

**Madera County Water Management Project
Workplan Narrative
Table of Contents**

I. <u>Overview</u>	
1. Work Plan	1
a. Previous Efforts and Studies	1
a.1 Community Planning Efforts	1
a.2. Existing and Ongoing Studies	3
b. Overview of Proposed Plan	5
b.1. General Approach	5
b.2. Major Study Areas	6
1. Groundwater	6
2. Water Supply Reliability	6
3. Water Quality Protection and Improvement	7
4. Increasing Water Resources	8
5. Recreation and Public Access	10
6. Environmental Resources and Sensitive Areas	10
b.3. Planning Process and Stakeholder Involvement	11
2. Description of Region	14
3. Plan Objectives	21
4. Integration of Water Management Strategies	24
5. Implementation	27
6. Impacts and Benefits	29
7. Data and Technical Analysis	31
8. Data Management	32
9. Stakeholder Involvement	34
10 Disadvantaged Communities	36
11 Relation to Local Planning	37
12 Agency Coordination	38
II. <u>Detailed Workplan</u>	40
Study Area 1 – Groundwater Studies	40
Study Area 2 – Water Supply Reliability	45
Study Area 3 – Water Quality Protection and Improvement	45
Study Area 4 – Increasing Water Resources	48
Study Area 5 – Recreation and Public Access	50
Study Area 6 – Sensitive Habitat Protection	50
Planning Process, Public Education and Administration	51
Budget (including match explanation)	53
Implementation Schedule	54
Resolution from Madera County Board of Supervisors	Attachment 1
Eligibility Information	Attachment 2
Budget Spreadsheet	Attachment 3.2
Attachments 4 and 5 (not applicable, no match waiver sought)	
Maps	Attachment 6
Match Documentation	Attachment 7
Letters of Support and Commitments to Participate in Planning Process	Attachment 8
Central Sierra Watershed Committee Participant List	Attachment 9
Watershed Management and Water Yield – UC Cooperative Extension	Attachment 10

I. Overview

1. Work Plan

a. Previous efforts and studies related to development of plan:

a1. Community Planning efforts. Residents of Eastern Madera County have been concerned about groundwater and watershed issues for many years. The committees and districts listed below have been developed in response to these concerns, and have provided planning, resources, leadership and policy development on which this planning program is based.

Central Sierra Watershed Committee: The Central Sierra Watershed Committee (CSWC) was organized in 1997 with the purpose of implementing a cooperative effort to improve and protect the area's watersheds and other resources. This group received a Proposition 204 Phase II Planning grant from the State Water Resources Control Board in 1999, which funded, among other things, the production of the Eastern Madera County and Mariposa County Long Term Plan for Watershed Conservation and Restoration [hereafter Watershed Plan]. That plan identified among potential problems:

- Lack of a long-term county-wide water plan
- No water quantity or quality study for the upper Fresno River watershed
- Continued growth and development in the region without a water plan.

These are all issues that are addressed in this application's proposed planning process.

The Central Sierra Watershed Committee is an unusually successful collaboration, including

- representatives from the County Board of Supervisors;
- staff from various County departments,;
- State and Federal Agencies such as the Department of Water Resources, the Regional Water Quality Control Board, the Air Pollution Control District, the Army Corps of Engineers and the Natural Resources Conservation Service;
- Local Resource Conservation Districts and Resource Conservation and Development Districts
- Local Indian Tribes/Rancherias
- Local private water companies, Water Districts and Irrigation Districts
- Local school districts
- Local planning groups, and
- Interested community residents

(See Attachment 9 for list of CSWC participants)

Since completing their Watershed Plan, these representatives have continued efforts in the planning, implementation and public education arena. These include:

- acting as the technical advisory committee for a Fresno River Nutrient Reduction study,
- developing and disseminating a variety of public information campaigns regarding water conservation, invasive plants, and other issues, and
- hosting community forums on water issues

This grant builds upon the efforts of the Watershed Committee by fulfilling needs for studies and plans identified in the Watershed Plan, providing additional resources to disseminate information

about water conservation, and providing an additional vehicle to further inter-agency communication and cooperation.

Madera County Water Oversight Committee. Around the same time that the CSWC was initiated, residents of Western Madera County began to organize in response to proposals from non-resident companies (specifically Azurix, a subsidiary of Enron Corporation) to operate a "water bank" in their area. The residents were concerned that the proposed facilities would drain the groundwater basin, which already was suffering from a significant overdraft, in order to export water out of the County. The Board of Supervisors appointed a Water Oversight Committee, which was charged with advising the Supervisors on water issues and proposing legislation to protect the County's water resources. This Committee developed a proposed Groundwater Banking Ordinance which was adopted by the Board of Supervisors in March 1999, placing significant restrictions on the exportation of water from Madera County. The Water Oversight Committee continues to fulfill the role of providing advisory assistance to the Board of Supervisors on water issues throughout the County.

Although the Azurix water bank was such a controversial project, an alternative conjunctive use/water bank project has recently been proposed by the Madera Irrigation District for the Madera Ranch area west of Highway 99. While this project is in the valley groundwater basin and outside of the eastern Madera County region, it could benefit the foothill areas by providing water storage capacity which could, through local exchanges, provide an important element in a plan for water supply reliability (see Section 1.b.2, pg 6.) The Water Oversight Committee is currently assessing this proposal. While it is clear that such a project could assist the valley areas in providing water supply reliability, it is not clear how these benefits would extend to eastern Madera County. The proposed planning process will further this project by providing a feasibility study for infrastructure to connect this storage capacity to the eastern portion of the County (see Section 1.b.2, pg 6).

Eastern Madera County Water Oversight Advisory Committee. When organized, the Water Oversight Committee membership mostly represented of the western portion of the County. When the Groundwater Banking Ordinance had been safely adopted, the few members that were from eastern Madera County began to raise groundwater concerns in their area. The Committee recognized that the solutions to Eastern Madera County's water problems were inextricably linked to water problems facing Madera County residents, farmers and businesses on the Valley Floor. In order to facilitate discussion and development of these issues, the Water Oversight Committee created an Eastern Madera County Subcommittee in July, 2001. This committee is the official advisory body to the Board of Supervisors on water issues of Eastern Madera County. Their activities include oversight of studies and planning efforts. (They are the official oversight committee of the County's AB 303 Local Groundwater Assistance grant for an Oakhurst Groundwater Study (see more detail in Section 1.a.2, pg 4). They have also produced a report outlining concerns over Eastern Madera County groundwater and proposing the basic components for a groundwater management plan. This report is particularly focused on issues of water availability related to anticipated land use and development in the region.

Upon completion of this initial report, the Committee moved forward with their analysis and estimated the future demand for water in eastern Madera County based on the anticipated

development and growth of the area. Although the exact amount of groundwater to support this development is unknown based on lack of professional assessment and studies, there are many individual complaints of wells going dry in areas of high development. The community's concerns about the sufficiency of groundwater to support future development lead the Committee to encourage additional research on groundwater and to start examining water supply reliability options. As a possible solution for water supply reliability, members of the committee have proposed a pipeline from Redinger Lake (on the San Joaquin River), over the hills to the Oakhurst, Raymond and Coarsegold areas (see Attachment 6 – map of proposed infrastructure).

This grant will further the work of the Eastern Madera County Water Oversight Advisory Committee by producing a detailed groundwater study of the Coarsegold area and other areas of the region where future development is a likely concern. (See Section b.2, pg 6.) It will also further the planning efforts for water supply reliability by implementing a feasibility study of the proposed Redinger Lake pipeline and examining alternative options for above-ground water delivery systems to assure water supply reliability. (See Section b.2, pg 7.)

Resource Conservation Districts. Even before these water planning efforts took place, Eastern Madera County was home to substantial community-driven resource conservation efforts. Resource Conservation Districts (RCD's) are governed by the California Public Resources Law. Two RCDs are represented in the planning area: The Coarsegold RCD and the Chowchilla/Red Top RCD. Both Districts were formed approximately 50 years ago and have provided leadership in agricultural land protection, soil and water management, forest stewardship and conservation education. Currently the Chowchilla/Red Top RCD has focused its efforts on the control of *Arundo Donax*, an invasive plant that is choking the waterways in its district, reducing habitat, draining water and causing fire hazards. The Coarsegold RCD has also worked on eradication of invasive species. In addition it has provided public information materials on Oak Woodlands Management (See b.2, pg 8), and has formed a Joint Powers with the Madera Fires Safe Council to implement fuel reduction efforts. The Coarsegold RCD has an award-winning web site with detailed information on its activities: www.crcd.org.

Most recently, the CRCD has taken a broader look at fuels management as a way not only of improving fire protection but also of enhancing soils, preserving habitat, and increasing the amount of water available for the region. This grant will further these efforts by providing resources for an assessment of the research in this area, the creation and dissemination of public information materials and fuels management guidelines, and a consensus-building process to explore legal and practical issues associated with beneficial use of this additional water source.

a2. Existing and Ongoing Studies:

This planning effort will build upon and leverage existing studies and planning efforts already produced for this region. These include the following:

- DWR investigations - The DWR published the Madera Area investigation in 1966 (preliminary Edition, Bulletin No. 135), This report assessed the groundwater conditions of the area and the projected growth and concluded that groundwater supplies were inadequate, and that additional water would need to be imported by the year 2020. It is important to note that the projected population at that time (the year 2020), has already been surpassed in the

area. More recently, an excerpt from DWR Bulletin 118-80 assessed the area's problems as follows:

"The Oakhurst area in Madera County is not identified as a ground water basin but is an area where ground water is used as a supply for continued development in the fractured-rock areas of the Sierra Nevada. Well yields are generally low, water quality may be affected by septic tank effluent, and well yields may diminish during the late summer months because ground water storage is limited to the cracks and fissures in the underlying formations. Continued development in these areas may pose a future problem due to inadequate and potentially poor-quality water supplies." (See DWR Bulletin 118-80, Ground Water Basins in California: A report to the Legislature in Response to Water Code Section 12924, January 1980 pp 14-16)

- Eastern Madera County and Mariposa County Long Term Plan for Watershed Conservation and Restoration. This document was produced in November, 2001 by the Central Sierra Watershed Committee. This plan includes an inventory of resources and problem in the region, including areas where there is a lack of information about the resources and problems. It identifies planning projects, monitoring programs and implementation projects necessary for the next steps in watershed management.
- Technical Memorandum – Groundwater Conditions in Eastern Madera County. This document was produced in March 2002 by Todd Engineering. Todd Engineering had been hired to produce the AB 3030 Groundwater Management Plan for the groundwater basin areas of Madera County. The County requested that the firm produce a report for the non-basin areas of the County which comprises the region to be studied under this proposal. This report is similar to the AB 3030 plans in its compilation and summary of existing data relating to hydrogeology and groundwater conditions and a preliminary analysis of this data with a focus on water demands, groundwater quality and groundwater quantity. However the plan does not suggest management measures but rather provides recommendations regarding additional data collection and monitoring that should be carried out in order to craft and support these management measures.
- Fresno River Nutrient Reduction Study. This study was implemented pursuant to a SWRCB 205 (j) grant awarded in 2001. This project focused on the Fresno River basin, and particularly on the potential sources of contaminants flowing into Hensley Lake. This water body experiences massive algae blooms in the spring and summer months, which interfere with recreational activities and are potentially damaging to aquatic life. Because of these problems, Hensley Lake has been proposed for addition to the 303 (d)list as potentially impaired and in need of further study. The purpose of the project was to collect appropriate historical and new data, identify nutrient sources, model the nutrient loading and develop an implementation plan to reduce nutrient loading and algal problems to acceptable levels. The study was implemented through a subcontract with the CSU Fresno Foundation (the California Water Institute), and is currently awaiting final approval of the draft report.
- AB 303 Oakhurst Groundwater Study. This study assessing the quantity and quality of groundwater in Oakhurst is currently being implemented pursuant to a DWR AB 303 Local Groundwater Assistance grant. This work is being performed by Kenneth Schmidt and Associates, a consultant who has performed most of the groundwater analysis for this region, as well as many other local areas. The activities of this study are under the oversight of the Eastern Madera County Water Oversight Advisory Committee. As a part of this proposal,

the County has worked with Ken Schmidt to develop additional analyses that will continue the work of the AB 303 study and expanding our knowledge of groundwater to the entire region.

- Area plans – Area plans have been produced by several of the towns in the region, including Ahwahnee, Coarsegold, Oakhurst, and North Fork. These plans are important to integrate into this effort as they reflect the proposed future growth and development patterns.

b. Overview of Proposed Plan

This grant represents a rare opportunity to implement a comprehensive water management plan for Eastern Madera County with multiple and synergistic benefits. The main Study Areas in the proposed planning process include:

1. Groundwater availability,
2. Water supply reliability,
3. Water quality improvement,
4. Increasing water resources,
5. Recreation and public access,
6. Sensitive resource protection

These Study Areas and their inter-relationships are discussed briefly in this section, along with justifications for their inclusion in this planning process. For a more detailed description of the tasks proposed for each Study Area, see Section II – Detailed Workplan. A budget and timeline outlining these tasks is provided separately in Attachment 3.2.

b.1. General Approach: While there are several main areas of study and planning proposed for this project, the approach for all of them is similar. This approach is designed to produce a water management plan that is:

- Based on objective data,
- Addresses community needs and concerns
- Develops win-win policies to the extent possible
- Is integrated and comprehensive
- Includes plans for continuing policy modification based on continued monitoring of water conditions
- Acknowledges and plans for the fiscal needs of implementation
- Clarifies legal issues and avoids future disputes, and
- Gathers the community and political support necessary for implementation

In order to do accomplish the above goals, resources are divided into three areas:

- Studies and analysis
- Facilitation of stakeholder involvement and consensus-building
- Public education

It is believed that this approach will be successful in producing a plan that is acknowledged and supported by the community, is legally supportable and will be adopted and implemented by the appropriate agencies and departments.

b.2. Major Study Areas:

1. Groundwater: This Study Area involves implementing detailed studies in those portions of the region where groundwater sufficiency is the most at issue. It will also include integrating information from other studies (including the current Oakhurst groundwater study), and performing a more general groundwater analysis for other areas of the region. Specific studies include the following:

- A detailed study of groundwater in the Coarsegold area will be implemented. Specific areas to be studied will include currently developed and developing areas (Indian Lakes, the Casino area, Quail Meadows, Yosemite Lakes, etc), as well as areas that are not likely to be developed, but could potentially serve as a source of groundwater for above-ground distribution where needed.
- A more general study will also be implemented for other areas of Eastern Madera County where there are issues of development and water quantity or quality, including Bass Lake, Cedar Valley, North Fork, Raymond, Hidden Lakes and Mountain Ranches.

