in this application, are the larger and more expensive projects beyond the District's ability to achieve without additional funding.

E.1.6.2. Subcriterion F.2— Performance Measures

As noted earlier in this application, through the completion of this project, 4,199 acre-feet (AF) of water will be saved and conserved each year.

The estimation for water available to be conserved through this project is based on the Bureau of Reclamation's hydromet data of "average daily by-pass" numbers at the Superior-Courtland Diversion Dam, over the last eleven years (2008 through 2018). The eleven-year data-set total was 46,184 Acre-feet as seen in the spreadsheet below.

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Yearly Average	9,718		Yearly Average	2,099
Yearly Average In Acre-Feet	19,436		Yearly Average In Acre-Feet	4,199

This project is conservatively expected to save an estimated 4,199 Acre-feet of water per year.

To verify the results of water savings following this project KBID will compare the total water captured annually at the Superior-Courtland Diversion to the average annual historical by-pass gauge readings. With the by-pass readings expected to remain at zero, or nearly zero almost constantly, KBID will easily be able to acquire the data to verify the water savings resulting from this project. Additionally, the precision flow measurement provided by the automation at each structure will allow KBID to determine locations of excessive leakage and seepage by providing real-time continuous pondage test information. This information will allow for

targeted canal lining improvements to further increase the Courtland Canal's efficiency.

E.1.6.3. Subcriterion F.3— Readiness to Proceed

The District plans to be ready to proceed immediately once funding approval is granted. The gates and supporting SCADA and control system will be installed in a two-year program. Should the project be awarded, installation of the needed components and gates will begin following the 2021 irrigation season and implementation and testing will proceed through the 2022 irrigation season in which the project will be considered complete. Over that 2-year time period the process for Rubicon's design and implementation will occur in the following process:

1. Conduct detailed field inspections of the canals to be automated
2. Survey the regulator check structures
3. Perform a radio field survey to verify the proposed Communications System is adequate and to verify proposed frequencies will not be subject to interference
4. Finalize gate sizing and selection
5. Order gates from Rubicon's factory
6. Order radial actuation from appropriate vendors
7. Scheduling of works to allow an implementation schedule to be committed to by Rubicon and Kansas Bostwick Irrigation District
8. Undertake required structure modifications
9. Install Gate External Frames
10. Install radial actuation and control cabinets
11. Gate Delivery
12. Install Gates and Meters
13. Test and Commission (all) Gates and Meters
14. Commission the Radio Communications System
15. Installation and configuration of Network Control server software and any required hardware infrastructure

16. SCADA Host Engineering
17. Staff training in the operation, management, and maintenance of the technology with an emphasis on skill development and change management.
18. Run hydraulic simulations and/or step tests to gather data for use in model calibration
19. Controller tuning to capture the characteristics of each of the pools to be controlled
20. Transition the canal to network control
21. Monitor the performance of the controllers

For project planning purposes, Rubicon will be able to complete each component of works for the system as follows:

- External frame delivery: Within 6 weeks of designs being approved
- Gate / Meter delivery: Within 16 weeks of designs being approved
- Gate / Meter external frame Installations: Allow 4 hrs per frame to install (24 hr curing time)
- Gate / Meter install: Allow 4 hrs per gate install. Note crane for gate install to be provided by others.
- Gate / Meter testing and commissioning: Allow 4hrs per gate
- Radio communication system: Operational within 12 weeks of design approvals, on condition of license and permit approvals.
- SCADA host engineering: Operational within 12 weeks of design approval.

The project will require a license to operate the 450 MHz radio telemetry communication system. Rubicon will aid KBID in acquiring the radio permits needed with their previous experience through similar projects.

All design and engineering work needed will be provided by Rubicon as described above.

There are no new policies or administrative actions needed to implement the project.

It is expected that all of the infrastructure and components will be installed following the 2021 irrigation season and prior to the 2022 irrigation season.

Testing, calibration and familiarization will occur while the canal is operated throughout the 2022 season until the season ends wherein the project will be considered complete.

E.1.7. Evaluation Criterion G – Nexus to Reclamation Project Activities (4 Points)

Kansas Bostwick Irrigation District (KBID) is a Pick-Sloan Project headquartered in Courtland, Kansas. KBID is a Bureau of Reclamation irrigation district served by and lying within the Bureau of Reclamation's Nebraska–Kansas Project Area headquartered in McCook, Nebraska. Water storage for the district is within the Corps of Engineers Harlan County Reservoir in Nebraska and in the Bureau of Reclamation's Lovewell Reservoir in Kansas, both of which are in the same basin of the Republican River.

E.1.8. Evaluation Criterion H – Additional Non-Federal Funding (4 points)

$810,073.15 / $1,599,878.15 = 50.6%

As shown in the calculation above, the non-federal funding percentage for this project will be 50.6%. Of the $810,073.15 of non-federal funding, KBID will provide $20,268.15 and the remaining $789,805 will come from the Supreme Court Settlement Funds held by the Kansas Water Office for exclusive use by KBID. (see KWO Contract No. 16-115 in the appendix)

The project will not benefit any tribe(s).

Project Budget

Funding Plan and Letters of Commitment

For many years the Republican River Basin remained embroiled in controversy over groundwater depletion of river flows; so much so that the matter ended up in litigation at the United States Supreme Court. As a result of the 2015 United States Supreme Court Settlement concerning the Republican River, in the case of The State of Kansas, Plaintiff v. The State of Nebraska and The State of Colorado, the Court ordered that the State of Kansas be awarded a settlement amount of $5.5 million from the State of Nebraska.

This led to significant collaboration between many users on the Republican River. Through the action of several individuals representing multiple agencies within the State of Kansas and key state legislators, $3.5 million of the award was secured to be used for water conservation projects in the Republican River Basin in Kansas.

Of the $3.5 million, KBID subsequently signed a contract with the Kansas Water Office (KWO) for $2.5 million of these non-Federal funds (see KWO Contract No. 16-115 in the appendix). The KWO is the agency who is charged with holding these funds for dispersal to the District. Therefore, the KWO will be an integral partner with KBID on projects like the one described within this application. This contract outlines that the $2.5 million earmarked for KBID be used to fund materials purchases for various projects outlined within the contract.

Kansas Bostwick's contribution to the project funding through in-kind work will come from the irrigation district's conservation reserve funds as well as O&M funds raised on annual basis through assessments.

