

TO: Board Members

THROUGH: Jeff Walker, Executive Administrator
John T. Dupnik, P.G., Deputy Executive Administrator, Water Science & Conservation
Todd Chenoweth, General Counsel
Rebecca Trevino, Chief Financial Officer

FROM: Cameron Turner, Manager, Agricultural Water Conservation
Kevin Kluge, Director, Conservation & Innovative Water Technology

DATE: April 19, 2018

SUBJECT: Fiscal Year 2018 Agricultural Water Conservation Grants

ACTION REQUESTED

Consider authorizing the Executive Administrator to negotiate and execute contracts with recommended applicants for Fiscal Year 2018 agricultural water conservation grants.

BACKGROUND

The Texas Water Development Board's (TWDB) Agricultural Water Conservation Grants Program offers grant funding to state agencies and political subdivisions for activities that promote water conservation in the state. Grant topics vary from year to year to address current issues in agricultural water conservation.

On October 31, 2017, the Board authorized the Executive Administrator to publish a request for applications for Fiscal Year 2018 agricultural water conservation grants, with up to \$600,000 in funding available through the following four project categories:

Category 1 Equipment cost share and technology transfer

Funding is available for equipment to monitor irrigation water use, implement irrigation scheduling, and/or improve upon irrigation efficiency.

Category 2 Demonstrations of innovative and alternative production systems

Funding is available for projects involving demonstrations of agricultural water conservation best management practices, innovative technologies, and alternative production systems. Projects should consist of field days,

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demonstrations, research, and education activities to promote the adoption of advanced water conservation technologies.

Category 3 Planning and design for irrigation system improvements

Funding is available for planning and design projects, including the development of plans, engineering designs, and environmental assessments for irrigation conveyance system improvement projects.

Category 4 Feasibility study of irrigating with produced water

Funding is available to determine the feasibility of irrigating with produced water from the oil and gas sector. Projects should identify any legal requirements, permitting constraints, barriers to entry, and end user needs and include an analysis of the cost associated with using produced water for agricultural irrigation purposes. Projects must identify the potential for conservation freshwater for irrigation of agricultural products.

KEY ISSUES

The request for applications appeared in the *Texas Register* on November 10, 2017. TWDB Contract Administration received 25 applications by the February 14, 2018, application deadline. A technical review panel reviewed and ranked the applications according to the rules contained in 31 Texas Administrative Code Chapter 367, ranking criteria outlined in the request for applications, and the application instructions.

Based on the scores from the technical review panel, the seven top-ranking applications are recommended for funding.

- The Wintergarden Groundwater Conservation District, for a metering equipment cost share project;
- The El Paso County Water Improvement District No. 1, for an equipment cost share project;
- The Delta Lake Irrigation District, for a planning and design project for irrigation system improvements;
- The High Plains Underground Water Conservation District No. 1, for an irrigation scheduling equipment cost share project;
- The El Paso County Water Improvement District No. 1, for a project involving the planning and design for irrigation system improvements;
- The Culberson County Groundwater Conservation District, for a metering equipment cost share project; and,
- El Paso Water Utilities, for a drip irrigation demonstration and technology transfer project in Hudspeth County.

The following table includes a list of the applicants, the grant funding amounts requested, and the funding recommendations. Additional information on each individual project proposal is included in Attachments A and B.

Table 1. Applicants and funding recommendation for Fiscal Year 2018 agricultural water conservation grants.

Category	Entity	Amount requested	Funding recommendation
1	Wintergarden GCD	\$150,000.00	\$150,000.00
1	El Paso County WID #1	\$50,000.00	\$50,000.00
3	Delta Lake ID	\$20,000.00	\$20,000.00
1	High Plains UWCD #1	\$150,000.00	\$150,000.00
3	El Paso County WID #1	\$50,000.00	\$50,000.00
1	Culberson County GCD	\$50,000.00	\$50,000.00
2	El Paso Water Utilities	\$150,000.00	\$130,000.00
1	Delta Lake ID	\$105,000.00	\$0.00
1	North Plains GCD	\$150,000.00	\$0.00
2	Texas A&M AgriLife Research (Uvalde)	\$126,563.56	\$0.00
1	Mesquite GCD	\$50,000.00	\$0.00
1	La Feria ID - Cameron County #3	\$49,845.09	\$0.00
1	Edwards Aquifer Authority	\$150,000.00	\$0.00
3	Santa Cruz ID #15	\$52,000.00	\$0.00
1	Panhandle GCD	\$150,000.00	\$0.00
3	Adams Garden ID #19	\$27,937.50	\$0.00
1	Engelman ID	\$80,000.00	\$0.00
4	Texas Tech University	\$99,590.00	\$0.00
2	Texas Tech University	\$150,000.00	\$0.00
4	University of Texas - Bureau of Economic Geology	\$100,000.00	\$0.00
2	Texas A&M AgriLife Research (Amarillo & Lubbock)	\$150,000.00	\$0.00
2	Texas Parks and Wildlife Department	\$26,000.00	\$0.00
2	Tarleton State University	\$137,755.00	\$0.00
4	Texas A&M Engineering Experiment Station	\$99,995.00	\$0.00
2	Tarleton State University	\$92,939.00	\$0.00
Total		\$2,417,625.15	\$600,000.00