The studies will include an evaluation of the groundwater supply available for use, an analysis of the hydraulic connection between the various subareas, and relation between streamflow and groundwater. As part of these studies, groundwater quality will also be determined and mapped, for use in the Study Area 3. (For the detailed workplan, see Section II, pg. 40.)

This Study Area includes drafting recommended land-use and development policies for each area in proportion to the available groundwater in that area. Such policies will be designed to be as area-specific as possible, so as to avoid unnecessary restrictions where not needed and to assure restrictions where they are appropriate.¹ Also included will be the development of monitoring programs that can continue to track groundwater availability and quality. It will be recommended that the land-use and development policies for the region be re-assessed and modified on a regular basis to take into account the results of this on-going water monitoring. Funding mechanisms will be recommended to cover this monitoring program and the policy re-assessment.

2. Water Supply Reliability This Study Area focuses on the feasibility of creating redundant or supplemental water supply delivery mechanisms for areas with a scarcity of groundwater resources. As previously stated, the Eastern Madera County Oversight Advisory Committee has suggested one option for such a water supply mechanism – a pipeline that takes water from Redinger Lake on the San Joaquin River and pumps it over the hill to storage facilities in Coarsegold, Raymond, Oakhurst and other population centers. The rights for the San Joaquin

¹ It should be noted that these policies will be based solely on the groundwater available without the water distribution methods that will be investigated in Study Area 2. If redundant supply capabilities are developed in the future, development and land-use policies may be modified, either by allowing additional development or by reconfiguring development to meet other planning objectives. (For instance, development patterns could be modified to promote clustering of development to enhance transportation systems, open-space, etc. Such clustering might be infeasible if groundwater is the only source of water resources for the area.) This planning process will include recommendations for re-assessing development guidelines in case any of the planned water supply mechanisms are implemented.

River water have all been contracted, so this scheme would rely on another infrastructure project that is currently being discussed, the Madera Ranch Water Bank. This project, currently being proposed by the Madera Irrigation District, would take excess water during flood years and use it to recharge the groundwater in an area west of Highway 99 where a depression in the basin bottom creates a natural water holding area. A series of existing infrastructure canals exist such that this banked water could then be pumped back upstream and used by valley farmers. The rights for the San Joaquin River water that would otherwise be used by these farmers can then be freed for exchange to other users, including the water users of eastern Madera County. They could also be exchanged for rights in other water bodies, such as Bass Lake. Thus the water supply projects that will be examined in this grant help complete an infrastructure system that will allow storage and beneficial use of water throughout Madera County.

For this task a qualified engineering firm will work with stakeholders, County staff and technical advisors to identify several options for above-ground water delivery systems that can provide groundwater supplements for more densely developed areas or water security during drought times. These can include:

- Proposed Redinger Lake pipeline and storage
- Pipeline/storage for groundwater from wells in nearby undeveloped areas
- Pipeline/storage for water from Fresno River, Bass Lake, or other surface supplies

The Engineering firm will implement a preliminary feasibility study for the most feasible options identifying

- Potential environmental impacts
- Cost of the proposed infrastructure
- Cost of water treatment
- Cost and availability of water rights (if applicable)

The planning group will use this information to determine a prioritized list of potential water supply projects. Upon adoption of these priorities by the Board of Supervisors, the County will prepare to take the next steps towards implementation, which will presumably be a pre-engineering study of the preferred alternative along with an Environmental Impact Report. This will put the County in a good position to apply for implementation funds through Prop. 50 or other future sources of water project funding.

3. Water Quality Protection and Improvement. This Study Area involves assessments and analyses that are needed to address water quality problems in the region. These include analysis of naturally occurring contaminants and those caused by human activities, as well as the feasibility of various mechanisms for improving water quality. The tasks are as follows:

- Mapping of areas where natural contaminants are present in the groundwater
- Hydro-geological analysis of fractures containing contaminants
- Recommendations regarding well design to isolate contaminated fractures and improve water quality
- Recommendations of options regarding mixing water from wells in areas of significantly poor water quality to improve usability
- Investigation of potential point sources identified in the Central Sierra Watershed Plan, such as mines, animal feeding operations, etc. for effects on water quality

- Investigation of other potential activities that could impair water quality, such as failing septic systems in high-density development next to the Fresno River and its tributaries.

The results of these studies will be translated into improved water quality through

- Dissemination to water companies, well drillers, and the general public of recommendations on areas to avoid when drilling groundwater wells
- Dissemination to water companies and concerned residents of recommendations for improving the performance of existing wells in areas of natural contamination
- Enforcement of water quality regulations when impairing activities are identified.

4. Increasing Water Resources – This Study Area examines options for increasing existing water resources in the region. The two most common strategies in this area are water conservation and water recycling. These strategies will be included in the planning process, the first through promotion of materials already created by the Central Sierra Watershed Committee, and the second through a feasibility study of recycling effluent from several wastewater treatment facilities in the region for use on landscaping.

It is possible that other appropriate strategies for “Demand Management” may emerge during this planning process. These issues will be assessed by the Planning Group and recommendations made for both public information and regulatory guidelines where appropriate.

There is a more controversial strategy for increasing water resources that is particularly appropriate for this region. This is to increase water by reducing the thick brush that characterizes most of the foothill areas. Such brush clearing is already recommended for fire safety and habitat improvement and is being actively promoted by the Madera Fire Safe Council, the Coarsegold Resource Conservation District, the Forest Service and the Central Sierra Watershed Committee. Opinions vary regarding the effectiveness of this strategy for increasing quantities of ground and surface water, however a leaflet produced by UC Cooperative Extension Water Task Force, Watershed Management and Water Yield provides a good summary of the current understanding in this area (see Attachment 10.) According to this document, treatment of brushlands, such as those that characterize eastern Madera County, provides the easiest and most economical opportunities for increasing water yield. The amount of rainfall in this region is also appropriate for an effective program; it must be at least 20 inches and less than 48 inches. Studies have shown that for areas where there is 30” of rainfall (most of the foothill region of eastern Madera County), where a dense stand of brush is removed and replaced with shallow-rooted plants (such as grasses), runoff can increase from 4.5 to 11.6 acre-inches per treated acre. That means that for every acre where such clearing is done, approximately ½ to 1 acre foot of additional water can be gained.²

² Of course, this additional water is only available for beneficial use if it can be captured and/or stored. One of the synergistic linkages in this plan is between this Study Area and the ‘Water Supply Reliability’ Study Area. Additional run-off can be stored in the Madera Ranch Water Bank Project; the Madera Irrigation District already has infrastructure which can transfer water from the Fresno River and the San Joaquin River to the water bank. If above-ground pipelines are developed from Redinger Lake, Bass Lake or the Fresno River, this water can then be re-distributed (possibly by means of some internal exchanges) to the target areas of eastern Madera County. Thus the feasibility studies proposed in Study Area 2 are an essential step in achieving beneficial use of this additional water.

Brush clearing/fuel reduction activities are already taking place in eastern Madera County. A Joint Powers Authority of the Coarsegold RCD and the Madera Fire Safe Council has recently obtained Prop. 40 funds to clear a 630 acre fuel break in the Oakhurst area. The Natural Resources Conservation Service has an Environmental Quality Incentive Program (EQIP) program that funds brush clearing activities for approximately 1000 acres per year. From existing activities alone, therefore, it is possible that an additional 1000 acre feet per year of useable water is being “created”. Since the town of Oakhurst uses only 3,000 acre feet/year, it is easy to see the potential significance of such a fuels reduction program in supplying needed water to the region.

This water management strategy abounds with questions and issues, including:

- Whether brush clearing can be implemented in a sustainable fashion (called “type conversion” where plant cover is changed from dense shrubs to oak grassland);
- Whether the additional water made available can be captured for beneficial use;
- Whether other land management strategies, such as the construction of berms and swales, can maximize the groundwater recharge from fuel reduction.
- The nature and ownership of the rights in the additional water that results from the treatment.

These are not simple issues and they have been ignored in most water management planning processes because of the amount of resources required to address them, particularly in the context of trying to develop consensus among a broad group of stakeholders. However, if properly managed and facilitated, they present a potential opportunity for a win-win situation with multiple benefits. The applicant feels that this will be a valuable addition to the comprehensive water management planning program and so has agreed to take the plunge into this arena, with the hopes of working through the issues, reaching a consensus on policies, and creating a model program that can be used in other foothill areas. In recognition of the controversial nature of these issues, appropriate resources have been designated for professional facilitation of a consensus-building process. Resources have also been designated for technical assistance regarding water rights from a legal expert in the area, including both the specific issue of water from fuels reduction programs and the more general issues of water rights that will arise throughout the planning process.

Tasks associated with this study area include the following:

- Enhance public information on water conservation
- Feasibility study for recycling of water from Waste Treatment plant(s)
- Assessment of information regarding increase of water from fuels reduction – share information with stakeholders
- Detailed area-by-area analysis of regional soils, including permeability, water holding capacity, slope, etc.
- Detailed area-by-area analysis of vegetation by type and percentage of canopy cover.
- Integration of detailed soils and vegetation data on GIS base map
- Development of fuel-management guidelines for soils improvement, habitat improvement and enhanced water availability.

- Explore options of how to get beneficial use of this increased water for Eastern Madera County
 - Precedents in obtaining water rights from fuels reduction programs
 - Explore options of transporting, storing or exchanging such water (such as with proposed MID water bank)
 - Professional facilitation of consensus-building process to develop agreements about beneficial use of increased water
- Agree on fuels reduction program and strategies
- Produce and distribute educational materials on fuels reduction program and strategies

The individuals who proposed this program for inclusion in this grant proposal include representatives from the Natural Resources Conservation Service, the Coarsegold Resource Conservation District, U.C. Cooperative Extension and the U.S. Forest Service. It should be noted that the level of detailed data collection, both for soils and for vegetation coverage, proposed to be collected as a part of this process has not been done in any other area of California. The merging of this data into a comprehensive assessment of opportunities and constraints for watershed management is likewise not otherwise available. Given the level of expertise of the various agencies agreeing to participate in this process, the results will provide a valuable model for similar foothill areas of California.

5. Recreation and public access. Eastern Madera County contains five major lakes: Redinger Lake, Bass Lake, Millerton Lake, Eastman Lake and Hensley Lake. These four lakes are already well developed for the purposes of recreation and public access. Enhancing the recreational value of these lakes, therefore, is only an issue where water quality is concerned³. However there is very little recreation and public access to creeks and rivers in the region. Current access includes the Lewis Creek trail, the San Joaquin River trail, the Oakhurst River Parkway (along the Fresno River) and the newly developed Ahwahnee Hill Park that includes a portion of Petersen Creek. Since the region abounds with streams, the potential exists for projects to increase public access and recreation on these waterways. This Study Area will therefore focus on creek restoration and public access projects. Tasks include:

- Identification of potential creek restoration projects, taking into account
 - Costs
 - Recreational benefits
 - Water Quality benefits (decreased sedimentation, etc.)
- Working with Stakeholder groups to prioritize projects in preparation for funding requests.
- Identification of stream flood areas and re-examining land-uses in these areas to consider reducing development and increasing public access/parklands.

6. Environmental Resources and Sensitive Areas. This is a catch-all Study Area that will focus primarily on resources and sensitive areas that should be identified and protected by the County. Information about such areas exists, but is not necessarily integrated into the County's GIS map so as to provide notification when a potentially encroaching development is proposed. Funding appropriated to the GIS portion of this project will allow geo-coding of such areas and inclusion

³ This issue is addressed in Study Area 3.

as a layer on the County's GIS system. The Stakeholder Planning group will also develop additional recommendations as needed for protective policies regarding these sensitive areas when nearby developments are proposed.

b.3. Planning Process and Stakeholder Involvement: The stakeholder involvement for the proposed planning program will be designed both (1) to collect input from the various agencies, entities and interest groups, and (2) to disseminate public education as broadly as possible about water issues in Eastern Madera County.

a. A stakeholder planning group will be formed by asking the following agencies and entities to designate at least one individual to participate in monthly planning meetings:

- County departments (Planning, Engineering, Environmental Health, County Counsel, Eastern Madera County Water Oversight Advisory Committee)
- State agencies (DWR, RWQCB, CDF, UC Coop Extension)
- Federal Agencies (Forest Services, NRCS, Army Corps of Engineers, Bureau of Reclamation)
- Local Agencies and Districts (Madera Irrigation District, Chowchilla Water District, Coarsegold RCD, Chowchilla/Red Top RCD)
- Tribes (North Fork Mono, Chukchansi)
- Area Planning Organizations (Oakhurst Community Advisory Committee, Coarsegold Area Planning Association, Coarsegold Citizens for Balanced Planning, Yosemite Lakes Owners Association, North Fork Community Development Council, Ahwahnee Community Advisory Committee)
- Other Interest groups: Central Sierra Watershed Committee, Farm Bureau, Cattlemen's Association, land-owners, Yosemite Visitor's Bureau, Chambers of Commerce, etc.

Many of these groups and agencies have already been contacted and have committed to being involved in the planning effort. (See Attachment 8.) The planning group will meet monthly, and will be responsible for development and approval of the draft Water Management Plan.

b. Ad Hoc Committees will be formed for each Study Area including stakeholder representatives and others with special interest and knowledge in that area. The Ad Hoc Committees will meet as needed to

- Review and agree on scope of studies and work plans
- Develop draft policies relating to their specific Study Area
- Develop draft recommendations for future projects
- Prioritize other recommended projects

Draft policies and recommendations will be sent to the full stakeholder group for discussion and integration into the overall Water Management plan.

c. Technical Assistance: Technical assistance will be provided as needed to the Ad Hoc committees. This will include

- Engineering technical assistance in analysis and assessment of infrastructure projects
- Legal technical assistance for review of policies. ***It is important to note that the legal assistance is not to promote legal action or disputes among the stakeholders, or to provide any advice or assistance regarding such legal disputes. This legal assistance is***

only intended to educate participants on the current state of water rights as they apply to the various projects proposed.

- Other technical assistance as needed.

d. The resulting plan will be presented in order to the following existing entities:

- The Eastern Madera County Water Oversight Advisory Committee
- The Water Oversight Advisory Committee
- The Board of Supervisors

In addition, if there are issues under the jurisdiction of the Madera County Flood Control and Water Conservation District, the plan will be presented to:

- The Madera County Flood Control and Water Conservation Advisory Committee
- The Madera County Flood Control and Water Conservation District

These agencies have been designated by the Board of Supervisors as the advisory channel for issues related to Eastern Madera County water.

The process will be managed by a Project Manager, an independent consultant familiar with water planning issues. The Project Manager will report on the progress of the plan to the Eastern Madera County Water Oversight Advisory Committee, the Central Sierra Watershed Committee. Additional facilitation assistance and technical advice will be available as needed for specific issues.