If successful, Kansas Bostwick will contribute $20,268.15 to the project by way of providing equipment and labor. Supreme Court Settlement funds earmarked for KBID water conservation projects in the amount of $789,905, held and subsequently dispersed by the Kansas Water Office will also be used as the applicant portion of the project costs. Finally, award funding in the amount of $789,905 will be used to fund the remainder of the total project costs. Therefore, total project costs would come to $1,599,878.15, with KBID providing 50.6% of the total with in-kind contributions along with Supreme Court Settlement funds, and award funding comprising the remaining 49.4%.

Budget Proposal

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	$789,805.00
Costs to be paid through Settlement Funds (KWO)-applicant	$789,805.00
Value of KBID's in-kind contributions-applicant	$20,268.15
TOTAL PROJECT COST	**$1,599,878.15**

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	$/UNIT	QUANTITY		
Salaries and Wages				
Foreman (BM)	$20.11	150.00	HOURS	$3,016.50
Excav. Optr (DD)	$18.36	100.00	HOURS	$1,836.00
Laborer (GK)	$16.00	100.00	HOURS	$1,600.00
Laborer (CL)	$14.70	100.00	HOURS	$1,470.00
Fringe Benefits				
Foreman (BM)	$10.46	150.00	HOURS	$1,569.01
Excav. Optr (DD)	$10.65	100.00	HOURS	$1,064.61
Laborer (GK)	$13.23	100.00	HOURS	$1,323.35
Laborer (CL)	$5.80	100.00	HOURS	$579.69
Equipment				
CAT 314 Long-Reach Excavator	$56.34	75.00	HOURS	$4,225.50
JLG 1255 Telehandler (Exact Model No)	$47.78	75.00	HOURS	$3,583.50
Supplies and Materials				
MDS SD4 450MHz licensed radios installed at regulator sites – including radio, co-ax cable, antenna and bracket	$1,850	11	PER STATION	$20,350
Radio Base Station – MDS SD4P located in district office cabinet, including collinear antenna and cable, and Rigging Labor	$13,350	1	PER PROJECT	$13,350
100' Repeater Tower - includes radios, power supply*	$80,000	2	PER TOWER	$160,000
Motorola MDLC-TCP/IP Communications Gateway	$7,200	1	PER PROJECT	$7,200
Dell PowerEdge Database and Application Server with backup tape media, UPS, firewall, switch, console, and industrial rack enclosure	$16,500	1	PER PROJECT	$16,500
Oracle Database Software License	$12,000	1	PER PROJECT	$12,000
First Year's Oracle Database Software Maintenance Plan	$2,400	1	PER PROJECT	$2,400
Rubicon SCADAConnect Base Software License	$15,000	1	PER PROJECT	$15,000
SCADAConnect Site Licenses (unlimited tags)	$600	11	PER STATION	$6,600
First Year's SCADAConnect Software Maintenance Plan	$4,320	1	PER PROJECT	$4,320
Central Software Installation and Build Labor	$12,600	1	PER PROJECT	$12,600
Controller Tuning	$6,500.00	10	PER POOL	$65,000.00
Training	$30,000.00	1	PER PROJECT	$30,000.00
Supply of FlumeGate-Accuation of Radials	$1,145,474.00	1	PER PROJECT	$1,145,474.00
Supply and Installation of Walkways and Operating Platforms	$26,816.00	1	PER PROJECT	$26,816.00
Delivery, Installation and Commissioning of Control Gates	$42,000.00	1	PER PROJECT	$42,000.00
Other				
Environmental-Reg. Compliance (See Remarks Below)				$0.00
TOTAL DIRECT COSTS				$1,599,878.15

Budget Narrative

Jared "Pete" Gile is the Superintendent of KBID and will be the Project Manager. He will be in charge of the day to day operations of the project and will be assisted by an on-site foreman. Office Manager, Ashleigh Brandenburgh will be in charge of tracking specific figures and costs as the project unfolds. Both individual's roles are considered normal day to day costs for KBID and within their regular daily scope of duties as employees of the district, so their salaries, specifically applicable to this project will not be included as a project cost.

KBID staff hours and the subsequent associated salary and fringe benefit figures were calculated using figures estimated by Rubicon as well as consulting other district's calculations who have embarked on similar automation projects before. The labor rates included for all personnel is certified to be the actual labor rates of each individual identified in this application. Also included in the tables below are the actual fringe benefit rates for each individual which includes Health coverage, FICA, and KPERs retirement.

2020 KBID SALARIES	
EMPLOYEE	**HOURLY WAGE**
Foreman (BM)	$20.11
Trencher Optr. (DD)	$18.36
Dozer Optr. (GK)	$16.00
Laborer (CL)	$14.70

2020 KBID PERSONNEL - BENEFITS PAID BY EMPLOYER									
EMPLOYEE	**MEDICARE**		**FICA**		**KPERS**		**HEALTH INSURANCE**		**BENEFIT HOURLY WAGE TOTAL**
	Monthly	**Hourly**	**Monthly**	**Hourly**	**Monthly**	**Hourly**	**Monthly**	**Hourly**	
Foreman (BM)	$47.90	$0.27	$204.83	$1.16	$299.20	$1.70	$1,289.04	$7.32	***$10.46***
Trencher Optr. (DD)	$45.21	$0.26	$193.31	$1.10	$273.16	$1.55	$1,362.04	$7.74	***$10.65***
Dozer Optr. (GK)	$37.26	$0.21	$159.30	$0.91	$238.05	$1.35	$1,894.48	$10.76	***$13.23***
Laborer (CL)	$38.18	$0.22	$163.27	$0.93	$218.71	$1.24	$600.09	$3.41	***$5.80***

As KBID owns all the necessary equipment and machinery that will be required for this project, none will have to be rented. KBID established hourly rates for this application by using rates established by the United States Army Corps of Engineers within their Construction Equipment Ownership and Operating Expense Schedule. Estimates on the number of hours required for the lifting equipment (long-reach excavator and telehandler) were provided by Rubicon and consulting other similar projects carried out by other irrigation districts.

All of the materials and supplies needed for the project are listed above in the Budget Proposal Table. The supplies are itemized by major category, unit price, quantity and purpose. All costs were derived from actual product costs or by quotes received by KBID on each product within the last 365 days.

