WaterSMART GRANT APPLICATION:

SMALL-SCALE WATER EFFICIENCY PROJECT FY2019
FOA: BOR-DO-19-F005

Sluice Way Automation
Fish Creek and Cimarron Canal

GUNNISON COUNTY, COLORADO

APPLICANT: Allen Distel, President
Bostwick Park Water Conservancy District
400 South 3rd.
Montrose, Colorado 81401

Phone: (970)-249-8707
# Table of Contents

**Acronyms** ..................................................................................................................................................... ii

**1 Technical Proposal and Evaluation Criteria** ............................................................................................ 1

1.1 Executive Summary .......................................................................................................................... 1

1.2 Background .......................................................................................................................................... 2

1.2.1 Bostwick Park Project .............................................................................................................. 2

1.2.2 Crops Grown ................................................................................................................................. 3

1.2.3 Project Facilities ........................................................................................................................... 3

1.2.4 Location Maps .............................................................................................................................. 5

1.3 Project Description ............................................................................................................................ 6

1.4 Evaluation Criteria ............................................................................................................................. 7

1.4.1 Criterion A - Project Benefits .................................................................................................. 7

1.4.2 Criterion B - Planning Efforts ................................................................................................ 9

1.4.3 Criterion C - Project Implementation ............................................................................. 10

1.4.4 Criterion D - Nexus to Reclamation ................................................................................. 10

1.4.5 Criterion E - Interior Priorities ......................................................................................... 11

**2 Budget** ..................................................................................................................................................... 11

2.1 Funding Plan .................................................................................................................................... 11

2.2 Budget Proposal .............................................................................................................................. 12

2.3 Budget Narrative ............................................................................................................................ 13

**3 Environmental and Cultural Resources Compliance** ................................................................................. 15

**4 Required Permits and Approvals** ............................................................................................................ 17

**5 Official Resolution** ............................................................................................................................... 17

**6 Appendix-Attachments** ..................................................................................................................... 18

6.1 Board Resolution ............................................................................................................................... A
# Acronyms

<table>
<thead>
<tr>
<th>Name</th>
<th>Acronym</th>
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<tbody>
<tr>
<td>Acre feet</td>
<td>AF or Ac-Ft</td>
</tr>
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<td>District</td>
</tr>
<tr>
<td>Cimarron Canal Company</td>
<td>Company</td>
</tr>
<tr>
<td>Cubic feet per second</td>
<td>CFS or cfs</td>
</tr>
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<td>CDWR</td>
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<td>FOA</td>
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<td>O&amp;M</td>
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1 Technical Proposal and Evaluation Criteria

1.1 Executive Summary

Date: April 24, 2019
Applicant Name: Bostwick Park Water Conservancy District
City: Montrose
County: Montrose/Gunnison
State: Colorado
Estimated Project Start: Fall 2019
Project Length: 12 Months
Estimated Project Completion: Fall 2020
Federal Facility: Serves a Reclamation Project
Amount Requested: $71,000

Project Summary: The Project Sponsors, comprised of the Bostwick Park Water Conservancy District (District) and Cimarron Canal and Reservoir Company (Company) desire to improve the operation of Reclamation's Silver Jack Reservoir by installing an automated water control structure at the confluence of Fish Creek and the Cimarron Canal. The purpose of the project is to improve operation and administration of releases from Fish Creek Reservoir that can be diverted into the Cimarron Canal and manage flood or excess flows from the Fish Creek watershed. The Cimarron Canal is the conveyance system for releases from Silver Jack Reservoir, which is the storage vessel for Reclamation's Bostwick Park Project. Improved management of Cimarron Canal inflow will consequently improve management efficiency of Silver Jack Reservoir. Major components of the project include a concrete water control structure, flow measurement sensors, Supervisory Control and Data Acquisition (SCADA) and automated water control gates.

This water measurement and automation project is estimated to cost about $146,000.

Eligibility: This project falls within this FOA's Section C.3.1 - Flow Measurement, SCADA and Automation.
1.2 Background

1.2.1 Bostwick Park Project

The District contracts with the Bureau of Reclamation for the storage water in Silver Jack Reservoir. The District then contracts with the Company to convey this storage water through the Cimarron Canal. The District and the Company share the cost of maintenance and repair of all District and Company works in the ratio of 65% and 35% respectively.

