

Water Supply Reserve Account – Grant and Loan Program
Water Activity Summary Sheet
March 18-19, 2014
Agenda Item 17(f)

Applicant: Colorado River Water Conservation District

Water Activity Name: No Chico Brush Agricultural Water Research Project

County: Montrose

River Basin: Gunnison

Water Source: Uncompahgre and Gunnison Rivers

Amount Requested: \$35,000 from the Gunnison Basin Account, and (delayed) \$55,000 from the Statewide Account.

Matching Funds: \$16,000 in-kind match CRWCD (5% of total project costs), \$59,000 cash match Trout Unlimited and The Nature Conservancy (20% of total project costs), \$180,000 cash match unspecified grant requests (43% of total project costs), Total Project Costs Match = 88%

| |
|---|
| Staff Recommendation: |
| Staff recommends approval of up to \$35,000 from the Colorado Basin Account for the project titled: Colorado River Water Conservation District - No Chico Brush Agricultural Water Research Project |

Water Activity Summary: WSRA Grant funds will be expended to perform farmer-led research on irrigation practices that will provide important information for both improved agricultural operations and future water use challenges in the Basin. To accomplish this, the project will compare furrow irrigation to overhead sprinkler, drip, and big gun irrigation systems in order to address the following water supply and water quality questions:

- How much water do these different irrigation systems currently “use” or need for the same crop type?
- What is the actual water demand for these crops?
- What is the application efficiency of these different irrigation systems? How much water is applied to the crop and at what times, compared to actual crop demands throughout the growing season?
- How much water returns to the system from the farm as either surface run off or deep percolation? What is the quality of water returning to the system in terms of salinity, selenium, nutrients and sediment?
- How much irrigation water can be saved by converting on-farm irrigation from open furrow or flood irrigation methods to systemized irrigation?
- What are the yield differences between the four irrigation methods? (comparing similar fields and soil types)

Project proponents wish to answer the question of what are the effects of on-farm and system wide improvements on other water demands.

- How would large scale changes affect water quality in the Gunnison River?
- How can on-farm data help farmers improve their water use?

- What other benefits occur as a result of improved efficiency?
- What types of incentives need to take place to expand irrigation efficiency projects?

The objective of this project is to complete irrigation related research in the Gunnison Basin from an on-farm level to identify how to best improve agricultural water use and management. Increasing agricultural efficiency has been identified by many as the most cost effective method of addressing ag water shortages and has also been linked to addressing non-consumptive needs while improving water quality by reducing salt and selenium discharges from inefficient applications. This research project will help guide and implement efficiency projects by increasing knowledge about agricultural demands and what happens to water on the farm, as such, water managers and farmers will be able to make more informed decisions about water and crop management. No Chico Brush will use the data gathered to help educate and inform irrigators and water managers.

Threshold and Evaluation Criteria:

The application meets all four Threshold Criteria.

Funding/Match Summary:

| <u>Funding Source</u> | <u>In-Kind</u> | <u>Cash</u> | <u>Total</u> |
|--|-----------------------|--------------------|---------------------|
| Colorado River Water Conservation District | \$16,000 | \$0 | \$16,000 |
| Trout Unlimited & The Nature Conservancy | \$0 | \$59,000 | \$59,000 |
| Unspecified grant requests | \$0 | \$180,000 | \$180,000 |
| WSRA Colorado Basin Account | \$0 | \$35,000 | \$35,000 |
| Total | \$16,000 | \$274,000 | \$290,000 |

Discussion:

The No Chico Brush Project applicants initially submitted a WSRA Grant request for \$35,000 from the Gunnison Basin Account funds, and \$55,000 from the Statewide Account funds, however due to an anticipated WSRA Statewide Account shortfall, and the potential for a future CWCB Alternative Agricultural Water Transfer Methods Grant submission, the applicant has agreed to delay or withdraw their Statewide Account request. Discussion between the applicant and CWCB staff has determined that the application may meet the Alternative Agricultural Water Transfer Methods Criteria and Guidelines, of which the applicant may submit a grant request in the near future to replace the foregone Statewide Account request.

Issues/Additional Needs:

No additional issues or needs were identified.