Past projects of similar type on KBID's facilities and infrastructure did not have any Environmental and Cultural Resources impacts. KBID will remain in close contact with the Nebraska-Kanas Area Office prior to and throughout the project. Past inspections by the NKAO staff were done at no cost to KBID.

No other expenses or indirect costs have been identified.

APPENDIX MATERIALS

ATTACHMENT B

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Kansas-Bostwick Irrigation District No. 2
Franklin, Superior-Courtland and Courtland Units
Bostwick Division
Pick-Sloan Missouri Basin Program, Kansas

"DISTRICT OPERATING PLAN"

This "District Operating Plan" hereinafter referred to as "Plan" is made for the purpose of providing a means to implement the contractual commitment made by the District to the United States concerning the operation of the District and the performance of certain water conservation and environmental activities which are part of the consideration for a 40 year repayment term. The District hereby agrees to honor the commitments in this Plan. The parties shall annually, or as otherwise agreed, review the Plan and may, by mutual agreement of the parties, modify and amend the operating criteria of the initial Plan necessary to achieve the District's commitments, Provided, That the District's commitments shall not be diminished or eliminated.

BACKGROUND:

The Bostwick Division is located in south-central Nebraska and north-central Kansas along the Republican River and the White Rock Creek. The Bostwick Division consists of the Franklin, Superior-Courtland, and Courtland Units. The Franklin and Superior-Courtland Units consists of Harlan County Dam and Lake, Superior-Courtland Diversion Dam, and a system of canals, laterals, and drains that currently serves 36,313 acres of project lands. The Courtland Unit consists of Lovewell Dam and Reservoir, and a system of canals, laterals, and drains that currently serves 29,122 acres of project lands. In addition to storing water for irrigation, the three units protect the downstream areas from floods and offer opportunities for recreation and for conservation and development of fish and wildlife.

Due to a depleting water supply, the District, in cooperation with the Bostwick Irrigation District in Nebraska, is willing to limit its irrigation deliveries in order to maintain higher reservoir levels and undertake water conservation measures to improve the efficiency of

the project delivery system and encourage on-farm efficiency improvement.

IRRIGATION DELIVERIES:

It is understood that from time to time the United States shall accomplish sediment re-surveys of the reservoirs which shall change the area-capacity data and the elevation-capacity relationship. It is further understood that when the data is officially revised and placed into use it shall be used in the calculation for the shutoff elevations. In the event the re-survey necessitates changes in reservoir elevations for flood control and irrigation this Plan shall be revised to incorporate those changes.

The available water supply to the District shall be flows of the Republican River, White Rock Creek, storage waters in Lovewell Reservoir above the established shutoff elevation, and the District's apportionment of storage waters available for release above the annually established reservoir shutoff elevation for Harlan County Lake as computed by the Contracting Officer.

The amount of irrigation water released during any one irrigation season from Harlan County Lake and Lovewell Reservoir shall be determined by the Contracting Officer in consultation with the District, based on the following:

1. By January 15 of each year, the United States shall provide the District and the Bostwick Irrigation District in Nebraska an estimate of the reservoir shutoff elevation, and the water supply available for the irrigation season. By June 15 of each year, the actual reservoir shutoff elevations shall be established. The following process will be used:

    A. The space available for irrigation use in Harlan County Lake has been established as 150,000 acre-feet between elevations 1945.7 and 1931.75. The current contents are 311,104 acre-feet (El. 1945.7) and 159,674 acre-feet (El. 1931.75) which establishes the current irrigation space as 150,000 acre-feet after a sediment adjustment of 1,430 acre-feet in this pool. In addition irrigation is allowed to use up to 20,000 acre-feet from the sediment pool to adjust for annual evaporation loss that is allocated to sediment storage provided irrigation releases are less than 119,000 acre-feet. The space available for irrigation use in Lovewell Reservoir is established as the space available between elevations 1582.6 and 1571.7.

The current contents are 35,666 acre-feet (El. 1582.6) and 11,644 acre-feet (El. 1571.7) which establishes the current irrigation space as 24,022 acre-feet.

B. The annual shutoff elevation for Harlan County Lake shall be estimated by January 15 of each year. By June 15 of each year the actual shutoff elevation shall be established using May 31 data as follows:

For January estimate:

1. Estimate the May 31 content by taking the December 31 total reservoir storage plus the January-May inflow estimate (57,600 acre-feet or the running average inflow for the last 5-year period, whichever is less) minus the January-May evaporation estimate (8,800 acre-feet). The value determined is the estimated reservoir content projected for May 31.

2. Establish the percentage of estimated water yield available in the irrigation pool using the 20,000 acre-feet adjustment for evaporation and this equation:

$$\frac{(\text{Total Estimated Content(End of May) minus Inactive Pool} + 20{,}000) \times 100}{\text{Total Irrigation Space Yield}}$$

(This result is used in steps 5 or 6 below)

3. Compute first shutoff line slope constant (equal to or greater than 60% irrigation space yield):

Use 130,000 release rate at 100% Irrigation Space Yield
Use 90,000 release rate at 60% Irrigation Space Yield

$$\frac{(\text{Irrigation Space Yield}) \times .40 - (130{,}000 - 90{,}000)}{40}$$

Current Constant:

$$\frac{((311{,}104 - 159{,}674 + 20{,}000) \times .40) - (40{,}000)}{40} = 714.3$$

4. Compute second shutoff line slope constant (less than 60%

irrigation space yield):

$$\frac{((\text{Irrigation Space Yield}) \times .60) - 90{,}000}{60}$$

Current Constant:

$$\frac{((311{,}104 - 159{,}674 + 20{,}000) \times .60) - (90{,}000)}{60} = 214.3$$

5. If Step 2 result is equal to or greater than 60.0:

   Shutoff Content equals ((Step 2 result - 60.0) x Step 3 constant) + inactive pool content - 20,000 + (Step 4 constant X 60).

6. If Step 2 result is less than 60.0:

   Shutoff Content = ((Step 2 result -0.0) x Step 4 constant) + inactive pool content - 20,000.

7. Convert computed shutoff content to shutoff elevation. This Plan does not provide for any shutoff elevation lower than El. 1927.0.

