2004 Water Use Efficiency Grant Application

Eastern San Joaquin County Agricultural Water Use Efficiency Feasibility Study

Submitted by

Northeastern San Joaquin County Groundwater Banking Authority

January 11, 2005

GBA MEMBERS
SAN JOAQUIN COUNTY
CITY OF LODI
CITY OF STOCKTON
STOCKTON EAST WATER DISTRICT
WOODBRIDGE IRRIGATION DISTRICT
CENTRAL SAN JOAQUIN WATER CONSERVATION DISTRICT
NORTH SAN JOAQUIN WATER CONSERVATION DISTRICT
CENTRAL DELTA WATER AGENCY
SOUTH DELTA WATER AGENCY

NORTHEASTERN SAN JOAQUIN COUNTY GROUNDWATER BANKING AUTHORITY

P.O. BOX 1810
1810 EAST HAZELTON AVENUE
STOCKTON, CALIFORNIA 95201
(209) 468-3089
(209) 468-2999/FAX

January 6, 2005

Ms. Debra Gonzalez
California Department of Water Resources
Office of Water Use Efficiency
Post Office Box 942836
Sacramento, California 94236-0001

SUBJECT: 2004 PROPOSITION 50 WATER USE EFFICIENCY PROGRAM - NORTHEASTERN SAN JOAQUIN COUNTY GROUNDWATER BANKING AUTHORITY

Dear Ms. Gonzalez:

The Northeastern San Joaquin County Groundwater Banking Authority's (Authority) is pleased to submit the enclosed 2004 Proposition 50 Water Use Efficiency Proposal for the Eastern San Joaquin County Agricultural Water Use Efficiency Feasibility Study.

The purpose of the Eastern San Joaquin County Agricultural Water Use Efficiency Feasibility Study is to determine if a net water savings can be achieved through the implementation of affordable agricultural water use efficiency and water conservation practices and policies that directly address critical groundwater overdraft in Eastern San Joaquin County while benefiting the CALFED Bay-Delta Program. The Study will provide valuable information concerning the benefits and impacts of a basin-wide agricultural water use efficiency program. Should the development of a program prove feasible, the program would be evaluated and considered in the Eastern San Joaquin County Integrated Conjunctive Use Program, as defined in the Authority's Eastern San Joaquin Groundwater Basin Groundwater Management Plan.

Your support of the Northeastern San Joaquin County Groundwater Banking Authority's 2004 Proposition 50 Water Use Efficiency proposal for the Eastern San Joaquin County Agricultural Water Use Efficiency Feasibility Study is requested. Thank you for your consideration.

Sincerely,

C. MEL LYTLE, Ph.D.
Water Resources Coordinator

TM:RV:ej
WR-4L106-J1

Enclosure

c: Board of Directors - Northeastern San Joaquin County Groundwater Banking Authority
T. R. Flinn, Director of Public Works
Thomas M. Gau, Deputy Director/Development

Table of Contents

I. Project Information Page and Signature Page

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 # 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):	Northeastern San Joaquin County Groundwater Banking Authority
4. Project Title:	Eastern San Joaquin County Agricultural Water Use Efficiency Feasibility Study
5. Person authorized to sign and submit proposal and contract:	Name, title: C. Mel Lytle, Ph.D. Secretary, Northeastern San Joaquin County Groundwater Banking Authority Mailing address: PO Box 1810 Stockton, CA 95201 Telephone: (209) 468-3089 Fax.: (209) 468-2999 E-mail: mlytle@co.san-joaquin.ca.us

6. Contact person (if different):

Name, title	Brandon Nakagawa, P.E. Water Resources Engineer San Joaquin County Department of Public Works
Mailing address	PO Box 1810 Stockton, CA 95201
Telephone	(209) 953-7460
Fax.	(209) 468-2999
E-mail	bnakagawa@co.san-joaquin.ca.us

7. Funds requested (dollar amount): $153,125
(from Table C-1, column III, row p)

8. Applicant funds pledged (dollar amount): $47,596
(from Table C-1, column II, row p)

9. Total project costs (dollar amount): $200,721
(from Table C-1, column IV, row p)

10. Is your project locally cost effective?

Locally cost effective means that the benefits to an entity (whether in dollar terms or qualitatively) of implementing a program exceed the costs of that program within the boundaries of that entity.

❑ (a) yes

❑ (b) no

(If yes, project is not eligible)

11. Explain why this project is not locally cost effective:

_____

12. Estimated Bay-Delta annual net water savings (reduced irrecoverable losses only, in acre-feet):

(from Table C-5a (row E)

13. Cost/AF of water saved to Bay-Delta:

(from Table C-7 (row L)

14. Cost/AF of water saved with Applicant Contribution:

(from Table C-7 (row N)

15. Duration of project (month/year to month/year): December 2005 to November 2006

16. State Assembly District where the project is to be conducted: 10, 15, 17, and 26

17. State Senate District where the project is to be conducted: 5 and 14

18. Congressional district(s) where the project is to be conducted: 11 and 18

19. County where the project is to be conducted: San Joaquin

20. Location of project (longitude and latitude): 121.299 and 37.9628

21. How many service connections in your service area (urban)? Approximately 110,640 combined urban connections represented by the City of Stockton, California Water Service Company, City of Lodi, and San Joaquin County.

22. How many acre-feet of water per year does your agency serve? The Applicant is not a water purveyor however the estimated combined total water use in the Basin is estimated at 1,100,000 acre-feet per year.

23. 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 _____

24. Is applicant a disadvantaged community? If 'yes' include annual median household income.

(Provide supporting documentation.)

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

2004 Water Use Efficiency Proposal Solicitation Package

APPENDIX B: Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

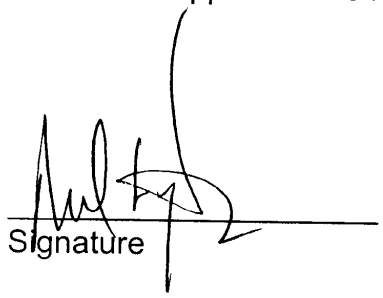
The individual signing the form has the legal authority to submit the proposal on behalf of the applicant;

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.



Signature

Mel Lytle, Water Resource Coord.
Name and Title

01/07/05
Date

APPENDIX C: Cost Table C-1

Applicant: Northeastern San Joaquin County Groundwater Banking Authority

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: 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	$14,275	0	$14,275	$14,275	$0	0	0.0000	$0
	Fringe benefits (47.05% of base salary	$6,741	0	$6,741	$6,741	$0	0	0.0000	$0
	Supplies	$0	0	$0	$0	$0	0	0.0000	$0
	Equipment	$0	0	$0	$0	$0	0	0.0000	$0
	Project Management	$7,944	0	$7,944	$7,944	$0	0	0.0000	$0
	Travel	$0	0	$0	$0	$0	0	0.0000	$0
	Overhead (129.7% of base salary)	$18,636	0	$18,636	$18,636	$0	0	0.0000	$0
(a)	Total Administration Costs	$47,596		$47,596	$47,596	$0			$0
(b)	Planning/Design/Engineering	$0	0	$0	$0	$0	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)	Travel	$1,200	5	$1,260	$0	$1,260	0	0.0000	$0
(k)	Other (Consultant Labor)	$149,712	5	$157,198	$0	$157,198	0	0.0000	$0
(l)	Monitoring and Assessment	$0	0	$0	$0	$0	0	0.0000	$0
(m)	Report Preparation (Printing)	$2,213	5	$2,324	$0	$2,324	0	0.0000	$0
(n)	**TOTAL**	$200,721		$208,377	$47,596	$160,781			$0
(o)	Cost Share -Percentage				23	77			

1- excludes administration O&M.

II. Statement of Work

Section 1: Relevance and Importance

Introduction

San Joaquin County (County) is a microcosm of California water issues. San Joaquin County, approximately 1,400 square miles in size, is located in the Northern San Joaquin Valley and is home to over 600,000 persons. Geographically located in the Northern San Joaquin Valley, the County is located within commuting distance form the San Francisco Bay Area. Predominately agribusiness based, the County is also experiencing tremendous urban growth and economic diversification and is expected to double in population by 2040. Figure 1 depicts the location of the County.

