Investigation to Develop Aids to Support Evaluation and Formulation of System Automation Applications

January 11, 2005

2004 Water Use Efficiency
Proposal Solicitation Package

Agricultural Water Management Council
Mike Wade
Kathryn Charlton

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APPENDIX A: Project Information Form

Applying for: ❑ Urban ☑ Agricultural

1. (Section A) **Urban or Agricultural Water Use Efficiency Implementation Project**
   - ❑ (a) implementation of Urban Best Management Practice, #_____
   - ❑ (b) implementation of Agricultural Efficient Water Management Practice, #_____
   - ❑ (c) implementation of other projects to meet California Bay-Delta Program objectives, Targeted Benefit # or Quantifiable Objective #, if applicable _____
   - ❑ (d) Specify other: _____

2. (Section B) **Urban or Agricultural Research and Development; Feasibility Studies, Pilot, or Demonstration Projects; Training, Education or Public Information; Technical Assistance**
   - ❑ (e) research and development, feasibility studies, pilot, or demonstration projects
   - ❑ (f) training, education or public information programs with statewide application
   - ☑ (g) technical assistance
   - ❑ (h) other

3. Principal applicant (Organization or affiliation): Agricultural Water Management Council

4. Project Title: Investigation to Develop Aids to Support Formulation and Evaluation of System Automation Applications

5. Person authorized to sign and submit proposal and contract:

Name, title	Mr. Mike Wade, Executive Director
Mailing address	Agricultural Water Management Council 717 K Street, Suite 511 Sacramento, CA 95814
Telephone	(916) 441-7868
Fax.	(916) 441-7864
E-mail	mwade@agwatercouncil.org

6. Contact person (if different):	Name, title.	Kathryn Charlton, Asst. Exec. Dir.
	Mailing address.	Agricultural Water Management Council 717 K Street, Suite 511 Sacramento, CA 95814
	Telephone	(916) 441-7868
	Fax.	
	E-mail	(916) 441-7864
		kcharlton@agwatercouncil.org

7. Grant funds requested (dollar amount): *(from Table C-1, column VI)*	**$283,900**
8. Applicant funds pledged (dollar amount):	$0
9.Total project costs (dollar amount): *(from Table C-1, column IV, row n)*	$283,900
10. Percent of State share requested (%) *(from Table C-1)*	100%
11. Percent of local share as match (%) *(from Table C-1)*	0%
12. Is your project locally cost effective? *Locally cost effective means that the benefits to an entity (in dollar terms) of implementing a program exceed the costs of that program within the boundaries of that entity.* *(If yes, provide information that the project in addition to Bay-Delta benefit meets one of the following conditions: broad transferable benefits, overcome implementation barriers, or accelerate implementation.)*	❑ (a) yes ☑ (b) no
11. Is your project required by regulation, law or contract? If no, your project is eligible. If yes, your project may be eligible only if there will be accelerated implementation to fulfill a future requirement and is not currently required. *Provide a description of the regulation, law or contract and an explanation of why the project is not currently required.*	❑ (a) yes ☑ (b) no

_____
_____
_____
_____
_____

12. Duration of project (month/year to month/year):	**12/1/2005 thru 9/30/2007**

13. State Assembly District where the project is to be conducted: Statewide

14. State Senate District where the project is to be conducted: Statewide

15. Congressional district(s) where the project is to be conducted: Statewide

16. County where the project is to be conducted: Statewide

17. Location of project (longitude and latitude) Statewide

18. How many service connections in your service area (urban)? Not Applicable

19. How many acre-feet of water per year does your agency serve? Not Applicable

20. Type of applicant (select one):

- ❑ (a) City
- ❑ (b) County
- ❑ (c) City and County
- ❑ (d) Joint Powers Authority
- ❑ (e) Public Water District
- ❑ (f) Tribe
- ☑ (g) Non Profit Organization
- ❑ (h) University, College
- ❑ (i) State Agency
- ❑ (j) Federal Agency
- ❑ (k) Other
  - ❑ (i) Investor-Owned Utility
  - ❑ (ii) Incorporated Mutual Water Co.
  - ❑ (iii) Specify _____

21. Is applicant a disadvantaged community? If 'yes' include annual median household income. (Provide supporting documentation.)

- ❑ (a) yes, _____ median household income
- ☑ (b) no

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By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form has the legal authority to submit the proposal on behalf of the applicant;

There is no pending litigation that may impact the financial condition of the applicant or its ability to complete the proposed project;

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant;

The applicant will comply with all terms and conditions identified in this PSP if selected for funding; and

The applicant has legal authority to enter into a contract with the State.

