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**WATER 2025 COURTLAND CANAL  
AUTOMATION PROJECT**

**LOWER REPUBLICAN RIVER –  
NEBRASKA AND KANSAS**

**Nebraska Bostwick Irrigation District  
Red Cloud, NE 68970-0446**

**Kansas Bostwick Irrigation District  
Courtland, KS 66939**

**January 21, 2005**

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Assurances Form

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A. General Project Information																	
A.1	Date: January 19, 2005 Applicant Names: Nebraska Bostwick Irrigation District Kansas Bostwick Irrigation District																
A.2	Project Name: Courtland Canal Automation Project																
A.3	<table border="0" style="width: 100%;"> <thead> <tr> <th style="width: 70%;"></th> <th style="text-align: right;">Funding Source</th> </tr> </thead> <tbody> <tr> <td>Funding Amount</td> <td></td> </tr> <tr> <td>Non-Federal Entities:</td> <td></td> </tr> <tr> <td>    Nebraska Bostwick Irrigation District*</td> <td style="text-align: right;">\$24,000</td> </tr> <tr> <td>    Kansas Bostwick Irrigation District*</td> <td style="text-align: right;">\$24,000</td> </tr> <tr> <td>Non-Federal Subtotal:</td> <td style="text-align: right;">\$48,000</td> </tr> <tr> <td>Reclamation Funding:</td> <td style="text-align: right;">\$48,000</td> </tr> <tr> <td><b>TOTAL PROJECT FUNDING:</b></td> <td style="text-align: right;"><b>\$96,000</b></td> </tr> </tbody> </table> <p>*The Nebraska Bostwick and Kansas Bostwick Irrigation Districts will provide in-kind funding to the project. Funding needs above the in-kind funding provided by the districts will be provided as cash by the Nebraska Department of Natural Resources and Kansas Division of Water Resources.</p>		Funding Source	Funding Amount		Non-Federal Entities:		Nebraska Bostwick Irrigation District*	\$24,000	Kansas Bostwick Irrigation District*	\$24,000	Non-Federal Subtotal:	\$48,000	Reclamation Funding:	\$48,000	<b>TOTAL PROJECT FUNDING:</b>	<b>\$96,000</b>
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A.4	An Official Resolution has been approved by the both the Nebraska Bostwick Irrigation District and the Kansas Bostwick Irrigation District																

A.5	<p>This project seeks to increase the water supply for the lands supplied to the Courtland Canal by automating the diversion dam. Doing this will conserve water that in the past may have passed over the dam and increase the efficiency of the operation of the canal. By automating the canal head gate structure it is estimated that an average of an additional 40 cfs could be captured during the irrigation season and an additional 10 cfs could be captured during the non-irrigation season. That totals to approximately 15,000 acre-feet annually.</p> <p>The additional water that could be collected by automating the headgate structure would temporarily be stored in the canal immediately downstream of the diversion dam until the other check structures could be adjusted to move the water through the system.</p>
A.6	<p>This project falls under Task B, automation of canal gates or other control structures.</p> <p>This project contributes to the accomplishment of the goals by provided equipment and controls to allow the capture of increased flows at the canal head gate.</p>
A.7	<p>Contact for Further Information:</p> <p>Mike Delka Nebraska Bostwick Irrigation District (402) 746-3424 bostwick@gpcom.net</p> <p>Kenneth Nelson Kansas Bostwick Irrigation District (785) 374-4305 kbid@courtland.net</p>
<b>B. Summary of Project Criteria</b>	
B.1	Conservation, Efficiency, Markets
B.1.1	None
B.1.2	None
B.1.3	<p>This project will increase conservation by not allowing excess water to bypass the diversion dam. Thereby increasing the water supply for the irrigation districts. Currently an average of 60,000 acre-feet of water is diverted at the headgate. Automating the head gate will allow the diversion of an additional 15,000 acre-feet of water.</p>
B.1.4	<p>This project will automate the diversion dam structure for the Nebraska Bostwick and Kansas Bostwick Irrigation Districts. The water from these irrigation districts is supplied from Reclamation dams.</p>
B.2	Demonstrated Results