Public Information and Education: Public information and education is an important element in the success of this planning process. Many of the strategies in the plan will be controversial, and broad public education is important to dispel misinformation and convince residents of the seriousness of the issues and the need for action. Other areas may be less controversial but may require broad-based compliance with voluntary guidelines to be effective.

Vehicles for public information include the following:

- Involvement of broad stakeholder planning groups. The members of the stakeholder planning group will play a large role in the public information by disseminating information to their various agencies and committees.
- Specific contracts for public information campaigns. The Central Sierra Watershed Committee and the Coarsegold Resource Conservation District have already developed public information materials in the areas of water conservation and fuels management. These groups will receive funding under the grant to further develop and distribute these and related public information materials through their existing community channels.
- Web-based GIS and related information. A GIS consultant will be paid to assist with integration of existing base maps and layers from Madera County, the Department of Water Resources, the US Forest Service, and other agencies. These maps will be needed for the specific planning projects that are part of this proposal. However, user-friendly technology exists to distribute this GIS information via the web. The CSU Fresno ISIS center has agreed to host the web site on their server for the period of this planning process. Visitors to the web site will be able to use the GIS planning map to examine conditions in their areas, turning on and off layers of information and zooming in to particular locations. Links to other information, such as appropriate fuel management for the specific area, will add to the value of this public information option.

- Integration into local educational curriculum. The use of GIS maps, as well as the information from other planning areas, can provide interesting and relevant science subjects for local school children. By raising the children's awareness of water issues, the information can make inroads into families that might otherwise not have access or capacity to learn about these matters. Specifically, Yosemite High School in Oakhurst has an Environmental and Spatial Technology Program which has participated in previous water projects. They will be invited to utilize the GIS for their activities over the two years of the planning project.

2. Description of region

a. Definition of region area: The study area for this grant is located in Eastern Madera County. Madera County consists of a relatively flat-lying portion of the San Joaquin valley (Western Madera County) and the foothills and mountains of the Sierra Nevada (Eastern Madera County). Western Madera County groundwater is contained in alluvial groundwater basins. Eastern Madera County groundwater conditions are significantly more complex. Groundwater occurs predominantly in undefined fracture systems of granitic and metamorphic bedrock. Ground surface elevations in eastern Madera County range from 300 feet above mean sea level (MSL) at the base of the foothills to over 13,000 feet MSL at the crest of the Sierra Nevada. Precipitation ranges from 20 to 60 inches per year, depending on elevation.

For purposes of this grant, we are defining the eastern Madera County region as the area east of the groundwater basin boundary, as defined in the County's AB 3030 Groundwater Management Plan. (See Map, Attachment 6⁴). This is a line that approximately follows the Madera Canal, with deviations up to 5 miles on either side.

b. Appropriateness as a region for water management.

This region has been selected for water management planning based on its hydrogeological characteristics. The boundaries follow the County boundaries except at the divide between the groundwater basin and the hardrock areas.

The eastern Madera County region is characterized by small towns and rural development. The populated areas of the region face similar water quality and availability issues, although the problems can be more or less serious based on the geology of the area and the growth patterns taking place. In addition to the similarity of the issues, there are linkages between the areas of this region that make it prudent to plan for them together. These linkages include groundwater flows, surface water flows, impacts between areas from type and density of vegetation, and development/land use issues.

The following factors make this region an appropriate region for water management:

- The area is within one county, so the adoption by jurisdiction of planning and policy guidelines created from this plan will create consistent implementation for the entire area.
- Similarity and linkages between water issues make it rational to plan on a regional basis for land use, infrastructure development, ecosystem enhancement, and other water management strategies.

c. Internal characteristics of region. The eastern Madera County region is characterized by small towns and rural development. Population for the area is estimated to be approximately 30,000. Water supply for the majority of developed properties consists of individual, on-site wells. Portions of the towns are served by a variety of small water systems, both County and private, with numbers of connections ranging from 15 to 403 (County) and 45 to 1,450 (private). Total of current connections to the 15 County systems is 969; for the 10 private systems the total current connections is 4,321. Of these 25 water systems, 19 have groundwater sources and six

⁴ Attachment 6 includes other maps (both .pdf and GIS formats) that feature other important characteristics of the region as well as information from this proposal.

have surface water. An estimated 4,609 additional wells exist, based on well logs for the area, though it is unclear how many residences these wells serve.

This area is growing rapidly. In terms of percentage growth, Madera County is the 4th fastest growing county in the State. Much of this growth is in the foothill areas. The largest population centers in the area are along the Highway 41 corridor, which is the main route to Yosemite National Park from the south and the closest commute to Fresno, the nearest metropolitan area. These towns include Coarsegold (pop. 4390, including surrounding areas), Oakhurst (pop. 6900, including surrounding areas), and Yosemite Lakes Park (population 4,000 +). Driving north on Highway 41 from Fresno, one first encounters Yosemite Lakes Park, then Coarsegold, which is five miles further. Oakhurst is located 8 miles on, separated from Coarsegold by Deadwood ridge, the summit of which is approximately 4000 feet. Continuing north, one reaches Cedar Valley, approximately 10 miles south of the entrance to Yosemite Park. Other population areas are Raymond and Ahwahnee (west of Highway 41) and Bass Lake, North Fork and O'Neils (East of Highway 41).

The land uses in the area are divided into three main types. The easternmost part of the region, (north east from Oakhurst and North Fork), is primarily Sierra National Forest and is zoned Open Space, with some minor patches of agricultural zoning. The middle portion of the region, including the areas of Ahwahnee, Raymond, Yosemite Lakes, Coarsegold, Oakhurst, and North Fork is zoned primarily rural residential, with some commercial areas. The westernmost part of the region is zoned Agricultural Exclusive. (See Madera County GIS map, Attachment 6.) The agricultural activities in the area consist of vineyards and orchards, grazing and some farmland.

The region can be divided into two watersheds. The northern part of the region is part of the Upper Chowchilla – Upper Fresno River watershed. This is divided by a range of hills running southwest – northeast from the southern part of the region, which is part of the Lower Chowchilla - Middle San Joaquin River watershed.

d. Issues regarding water quantity and quality. All of the three major towns in eastern Madera County - Coarsegold, Oakhurst and Yosemite Lakes Park – are dealing with serious water issues:

- Coarsegold: In Coarsegold the major issue is adequacy of groundwater in response to pressures for growth. Generally in Madera County, if a developer wishes to build a residence, he must show that there is adequate water supply for that residence, an amount generally estimated at 3 gallons per minute (gpm). In the Coarsegold area, the County was approving building permits on this basis, but began to hear of situations where the new wells, though they had adequate supply of water, were impacting the yields of wells at nearby homes. Although this was alarming, the current provisions of the Madera County code do not include minimum standards for demonstrating water or require the monitoring of nearby wells.

However, County regulations are such that if a developer wishes to subdivide a parcel of land into smaller lots the project becomes subject to review under the California Environmental Quality Act and it is possible to address potential impacts regarding water availability. In response to such land divisions in the Coarsegold Area where neighbors

reported diminishing well yields, the Board of Supervisors directed that lot splits be subject to an evaluation of water usage, including any cumulative impacts that would be generated. As an alternative, several developers have proposed to limit the number of residential units which can be developed and to rezone their properties to ensure that no additional parcels can be created. While this alternative has allowed individual land divisions to proceed, the potential for cumulative impacts to water availability continues to be of significant concern.

Coarsegold is currently completing an update of the Coarsegold Area Plan. This planning effort has been taking place for the last five years, and has been very controversial. One of the most hotly disputed items is the minimum parcel size that is allowed. This is an issue because of the many parcel splits that have taken place in Coarsegold as the land becomes more desirable for development. Coarsegold is currently growing at a rate of 5% per year. The existence of limited groundwater is one of the most important considerations leading to a proposal to reduce the allowable densities within the planning area. However, there is no reliable data on the actual quantity of groundwater and how much development it could support. In addition, it appears that the availability of groundwater is not consistent over the Coarsegold area. Some areas have very productive wells, where others get very little water.

The groundwater availability issues have been compounded by the development of a Casino and resort along Highway 41 by the Picayune Rancheria of the Chukchansi Tribe. While the Casino development has sufficient water, surrounding residents found their wells going dry after the Casino wells were drilled. The Tribe now supplies water to recharge these wells. This water is shipped in to Coarsegold from Mariposa County. In addition to the current impacts, the Casino has increased the commercial desirability of the area, and shopping center developments are being proposed on surrounding land. The need for affordable and low-cost housing has also increased as values rise.

Water Quality issues also affect Coarsegold, including salt water and high concentrations of manganese and iron. Since these are treatable issues, they are not considered as pressing as the issue of groundwater sufficiency.

- Oakhurst: In Oakhurst the water situation is even more critical than Coarsegold. Water quality has been an increasing concern in the area. Much of the area is served by nine active bedrock wells operated by the Hillview Water Company. Over time, the concentration of minerals in the groundwater from these wells has increased. Iron and manganese treatment is required for most of the wells, and gross alpha, uranium and TDS concentrations exceed the standard at some wells. The California Department of Health Services issued a Compliance Order to Hillview Water Company for failure to comply with the Uranium MCL and a failure to insure that customers are provided with a reliable and adequate source of pure, wholesome, healthful and potable water. The Health Department has directed the water company to issue drinking water advisories in 1998 through 2002.

Water quantity is also an issue in Oakhurst. As of this spring 2002, wells serving the area were producing an estimated 850 gpm. Although the average daily demand was estimated at 386 gpm, the estimated peak daily demand is 1,007 gpm, which means that the system's ratio of peak demand/capacity was 118. Several summers ago one of the well's production

dropped unexpectedly from 240 gpm to 130 gpm, leaving Oakhurst in a critical water shortage situation. Water rationing was instituted and residents were asked to do exterior watering only once per week. More significantly, the water shortage prompted the use of wells with very high uranium levels, making the water delivered to the residents unfit for drinking. Residents were warned to use bottled water for drinking and cooking.

Oakhurst's water problems have been noted by the Department of Water Resources in the past. The Madera Area Investigation published by DWR in 1966 (preliminary Edition, Bulletin No. 135), concluded that groundwater supplies were inadequate, and that additional water would need to be imported by the year 2020. It is important to note that the projected population at that time (the year 2020), has already been surpassed in the area.

- Yosemite Lakes Park: The Yosemite Lakes Park is a 3,200 acre development created in the late 1960's. The developer subdivided this area into a planned community of 2,258 residential lots of 1 acre or larger. This area was originally developed for part-time vacation living and expected to take until 2040 for development of 80% of the parcels. Today the parcels are almost all developed and most of the residents are full-time residents. The water use is 45 years ahead of their projected usage. The appropriateness of the area's aerobic water treatment infrastructure is also being questioned. Much of the water infrastructure is old and deteriorated. The area already has one of the highest water rates in the State, and is struggling to find ways to upgrade their system.

The water situations in Oakhurst, Coarsegold and Yosemite Lakes Park are the most serious in the area, but groundwater concerns exists throughout Eastern Madera County. The area has more than doubled in the last 10 years. Even without lot splits or subdivision, there are 9,000 buildable parcels in the foothill area, which if built upon would almost double the current population. The seriousness of this issue has generated activities on the part of the residents, County staff and other stakeholders to develop groundwater management policies and practices.

e. Social and cultural makeup of regional community - Eastern Madera County is an area in transition. Previously this area was dominated by grazing, irrigated pasture, animal husbandry, small towns, vacation homes and rural development centered around mines, quarries and lumber mills. However, with the rising cost of living in the coast, the area is becoming home to a very different population. New residents are often retirees from other areas or professionals who enjoy living in a rural area but commute to nearby Fresno. Madera is now the 4th fastest developing counties in the State (percentage-wise) and this area is one of the fastest developing areas of the County.

There is a large disparity in income levels among the population. Older areas such as North Fork and Oakhurst are lower income. (Oakhurst meets the criteria for "disadvantaged community" based on a Median Household Income that is 71% of the State's MHI.). Other areas that have experienced major recent development, such as Coarsegold, have higher income levels.

The region is home to two federally-recognized Indian tribes – the Chukchansi and the North Fork Mono. These indigenous people of the area have engaged in ecosystem management even in pre-technology time by setting fires to control fuel densities. Since their tribal lands were

overtaken by the US government, members of these tribes have had struggles with poverty and unemployment. A new phase of economic status is beginning with the development of casino complexes. The Picayune Rancheria of the Chukchansi tribe has developed a casino and resort just south of Coarsegold on Highway 41. The North Fork Mono Tribe is planning a casino along Highway 99 in the western portion of the County.

f. Areas of special biological significance, other sensitive habitats, impaired water bodies

Hensley Lake, and the Fresno River that drains into it, was the focus of a water quality study implemented pursuant to a SWRCB 205 (j) grant awarded in 2001. This water body experiences massive algae blooms in the spring and summer months, which interfere with recreational activities and are potentially damaging to aquatic life. Because of these problems, Hensley Lake has been proposed for addition to the 303 (d) list as potentially impaired and in need of further study. The purpose of the project was to collect appropriate historical and new data, identify nutrient sources, model the nutrient loading and develop an implementation plan to reduce nutrient loading and algal problems to acceptable levels. The study was implemented through a subcontract with the CSU Fresno Foundation (the California Water Institute), and is currently awaiting final approval of the draft report.

g. Important ecological processes and environmental resources

- Vegetation Management - Vegetation management has been identified as an important strategy in maximizing the environmental resources of this area. According to the California Fire Plan, this area is at major risk for wildfire. The major source of this risk is an increase in fuel loads due to reduction of activities that managed that fuel load in the past: logging, grazing and naturally-occurring wildfires. The dense brush that characterizes much of the foothill areas also decreases plant and animal biodiversity. This issue demonstrates the web of ecosystem inter-relationships. Dense brush utilizes more groundwater, reducing above-ground flows in the area and threatening sensitive plants and animals that live in and around creek beds. Dense brush also chokes out more delicate plants. As an example, elderberry bushes are protected in the Eastern Madera County area because they are the habitat of the valley long-horned elderberry beetle. Elderberry bushes cannot compete with dense stands of chaparral and manzanita, however where these stands are been thinned for fire purposes, you will find elderberry bushes springing up abundantly. Vegetation management is therefore one of the strategies proposed for benefiting ecological processes and environmental resources.
- Stream restoration – Although creeks and streams in the area are not considered “impaired” water bodies, sedimentation is a continuing problem from erosion of stream banks due to construction, reconfiguration of stream beds, and other developmental impacts. Sedimentation can cause problems for fish and plants in stream beds, both through reducing the available oxygen and by filling up spaces between gravel so the fish cannot spawn. Stream restoration is one of the areas of study in this grant, both for its benefits to recreation and to environmental processes.

j. Water-Related Infrastructure

The major water-related infrastructure currently existing in the area includes:

- Dams: Friant Dam (Millerton Lake), Hidden Dam (Hensley Lake), the Eastman Reservoir and the Crane Valley dam (Bass Lake).
- Public and Private Water systems (discussed above)
- Sewer systems have been developed for several of the towns in the region, including Oakhurst, North Fork, and Yosemite Lakes Park. Other areas rely on septic systems.