For Adjustment using actual May 31 data:

1. Compare the estimated May 31 content with the actual May 31 content.

2. If the actual end of May content is less than the estimated end of May content lower the shutoff content by using this equation:

   Shutoff content = Estimated shutoff content - (Estimated May 31 content - Actual May 31 content).

3. If the actual end of May content is equal to or greater than the estimated end of May content, the estimated shutoff content is established as the annual shutoff content.

4. Convert computed shutoff content to shutoff elevation. This Plan does not provide for any shutoff elevation lower than El. 1927.0.

5. If the shutoff content is below the bottom of the irrigation pool, releases shall be discontinued at the shutoff elevation or whenever 119,000 acre-feet has been released and the reservoir is below the bottom of the irrigation pool, whichever occurs first.

C. The annual shutoff elevation for Lovewell Reservoir is established as El. 1571.7 which is a current content of 24,022 acre-feet.

D. The water supply shall be apportioned between the beneficiaries according to a separate agreement between the District and the Bostwick Irrigation District in Nebraska, subject to approval of the Contracting Officer.

2. The United States reserves the right to make any releases necessary to protect the project facilities and the public in accordance with appropriate safety procedures.

WATER CONSERVATION MEASURES:

The District agrees to:

1. Establish a revolving water conservation fund to be utilized for annual costs associated with the water conservation program activities. The funding shall be provided by an annual assessment on all project lands collected by the District as part of their annual operation and maintenance charge. It is provided that these funds may be fully utilized on an annual basis or accumulated to allow the District to perform water conservation projects that would not otherwise be within the District's financial capability should such projects have to be funded through collections or charges during any one year period. It is specifically provided that these funds may be utilized for Reclamation or other cost-share assistance that may be available to the District for water conservation activities.

2. Continue, when permitted, the practice of seasoning canals with stream flows or flood waters to reduce canal losses and control the growth of vegetation. Diversion of natural flows or flood waters to season canals shall not be initiated without concurrence of the Contracting Officer, and may not be permitted during those times that the resulting flow reduction would impact the storage of water in downstream reservoirs.

3. Continue the established practice of providing assistance to irrigators who upgrade on-farm irrigation facilities by improving turnout locations, installing meters, assisting with buried pipe projects to allow the use of gated pipe or center pivots, and implementation of other new technology.

4. Continue to work with Reclamation on evaluating computer software and other new technology that shall improve water scheduling and accounting.

The District also agrees to: continue and/or improve its existing policies and practices that further the goals of water conservation; provide educational opportunities for District employees, such as canal operations training, water scheduling, water use seminars, etc.; and work with irrigators through educational type demonstrations or projects that measure on-farm efficiencies and crop water requirements in terms of the type of irrigation methods employed by individual irrigators.

The District further agrees to provide for proper accounting for all water deliveries and operational waste within five years of the date of this Plan. Water delivery and operational waste accounting records shall be provided to the United States on or before November 1 of each year. Prior to March 1 of each year, the District and the Contracting Officer's representative shall meet to assess the past year's water supply and delivery records and accounting, and to evaluate the upcoming irrigation season. Through the use of these records and other available data, the Contracting Officer shall assess the delivery efficiency and on-farm efficiency improvements resulting from the District's implementation of water conservation commitments. The improvements shall be measured against pre-Plan water use data. On that basis, it is the general goal of the District to increase the delivery efficiency of the District by 6 percent and on-farm efficiencies by 5 percent. If the "improvements" are not expected to result in the individual or cumulative increase in efficiencies during the first ten year period of this Plan as determined by the Contracting Officer, additional water conservation measures

shall be identified, by mutual agreement of the parties, to be undertaken to ensure the increased efficiency is realized during the succeeding five year period.

Prior to July 1 of each year, the District shall provide the Contracting Officer an annual report of water conservation activities/accomplishments for the prior year, and a statement of water conservation funds collected, expended, and water conservation fund balance as of the end of the prior calendar year.

ENVIRONMENTAL MEASURES:

The District agrees to:

1. Install or create better screening devices to prevent the passage of fish, crayfish, etc., into turnouts and lateral systems.
2. Establish policies to preserve lake levels.

In addition to accepting the changes in operation the District is willing to cooperate with Reclamation, the Bostwick Irrigation District in Nebraska and others in improving fish and wildlife habitat and recreation on Reclamation lands. If requested, the District shall annually furnish 20 man-days of labor at project related fish and wildlife and recreational areas provided the work is coordinated through Reclamation and scheduled during the non-irrigation season at least one month in advance. In lieu of the man-days of labor, the District shall furnish a district-owned machine and operator for 4 days. It is further provided that the District, if requested, may agree to perform more man-days and/or more machine and operator days during one calendar year than the annual commitment, and that any man-days and/or machine and operator days furnished in excess of the annual commitment shall apply as a credit to the succeeding years' commitment(s).

Reclamation is committed to determine the significance of selenium concentration levels for fish and wildlife resources in the Republican River Basin. This commitment by Reclamation shall be implemented through an adaptive management process as outlined in the Record of Decision for the Final Environmental Impact Statement, Long-Term Water Supply Contract Renewals, Republican River Basin, Kansas and Nebraska dated July 22, 2000. The adaptive management process includes, but is not limited to: identification and selection of objectives, implementation and monitoring of response, and assessment of accomplishment that can conclude or refine management actions.

KANASAS BOSTWICK IRRIGATION DISTRICT NO. 2

RESOLUTION NO. 2020-005

Whereas the Republican River Basin is frequented by drought,

Whereas water is the lifeblood of the agricultural community,

Whereas WaterSMART grants provide a source of funding for capital improvements of the District,

Whereas the installation of canal automation products and technology to increase efficiencies within the District are necessary for the District's future viability,

Whereas funding is needed to maintain continuity in the District's efforts to improve efficiency,

Now therefore be it resolved that the Kansas Bostwick Irrigation District No. 2 Board of Directors agrees and authorizes that this application be submitted to the Bureau of Reclamation for the consideration under the **WaterSMART Grants: Water and Energy Efficiency Grants for Fiscal Year 2021, Funding Opportunity Number BOR-DO-21-F001** for the automation of the entire Courtland Canal from the Superior-Courtland Diversion Dam to the Lovewell Inlet. If selected, the Board of Directors agree to provide in-kind services and their own funding needed to complete the project, as well as coordinate with the Kansas Water Office to utilize Supreme Court Settlement Funds to ultimately provide the 51% total recipient portion needed for the project per the WaterSMART Grants protocol and will work closely with Reclamation to meet all established deadlines.

