

ADWR CONCEPTUAL GRANT PROPOSAL

To: Arizona Department of Water Resources, Tucson Active Management Area

From: Jing Luo PhD, P.E., Apex Applied Technology, Inc.
Michael Caporaso, WestLand Resources, Inc.

Date: June 1, 2015, Revised October 16, 2015

**RE: IRRIGATION CONSERVATION ASSISTANCE PROGRAM –
CONCEPTUAL ADWR CONSERVATION ASSISTANCE GRANT PROPOSAL**

BACKGROUND

With the advent of shortages on the Colorado River and reduction of available excess Central Arizona Project (CAP) water, agriculture water users in the Tucson Active Management Area (TAMA) will become more dependent on groundwater resources. Many agricultural producers in TAMA have been receiving CAP water for irrigation of crops in lieu of using groundwater under the Arizona Department of Water Resources (ADWR) Groundwater Savings Program. Access to excess CAP water and M&I CAP subcontractors have facilitated this program for area farmers, which has contributed to rises in groundwater levels in the Avra Valley sub-basin; however, groundwater resources will again be a primary source of irrigation water supply for agriculture.

Approximately 20 years ago under its Conservation Assistance Program, ADWR began funding the Irrigation Conservation Assistance Program (ICAP) in the TAMA, similar to the programs currently operating in the Pinal and Phoenix Active Management Areas. The ICAP was proven successful in assisting cooperating area farmers with the principals of Irrigation Water Management (IWM) that included irrigation scheduling, water application rates, and quantification of irrigation water savings.

The ICAP was originally developed by ADWR as a cooperative effort between local, state, and federal agencies to reduce agricultural groundwater withdrawals. Oversight for ICAP was provided by ADWR's Agricultural Specialist. The ICAP program manager worked directly with the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Tucson Field Office and Pima Natural Resources Conservation District (NRCD) who provided in-kind services to the program. It is noted that NRCS/NRCD are not able to provide this level of oversight or commitment for ICAP.

During its operation in the mid-1990's, ICAP reported annual water savings for cotton and wheat crops specific to the fields serviced and monitored under the program. In the year 1996, ICAP reported providing assistance to 15 wheat fields and 23 cotton fields with a combined area of 2,264 acres and a measured water savings of 1,397 acre-feet. In 1997, 14 wheat fields and 17 cotton fields were monitored with a combined area of 2,151 acres and a measured water savings of 1,824 acre-feet. The ICAP reported that most farmers participating in the program were applying ICAP data to other irrigated fields making actual water savings even greater.

STATEMENT OF PURPOSE

To obtain a Conservation Assistance Grant from ADWR to reinstate ICAP in the TAMA to provide IWM education and technical assistance to agricultural producers to increase irrigation efficiencies and reduce

groundwater withdrawals. Investigate available grant funding opportunities to implement on-farm infrastructure improvements to increase irrigation efficiency.

PROGRAM DESCRIPTION AND GOALS

The ICAP is a service oriented program that proposes to employ a part-time project manager to oversee one full-time irrigation specialist to provide IWM assistance to farm operators in the TAMA. The ICAP Irrigation Specialist will work closely with each farmer, irrigation foreman, and/or irrigator to provide technical assistance specific to IWM practices. This service will provide recommendations specific to soil moisture monitoring, soil moisture availability for optimal plant growth, irrigation scheduling, and irrigation application rates. Resource information will include meteorological data, computer based irrigation scheduling software, smart phone applications, and traditional on-site interactions. The ICAP Irrigation Specialist will also provide educational information specific to agricultural Best Management Practices program established by ADWR.

It is the intent of ICAP to encourage farm managers to become self-sufficient with the implementation of IWM practices and tools, allowing the ICAP Irrigation Specialist to extend services over increased acreage. Participants will also be encourage to extrapolate ICAP field data for use over larger farming areas under their management. ICAP will identify on-farm infrastructure improvement needs and cost-share assistance funding opportunities from available grant programs.