The Cimarron Canal begins approximately three miles downstream of Silver Jack Reservoir, storage vessel for Reclamation's Bostwick Park Project, at the diversion structure on the Cimarron River. The canal has a decreed capacity of 185 cubic feet per second (cfs) and traverses approximately 23 miles where it discharges into the private Hairpin and Vernal Mesa ditches. At this point a small flow is also diverted into the Cerro Reservoir on top of Cerro Summit. Only a minor amount of irrigation water is used in this 23-mile reach. The City of Montrose owns and operates Cerro Reservoir for domestic water supply purposes. The Vernal Mesa Ditch, with an initial capacity of at least 80 cfs, and the Hairpin Ditch, with an initial capacity of at least 45 cfs, begin at Cerro Summit. The Vernal Mesa Ditch serves the Bostwick Park Project area to the northwest. The Hairpin Ditch serves the Shinn Park and Kinikin Heights areas to the south. Other laterals and ditches subsequently originate from the Vernal Mesa and Hairpin Ditches to distribute water to the irrigated lands.

The Fish Creek drainage consists of 4,465 acres of northeast facing mountainside. The Cimarron Canal runs along the lower east end of the drainage and holds a direct flow water decree for Fish Creek in the amount of 15 CFS and a storage decree in the amount of 523 Acre Feet. These water rights are pre compact.

When the Cimarron Canal was built in the late 1800's the natural drainage from Fish Creek into the Cimarron River was dammed off and all the water was diverted into the canal. This causes the following problems:

- Allows too much water to flow down the canal
- Prevents water to flow into the Cimarron River when not being diverted from the canal
- Creates freeze problems during winter
- Safety of the canal and surrounding area during high water or flooding events by overtopping the canal.
In the early years the flows in the off season were used by the ranchers as a domestic water source therefore the water was used and did not create a problem, now, with the use of deep wells, increase in population, and development of subdivisions a canal safety issue is created with the water not being used. The canal safety has become a very large liability of the canal company and will continue to increase, therefore more safety features are needed in the event of a large weather event.

1.2.2 Crops Grown

Originally a fairly wide variety of crops were grown in the project area. They included hay, grain, and truck farm crops. The predominant crops grown at the present are alfalfa and grass hay, grain for livestock feed, and a minor amount of cereal and miscellaneous crops.

1.2.3 Project Facilities

Bostwick Park Project District facilities consist primarily of open earthen ditches/canals. A pipe/siphon is used on the Bostwick Lateral to convey the water across the valley and then goes back to an open ditch. Table 9 below shows an inventory of facilities.

<table>
<thead>
<tr>
<th>COMBINED FACILITY INVENTORY</th>
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<tbody>
<tr>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>Storage Dams</td>
</tr>
<tr>
<td>Diversion Dams</td>
</tr>
<tr>
<td>Canals</td>
</tr>
<tr>
<td>Laterals/Ditches</td>
</tr>
<tr>
<td>Drains</td>
</tr>
<tr>
<td>Siphons</td>
</tr>
<tr>
<td>Large Parshall Flumes</td>
</tr>
<tr>
<td>Turn-out structures with gates and flumes</td>
</tr>
<tr>
<td>Spill Boxes</td>
</tr>
</tbody>
</table>
The Vernal Mesa Ditch splits on the upper (south) end of Bostwick Park into the East and West Vernal Mesa Ditches. However, this arrangement was not sufficient to provide irrigation to arable land on the far west side of Bostwick Park. Because of this the BPWCD Project developed a 24" concrete siphon approximately 1.1 miles long that carries water from the East Vernal Mesa Ditch across Bostwick Park to the Bostwick Lateral.

Ownership/Management of facilities is demonstrated in the following Table. Project water refers to storage water made available by the Bostwick Park Project works. Other water is made available by storage and direct flow water rights held by the CC & RC.

<table>
<thead>
<tr>
<th>FACILITY OWNERSHIP/MANAGEMENT</th>
<th>DISTRICT – PROJECT WORKS</th>
<th>COMPANY WORKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver Jack Reservoir</td>
<td>13,500 acre-feet</td>
<td>Cimarron Canal including headgate and diversion dam. Approximately 23 miles</td>
</tr>
<tr>
<td>Bostwick Lateral</td>
<td>1.771 miles Earthen ditches</td>
<td>Hairpin Ditch 7.468168 Miles</td>
</tr>
<tr>
<td>Bostwick Lateral Siphon</td>
<td>1.1 mile 24&quot; concrete pipe</td>
<td>Kinikin Ditch 3.15351 Miles</td>
</tr>
<tr>
<td>Land Drains</td>
<td>6.1 miles rehab. 1.1 miles new</td>
<td>Waterdog Ditch 4.298551 Miles</td>
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<td></td>
<td></td>
<td>Shinn Park Ditch 3.346298 Miles</td>
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<tr>
<td></td>
<td></td>
<td>Vernal Mesa Ditch 11.083 Miles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>East Vernal Mesa Ditch 4.21 Miles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>West Vernal Mesa Ditch 4.484 Miles</td>
</tr>
</tbody>
</table>