The foregoing Resolution was considered by the Board of Directors of the Kansas Bostwick Irrigation District No. 2 at a meeting held on 8 September 2020, and unanimously adopted.

BOARD OF DIRECTORS

Gary L. Housholder – President

Brad D. Peterson - Secretary

Monty D. Dahl - Treasurer

Conversion of Open Irrigation Canals to Buried Pipe Systems
Within the Kansas Bostwick Irrigation District
Kansas Water Office Contract Number 16-115

OPENING CLAUSE:

This Contract between the Kansas Water Office, 900 SW Jackson Ave, Suite 404,Topeka, Kansas, 66612 and the Kansas Bostwick Irrigation District, P.O. Box 165, Courtland, KS 66939. The parties enter into this Contract for the purposes of completing a conversion of open irrigation canals to that of buried pipe systems.

I. PROJECT TITLE

The project has been entitled: Conversion of open irrigation canals to buried pipe systems within the Kansas Bostwick Irrigation District. All references to this Contract shall include this title and the Kansas Water Office Contract Number: 16-115.

II. SCOPE OF WORK

A. The Scope of Work, Deliverables and the Payment Schedule, Attachment B, is hereby incorporated in this contract and made a part hereof by reference.

B. The Kansas Water Office will have 30 business days from the date of receipt to review the deliverable, ask for changes or approve the deliverable.

III. COMPENSATION

A. The Kansas Water Office agrees to pay, Kansas Bostwick Irrigation District (KBID), an approximate cost of Two Million and Five Hundred Thousand Dollars and No/100 ($2,500,000.00) for the work to be completed or performed under the attachments incorporated into this agreement by reference as Attachments B and C. Payments will be made based upon actual costs incurred for the purchase of materials to complete tasks included in the Scope of Work from KBID, under the schedule in Attachment B, upon receipt, review and acceptance by the Kansas Water Office of the indicated deliverables listed in Attachment B. Additional projects may be added as approved by the Kansas Water Office, if the entire 2,500,000.00 is not expended on these projects. See the Payments clause, *infra*.

B. The Conversion of Open Irrigation Canals to Buried Pipe Cost Estimate, Attachment C, is hereby incorporated in this contract and made a part hereof by reference. The Kansas Water Office and the Kansas Bostwick Irrigation District agree that Attachment C is the best estimate, as of the date of this contract, for prices of the materials needed to complete the project and agree that the price may fluctuate depending on outside variables.

C. The Kansas Bostwick Irrigation District agrees to contribute in kind services by providing machinery and cost of labor as shown in Attachment C in an amount of approximately $1,157,000.00.

ORIGINAL COPY JAN 26 2016

JAN 21 2016

III. PAYMENTS

Invoices for payments for work completed under the terms of this Contract, as outlined in the attachments to this Contract should be sent to:

Kansas Water Office
Attention: Accounts Payable
900 SW Jackson St., Suite 404
Topeka, Kansas 66612

Payments will be due and payable 30 calendar days following the receipt of the invoice from, Kansas Bostwick Irrigation District (KBID). No payment will be remitted unless and until the appropriate work or work to be delivered has been received and approved by the Kansas Water Office in the manner specified in the attachments hereto.

IV. EFFECTIVE DATES

This Contract shall be effective for the period of January 11, 2016, through June 30, 2024, inclusive.

V. MODIFICATION AND EXTENSION/RENEWAL OF CONTRACT

This Contract may be modified, extended or renewed by written agreement of all parties to this Contract. The parties agree that any request by Kansas Bostwick Irrigation District (KBID) for an extension of time of the completion of the Contract should be communicated to the Kansas Water Office no later than 60 days prior to the stated completion date.

VI. CONTACT PERSONS

Each party has designated a contact person to facilitate communication between the parties for purposes of this Contract. The designated contact person may be changed by either party at any time by sending notice of such change, via first class mail, to the appropriate party at the address first given above.

A. The Kansas Water Office contact person for purposes of this Contract will be:
   Name: Katie Goff
   Address: 900 SW Jackson St., Suite 404, Topeka, KS 66612
   Phone: (785) 296-0863
   E-mail: Katie.Goff@kwo.ks.gov

B. The Kansas Water Office contact person for purposes of contract administration will be:
   Name: Earl Lewis
   Address: 900 SW Jackson St., Suite 404, Topeka, KS 66612
   Phone: (785) 296-3185
   E-mail: Earl.Lewis@kwo.ks.gov

C. The Kansas Bostwick Irrigation District (KBID) contact person for purposes of this Contract will be:
   Name: Jared "Pete" Gile
   Address: P.O. Box 165, Courtland, KS 66939-7941
   Phone: (785) 374-4514
   E-mail: kbid@courtland.com

VII. OWNERSHIP OF INFORMATION, DOCUMENTS, ETC.

All reports, information, data, photos, documents, procedures, and descriptions accumulated, developed or acquired by Kansas Bostwick Irrigation District (KBID), under this Contract shall be jointly owned by the Kansas Water Office and KBID. Either party may use, release or otherwise use any such materials without the written approval of the other party.

VIII. ADDITIONAL PROVISIONS

A. KANSAS CONTRACT PROVISIONS ATTACHMENT. The provisions found in contractual provisions attachment (Form DA-146a – Attachment A), which is attached hereto, are hereby incorporated in this contract and made a part thereof.

B. HEADINGS. Headings used in this Agreement are informational and not to be considered persuasive or determinative of any clause or matter in dispute.

C. FUNDING. The Kansas Bostwick Irrigation District agrees to explore other opportunities for funding in order to meet the estimated total cost to complete projects listed in Attachment C.

IX. SIGNATURES

In agreement to the terms of this Contract, we set our hand this 22nd day of January 2016, under the authority and power granted to us by virtue of our position or office.

For the Kansas Water Office

Tracy Streeter
Director
Kansas Water Office

Kansas Bostwick Irrigation District

Kenneth Nelson
Superintendent
Kansas Bostwick Irrigation District

State of Kansas
Department of Administration
DA-146a (Rev. 06-12)

CONTRACTUAL PROVISIONS ATTACHMENT A

Important: This form contains mandatory contract provisions and must be attached to or incorporated in all copies of any contractual agreement. If it is attached to the vendor/contractor's standard contract form, then that form must be altered to contain the following provision:

"The Provisions found in Contractual Provisions Attachment (Form DA-146a, Rev. 06-12), which is attached hereto, are hereby incorporated in this contract and made a part thereof."