Agriculture is the primary land use within the County. The semi-arid climate in San Joaquin County is ideal for farming, with long, warm, dry summers (May through October) and cool, rainy winters. The average annual precipitation ranges from 9 to 16 inches depending on the geographic area. In 2002, the value of agricultural production in the County was valued at $1.34 billion. Figure 2 depicts the distribution of commodities grown in the County in 1996. In general, both urban and agricultural areas are primarily dependant on groundwater. Table 1 depicts what percentage of the County, in terms of surface area, uses groundwater and/or surface water, and Figure 3 illustrates the distribution of surface water and groundwater use by area of the County.

Table 1
County Water Sources

Eastern San Joaquin	**Land (acres)**	**Percent**
Groundwater	222,450	40%
Surface Water	53,940	10%
Mixed	129,300	23%
Non-irrigated, Vacant, Ponds	156,720	28%
Eastern San Joaquin subtotal	**562,410**	**62%**
Delta and Southwest County		
Groundwater	14,800	4%
Surface Water	212,900	61%
Mixed	12,060	3%
Non-irrigated, Vacant, Ponds	110,640	32%
Delta & Southwest County subtotal	**350,400**	**38%**
County Total	**912,810**	

Source: 1996 DWR Land Use Survey – San Joaquin County
Note: The cities of Escalon, Lathrop, Lodi, Manteca, and Ripon use groundwater. The cities of Stockton and Tracy use a combination of surface water and groundwater.