GCD: groundwater conservation district

ID: irrigation district

UWCD: underground water conservation district

WID: water improvement district

RECOMMENDATION

The Executive Administrator recommends approval of this item, as the projects will further water conservation in the state by supporting the implementation of the irrigation conservation water management strategies identified in the 2017 State Water Plan.

Attachment(s):

Attachment A: Summary of Project Proposals Recommended for Funding
Attachment B: Summary of Project Proposals Not Recommended for Funding

Wintergarden Groundwater Conservation District
Installation of Flow Meters on Irrigation Wells

Category 1. Equipment cost share and technology transfer

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$150,000.00
Local cash or in-kind	\$150,000.00
Total study costs	\$150,000.00

This project is recommended for TWDB grant funding, in an amount not to exceed \$150,000.00.

Participants:

The Wintergarden Groundwater Conservation District and agricultural producers

Project area:

This project would occur within the boundaries of the Wintergarden Groundwater Conservation District, which includes all or parts of Dimmit, LaSalle, and Zavala counties, and is located within the South Central Texas Regional Water Planning Area (Region L).

Project summary:

This project would involve the purchase and installation of flowmeters on irrigation wells to enable the accurate measurement of actual water use, allowing for the more efficient use of groundwater resources and implementation of water conservation strategies. The district is located in an area with limited water resources and a growing water demand; however, the district currently has limited information on groundwater used by the agricultural industry. The metered water use data would improve upon the district's groundwater availability model and put the district in a better position to monitor water usage and justify conservation and drought plans. The district plans to actively engage agricultural producers through an educational program to explain the benefits of participating in the program and the value of the data to the district.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and 2016 South Central Regional Water Plan (Region L). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

The project would involve a three-year installation period, followed by five years of reporting irrigation water use data and water savings information.

Attachment A: Summary of Project Proposals Recommended for Funding

El Paso County Water Improvement District No. 1

**Expanding the Capacity of District Telemetry Systems
to improve Water Management and Conservation**

Category 1. Equipment cost share and technology transfer

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$50,000.00
Local cash or in-kind	\$75,000.00
Total study costs	\$125,000.00

This project is recommended for TWDB grant funding, in an amount not to exceed \$50,000.00.

Participants:

The El Paso County Water Improvement District No. 1, consulting engineering firm, and agricultural producers

Project area:

The project would occur within the boundaries of the El Paso County Water Improvement District No. 1, in El Paso County, in the Far West Texas Regional Water Planning Area (Region E).

Project summary:

The project involves the purchase and installation of equipment to expand upon the district's telemetry system. The project would allow the district to improve water delivery management and efficiency and reduce losses due to spills, which would lead to water savings. The benefit of providing near real-time data on water elevations within canals and laterals, would assist the district in conservation efforts to balance irrigators' water needs with the irrigation delivery water flows. The project would also involve educational outreach through presentations at area conferences and water symposiums.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and 2016 Far West Texas Regional Water Plan (Region E). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

The project would involve a one-year installation period, followed by five years of reporting irrigation water use data and water savings information.

Delta Lake Irrigation District

**Planning and Design for Canal Improvements,
Water Conservation through Canal to Pipeline Conversion**

Category 3. Planning and design of irrigation system improvements

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$20,000.00
Local cash or in-kind	\$40,000.00
Total study costs	\$60,000.00

This project is recommended for TWDB grant funding, in an amount not to exceed \$20,000.00.

Participants:

The Delta Lake Irrigation District, Texas A&M AgriLife Extension, Texas Water Resource Institute, consulting engineering firms, private industry representatives, and agricultural producers

Project area:

This project would occur within the boundaries of the Delta Lake Irrigation District, located in Hidalgo County, in the Rio Grande Regional Water Planning Area (Region M).

Project summary:

The project involves the planning and design for irrigation system improvements in the Delta Lake Irrigation District's distribution system. The district would subcontract with an engineering firm to development the plans and conduct the necessary environmental assessment for a canal lining and canal-to-pipeline conversion project involving four sections of canal within the district. The district would partner with Texas A&M AgriLife Extension and the Texas Water Resource Institute to host a workshop, to promote the adoption of best management practices and explain the benefits and urgent need for the project and the importance of irrigation water conservation to agricultural producers, the district, and the region.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and 2016 Rio Grande Regional Water Plan (Region M). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

The project would involve a one-year period to develop the construction plans and perform environmental assessments, leading to the subsequent construction project.