PROPOSED ICAP STRUCTURE

It is proposed that ADWR Conservation Assistance Grant funds for ICAP be directed for the implementation of ICAP. A private-public partnership is proposed through contractual agreements between ADWR and Apex Applied Technology, Inc. (AATech), operated in Tucson, Arizona. WestLand Resources Inc. (WestLand) is proposing to provide ICAP technical assistance for first year start up as a subconsultant to AATech. It is proposed that ADWR will contract directly with AATECH who would be responsible for personnel, office accommodations, administrative services, outreach, field services, and administrative management.

AATECH, independent from ICAP, will pursue alternative grant funding opportunities for farmers interested in implementing on-farm infrastructure improvement projects. Having the ability to assist farmers to pursue available grant funding opportunities to install physical on-farm water conservation improvements has significant potential to conserve groundwater resources.

GENERAL TASKS/SCOPE OF SERVICES

The proposed tasks and services for ICAP include the following:

- Enroll a minimum of 10 participants to provide IWM assistance and irrigation scheduling services.
 - Target farms irrigating high water use crops such as alfalfa and summer crops (e.g. cotton).
 - Continue technical assistance for winter crops (e.g. wheat).
- Evaluate soil moisture for purposes of available soil water for crop growth and irrigation scheduling.
 - Use “feel method” procedures for estimating soil moisture content.
 - Investigate and implement available soil moisture monitoring tools.

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- Provide irrigation scheduling dates as determined by actual field soil moisture monitoring and/or data generated by the University of Arizona-Arizona Meteorological weather station using the AZSCHED computer model.
 - Provide participants with actual irrigation dates and application rates.
 - Investigate and recommend applicable technologies to assist with irrigation scheduling.
 - Estimate irrigation application rates and calculate application (single event) and seasonal irrigation efficiencies for each ICAP participant.
 - Quantify groundwater savings.
 - Provide ICAP participants with information on agricultural BMPs.
 - Maintain a computer generated tracking system to monitor and report program progress.
 - Provide bi-monthly ICAP updates and prepare one comprehensive annual report.

It is proposed that a detailed Scope of Services would be provided upon direction from ADWR to proceed.

BUDGET OVERVIEW

A detailed budget will be provided upon review and approval of this conceptual proposal by ADWR. At this time it is estimated that ICAP will require first year annual funding of \$90,000. Funds would be provided by ADWR Conservation Assistance Grant program. The majority of the funds are proposed to be used to employ one part-time ICAP Project Manager and a full-time Irrigation Specialist. Remaining funds will be used to support operating and administrative expenses related to the implementation of ICAP and consultant services (WestLand) to provide ICAP technical assistance for first year program start-up. A detailed budget will be provided when directed to proceed by ADWR.



United States Department of Agriculture

August 28 2015

Mr. Jeff Tannler
Arizona Department of Water Resources
3550 N. Central Avenue, 2nd Floor
Phoenix, Arizona 85012-2105

Re: Letter of Support for "Tucson AMA Irrigation Conservation Assistance Program (ICAP)"

Dear Mr. Tannler:

The USDA-Natural Resources Conservation Service (NRCS), Tucson Field Office is pleased to support to the "Tucson AMA Irrigation Conservation Assistance Program (ICAP)". As we all know that Arizona Department of Water Resources (ADWR) is committed to the conservation of water resources. The proposed program is to reduce agricultural water use in the Tucson Active Management Area (AMA), where groundwater withdrawals are most prevalent.

The ICAP historically was a cooperative program with ADWR, NRCS, and the Pima Natural Resources Conservation District. Although the NRCS cannot administer ICAP, it provides its full support for the program. The NRCS can coordinate with ICAP staff and the farming community to bridge cooperation and technical guidance. The ICAP provides irrigation scheduling and water application rate information to participating farmers. A computer program which integrates crop type, field and soil conditions, and weather conditions is used by ICAP to assist farmers to schedule irrigation events leading to the conservation of groundwater.