The parties agree that the following provisions are hereby incorporated into the contract to which it is attached and made a part thereof, said contract being the 22nd day of January, 2016.

1. **Terms Herein Controlling Provisions**: It is expressly agreed that the terms of each and every provision in this attachment shall prevail and control over the terms of any other conflicting provision in any other document relating to and a part of the contract in which this attachment is incorporated. Any terms that conflict or could be interpreted to conflict with this attachment are nullified.

2. **Kansas Law and Venue**: This contract shall be subject to, governed by, and construed according to the laws of the State of Kansas, and jurisdiction and venue of any suit in connection with this contract shall reside only in courts located in the State of Kansas.

3. **Termination Due To Lack Of Funding Appropriation**: If, in the judgment of the Director of Accounts and Reports, Department of Administration, sufficient funds are not appropriated to continue the function performed in this agreement and for the payment of the charges hereunder, State may terminate this agreement at the end of its current fiscal year. State agrees to give written notice of termination to contractor at least 30 days prior to the end of its current fiscal year, and shall give such notice for a greater period prior to the end of such fiscal year as may be provided in this contract, except that such notice shall not be required prior to 90 days before the end of such fiscal year. Contractor shall have the right, at the end of such fiscal year, to take possession of any equipment provided State under the contract. State will pay to the contractor all regular contractual payments incurred through the end of such fiscal year, plus contractual charges incidental to the return of any such equipment. Upon termination of the agreement by State, title to any such equipment shall revert to contractor at the end of the State's current fiscal year. The termination of the contract pursuant to this paragraph shall not cause any penalty to be charged to the agency or the contractor.

4. **Disclaimer Of Liability**: No provision of this contract will be given effect that attempts to require the State of Kansas or its agencies to defend, hold harmless, or indemnify any contractor or third party for any acts or omissions. The liability of the State of Kansas is defined under the Kansas Tort Claims Act (K.S.A. 75-6101 et seq.).

5. **Anti-Discrimination Clause**: The contractor agrees: (a) to comply with the Kansas Act Against Discrimination (K.S.A. 44-1001 et seq.) and the Kansas Age Discrimination in Employment Act (K.S.A. 44-1111 et seq.) and the applicable provisions of the Americans With Disabilities Act (42 U.S.C. 12101 et seq.) (ADA) and to not discriminate against any person because of race, religion, color, sex, disability, national origin or ancestry, or age in the admission or access to, or treatment or employment in, its programs or activities; (b) to include in all solicitations or advertisements for employees, the phrase "equal opportunity employer"; (c) to comply with the reporting requirements set out at K.S.A. 44-1031 and K.S.A. 44-1116; (d) to include those provisions in every subcontract or purchase order so that they are binding upon such subcontractor or vendor; (e) that a failure to comply with the reporting requirements of (c) above or if the contractor is found guilty of any violation of such acts by the Kansas Human Rights Commission, such violation shall constitute a breach of contract and the contract may be cancelled, terminated or suspended, in whole or in part, by the contracting state agency or the Kansas Department of Administration; (f) if it is determined that the contractor has violated applicable provisions of ADA, such violation shall constitute a breach of contract and the contract may be cancelled, terminated or suspended, in whole or in part, by the contracting state agency or the Kansas Department of Administration.

   Contractor agrees to comply with all applicable state and federal anti-discrimination laws.

   The provisions of this paragraph number 5 (with the exception of those provisions relating to the ADA) are not applicable to a contractor who employs fewer than four employees during the term of such contract or whose contracts with the contracting State agency cumulatively total $5,000 or less during the fiscal year of such agency.

6. **Acceptance Of Contract**: This contract shall not be considered accepted, approved or otherwise effective until the statutorily required approvals and certifications have been given.

7. **Arbitration, Damages, Warranties**: Notwithstanding any language to the contrary, no interpretation of this contract shall find that the State or its agencies have agreed to binding arbitration, or the payment of damages or penalties. Further, the State of Kansas and its agencies do not agree to pay attorney fees, costs, or late payment charges beyond those available under the Kansas Prompt Payment Act (K.S.A. 75-6403), and no provision will be given effect that attempts to exclude, modify, disclaim or otherwise attempt to limit any damages available to the State of Kansas or its agencies at law, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

8. **Representative's Authority To Contract**: By signing this contract, the representative of the contractor thereby represents that such person is duly authorized by the contractor to execute this contract on behalf of the contractor and that the contractor agrees to be bound by the provisions thereof.

9. **Responsibility For Taxes**: The State of Kansas and its agencies shall not be responsible for, nor indemnify a contractor for, any federal, state or local taxes which may be imposed or levied upon the subject matter of this contract.

10. **Insurance**: The State of Kansas and its agencies shall not be required to purchase any insurance against loss or damage to property or any other subject matter relating to this contract, nor shall this contract require them to establish a "self-insurance" fund to protect against any such loss or damage. Subject to the provisions of the Kansas Tort Claims Act (K.S.A. 75-6101 et seq.), the contractor shall bear the risk of any loss or damage to any property in which the contractor holds title.

11. **Information**: **No provision of this contract shall be construed as limiting the Legislative Division of Post Audit from having access to information pursuant to K.S.A. 46-1101 et seq.**

12. **The Eleventh Amendment**: "The Eleventh Amendment is an inherent and incumbent protection with the State of Kansas and need not be reserved, but prudence requires the State to reiterate that nothing related to this contract shall be deemed a waiver of the Eleventh Amendment."

13. **Campaign Contributions / Lobbying:** Funds provided through a grant award or contract shall not be given or received in exchange for the making of a campaign contribution. No part of the funds provided through this contract shall be used to influence or attempt to influence an officer or employee of any State of Kansas agency or a member of the Legislature regarding any pending legislation or the awarding, extension, continuation, renewal, amendment or modification of any government contract, grant, loan, or cooperative agreement.