Staff Recommendation:

Staff recommends approval of up to \$35,000 from the Gunnison Basin Account for project titled: Colorado River Water Conservation District - No Chico Brush Agricultural Water Research Project.

All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and will help promote the development of a common technical platform. In accordance with the revised WSRA Criteria and

Guidelines, staff would like to highlight additional reporting and final deliverable requirements. The specific requirements are provided below.

Reporting and Final Deliverable: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the scope of work including a description of any major issues that have occurred and any corrective action taken to address these issues. At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

Engineering: All engineering work (as defined in the Engineers Practice Act (§12-25-102(10) C.R.S.)) performed under this grant shall be performed by or under the responsible charge of professional engineer licensed by the State of Colorado to practice Engineering.

The Gunnison Basin Roundtable
501 Palmer Street
Delta, CO 81416

February 4, 2014

Mr. Craig Godbout
Intrastate Water Management and Development Section
COLORADO WATER CONSERVATION BOARD
1580 Logan Street, Suite 600
Denver, CO 80203

Re: Grant Request from the Water Supply Reserve Account
NoChicoBrush/Colorado River Water Conservation District
Water Efficiency Improvements Research Project

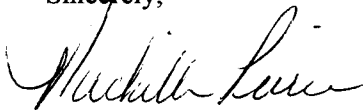
Dear Mr. Godbout:

This letter is presented to advise you that the grant application submitted by NoChicoBrush/Colorado River Water Conservation District for \$35,000 from Basin Account funds and \$55,000 in Statewide Account funds from the Water Supply Reserve Account for its Water Efficiency Improvements Research Project was reviewed by the Gunnison Basin Roundtable and its Project Screening Committee, and was approved by a unanimous vote of the Gunnison Basin Roundtable during our meeting on February 3, 2014.

This water activity meets the provisions of Section 37-75-104(2), Colorado Revised Statutes. The requirements/language from the statute is provided in Part 3 of the Criteria and Guidelines.

This activity furthers basin-wide consumptive needs for the Gunnison Basin by helping to reduce agricultural water shortages in the basin.

Sincerely,



Michelle Pierce
Chair

cc: Tom Alvey (e-mail)



COLORADO WATER CONSERVATION BOARD



WATER SUPPLY RESERVE ACCOUNT APPLICATION FORM

NoChicoBrush Agricultural Water Research Project

Name of Water Activity

NoChicoBrush
Colorado River Water Conservation District

Name of Applicant

Steve Schrock,
NoChicoBrush Project
Coordinator

Amount from Statewide Account:

\$55,000

Amount from Basin Account(s):

\$35,000

Total WSRA Funds Requested:

\$90,000

Approving Basin Roundtable(s)

(If multiple basins specify amounts in parentheses.)

Application Content

| | |
|--|---------|
| Application Instructions | page 2 |
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Required Exhibits

- A. Statement of Work, Budget, and Schedule
- B. Project Map
- C. As Needed (i.e. letters of support, photos, maps, etc.)

Appendices – Reference Material

- 1. Program Information
- 2. Insurance Requirements
- 3. WSRA Standard Contract Information (Required for Projects Over \$100,000)
- 4. W-9 Form (Required for All Projects Prior to Contracting)

Water Supply Reserve Account – Application Form

Revised December 2011

Instructions

To receive funding from the Water Supply Reserve Account (WSRA), a proposed water activity must be approved by the local Basin Roundtable **AND** the Colorado Water Conservation Board (CWCBC). The process for Basin Roundtable consideration and approval is outlined in materials in Appendix 1.

Once approved by the local Basin Roundtable, the applicant should submit this application **with a detailed statement of work including budget and schedule as Exhibit A** to CWCBC staff by the application deadline.

WSRA applications are due with the roundtable letter of support 60 calendar days prior to the bi-monthly Board meeting at which it will be considered. Board meetings are held in January, March, May, July, September, and November. Meeting details, including scheduled dates, agendas, etc. are posted on the CWCBC website at: <http://cwcb.state.co.us> Applications to the WSRA Basin Account are considered at every board meeting, while applications to the WSRA Statewide Account are only considered at the March and September board meetings.