Mike Wade	Mike Wade, Executive Director	January 11, 2005
Signature	Name and title	Date

STATEMENT OF WORK, SECTION 1: Relevance and Importance

The Agricultural Water Management Council (AWMC) proposes to explore, identify and evaluate existing system automation applications in California.

Automation of canal systems (or "system automation") is listed as one of the efficient water management practices of the AB 3616 MOU and as a federal Best Management Practice according to the 1999 and 2003 criteria. This reflects the general acknowledgement that system automation can often contribute to improved water management.

Goals & Objectives:
The goal of this proposed effort is to develop reference materials that could be used by irrigation water purveyors to help in formulating appropriate system automation applications and in assessing the potential costs and benefits associated with implementing those applications. The following objectives have been identified as contributing to this goal:

- Characterize and evaluate existing system automation applications with respect to objectives, conceptual design and system components.

- Characterize and evaluate various system automation implementation approaches.

- Characterize and evaluate the costs and benefits associated with system automation.

Project Need:
Water managers are actively striving to find cost-effective solutions to improve water management. Automated delivery systems are a proven and feasible solution to better water management, water conservation and reduced operating costs. System automation has spread rapidly among irrigation water purveyors, especially over the past 10 years, due to the convergence of the need to improve canal operations and the substantial progress made toward improving the quality, reliability and affordability of system automation components. The primary benefits generally associated with system automation are reduction of spillage losses and increased flexibility in farm deliveries. In turn, increased delivery flexibility enables growers to do a better job of irrigating on-farm.

Modernizing irrigation delivery systems produces multiplying benefits to the State, water purveyors, and water users by opening new opportunities for growers to further their on-farm water use efficiency. Growers have voiced repeatedly at various forums the immediate need for more flexible water deliveries in order to be able to continue on-farm water use efficiency improvements. Without flexible water delivery, on-farm water conservation opportunities become limited. Growers are forced to take advantage of irrigation water when it is available and do not have access to the water when the crop needs it. As a result growers are unable to operate an optimal irrigation schedule for water conservation and crop

quality. This project will provide irrigation water purveyors with the most cost effective options to install automated technologies and promote flexible water delivery.

System automation has the potential to contribute to many of the California Bay-Delta Authority Targeted Benefits and Quantifiable Objectives by producing substantial water savings and providing direct control for in-stream flows and timing and improving water quality. The ability for water managers to recognize and react promptly to changing hydrologic and operating conditions has demonstrated consistent improvements to water conservation, economic output and environmental restoration. Real time automation technology is revolutionizing the management of water projects where automation has increased the capability to closely monitor canal and reservoir flows, accurate timing of water deliveries and reduction in spills and waste.

There remain many districts that have not considered or implemented system automation, suggesting that significant potential remains for broader application statewide. One of the impediments to more rapid adoption is the lack of references and guidelines to help districts formulate appropriate system automation applications and assess the merits of system automation relative to their specific objectives and system characteristics.

STATEMENT OF WORK, SECTION 2: Technical and Scientific Merit

Scope of Work

The following tasks would be performed to accomplish the goals and objectives of the proposed investigation.

Task 1 – Identify system automation applications in California.

Work to be Performed: The AWMC's *EWMP Database* and DWR records will be accessed to identify agricultural water suppliers that have implemented system automation in some form. (Note: this task will address suppliers that deliver 10,000 acre-feet or more annually, on average.) Agricultural water suppliers with open canal systems that do not appear in the records will be contacted and interviewed to determine whether they have considered or implemented system automation. The result will be a comprehensive data base that identifies the status of system automation purveyor by purveyor, statewide.

Deliverables:

1. A digital data base (in Microsoft Excel or Access) identifying agricultural water purveyors in California serving more than 10,000 acre-feet annually, and summarizing the status of system automation for each.

2. A Technical Memorandum describing how the data base was developed.

Task 2 – Characterize system automation objectives, applications and components.

Work to be Performed: The water suppliers with automated canal systems identified in Task 1 will be screened to no more than 20 for more detailed evaluation under this task. The objective of screening will be to identify a representative range of types of systems and automation applications. The selected suppliers will be surveyed to *identify district objectives* for installing automated features, to *characterize the conceptual design of the system automation application* (including the essential characteristics of the canal system), and to *document the automation components used*. This will involve a review of available district water management plans augmented with follow-up contacts with district staff to validate, update and expand the information contained in the water management plans.