This application proposes feasibility studies for additional infrastructure in the form of water delivery systems that could provide an alternative source to the groundwater that is insufficient to support development in many areas.

k. Regional water management agency responsible for development of proposed plan

Responsibility for Developing Plan: The agency responsible for the development of the proposed plan is a Stakeholder Planning group consisting of representatives from County departments, State agencies, federal agencies, local agencies and districts, local Indian Tribes, area planning organizations, and other interest groups. (See Section 1.b.3 above for a detailed list.) This group includes participation by at least two agencies which have statutory authority over water, including

- Madera County Board of Supervisor
- Madera County Flood Control and Water Conservation District
- Madera Irrigation District

Responsibility for Approving Plan: The resulting plan will be presented in order to the following existing entities:

- The Eastern Madera County Water Oversight Advisory Committee
- The Water Oversight Advisory Committee
- The Board of Supervisors

In addition, if there are issues under the jurisdiction of the Madera County Flood Control and Water Conservation District, the plan will be presented to:

- The Madera County Flood Control and Water Conservation Advisory Committee
- The Madera County Flood Control and Water Conservation District

This process has been designated by the Board of Supervisors as the advisory path for issues related to Eastern Madera County water.

Adoption of Plan: The resulting plan will be adopted by the Madera County Board of Supervisors and the Madera County Flood Control and Water Conservation District. The Board of Supervisors has committing to integrating the adopted plan into its General Plan to assure implementation and accountability. (See Resolution, Attachment 1.)

Fiscal Agency and Coordination: The fiscal agent for the implementation of this plan will be the Madera County Resource Management Agency.

Planning Process Oversight: The Eastern Madera County Water Oversight Advisory Committee is the body designated by the Board of Supervisors to provide recommendations and oversight on water issues in eastern Madera County. The project manager for this project will provide status reports to this body on a monthly basis.

i. Maps

Attachment 6 includes the following maps of the region:

- A PDF format map of the region
- A PDF format map showing the location of proposed infrastructure projects
- A PDF format map that identifies the location of planning groups in the region

In addition, a CD is being mailed to DWR containing

- A DWR watershed map of the region in GIS format
- A County GIS map including towns, water bodies, sewer and water districts

3. Plan Objectives

The goal of this planning process is to produce a water management plan that:

- Has broad-based stakeholder input and support
- Manages and enhances water quality and quantity within the region
- Creates water supply reliability while reducing potential dependence on imported water
- Includes mechanisms for implementation and accountability.

The draft objectives for the plan are as follows:

1. Determine sustainable groundwater capacity in the various sub-areas of the region
 - a. Complete detailed groundwater studies for Coarsegold area (including four sub-areas of Coarsegold)
 - b. Complete more general groundwater studies for six other sub-areas of the region
2. Create rational connections between land use and water availability in each sub-area
 - a. Create draft land-use and development policies for each sub-area in proportion to the available groundwater in that area.
3. Plan for on-going studies and monitoring as needed to determine on-going capacity of groundwater to support development
 - a. Programs will be developed for continuing monitoring of groundwater availability and quality.
 - b. Specific recommendations will be created regarding the periodic re-assessment and modification of land-use and development policies based on updated groundwater information.
4. Increase water yield and retention capabilities in the region
 - a. Enhance public information on water conservation
 - b. Create feasibility study for recycling of water from Waste Treatment facilities
 - c. Data collection and analysis necessary to assess potential for increasing available water through fuels reduction, including
 - i. application of current studies and research to region's conditions
 - ii. assessment of potential increase in useable water.
 - d. Develop consensus on policies regarding beneficial use of increased water and on recommended fuels reduction program and strategies
 - e. Produce outreach and educational materials on fuels reduction program and strategies
5. Design programs and policies to improve, restore and enhance the ecosystem
 - a. Fuels reduction for fire-safety, soils improvement and habitat enhancement
 - b. Stream restoration study
6. Design mechanisms for water supply reliability and drought protection
 - a. Feasibility study for water delivery pipeline options
 - b. Facilitation of discussions with Madera Irrigation District about integration of Madera Ranch Water Bank with eastern Madera County infrastructure system.
7. Preserve and enhance water quality
 - a. Identify areas of natural contaminants
 - b. Identify mechanisms for structuring wells to isolate fractures with natural contaminants
 - c. Create outreach materials to affected groundwater users with recommendations for water quality improvement
 - d. Feasibility study for water combining to enhance water quality

- e. Identification and assessment of mines and other activities that could be threatening water quality
- f. Identification of inappropriate or failing septic systems near waterways and regulatory action to correct
- 8. Maximize the recreational enjoyment of water
 - a. Take protective and regulatory actions to improve water quality in streams and lakes
 - b. Identify, assess and prioritize potential stream restoration projects in region
- 9. Minimize destructive abilities of water
 - a. Identify flood areas and recommend development guidelines to minimize damage to property
- 10. Educate homeowners, developers, and other water users to value and preserve water resources
 - a. Increase existing public education efforts in the areas of water conservation and fuels management
 - b. Create new public information materials related to water policies and recommendations based on results of planning process
 - c. Create user-friendly web site with GIS capability and promote through school curriculum
- 11. Provide mechanisms for resolving or minimizing disputes and conflicts about water issues.
 - a. Initiate and facilitate a stakeholder-driven planning process
 - b. Design and implement a facilitated consensus-building process around beneficial use of increased water resources from fuel reduction
- 12. Design sustainable funding mechanisms to support studies, monitoring, plan updates and plan implementation
- 13. Plan and prepare for funding needed to support water supply infrastructure
- 14. Successfully locate funding sources

How objectives were determined: These objectives are drawn from current plans and studies for the region. They are a compilation of the goals and objectives from those plans along with recommendations for further studies and policy development.

These objectives, in their initial draft form, were shared at presentations before 14 different community groups, committees and agencies. Suggestions and additions were noted and integrated into this planning application.

These objectives will be reviewed and refined by the Stakeholder Planning Group when it is first convened.

Addressing major water related objectives and conflicts in the region. The objectives and the Study Areas are designed to address the major water-related objectives and conflicts in the region. In fact, the Study Areas identified in the plan are a direct response to the requests of the major water planning entities in the region over the last few years for funding resources, as follows:

- The Madera County Planning Department has requested funding to determine the groundwater conditions of the various sub-areas of the region, particularly the Coarsegold

area, in order to assist with land-use policies and responses to specific development requests.

- The Eastern Madera County Water Oversight Advisory Committee requested funding for a feasibility study of above-ground water delivery mechanisms, specifically the proposed Redinger Lake Pipeline.
- The Central Sierra Watershed Committee has sought funding for public information and ecosystem restoration.
- The Coarsegold Resource Conservation District has been looking for funding to document the connection between their brush-clearing activities and increase of water resources.
- Community groups have been looking for funding for creek restoration projects (specifically Ahwahnee and North Fork)
- Community residents, community groups and County Supervisors have deplored the dangerous water quality and lack of water supply reliability in Oakhurst and have made this a priority for funding.
- Conflicts over planning policies in Coarsegold have led community groups to request better information about groundwater conditions.

Statewide Priorities: These planning objectives support the following Statewide Priorities:

- Reduce conflicts between water users or resolve water rights disputes.
- Implementation of RWQCB Watershed Management Initiative through furthering the following Water Quality Priorities:
 - Priority 3. Projects which establish and implement watershed management programs
 - Priority 4. Implementation of watershed education
 - Priority 5. Projects which improve or restore natural functioning condition of stream channels
 - Priority 8. Projects which improve upland conditions (i.e. fuels management) and result in improved water quality.
 - Priority 15. Projects that assess impacts of various land-use practices on drinking water sources and develop implementation measures to protect these water sources.The plan also addresses the following project numbers that are priorities in the San Joaquin River Watershed: 1, 7, 9, 12, 29, 31, 53, 54, 79 and 90.
- Addressing environmental justice concerns through activities to improve water quality and water supply reliability in the disadvantaged community of Oakhurst.

4. Integration of Water Management Strategies

a. IRWM Plan Requirements: The six Study Areas outlined in this plan include in their scope all of the required water management strategies to meet the minimum IRWM Plan standards, as follows:

Study Area 1, Groundwater, includes the strategies of

- Groundwater management
- Land use planning

Study Area 2, Water Supply Reliability, includes the strategies of

- Water supply reliability
- Storm water capture and management
- Conjunctive use
- Surface storage
- Water transfers
- Water treatment

Study Area 3, Water Quality Protection and Improvement, includes the strategies of

- Water quality protection and improvement
- NPS pollution control
- Water and wastewater treatment

Study Area 4, Increasing Water Resources, includes the strategies of

- Water recycling
- Water conservation
- Wastewater treatment
- Ecosystem restoration
- Environmental and habitat protection and improvement
- Surface Storage
- Water transfers
- Watershed planning

Study Area 5, Recreation and Public Access, includes the strategies of

- Recreation and Public Access
- Environmental and habitat protection and improvement
- Flood management

Study Area 6, Environmental Resources and Sensitive Areas, includes the strategies of

- Environmental and habitat protection and improvement
- Wetlands enhancement and creation

b. Synergistic effects of proposed water management strategies: The Study Areas and water management strategies proposed in this plan have multiple points of inter-relation. It is

impossible to describe all of these linkages within the context of this grant application. However, some of the main ones are as follows:

- Groundwater and Increasing Water Resources through Fuels Reduction: The “water budget” of an area consists of the amount of precipitation (the income), which is then utilized as groundwater recharge, surface water run-off, and evapotranspiration (the expenses). When any one of these “expense” items of water use is reduced, there is more water for the other items. Studies have shown that in ecosystems that have characteristics of this area, (foothill areas with heavy brush and rainfall between 20” and 40” per year) fuels reduction can substantially reduce evapotranspiration. This leaves more water for run-off and groundwater recharge.

An important point regarding water management is that groundwater and surface water are not really separate entities. In areas where the groundwater level is lower than the surface water, surface water will go to recharge the groundwater. Similarly where surface water is lower than groundwater levels, the groundwater will flow into the surface water. This creates additional complexity when looking at the uses of water. Groundwater, for the most part, is used by residents of the area. Surface water flows to rivers and is stored, released and utilized according to a complex system of water rights. Whether the increased water from fuels reduction will benefit local groundwater users depends on how much of that water will recharge the groundwater, how much can be stored in infrastructure projects, and whether an agreement can be developed on the rights associated with that additional water. If such an agreement is reached and infrastructure is developed to re-deliver water to eastern Madera County, the surface water run-off can also benefit groundwater through a reduced reliance on and depletion of that resource.

- Increasing Water Resources and Water Supply Reliability: For the increased water created through Fuel Reduction projects to benefit local residents, infrastructure to deliver this water must be available. The Water Supply Reliability Study Area will provide feasibility studies and analyses of these infrastructure options. Such studies and analyses are a necessary step in obtaining implementation funding for such infrastructure.
- Ecosystem Restoration/Habitat Improvement and Increasing Groundwater Resources: According to many local resource management agencies, fuels reduction, if properly implemented, can restore ecosystems put out of balance by changes in land-use and a corresponding lack of natural and man-made fuel reduction (fire, grazing, etc.). Fuel reduction also protects ecosystems from the devastation of major forest fires, particularly where there is a build-up of fuels. In addition, reduction in areas of dense brush increases both plant and animal bio-diversity⁵. Increasing groundwater resources through fuels reduction can therefore be easily linked to eco-system restoration and habitat protection measures.

• ⁵ As an example, one of the major endangered species in this area is the long-horned elderberry beetle. elderberry bushes, which are protected based on being the habitat for this species, do not compete well with the chaparral and manzanita that grows in such thick stands. However when these stands are cleared, elderberry bushes flourish.

•

- Recreation/Public Access, Flood Control, Land Use and Water Quality: Stream restoration projects have potential benefits for recreation, but only if public access is allowed. Public access depends on land use, which is set by the County. If land use policies take into account the potential of flooding on streams, they can be modified to discourage development which then increases the chances of public access. Increased public access to stream resources increases recreational opportunities for enjoying local creeks. In a more direct way, as well, creek restoration can prevent flooding by improving configurations of the stream channel and adding beneficial plants to the stream bed. This in turn can benefit water quality through a reduction of sedimentation.
- Groundwater, Land Use, and Water Supply Reliability: The Study Area of Groundwater includes a land use analysis to determine the amount of development that can be supported by groundwater alone. This is an important analysis and will help resolve planning and development disputes that are common in this region. However, this is not the end of the story. If alternative water supply delivery mechanisms are put in place, this could suggest different land-use and development policies. With only groundwater as a resource, higher density development may be discouraged, because it draws too much from a small groundwater area. However, higher density developments may be more beneficial for other reasons, such as reducing transportation impacts, enhancing open-space, providing housing for low-income residents, etc. With a pipeline that can move groundwater water from one area to another or can take water from existing reservoirs⁶, planning policies can be freed from some of the constraints of groundwater. This possibility, however, also has its dangers. Groundwater availability is a convenient limiting mechanism for development. Many stakeholders, including both existing residents and agricultural water users in the valley area, prefer to have development limited. This explains why the proposed planning process includes facilitated consensus building activities that help reach win-win situations and/or fair compromises between all of these competing interests.

The planning process proposed in this application will also help to maximize the synergistic benefits of the water management strategies proposed. Although all members of the Stakeholder Planning Group will not be involved with each study area, these areas will report on their activities to the entire group on a monthly basis. Skilled facilitation will help identify areas where one strategy affects another, and will create a process for discussing these linkages. The intention is to create a managed planning process where mutual education and trust-building makes it possible to address disputes directly instead of sweeping them under the rug, and where participants are assisted to work together to discover win-win solutions and synergistic opportunities.

⁶ Made available through collecting the additional water run-off created through fuels reduction in reservoirs or water banks and exchanging it for rights in up-stream water,

5. Implementation

a. Schedule to implement plan

1. Planning process: The planning process will be implemented over a two-year period, from January 2006 through December 2007. A detailed schedule for implementation is included in Attachment 3.2, worksheet 2. Adoption of the plan is anticipated within that 2-year period.

2. Implementation. The exact schedule to implement the plan beyond its adoption cannot be determined at this stage. However, an estimated schedule for implementation of specific elements is as follows. The agency or department responsible for implementation is included in parentheses at the end of each item.