Attachment A: Summary of Project Proposals Recommended for Funding

High Plains Underground Water Conservation District No. 1

Assistance in Irrigation Management

Category 1. Equipment cost share and technology transfer

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$150,000.00
Local cash or in-kind	\$300,000.00
Total study costs	\$450,000.00

This project is recommended for TWDB grant funding, in an amount not to exceed \$150,000.00.

Participants:

The High Plains Underground Water Conservation District No. 1, private industry representatives, and agricultural producers

Project area:

The project would occur within the boundaries of the High Plains Underground Water Conservation District No. 1, encompassing all or parts of Armstrong, Bailey, Castro, Cochran, Crosby, Deaf Smith, Floyd, Hale, Hockley, Lamb, Lubbock, Lynn, Parmer, Potter, Randall, and Swisher counties, primarily in the Llano Estacado Regional Water Planning Area (Region O), and partially in the Panhandle Regional Water Planning Area (Region A).

Project summary:

This project would involve cost share opportunities for agricultural producers to purchase and install telemetry equipment, to be connected with existing center pivot and subsurface drip irrigation systems. The program allows the district to quantify water savings acquired from the irrigation management equipment. The district will work with industry representatives to provide education and outreach to area producers.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and the 2016 Llano Estacado Regional Water Plan (Region O). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

The project would involve a one-year installation period, followed by five years of reporting irrigation water use data and water savings information.

El Paso County Water Improvement District No. 1

**Designing Improvements to the Riverside Canal
for Improved Conveyance and Conservation**

Category 3. Planning and design of irrigation system improvements

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$50,000.00
Local cash or in-kind	\$50,000.00
Total study costs	\$100,000.00

This project is recommended for TWDB grant funding, in an amount not to exceed \$50,000.00.

Participants:

The El Paso County Water Improvement District No. 1, consulting engineering firm, and agricultural producers

Project area:

The project would occur within the boundaries of the El Paso County Water Improvement District No. 1, in El Paso County, in the Far West Texas Regional Water Planning Area (Region E).

Project summary:

The project involves the planning and design for improvements to the largest canal system within the district, the Riverside Canal and Riverside Extension Canal. The consulting engineering firm would develop the construction plans, perform the necessary environmental assessments, conduct a feasibility study of linking the Riverside Project operations to a planned regulating reservoir, and identify opportunities for implementing automated gates throughout the canal system. The subsequent construction project would lead to significant water savings benefiting agricultural and municipal customers. In addition, it would also improve stormwater management and flood mitigation. The project would assess various funding options for the construction project, including reviewing the potential for SWIFT funding. The district would host educational workshops and a conservation symposium as a part of this project.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and 2016 Far West Texas Regional Water Plan (Region E). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

The project would involve approximately a one-year period to develop the construction plans, perform environmental assessments, host workshops, and deliver a final report.

Attachment A: Summary of Project Proposals Recommended for Funding

Culberson County Groundwater Conservation District

Metering and Monitoring Project to Implement District Telemetry Systems to Improve Water Management and Conservation

Category 1. Equipment cost share and technology transfer

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$50,000.00
Local cash or in-kind	\$50,000.00
Total study costs	\$100,000.00

This project is recommended for TWDB grant funding, in an amount not to exceed \$50,000.00.

Participants:

Culberson County Groundwater Conservation District, consulting engineering firm, and agricultural producers

Project area:

The project would occur within the boundaries of the Culberson County Groundwater Conservation District, in the Far West Texas Regional Planning Area (Region E).

Project summary:

The project involves the purchase and installation of metering, monitoring, and weather station devices with remote telemetry capability to provide accurate total water flow amounts and depth reports to the district office. This investment will assist the district in monitoring water use and loss, increasing the efficiency of irrigation systems, and conserving water.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and the 2016 Far West Texas Regional Water Plan (Region E). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

The project would involve a two-year installation period, followed by five years of metering data and water savings reporting.

El Paso Water Utilities

Comparison of Drip Irrigation to Flood and Center Pivot Irrigation Systems in Hudspeth County

Category 2. Demonstrations of innovative and alternative production systems

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$150,000.00
Local cash or in-kind	\$200,000.00
Total study costs	\$350,000.00

This project is recommended for TWDB grant funding, in an amount not to exceed \$130,000.

Participants:

El Paso Water Utilities, Dell Valley Ranch Management, private industry, university systems, and agricultural producers

Project area:

This project would occur in Hudspeth County, in the Far West Texas Regional Water Planning Area (Region E).