Identification of objectives will focus on the various benefits that the water supplier anticipated when they decided to pursue system automation, and the actual benefits that they feel they have achieved. These targeted and actual benefits will be correlated with system attributes to assess whether the targeted benefits were realistic and to develop a basis for predicting the potential benefits of automation on other similar systems.

Characterization of each system automation application will involve developing a conceptual framework for identifying "typical" applications, and use of the framework to describe the various systems encountered. The conceptual soundness and viability of each selected application will be assessed.

There are many components used in implementing system automation, and typically many name brands available for each component. The objective will be to identify the various components and name brands used in the following categories:

1. sensors
2. RTUs/PLCs
3. radio/antenna/communication system
4. electrical power supply (solar, grid, etc.)
5. enclosures/theft and security provisions
6. motors
7. gate operators
8. software
9. other

Deliverables:

1. A tabular summary together with supporting text, representing descriptions of the various system automation applications reviewed, and the work performed to conduct the survey. This will cover objectives, application concepts and system components as discussed above.

2. A glossary defining each system component and how it operates in the automated system.

3. Conceptual framework for categorizing typical system automation applications, and the system characteristics to which each typical application generally applies.

Task 3 – Characterize System Automation Implementation Approaches

Work to be Performed: Because implementing system automation usually poses some degree of risk of malfunction, most water purveyors approach implementation in a cautious, step-wise manner. Typically, the first step is to use automation to monitor selected system parameters, and factor acquired data into operations decisions on a more frequent, timely basis. An example of this is monitoring of operational spillage at key sites, and providing information to operators so that they can make system adjustments to reduce spillage. The reliability of sensors, PLCs/RTUs and communications components is usually tested in this phase. Once basic reliability is established, the next step is typically to establish remote control of selected hydraulic structures, enabling operators at a central location to adjust water control structures based on system status acquired via automation. Some applications progress only this far, providing significant benefit. Other systems progress a step further, where certain system functions are locally controlled with only periodic operator involvement; for example, automated gate adjustments as needed to maintain constant upstream water levels or downstream flows (as periodically specified by operators). There are many permutations involving different combinations of the above phases.

A representative sample of up to six (6) systems will be selected for further evaluation from among those inventoried in Tasks 1 and 2. Based on field inspections and interviews with staff, the selected systems will be characterized with respect to the following aspects of implementation:

- How the purveyor approached and made the decision to proceed with system automation, with particular emphasis on primary driving forces.
- Whether and how the purveyor engaged outside services for design and implementation of the application.
- The timeline and sequencing used for implementation and utilization of system automation capabilities.
- Organizational, management and staffing changes that accompanied implementation.
- Problems encountered and lessons learned (would they do it the same way or differently, if they had to do it over?).

The information gathered will be analyzed with the objective of identifying prerequisites for successful implementation, and developing guidelines for formulating successful implementation approaches, given stated objectives and system characteristics.

Deliverable:

1. A Technical Memorandum describing lessons learned and providing recommendations to assist purveyors in developing successful system automation implementation approaches.

Task 4 – Detailed Evaluation of Selected System Automation Applications

Work to be Completed: Up to six (6) system automation applications (ideally the same systems addressed in Task 3) will be selected for further technical evaluation, covering a range in level of perceived success, from highly successful to moderately successful (or unsuccessful) applications. The evaluation will address the following factors:

- Technical merits of application design
- Effectiveness of implementation approach
- Quantitative assessment of benefits and costs associated with the application
- Means used to measure water savings, if any

This will involve field inspection of the selected systems, interviews with pertinent staff members and collection and analysis of available data. The analysis will begin with a characterization of the original distribution system and the system automation application using the conceptual framework developed in Task 2. The objective will be to determine whether the application was correctly conceived relative to the system characteristics.

The implementation approach will be described and critiqued, with a view of identifying the factors that contributed to success and those that would be approached differently if the process were to be repeated.

Staff interviews will (among other things) document the district's perception of how well their system fulfills its automation objectives, where the system fell short of expectations and how the district would redesign its system, if the process were to be repeated. Using available data, together with necessary assumptions, "best possible" quantitative estimates of the costs and benefits of the system automation applications will be prepared. Costs and benefits will be categorized as either "direct" or "indirect", with direct costs and benefits being the ones that were anticipated when the system was planned, and the indirect ones as those that were not anticipated prior to system implementation. An analysis of the net benefits provided by the system will be developed.