ICAP intends to reach out to farm managers and irrigators to provide technical information to implement Irrigation Water Management (IWM) practices. The ICP will encourage the implementation of the practices, which promote efficient agricultural water use. A significant portion of groundwater use in the Tucson AMA is used for the production of agricultural crops. NRCS believes that the agriculture sector has the potential to contribute greatly to the conservation of groundwater resources, especially in the light of limiting Central Arizona Project water supplies. Ongoing technical assistance and education is essential to maintain and enhance conservation efforts. As a direct outcome of ICAP, we expect to see more local farmers and producers who are motivated to conserve water resources, which in turns promotes the NRCS mission of "helping people to help the land".

Sincerely,

Kristen Egen, District Conservationist
USDA-NRCS, Tucson Field Office
3241 N. Romero Rd.
Tucson, AZ., 85705

Natural Resources Conservation Service
3241 N. Romero Rd, Tucson, Arizona 85705
Tel. (520)292-2999 • Fax (855) 848-4339

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October 21, 2015

Mr. Jeff Tannler
Arizona Department of Water Resources
3550 N. Central Avenue, 2nd Floor
Phoenix, Arizona 85012-2105

Re: Letter of Support for ADWR Water Conservation Program Grant

Dear Mr. Tannler:

BKW Farms, Inc. is an agricultural service corporation which serves irrigation water to farms in the Marana area. BKW is one of three largest agricultural water providers in the Marana region and began farming in 1939.

BKW Farms supports the goals of restoring the Irrigation Conservation Assistance Program (ICAP) in the Tucson Active Management Area. We began using CAP water for irrigation in 1993. As you know, shortages are predicted for the Colorado River which will directly impact agriculture's access to CAP water. If there are CAP water shortages for agriculture, many farmers will have to increase their use of groundwater supplies.

A Water Conservation Program grant award by the Arizona Department of Water Resources for ICAP would help farmers increase their irrigation efficiency. If the grant is awarded, BKW Farms will help the ICAP Program Manager and Irrigation Specialist meet its stated goals by helping to coordinate with the farmers that BKW serves.

Sincerely,

A handwritten signature in black ink, appearing to read "Brian Wong", is written over a long, sweeping horizontal line that extends to the right.

Brian Wong
President

AVRA VALLEY IRRIGATION AND DRAINAGE DISTRICT
P O BOX 2305
CORTARO, ARIZONA 85652
TEL: (520) 791-2409

September 7th, 2015

Re: Letter of Support for the Irrigation Conservation Assistance Program in Tucson AMA Proposed by Apex Applied Technology, Inc.

Mr. Tannler,

Avra Valley Irrigation and Drainage District (AVIDD) is pleased and honored to write this Letter of Support for the establishment of Irrigation Conservation Assistance Program (ICAP) in Tucson Active Management Area proposed by Apex Applied Technology, Inc. (AATech).

AVIDD is a political subdivision located in Tucson Active Management Area, along the Santa Cruz River and west Interstate 10 in northern Pima County. The District includes over 40 square miles of agriculture and rural lands, which are generally sloped from southwest to northeast. Currently, AVIDD has over 50 privately owned/leased irrigation wells with pumping capacity in the range of 1,000 – 3,000 gallons per minute each. Each well either has its own distribution system or shares one with nearby wells. Most of the wells in the District were drilled in the 1940s and 1950s. These wells were originally equipped with natural gas driven, oil lubricated, vertical turbine well pumps. The annual irrigation water demand of the entire District can be as high as 40,000. Energy and water efficiency improvements are most needed in AVIDD.

Water is extremely important for the agriculture in Arizona. The District is actively involved in all kinds of agricultural activities in Southern Arizona. The members in AVIDD will definitely benefit from the proposed ICAP Program. The goals and objectives this program meet the best needs and interests of the agricultural producers in our District.

Dr. Jing Luo, PE with Apex Applied Technology, Inc. (AATech) has worked closely with AVIDD and successfully obtained numerous Federal grants to improve energy and water use efficiency in the District. Without her assistance and the financial support from Bureau of Reclamation, many water conservation projects would not happen. Since, 2010, AATech actively works in the rural areas in Arizona and has brought over \$2,000,000 Federal funding to these agricultural communities. They are currently working to bring another \$7 million Federal funding to the State.