When completing this application, the applicant should refer to the WSRA Criteria and Guidelines available at: <http://cwcb.state.co.us/LoansGrants/water-supply-reserve-account-grants/Documents/WSRACriteriaGuidelines.pdf>

The application, statement of work, budget, and schedule **must be submitted in electronic format** (Microsoft Word or text-enabled PDF are preferred) and can be emailed or mailed on a disk to:

Craig Godbout - WSRA Application
Colorado Water Conservation Board
1580 Logan Street, Suite 200
Denver, CO 80203
Craig.godbout@state.co.us

If you have questions or need additional assistance, please contact Craig Godbout at: 303-866-3441 x3210 or craig.godbout@state.co.us.

Water Supply Reserve Account – Application Form

Revised December 2011

Part I. - Description of the Applicant (Project Sponsor or Owner);

| | | | | |
|----|--------------------|--|-----------------|---------------------|
| 1. | Applicant Name(s): | NoChicoBrush Colorado River Water Conservation District | | |
| | Mailing address: | 408- 1740 Rd. Delta, CO 81416 | | |
| | Taxpayer ID#: | | | |
| | Primary Contact: | Steve Schrock | Position/Title: | Project Coordinator |
| | Email: | stephendschrock@yahoo.com | | |
| | Phone Numbers: | Cell: (970) 216-7204 | Office: | |
| | Alternate Contact: | Cary Denison | Position/Title: | Participant |
| | Email: | Cdenison@tu.org | | |
| | Phone Numbers: | Cell: (970) 596-3291 | Office: | same |

2. Eligible entities for WSRA funds include the following. What type of entity is the Applicant?

- ☐ Public (Government) – municipalities, enterprises, counties, and State of Colorado agencies. Federal agencies are encouraged to work with local entities and the local entity should be the grant recipient. Federal agencies are eligible, but only if they can make a compelling case for why a local partner cannot be the grant recipient.
- ☒ Public (Districts) – authorities, Title 32/special districts, (conservancy, conservation, and irrigation districts), and water activity enterprises.
- ☐ Private Incorporated – mutual ditch companies, homeowners associations, corporations.
- ☐ Private individuals, partnerships, and sole proprietors are eligible for funding from the Basin Accounts but not for funding from the Statewide Account.
- ☒ Non-governmental organizations – broadly defined as any organization that is not part of the government.

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3. Provide a brief description of your organization

The No-ChicoBrush group evolved in 2013 out of the Soil Health Initiative, an ongoing project directed at assisting farmers with implementing practices that improve soil health, profitability, and sustainability of farming in order to address the growing water availability and water quality concerns in the Gunnison and Colorado River Basins. The obvious tie to soil health is water. This group understands the severity of the issues related to water in Colorado and downstream on the Colorado River and realizes that without implementing creative water management strategies to improve water availability that farming in the lower Gunnison Basin will be increasingly difficult and will lead to an increasing strain on water resources. This is why local farmer leaders along with interested parties including Uncompahgre Valley Water Users Association managers, Colorado River District, Delta Montrose Electric Association, local business leaders, local lending institutions, Montrose and Delta County Commissioners, Trout Unlimited, The Nature Conservancy, and others have formed **a farmer led group focused on creating solutions to future water management and water quality issues in the basin.**

To address the issues associated with increasing demand, limited supply, agricultural water shortages and water quality, this group has envisioned a “Grand Design” for agricultural water use and deliveries in the Lower Gunnison Basin including the Uncompahgre and North Fork Valleys that is **driven by the simple idea of making the best use of water as possible.** The group foresees and wishes to encourage implementation of improvements to irrigation water systems that include common sense solutions such as canal lining, piping, on farm/system storage, and system optimizations as well as more multipart improvements such as increased hydroelectric production, and on- farm efficiency projects. The No-ChicoBrush group realizes that improved agricultural delivery systems may lead to increased consumptive use of water, in some cases, but that reductions in consumption by non-beneficial plants and evaporation coupled with deliveries driven by crop demands can result in numerous benefits.