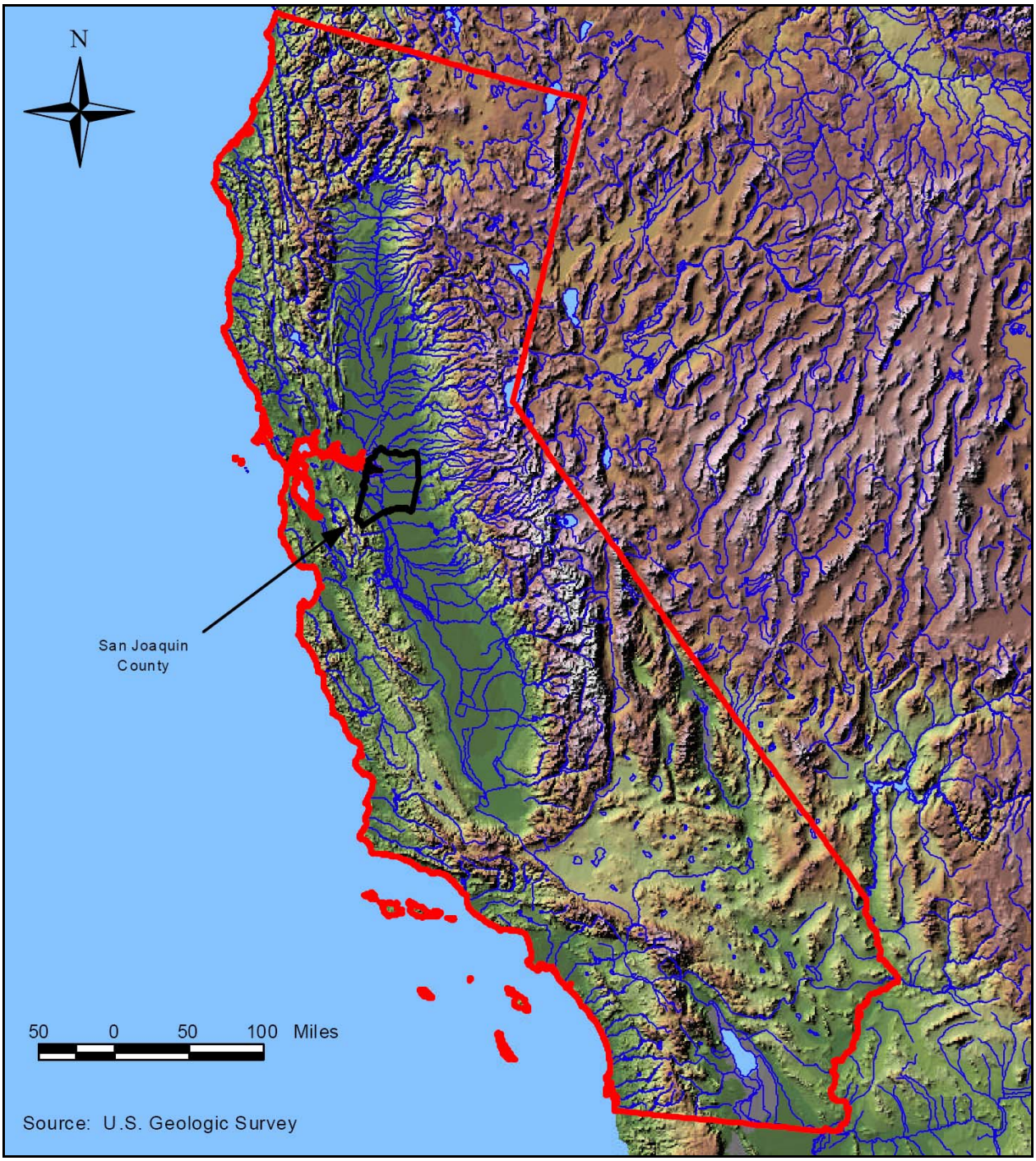


Figure 1 Location of San Joaquin County

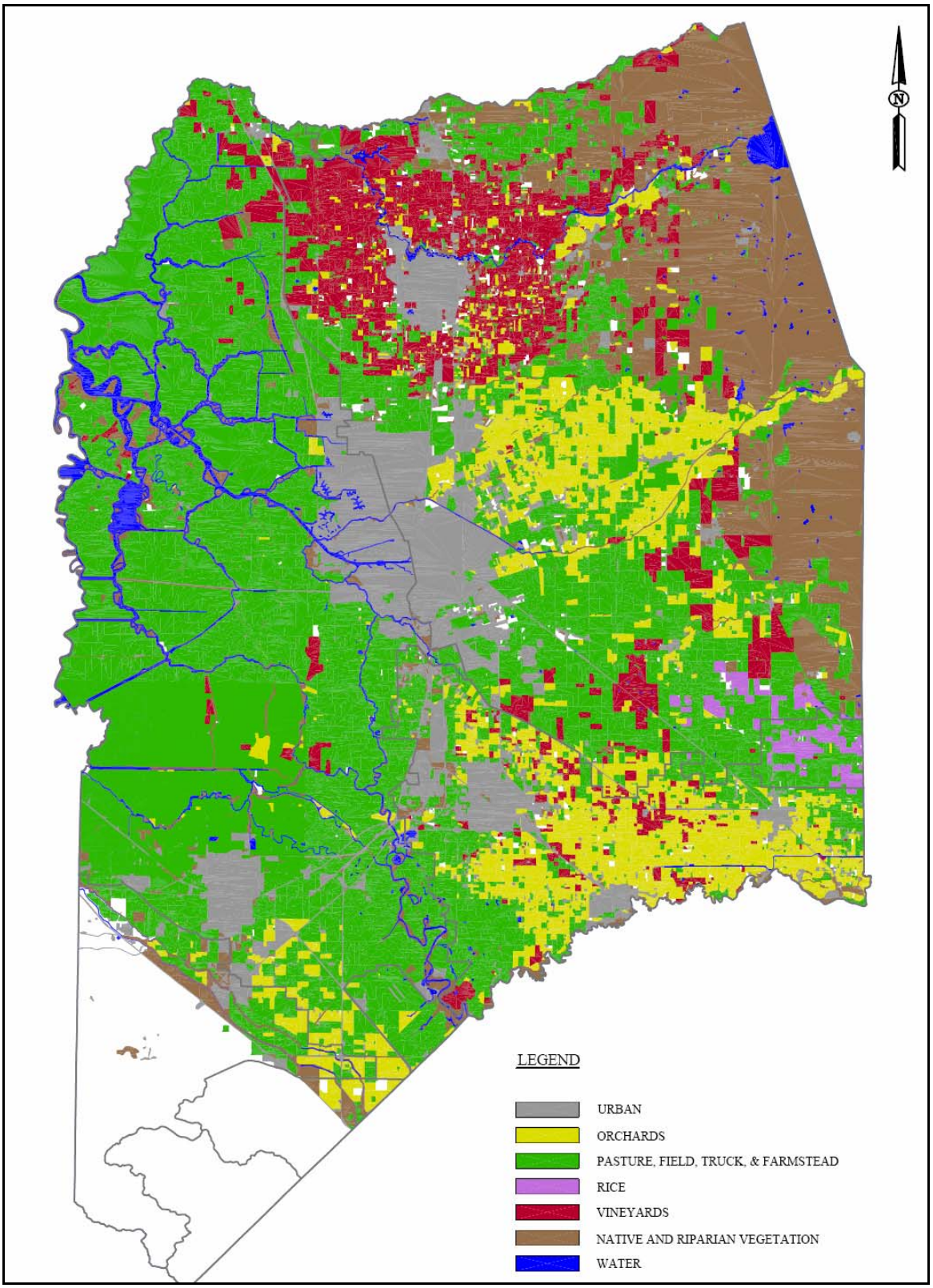


Figure 2 Distribution of Commodities Grown in San Joaquin County

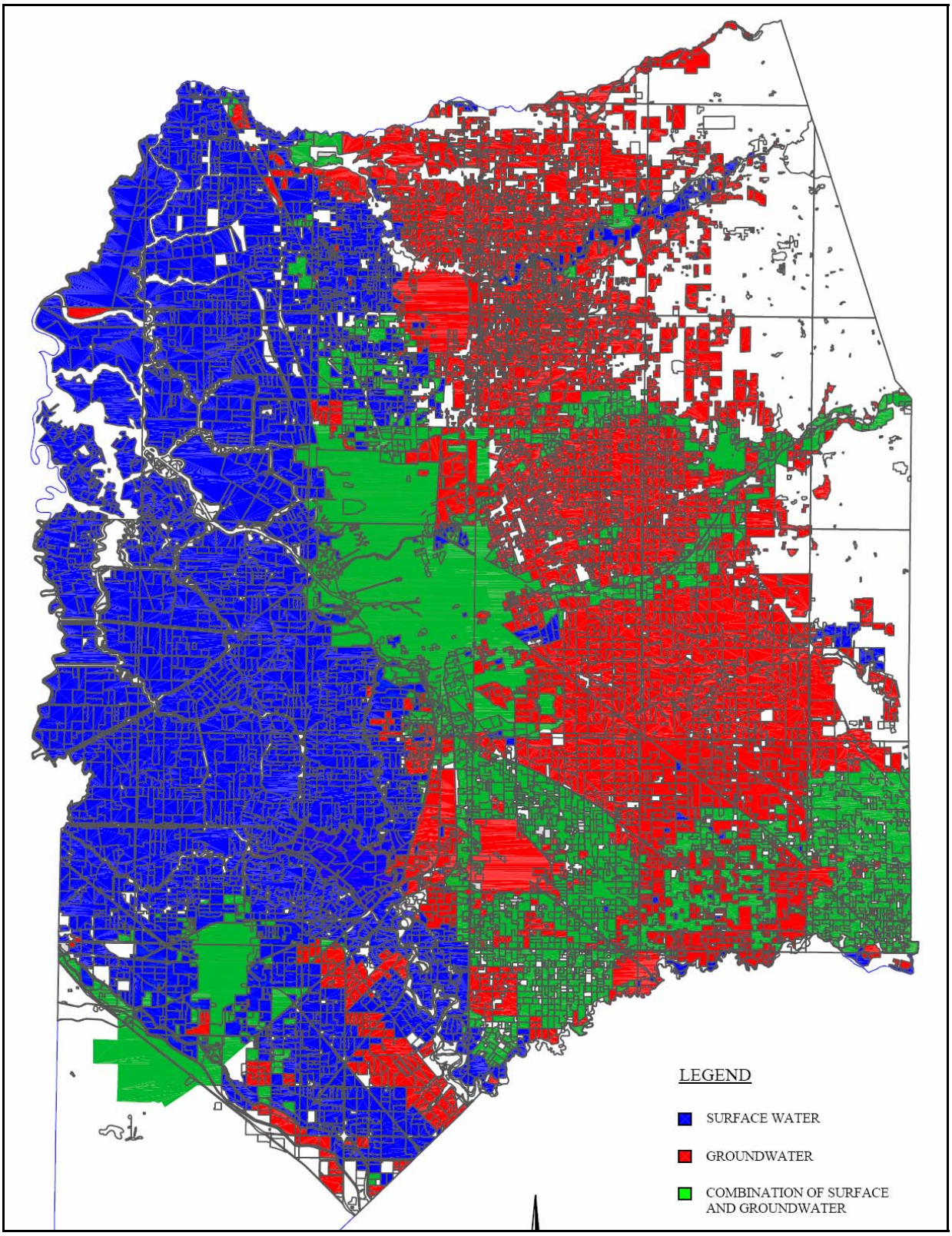


Figure 3 Surface Water and Groundwater Use in San Joaquin County

Hypothesis and Purpose

In California Department of Water Resources (DWR) Bulletin 118-80, the Eastern San Joaquin Groundwater Basin (Basin) has been declared "critically overdrafted," indicating that the current rate of groundwater pumping exceeds the rate of recharge and is not sustainable. Basin overdrafted is estimated at approximately 150,000 to 200,000 acre-feet per year and has lowered the groundwater table by 2 feet per year in some areas to -70 ft (MSL) and has induced the intrusion of saline groundwater into the Basin from the west. Basin overdraft threatens the environmental, social, and economic viability of Eastern San Joaquin County. Figure 4 depicts the Fall 1993 groundwater contour and illustrates the severity of the overdraft problem especially in prolonged drought events.

Water management strategies in Eastern San Joaquin County include both urban and agricultural water conservation as a means of demand management. Currently, urban areas have implemented water conservation best management practices (BMP) and demand management measures (DMM) as part of programs primarily defined by existing Urban Water Management Plans. Actual and estimated urban water savings are fairly well defined; however, the water savings achievable through the implementation of a Basin-wide agricultural water use efficiency program is unknown.

Currently, agricultural water use efficiency practices are implemented voluntarily based on perceived benefit to individual landowners and/or sponsoring irrigation and water conservation districts. To explore the potential benefits and impacts of a Basin-wide agricultural water use efficiency program, the applicant proposes to undertake the Eastern San Joaquin County Agricultural Water Use Efficiency Feasibility Study (Study). The purpose of the Study is to determine if a net water savings to the Basin can be achieved through the implementation of affordable agricultural water use efficiency and water conservation practices and policies while directly benefiting the CALFED Bay-Delta Program.

Goals and Objectives

The heart of the California Water system, the Sacramento-San Joaquin Delta, is the switchyard for the State Water Project and Central Valley Project where water is exported to supply over 22 million people with drinking water and used by growers to support California's $27 billion agricultural industry. Most water flowing though the County is either tributary to the Delta or preempted for use by exporters, and is not used beneficially within the County for water supply. Eastern San Joaquin County has been forced to use groundwater to sustain its constituents and the result has been sustained "critical overdraft." Historically, the scarcity of supplemental surface water has been the cause for conflict and feuding amongst water interests in the County.

Today, County water interests are engaged in consensus building forums including the Northeastern San Joaquin County Groundwater Banking Authority[1] (Authority).

1 Authority member agencies include the City of Stockton, City of Lodi, Woodbridge Irrigation District, North San Joaquin Water Conservation District, Central San Joaquin Water Conservation District, Stockton East Water District, Central Delta Water Agency, South Delta Water Agency, San Joaquin County Flood Control and Water Conservation District, California Water Service Company (appointed through the City of Stockton), San Joaquin Farm Bureau Federation (associate non-voting member).

The Authority employs a consensus based process to develop groundwater management and conjunctive use programs and projects. Authority member agencies represent various water needs and perspectives such as: urban, investor owned utilities, industry, agriculture, downstream, Delta, CVP contractors, riparian water users, groundwater users, and surface water diverters. To balance the interests at the table, Authority meetings are facilitated through the Center for Collaborative Policy.

In concert with its commitment to consensus building, the Authority has defined the following goals for a Basin-wide agricultural water use efficiency program:

1. Demonstrate a net water savings to the Basin;
2. Minimize adverse effects to the environment;
3. Ensure sufficient water quality and quantity for downstream water users;
4. Be affordable for the community; and
5. Maintain or enhance the local economy;

To meet the purpose of the Study, the Authority has developed the following objectives:

1. Identify existing irrigation inefficiencies in Eastern San Joaquin County;
2. Recommend specific agricultural water use efficiency and conservation methods based on source water, geographic location, commodity grown, and current irrigation method;
3. Estimate potential water savings;
4. Determine the impacts of implementation to growers, the groundwater Basin, downstream water users, and the environment;
5. Explore the cost and benefits of implementing a Basin-wide program or policy; and
6. Should a regional water use efficiency program or policy be feasible, recommend a course of action for implementation.