Project summary:

This project would involve the purchase and installation of a drip irrigation system on farm land owned by El Paso Water in Hudspeth County. Dell Valley Ranch Management is contracted with El Paso Water Utilities to manage the operations of the farm. The project would allow El Paso Water and Dell Valley Ranch Management to host field days to demonstrate, to area agricultural producers, the water savings potential and improved crop productivity of drip irrigation, relative to customary flood and center pivot irrigation methods. The land is currently flood irrigated. It is anticipated that the drip irrigation system will reduce water use by 20 to 30 percent, and increase crop production by up to 35 percent.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and the 2016 Far West Texas Regional Water Plan (Region E). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

The project would involve a one-year installation period and a two-year demonstration period, followed by the submission of a comprehensive final report.

Attachment B: Summary of Project Proposals Not Recommended for Funding

Delta Lake Irrigation District

**Rubicon Gates and Flow Meters:
Water Conservation through improved Technology and Management**

Category 1. Equipment cost share and technology transfer

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$105,000.00
Local cash or in-kind	\$315,000.00
Total study costs	\$420,000.00

This project is not recommended for TWDB grant funding.

Participants:

The Delta Lake Irrigation District, Texas A&M AgriLife Extension, private industry representatives, and agricultural producers

Project area:

This project would occur within the boundaries of the Delta Lake Irrigation District, located in Hidalgo County, in the Rio Grande Regional Water Planning Area (Region M).

Project summary:

This project would involve the purchase and installation of Rubicon gates designed to reduce water loss by monitoring and controlling water within the irrigation delivery system. This project will also include an educational component to inform district staff, leadership, agricultural producers, other irrigation districts, and the public of the how the project increases water use efficiency, improves management, and conserves water.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and 2016 Rio Grande Regional Water Plan (Region M). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

The project would involve a one-year installation period, followed by five years of reporting irrigation water use data and water savings information.

Attachment B: Summary of Project Proposals Not Recommended for Funding

North Plains Groundwater Conservation District

Irrigation Conservation Initiative

Category 1. Equipment cost share and technology transfer

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$150,000.00
Local cash or in-kind	\$150,000.00
Total study costs	\$300,000.00

This project is not recommended for TWDB grant funding.

Participants:

The North Plains Groundwater Conservation District, private industry representatives, and agricultural producers

Project area:

The project would occur within the boundaries of the North Plains Groundwater Conservation District, encompassing all or parts of Dallam, Hansford, Hartley, Hutchinson, Lipscomb, Moore, Ochiltree, and Sherman counties, in the Panhandle Regional Water Planning Area (Region A).

Project summary:

This project would provide agricultural producers with cost share funding to purchase and install irrigation conservation tools and technologies, such as soil-moisture probes and pivot monitoring and control systems. Participating agricultural producers would be eligible for up to 50 percent cost share of eligible conservation practices. This project is supported by outreach, demonstrations, and meter reimbursements offered through other district programs funded by TWDB, as well as the district's Master Irrigator Program.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and 2016 Panhandle Regional Water Plan (Region A). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

The project would involve a two-year installation period, followed by five years of reporting irrigation water use data and water savings information.

Texas A&M AgriLife Research

Research and Demonstration of Integrated Control Irrigation and Drip Technology

Category 2. Demonstrations of innovative and alternative production systems

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$126,563.56
Local cash or in-kind	\$126,563.56
Total study costs	\$253,127.12

This project is not recommended for TWDB grant funding.

Participants:

Texas A&M AgriLife Research in Uvalde, private industry, and agricultural producers

Project area:

This project would occur at Texas A&M AgriLife Research Station in Uvalde County, in the South Central Texas Regional Water Planning Area (Region L).

Project summary:

This project consists of a public-private partnership with the Texas A&M AgriLife Research Station in Uvalde, involving the installation and demonstration of an innovative drip irrigation control system developed by Eco-Drip, a Texas-based company, in conjunction with Jain Irrigation. The project would demonstrate the benefits of this integrated control system and associated soil-moisture sensors in a deficit-irrigated field with subsurface drip irrigation, compared to a high tunnel greenhouse production system and a hydroponic production system. Field day demonstrations would provide agricultural producers in the area with an opportunity to learn about the water savings and increased productivity benefits of these innovative and alternative production systems.

This project supports implementation of irrigation conservation water management strategies in the 2017 State Water Plan and the South Central Texas Regional Water Plan (Region L). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

This project would involve a three-year demonstration period, including the submission of a comprehensive final report.

Mesquite Groundwater Conservation District

Irrigation Water Use Measurement

Category 1. Equipment cost share and technology transfer

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$50,000.00
Local cash or in-kind	\$50,000.00
Total study costs	\$100,000.00

This project is not recommended for TWDB grant funding.

Participants:

The Mesquite Groundwater Conservation District and agricultural producers

Project area:

The project would occur within the boundaries of the Mesquite Groundwater Conservation District, encompassing all or parts of Briscoe, Childress, Collingsworth, and Hall counties, primarily in the Region B Regional Water Planning Area, and partially in the Llano Estacado Regional Water Planning Area (Region O).