Farmers in the North Fork, lower Gunnison and Uncompahgre valleys stand to benefit from the efficiency projects directly through improved crop yields, reduced operational inputs, and numerous other benefits from improved water quality and system reliability. Additionally, downstream users could see improved flows and water quality, while users upstream of the Uncompahgre would benefit as a result of the improved efficiency which could result in a decrease the likelihood of being called out during times of shortage

4. If the Contracting Entity is different then the Applicant (Project Sponsor or Owner) please describe the Contracting Entity here.

The contracting entity for this grant application is Colorado River Water Conservation District

5. Successful applicants will have to execute a contract with the CWCB prior to beginning work on the portion of the project funded by the WSRA grant. In order to expedite the contracting process the CWCB has established a standard contract with provisions the applicant must adhere to. A link to this standard contract is included in Appendix 3. Please review this contract and check the appropriate box.

☒ The Applicant will be able to contract with the CWCB using the Standard Contract

☐ The Applicant has reviewed the standard contract and has some questions/issues/concerns. Please

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be aware that any deviation from the standard contract could result in a significant delay between grant approval and the funds being available.

6. The Tax Payer Bill of Rights (TABOR) may limit the amount of grant money an entity can receive. Please describe any relevant TABOR issues that may affect the applicant.

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Part II. - Description of the Water Activity/Project

1. What is the primary purpose of this grant application? (Please check only one)

☒ Nonconsumptive (Environmental or Recreational)

☒ Agricultural

☐ Municipal/Industrial

☒ Needs Assessment

☒ Education

☒ Other Explain:

2. If you feel this project addresses multiple purposes please explain.

The intent of this project is to complete irrigation related research in the Gunnison Basin from an on-farm level to identify how to best improve agricultural water use and management. Increasing agricultural efficiency has been identified by many as the most cost effective method of addressing ag water shortages and has also been linked to addressing non-consumptive needs while improving water quality by reducing salt and selenium discharges from inefficient applications. This research project will help guide and implement efficiency projects by increasing knowledge about agricultural demands and what happens to water on the farm, water managers and farmers will be able to make more informed decisions about water and crop management. NoChicoBrush will use the data gathered to help educate and inform irrigators and water managers.

3. Is this project primarily a study or implementation of a water activity/project? (Please check only one)

☒ Study ☐ Implementation

4. To catalog measurable results achieved with WSRA funds can you provide any of the following numbers?

New Storage Created (acre-feet)

New Annual Water Supplies Developed, Consumptive or Nonconsumptive (acre-feet)

Existing Storage Preserved or Enhanced (acre-feet)

Length of Stream Restored or Protected (linear feet)

Length of Pipe/Canal Built or Improved (linear feet)

Efficiency Savings (acre-feet/year OR dollars/year – **circle one**)

Area of Restored or Preserved Habitat (acres)

Other -- Explain:

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This project will not directly improve water resources during the period of the project but rather will provide guidance to water users on how improvements can be made that will make marked improvements to water resources.

4. To help us map WSRA projects please include a map (Exhibit B) and provide the general coordinates below:

Latitude: 38deg. 29' 29"N

Longitude: 108deg. 07' 03"W

5. Please provide an overview/summary of the proposed water activity (no more than one page). Include a description of the overall water activity and specifically what the WSRA funding will be used for. A full **Statement of Work** with a detailed budget and schedule is required as **Exhibit A** of this application.

The intent of this project is to perform farmer-led research on irrigation practices that will provide important information for both improved agricultural operations and future water use challenges in the Basin. To accomplish this, the project will compare furrow irrigation to overhead sprinkler, drip, and big gun irrigation systems in order to address the following water supply and water quality questions:

- How much water do these different irrigation systems currently “use” or need for the same crop type?
- What is the actual water demand for these crops?
- What is the application efficiency of these different irrigation systems? How much water is applied to the crop and at what times, compared to actual crop demands throughout the growing season?
- How much water returns to the system from the farm as either surface run off or deep percolation? What is the quality of water returning to the system in terms of salinity, selenium, nutrients and sediment?
- How much irrigation water can be saved by converting on-farm irrigation from open furrow or flood irrigation methods to systemized irrigation?
- What are the yield differences between the four irrigation methods? (comparing similar fields and soil types)

Project proponents wish to answer the question of what are the effects of on-farm and system wide improvements on other water demands.