AVIDD would like to express our whole-hearted support for the ICAP Program proposed by AATech and its partners. Please feel free to contact me at: (520) 990-8888 or johnkaijr@yahoo.com with any question.

Sincerely,



John Kai Jr., President
Avra Valley Irrigation and Drainage District

September 15th, 2015

Re: Letter of Support for an Irrigation Conservation Assistance Program in Tucson and Marana

To Whom It May Concern:

My name is Tom Glover. I am a lifetime cotton farmer in Marana, Arizona. I am writing this letter to support the establishment of an Irrigation Conservation Assistance Program in our area. We are very much blessed for always having sufficient groundwater for our crops for many generations in the past. However, recent years the cost to pump water has gone up significantly, which greatly impacts the economics of our operation. We are always interested in exploring opportunities to improve water and energy efficiency and reduce water costs. However, technical assistance is not always made available to small to mid-size farms like us.

Re-establishing an Irrigation Conservation Assistance Program in this region will certainly benefit all the farmers in Tucson and Marana. The program will provide the most need technology and technical assistance educating and guiding us to be more efficient in water and energy uses. I and my fellow farmers strongly support this exciting program!

Sincerely,

A handwritten signature in cursive script that reads "Tom Glover".

Tom Glover
Cotton Farmer in AVIDD

September 15th, 2015

Mr. Jeff Tannler, AMA Director
Arizona Department of Water Resources
3550 N. Central Avenue, 2nd Floor
Phoenix, Arizona 85012-2105

Re: Letter to Support the Establishment of an Irrigation Conservation Assistance Program in Tucson Active Management Area

Dear Mr. Tannler

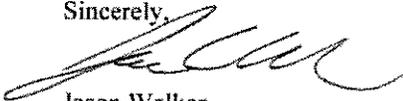
I am Jason Walker, current owner of Walker Farms in Marana. As a third generation farmer, I farm a total of 2,850 acres of agricultural land. I am just a guy who knows our world needs us to take care of it. Looking towards the future, the cost and volatility of water should be of primary concern of all the farmers in the southwest region of the Country. Our fields are irrigated through a combination of groundwater wells and CAP water, which originated from Colorado River. With extended years of drought, the Colorado River and its tributaries continue to recede at alarming rates, the irrigation cost continue to increase, leaving farming a smaller opportunity to be profitable.

It's absolutely our responsibility to conserve our finite resources. In the past four years, working with NRCS, we have not only replaced badly damaged concrete irrigation ditches but also leveled the adjoining fields. Through this effort, we are able to transition our first 175 acres field to a level basin surface irrigation system. This basin now is 20-30% more water efficient than the graded surface system. We are also going to put in the first central pivot sprinkler system in Marana.

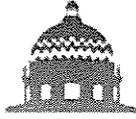
Our experience has demonstrated that there are lots of room and opportunities to improve water and energy efficiency in our current farming practices. I am only one farm in a major farming community. Farming takes everyone. We are all in this together and we have to protect the opportunity for the future.

For that, I am whole-hearted support the establishment of the Irrigation Conservation Assistance Program in Tucson Active Management Area. Through this Program, we will see more and more farmers working together protecting our finite water resources for our future generations. I am looking forward to work with Apex Applied Technology, Inc. and other stakeholder on this exciting endeavor. Should you have any question on this letter of support, please contact me at 602-620-9003.

Sincerely,



Jason Walker
Walker Farms



PIMA COUNTY

REGIONAL WASTEWATER RECLAMATION DEPARTMENT

201 NORTH STONE AVENUE
TUCSON, ARIZONA 85701-1207

JACKSON JENKINS
DIRECTOR

PH: (520) 724-6500
FAX: (520) 724-9635

September 23rd, 2015

Mr. Jeff Tannler, AMA Director
Arizona Department of Water Resources
3550 N. Central Avenue, 2nd Floor
Phoenix, Arizona 85012-2105

Re: Letter of Support to Reinstate the Irrigation Conservation Assistance Program (ICAP) in TAMA

Dear Mr. Tannler,

I am writing this letter to express Pima County Regional Wastewater Reclamation Department (PCRWRD)'s support to reinstate the Irrigation Conservation Assistance Program (ICAP) in Tucson Active Management Area (TAMA).