Project summary:

This project would involve cost share opportunities for agricultural producers to purchase and install metering equipment. The meters would provide participating agricultural producers with a tool to improve upon their irrigation water management. The data obtained through the meters would improve upon the district’s ability to make informed decisions regarding the current state of the aquifer, how much water is actually consumed, and the impacts of production on the water level.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and 2016 Llano Estacado Regional Water Plan (Region O). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

The project would involve a two-year installation period, followed by five years of reporting irrigation water use data and water savings information.

La Feria Irrigation District, Cameron County No. 3

Main Canal Gate Automation – Phase I

Category 1. Equipment cost share and technology transfer

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$49,845.09
Local cash or in-kind	\$49,845.09
Total study costs	\$99,690.18

This project is not recommended for TWDB grant funding.

Participants:

The La Feria Irrigation District, consulting engineering firm, and agricultural producers

Project area:

The project would occur within the boundaries of the La Feria Irrigation District, within Cameron County, in the Rio Grande Regional Water Planning Area (Region M).

Project summary:

This project would involve the construction and installation of automated canal gates with remote monitoring and measurement capabilities. The project would allow the district to maintain canal levels and optimize water flows, providing real-time information to staff and virtually eliminating water losses from canal overflows. The project would benefit the district and agricultural producers through reduced pumping costs, water savings, and improved reliability of irrigation water deliveries.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and 2016 Rio Grande Regional Water Plan (Region M). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

The project would involve a one-year installation period, followed by five years of reporting irrigation water use data and water savings information.

Attachment B: Summary of Project Proposals Not Recommended for Funding

Edwards Aquifer Authority

**2018 EAA Groundwater Conservation Grant:
Efficient Irrigation Equipment**

Category 1. Equipment cost share and technology transfer

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$150,000.00
Local cash or in-kind	\$200,000.00
Total study costs	\$350,000.00

This project is not recommended for TWDB grant funding.

Participants:

The Edwards Aquifer Authority, private industry representatives, and agricultural producers

Project area:

The project would occur within the boundaries of the Edwards Aquifer Authority, in Atascosa, Bexar, Caldwell, Comal, Guadalupe, Hays, Medina, and Uvalde counties, in the South Central Texas Regional Water Planning Area (Region L).

Project summary:

This project involves the administration of a competitive conservation grant program. The program is designed to assist agricultural producers with implementing conservation plans and improving the water use efficiency. The Authority solicits applications from irrigation permit holders and selects projects that result in the installation of efficient irrigation systems and technologies, thus eliminating outdated and inefficient irrigation methods.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and 2016 South Central Texas Regional Water Plan (Region L). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

The project would involve a one-year solicitation and installation period, followed by five years of reporting irrigation water use data and water savings information.

Santa Cruz Irrigation District No. 15

A Planning and Feasibility Report for a United Delivery Pipeline and Related Conservation

Category 3. Planning and design of irrigation system improvements

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$52,000.00
Local cash or in-kind	\$57,038.32
Total study costs	\$109,038.32

This project is not recommended for TWDB grant funding.

Participants:

The Santa Cruz Irrigation District No. 15, United Irrigation District, Hidalgo County Irrigation District No. 1, consulting engineering firm, and agricultural producers

Project area:

The project would occur in Hidalgo County, in the Rio Grande Regional Water Planning Area (Region M).

Project summary:

The project would assess the feasibility of constructing a new pipeline to enable water deliveries from the United Irrigation District (UID) to the Santa Cruz Irrigation District No. 15 (SCID#15), which currently relies on Hidalgo County Irrigation District No. 1 (HCID#1) for its water deliveries. The current water supply is inadequate to meet the needs of the SCID#15 and requires several lift stations to irrigate the west side of the district. This project would determine the excess capacity of UID, survey existing canals of SCID#15, determine potential pipeline routes, design pump and pipeline capacities, prepare cost estimates and water savings potential, identify energy savings, evaluate potential funding sources (including SWIFT), assess cost alternatives regarding flat rate and delivery charges, prepare the planning and feasibility report, and host a public hearing.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and the 2016 Rio Grande Regional Water Plan (Region M). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

The project would involve a two-year planning, design, and feasibility study, followed by the submission of a final report.

Attachment B: Summary of Project Proposals Not Recommended for Funding

Panhandle Groundwater Conservation District

Agricultural Production Metering Adjacent to Existing Study Areas

Category 1. Equipment cost share and technology transfer

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$150,000.00
Local cash or in-kind	\$195,570.00
Total study costs	\$345,570.00

This project is not recommended for TWDB grant funding.

Participants:

The Panhandle Groundwater Conservation District and agricultural producers

Project area:

The project would occur within the boundaries of the Panhandle Groundwater Conservation District, which consists of all or parts of Armstrong, Carson, Donley, Gray, Hutchinson, Potter, Roberts, and Wheeler counties, in the Panhandle Regional Water Planning Area (Region A).