ATTACHMENT B

Scope of Work, Deliverables and the Payment Schedule

SCOPE OF WORK

Item No.	Work Item Description
1.	All materials needed for the project will be ordered by KBID to allow for delivery to site location before work begins. Materials can include PVC pipe, (as small as 10", or as large as 36"), lateral turnouts and fittings.
2.	Bull dozer and patrol work will be done to prepare the alignment of the proposed buried line and excavator work to remove existing structures. Removed structures will be broken with the KBID crane and wrecking ball if they are too large to load and haul. Structures will be loaded with the KBID loaders into dump trucks and taken to an established scrap yard.
3.	The KBID Hydramaxx Wheel Trencher will be used to trench the line for the pipe. An excavator with a sling will be used to swing the pipe into the trench and align the pipe to be pushed together. A bull dozer will be used to back fill the trench.
4.	KBID will pick up any and all scrap or excess material left on the site and leave the site in a manner that the landowner can work it with his farm equipment.
5.	Any open lateral, which is not in the alignment of the pipeline, will be destroyed and left in a manner that the landowner can work the area with his farm equipment and returned to the farmer's operations.

Open Irrigation Canals to be Converted to Buried Pipe System	
Canal Project in Order of Priority	Miles of Open Canal to be Eliminated
31.1 – 3rd Section	1.91
32.1 – 3rd Section	2.99
33.0 – 3rd Section	3.84
1.3R – Ridge Canal	3.05
2.6 – Ridge Canal	2.19
PUMP #1 North Canal	5.33
48.8 – Courtland 5th Canal	0.93
50.7 – Courtland 5th Canal	2.90
Total	23.14

DELIVERABLES

The KBID shall submit project deliverables to the KWO, 900 SW Jackson St, Ste. 404, Topeka, KS 66612.

1. Prior to purchase of materials, for which reimbursement will be sought, for the canal conversion projects listed in the Scope of Work above, KBID will provide to the KWO a listing of all expected materials to be purchased. The Kansas Water Office will review and respond to the proposed purchase within 7 calendar days.
2. By October 31 of each calendar year, KBID will provide to KWO verify purchase of equipment and supplies with Financial Estimate and Invoice Receipt. The Kansas Water Office will use this deliverable as basis for payment under the terms of this contract.
3. By June 30 of each calendar year, for the preceding 12 month period, KBID will provide to the KWO a report of:
    a. the open irrigation canal section or sections converted to buried pipe systems,
    b. the amount of in kind contribution provided by KBID,
    c. other sources and amounts of funding obtained and used (if applicable),
    d. the estimated amount of water loss saved as a result of the conversion,
    e. significant issues encountered during implementation,
    f. any significant changes to plans to canal conversion previously submitted, and
    g. general plans of work for conversion of open irrigation canal to buried pipe systems to be accomplished in the subsequent July to June, 12 month period.

COMPENSATION AND PAYMENT SCHEDULE

The Kansas Water Office agrees to pay the KBID an approximate amount of $2,500,000.00 for the deliverables identified in Attachment B, above. If the described projects are constructed for less than $2,500,000.00 the remaining amount and any additional funds that may be available may be used for additional projects as approved by the Kansas Water Office.

Payments will be made within 30 days, upon receipt of a financial estimate and an invoice as described in deliverable 2 by October 31 each year from the KBID, and subject to all deliverables above for the preceding 12 months being considered final as provided in Section III of this Contract.

ATTACHMENT C

Conversion of Open Irrigation Canals to Buried Pipe
Cost Estimate

Canal Project in Order of Priority	Miles of Open Canal to be Eliminated	Material Cost Est.	KBID In Kind Labor/Machinery Cost Est.
31.1 – 3rd Section	1.91	$237,590.02	$95,500.00
32.1 – 3rd Section	2.99	$432,053.00	$149,500.00
33.0 – 3rd Section	3.84	$625,392.76	$192,000.00
1.3R – Ridge Canal	3.05	$383,467.02	$152,500.00
2.6 – Ridge Canal	2.19	$176,772.97	$109,500.00
PUMP #1 North Canal	5.33	$653,560.18	$266,500.00
48.8 – Courtland 5th Canal	0.93	$112,526.69	$46,500.00
50.7 – Courtland 5th Canal	2.90	$503,394.86	$145,000.00
Totals	23.14	$3,124,757.50	$1,157,000.00
	Total Cost	**$4,281,757.50**	
	10% Contingency Added	**$4,709,933.25**	

Conversion of Open Irrigation Canals to Buried Pipe Systems Within the Kansas Bostwick Irrigation District Kansas Water Office Contract Number 16-115 Amendment #1

Contract #16-115, titled *Conversion of Open Irrigation Canals to Buried Pipe Systems Within the Kansas Bostwick Irrigation District,* between the Kansas Water Office and the Kansas Bostwick Irrigation District is hereby amended to add Attachment D, amended to revise Attachment B, and extend the effective end date.

Attachment D. Scope of Work is added to read:

SCOPE OF WORK - CANAL AUTOMATION	
Item No.	**Work Item Description**
1.	All materials, labor, and consultation between the automation contractor and KBID, required for converting KBID canals to automated systems will be the responsibility of KBID.
2.	Nearly all prep, materials, construction work/labor, and installation costs required for canal automation projects will be handled by the automation contractor. If minor items are needed for the projects, such as the fabrication of existing KBID infrastructure to allow for the installation of automation equipment, or the erection and placement of radio towers for communication between automation sites, which could be accomplished by KBID, those items will be done by KBID employees. All expenses related to these costs will be borne by KBID.

KBID CANALS PROSPECTIVE FOR AUTOMATION - In order of priority	
1.	The Upper Courtland Canal from the Superior-Courtland Diversion Dam to the Lovewell Inlet
2.	The Lower Courtland Canal from Lovewell Reservoir, including the "skimming weir" (Spillway, Wasteway, Overchute, and Check) structure at mile-marker 46.8, and the Courtland West Canal Headgates, The Miller Canal Headgates, and the Courtland 5th Canal Headgates.
3.	The Courtland West Canal - Main
4.	The Miller Canal - Main
5.	The Courtland 5th Canal - Main
6.	The White Rock Canal Main and White Rock Extension Canal - Main

Attachment D. Deliverables is added to read:

The KBID shall submit project deliverables to the KWO, 900 SW Jackson St, Ste. 404, Topeka, KS 66612.