In 2018 the District installed a Fiber Optic line to the headgate for high speed Internet for the monitoring and control with live feed cameras. Also in 2018 the District installed a new ramp flume to accurately measure and record the water diverted out of the Cimarron River, this measurement will be used for the auto control of the headgate. The control and monitoring are part of the District’s SCADA system, which is to be expanded as structures are installed within the system. The long-range plan is for the entire system to be completely automated.
1.2.4 Location Maps
The project is located about 22 miles east southeast of Montrose, Colorado at approximately 38° 16' 10.69"N, 107° 32' 39.54"W.

1.3 Project Description

1.3.1 The project is comprised of the installation of an automated water control structure at the confluence of Fish Creek and the Cimarron Canal. The purpose of the project is to improve operation and administration of releases from Fish Creek Reservoir that can be diverted into the Cimarron Canal and manage flood or excess flows from the Fish Creek watershed.

The canal company and the District desire to automate a waste way in Fish Creek and install a controlled structure for monitoring the canal levels downstream of the wastegate. This control structure will be monitored by the SCADA equipment on the Fish Creek waste way gate. In the event of a large rain storm the level of the canal will rise and send a signal to the waste way gate to open and release some water alleviating the chance of a canal over top. During the winter months, when water is not being diverted, the waste way gate may remain open and the guard gate on the canal will be closed allowing
water to continue on to the Cimarron River through the natural drainage channel.

**The project is comprised of the following specific tasks:**

- Design, materials, fabrication and installation of an automated water control structure including a box culvert, waste gate, and canal gate.
- Provide, install and calibrate SCADA instrumentation.
- Engineering – design review, flow calibration, and permitting

1.4 Evaluation Criteria

1.4.1 Criterion A: Project Benefits

- **Describe the expected benefits and outcomes of implementing the proposed project. What are the benefits to the applicant’s water supply delivery system?**

Implementation of the project will allow the District to improve water management by more accurately diverting water from Silver Jack Reservoir, the Cimarron River, and Fish Creek Reservoirs. Only water needed to meet downstream requirements will be released from the reservoirs as automated operation of the new water control structure, in conjunction with the previously installed ramp flume and automated headgate at the Cimarron Diversion will allow the released water to be properly divided between the Cimarron Canal and Cimarron River. Thus storage in Silver Jack Reservoir will be maintained at the maximum level for later use by the District and instream flow purposes. Excess water that may be flowing down Fish Creek due to excess runoff can be diverted back to the Cimarron River, thus reducing the need for releases from Silver Jack Reservoir.

- **If other benefits are expected explain those as well in consideration of the following:**
  - **Extent to which the proposed project improves overall water supply reliability.**

Accurate diversion into the Cimarron Canal is necessary to ensure that the District and Company’s water rights (including those in Fish Creek Reservoirs) are being properly utilized. The project will extend storage in Silver Jack Reservoir by minimizing over-diversions, thus improving overall water supply reliability.

  - **The expected geographic scope of benefits from the proposed project (e.g., local, sub-basin, basin)**
Operations of the Fish Creek Reservoirs and the Cimarron Canal impact the area covered by the District and Company, an area spanning approximately 100 square miles. In addition, operation of the canal provides a portion of the domestic water for the City Montrose, Colorado.

In a larger context, diversions into the Cimarron Canal and from Fish Creek Reservoirs can impact the discharge of flows in the Cimarron River, which is a critical tributary and integral component to Reclamation's Aspinall Unit on the Gunnison River, which ultimately impacts operation for the Black Canyon Water Right, benefit of endangered fishes in the Colorado and Gunnison rivers and water levels in Lake Powell.

- **Extent to which the proposed project will increase collaboration and information sharing among water managers in the region.**

  The project will provide more accurate diversion into the Cimarron Canal, control of releases from Fish Creek Reservoirs and flows in the Cimarron Canal. In conjunction with the recently installed ramp flume and an expanded SCADA system, the project will provide additional real-time water flow information to the District, Company, the State Engineer’s Office, and Reclamation so that water rights, water allocations, and downstream commitments can be met.