Project summary:

This project would allow the district to expand upon their existing metering program. The district would provide agricultural producers with cost share funding for the purchase of metering equipment installed on irrigation wells within the district, but currently outside of established study areas. The data from the meters would assist the district in making informed decisions about the management of the aquifer.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and 2016 Panhandle Regional Water Plan (Region A). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

The project would involve a two-year installation period, followed by five years of reporting irrigation water use data and water savings information.

Adams Garden Irrigation District No. 19

System Interconnection with La Feria Irrigation District Cameron County No. 3

Category 3. Planning and design of irrigation system improvements

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$27,937.50
Local cash or in-kind	\$27,937.50
Total study costs	\$55,875.00

This project is not recommended for TWDB grant funding.

Participants:

Adams Garden Irrigation District No. 19, La Feria Irrigation District Cameron County No. 3, consulting engineering firms, and agricultural producers

Project area:

This project would occur in Cameron County, in the Rio Grande Regional Water Planning Area (Region M).

Project summary:

This project involves the planning, design, and construction of a 30-inch irrigation pipeline to facilitate an interconnection between the La Feria Irrigation District’s Wilson Canal and the Adams Gardens Canal. The project would involve the completion of a hydraulic study, engineering design work, a geotechnical study, and construction plans for the proposed interconnection project. The project also includes an educational meeting to review the proposed project benefits and construction plans with the board of directors, staff, and agricultural producers from both districts. The project would eliminate seepage losses occurring in the Adams Gardens Canal.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and the 2016 Rio Grande Regional Water Plan (Region M). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

This project involves a one-year engineering planning and design project. The district intends to pursue construction of the project following the completion of the engineering and environmental work.

Engelman Irrigation District

**Purchase and Installation of a Water Measuring Device
for Agricultural Water Conservation Monitoring**

Category 1. Equipment cost share and technology transfer

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$80,000.00
Local cash or in-kind	\$120,000.00
Total study costs	\$200,000.00

This project is not recommended for TWDB grant funding.

Participants:

The Engelman Irrigation District, consulting engineering firm, and agricultural producers

Project area:

The project would occur within the boundaries of the Engelman Irrigation District, in Hidalgo County, in the Rio Grande Regional Water Planning Area (Region M).

Project summary:

This project involves the purchase and installation of metering and telemetry equipment, to accurately measure water deliveries received by the district. (The district does not have a river pumping station to divert its allotted water from the Rio Grande, therefore it has contracted with the Donna Irrigation District to divert and deliver water to the district.) The metering and telemetry equipment is the first phase in a multi-phase project to accurately measure irrigation water deliveries, identify critical areas of water loss, and target efforts to replace or rehabilitate existing lines and canals.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and 2016 Rio Grande Regional Water Plan (Region M). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

The project would involve a one-year installation period, followed by five years of reporting irrigation water use data and water savings information.

Texas Tech University

Feasibility of Produced Water Desalination for Irrigation Water Augmentation

Category 4. Feasibility study of irrigating with produced water

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$99,590.00
Local cash or in-kind	\$0.00
Total study costs	\$99,590.00

This project is not recommended for TWDB grant funding.

Participants:

Texas Tech University, private consultants from water treatment and energy generation firms, the oil and gas industry, agricultural producers, and local groundwater conservation districts

Project area:

This project would occur in Gaines, Howard, and Martin counties, located in the Region F Water Planning Area and the Llano Estacado Regional Water Planning Area (Region O).

Project summary:

This project involves a feasibility study for the generation of irrigation water from highly saline produced water from oil and gas operations in Texas. The project would identify all legal and permitting requirements, legal and economic barriers to entry, the needs of the end users of this new water source, and the associated costs (pretreatment and desalination, blending the treated effluent, transmission and storage). The project would conduct focus groups with the board members of the three local groundwater conservation districts in the area, as well as agricultural producers. The project proposal also identifies about 50 oil and gas operators in the three counties in the proposed study area, many of whom have already been contacted by the project team and made aware of the potential opportunity to be engaged as interested stakeholders.

This project would indirectly support the conservation water management strategies in the 2017 State Water Plan and 2016 regional water plans. If funded, the project would serve the public interest and potentially further water conservation in the state, if proven feasible. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

This project would involve a one-year feasibility study, including the submission of a comprehensive final report.

Texas Tech University System

**Irrigation Scheduling Using Unmanned Aerial System
Remote Sensing and Weather Data**

Category 2. Demonstrations of innovative and alternative production systems

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$150,000.00
Local cash or in-kind	\$157,819.00
Total study costs	\$307,819.00

This project is not recommended for TWDB grant funding.