- How would large scale changes affect water quality in the Gunnison River?
- How can on-farm data help farmers improve their water use?
- What other benefits occur as a result of improved efficiency?
- What types of incentives need to take place to expand irrigation efficiency projects?

Project Outreach Component Objective: As the research projects progress, findings will be shared with local agricultural producers and water managers. This part of the project will rely on farmer to farmer education and farmer to government agency rather than only expert to farmer education. Additionally the project proponents will share the data gathered with area water groups including local conservancy districts and water user associations.

Part III. – Threshold and Evaluation Criteria

1. Describe how the water activity meets these **Threshold Criteria**. (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines.)
 - a) The water activity is consistent with Section 37-75-102 Colorado Revised Statutes.¹

¹ 37-75-102. Water rights - protections. (1) It is the policy of the General Assembly that the current system of allocating water within Colorado shall not be superseded, abrogated, or otherwise impaired by this article. Nothing in this article shall

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Yes, the proposed research project is consistent with the referenced Section of the Colorado Revised Statutes and will continue to protect the use of senior water rights in the State of Colorado.

- b) The water activity underwent an evaluation and approval process and was approved by the Basin Roundtable (BRT) and the application includes a description of the results of the BRT's evaluation and approval of the activity. At a minimum, the description must include the level of agreement reached by the roundtable, including any minority opinion(s) if there was not general agreement for the activity. The description must also include reasons why general agreement was not reached (if it was not), including who opposed the activity and why they opposed it. Note- If this information is included in the letter from the roundtable chair simply reference that letter.

The NoChicoBrush group gave a presentation to the Gunnison Basin Roundtable on November 4, 2013, to inform the Roundtable of the groups purpose and address any questions. Additionally, various members of the Roundtable regularly attend NoChicoBrush meetings and are up-to-date on the research study proposal being submitted.

NoChicoBrush submitted a grant application request to the Roundtable Project Screening Committee on January 6th and is prepared to present the application and address any questions at the full Roundtable meeting on February 3rd. NoChicoBrush is committed to working with the Roundtable to address any questions or concerns they may have about the proposed project.

be interpreted to repeal or in any manner amend the existing water rights adjudication system. The General Assembly affirms the state constitution's recognition of water rights as a private usufructuary property right, and this article is not intended to restrict the ability of the holder of a water right to use or to dispose of that water right in any manner permitted under Colorado law. (2) The General Assembly affirms the protections for contractual and property rights recognized by the contract and takings protections under the state constitution and related statutes. This article shall not be implemented in any way that would diminish, impair, or cause injury to any property or contractual right created by intergovernmental agreements, contracts, stipulations among parties to water cases, terms and conditions in water decrees, or any other similar document related to the allocation or use of water. This article shall not be construed to supersede, abrogate, or cause injury to vested water rights or decreed conditional water rights. The General Assembly affirms that this article does not impair, limit, or otherwise affect the rights of persons or entities to enter into agreements, contracts, or memoranda of understanding with other persons or entities relating to the appropriation, movement, or use of water under other provisions of law.

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- c) The water activity meets the provisions of Section 37-75-104(2), Colorado Revised Statutes.² The Basin Roundtable Chairs shall include in their approval letters for particular WSRA grant applications a description of how the water activity will assist in meeting the water supply needs identified in the basin roundtable's consumptive and/or non-consumptive needs assessments.

Yes, the proposed activity is consistent with the referenced section of the Colorado Revised Statutes and in no way impair any contractual or property rights related to the use of irrigation water.

- d) Matching Requirement: For requests from the **Statewide Fund**, the applicants is required to demonstrate a **20 percent** (or greater) match of the request from the Statewide Account. Statewide requests must also include a minimum match of **5 percent** of the total grant amount from Basin Funds. Sources of matching funds include but are not limited to Basin Funds, in-kind services, funding from other sources, and/or direct cash match. Past expenditures directly related to the project may be considered as matching funds if the expenditures occurred within 9 months of the date the application was submitted to the CWCBC. Please describe the source(s) of matching funds. (NOTE: These matching funds should also be reflected in your Detailed Budget in **Exhibit A** of this application)

Matching funds and In-kind contributions are being provided by Trout Unlimited, The Nature Conservancy, Colorado Water Institute, and local farmers.