Consistency with an Adopted Groundwater Management Plan

On September 22, 2004, the Authority formally adopted the Eastern San Joaquin Groundwater Basin Groundwater Management Plan[2] (Groundwater Management Plan). The Groundwater Management Plan defines several key groundwater management programs and policies and conjunctive use projects that, when implemented, will ensure the long-term sustainability of groundwater resources in Eastern San Joaquin County.

To ensure that the programs, projects, and policies developed as part of the Groundwater Management Plan, the Authority developed the following Basin Management Objectives (MO's):

Management Objective #1: Groundwater Levels

2 The Eastern San Joaquin Groundwater Basin Groundwater Management Plan can be downloaded at http://www.sjgov.org/pubworks/Docs/Final%20Eastern%20San%20Joaquin%20Groundwater%20Basin%20Groundwater%20Management%20Plan.pdf

Maintain or enhance groundwater elevations to meet the long-term needs of groundwater users within the Groundwater Management Area (GMA).

Management Objective #2: Water Quality

Maintain or enhance groundwater quality underlying the Basin to meet the long-term needs of groundwater users within the Groundwater Management Area.

Management Objective #3: Surface Water Quality

Minimize impacts to surface water quality and flow due to continued Basin overdraft and planned conjunctive use.

Management Objective #4: Water Quality

Prevent inelastic land subsidence in Eastern San Joaquin County due to continued groundwater overdraft.

Additionally, the Authority created and used the following list of supporting mission values in the development of the Groundwater Management Plan contents and to make possible broad-based support amongst the Authority member agencies and throughout the region:

- Be implemented in an equitable manner
- Maintain or enhance the local economy
- Protect groundwater and surface water quality
- Be affordable
- Minimize adverse impacts to entities within the County
- Provide more reliable water supplies
- Exhibit multiple benefits to land owners and participating agencies
- Maintain overlying landowner and Local Agency control of the Basin
- Restore and maintain groundwater resources
- Minimize adverse impacts to the environment
- Protect the rights of overlying land owners
- Increase amount of water put to beneficial

Agricultural water use efficiency and water conservation measures are considered by the Groundwater Management Plan as potential options for reducing demand within the GMA, however, a comprehensive study that either affirms or discounts agricultural water conservation as an economically, technically, or environmentally viable conjunctive use option on a Basin-wide scale has not been performed. The proposed Study is intended to address the needs of the Groundwater Management Plan and would be developed in a manner that is consistent with the adopted MO's and supporting mission values of the Authority. Figure 4 depicts the GMA and the proposed Study Area.

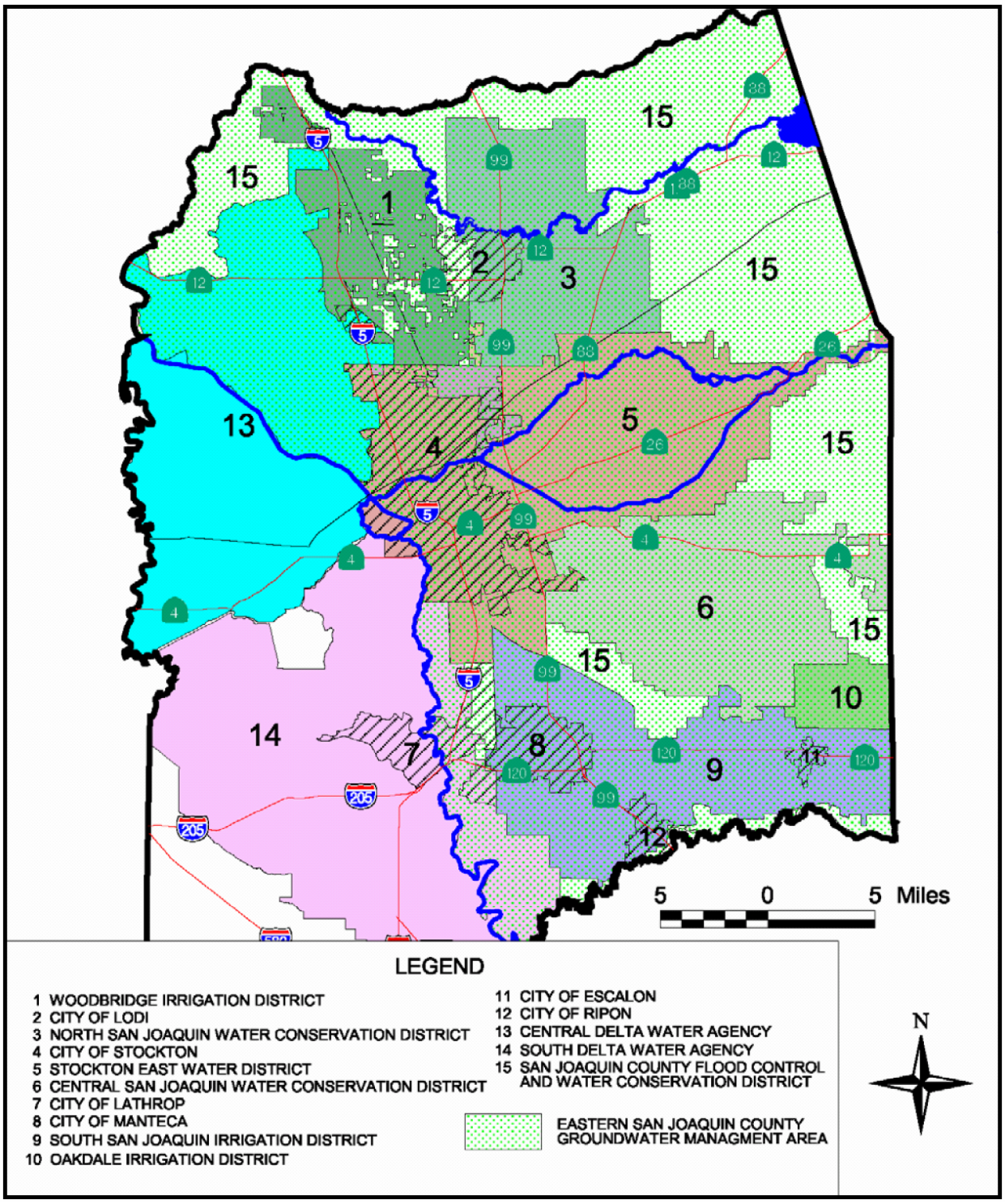


Figure 4 Eastern San Joaquin County Groundwater Management Area and Proposed Study Area

Consistency with a Proposed Integrated Regional Water Management Plan

On December 8, 2004, the Authority Board of Directors took action to initiate the development of an Integrated Regional Water Management Plan (IRWMP) for Eastern San Joaquin County. The intent of the IRWMP is to further define the implementation strategy of the Eastern San Joaquin County Integrated Conjunctive Use Program (ICU Program) previously introduced in the Groundwater Management Plan. The ICU Program consists of water supply projects such as new diversions, on and off-stream storage, major conveyance infrastructure, in-lieu and direct groundwater recharge facilities, and moderate to aggressive agricultural and urban water use efficiency and conservation programs.

The IRWMP would first develop the Basin Operations Criteria, which defines target groundwater level goals throughout the Basin. Subsequently, projects will be selected and grouped into alternatives that, when implemented, will meet the Basin Operations Criteria. The proposed Study would provide the Authority with enough information to evaluate agricultural water use efficiency and conservation as a project alternative in the ICU Program Alternatives. The Authority intends to evaluate each developed alternative in the Eastern San Joaquin County Groundwater Model.

Once the ICU Program Alternatives have been formulated, a Programmatic Environmental Impact Report (EIR) will be prepared in accordance with the California Environmental Quality Act (CEQA). The proposed Study would allow the Authority to defend the rationale behind the preferred ICU Program Alternative by demonstrating that improved water management is considered in concert with more contentious projects with the potential for significant environmental impacts. The Authority intends to submit a Proposition 50, Chapter 8, Integrated Regional Water Management Planning Grant Application to the DWR for continued support of the IRWMP and the preparation of the accompanying Programmatic EIR.