- Land use policies –within 9 months of plan adoption. Implementation will involve adoption into the County’s General Plan. (Planning Department)
- Regulations regarding water requirements for development – within 9 months of plan adoption. Implementation will involve revision of ordinances regarding demonstration of water availability for approval of developments. (Engineering/Environmental Health Departments)
- Infrastructure development – Unknown. Implementation will depend on obtaining implementation funding for the infrastructure projects (above-ground water supplies and storage) as assessed in the feasibility study, approved by the Stakeholder Planning Group and adopted by the Board of Supervisors. (Engineering Department)
- Water Quality Protection/regulatory enforcement – within 12 months of plan adoption. The work plan involves identifying on-site waste treatment systems that are failing and causing contamination of surface water flows. Regulatory action can take place immediately following identification of these problem areas and can be completed within one year. (Environmental Health Department)
- Water Quality Protection/infrastructure – Unknown. Studies will identify beneficial and feasible infrastructure projects to improve water quality from existing wells. Implementation will depend on obtaining implementation funding for these projects (Engineering and Environmental Health Departments)
- Fuels Management Guidelines – within 3 months of plan adoption. Fuels management guidelines will be voluntary and will be distributed through public information mechanisms. (Coarsegold Resource Conservation District)
- Beneficial use of increased water from Fuels Management – Unknown. This strategy will depend on infrastructure development, which will depend on obtaining infrastructure funding. However, the goal is to obtain conceptual agreements from all relevant stakeholders regarding beneficial use of the water by the completion of the grant process. (Grant Project Manager)
- Water recycling from Waste Treatment Plan and Casino Complex – Unknown. This strategy will depend on infrastructure development, which will depend on obtaining infrastructure funding. However, the goal is to reach agreement on policies and necessary changes in County Ordinances by the end of the planning period. Ordinances will be modified within 9 month of plan adoption. (Engineering and Environmental Health Departments).

- Public information on Water Conservation – within 3 months of plan adoption and continuing. This information will be distributed through various public information channels. (Central Sierra Watershed Committee)
- Stream restoration projects – Unknown. Implementation will depend on obtaining funding for stream restoration projects (Engineering and Environmental Health Departments)
- Environmentally Sensitive Area Protection – within 9 months of plan adoption. Implementation will involve development of GIS layers of environmentally sensitive areas as well as modification of development guidelines to assure protection of these areas. (Planning Department)

b. Institutional Structure to Assure Project Implementation, Monitor Progress and Recommend Modifications to the Plan.

The County of Madera currently has several committees overseeing aspects of water management. These include the Water Oversight Committee and Eastern Madera County Water Oversight Advisory Committee (which report to the Board of Supervisors), and the Flood Control and Water Conservation Advisory Committee, (which reports to the Supervisors sitting as the Flood Control and Water Conservation District). Many local stakeholders, including the Board of Supervisors, have noted the awkwardness created by these overlapping entities. This planning process will provide the opportunity for stakeholders to make recommendations on combining entities where possible, or otherwise clarifying the jurisdiction and authority of each entity. As part of this process, the plan will recommend a body to oversee the implementation of this plan. That body will probably be the Eastern Madera County Water Oversight Advisory Committee, which will have received monthly progress reports during the planning process. This body will oversee the implementation of the plan, a schedule for which will be produced as part of the final plan adopted by the Board of Supervisors. As elements of the plan are implemented, other elements of the plan may require modification. The entity in charge of plan implementation will convene plan modification sessions as needed.

c. Issues of Interdependence. Many of the implementation activities are mutually dependent. That is, the implementation of one activity will depend on another activity’s progress. For instance, planning guidelines and restrictions may be put into place based on information from the groundwater studies. However, if infrastructure projects are implemented, these restrictions may be modified to take into account increased flexibility of water supply. As part of the planning process an implementation chart will be produced showing the timelines for the various projects and their inter-relationships. As stated above, as elements of the plan are implemented, other elements of the plan may require modification. These issues will be integrated into the plan implementation and oversight process.

d. Dispute resolution mechanisms. This planning process and the resulting plan are designed not only to implement specific projects but also to be responsive to needs and issues as they arise in the areas of water management. The plan will therefore include specific recommendations about dispute resolution mechanisms. These recommendations will be developed among the stakeholders with the goal of obtaining agreement from these stakeholders to use the dispute resolution mechanisms as a first resort before taking more adversarial action.

6. Impacts and Benefits

This planning process is designed to produce multiple benefits in the area of water management, both from the implementation of the plan and from the planning process itself.

a. Impacts and Benefits of Planning Process:

. The benefits from the planning process include:

- The plan will fund the production of detailed, scientifically-sound data about the region's water quantity and quality, the geological characteristics, soils types, vegetation types, and other relevant information for water and ecosystem management.
- Information that is generated during the planning process will allow the County's planning and development regulations to be based on sound scientific evidence and to be appropriate for specific areas, thus improving the course of the region's development and reducing conflicts among the stakeholders.
- Analysis of seasonal fluctuations in groundwater availability will help the region prepare for and reduce the impacts of drought.
- Detailed information from studies will be added to GIS maps for the area, enhancing analysis and decision-making capacity on an area-by-area basis.
- The integration of the infrastructure planning and the fuel management planning will provide a model for intra-regional water transfers, enhancing options for reducing dependence on imported water.
- Fuel/vegetation management investigations will identify mechanisms to improve water quality from run-off, contributing to the long term attainment and maintenance of water quality standards.
- Water quality investigations and subsequent regulatory action will contribute to the long-term attainment and maintenance of water quality standards.
- Public information and enhanced watershed coordination activities will result in implementation of RWQCB Watershed Management Initiative Chapters, plans and policies (see Section 3 "Statewide Priorities" for details)
- Investigation into water quality impacts from use of recycled water (as well as any necessary mitigation measures) will allow the beneficial use of recycled water from the Oakhurst Waste Treatment Plant and the Chukchansi Casino Complex water treatment plant.
- Public information materials will result in improved water conservation, fuels management, fire protection and habitat protection.
- The professionally facilitated stakeholder-driven planning process will improve relationships and build trust among stakeholders, reducing conflicts between water users through mutual education and providing less adversarial options for dispute resolution.
- Identification and mapping of sensitive environmental areas will improve protection of these areas from development impacts.
- Feasibility studies on infrastructure projects (and other projects such as stream restoration), along with stakeholder agreement on priorities for these projects will improve the likelihood of obtaining implementation funding.

b. Impacts and Benefits of Plan Implementation. The benefits from plan implementation will depend partially on success in obtaining funding for the proposed infrastructure projects. These benefits are expected to include the following:

- Increased water supply reliability for the region through the development of infrastructure projects that allow
 - the storage of flood waters or additional run-off created through fuels management
 - the redistribution of these waters via pipelines and intra-County transfers
- Enhanced water quality:
 - Water from groundwater wells, due to mapping of naturally-occurring contaminants
 - Water from groundwater wells, due to recommendations for well structuring to isolate contaminated fractures
 - Improved surface water through regulation of contaminating activities
- Reduction in potential dependence on imported water through increased water supply reliability and appropriate planning and development guidelines
- Increase in water availability through water conservation guidelines and education
- Continued use of dispute resolution mechanisms to reduce the incidence and severity of water conflicts in the region.
- Models for water management in the foothills of the Sierras that can be used in similar areas throughout the State.

c. Monitoring of Benefits. The committee designated with authority over the implementation of the plan will also have responsibility to monitor the benefits produced by the plan and its implementation. Yearly reports will be produced outlining these benefits on the water quality, water availability and ecosystem health of the area.

d. CEQA Compliance – The proposed planning process falls within a categorical exemption from CEQA. Implementation of the plan will require CEQA documentation as follows:

- Infrastructure projects considered as part of the plan will include costs and issues regarding CEQA in their feasibility analysis. Those projects which obtain funding for implementation will include in their pre-development budget funds required for a full CEQA review as needed.
- Adoption of the plan as a part of the County’s General Plan and implementation of ordinances will also require CEQA review. Funding for these costs will be sought from the State CDBG Planning/Technical assistance grant program.

7. Data and technical analysis

This planning process will utilize existing data where available, and will include technical studies to develop additional data where current gaps exist.

a. Existing data available to support the plan include:

- The Todd Engineering Technical Memo which summarizes existing data relating to hydrogeology and groundwater conditions throughout eastern Madera County as well as a preliminary analysis of this data with a focus on water demands, groundwater quality and groundwater quantity.
- Current Oakhurst Groundwater Study (AB 303), which identifies groundwater quantity and quality for the Oakhurst Area.
- The Fresno River Nutrient Reduction Study which was implemented pursuant to a SWRCB 205 (j) grant awarded in 2001. This project focused on the Fresno River basin, and includes data regarding water quality and nutrient sources at various points in the river draining, as well as a model of the nutrient loading and development of an implementation plan to reduce nutrient loading.
- The Central Sierra Watershed Committee Long Range Plan for Watershed Restoration, which identifies water and land-use problems and issues throughout the area.

b. Technical studies proposed as part of this planning process have been designed to fill the existing data gaps. They include:

- A Coarsegold groundwater study which assembles information about geology in the area, conducts a well inventory determining location and well elevations, a seasonal water level measurement, aquifer testing to determine well interference, and produces a watershed delineation and water budget for the area.
- A groundwater study of other areas in the region which assembles information about geology in the area, evaluates well data, and produces a watershed delineation and water budget for these areas.
- An assessment of natural contaminants throughout the region through sampling and assessment of groundwater.
- An evaluation of hydraulic connections between stream flow and groundwater in various areas of the region.
- An assessment of human-based contamination of waterways
- A detailed study of soils and vegetation throughout the region
- A feasibility study and analysis of potential infrastructure
- A feasibility study of costs and benefits for stream restoration

(For more details on these studies, see the detailed Work Plan, Section II, pg. 40.)

The proposed technical studies are designed to fill gaps in the current data and produce sufficient scientific information to support a responsive, appropriate, and defensible planning process.

8. Data management

a. Existing monitoring efforts for water quantity and quality. Madera County has recognized the need for gathering data on water quantity and quality in order to inform its planning decisions and activities, however it does not have general fund resources to devote to these activities. It has therefore attempted to pull together this information from grants, individual EIRs, and recent applications for permits, which are recorded on the County's GIS system. These data provide some assistance, particularly for the specific areas in which they are focused (such as the Oakhurst Water Study). However detailed and consistent information is not available for the entire region, including some of the areas where the growth pressures are the strongest. The proposed planning process includes studies that will fill these data gaps in the areas of water quality and quantity. Other important information, such as soils type, vegetation coverage, etc. will also be developed. The planning process will take into account the need for future monitoring of this information, and will design monitoring programs as well as suggestions for the sustainable financing of these programs.

b. Spatial Data Management. Stakeholder education and public information dissemination are extremely important aspects of the proposed planning process. Since the proposed planning process includes assembling a great deal of existing data as well as several technical studies (many of which involve detailed assessments on an area-by-area basis), data management resources with spatial capability will be required. Finally, since the strategies proposed are inter-related, the data gathered from the studies must be made available to the planning groups in a way that displays the integration and interrelation of various water and ecosystem data.

The best way to manage this type of data is through the use of GIS. The County has a base map that already includes some of the important layers for this analysis, including

- Wells and septic systems (installed after 1991)
- Underground storage tanks
- Drinking water contaminants in wells
- Zoning and Area Plan information
- Streams, lakes and other water bodies
- Parcel boundaries
- Williamson Act Land
- Farmland Security Zones
- Flood plain areas
- Small water systems

Additional layers that have been prioritized by the County for future development include

- Slopes
- Fire criteria
- Information about endangered species, sensitive habitats and vernal pools
- Information about water quality

In addition to the County's GIS system, DWR is in the process of developing a detailed watershed base map for the region (see attached).⁷ There may be other base maps available, and there are certainly GIS layers that have been developed by other institutions and agencies that would be valuable for the planning process. In addition, most of the studies that are proposed for this planning process involve the gathering of detailed geographic information (such as soils type, vegetation coverage, location of natural groundwater contaminants, etc.) In addition to the benefits for this project, some of these layers would provide the additional information prioritized by the County which would allow them to provide more protection of sensitive areas when responding to development proposals.

Madera County has contacted the Interdisciplinary Spatial Information Systems Center (ISIS) at CSU Fresno regarding providing GIS services for this project. The director of the Center responded with enthusiasm, and in addition to providing the technical mapping services proposed to develop a web-based GIS viewer that could be used both for the planning groups and for public information. (See pg. 51.)

The benefits of this web-based GIS are many. Some of these include:

- Information from research and assessments will be able to be easily disseminated to all of the different Study Area planning groups, promoting maximum integration of strategies.
- Planning group areas will be able to produce their own maps with whatever layers they need for whatever areas they are studying.
- The public can utilize these maps for information about soils, water and vegetation in their area, which information can be linked to recommendations and information such as
 - water conservation measures,
 - fuel management guidelines,
 - well design and placement to maximize water quantity and quality,
 - nearby recreational options
- Easy access to information by regional and statewide agencies,
- Example of water management data planning for other regions.

c. Other Mechanisms for Data Management. In addition to the GIS data management tool, the process and outcome from the planning groups must be managed and made available. The Board Clerk's office already provides record-keeping services for the various water-related committees. The staff most knowledgeable about these areas will be assigned to this planning process to maintain and distribute records of meetings, draft of policies and other important documentation.

d. Supporting Statewide Data Needs. By providing easily accessible and scientifically reliable data on soils, vegetation, water quality, sources of groundwater and surface water contamination, and other water related data, this project will support the state-wide data needs of DWR, SWRCB, etc.

⁷ Note that both the DWR base map and the County's base map are included in Attachment 6: Maps.CD. They are both slightly different and will need to be manipulated to be able to use all of their relevant layers. Also attached in Attachment 6 are maps produced by the Todd report with information that is not on either the County's or DWR's system.

9. Stakeholder involvement

This plan is built around stakeholder involvement. There are so many different interests and view points represented by the stakeholders in this County, no plan could possibly succeed in being implemented if stakeholder involvement was not present throughout the planning process.