B.2.1	<p>The direct benefit of this project is an increased water supply for the Nebraska Bostwick and Kansas Bostwick Irrigation Districts. Up to an average of 0.5 additional inches of water per acre would be available to the irrigators in the districts. The additional water would mean an increase in net revenue per acre of \$3.60 for a total 100-year value of almost \$4,000,000 in net present day.</p> <p>The indirect benefits of this project are increased carryover storage in Lovewell Reservoir and Harlan County Lake and laying the foundation for future improvements to the Courtland Canal. Increased carryover water supplies in the reservoirs will benefit recreation access, especially during droughts. The infrastructure developed in this project will benefit future canal automation at the check structures.</p> <p>The calculation of the benefits of this project came from the draft "Appraisal Study Lower Republican River Basin Nebraska and Kansas" prepared by Reclamation and dated January 2004 the Value Study completed prior to the Appraisal Study.</p> <p>Actual benefits will be verified through diversion records and field deliveries.</p>
B.3	Project Financing and Cost-Sharing
B.3.1	<p>A project funding plan is included in the proposal. It calls for 50-50 cost sharing between Reclamation and the project applicants. The project applicants will provide in-kind funding for their portion of the project. The Nebraska Department of Natural Resources and the Kansas Division of Water Resources will provide cash to cover shortfalls to the in-kind funding from the Districts.</p> <p>The operation and maintenance costs for the district are not expected to significantly increase due to the addition of the infrastructure to the project. Operation cost should remain the same.</p> <p>Letters of commitment from the project applicants, the Nebraska Department of Natural Resources and the Kansas Division of Water Resources are forthcoming.</p>
B.3.2	Yes
B.3.3	No
B.4	Relevance to Water 2025

B.4.1	This project shows the spirit of cooperation that now exists between Kansas and Nebraska. The Irrigation Districts and two states are working together to make capital improvements within the basin for the benefit of all. The irrigation districts will benefit from the increased supply, Kansas will benefit by having more control over the location of flow into the state, and Nebraska will benefit from having more flexibility of water use during extended periods of drought.
B.4.2	The proposed project will reduce tension over water between Kansas and Nebraska. Instead of water passing the diversion dam and continuing downstream, the water will be diverted and made available to the irrigation districts.
B.4.3	The proposed work is not in an identified "hot spot", but is located in a basin that is located in an area experiencing tension over water. The project area is part of the Republican River Basin, which was recently the subject of an interstate compact lawsuit. The area is experiencing major shortages of water during the current drought with some irrigation districts unable to divert water for multiple years.

<b>Part II – Technical Proposal</b>	
A	Background Data
A.1	Webster & Nuckolls County, Nebraska and Jewell & Republic County, Kansas East and South of Guiderock, Nebraska
A.2	60,000 acre-feet of diversion
A.3	Irrigation water for the Nebraska Bostwick and Kansas Bostwick Irrigation Districts
A.4	Corn
A.5	<p>The Courtland Canal, Harlan County Lake, Guide Rock Diversion Dam and Lovewell Reservoir serve the Nebraska Bostwick and Kansas Bostwick Irrigation Districts. In the Districts there are 150 miles of canals and 200 miles of laterals.</p> <p>The following improvements have been made:</p> <ul style="list-style-type: none"> <li>• Four miles of Courtland Canal have been lined.</li> <li>• Several open ditch laterals have been converted to buried pipe.</li> <li>• Polyacrylimide is applied annually to canals and several laterals.</li> </ul> <p>The seepage rates for the canals are estimated to average one cfs per mile per day.</p> <p>The average annual system efficiency ranges from 35% to 40%. The on-farm efficiency is estimated to be 60%.</p>
A.6	
B	Consistency with State of Local Water Plan
B.1	This project is consistent with the settlement stipulation of the Kansas v. Nebraska lawsuit.
C	Project Description
C.1	Automating the head gate structure consists of installing radial gates at the canal headworks at the Diversion dam. A local control mode would be used, based on upstream and downstream water depths to control the radial gates. The RTU would consist of a PC-based controller which would receive input from gate position and water depth sensors. The RTU would provide local control of the radial gate based on control algorithms and control software. The radial gates would be provided with a motor operator to allow the RTU to automatically raise or lower the gate position.
C.2	The project would begin immediately following the irrigation season and would be completed by the start of the 2006 irrigation season.
C.3	The only deviations to the time table provided.
C.4	Currently no detailed engineering plans have been prepared.
C.5	Water Conservation will be made in the form of minimizing flow bypass at the diversion dam when water is needed for storage or irrigation.
D	Environmental and Regulatory Compliance

D.1	No
D.2	No
D.3	No
D.4	The majority of the canal system was constructed between 1949 and 1957.
D.5	The diversion dam and headgate structure was constructed in 1949.
D.6	No
D.7	No
D.8	A 404 permit may be necessary, the applicant will contact Reclamation and the Corps of Engineers to verify whether one is needed.
E	Environmental Compliance Costs
E.1	Yes, this is part of the 20% unlisted item cost.