- **Any anticipated positive impacts/benefits to local sectors and economics (e.g., agriculture, environment, recreation, tourism).**

  According to the Outdoor Industry Association, the outdoor recreation economy generates $28 Billion in consumer spending in Colorado alone. A major draw to Colorado outdoors is running water or instream flows. Operation of the proposed automated water control structure, along with operation of the recently installed Knife Gate, in coordination with the Silver Jack measuring device, Cimarron Canal Ramp Flume, and Cimarron River gage will allow for the proper release of instream flows for the trout fishery and environmental purposes in the Cimarron River below the diversion to the Cimarron Canal. Also, as mentioned above, operation of these three gages allow for coordination of releases to supplement the Aspinall Unit's operation for benefit of the Black Canyon Water Right and endangered fishes.
Extent to which the project will complement work done in coordination with NRCS in the area. Describe any on-farm efficiency work that is currently being completed or is anticipated to completed in the future using NRCS assistance through EQIP or other programs.

No NRCS work is anticipated in conjunction with this project.

1.4.2 Criterion B – Planning Efforts Supporting the Project

- Describe how your project is supported by an existing planning effort.

According to the District’s Water Management Plan (which is in the process of update), there are three critical water measuring locations for proper operation of the District. They are comprised of the pressure transducer at Silver Jack Dam which measures water elevation/storage in the reservoir; a gaging station on the Cimarron River which measures releases from Silver Jack Reservoir; and the measuring flume recently installed at the head of the Cimarron Canal that measures water diverted into the canal. This automated water control structure is located less than one mile from the head of the Cimarron Canal and will become an integral component of the overall measurement of the District’s water resources. Accurate flow diversion at this location is the critical next step to efficient operation of the headgate and Silver Jack Reservoir for without water measurement good water management is impossible.

- Does the proposed project implement a goal or address a need or problem identified in the existing planning effort?

The District’s existing water management plan identifies accurate water measurement and the need for proper delivery of water as a water management problem.

- Explain how the proposed project has been determined as a priority in the existing planning effort as opposed to other potential projects/measure.

This project is actually an extension of the water measurement components of the water management plan. The District believes it is critical to accurately divert and divide the proper flowrate from Silver Jack Reservoir. This project further implements that goal.
1.4.3 Criterion C: Project Implementation

- Describe the implementation plan for the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.

Installation of the automated water control structure will take place during the 2019-2020 off-season beginning in October of 2019. Any work not completed prior to winter conditions setting in will be completed in the spring of 2020 as conditions allow.

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

No permits should be necessary. Although if a Corp of Engineers permit is required it will be under a Nationwide Permit.

- Identify and describe any engineering or design work performed specifically in support of the proposed project.

- Describe any new policies or administrative actions required to implement the project.

No new policies or administrative actions are required to implement the project.

- Describe how the environmental compliance estimate was developed. Have the compliance costs been discussed with the local Reclamation Office?

Yes, environment needs have been discussed with the Western Colorado Area Office. Environmental compliance costs were estimated based on the minimum ground-disturbing aspect of the project. The project is comprised of the installation of a box culvert and water control gates in or near the County Road Right-of-Way. See Section 2 below.

1.4.4 Criterion D – Nexus to Reclamation

- Is the proposed project connected to a Reclamation project or activity? Is so, how? Please consider the following:

- Does the applicant receive Reclamation project water?
Yes. The District is the contracting entity for operation and maintenance of Silver Jack Dam and Reservoir and the Bostwick Park Project. 11,320 Ac-Ft of storage water is allocated to the District for irrigation.

- **Is the project on Reclamation project lands or involving Reclamation facilities?**

The proposed project is a critical component in dividing water released from Reclamation’s Silver Jack Reservoir for Reclamation’s Bostwick Park Project for which the District is responsible.

- **Is the project in the same basin as a Reclamation project or activity?**

Yes. The project is located 3.8 miles immediately downstream of Reclamation’s Silver Jack Dam on the Cimarron River.

- **Will the proposed work contribute water to a basin where a Reclamation project is located?**

Waste-water from the Bostwick Park Project flows into Reclamation’s Uncompahgre Project and is reused for irrigation purposes.

- **Will the project benefit any tribe(s)?**

None of Reclamation’s tribe trust responsibilities will be helped with implementation of this project.

**1.4.5 Criterion E – Department of the Interior Priorities**

- **Modernizing our infrastructure**

This project will be a component to the modernization of the Cimarron Canal. Installation of an automated water control structure enhances and protects an aging canal system with a modern efficient gate system supported by 21st century SCADA technology.

**2 Budget**

**2.1 Funding Plan and Letters of Commitment**

- The Cimarron Canal Company and the Bostwick Park Water Conservancy District through a combination of cash and in-kind service will cover the non-federal costs for the project. The District
has sufficient funds in reserve accounts available to cover the non-federal cash needs of the project. Annual audit and financial reports are available if required.