The stakeholder involvement for planning program will be designed both (1) to collect input from the various agencies, entities and interest groups, and (2) to disseminate public education as broadly as possible about water issues in Eastern Madera County. The public information activities will be important in dispelling misinformation about water and helping to promote compliance with the voluntary guidelines that are developed.

a. Stakeholder Involvement in Planning. The plan for stakeholder involvement in the proposed process is as follows:

1. A stakeholder planning group will be formed by asking the following agencies and entities to designate at least one individual to participate in monthly planning meetings:

- County departments (Planning, Engineering, Environmental Health, County Counsel, Eastern Madera County Water Oversight Advisory Committee)
- State agencies (DWR, RWQCB, CDF, UC Coop Extension)
- Federal Agencies (Forest Services, NRCS, Army Corps of Engineers, Bureau of Reclamation)
- Local Agencies and Districts (Madera Irrigation District, Chowchilla Water District, Coarsegold RCD, Chowchilla/Red Top RCD)
- Tribes (North Fork Mono, Chukchansi)
- Area Planning Organizations (Oakhurst Community Advisory Committee, Coarsegold Area Planning Association, Coarsegold Citizens for Balanced Planning, Yosemite Lakes Owners Association, North Fork Community Development Council, Ahwahnee Community Advisory Committee)
- Other Interest groups: Central Sierra Watershed Committee, Farm Bureau, Cattlemen's Association, land-owners, Yosemite Visitor's Bureau, Chambers of Commerce, etc.

Many of these groups and agencies have already been contacted and have committed to being involved in the planning effort. (See Attachment 8: Letters of Support and Commitment to Participate in Planning Process.) The planning group will meet monthly, and will be responsible for development and approval of the draft Water Management Plan.

2. Ad Hoc Committees will be formed for each Study Area including stakeholder representatives and others with special interest and knowledge in that area. The Ad Hoc groups will meet as needed to

- Review and agree on scope of studies and work plans
- Develop draft policies relating to their specific Study Area
- Develop draft recommendations for future projects
- Prioritize other recommended projects

Draft policies and recommendations will be sent to the full stakeholder group for discussion and integration into the overall Water Management plan.

3. **Technical Assistance:** Technical assistance will be provided as needed to the Ad Hoc committees. This will include

- Engineering technical assistance in analysis and assessment of infrastructure projects
- Legal technical assistance for review of policies. *It is important to note that the legal assistance is not to promote legal action or disputes among the stakeholders, or to provide any advice or assistance regarding such legal disputes. This legal assistance is only intended to educate participants on the current state of water rights as they apply to the various projects proposed.*
- Other technical assistance as needed.

4. The resulting plan will be presented in order to the following existing entities:

- The Eastern Madera County Water Oversight Advisory Committee
- The Water Oversight Advisory Committee
- The Board of Supervisors

These agencies have been designated by the Board of Supervisors as the advisory channel for issues related to Eastern Madera County water.

b. Outreach to Stakeholder Groups. The participant groups listed above were recommended by the participants in the Central Sierra Watershed Committee. The CSWC was organized in 1997 with the purpose of implementing a cooperative effort to improve and protect the area's watersheds and other resources. The group has held monthly meetings since then, with additional contact through informational e-mails. A participant roster from the CSWC is included as Attachment 9. As can be seen, this is a very comprehensive stakeholder group that has already laid the ground work for collaboration between multiple interests.

Most of the groups identified for participation in this planning process have already been contacted and have committed their involvement (See Attachment 8). As additional stakeholders are identified, they will be included in the Stakeholder Planning Group.

c. Efforts to address Environmental Justice Concerns. As noted in the description of the region, eastern Madera County has a wide range of socio-economic groups. The lower income areas include Oakhurst and North Fork. Of these, Oakhurst is experiencing the worst issues regarding water quality and quantity.⁸ The grant includes resources for feasibility studies that can improve these issues. North Fork's concerns include the rapid development that is taking place in the area. A groundwater study will help identify appropriate development constraints to prevent future water quantity problems.

⁸ Water quality has been an increasing concern in the area. Over time, the concentrations of minerals in the groundwater have increased. Iron and manganese treatment is required for most of the wells, and gross alpha, uranium and TDS concentrations exceed the standard at some wells. The California Department of Health Services issued a Compliance Order to Hillview Water Company for failure to comply with the Uranium MCL and a failure to insure that customers are provided with a reliable and adequate source of pure, wholesome, healthful and potable water. The Health Department has directed the water company to issue drinking water advisories in 1998 through 2002. Low water quantity during summer months has also caused water rationing. More significantly, the water shortage prompted the use of wells with very high uranium levels, making the water delivered to the residents unfit for drinking. Residents have been warned to use bottled water for drinking and cooking.

10. Disadvantaged communities

Although this application does not request a match waiver, the region does include disadvantaged communities, including the following:

- Oakhurst – According to the 2000 census, the Median Household Income for the Oakhurst Census Data Place is \$27,679, which equals 71% of the State MHI.
- North Fork –North Fork is a documented low-income region.⁹ However, the census block groups in this rural area are so large that they take into account nearby higher-income vacation areas such as Bass Lake, and thus do not reflect this in the Median Household Income.

As stated in the previous section, (and in more detail in the ‘Description of Region’ section), these areas have documented water supply and quality issues. In Oakhurst’s case, the water issues reach the level where they are a threat to public health and safety. This application therefore meets the program preference of providing safe drinking water and water quality projects that serve disadvantaged communities.

This grant includes projects that will directly benefit these disadvantaged communities. Such projects include:

- Feasibility studies for infrastructure that could mix water from multiple wells, thus improving water quality in Oakhurst
- Feasibility studies for alternative water supply infrastructure that would serve the Oakhurst area;
- Water Quality assessments in the Oakhurst area; and
- Groundwater studies in the North Fork area

Representatives of these communities are included in the planning process through the Oakhurst Community Action Committee, the North Fork Community Development Council and the North Fork Mono Rancheria Tribal Council.

⁹ In 1998 the North Fork CDC conducted a survey, which was certified by an independent Certified Public Accountant, of 39 households or 192 residents in the area. According to the results of this survey, 87.25% (168 out of 192) of the residents in this area were living below the 1998 poverty rate of \$8,316.

11. Relation to local planning

This planning effort will build upon and leverage existing studies and planning efforts already produced for this region. These include the following (described in detail in Section 1.a.2):

- DWR investigations for the eastern Madera County area.
- Eastern Madera County and Mariposa County Long Term Plan for Watershed Conservation and Restoration – produced by the Central Sierra Watershed Committee.
- Technical Memorandum – Groundwater Conditions in Eastern Madera County. produced in March 2002 by Todd Engineering.
- Fresno River Nutrient Reduction Study - implemented pursuant to a SWRCB 205 (j) grant awarded in 2001 through a subcontract with the CSU Fresno Foundation (the California Water Institute).
- AB 303 Oakhurst Groundwater Study. – currently being completed by Kenneth Schmidt and Associates.
- The Madera County General Plan
- Area plans – Area plans for Ahwahnee, Coarsegold, Oakhurst, and North Fork will also be used to guide the planning process.

The technical memoranda and studies listed above will relate to the proposed planning effort by providing background data and outlining areas of concern. They also provide specific recommendations for studies and monitoring, as well as planning guidelines.

The County's General Plan and Area Plans provide specific policy guidelines for the following relevant areas

- land use,
- water supply and delivery,
- wastewater collection, treatment and disposal,
- storm drainage and flood control,
- public recreation and parks,
- management of natural resources
 - agriculture
 - forest resources
 - water resources
 - wetland and riparian areas
 - fish and wildlife habitat
 - vegetation
 - geologic resources
 - open space for the preservation of natural resources
- Health and safety
 - Flood hazards
 - Fire hazards

These policy guidelines are the starting point for this planning process. During the plan we will obtain the scientific knowledge and technical advice for the stakeholder group to make recommendations regarding these policies. In essence, this planning process will function like a General Plan Update for the region in the policy areas listed above. Madera County's General

Plan is not due to be updated until 2015, however the Board of Supervisors has indicated its willingness, upon adoption of the recommended IRWM plan, to take the additional steps required to make it a part of the General Plan (See Attachment 1, Resolution of the Board of Supervisors.)

12. Agency Coordination

a. Proposal Development and Planning Process

This project relies on broad stakeholder involvement. Every effort will be made to include relevant stakeholders, including local, State and federal agencies. This involvement has already begun with outreach regarding the work described in this application. Letters of support and commitment to be involved in the planning process have been obtained from

- Community Planning Groups
 - North Fork Community Development Council
 - Oakhurst Community Advisory Committee
 - Coarsegold Area Planning Association
 - Coarsegold Citizens for Balanced Planning
- Local Tribes
 - North Fork Mono Rancheria
 - Picayune Rancheria of Chukchansi Tribe
- Local Agencies:
 - Eastern Madera County Water Oversight Advisory Committee
 - Central Sierra Watershed Committee
- Local Districts
 - Madera Irrigation District*
 - Chowchilla Water District
 - Coarsegold Resource Conservation District
 - Chowchilla/Red Top Conservation District
- Educational Institutions
 - Interdisciplinary Spatial Information Systems Center, CSU Fresno
 - Cooperative Extension – UC Davis
- State agencies
 - California Department of Forestry*
- Federal Agencies
 - U.S. Forest Services
 - Natural Resources Conservation Service

In addition, although it was not appropriate for them to provide letters of support, participation is expected from County Departments (including Planning, Environmental Health, Engineering) and local offices of State Agencies (RWQCB and DWR). Representatives from these departments and offices have participated in the preparation of this application.

**Letters promised but not obtained as of submission of grant*

The agencies and groups listed above include the local land-use decision-makers, specifically the County Planning Department and the Community Planning Groups. Since the proposed planning effort will directly related to land use planning, it is essential that these groups are part of the planning process. State and Federal regulatory agencies have been involved in the development of the application (through their participation in the Central Sierra Watershed Committee), and are expected to play an important role as technical advisors to the planning process.

b. Plan Implementation:

The results of the planning process will include some specific policy recommendations that can be readily used in the County's planning guidelines. However, there are many areas where the process of bringing the plan into implementation will require on-going efforts and participation of stakeholders. These include:

- Revising area plan guidelines to reflect new knowledge about groundwater availability
- Maintaining a monitoring program of groundwater availability and quality, and modifying land use policies based on updated information
- Implementing fuels reduction programs and developing methods for beneficial use of the additional water created
- Implementation of infrastructure projects.

The broad stakeholder involvement and education that is proposed through this grant will benefit these future efforts through building mutual understanding and trust among the various interests involved in these matters, as well as providing mutually agreed-upon objective information and policy recommendations on which to base their work.

II. Detailed Work Plan and Budget

This section discusses each Study Area and the tasks associated with it. These tasks form the basis of the attached budget (Attachment 3.2). For each task listed in the budget, a narrative explanation is provided in this section.

With few exceptions, Madera County cannot commit the work proposed in this grant to a specific contractor without undergoing standard procurement procedures. (The exception is if a contractor has unique and specialized knowledge and/or is already engaged in project proposed, such as public education tasks contracted to the Central Sierra Watershed Committee). Even though this is the case, in order to get a technically accurate work plan and budget we requested that qualified contractors, most of which have already worked on water projects in this area, submit estimated budgets and work plans for the proposed projects. The contractors which developed these work plans are listed below in the task description.

Two of the contractors who assisted with the budget and work plan process – Provost and Pritchard and Kenneth Smith and Associates – submitted detailed budget estimates including different hourly rates for various staff, expenses, etc. These details did not fit into the format of the overall budget, therefore the costs for each task were summarized and the detailed budget spreadsheets from the firms are attached (as sheets 3 and 4 in Attachment 3.2) for more information.

Study Area 1 – Groundwater Studies

a. Coarsegold Area Groundwater Study.

Workplan and budget developed by Kenneth Smith and Associates

-Objectives

- Develop the hydrogeologic framework for a conceptual model for groundwater occurrence and flow
- Determine water budget and estimate potential recharge to groundwater in specific parts of the area
- Determine aquifer characteristics and well interference due to pumping of large-capacity wells at selected sites.
- Develop understanding of hydraulic connection between various subareas, and relation between streamflow and groundwater.

-Specific Tasks and Budget Notes

- Task 1.1 – Assemble and Supplement Geologic Data – A number of geologic maps are available in the Coarsegold area. Such maps show rock types, geologic contacts, faults, lineaments, and other features. This information is important in terms of preferential groundwater flow paths, favorable well sites, well interference, and groundwater quality. Substantial geologic information is available from the U.S. Geologic Survey, California Division of Mines and Geology, and California State University, Fresno (CSUF). Mapping for some specific subdivisions is also available. Work of this type has previously been conducted in the Yosemite Lakes area. This would be assembled and data gaps identified. Aerial photos would be obtained and reviewed and limited field mapping of fracture traces

would then be done to fill in the data gaps in specific areas. Fracture traces would be plotted on Study area maps.

- Task 1.2 – Conduct Well Inventory – A well inventory for much of the denser developed part of the Coarsegold area is an essential component of this project. It will involve locating and mapping locations of water wells and matching well drillers reports to specific wells. Selected wells will be field located with GPS devices and the exact longitude and latitude and approximate wellhead elevation determined. A file of drillers reports will be assembled from County and DWR sources. For most water systems, much of this information is already available and will be assembled.

The well inventory will focus on private domestic wells in densely developed areas. First, maps will be prepared showing the service areas for each water purveyor. Large and small water systems will be included. Aerial photos will then be used to determine locations where individual domestic wells are used in relatively densely developed areas (lot size approximately 10 acres or less). For most subdivisions, large scale topographic maps are often available, which can help determine the approximate land surface and well head elevations.

When wells are field located, locations will first be plotted on aerial photos. When each well is field located, an attempt will also be made to measure the water level. Notes will be kept, including a sketch of the well location (showing access roads, buildings and other features) and descriptions of the water-level measuring points and the nearest taps for water sampling.

- Task 1.3 – Water Level Measurements – Water levels will be measured in as many wells as feasible during two periods. One would be in the spring 2006, probably in March or April, near the end of winter precipitation and prior to heavy pumping. The other will be during the fall of 2006, likely in October or early November, prior to the onset of winter precipitation. Wells would be selected for which driller's reports are available, and to provide geographic coverage. Electric sounders will be used for measuring the water levels. Water-level elevations will be determined and plotted. Water-level elevation contours and direction of groundwater flow maps will then be prepared for the spring and fall. In specific developed areas where both shallow and deep wells are present, separate maps will be prepared for the shallow and deep groundwater. Water-level maps will also be put into a GIS data base. In addition to these measurements, routine water level measurements will be made on an estimated 50 wells to determine seasonal water level changes. For these sites, both shallow and deep wells (if available) will be selected for monthly water-level measurements. These will continue over a period of about one year. This will provide some of the best information on the extent and timing of recharge to the shallow and deep groundwater.
- Task 1.4 – Aquifer Testing – It is estimated that about three aquifer test will be done. The aquifer testing is done by using existing large-capacity (likely public supply) wells as the pumped wells, and approximately four to six shallow and deep nearby water supply wells in each case as observation wells. Some such test have already been successfully conducted in the Yosemite Lake area and at the Chukchansi Casino. Each of the pumping periods for the test will likely last for a period of from one to two weeks, and the test will probably be done during the spring or fall. The pumping rates will be measured with totalizing flowmeters, and both water-level drawdown and recovery will be measured in the pumped well and observation wells. Semi-log plots will be prepared for the drawdown and recovery. These

tests are the most direct way to evaluate well interference. That is, the drawdown in the other wells is directly determined, as well as values for aquifer parameters. The drawdowns after prolonged pumping (i.e., 100-210 days) in the absence of recharge (i.e. in the summer and fall) can be estimated. These tests also enable the long-term yields of the pumped wells to be determined. The results will then be interpreted. Well interference evaluations could be used in the future to develop guidelines for spacing of new large-capacity wells from existing supply wells, and possibly for controlling pumping rates of new wells.