Consistency with California Bay-Delta Program Goals

The proximity of Eastern San Joaquin County to the Delta presents opportunities for integration of projects to meet both local needs while benefiting the California Bay-Delta Program (CALFED) goals. The application of agricultural water use efficiency and conservation measures in Eastern San Joaquin County in the context of conjunctive water management could potentially speak directly to improved water quality and quantity for the Delta. The potential for banked groundwater to be released into the Delta for fisheries, water quality, or flow augmentation purposes is high should the ICU Program be implemented and operated like a reservoir. In addition, agricultural water use efficiency and conservation measures would be developed with the needs of its downstream member agencies in the Delta that rely heavily on water quality and flow during the irrigation season. Unmitigated degradation of water quality or flow to the environment or downstream in the Delta is not acceptable.

Section 2: Technical/Scientific Merit, Feasibility

Unless otherwise noted in the Scope of Work or the Budge, the following Scope of Work is intended to be primarily carried out by a consultant procured through a Request for Proposals or Request for Qualifications . The total cost for each task and subtask included below are based on time estimated per task. Mileage and Printing Costs of the final report are presented in Section VI. Benefits and Cost. Contingencies are not included below; however, Table C-1 in Appendix C assumes a 5 percent contingency on all Consultant costs.

Scope of Work

Task 1: Water Use Efficiency Assessment *$51,260*

Task 1 is intended to establish a water use efficiency baseline and identify any current water use inefficiencies. 100 percent of Task 1 will be performed by the Consultant.

Subtask 1.1: Review Existing Pertinent Studies, Reports, and Data $13,820

Existing studies and research will be obtained and reviewed by the Study Team. Sources to be considered include Authority and member agency planning documents, previous water agricultural water use efficiency and conservation studies or projects performed in the area, and other pertinent regional and Statewide documents.

Subtask 1.2: Irrigation District Specific Research $6,136

Major irrigation districts within the Study area include the South San Joaquin Irrigation District, Oakdale Irrigation District, Stockton East Water District, North San Joaquin Water Conservation District, and Woodbridge Irrigation District. In addition, the San Joaquin County Resource Conservation District and the University of California Cooperative Extension are excellent sources of information. The Study Team will contact the Districts for information on district-wide and individual water use efficiency and conservation efforts. In addition, district owned or maintained conveyance or irrigation facilities such as canals, ditches, pipelines, siphons, and pumps will be inventoried and considered in subsequent tasks for improvement.

Subtask 1.3: Field Verification and Canvassing $9,136

Field verification and canvassing will allow the Study Team to observe on farm practices and will provide the basis for actual and estimated water savings. The task includes mileage for travel in the field.

Subtask 1.4: GIS Compilation $9,260

The information received will be managed in a Geographic Information System (GIS) Database. The 1996 DWR Land Use Survey will provide the basis for the Study with the addition of updated urban land uses and shifts in cropping patterns based on specific research done in the prior subtasks.

Subtask 1.5: Technical Memorandum $10,740

The information gained and assimilated in Task 1 will be reported in a technical memorandum. Additionally, the technical memorandum will include a baseline water use efficiency rating which defines the current level of effort and the current estimated water savings achieved. A copy will be provided to the DWR OWUE.

Subtask 1.6: Water Use Efficiency Assessment Workshop $2,168

The Authority will host a workshop at one of its regularly scheduled semi-monthly meetings to disseminate the information gained in Task 1. The meetings/workshops are open to the public.

Task 2: Evaluation of Efficient Water Management Practices (EWMPs) *$22,180*

Task 2 is intended to explore various water use efficiency and water conservation methods available to the agricultural community and to formulate specific evaluation criteria in order to determine the methods best for Eastern San Joaquin County. 100 percent of Task 2 will be performed by the Consultant.

Subtask 2.1: Available Efficient Water Management Practices $1,500

The Study Team will compile a list of efficient water management practices (EWMPs) and water conservation methods available to growers. EWMPs, as defined by the Agricultural Water Management Council (AWMC), will provide the basis for the compilation. Considered practices will identify any limitations on specific crops or soil types and the potential for reduction in downstream water quality.

Subtask 2.2: Ranking Criteria Matrix Development $8,520

Prior to performing detailed analysis of the proposed EWMPs, a series of ranking criteria will be developed to ensure that stakeholder concerns are considered. Criteria may include impact to the Basin, impact to crop yields, changes in consumptive use, cost per acre-foot, downstream water quality and flow impacts, environmental impacts, and net economic impact.

Subtask 2.3: Ranking Criteria Development Workshop $3,360

To ensure that the ranking criteria development process involves stakeholders, the Authority will host a workshop at one of its regularly scheduled semi-monthly meetings to finalize the criteria and weighting factors. The meetings/workshops are open to the public.

Subtask 2.4: Report Preparation $8,800

The findings of Task 2 will be reported in a technical memorandum.

Task 3: Quantitative Analysis and Ranking *$44,484*

Task 3 consists of the quantitative portion of the Study which estimates the actual projected water savings and cost to implement the EWMPs. Additionally, the impacts to the Basin, downstream water quality and quantity, and decreased agricultural

production will also be quantified to the extent possible. The ranking criteria developed in Task 2 will then be applied to the EWMPs. 100 percent of Task 3 will be performed by the Consultant.

Subtask 3.1: Water Savings Analysis $8,960

The estimated water savings for the proposed EWMPs will be estimated based on projected applied water savings, consumptive use and system loses.

Subtask 3.2: Water Quality and Environmental Impacts Analysis $4,260

The impacts to downstream users and the environmental will be quantified to the extent practical.

Subtask 3.3: Cost Analysis $15,096

The cost associated with the proposed EWMPs will be developed. The cost analysis will include capital, operations, and maintenance costs at Authority, district, and on-farm levels. The analysis will also include quantifying impacts to crop production due to water quality losses and changes in consumptive use.

Subtask 3.4: EWMP Ranking $4,260

The ranking criteria developed in Task 2 will be applied to the proposed EWMPs.

Subtask 3.5: Technical Memorandum $13,740

The findings of Task 3 will be reported in a technical memorandum.

Subtask 3.6: Ranking Workshop $2,168

The Authority will host a workshop at one of its regularly scheduled semi-monthly meetings to disseminate the findings of Task 3. The meetings/workshops are open to the public.

Task 4: Recommendations and Implementation Plan *$23,084*

Task 4 consists of the formulation of alternatives consisting of the top ranked EWMPs and the accompanying implementation strategy. 100 percent of Task 4 will be performed by the Consultant.

Subtask 4.1: Alternatives Packaging $2,768

The highest ranking EWMPs from Task 3 will be grouped into moderate and aggressive project alternatives. The net savings and impact of the alternatives and costs will be determined also.

Subtask 4.2: Implementation Strategy $7,328

The alternatives implementation strategy will consist of a proposed timeline and construction schedule, permitting strategy, environmental review strategy, and financing plan.

Subtask 4.3: Policy Development $3,360

Based on the findings of the Study, policies addressing agricultural water use efficiency and conservation may be developed and recommended for adoption by San Joaquin County, the Authority, or individual Irrigation Districts.

Subtask 4.4: Final Report Preparation $6,860

The findings of Task 4 will be reported in a Final Report which will also include information gained in previous Technical Memoranda. Additionally, should DWR OWUE solicit proposals for implementation funding again in FY 2006-2007, the technical memorandum would provide the basis for an implementation project proposal. The consultant will produce 25 copies of the draft report for review by Authority Staff and 25 final copies for distribution to stakeholders and the DWR OWUE.

Subtask 4.5: Final Workshop and Presentation $2,768

The Authority will host a workshop at one of its regularly scheduled semi-monthly meetings to present the findings and recommendations of the Study. The meetings/workshop are open to the public.

Task 5: Project Management *$12,648*

Project management duties will be shared between Authority Staff (63%) and the Consultant (37%).

Subtask 5.1: Bi-weekly PM Meetings $12,648

Bi-Weekly project management meetings will be held with the Study Team to ensure that adequate direction is given by Authority Staff and to coordinate general project needs. Meetings will be held as conference calls and in person as needed (12 total based on proposed project schedule). The item also includes time for gathering progress data to be included in quarterly reports to be submitted to the DWR OWUE.

Task 6: Project Administration *$39,652*

Project Administration duties are defined as essential tasks not directly related to the purpose and goals of the Study. 100 percent of Task 6 will be performed by Authority Staff.