Non-Federal Costs: $74,789.80 to be provided through cash and in-kind contributions from Bostwick Park Water Conservancy District.

Amount Requested from Reclamation: $71,000

Total Project Costs: $145,789.80
### 2.2 Budget Proposal

- The table below comprises the proposed budget for the project:

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<th>Description</th>
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<th>Quantity</th>
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<th>Total Price</th>
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<th>Non-Federal</th>
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<td><strong>In-Direct Costs</strong></td>
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<td>NEPA/Cultural Resource Inventory</td>
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<td><strong>Total Project Costs</strong></td>
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<td>$71,000.00</td>
<td>$74,789.80</td>
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The total project costs are $145,789.80.
2.3 Budget Narrative

- The following is an explanation of proposed costs for the project:
  - Personnel Costs: The following is the personnel needed to complete the job. Their salary and fringe benefits can be found in the table above.
    - Trey Denison is the Project Supervisor
    - Terry Hawkins will be the lead equipment operator.
    - Allen Distel is the Project Administrator. He will responsible for reports, billing, and general project administration.
    - Laborers will be hired as needed for hand labor.
    - SCADA Technician – will install communications and electronic equipment.
  - Equipment Usage – The equipment needed to remove perform the required excavation and install the culvert and gates include:
    - Kelebco 160 Excavator for excavating area for Box Culvert Installation
    - Kubota K080 Excavator for tight excavation and backfill
    - SVL Skid Loader for general work around site, backfilling and grading.
    - International Dump Truck for hauling material to and from the site.
    - Caterpillar Backhoe – General trench excavation and minor lifting.
    - Lifting Crane for placement of box culvert sections and large components. Price includes lifting crane mobilization, demobilization, and operator.
  - Materials – The following materials will be installed to complete the project:
    - Concrete Box Culvert is a combined crossing and water control structure. It will be prefabricated and placed onsite with the equipment listed above.
    - 4'x4' Wastegate will be purchased and installed to release water back to the Cimarron River.
    - Autocontrol Canal Gate will be purchased and installed to release water from Fish Creek to the Cimarron Canal.
Various SCADA components will be purchased and installed to automate the Wastegate and AutoControl Canal Gate, and report water levels remotely.

Internet Hookup is required to report water levels and make gate changes remotely.

- Engineering – Engineering costs include final design, flow calibration/calculations, and permitting.
- NEPA/Cultural Resource Inventory – NEPA is expected to be comprised of a Categorical Exclusion conducted by the Western Colorado Area Office at no charge, but some costs have been designated to cover unexpected issues that may arise. A private archeology firm may be contacted to perform cultural resource consultation as needed.

3 Environmental and Cultural Resources Compliance

- Will the proposed project impact the surrounding environment?

The project is comprised of construction work in the existing canal prism and immediate surrounding area.

- Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area?

The District is not aware of any threatened or endangered species, proposed or listed in the project area.

- Are there wetlands or other surface waters inside the project boundaries that potentially fall under Clean Water Act (CWA) jurisdiction as “Waters of the United States?”

None

- When was the water delivery system constructed?

Construction of the Cimarron Canal took place between 1899 and 1902.

- Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were
constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.

Yes: The project will modify the existing canal prism and localized diversion facilities from Fish Creek to the Cimarron Canal. These features were built in the early 1900's and modified in the later years to improve the operation of the canal.

• Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.

A Class III cultural resource inventory will likely be done on the project area. The canal is likely eligible for the NRHP, so there may be a MOA and some mitigation that will need to be done, such as Level I Documentation.

• Are there any known archeological sites in the proposed project area?

None known at this time.

• Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?

The total project cost is about $146,000 and should not affect low income or minority populations.

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

No. The project is not situated near any tribal lands.

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

During the construction process, Best Management Practices will be utilized to minimize the spread of weeds from the project area.
4 Required Permits and Approvals

The project will likely qualify for the USACE’s irrigation exemption or be covered under Nationwide Permit No. 5 - Scientific Measurement Devices. This permit doesn’t require a Pre-Construction Notification to the USACE, and there are no Regional Conditions for Colorado associated with that permit. Any other required state or local permitting will be acquired as necessary.

5 Official Resolution

- A Directors Consent Statement is included in the Appendix.
6  APPENDIX - Attachments

6.1  Board Resolution
The directors of Bostwick Park Water Conservancy District, a Colorado corporation, consent to the following:

To apply for a WaterSMART Small Scale Water and Efficacy Grant to install a waste-way and canal monitoring equipment in the Cimarron Canal.

Dated: 12/14/18

By: Allen Distel

Allen Distel, President
Director, Bostwick Park Water Conservancy District