We are well within the match requirement as reflected in the Project Budget in Exhibit A.

² 37-75-104 (2)(c). Using data and information from the Statewide Water Supply Initiative and other appropriate sources and in cooperation with the on-going Statewide Water Supply Initiative, develop a basin-wide consumptive and nonconsumptive water supply needs assessment, conduct an analysis of available unappropriated waters within the basin, and propose projects or methods, both structural and nonstructural, for meeting those needs and utilizing those unappropriated waters where appropriate. Basin Roundtables shall actively seek the input and advice of affected local governments, water providers, and other interested stakeholders and persons in establishing its needs assessment, and shall propose projects or methods for meeting those needs. Recommendations from this assessment shall be forwarded to the Interbasin Compact Committee and other basin roundtables for analysis and consideration after the General Assembly has approved the Interbasin Compact Charter.

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2. For Applications that include a request for funds from the **Statewide Account**, describe how the water activity/project meets all applicable **Evaluation Criteria**. (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines and repeated below.) Projects will be assessed on how well they meet the Evaluation Criteria. **Please attach additional pages as necessary.**

Evaluation Criteria – the following criteria will be utilized to further evaluate the merits of the water activity proposed for funding from the Statewide Account. In evaluation of proposed water activities, preference will be given to projects that meet one or more criteria from each of the three “tiers” or categories. Each “tier” is grouped in level of importance. For instance, projects that meet Tier 1 criteria will outweigh projects that only meet Tier 3 criteria. WSRA grant requests for projects that may qualify for loans through the CWCB loan program will receive preference in the Statewide Evaluation Criteria if the grant request is part of a CWCB loan/WSRA grant package. For these CWCB loan/WSRA grant packages, the applicant must have a CWCB loan/WSRA grant ratio of 1:1 or higher. Preference will be given to those with a higher loan/grant ratio.

1. Tier 1- Promotes Collaboration/Cooperation and Meeting Water Management Goals and Identified Water Needs:
 - A. This project is being forwarded with the cooperation and assistance from the Uncompahgre Valley Water Users Association, Tri- County Water Conservancy District, Delta Montrose Electric Association, Colorado River Water Conservation District, Trout Unlimited, The Nature Conservancy, the Colorado Water Institute, local farmers and others, to meet multiple demands and water needs.
 - B. Numerous sources including local farmers, Trout Unlimited, CSU, and The Nature Conservancy, are providing direct contributions and important in-kind donations for this project.
 2. Tier 2- Facilitating Water Activity Implementation:
 - C. This research and outreach project will affect how agricultural producers implement water efficiency projects in the future.
- Tier 3-Project Provides Statewide Value:
- D. The implemented project will provide valuable information about the benefits related to on-farm irrigation efficiency in western Colorado.
 - E. The information from this project can be used to address the growing demand and limited supply problems throughout the state.
 - F. Results of this project will address water quality concerns on the Gunnison River related to native species conservation including the Colorado Pikeminnow and Razorback Sucker, which are endangered species, as well the Roundtail Chub, Flannelmouth and Bluehead suckers which are species of special concern in the Gunnison and Colorado River.
 - G. This project will provide valuable, farmer-tested research data to agricultural producers, governmental organizations and water managers.
 - H. This project will address both consumptive and non-consumptive needs by evaluating how improvements in irrigation technology and irrigation water management can address both current and future water demands.

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The above statements are true to the best of my knowledge:

Signature of Applicant: 

Print Applicant's Name: Stephen Schrock

Project Title: NoChicoBrush Coordinator

Return an electronic version (hardcopy may also be submitted) of this application to:

Exhibit A
Statement of Work

WATER ACTIVITY NAME – NoChicoBrush Agricultural Water Research Project

GRANT RECIPIENT – Colorado River Water Conservation District

FUNDING SOURCE – Gunnison Basin Roundtable Basin Account, Water Supply Reserve Account

INTRODUCTION AND BACKGROUND

Provide a brief description of the project. (Please limit to **no more than 200 words**; this will be used to inform reviewers and the public about your proposal)

NoChicoBrush is a farmer led group focused on creating solutions to water management and water quality issues in the Gunnison River Basin. The group recognizes the severity of the issues related to water supply locally and downstream on the Colorado River and realizes that without taking action to improve water use, the future of agriculture in the Gunnison Basin is in jeopardy. That is why local farmers have partnered with municipal water providers, energy providers, conservation organizations, and others to improve agricultural water use through tools and management practices designed and tested by producers.