Subtask 6.1: Consultant Solicitation $9,600

The Authority will solicit through either a Request for Proposals or Request for Qualifications procurement process. The San Joaquin County Department of Public Works currently has in place consultant procurement procedures and has agreed to provide support to the Authority in-kind. The Consultant Procurement Process is typically a 6 to 10 week process.

Subtask 6.2: Project Coordination $12,600

Authority staff will oversee the overall coordination of the Study to facilitate the flow of information from stakeholders to the consultant and to ensure

that stakeholder concerns are fully addressed. Authority staff will also coordinate the scheduling and hosting of Study workshops.

Subtask 6.3: Quarterly Reports $9,600

Authority staff will produce in-house and submit quarterly fiscal and programmatic reports on January 15, April 15, July 15, and October 15 throughout the project and a comprehensive final report at the end of the project.

Subtask 6.4: Accounting and Invoicing $1,552

Accounting and invoicing tasks require review and final processing for payment by Authority Staff.

Subtask 6.5: Administrative Review of Reports $3,600

The Administrative Review of technical memoranda and the Final Report prior to release to stakeholders is a quality control measure to ensure that the goals and objectives of the Study are met.

Proposed Schedule

The proposed Study schedule is depicted in Table 5. The expected Study duration is 12 months beginning in December 2005 with the Final Report submitted in November 2006. To expedite the Study, once confirmation that the Study will be funded by the WUE Program is established, the Authority will commit to the consultant solicitation process prior to the December 2005 start date.

Section 3: Monitoring and Assessment

The proposed scope of work intends to first establish a water use efficiency baseline by identifying any current water use inefficiencies or organized programs already implemented. Information gained from existing studies, scientific research, and irrigation districts will be obtained and reviewed by the Study Team. In addition, district owned or maintained conveyance or irrigation facilities such as canals, ditches, pipelines, siphons, and pumps will be inventoried and considered in subsequent tasks for improvement. Field verification and canvassing will allow the Study Team to observe on farm practices and will provide the basis for actual and estimated water savings. The task includes mileage for travel in the field.

The information received will be managed in a Geographic Information System (GIS) Database. The 1996 DWR Land Use Survey will provide the basis for the Study with the addition of updated urban land uses and shifts in cropping patterns based on specific research done in the prior subtasks. The baseline water use efficiency rating is the basis for determining the marginal benefit and cost of implementing more aggressive water use efficiency programs in Eastern San Joaquin County. Should the proposed Study lead to the implementation of a Water Use Efficiency Program in Eastern San Joaquin County, the success of the program would be measured as a project in the Authority Integrated Conjunctive Use Program.

Table 5 Proposed Timeline

Task	2005				2006											
	S	O	N	D	J	F	M	A	M	Jn	Jl	A	S	O	N	D
Task 1: Water Use efficiency Assessment																
Subtask 1.1: Review Existing Information																
Subtask 1.2: Irrigation District Research																
Subtask 1.3: Field Canvassing																
Subtask 1.4: GIS Compilation																
Subtask 1.5: Technical Memorandum																
Subtask 1.6: Workshop																
Task 2: Evaluation of EWMPs																
Subtask 2.1: Available EWMPs																
Subtask 2.2: Ranking Criteria Development																
Subtask 2.3: Workshop																
Subtask 2.4: Technical Memorandum																
Task 3: Quantitative Analysis and Ranking																
Subtask 3.1: Water Savings Analysis																
Subtask 3.2: Impacts Analysis																
Subtask 3.3: Cost Analysis																
Subtask 3.3: EWMP Ranking																
Subtask 3.4: Technical Memorandum																
Subtask 3.5: Ranking Workshop																
Task 4: Recommendations and Implementation Plan																
Subtask 4.1: Alternatives Packaging																
Subtask 4.2: Implementation Strategy																
Subtask 4.3: Policy Development																
Subtask 4.4: Final Report																
Subtask 4.5: Final Workshop and Presentation																
Task 5: Project Management																
Subtask 5.1: Monthly PM Meetings																
Task 6: Project Administration																
Subtask 6.1: Consultant Solicitation																
Subtask 6.2: Quarterly Reports																
Subtask 6.3: Accounting and Invoicing																
Subtask 6.4: Administrative Review of Reports																

III. Qualifications of the Applicants and Cooperators

Applicant Project Manager

C. Mel Lytle, Ph.D.
Water Resources Coordinator

Education

Ph.D. Botany (1991-94) - Department of Botany and Range, Brigham Young University, Provo, Utah

M.S. Agronomy (1988-90) - Department of Agronomy and Horticulture, Brigham Young University, Provo, Utah.

B.S. Agronomy (1988) - Ricks College, Rexburg, Idaho and Department of Agronomy and Horticulture, Brigham Young University, Provo, Utah.

Qualifications

Dr. Lytle has worked in Natural Resource and Environmental Consulting, Research and Teaching for over 12 years. After the completion of a Ph.D. in 1994, Dr. Lytle finished a three-year Postdoctoral Fellowship at the University of California, Berkeley where he conducted a nationwide study of the design and treatment efficiency of constructed wetland systems for wastewaters from mining, industry and agriculture. His project expertise in both the Private and Public Sectors includes water supply, water resource management planning, groundwater banking, conjunctive use, lake, wetland and watershed assessment, restoration/management, treatment wetlands, stormwater and groundwater quality. Dr. Lytle has broad teaching experience, a solid publication history and is a frequent invited lecturer at local, national and international workshops and symposia.

As the Water Resource Coordinator, Dr. Lytle is responsible for the coordination and management of San Joaquin County's water interests and prepares, administers and evaluates the annual program and budget for the San Joaquin County Department of Public Works Water Resource Division, the San Joaquin County Flood Control and Water Conservation District, the Northeastern San Joaquin County Groundwater Banking Authority, and the Mokelumne River Water and Power Authority. Dr. Lytle's responsibilities also include the management and formulation of coalitions with other agencies, the development of water resource plans and programs, and representation of County interests in federal, state, regional and local governing boards, committees and task forces.

Previous Accomplishments

The Authority has not previously submitted a proposal to the DWR OWUE for a grant; however, previous accomplishments demonstrate the Authority's ability to manage planning, monitoring and science projects and studies. To date, the most notable accomplishment for the Authority has been the development and adoption of the Eastern San Joaquin Groundwater Basin Groundwater Management Plan. The Authority was committed to producing a high-quality Plan on-time and under budget and was successful in doing so.

External Cooperators

The California Center for Collaborative Policy (Center) has been an integral part to the success of the Authority's consensus based process. The Center's continued presence and facilitation since the inception of the Authority has maintained an atmosphere conducive to openness, compromise, and agreement. It is expected that the Center will continue to facilitate Authority meetings as well as workshops proposed as part of the Study. Center services are sponsored through the DWR Conjunctive Water

Management Branch Memorandum of Understanding Partnership with the San Joaquin County Flood Control and Water Conservation District.

IV. Innovation

The Study approach intends to broaden the traditionally evaluated impacts of agricultural water use efficiency programs to include a look at broader scale impacts at the Basin level. The purpose, goals, and objectives of the Authority Plan are explicit in promoting actions and projects that are of benefit to the Basin in terms of groundwater levels and quality. Should a feasible Program be proposed by the Study, the projected water savings would be applied in the Eastern San Joaquin County Groundwater Model and evaluated in the same manner as other conjunctive use and groundwater recharge projects.

V. Outreach, Community Involvement and Acceptance

The Authority's commitment to consensus building and dedication to locally driven groundwater management efforts facilitates the sharing of data and knowledge between member agencies and water users within the Authority management area. Key to the outreach and involvement process is the proposed Study's use of field time as a chance to interact with farmers and individual irrigation district staff members whose knowledge and influence are great assets. Additionally, scheduled workshops throughout the Study at regularly scheduled Authority meetings will provide stakeholders and the general public with the progress of the Study. In addition, the integration of the Study findings into future planning efforts of the Authority will also be done in a public stakeholder driven process.

Authority staff is currently in the process of developing an Authority quarterly newsletter and website. The intent of the newsletter is to provide information to local and regional stakeholders and representatives at regular intervals, but also to inform other potential interests across the State of accomplishments and activities. The website will provide detailed information on the activities of the Authority including background information, meeting agendas and minutes, event notices, project and program updates, contact information, previously completed work, key documents, and groundwater data. In the future, the Authority may move to adopt an official logo or pursue additional outreach through alternative media including video, radio, mailers, commercials, etc. The Draft Authority Homepage is depicted in Figure 5 and is expected to be on-line in Spring 2005. Study findings would be located in the Groundwater Recharge portion of the website as a stand alone project in the Integrated Conjunctive Use Program.