Participants:

Texas Tech University System, the Texas Alliance for Water Conservation project participants, and other agricultural producers

Project area:

This project would occur at the Texas Tech Quaker Research Farm in Lubbock County, in the Llano Estacado Regional Water Planning Area (Region O).

Project summary:

The overall goal of the project is to provide crop producers with a robust tool that aids in reducing unnecessary irrigation while maximizing profitable production. The project would improve crop water use efficiency using smart irrigation scheduling technologies that integrate unmanned aerial systems (UAS) remote sensing and weather data. The project involves research and development at the Quaker Research Farm in Lubbock County, and the incorporation of the technology into the existing irrigation scheduling tool developed through the Texas Alliance for Water Conservation (TAWC) project. The TAWC field days would provide an forum for promoting the adoption of the tool.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and the 2016 Llano Estacado Regional Water Plan (Region O). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

This project involves two years of research demonstration, followed by the submission of a comprehensive final report.

**University of Texas,
Bureau of Economic Geology**

Feasibility of Irrigation with Produced Water in Texas

Category 4. Feasibility study of irrigating with produced water

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$100,000.00
Local cash or in-kind	\$90,017.00
Total study costs	\$190,017.00

This project is not recommended for TWDB grant funding.

Participants:

University of Texas-Bureau of Economic Geology, oil and gas industry, and agricultural producers

Project area:

This project would occur in the Permian Basin, located primarily in the Region F Regional Water Planning area and the Llano Estacado Regional Water Planning Area (Region O).

Project summary:

The objective of this study is to assess the feasibility of using produced water for irrigated agriculture in the Texas High Plains. This project consists of three tasks: the primary feasibility assessment, a stakeholder workshop, and a final report. The scope of the project would address the feasibility by examining the following issues: 1) review of case studies of produced water for irrigation, 2) regulatory aspects of produced water management, 3) availability of produced water, quality of produced water, 4) treatment options for produced water, 5) availability of land for irrigation within plays, 6) fate of solutes from produced water in soils and aquifers, 7) crop tolerances and potential crop yields, 8) potential application volumes of produced waters, and 9) the economic feasibility of using produced water for irrigation. The stakeholder workshop would provide an opportunity for TWDB, the Texas Railroad Commission, regulatory groups, industry partners, agricultural extension agents, water disposal companies, and others to provide input.

This project indirectly supports the conservation water management strategies in the 2017 State Water Plan and 2016 regional water plans. If funded, the project would serve the public interest and potentially further water conservation in the state, if proven feasible. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

This project would involve a two-year feasibility study, including a stakeholder workshop and the submission of a comprehensive final report.

Texas A&M AgriLife Research

Deploying New Corn Genetics with High Water Use Efficiency, Drought and Heat Tolerance, and Fumonisin Resistance for Texas Corn Production

Category 2. Demonstrations of innovative and alternative production systems

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$150,000.00
Local cash or in-kind	\$150,000.00
Total study costs	\$300,000.00

This project is not recommended for TWDB grant funding.

Participants:

Texas A&M AgriLife Research in Lubbock and Amarillo, commodity groups, groundwater conservation districts, and agricultural producers

Project area:

This project would occur at Texas A&M AgriLife Research fields in Lubbock County, Hale County, and Potter County, in the Llano Estacado Regional Water Planning Area (Region O) and the Panhandle Regional Water Planning Area (Region A).

Project summary:

This project is designed to demonstrate the advantages of new fumonisin-resistant drought and heat-tolerant short-season corn hybrids for sustainable crop production under limited irrigation, and to prepare the hybrids with biotech-traits for widespread commercial use. The demonstrations would result in improved farm profitability and conservation of water and soil resources. The project involves multiple field days for agricultural producers, crop consultants, and policy makers, as well as the development of publications and outreach efforts to promote the project results.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan, the 2016 Llano Estacado Regional Water Plan (Region O), and the Panhandle Regional Water Plan (Region A). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

This project would involve a two-year demonstration period, followed by the submission of a comprehensive final report.

Attachment B: Summary of Project Proposals Not Recommended for Funding

Texas Parks & Wildlife Department

Water Conservation Landscape Exhibit

Category 2. Demonstrations of innovative and alternative production systems

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$26,000.00
Local cash or in-kind	\$26,000.00
Total study costs	\$52,000.00

This project is not recommended for TWDB grant funding.

Participants:

Texas Parks & Wildlife Department, Friends of the Texas Freshwater Fisheries Center, and the public

Project area:

This project would occur at the Texas Freshwater Fisheries Center in Henderson County, in the East Texas Regional Water Planning Area (Region I).