- Task 1.5 – Watershed Delineation and Water Budget – Recharge to groundwater in the fracture rock comes from precipitation. Watersheds can be delineated that are tributary to a well or groups of wells. In order to evaluate recharge, watersheds are mapped based on land surface drainage divides. It is expected that groups of private wells (high density) and locations of water purveyors systems and wells would be highly utilized in delineating tributary watersheds to be evaluated. These will also be entered into a GIS data base. Long-term isohyetal maps for precipitation are already available. Evapotranspiration will be determined for the various delineated watersheds, based on already developed values for various types of vegetation. These are available primarily from studies of the U.S. Forest Service and the University of California. Streamflow records will be evaluated to compare precipitation, evapotranspiration, and runoff in the Coarsegold area. In general, groundwater pumpage in the hardrock is based on pumping water that would have otherwise been used by plants, lost to evaporation or runoff as streamflow. This enables one to develop reasonable values of potential groundwater recharge in various watersheds. Potential groundwater recharge in the Coarsegold area would then be determined in developed watersheds, and this would be compared to the existing pumpage. The potential recharge estimates will be extremely useful in evaluating future potential developments.
- Task 1.6 – Develop understanding of hydraulic connection between subareas and between streamflow and groundwater – Water-level elevation maps and other tools will be used to evaluate the hydraulic connection between streamflow and groundwater in various sub-areas of the region, for example, between the Sierra Lakes – Picayune Rancheria Area and Yosemite Lakes. Also, comparison of stream channel elevations, in particular for Coarsegold Creek, to groundwater level elevations would be used to evaluate the relation between streamflow and groundwater. Locations of groundwater recharge from streamflow and groundwater discharge to streams would be determined.
- Task 1.7 – Data Integration and Evaluation/Development of Monitoring Program – In this project, as in most other fractured-rock groundwater settings, development of a sophisticated groundwater model is not technically or economically feasible. However, a conceptual model will be developed that adequately describes the hydrogeologic framework, groundwater flow system, recharge, long-term well yields, well interference, and groundwater quality. This data integration and analysis will be on-going throughout the project and will entail developing and testing new ideas and reconciling and integrating data from the various above-described tasks. In addition, the process of data integration and analysis will suggest the necessity for future monitoring programs, and detailed recommendations for such programs will be developed.
- Task 1.8 – Prepare Quarterly Reports – Reports will be prepared on a quarterly basis discussing accomplishments, findings, important data and draft illustrations, as they become available.

- Task 1.9 – Prepare Final Report - A final technical report will be prepared presenting accomplishments, findings, important data, maps and illustrations, as well as recommendations for future studies and monitoring programs. This report will be reviewed by interested parties prior to submission.

-Deliverables/Results

- Maps and cross sections will be developed for the region to illustrate geologic features influencing groundwater flow, the direction of groundwater flow, and tributary watersheds.
- Quarterly reports including accomplishments, findings, important data and illustrations.
- A final technical report presenting accomplishments, findings, important data, maps and illustrations, as well as recommendations for future studies and monitoring programs.

b. Groundwater Study for Other Regional Areas, including Bass Lake, Yosemite Forks and Cedar Valley, North Fork and Cascadel, Raymond, Hidden Lakes and Mountain Ranches.

Workplan and budget developed by Kenneth Smith and Associates

-Objectives

- Develop the hydrogeologic framework for a conceptual model for groundwater occurrence and flow in specific areas.
- Determine water budget and estimate potential recharge to groundwater in specific parts of the area
- Evaluate groundwater supply availability for use
- Develop understanding of hydraulic connection between various subareas, and relation between streamflow and groundwater.

-Specific Tasks and Budget Notes

- Task 1.10 – Assemble geologic data and maps and supplement with limited field work– A number of geologic maps are available for the other target areas in the region. Such maps show rock types, geologic contacts, faults, lineaments, and other features. This information is important in terms of preferential groundwater flow paths, favorable well sites, well interference, and groundwater quality. Substantial geologic information is available from the U.S. Geologic Survey, California Division of Mines and Geology, and California State University, Fresno (CSUF). Mapping for some specific subdivisions is also available. This would be assembled and data gaps identified. Aerial photos would be obtained and reviewed and limited field mapping of fracture traces would then be done to fill in the data gaps in specific areas. Fracture traces would be plotted on Study area maps.
- Task 1.11 – Evaluate Well Data–This will involve locating and mapping locations of water wells and matching well drillers reports to specific wells. A file of drillers reports will be assembled from County and DWR sources. For some water systems, much of this information is already available and will be assembled. Maps will be prepared showing the service areas for each water purveyor. Large and small water systems will be included.
- Task 1.12 – Watershed Delineation and Water Budget – Recharge to groundwater in the fracture rock comes from precipitation. Watersheds can be delineated that are tributary to a well or groups of wells. In order to evaluate recharge, watersheds are mapped based on land surface drainage divides. It is expected that groups of private wells (high density) and locations of water purveyors systems and wells would be highly utilized in delineating tributary watersheds to be evaluated. Evapotranspiration will be determined for the various delineated watersheds, based on already developed values for various types of vegetation. These are available primarily from studies of the U.S. Forest Service and the University of

California. Streamflow records will be evaluated to compare precipitation, evapotranspiration, and runoff in the various areas. In general, groundwater pumpage in the hardrock is based on pumping water that would have otherwise been used by plants, lost to evaporation or runoff as streamflow. This enables one to develop reasonable values of potential groundwater recharge in various watersheds. Potential groundwater recharge in the various areas would then be determined, and in developed watersheds this would be compared to the existing pumpage. The potential recharge estimates will be extremely useful in evaluating future potential developments.

- Task 1.13 – Evaluate Groundwater Supply Availability – Records on well yields and declines during droughts will be reviewed for each of the water systems and, to the extent possible, for private domestic wells in selected areas.
- Task 1.14 – Data Integration and Evaluation/Development of Monitoring Program – In this project, as in most other fractured-rock groundwater settings, development of a sophisticated groundwater model is not technically or economically feasible. However, a conceptual model will be developed that adequately describes the hydrogeologic framework, groundwater flow system, recharge, long-term well yields, well interference, and groundwater quality. This data integration and analysis will be on-going throughout the project and will entail developing and testing new ideas and reconciling and integrating data from the various above-described tasks. In addition, the process of data integration and analysis will suggest the necessity for future monitoring programs, and detailed recommendations for such programs will be developed.
- Task 1.15 – Prepare Quarterly Reports – Reports will be prepared on a quarterly basis discussing accomplishments, findings, important data and draft illustrations, as they become available.
- Task 1.16 – Prepare Final Report - A final technical report will be prepared presenting accomplishments, findings, important data, maps and illustrations, as well as recommendations for future studies and monitoring programs. This report will be reviewed by interested parties prior to submission.

-Deliverables/Results

- Maps and cross sections will be developed for the region to illustrate geologic features influencing groundwater flow, the direction of groundwater flow, and tributary watersheds.
- Quarterly reports including accomplishments, findings, important data and illustrations.
- A final technical report presenting accomplishments, findings, important data, maps and illustrations, as well as recommendations for future studies and monitoring programs.

c. Development of recommended land-use policies based on results of groundwater studies

Objectives

- Refine current land-use guidelines through use of new data on groundwater availability

-Specific Tasks and Budget Notes

- **Task 1.17 - Prepare land-use recommendations based on groundwater information** – A Land-Use Committee of the Stakeholder Planning Group will work with the groundwater consultant and staff of the County Planning Department to interpret the results of the groundwater studies in terms of preferable densities of land-use. Recommendations regarding changes in current land-use policies will be developed for submission to the Board of Supervisors.

-Deliverables/Results

- Recommendations for changes in land-use guidelines for the target areas of the region.

d. Development on recommendations regarding on-going monitoring and revision of land-use policies based on future changes in groundwater or alternative groundwater supply mechanisms

Objectives

- Provide a mechanism for on-going review of land-use guidelines based on changes of water availability based either on
 - Changes in groundwater levels (to be determined through the recommended monitoring program) or
 - Alternative water supply mechanisms that may be developed in the future

-Specific Tasks and Budget Notes

- **Task 1.18 - Prepare recommendations for on-going program to review and revise land-use policies**– A Land-Use Committee of the Stakeholder Planning Group will work with the staff of the County Planning Department to develop recommendations for an on-going program to review and revised land-use policies based on changes in groundwater availability. Recommendations will be submitted to the Board of Supervisors.

-Deliverables/Results

- Recommendations for on-going program to review and revise land-use guidelines.

Study Area 2: Water Supply Reliability

Workplan and budget developed by Provost and Pritchard Engineering Group

-Objectives

- Explore feasible alternatives for water supply delivery to Coarsegold and other areas in the region with insufficient groundwater to meet projected development and/or drought conditions.
- Develop feasibility and costs analyses for the three most desirable alternatives.
- Reach consensus on the preferred option.
- Develop strategy for obtaining funding for implementation of preferred option.

-Specific Tasks and Budget Notes

- **Task 2.1 – Consultant and Stakeholders identify alternatives for water supply infrastructure** – Technical advisor will work with the Infrastructure committee of the Stakeholder Planning Group to determine possible mechanisms for water supply reliability.
- **Task 2.2 – Consultant evaluates alternatives and selects three most feasible** – Consultant will work with Infrastructure committee to winnow list of potential options to the most feasible alternatives to be investigated. Consultant will provide Infrastructure committee with general technical information including
 - Similar projects attempted in other areas
 - Typical costs for like projects,
 - Potential fatal flaws,
 - Estimated likelihood of success.
- **Task 2.3 – Engineering feasibility study on alternatives** – Consultant will evaluate at a planning level the feasibility of up to three options for water delivery methods, as identified in Task 2.2. Potential options include a pipeline to an existing reservoir, pipeline and

storage of groundwater from undeveloped areas, and pipeline and storage of water from existing surface water sources. Subtasks will include:

- Review of existing information on similar projects
 - Determining availability and cost of water source
 - Estimating water reliability
 - Estimating water quality
 - Identification of and conformity with legal and regulatory guidelines
 - Development of a conceptual layout
 - Determining potential environmental impacts
 - Estimating capital and operational costs
 - Preparing summary memorandums conveying evaluation findings
- **Task 2.4 – Develop consensus on preferred alternative and prepare final report –** Consultant will work with Infrastructure committee to discuss draft study report and assist in developing consensus on preferred alternative. Consultant will then draft final report incorporating comments by the Infrastructure committee and other reviewers.

-Deliverables/Results

- Summary memorandums conveying findings from feasibility studies on alternatives
- Draft report describing findings from analysis and resulting conclusions of Infrastructure committee. Report will contain sufficient detail for future pre-development funding applications.
- Final report incorporating comments by other relevant agencies.

Study Area 3: Water Quality Protection and Improvements

a. Analysis of water quality

Workplan and budget developed by Kenneth Smith and Associates

-Objectives

- Determine groundwater quality in the Coarsegold area and delineate and evaluate problem areas.
- Determine groundwater quality in the other areas in the region and delineate and evaluate problem areas.
- Use groundwater quality information to create recommendations for preferred groundwater extraction areas

-Specific Tasks and Budget Notes

- **Task 3.1 – Chemical analyses and delineation of water quality problem areas in Coarsegold –** Several groundwater quality problems have been identified in parts of the Coarsegold area. These problems include salt water and high concentrations of manganese and iron in localized areas. In the Wawona area, about 35 miles north of Coarsegold, the U.S. Geological Survey research found that groundwater in the deep fractures had a different chemical quality than groundwater in the shallow fractures. Groundwater quality provides important information in understanding groundwater flow in most hardrock areas. Available water quality data will be collected. Water quality problem areas will be mapped to the extent possible. Concentrations of major cations and anions are often a good indicator of water-rock interactions and the sources of recharge. Present water quality data for the Coarsegold basin are largely limited to water systems. Data gaps will be identified and recommendations made for future sampling and analyses.

- Task 3.2 - Chemical analyses and delineation of water quality problem areas in other areas of the region – Several groundwater quality problems have been identified in other areas of the region. These problems include high concentrations of manganese and iron in localized areas. Water quality problem areas will be mapped to the extent possible. Present water quality data for these areas are largely limited to water systems. Data gaps will be identified and recommendations made for future sampling and analyses.

-Deliverables/Results

- Maps and cross sections for the region to groundwater quality problem areas.
- Report identifying data gaps
- Recommendations for future sampling, analyses, and monitoring programs

b. Infrastructure and technologies to improve water quality

Workplan and budget developed by Provost and Pritchard Engineering Group

-Objectives

- Identify feasible methods of utilizing infrastructure or technology to improve water quality in areas with the greatest problems

-Specific Tasks and Budget Notes

- Task 3.3 – Analysis of infrastructure or other technologies to improve water quality – Consultant will work with Stakeholder Planning Group and hydrogeology consultant to evaluate options for protecting and improving water quality. Services provided will include researching technologies used in other areas, estimating costs of various options, providing maps and layouts, and producing a summary memorandum. Consultant will perform one planning level evaluation of a potential alternative. This evaluation may include:
 - Review of existing information
 - Identification of and conformity with legal and regulatory guidelines
 - Development of a conceptual layout
 - Determining potential environmental impacts
 - Estimating capital and operational costs

-Deliverables/Results

- Summary memorandum identifying potential options for improving water quality through infrastructure or technology
- Report identifying costs and benefits of most feasible technology for improving water quality

c. Analysis of impact of failing septic systems on water quality

Workplan and budget developed by Madera County Environmental Health Department

-Objectives

- Identify impacts from high-density areas utilizing septic systems nearby to waterways
- Follow-through with regulatory action in areas where contamination of waterways is taking place

-Specific Tasks and Budget Notes

- Task 3.4 – Field investigation of failing septic systems – Environmental Health staff will perform field investigations of areas having received notices of violation from the Regional Water Quality Control Board, or which have issues of lot size, setback limitations or soil types potentially unsuitable for on-site waste water treatment. These could include Broadview Terrace, South Fork, Fresno Estates, Hidden Lakes Estates, Cascadel Woods and

other areas. Staff will take upstream and downstream samples at any sites of suspected entry, visually inspect the area and perform an analysis to identify areas where regulatory action should take place.