On December 15, 2004, the San Joaquin County Flood Control and Water Conservation District Advisory Water Commission (AWC) voted unanimously to support the Authority's proposal for the Study. The AWC is comprised of 17 representatives from urban, agricultural, environmental, and general water interests across San Joaquin County and is commissioned to make recommendations to the San Joaquin County Board of Supervisors on matters concerning water. A letter of support from the AWC is attached as Figure 6.

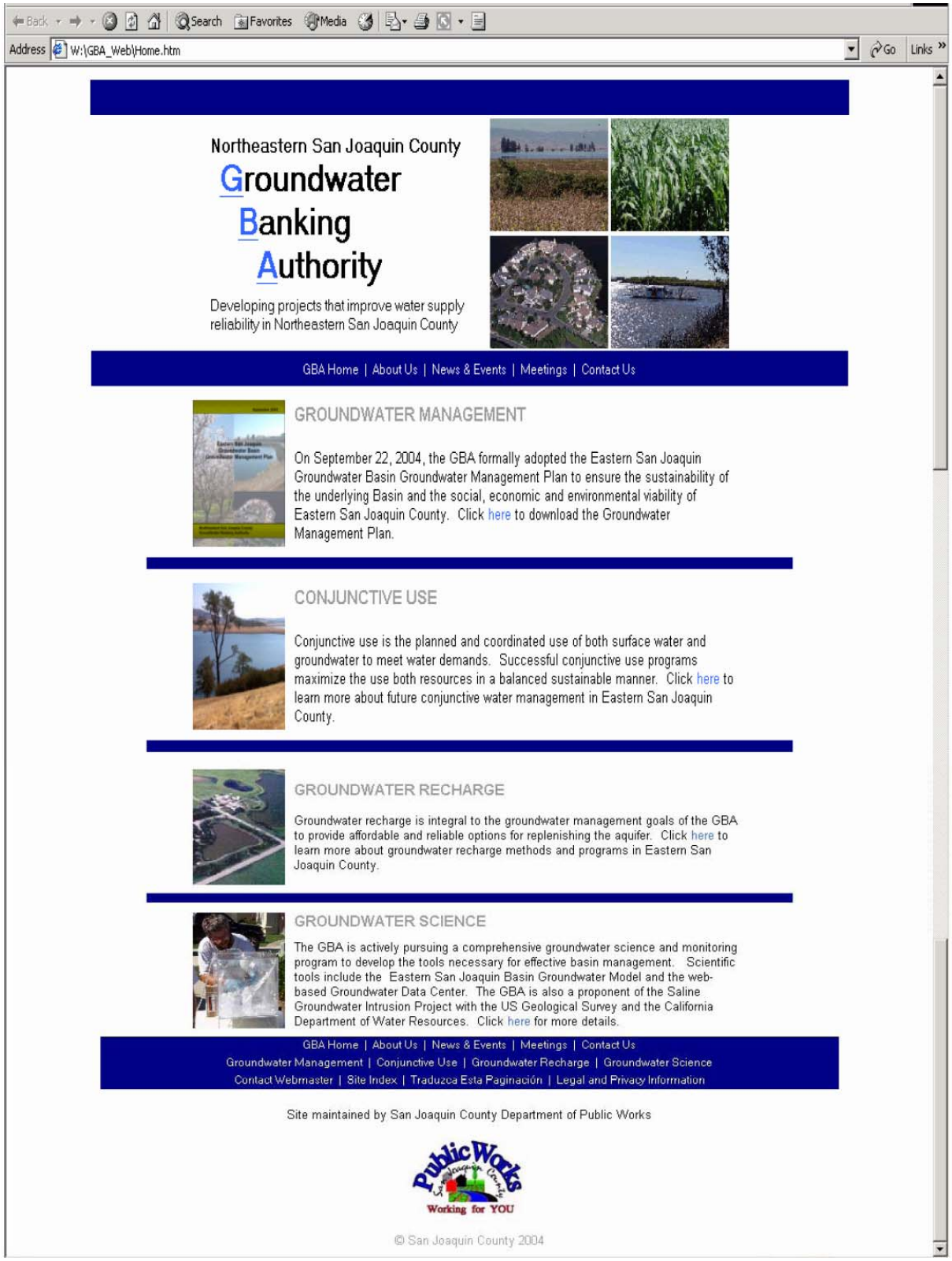


Figure 5 Draft Authority Homepage

SAN JOAQUIN COUNTY
FLOOD CONTROL & WATER CONSERVATION DISTRICT
P. O. BOX 1810
1810 EAST HAZELTON AVENUE
STOCKTON, CALIFORNIA 95201
TELEPHONE (209) 468-3000
FAX NO. (209) 468-2999

THOMAS R. FLINN
DIRECTOR OF PUBLIC WORKS
FLOOD CONTROL ENGINEER

January 4, 2005

Ms. Debra Gonzalez
California Department of Water Resources
Office of Water Use Efficiency
Post Office Box 942836
Sacramento, California 94236-0001

SUBJECT: LETTER OF SUPPORT FOR THE NORTHEASTERN SAN JOAQUIN COUNTY GROUNDWATER BANKING AUTHORITY PROPOSITION 50 WATER USE EFFICIENCY GRANT APPLICATION

Dear Ms. Gonzalez:

On December 15, 2004, the San Joaquin County Flood Control and Water Conservation District Advisory Water Commission unanimously supported the Northeastern San Joaquin County Groundwater Banking Authority 2004 Proposition 50 Water Use Efficiency proposal for the Eastern San Joaquin County Agricultural Water Use Efficiency Feasibility Study (Study).

The purpose of this Study is to determine if a net water savings can be achieved through the implementation of affordable agricultural water use efficiency and water conservation practices and policies that directly address critical groundwater overdraft in Eastern San Joaquin County while benefiting the CALFED Bay-Delta Program. The Study will provide valuable information concerning the benefits and impacts of a basin-wide agricultural water use efficiency program. Should the development of a program prove feasible, the program would be evaluated and considered in the Eastern San Joaquin County Integrated Conjunctive Use Program as defined in the Authority's Eastern San Joaquin Groundwater Basin Groundwater Management Plan.

Your support of the Northeastern San Joaquin County Groundwater Banking Authority's 2004 Proposition 50 Water Use Efficiency proposal for the Eastern San Joaquin County Agricultural Water Use Efficiency Feasibility Study is requested. Thank you for your consideration.

Sincerely,

Thomas McGurk

THOMAS McGURK
Chairman, Advisory Water Commission

TM:THM:tee
WR-4L092-E1

c: Advisory Water Commission Members
T. R. Flinn, Director of Public Works
Thomas M. Gau, Deputy Director/Development
Mel Lytle, Water Resource Coordinator

Figure 6 Letter of Support – San Joaquin County Flood Control and Water Conservation District Advisory Water Commission

VI. Benefits and Costs

Benefits

The proximity of Eastern Agricultural water use efficiency and conservation programs is a potentially cost effective water management tool available to assist the Authority in meeting the adopted Basin Management Objectives. Without considering the broader impacts to the groundwater Basin, downstream water users, and the environment, the actual benefits of water use efficiency programs are questioned. The proposed Study is intended to provide a systematic evaluation of the impacts and benefits of agricultural water use efficiency methods and propose a program that is consistent with the Authority's adopted Basin Management Objectives.

The Authority's supporting values list the minimization of impacts to neighboring entities by developing projects and programs in a consensus based process. The South and Central Delta Water Agencies are member agencies of the Authority and are key stakeholders in the Study. Any proposed agricultural water use efficiency program would consider and either avoid or mitigate for impacts to our neighbors in the Delta. Of particular concern are the loss of agricultural return flow and the degradation of water quality during the irrigation season when San Joaquin River flow and quality are typically poorest. The Study goals are consistent with both local values and the CALFED Bay-Delta Program.

Proposed Cost

Tables 2 through 5 depict the proposed Study cost based on estimated labor rates, time, mileage, and printing costs. Table 6 depicts the cost share breakdown between the Authority and the WUE Grant.