The purpose of this project is to compare different irrigation and agricultural management practices over a three year period in order to estimate the amount of water that can be saved by converting from furrow irrigation to overhead sprinkler, drip, or big gun irrigation systems and what the impacts are on farmers. Since this is a farmer-led, participatory research project, we will install tools that will allow producers to monitor field inputs (water applied, fertilizer, soil moisture, soil carbon, etc.) and outputs (surface runoff quantity and quality, sediment, crop yield, etc.) and adjust their management practices accordingly. This data will help improve agricultural operations at the farm level and help address Basin-wide water issues.

OBJECTIVES

List the objectives of the project

The project objectives will be to address the following water supply and water quality questions:

- How much water do furrow, overhead sprinkler, drip and big gun irrigation systems currently “use” for the same crop type?
- What is the actual water need for these crops?
- What is the application efficiency of these different irrigation systems? How much water is applied to the crop at what times compared to actual crop demands throughout the growing season?
- How much water returns to the system from the farm as either surface run-off or deep percolation?

- How much irrigation water can be saved by converting on-farm irrigation from open furrow or flood irrigation methods to systemized irrigation with advanced irrigation scheduling?
- What are the crop yield differences between the four irrigation methods?
- What is the quality of water returning to the system or to the rivers in terms of salinity, selenium, nutrients and sediment?

TASKS

Provide a detailed description of each task using the following format

TASK 1 – Research Design/Funding

Description of Task

NoChicoBrush and project partners will finalize the details, methods, and schedule of the three year research project to ensure that we will gather usable data for both agricultural producers and water planners and managers. Secure additional funding likely from other CWCB sources.

Method/Procedure

- Work with partners at the Colorado Water Institute to finalize study site needs, research variables, management practices, and measurement tools for scientifically sound data collection.
- Work with interested producers to enroll a minimum of four sites and a maximum of eight sites in the research project.
- Document existing irrigation, farming, and land management practices.
- Hire program assistant or agricultural related graduate student.

Deliverables

Final research project document that outlines the three-year study with a schedule of tasks, a lead person/organization for each task, and a description of the data to be collected, including how and where it will be collected.

Document detailing best management practices and producer expectations for research study.

TASK 2 – Research Setup & Equipment Test

Description of Task

With the research outline and identified study sites from Task 1, we will install data monitoring equipment at study sites, begin education process and outline by working with participating producers on data collection equipment and study expectations, and begin project outreach.

Method/Procedure

- Install water quality monitoring sites, soil moisture sensors, and flow monitors and other necessary hardware at each study site.
- Host training and outreach sessions for participating producers, members of NoChicoBrush, and other interested parties on demonstration properties.
- Hold three community presentations in 2014 to explain purpose of project and this year's activities.

Deliverables

Training materials for participating producers.
Presentation and outreach materials.

TASK 3 – Data Collection

Description of Task

Using the installed monitoring equipment, we will begin data measurement and collection for a three-year period starting with the 2014 irrigation season.

Method/Procedure

- Participating producers will collaboratively develop best management practices recommended by NoChicoBrush for their irrigation systems. These producers with assistance from NoChicoBrush will keep and submit records for their operation that includes field inputs (fertilizer, diesel fuel, electricity, etc.) and outputs (crop yield and quality).
- Field Assistant will collect data including crop demand, crop consumption, run-off water quality, delivered water quality, etc. according to schedule defined in Research Outline.
- NoChicoBrush and partners (TU, TNC, and CWI) will provide project management services.

Deliverables

- Producer and water budget data including yield and information about water management
- Monitoring equipment data from field assistant

TASK 4 – Data Analysis

Description of Task

Beginning in January 2015, NoChicoBrush will work with CWI and a consultant as needed to begin analyzing data from the field. Data analysis will conclude with information from the 2016 growing season.

Method/Procedure

- Analyze data from producers and field equipment, compare irrigation systems for similar crops and soil types.