The procedures used to estimate any water savings benefits will be described and evaluated relative to standardized water conservation savings estimating techniques.

Deliverable:

1. A technical memorandum summarizing the evaluation of each selected system, and a synthesis of lessons learned from the evaluation.
2. Recommendations and decision logic that would guide agricultural water purveyors through the processes of:
    a. Characterizing their distribution system and developing system automation applications that are matched with those characteristics.

b. Assessing their implementation capability, and designing an implementation approach that maximizes the potential for successful application of system automation.
c. Evaluating the potential costs and benefits of system automation.

3. A critique of the procedures used to estimate water savings, together with suggested improvements.

Task 5 – Final Report

Technical memoranda prepared during previous tasks will be used as the foundation for preparation of a final report that will present the project results and information learned. The report will be in a format that is conducive to irrigation water suppliers for researching system automation applications.

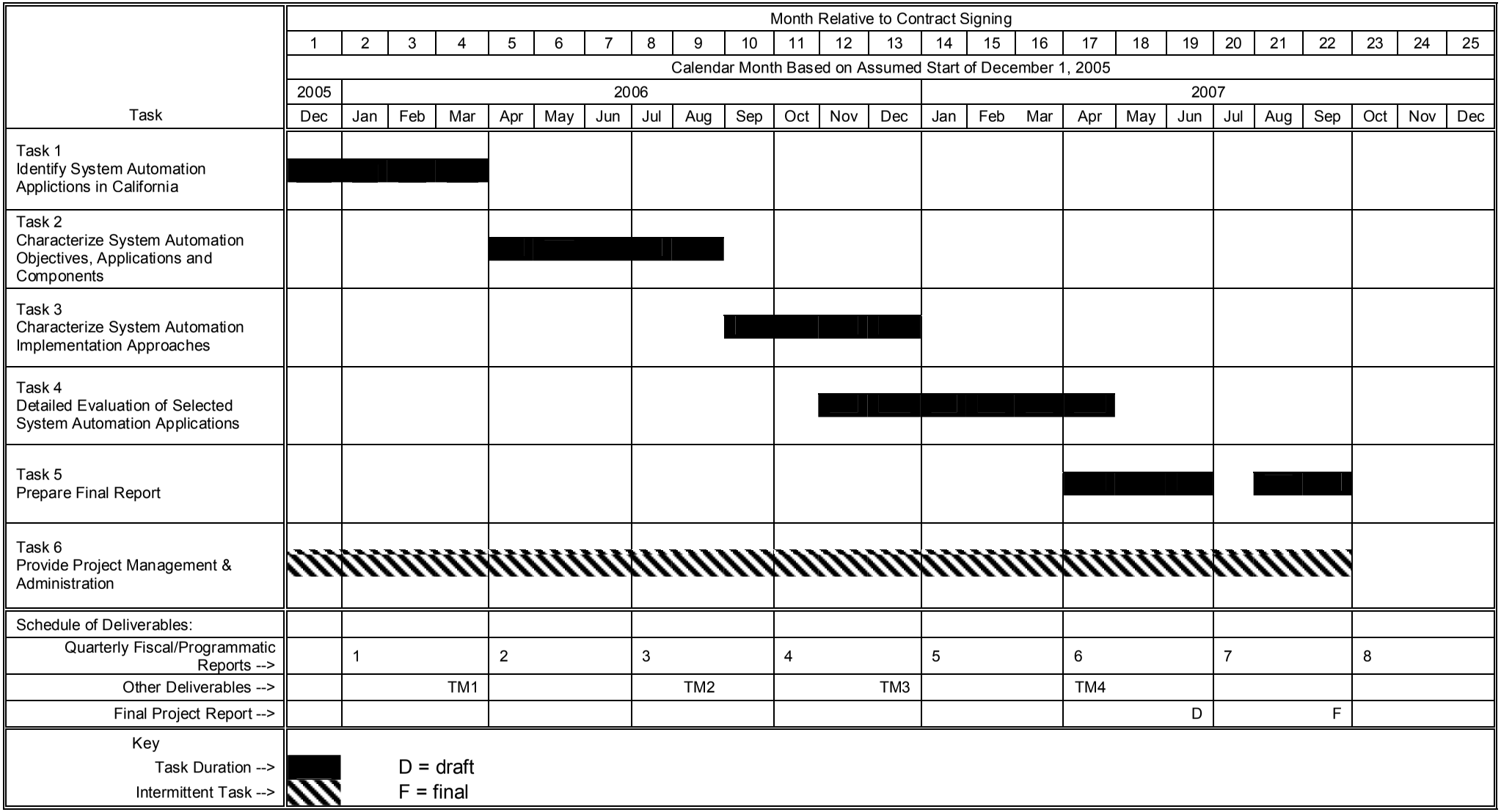
Deliverable:

1. Final report of the project.

The following tables summarize the proposed project's tasks, including the individual costs and start and end dates.