1. Prior to purchase of materials, for which reimbursement will be sought, for the canal automation projects listed in the Scope of Work above, KBID will provide to the KWO a listing of all expected materials to be purchased. The Kansas Water Office will review and respond to the proposed purchase within 7 calendar days.
2. By October 31 of each calendar year, KBID will provide to KWO verify purchase of equipment and supplies with Financial Estimate and Invoice Receipt. The Kansas Water Office will use this deliverable as basis for payment under the terms of this contract.

3. By June 30 of each calendar year, for the preceding 12 month period, KBID will provide to the KWO a report of:
    a. the canal section or sections converted to automation,
    b. the amount of in kind contribution provided by KBID,
    c. other sources and amounts of funding obtained and used (if applicable),
    d. the estimated amount of water loss saved as a result of the automation,
    e. significant issues encountered during implementation,
    f. any significant changes to plans to canal automation previously submitted, and
    g. general plans of work for automation of canal to be accomplished in the subsequent July to June, 12 month period.

This amendment also includes an update to the Attachment B *Open Irrigation Canals to be Converted to Buried Pipe System* table, whereas the payment amount has stayed the same.

Remaining Open Irrigation Canals to be Converted to Buried Pipe System
Canal Project in Order of Priority
1.3R – Ridge Canal
50.7 – Courtland 5th Canal
48.8 – Courtland 5th Canal
8.5-0.2 - Courtland West Canal
54.5-0.8 - Courtland 5th Canal
2.8-0.4 - Miller Canal
2.8 Miller Canal
13.0 - White Rock Extension
Ridge Main - Tail End

The effective end date of contract #16-115 is extended by this written amendment to June 30, 2027.

In agreement to the terms of this Contract, we set our hand this 25 day of August 2020, under the authority and power granted to us by virtue or our position or office.

For the Kansas Water Office

Earl Lewis
Director
Kansas Water Office

Kansas Bostwick Irrigation District

Jared "Pete" Gile
Superintendent
Kansas Bostwick Irrigation District

900 SW Jackson Street, Suite 404
Topeka, KS 66612

Kansas Water Office

Phone: (785)-296-3185
Fax: (785)-296-0878
www.kwo.ks.gov

Earl Lewis, Director

Laura Kelly, Governor

August 24, 2020

Dear WAterSMART Grants Selection Committee,

The Kansas Water Office (KWO) is pleased to support the WaterSMART grant application by the Kansas Bostwick Irrigation District. The District intends to use the grant to automate the entire Courtland Canal from the Superior-Courtland Diversion Dam to Lovewell Reservoir.

The proposed project will contain a 34.8 mile stretch of canal to be automated with the involvement of 12 radial gates. This will allow for any excess water arriving at the diversion dam to be transported to Lovewell Reservoir, and therefore will not be lost to by-pass.

KWO continues to seek out potential opportunities to collaborate with water conscious entities like the Kansas Bostwick Irrigation District. The District lies within the Solomon-Republican Regional Planning Area and water conservation and collaboration are goals of this region's committee. Funding of this grant will positively affect both of these, positively impacting water consumers within the region.

Please let me know if you need further information or clarification in order for funding of this grant to move forward.

Sincerely,

Earl Lewis, P.E.
Director
Kansas Water Office

Bostwick Irrigation District in Nebraska

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

August 26, 2020

To everyone it may concern;

This letter is written on behalf of the management and Board of Directors of the Bostwick Irrigation District in Nebraska (NBID). We would like to wholeheartedly express our full support for the Kansas Bostwick Irrigation District's (KBID) application for a WaterSMART grant to fully automate the structure gates on the Courtland Canal.

Both districts rely on an ever dwindling supply of our most important resource, water, in the Republican River Valley, to deliver water to our constituents so they might be able to irrigate crops in a timely fashion. As NBID is in the finishing phases of fully automating our largest canal, we can vouch for the importance of fully automating a canal. In just our first year of record, it has shown to have several benefits, while retaining large water savings. This project will work nicely along with the NBID WaterSMART grant just approved to fully automate the headgates on the Superior and Courtland Canals. These conservation measures have been going on for years and will be ongoing for the future. This project would be another step in furthering our efforts to save water.

KBID and NBID both strive to manage our water resources as effectively as we can and this project would be another step forward towards that goal. NBID supports this project without hesitation.

Sincerely,

Tracy Smith
General Manager
Bostwick Irrigation District in Nebraska

"Water is Life"

Chase Larson
Bestifor Farms
1817 East Frontage Road
Belleville, Ks 66935
9/2/2020

Dear WaterSMART Grants Selection Committee:

I am writing this letter in support of Kansas Bostwick Irrigation District's efforts to be successful in their grant application: BOR-DO-21-F001 to automate the Courtland canal with the goal of increasing water efficiency. I am a local farmer\businessman who does irrigate out of the KBID, but also use other sources, including Republican River surface water, alluvial wells within the basin and also wells in the Dakota formation.

If Kansas Bostwick can be more water efficient with this grant to increase excess water for downstream users that would be a beneficial impact for agricultural, recreation, and municipalities. Downstream water users would be able to irrigate more acres which in a rural agricultural community is a big economic improvement. With this grant Kansas Bostwick excess water in the Warren Act would give downstream user access to more consistent water supply for junior wells also. I feel this grant to Kansas Bostwick is a great project to enhance North Central Kansas communities.

Sincerely,

Chase Larson

To whom it may concern:

My name is Andrew Meyer and I own irrigated land in both KS Bostwick Irrigation District and Bostwick Irrigation District in Nebraska. I write this letter to express my full support of KS Bostwick's proposal to automate the Courtland Canal. I own or farm several properties that get their water either directly of indirectly from the Courtland Canal. On one piece I farm just south of the Kansas-Nebraska state line I often experience issues on my turnout from the Courtland Canal. If the Courtland Canal at this location is operating at lower flow volumes, I have trouble getting my full amount of water desired. The District has told me they expect the automation of the gates to fix this issue.

I also take water from the Ridge Canal which is directly supplied by the Courtland Canal. Whenever there are fluctuations on the Courtland Canal due to manual operations and human error it can adversely affect the discharge to the Ridge Canal and all irrigators along the Ridge experience issues. With the automation of the Courtland Canal these issues should be fixed.

So, once again, as an irrigator affected by the troubles currently experienced on the Courtland Canal I'm very supportive of the project KS Bostwick is proposing here.

Sincerely,

Andy Meyer