Tables 2 and 3 Consultant an Authority Staff Fully Loaded Hourly Billing Rates

	Consultant Staff[1]				
	Project Manager/ Principal	Senior Engineer	Staff Engineer	GIS Analyst	Clerical
Hourly Salary	$70.65	$53.85	$27.00	$35.00	$20.00
Fringe Benefits (47.05%)	$33.24	$25.34	$12.70	$16.47	$9.41
Overhead (129.7%)	$91.63	$69.84	$35.02	$45.40	$25.94
FY 2004-05 Fully Loaded Hourly Billing Rate	**$196.00**	**$149.00**	**$75.00**	**$97.00**	**$55.00**

	Northeastern San Joaquin County Groundwater Banking Authority Staff		
	Water Resources Coordinator	Water Resources Engineer	Management Analyst
Hourly Salary	$45.11	$33.33	$35.00
Fringe Benefits (47.05%)	$21.22	$15.68	$16.47
Overhead (129.7%)	$58.51	$43.23	$45.39
FY 2004-05 Fully Loaded Hourly Billing Rate	**$125.00**	**$93.00**	**$97.00**

1 Consultant Staff costs have been adapted from a proposal for the completion of a Programmatic Environmental Impact Report for the Integrated Conjunctive Use Program. The original proposal contained a scaled down version of the proposed Eastern San Joaquin County Agricultural Water Use Efficiency Study.

Table 4 Proposed Labor Hours and Cost by Task

	Consultant Costs							Authority Staff					
	Project Manager	Senior Engineer	Staff Engineer	GIS Analyst	Clerical	Hours by Task	Cost by Task	Water Res. Coord.	Water Res. Engineer	Mgmt Analyst	Hours by Task	Cost by Task	Total Cost
Hourly Rate	$196.00	$149.00	$75.00	$97.00	$55.00			$125.00	$93.00	$97.00			
Task 1: Water Use efficiency Assessment													
Subtask 1.1: Review Existing Information	40	20	40	0	0	100	$13,820	0	0	0	0	$0	$13,820
Subtask 1.2: Irrigation District Research	16	0	40	0	0	56	$6,136	0	0	0	0	$0	$6,136
Subtask 1.3: Field Canvassing	16	0	80	0	0	96	$9,136	0	0	0	0	$0	$9,136
Subtask 1.4: GIS Compilation	0	0	20	80	0	100	$9,260	0	0	0	0	$0	$9,260
Subtask 1.5: Technical Memorandum	8	8	40	40	20	116	$10,740	0	0	0	0	$0	$10,740
Subtask 1.6: Workshop	8	0	8	0	0	16	$2,168	0	0	0	0	$0	$2,168
Subtotal	**88**	**28**	**228**	**120**	**20**	**484**	**$51,260**	**0**	**0**	**0**	**0**	**$0**	**$51,260**
Task 2: Evaluation of EWMPs													
Subtask 2.1: Available EWMPs	0	0	20	0	0	20	$1,500	0	0	0	0	$0	$1,500
Subtask 2.2: Ranking Criteria Development	16	16	40	0	0	72	$8,520	0	0	0	0	$0	$8,520
Subtask 2.3: Workshop	8	8	8	0	0	24	$3,360	0	0	0	0	$0	$3,360
Subtask 2.4: Technical Memorandum	8	8	40	20	20	96	$8,800	0	0	0	0	$0	$8,800
Subtotal	**32**	**32**	**108**	**20**	**20**	**212**	**$22,180**	**0**	**0**	**0**	**0**	**$0**	**$22,180**
Task 3: Quantitative Analysis and Ranking													
Subtask 3.1: Water Savings Analysis	0	40	40	0	0	80	$8,960	0	0	0	0	$0	$8,960
Subtask 3.2: Impacts Analysis	8	8	20	0	0	36	$4,260	0	0	0	0	$0	$4,260
Subtask 3.3: Cost Analysis	16	40	80	0	0	136	$15,096	0	0	0	0	$0	$15,096
Subtask 3.3: EWMP Ranking	8	8	20	0	0	36	$4,260	0	0	0	0	$0	$4,260
Subtask 3.4: Report Preparation	8	8	80	40	20	156	$13,740	0	0	0	0	$0	$13,740
Subtask 3.5: Ranking Workshop	8	0	8	0	0	16	$2,168	0	0	0	0	$0	$2,168
Subtotal	**48**	**104**	**248**	**40**	**20**	**460**	**$48,484**	**0**	**0**	**0**	**0**	**$0**	**$48,484**
Task 4: Recommendations and Implementation Plan													
Subtask 4.1: Alternatives Packaging	8	0	16	0	0	24	$2,768	0	0	0	24	$0	$2,768
Subtask 4.2: Implementation Strategy	16	8	40	0	0	64	$7,328	0	0	0	64	$0	$7,328
Subtask 4.3: Policy Development	8	8	8	0	0	24	$3,360	0	0	0	24	$0	$3,360
Subtask 4.4: Report Preparation	8	8	40	0	20	76	$6,860	0	0	0	76	$0	$6,860
Subtask 4.5: Final Workshop and Presentation	8	0	16	0	0	24	$2,768	0	0	0	24	$0	$2,768
Subtotal	**48**	**24**	**120**	**0**	**20**	**212**	**$23,084**	**0**	**0**	**0**	**212**	**$0**	**$23,084**
Task 5: Project Management													
Subtask 5.1: Monthly PM Meetings	24	0	0	0	0	24	$4,704	36	12	24	24	$7,944	$12,648
Subtotal	**88**	**32**	**176**	**0**	**40**	**24**	**$4,704**	**36**	**12**	**24**	**336**	**$7,944**	**$12,648**
Task 6: Project Administration													
Subtask 6.1: Consultant Solicitation	0	0	0	0	0	0	$0	16	40	40	96	$9,600	$9,600
Subtask 6.2: Project Coordination	0	0	0	0	0	0	$0	40	40	40	120	$12,600	$12,600
Subtask 6.3: Quarterly Reports	0	0	0	0	0	0	$0	16	40	40	96	$9,600	$9,600
Subtask 6.4: Accounting and Invoicing	0	0	0	0	0	0	$0	0	0	16	16	$1,552	$1,552
Subtask 6.5: Administrative Review of Reports	0	0	0	0	0	0	$0	20	20	20	60	$6,300	$6,300
Subtotal	**0**	**0**	**0**	**0**	**0**	**0**	**$0**	**92**	**140**	**156**	**388**	**$39,652**	**$39,652**
Total Labor Hours	304	220	880	180	120	Total	$149,712	128	152	180	Total	$47,596	$197,308
Total Labor Cost	$59,584	$32,780	$66,000	$17,460	$6,600			$16,000	$14,136	$17,460			

Table 5 Travel and Printing Costs

Travel	Unit	Cost Per Unit	Quantity	Subtotal
Mileage (Field Canvassing: 200 mi per day for 10 days)	Mile	$0.38	2000	$750.00
Mileage (100 mi roundtrip from Sacramento x 12 trips)	Mile	$0.38	1200	$450.00
			Total Travel Cost	$1,200.00

Printing[1]	Unit	Cost Per Unit	Quantity	Subtotal
Black and White	Each	$0.10	0	$0.00
Color	Each	$1.40	0	$0.00
Blended Cost (50 Reports x 150 pages @ 85% B&W)	Each	$0.30	7500	$2,212.50
			Total Printing Cost	$2,212.50

1 Consultant Staff costs have been adapted from a proposal for the completion of a Programmatic Environmental Impact Report for the Integrated Conjunctive Use Program. The original proposal contained a scaled down version of the proposed Eastern San Joaquin County Agricultural Water Use Efficiency Study.

Table 6 Proposed Cost Share Plan

	Total Cost	WUE Grant Portion		Authority Cost Share	
		$	%	$	%
Task 1: Water Use efficiency Assessment	$51,260	$51,260	100%	$0	0%
Task 2: Evaluation of EWMPs	$22,180	$22,180	100%	$0	0%
Task 3: Quantitative Analysis and Ranking	$48,484	$48,484	100%	$0	0%
Task 4: Recommendations and Implementation Plan	$23,084	$23,084	100%	$0	0%
Task 5: Project Management	$12,648	$4,704	37%	$7,944	63%
Task 6: Project Administration	$39,652	$0	0%	$39,652	100%
Travel Cost	$1,200	$1,200	100%	$0	0%
Printing Cost	$2,213	$2,213	100%	$0	0%
Breakdown of Total Cost	**$200,721**	**$153,125**	**76%**	**$47,596**	**24%**