Task	**Cost**
Task 1: Identify system automation applications in California.	$15,735.50
Task 2: Characterize system automation objectives, applications and components.	$63,183.32
Task 3: Characterize automation implementation approaches.	$64,223.28
Task 4: Detailed evaluation of selected system automation approaches.	$86,768.00
Task 5: Prepare final report.	$16,792.60
Task 6: Project management and Administration.	$37,206.30

Figure __. Proposed Schedule for Development of Aids to Support Evaluation of System Automation Applications



STATEMENT OF WORK, SECTION 3: Monitoring and Assessment

This proposal is to develop aids and materials that would fit into existing or possible new statewide agricultural water use efficiency technical assistance programs. Thus, the contribution of the project toward the achievement of water savings and other indirect Bay-Delta system benefits. In other words, the objective of the technical assistance materials is to encourage agricultural water purveyors to adopt system automation technology; actual water savings would be accomplished by the automation itself. Therefore, an appropriate monitoring and evaluation approach is to assess the influence or effectiveness of the technical assistance materials on the adoption of system automation. The hope is that more districts would adopt system automation, or would adopt system automation earlier, than would occur if the materials were not developed.

The technical assistance materials will be made available online and in hard copy in training and conference venues, the following indicators would be tracked as a measure of effectiveness.

- The number of websites offering to host or provide links to the technical assistance materials
- Number of hits on host websites
- Number of downloads of technical assistance materials
- Number of courses and conferences where the technical assistance materials are distributed
- The reaction and rating of users regarding the user-friendliness and utility of the technical assistance materials

QUALIFICATIONS OF THE APPLICANTS AND EXTERNAL COOPERATORS

Resume of Project Manager

Mike Wade, Executive Director of the Agricultural Water Management Council will be the Project Manager and supervise the project implementation. Mr. Wade's resume is included in Appendix A at the end of this application.

The Agricultural Water Management Council

The AWMC is a non-profit organization established in 1996 dedicated to bringing together all interested parties in agricultural water management. The AWMC formed as a result of AB 3616 - the Agricultural Water Suppliers Efficient Water Management Practices Act of 1990. The purpose of the AWMC is to work with agricultural water suppliers to improve water management efficiency and to demonstrate to the public and water industry how agricultural water is efficiently used.

The AWMC works in a voluntary and cooperative manner to establish a consistent, unified, and credible process that will advance agricultural water management in California. It is the AWMC's responsibility to aid the signatory water suppliers through development and implementation of Water Management Plans to increase efficiency.

The AWMC maintains a unique position to provide research and data to agencies and the public interested in California water resource management. The AWMC has formed partnerships with the California Department of Water Resources, U.S. Bureau of Reclamation, California Bay-Delta Authority, California Department of Food and Agriculture and California Irrigation Institute as well as members from the agricultural community and environmental and public interest groups. All are signatories to the AB 3616 Memorandum of Understanding (MOU). Partnerships strengthen the consensus-based actions of the AWMC and ensure various points of view are represented in AWMC actions. The AWMC continues to seek partnerships with those interested in efficient water management.

The AWMC strives to create a forum to share and communicate water management strategies and new technologies. AWMC maintains a positive relationship with agricultural water purveyors throughout California and works cooperatively on projects that support water use efficiency. Over 100 water suppliers and water resource conservation districts are signatories to the AB 3616 MOU.

The AWMC has assembled a qualified project team to implement the proposed Project. The Project Team is comprised of the AWMC and its consultants. The Project Team provides extensive experience and knowledge in agricultural engineering, water use efficiency implementation, system automation and the CALFED program.

External Cooperators

The AWMC will use the consulting services of Davids Engineering Inc., to help implement the proposed Project. The AWMC has chosen qualified consultants with extensive experience in water use efficiency implementation and California water resource planning.