- Task 3.5 Report and Recommendations for regulatory action – Environmental Health staff will draft a report with recommendations for areas where regulatory action would be appropriate, as well as suggestions for future infrastructure needed by the areas investigated.

-Deliverables/Results

- Analysis of areas where greatest potential exists for contamination of waterways through on-site waste treatment systems.
- Report recommending areas of regulatory action and areas that should consider alternative waste water infrastructure in the future.

Study Area 4: Increasing Water Resources

a. Water Recycling

Workplan and budget developed by Provost and Pritchard Engineering Group

-Objectives

- Provide feasibility analysis of recycling of treated wastewater for use on landscaping at
 - Oakhurst Wastewater Treatment Plant
 - Chukchansi Casino and Resort

-Specific Tasks and Budget Notes

- Task 4.1 – Feasibility study for treated wastewater recycling – Engineering consultant will work with Stakeholder Planning Group to assess opportunities for use of treated wastewater on landscaping. Consultant will perform planning-level analysis of alternatives, costs and impacts of such treatment, including the following:
 - Review of existing information regarding similar programs
 - Estimate water quality and impacts from use of water
 - Identification of and conformity with legal and regulatory guidelines
 - Determine potential environmental impacts
 - Estimate capital and operational costs of any infrastructure needed for recycling.

Consultant will present material and work with Planning group to develop recommendations for water recycling programs.

-Deliverables/Results

- Report on costs, impacts and other issues associated with water recycling opportunities
- Recommendations from Planning Group regarding future projects for water recycling.

b. Fuels Management

Workplan and budget developed by Coarsegold Resource Conservation District and UC Cooperative Extension – Neil McDougald, Rangeland Farm Advisor, Fresno and Madera Counties

-Objectives

- Compile existing information about fuels management as an option for improving water availability and integrate information on soils, erosion, habitat protection and fire protection, to assess value of fuel management program to Madera County
- Produce detailed soils and vegetation maps for Madera County
- Assess most favorable areas for fuel management treatment

- Discussion and agreement on fuel management programs and beneficial use of water resulting from treatment
- Create public information reports and guidelines regarding fuels management

-Specific Tasks and Budget Notes

- Task 4.2 – Compile soils information and field verification - The consultant will obtain existing soils maps of Madera County and will perform field verification to correct and improve detail of such maps. Soils information will include permeability, water-holding capacity, slopes, and other information necessary to analyze the potential results of a fuels management program in that area. Maps will then be produced identifying areas with potential benefit to groundwater recharge and run-off. Together with the maps produced in Task 4.3, analysis will be made of opportunity areas for increased water availability and water quality through fuels management. All data will be included as a layer on the GIS map produced as part of this project.
- Task 4.3 – Verification and mapping of vegetation coverage – The consultant will review current vegetation maps of the County and will perform field verification to provide more detail on vegetation type and canopy coverage. Based on this information and the soils information obtained in task 4.2, Consultant will link soils type with canopy, assess constraints and opportunities for improved water yield and water quality and will create area-by-area management recommendations. These fuel management recommendations will be included as a layer on the GIS map produced as part of this project.
- Task 4.4 – Public education re fuels management – Based on the above maps and analyses, consultants will produce guidelines regarding fuels management that are specific to subareas in the region. These guidelines will be published in paper form and also recorded as part of the GIS map. Residents will be able to click on their area on the GIS map and access the appropriate fuel management guidelines to minimize fire danger and maximize water availability and biodiversity. (Costs for this task are included in Section 7)
- Task 4.5 – Technical presentations and consensus building process – Consultants will compile existing data about fuels management and its impacts on water availability, water quality, soils, erosion, and habitat protection/biodiversity. Areas of disagreement on impacts and data gaps will be noted. Consultants will engage in educational technical presentations as an initial educational kick-off to a facilitated consensus-building process. This process will attempt to reach agreement on the types of fuel management programs that should be undertaken, the methods to verify additional water created, the rights over such additional water and the methods to obtain beneficial use of this water. (Consensus building facilitation costs are included in Section 7). Opportunities for funding fuel management programs will also be assessed.

-Deliverables/Results

- Detailed maps of soils information for Madera County
- Detailed maps of vegetation coverage and type in Madera County
- Recommendations for fuel management and assessment of impacts
- Integration of maps and recommendations on GIS map
- Consensus on controversial issues such as rights in water produced and methods to beneficially use this water for the region.

c. Public Education on Water Conservation (See Section 7 for costs and deliverables) – This area involves public information on water conservation. The Central Sierra Watershed Committee has already produced materials on water conservation and will extend their outreach efforts through this grant. Other relevant public information materials resulting from the planning process will also be produced and distributed.

Study Area 5: Recreation and Public Access

Workplan and budget development assisted by Roland Brady, Ph.D., Professor, CSU Fresno Department of Geology and students in his Stream Restoration classes.

-Objectives

- Identify opportunities for stream restoration projects in region and assess costs and benefits
- Produce a prioritized list of stream restoration projects as a guideline to future funding and implementation efforts

-Specific Tasks and Budget Notes

- Task 5.1 – Identify 7 potential stream restoration projects in region – Consultant will work with the Stakeholder committee to identify potential stream restoration projects that could have water quality and/or recreation benefits and will assist the committee in selecting the seven projects with the most potential benefits for analysis.
- Task 5.2 – Field Investigation - Consultant will perform an analysis of current conditions of each stream, including physical hydrology, health of stream system, recreational access, etc. EPA guidelines for Rapid Bio-Assessment will be used, as modified for California streams. Assessment will include water samples, biological assessments, photos, drawings and maps. Potential for damage through flooding and/or erosion of stream bed will be evaluated. (Opportunities will be provided for stakeholders to obtain training and participate in the assessment process.)
- Task 5.3 – Analyze data and write reports – Consultant will analyze data for each project and produce report detailing current conditions and recommended restoration options, including costs and benefits.
- Task 5.4 – Work with Stakeholders to prioritize projects – Consultant will work with the Stakeholder committee to discuss the findings of the assessment and to prioritize the projects for restoration.
- Task 5.5 – Flood Control Planning – Stakeholder groups will examine existing DWR information on flood areas to identify potential stream flood areas in the region and will propose revised land uses in these areas to reducing flood danger. (Included in Planning Area)

-Deliverables/Results

- Report assessing current conditions of 7 potential stream restoration areas in region
- Analysis of costs and benefits of restoration projects for target areas
- Prioritized list of stream restoration projects
- List of recommended land-use changes to reduce flood danger

Study Area 6: Sensitive Habitat Protection

-Objectives

- Compile information on wetlands and other sensitive habitat areas and map on County's GIS

- Provide technical capability to identify these areas when potentially-threatening developments are proposed nearby
- Develop policies to facilitate protection of environmentally sensitive areas from development

-Specific Tasks and Budget Notes

- Task 6.1 – Identify wetlands and other sensitive habitat areas – Stakeholder planning group will work with existing maps and analyses (including DWR maps, EIR reports, etc.) to identify wetlands and other sensitive habitat areas.
- Task 6.2 – Geocode areas for inclusion on County’s GIS system - County staff will map identified areas for inclusion on County’s GIS system and will develop “flagging mechanisms” that will provide notification if potentially-threatening developments are proposed within a radius close enough to impact the sensitive area.
- Task 6.3 – Develop policies for protection of areas – County staff will work with Stakeholder group to develop policy recommendations to assure protection of these environmentally sensitive areas, which will be presented to the Board of Supervisors for consideration.

(Note, the costs for these tasks are included within the Planning Process and Administrative area, Section 7)

-Deliverables/Results

- GIS layer identifying wetlands and other environmentally sensitive areas with notice capability when potentially threatening development is proposed
- Policy recommendations regarding protection of environmentally sensitive areas

Area 7: Planning Process, Public Education and Administration

Project Management and Administration

Tasks a.1 and a.2 provide the management and administration resources necessary to supervise, coordinate and document this comprehensive planning process. A Project Manager is provided approximately half-time (75 hours/month at \$50/hour), and an Administrative Assistant is provided for approximately the same amount of services. It is expected that the Project Manager will be an outside consultant, and the Administrative Assistant will be current County staff familiar with the process of documenting the activities of boards and committees. The Administrative Assistant will also assist in the development of the GIS system by collecting the information from the various Study Areas and compiling it a manner that can be easily utilized by the GIS consultants. Other activities of the Administrative Assistant include developing agendas and keeping minutes of various Stakeholder committees, distributing notice to participants and the public, and maintaining records of all activities performed under the planning project. The Project Manager will be responsible coordination between the various sub-areas, and will be the individual who reminds participants of the “big picture” and the linkages between the projects. The Project Manager will also be responsible for collecting the quarterly reports from each consultant and Stakeholder planning committee, compiling them into a comprehensive document and presenting them to the various oversight groups and agencies as required.

-Deliverables/Results

- Documentation of the planning project and the results of all the studies and activities undertaken
- Comprehensive quarterly reports and final report

GIS Project

Tasks a.3 and a.4 provide the resources to integrate GIS capabilities in the planning, documentation and public information aspects of the proposed process. It is anticipated that the consultant will be the Interdisciplinary Spatial Information Systems Center (ISIS) at CSU Fresno. The Director of ISIS has responded enthusiastically to assist with the development of the proposal, and sees an opportunity for effective data management and public education through use of GIS in this process. Tasks will involve reconciling two or more base maps (the County's, DWR's, and possibly others) to be able to use the layers in both, and integrating additional layers from other agencies, such as the US Forest Service. The Consultant will also transform data produced from the studies associated with this planning process into GIS layers to be added to the system. Finally, the Consultant will develop a Windows-based, on-line visualization tool to enable stakeholders and general public to access this information. Reports and guidelines developed for specific areas will be linked to the GIS map. This tool will be used in a variety of ways:

- Planning committees will be able to produce maps with relevant layers and for targeted areas without delays involved in requesting services of County staff
- General public will be able to have user-friendly, on-line access to GIS map with the ability to turn on and off various layers, and with references to important area-based issues such as water availability, water quality and fuels management
- Local students can use the GIS tool in their curriculum for computer studies, as well as geology, biology and other sciences. (Robert Collins, a teacher at Yosemite High School and director of their Environmental and Spatial Technology project is particularly interested in using this tool for the students' water-related project activities.)

The GIS will be developed in a way that it is easy to extend and modify and the future overhead for maintenance is relatively easy and low-cost. Because of current County needs for upgraded server capacity, ISIS will host the application for the two-year planning period. It will then be turned over to the County.

-Deliverables/Results

- Base map with existing information layers as required for the planning process
- Documentation of study activities in GIS format
- Development of on-line GIS tool that can provide comprehensive, area-based information to the project's planning group, general public, students and other efforts.

Public Information Projects

The eastern Madera County region is fortunate to already have in place two agencies that provide public information on water and eco-system related issues. The Central Sierra Watershed Committee has produced flyers and articles related to water conservation, fire-safe landscaping, invasive plants, and other relevant issues. Task a.5 will provide them with 500 hours of consulting services to develop and distribute additional public information materials. The Coarsegold Resource Conservation District provides information about fuels management, fire safety and other ecosystem issues, both as paper documents for distribution and on their award-winning website – www.crcd.org. Tasks a.6. and a.7 will allow them to update and re-publish their Oak Woodlands Management guidelines based on the additional information obtained in Study Area 4. Funds will also be provided to upload this information to their website.

Process Technical Assistance

Consensus Building Facilitation: Many of the issues examined in this process are not simple issues, particularly Study Area 2, (providing additional water supply reliability) and Study Area 4 (creating additional water through fuels management). These areas involve issues of technical feasibility, water rights, environmental impacts, and funding for implementation. The stakeholders involved in this process have different interests and will be differently impacted by the proposals and policies produced. These are areas where there is the most potential for dispute and even legal action. However, if properly managed and facilitated, they present potential opportunities for win-win solutions with multiple benefits. Task a.7 provides resources for professional facilitation of a consensus building process over these controversial issues. The budget for this task was developed with the assistance of Sharon Huntsman, former staff to the Center for Collaborative Policy, which has provided consensus-building services for many such controversial planning efforts. The process proposed involves:

- Assessment – interviews with critical players and opinion leaders, production of a report outlining interests and concerns
- Education – providing an opportunity for stakeholders to learn about each other’s positions/interests and to obtain necessary objective information to clarify issues
- Option Development – breaking away from positions to look creatively at options that could meet the represented interests
- Policy Development – reaching consensus on preferred policies
- Implementation – providing assistance as disputes arise in putting the policies into practice.

The resources invested in building consensus around controversial issues can leverage many times the initial investment many times through preventing legal disputes. In addition, the process educates and builds trust among the diverse stakeholders, facilitating the implementation of controversial policies and programs and preventing future disputes.

Water Rights Law Educational Assistance: Task a.8. provides resources for legal technical assistance to clarify water rights issues. This is an extremely complex area of the law, and there is a great deal of confusion and misinformation, even among the most educated stakeholders in the region. The proposed planning process includes attempts to reach agreement on water rights issues (over the additional water created from fuel management), for which a clear comprehension of the status of water rights law will be essential. In addition, education on water rights will be important to participants as they examine options for water supply reliability, which could involve the purchase of water for transport into needy areas of the region. The estimate of services required was developed with the assistance of Ken Franzen, a water rights attorney in the Clovis area.

III. Budget and Match

Budget: see attached Budget Spreadsheet (Attachment 3.2) – Sheet 1

Match Information: A match in the amount of \$125,000 is being provided by the Picayune Rancheria of the Chukchansi Indians. This funding is provided pursuant to a MOU between the

Tribe and Madera County entered into when the Tribe was planning their casino and resort in Coarsegold. The County is providing \$45,000 in-kind match. This total match of \$170,000 amount fulfills the requirement for the 25% local (non-State) match for the project, which totals \$670,000.

In addition, the County has been awarded an AB 303 local groundwater assistance grant which includes activities that overlap the activities proposed in this grant. The AB 303 grant is for a groundwater planning process for the entire County, including the identification of major issues and the implementation of feasibility studies for water supply reliability infrastructure. \$100,000 of those AB 303 grant funds (the portion allocated for eastern Madera County) have been integrated into the work plan for this project. This will avoid duplicate planning processes and will leverage a more detailed and useable product for the eastern Madera County region. These funds, and the work items they will pay for, are identified in the budget, but will be kept separate for financial and administrative purposes.

IV Schedule – from Jan 2, 2006 – Jan 2,2008

See Attached Budget Spreadsheet (Attachment 3.2) – Sheet 2