Project summary:

This project involves the development of a water conservation landscape exhibit to demonstrate best management practices for stormwater management, some of which are applicable to agricultural lands. The exhibit would support educational programs, including the existing rainwater harvesting demonstration system that may be applicable to agricultural producers, such as dairy farmers, greenhouse production systems, and feedlots with covered structures in their operations. The system would demonstrate the potential for captured rainwater to be used for the irrigation of landscapes and agricultural crops, or as a water source for livestock.

This project supports implementation of conservation water management strategies in the 2017 State Water Plan and the 2016 East Texas Regional Water Plan (Region I). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

This project would involve a one-year installation and demonstration period, followed by the delivery of a comprehensive final report.

**Tarleton State University,
Texas Institute for Applied Environmental Research**

Demonstration of Crop Irrigation with Treated Produced Water

Category 2. Demonstrations of innovative and alternative production systems

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$137,755.00
Local cash or in-kind	\$137,768.00
Total study costs	\$275,523.00

This project is not recommended for TWDB grant funding.

Participants:

Tarleton State University – Texas Institute for Applied Environmental Research, Texas A&M AgriLife Extension, oil and gas industry collaborators, and agricultural producers

Project area:

This project would be located at a demonstration farm on the Tarleton State University Campus, in Erath County, in the Brazos Regional Water Planning Area (Region G).

Project summary:

This project would include a demonstration of crop irrigation with treated produced water. The project would investigate the ability of plant derived polysaccharides as adsorbents/flocculants to remediate oil-field produced water sufficiently for use in irrigating economically important plants. The project involves the transport of produced water from collaborators working with oil and gas entities in East Texas. The project would compare the effects of irrigating with the produced water against tap water. The project team would discuss the research results with agricultural stakeholders to assess their concerns and determine their interest in using produced water in their operations, to reduce irrigation use from freshwater sources.

This project supports the implementation of conservation water management strategies in the 2017 State Water Plan and the 2016 Brazos Regional Water Plan (Region G). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

This project would involve a two-year study period, including the submission of a comprehensive final report.

**Texas A&M Engineering Experiment Station,
Texas Center for Applied Technology**

**Produced Water for Agriculture Use:
Modeling Water Management Economics and User Cost Savings**

Category 4. Feasibility study of irrigating with produced water

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$99,995.00
Local cash or in-kind	\$0.00
Total study costs	\$99,995.00

This project is not recommended for TWDB grant funding.

Participants:

Texas A&M Engineering Experiment Station-Texas Center for Applied Technology, Texas A&M Petroleum Engineering Department, Texas A&M AgriLife Research and Extension, the oil and gas industry, and agricultural producers

Project area:

This project would occur in Pecos County, in the Far West Texas Regional Water Planning Area (Region E).

Project summary:

The goal of this project is to evaluate cost-effective sources of nontraditional water to be used for agriculture through two objectives: 1) development of a user-friendly model to calculate costs for alternative water sources of water as compared to end user water sources, and 2) testing of the model with onsite data generated from mobile treatment of produced water and crop irrigation information in West Texas. This integrated research and extension project seeks to identify nontraditional water sources from the oil and gas sector that can be treated and safely used by agriculture to replace dwindling freshwater supplies.

This project indirectly supports the conservation water management strategies in the 2017 State Water Plan and 2016 regional water plans. If funded, the project would serve the public interest and potentially further water conservation in the state, if proven feasible. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

This project would involve a one-year feasibility study, including the submission of a comprehensive final report.

**Tarleton State University,
Texas Institute for Applied Environmental Research**

Best Management Practices and Alternative Production Systems to Conserve Water

Category 2. Demonstrations of innovative and alternative production systems

Requested project funding, local match, and funding recommendation:

TWDB amount requested	\$92,939.00
Local cash or in-kind	\$92,949.00
Total study costs	\$185,888.00

This project is not recommended for TWDB grant funding.

Participants:

Tarleton State University – Texas Institute for Applied Environmental Research

Project area:

This project involves a study area in the middle Brazos River Basin that also overlies the Seymour Aquifer, including all or parts of Archer, Baylor, Callahan, Dickens, Eastland, Fisher, Haskell, Jones, King, Knox, Nolan, Scurry, Shackelford, Stephens, Stonewall, Taylor, Throckmorton, and Young counties, located primarily in the Brazos Regional Water Planning Area (Region G).

Project summary:

This project involves research to identify the agricultural best management practices and alternative production systems that save water and increase agricultural producers' income. The project would use the Nutrient Tracking Tool and the Agricultural Policy Environmental eXtender (APEX) computer model to simulate the flow of water, sediment, and nutrients throughout the watershed.

This project supports the implementation of irrigation conservation water management strategies in the 2017 State Water Plan and the 2016 Brazos Regional Water Plan (Region G). If funded, the project would serve the public interest and further water conservation in the state. The TWDB grant funding would supplement rather than replace the funding of the applicant.

Project duration (to be determined during contract negotiations, if funded):

This project would involve a two-year study period, including the submission of a comprehensive final report.