<b>Part III – Funding Plan</b>	
A	The project applicants will provide in-kind funding for their portion of the project. The Nebraska Department of Natural Resources and the Kansas Division of Water Resources will provide cash to cover shortfalls to the in-kind funding from the Districts.
B	
C	Nebraska Bostwick Irrigation District \$24,000 Kansas Bostwick Irrigation District \$24,000
D	Funding request does not exceed \$300,000.
E	No other federal funds requested.
F	No other funding requests made.

# BOSTWICK IRRIGATION DISTRICT IN NEBRASKA

P.O. BOX 446 • Red cloud, Nebraska 68970-0446 • Ph/Fax: (402) 746-3424

## WATER 2025 RESOLUTION

January 18, 2005

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

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

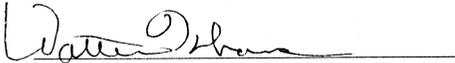
**WHEREAS**, the District is now suffering through a drought that allowed no irrigation releases in 2004 and a similar projection for 2005, and

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

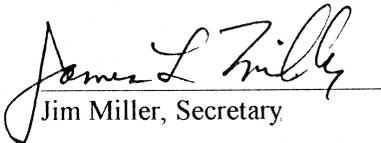
**THEREFORE, BE IT RESOLVED** that the Board of Directors of the Bostwick Irrigation District in Nebraska agrees and authorizes that:

1. The Board has reviewed and supports the "Courtland Canal Automation Project" proposal for the Water 2025 grant program;
2. The Bostwick Irrigation District in Nebraska is capable of providing the in-kind contributions, specified in the funding plan; and
3. If selected for a Challenge Grant, the applicant will work with Reclamation to meet established deadlines for entering into a cooperative agreement.

DATED: 1-18-05

  
Walter Knehans, President

ATTEST:

  
Jim Miller, Secretary

Resolution 2005-1

Whereas the Republican River Basin has been in a drought for 5 years,

Whereas the Republican River Compact has recently been subject to Supreme Court litigation,

Whereas water is the lifeblood of the agriculture community,

Whereas Water 2025 provides a source of funding for capital improvements the infrastructure of the District,

Whereas headgate automation will capture water previously unavailable to the district,

Now Therefore, be it resolved that the Kansas Bostwick Irrigation District Board of Directors agrees and authorizes that this application be submitted to Reclamation for consideration under the Water 2025 grant program. If selected, the Board agrees to provide in-kind funding to the project and will work closely with Reclamation to meet all established deadlines.

January 21, 2005

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*Louis W. Allen*

*Elvin C. Halson*

*Gary Hunkler*

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**Part V– Budget**

<b>Description</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Total Cost</b>
Furnish and Install Remote Terminal Unit and PC type box for the control of the motorized radial gates.	1	\$10,000	\$10,000
Furnish and Install 120V power for RTU from power drop.	1	\$4,000	\$4,000
Furnish and Install motor operator with combination motor/starter NMA Type 4 enclosure, 240V single phase. (5 Bays)	5	\$7,000	\$35,000
Subtotal 1			\$49,000
Mobilization (+/-5% of Subtotal 1)			\$2,500
Subtotal 2			\$51,500
Unlisted Items (+/-20% of Subtotal 2)			\$10,000
Contract Cost			\$61,500
Contingencies (+/-25% of Contract Cost)			\$15,500
Field Cost			\$77,000
Non-Contract Cost (+/-25% of Field Cost)			\$19,000
<b>Total Project Cost</b>			<b>\$96,000</b>

The budget for the Courtland Canal Automation Project came from numbers out of the January 2004 Draft Appraisal Study, Lower Republican River Basin, Nebraska and Kansas. These numbers were found in Appendix A, Alternative B. The estimate is dated December 16, 2003.

The in-kind funding that the districts would provide to the project would include, but not be limited to, salaries, fringe benefits, and travel.