Davids Engineering has provided professional engineering services to irrigation districts and resource management agencies since its founding in 1993, with an emphasis on agricultural water management. The Company has successfully completed more than 70 projects for clients in California, Oregon, Arizona, Washington and Nebraska and in several developing countries. Most of these projects seek to increase water supplies or improve water quality for environmental or other benefits, through changes in agricultural water management practices, while maintaining or enhancing agricultural production and profitability.

Davids Engineering is based in Davis, near the hub of California's diverse and immensely productive Central Valley. Close proximity to Sacramento, California's capital, allows convenient access to State and Federal agencies and enables staff to travel to client's offices throughout the West and overseas through Sacramento International Airport.

Along with their experience in the United States, most members of Davids Engineering's staff have spent resident as well as short-term assignments overseas for agencies including USAID, the World Bank, the Asian Development Bank and non-profit foundations. The breadth of experience gained working on U.S. and foreign assignments enables staff to help clients develop innovative solutions to local problems by drawing on practices proven elsewhere.

Services
As listed below, Davids Engineering offers a wide range of services pertaining to agricultural water management. These services are often utilized in support of water rights determinations, design and assessment of water conservation and transfer programs, conjunctive water management, and water quality improvement initiatives.

- Irrigation system modernization & automation
- Water conservation planning and verification
- Water user surveys and needs assessments
- Consumptive use and water requirements studies
- Historical water use & irrigation efficiency audits
- Flow measurement & related data management
- Conjunctive water management in irrigated areas
- Distribution & drainage system analysis and modeling
- Water quality and non-point source pollution management

Previous Water Use Efficiency Grants

USBR Education Grants (2000-2001)
AWMC received an $85,000 grant in 2001 from the US Bureau of Reclamation (USBR) to conduct irrigation water management education to farmers. Grant funds were redistributed to irrigation and resource conservation districts for the purpose of conducting a variety of water management workshops including micro-irrigation, improvement of irrigation practices to reduce deep percolation, irrigation system maintenance, mobile lab training and water use efficiency workshops. Programs goals were met on-time and under budget.

Three-way Cooperative Agreement (2002-2004)
AWMC received additional support in 2001 when a three-way cooperative agreement was signed between the AWMC, DWR and USBR. The Cooperative Agreement's primary purpose was to implement AB3616, the Efficient Management Practices by Agricultural Water Suppliers Act of 1990. The California Bay Delta Authority (CBDA, at the time referred to as CalFed) assisted in negotiations to bring the three parties together and develop a work plan outlining the tasks that would guide AWMC activities. DWR and USBR each provided $600,000 in funding over the three year Cooperative Agreement contract period.

Under the guidance of the Cooperative Agreement the AWMC assisted member-districts in developing water management plans, oversaw independent audits of the Plans, worked to integrate CalFed Quantifiable Objectives into the Plans, created a database for tracking Plan implementation as well as initiated additional cooperative activities within the water management community. Today over 4 million irrigated acres are part of the AWMC water management planning process

and efforts continue to increase AWMC membership among non-member districts and the environmental community.

Integration of Quantifiable Objectives into Water Management Planning
As part of the Cooperative Agreement, AWMC developed a process for agricultural water suppliers to identify local water management opportunities that contribute to specific Bay-Delta Authority objectives. This project communicates regional objectives to the local water management planning level and assists water suppliers understand the relationship between local and statewide management objectives. The Targeted Benefits and Quantifiable Objectives were developed for specific geographic regions and water bodies. AWMC has developed district reports for members showing which Targeted Benefits and Quantifiable Objectives are applicable to each district and a methodology for linking the Targeted Benefits and Quantifiable Objectives to local actions. AWMC is currently working to develop a format to integrate the Quantifiable Objectives into the water management planning process.

USBR Water Conservation Plan Update Reporting Website (2004-2007)
AWMC and USBR worked together in 2004 to develop an Internet web site that would allow federal water contractors with water conservation plans to complete and submit their required annual updates completely on-line. The project is funded through a $101,000 USBR grant over three years. Utilizing a special data base on a secure server, AWMC will be able to collect and report data to USBR in a variety of report formats that will improve the speed and accuracy of the reporting process. AWMC members can access the web site with a secure username and password, edit their reports, print copies and submit a final version in electronic format.