As one of the major wastewater management agencies in Southern Arizona, PCRWRD plays an important role of collecting, treating, and reusing water as a vital resource for the prosperity and longevity of human beings. PCRWRD is always seeking and supporting integrated activities and programs, which maximize the benefits of water resource in Pima County.

Many agricultural producers in TAMA have been receiving Central Arizona Project (CAP) water for irrigation of crops in lieu of using groundwater under the Arizona Department of Water Resources (ADWR) Groundwater Savings Program. With the advent of shortages on the Colorado River and reduction of available excess CAP water, agriculture water users in the TAMA will become more dependent on groundwater resources.

We understand the goals and objectives of the ICAP program are to provide Irrigation Water Management (IWM) education and technical assistance to agricultural producers to increase irrigation efficiencies and reduce groundwater withdrawals. The project team will also investigate available grant funding opportunities from either local or Federal sources to implement on-farm infrastructure improvements to increase irrigation efficiency.

At PCRWRD, we believe that a program like this is beneficial to the rate payers in Pima County. We would like to endorse the efforts to reinstate this timely program in TAMA.

Sincerely,

A handwritten signature in black ink, appearing to read "Jackson Jenkins".

Jackson Jenkins, Director
Pima County Regional Wastewater Reclamation Department



SOUTHERN ARIZONA WATER USERS ASSOCIATION
PO Box 35481
Tucson AZ 85740-5481

October 23, 2015

Mr. Jeff Tannler
Arizona Department of Water Resources
3550 N. Central Avenue, 2nd Floor
Phoenix, Arizona 85012-2105

MEMBERS

Aqua Water Co-op

BKW Farms

*Community Water Company
of Green Valley*

FICOM Farms Water Co.

Flowing Wells Irrigation District

*Green Valley Domestic Water
Improvement District*

Kal Farms

*Town of Marana Municipal
Water System*

Metro Water District

Oro Valley Water Utility

*Pima County Regional Wastewater
Reclamation Department*

Red Rock Utilities, LLC

Sahuarita Water Company

*Town of Sahuarita Wastewater
Treatment and Reclamation Facility*

Tucson Water Department

Re: Letter of Support to Implement the Irrigation Conservation Assistance Program (ICAP) in the Tucson Active Management Area

Dear Mr. Tannler:

The Southern Arizona Water Users Association (SAWUA) is pleased to provide this Letter of Support to the Arizona Department of Water Resources (ADWR) for the development of the Irrigation Conservation Assistance Program (ICAP) in the Tucson Active Management Area (TAMA). The ICAP was historically an integral part of ADWR's overall Water Conservation Assistance Program. Providing a serviced based Irrigation Water Management (IWM) program for the agricultural sector would benefit the conservation of valuable groundwater resources.

Water conservation is an important factor in balancing our current and future water demands and supplies for all water use sectors. The ICAP objectives are well aligned with the mission to promote water conservation for our municipal water users. This program will focus on water conservation in the agricultural sector, providing individual technical assistance, and the use of innovative technologies to schedule irrigations and implement effective IWM practices. Reducing agricultural water use will become increasingly important, especially during times of Central Arizona Project (CAP) water shortages and increased dependence on groundwater.

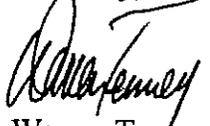
It is understood that the ADWR Conservation Grant Program has the funds to support ICAP in the TAMA which have been collected from the agricultural sector as part of the annual water use fees. SAWUA supports the use of these funds for ICAP through its endorsement of this program.

CONTACT INFORMATION

Mary Bauer, Executive Assistant
(520) 406-2229
marybauer@gmail.com

Stuart Goodman, Capitol Lobbyist
(602) 277-0911
sgoodman@goodmanschwartz.com

Sincerely,



Warren Tenney
President

Achieving long-term quality water for Southern Arizona

www.sawua.org