Deliverable

Final report with project data, analysis, conclusions, and recommendations.

TASK 5 – Outreach & Education

Description of Task

This is an ongoing task that will involve community presentations, field visits, and other farmer-to-farmer outreach describing the project, its purpose, and findings to date.

Method/Procedure

- Make regular community presentations
- Hold annual field visits to the study sites

Deliverable

Presentation materials

Summary report of producer opinions on the study and interest, concerns, and/or questions about improving their own irrigation system.

TASK 6 – Final Reporting/Strategies for Scaling Up

Description of Task

The final project report will also include strategies for how to apply improved water use tools and techniques to significant acreage in the Basin. It will address the question of how we can take what is learned on a few farms and apply it Basin-wide to make a larger impact on water quality and quantity issues. This report will also use the data collected to illustrate potential effects of large scale irrigation improvements on water quality and water supplies.

Method/Procedure

NoChicoBrush members, and other interested parties will brainstorm ideas for creating a program for wide scale adoption of improved water use practices specific to the findings of the research.

Deliverable

Program outline.

REPORTING AND FINAL DELIVERABLE

Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

BUDGET

Provide a detailed budget by task including number of hours and rates for labor and unit costs for other direct costs (i.e. mileage, \$/unit of material for construction, etc.). A detailed and perfectly balanced budget that shows all costs is required for the State's contracting and purchase order processes. Sample budget tables are provided below. Please note that these budget tables are examples and will need to be adapted to fit each individual application. Tasks should correspond to the tasks described above.

Budgets

| NoChicoBrush WSRA Grant Request Budget | | | | | |
|---|----------------------|-------------------------|----------------------|--------------------------|--------------------|
| | In-Kind Contribution | Matching Funds & source | Other Grant requests | WSRA Grant Total Request | Total Project Cost |
| Project design and engineering | | \$1000 (TU) | \$10,000 | \$10,000 | \$21,000 |
| Instrumentation purchase and installation | | \$12,000 (TU & TNC) | \$20,000 | \$20,000 | \$52,000 |
| Project Management (3 yrs) | \$10,000 | \$30,000 (TU & TNC) | \$25,000 | \$20,000 | \$85,000 |
| Field Assistant (3yrs) | | \$7,000 (TNC & TU) | \$30,000 | \$25,000 | \$62,000 |
| Project Data Analysis (3yrs) | \$3,000 | \$9,000 (TU & TNC) | \$25,000 | \$12,000 | \$49,000 |
| Outreach (3yrs) | \$3,000 | | \$15,000 | \$3,000 | \$21,000 |
| Total Costs: | \$16,000 | \$59,000 | \$125,000 | \$90,000 | \$290,000 |

| NoChicoBrush WSRA Grant Request Dispersal by Year | | | |
|---|----------|----------|----------|
| Year | 2014 | 2015 | 2016 |
| Project design and engineering | \$10,000 | | |
| Instrumentation purchase and installation | | \$10,000 | \$10,000 |
| Project Management (3 yrs) | | \$10,000 | \$10,000 |
| Field Assistant (3yrs) | | \$13,000 | \$12,000 |
| Project Data Analysis (3yrs) | | \$5,000 | \$7,000 |
| Outreach (3yrs) | | | \$3,000 |
| Total= \$90,000 | \$10,000 | \$38,000 | \$42,000 |

Project Schedule

| <u>Tasks</u> | <u>Year 1</u> | | | | <u>Year 2</u> | | | | <u>Year 3</u> | | | |
|----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | 1 st | 2 nd | 3 rd | 4 th | 1 st | 2 nd | 3 rd | 4 th | 1 st | 2 nd | 3 rd | 4 th |
| 1 – Research Design | | | | | | | | | | | | |
| 2 – Project Set Up | | | | | | | | | | | | |
| 3 – Data Collection | | | | | | | | | | | | |
| 4 – Data Analysis | | | | | | | | | | | | |
| 5 – Outreach & Education | | | | | | | | | | | | |
| 6 – Strategies to Scale Up | | | | | | | | | | | | |
| Interim Update Reports | | | | | | | | | | | | |
| Final Report | | | | | | | | | | | | |