OUTREACH, COMMUNITY INVOLVEMENT, and ACCEPTANCE

AWMC works in a voluntary and cooperative manner to provide technical assistance that will advance agricultural water management efficiency in California. The AWMC maintains a unique position in the agricultural water community to provide technical assistance to water suppliers that improves water management. AWMC strives to create a forum where water suppliers interact and share information and water management strategies. With over 100 water suppliers and water resource conservation districts members, AWMC has already utilized this unique relationship when seeking stakeholder input and acceptance of the investigation to develop system automation reference materials project. AWMC will also optimize this relationship to promote and distribute the materials within the agricultural water community so that water purveyors may benefit from the work performed when considering delivery system upgrades.

AWMC holds quarterly public meetings that are attended by stakeholders in the agricultural community throughout the state, including members of environmental and public interest groups, the academic community and representatives from the California Department of Water Resources and U.S. Bureau of Reclamation. The AWMC has worked through these public meetings to help complete this grant proposal. At the January 27, 2004 meeting, AWMC staff presented the project concept to develop system automation reference materials to members and meeting attendees for input and feedback. A subcommittee was thereby

appointed to work with AWMC staff and develop the project concept further. At the April 21, 2004 meeting, the AWMC discussed a comprehensive project outline and agreed by common consent to pursue Proposition 50 grant funding to create system automation reference materials. Furthermore, AWMC publishes a quarterly newsletter, *Best Management*. An article appeared in the August 2004 issue of *Best Management* that was distributed to all irrigation water purveyors, including a wider distribution to urban counterparts on the Urban Water Conservation Council, notifying readers of AWMC's intent to pursue this project. Through the public meetings and newsletter, AWMC has not received any opposition or negative responses to this project.

The AWMC will use several methods to notify member agencies and stakeholders of the project when the reference materials are available. The AWMC will mail an announcement to agricultural water suppliers (both AWMC members and non-members) as well as post an announcement in an issue of the AWMC quarterly newsletter, *Best Management*, and the Association of California Water Agencies newsletter, *ACWA News*, to notify the agricultural water community about the project.

The AWMC hosts a full functioning website at www.agwatercouncil.org that provides tools and resources for irrigation water purveyors to evaluate their water operations and prepare water management plans. The AWMC will add a feature to the website that describes the project and explains how the materials can be used. The system automation reference materials will be posted to the AWMC website alongside other technical resources specific for water management planning and implementing the AB 3616 Efficient Water Management Practices.

AWMC will work to provide water suppliers with the reference materials and aids so it can be made available for use. Copies of the materials will be sent to all AWMC members upon project completion. Other industry stakeholders and additional copies may be requested by directly contacting the AWMC office as well as through the AWMC website. The reference materials will be presented at one of the AWMC quarterly public meetings. The AWMC will also invite additional stakeholders through the notification activities above.

The AWMC is a regular exhibitor at the semi-annual Association of California Water Agencies conferences, the Mid-Pacific Region Water Contractors Conference, and the California Irrigation Institute Conference. AWMC will exhibit and distribute the reference materials at these conferences. In addition, in at least one of the conferences AWMC will coordinate a training session with additional training sessions depending on need.

INNOVATION

One of the objectives of this project is provide irrigation water purveyors with technical information of the different system automation applications and approaches, which includes a thorough survey characterization and evaluation of the innovative automation technologies and designs that have been employed throughout the state. No comprehensive materials exist outlining the possible automation approaches.

BENEFITS AND COSTS

Local Benefits

The proposed project provides benefits to the local agricultural community. System automation is a method districts can employ proven to reduce operational spills, operational costs and enable more flexible water deliveries for on-farm water use. Providing reference materials and aids can assist irrigation water purveyors evaluate which automated technologies to install that will maximize these benefits.

CALFED Bay-Delta Benefits

System automation has the potential to contribute to many of the California Bay-Delta Authority Targeted Benefits and Quantifiable Objectives. There are three types of CALFED Targeted Benefits and Quantifiable Objectives, improvements to water quantity, water quality and in-stream flow and timing. By assisting irrigation water suppliers adopt system automation, there exists the potential for substantial contributions to water savings and in-stream flows, timing and water quality through the direct controls that automation offers. As a result, water managers will be able to recognize and react promptly to changing operating conditions.

Applicant:

THE TABLES ARE FORMATTED WITH FORMULAS: FILL IN THE SHADED AREAS ONLY

Section A projects must complete Life of investment, column VII and Capital Recovery Factor Column VIII. Do not use 0.

Table C-1: System Automation Reference Materials Project Costs (Budget) in Dollars)

	Category (I)	Project Costs $ (II)	Contingency % (ex. 5 or 10) (III)	Project Cost + Contingency $ (IV)	Applicant Share $ (V)	State Share Grant $ (VI)	Life of investment (years) (VII	Capital Recovery Factor (VIII)	Annualized Costs $ (IX)
	Administration[1]								
	Salaries, wages	$17,738	10	$19,512	$0	$19,512	0	0.0000	$0
	Fringe benefits	$11,830	10	$13,013	$0	$13,013	0	0.0000	$0
	Supplies	$0	0	$0	$0	$0	0	0.0000	$0
	Equipment	$0	0	$0	$0	$0	0	0.0000	$0
	Consulting services	$0	0	$0	$0	$0	0	0.0000	$0
	Travel	$4,500	0	$4,500	$0	$4,500	0	0.0000	$0
	Other	$0	0	$0	$0	$0	0	0.0000	$0
(a)	Total Administration Costs	$34,068		$37,025	$0	$37,025			$0
(b)	Planning/Design/Engineering	$225,634	0	$225,634	$0	$225,634	0	0.0000	$0
(c)	Equipment Purchases/Rentals/Rebates/Vouchers	$0	0	$0	$0	$0	10	0.0000	$0
(d)	Materials/Installation/Implementation	$0	0	$0	$0	$0	0	0.0000	$0
(e)	Implementation Verification	$0	0	$0	$0	$0	0	0.0000	$0
(f)	Project Legal/License Fees	$0	0	$0	$0	$0	0	0.0000	$0
(g)	Structures	$0	0	$0	$0	$0	0	0.0000	$0
(h)	Land Purchase/Easement	$0	0	$0	$0	$0	0	0.0000	$0
(i)	Environmental Compliance/Mitigation/Enhancement	$0	0	$0	$0	$0	0	0.0000	$0
(j)	Construction	$0	0	$0	$0	$0	0	0.0000	$0
(k)	Other (Specify)	$0	0	$0	$0	$0	0	0.0000	$0
(l)	Monitoring and Assessment	$3,700	0	$3,700	$0	$3,700	0	0.0000	$0
(m)	Report Preparation	$16,706	5	$17,541	$0	$17,541	0	0.0000	$0
(n)	**TOTAL**	$280,108		$283,900	$0	$283,900			$0
(o)	Cost Share -Percentage				0	100			

1- excludes administration O&M.

APPENDIX A

Resume of the Project Manager

MIKE WADE

Executive Director
Agricultural Water Management Council 2002 - present
California Farm Water Coalition 1998 - present
Commenced duties as the Agricultural Water Management Council Executive Director in May 2002. Responsibilities include operating the statewide non-profit AWMC organization and implementation of AB 3616-The Agricultural Water Suppliers Efficiency Water Management Practices Act of 1990. Assists agricultural water suppliers improve water management efficiency through water management planning and technical assistance as well as participates in public policy stakeholder workgroups. Holds a seat on the California Bay-Delta Authority Water Use Efficiency Subcommittee.

Also responsible for the day-to-day operation of the California Farm Water Coalition, the State's only educational organization dedicated to providing the public with factual information on agricultural water use. Duties include staff management and delegation of assignments and development of educational programs and public awareness activities on a statewide basis. The distribution of fact-based farm water information to the public is the primary focus of the Coalition.

Executive Director
Merced County Farm Bureau 1988 - 1998
Responsible for the day-to day operation of Merced County's largest general farm organization. Duties included staff management and delegation of assignments to accommodate organizational needs; assisting the board of directors in policy development and carrying out policy motives with governmental agencies; active involvement in legislative issues at local, state and national levels; served on the Citizens Advisory Committee to the San Joaquin Valley Unified air pollution Control District; on the Merced County General Plan Advisory Committee and on the California Farm Bureau Federation State Biosolids Working Group.

Testified before Congressional subcommittee and at USEPA hearings on air quality issues, as well as before the California State Senate and Assembly on behalf of the agriculture industry on air quality, transportation and rural crime prevention issues.

Executive Director
California Christmas Tree Association 1991 - 1998
Responsible for the day-to day operation of California's only organization dedicated to the Christmas tree industry. Duties included management of association resources and providing technical information to grower-members in order to improve productivity and marketability of Christmas trees; developing marketing strategies and tools for grower use as well as providing public relations and media services to promote the California Christmas tree industry; maintaining a comprehensive research library of technical information, articles and bulletins for