



TUOLUMNE – STANISLAUS INTEGRATED REGIONAL WATER MANAGEMENT REGION

**PROPOSITION 84 IMPLEMENTATION GRANT PROPOSAL
ROUND 2**

**ATTACHMENT 6 - MONITORING, ASSESSMENT, AND
PERFORMANCE MEASURES**

**Integrated Regional Water Management Program
Applicant: Tuolumne County Resource Conservation District**

ATTACHMENT 6 – MONITORING, ASSESSMENT, AND PERFORMANCE MEASURES

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Introduction and Overview

Introduction

This attachment describes the performance measures that will be used to quantify and verify the performance of each project in this grant proposal. A separate Project Performance Measures table has been prepared for each project or combination of interrelated projects.

Each table provides a description of: project goals, desired outcomes, output indicators, outcome indicators, measurement tools and methods, and targets for the project or group of projects. This information illustrates how results will be measured, with respect to meeting the overall goals and objectives of the Tuolumne-Stanislaus Integrated Regional Water Management (IRWM) Plan.

Following each table are additional notes on the monitoring system that will be used to verify project performance, and the data management methods and analyses that will be employed. A final section indicates how the monitoring results will correlate with the objectives of WCVV's grant proposal, the WCVV IRWM Plan, and State of California preferences. As described in Attachment 3 – Work Plan, the information provided in Attachment 6 will form the foundation for a Monitoring Plan specific to the project or suite of project

Murphys Sanitary District Wastewater Treatment Facility Sprayfield Improvement Project (TS-IRWM Project No. 2)

Project Goals	Desired Outcomes	Targets (measurable targets that are feasible to meet during the life of the project(s))	Performance Indicators (measures to evaluate change that is a direct result of the project being built)	Measurement Tools & Methods (to effectively track performance)
<ul style="list-style-type: none"> • Installation of required facilities for development of effluent disposal system. • Protection of public health and the environment and regulation compliance. • Protect beneficial uses of surrounding areas. • Effective utilize property purchased for disposal purposes. • Promote agricultural water use efficiency. 	<ul style="list-style-type: none"> • Successful implementation of District effluent disposal facilities. • Reliable effluent disposal system. • Reduce surface water contamination. • Minimize potential groundwater degradation. • Flexibility for Hay Station Ranch irrigation needs and facilitate recycled water use. 	<ul style="list-style-type: none"> • Project completion by 2015. • Absence of future Notices of Violation related to effluent disposal. • Complete land containment. • Compliance with RWQCB regulations. • Compliment future WWTF Improvement Project. 	<ul style="list-style-type: none"> • Timing of project completion. • Compliance with RWQCB regulations. • Successful complete land containment. • Groundwater Quality. • Successful integration with WWTF Improvement Project. 	<ul style="list-style-type: none"> • Project schedule and construction administration. • Self reporting and compliance inspections. • Complete land containment. • Flow monitoring, general monitoring, and groundwater monitoring as required by State Water Board. • Project report and technical studies.

Monitoring System:

Murphys Sanitary District will implement flow monitoring, groundwater monitoring and general monitoring & reporting procedures as required by the Central Valley Regional Water Quality Control Board. Anticipated compliance with state regulations will result in protection of public health and the environment. While this is an un-measurable performance indicator, project success is easily evaluated with the ability to address Regional Water Board requirements. In addition to the various monitoring programs for effluent and groundwater quality that will become part of the Sprayfield Project, user rates will be evaluated to assess the efficiency of public works investments by the District upon completion of the planned Wastewater Treatment Facilities Improvement Project.

Data Management and Analyses:

As discussed above, Murphys Sanitary District will use monitoring programs to collect and evaluate data. Data will be maintained and conveyed in spreadsheets, hard-copy, and/or electronic format and reported to the RWQCB as required. Adjustments and/or improvements will be made to the operational procedures in order to optimize land disposal capacity while maintaining groundwater quality and compliance with regulations. Where warranted and/or required by regulations, technical analyses will be completed. All data collected would be made available to the District's consultant engineer or other consultants as needed.

Monitoring for IRWM Plan Goals and Objectives:

The Data Management and Analyses findings will be compared against the goals and objectives of the Tuolumne-Stanislaus IRWM Plan, as denoted below:

Tuolumne-Stanislaus IRWM Primary Objectives:

- B. Reduce contamination in groundwater, natural streams, raw water conveyance systems, and reservoirs from the negative impacts of storm water, urban runoff, and nuisance water.
- C. Improve infrastructure to meet wastewater discharge/disposal requirements and drinking water that meets drinking water standards and customer expectations.
- L. Increase current and future water use efficiency (WUE) by both municipal (residential and commercial) and agricultural end users.
- M. Develop sufficient reliable and affordable water supplies to meet regional demands of existing and projected water supply needs under a multi-year drought now and into the future.

Stanislaus National Forest Upper South Fork Stanislaus River Watershed Restoration and Water Quality Enhancement Project (T-S IRWM Project No. 9)

Project Goals	Desired Outcomes	Targets (measurable targets that are feasible to meet during the life of the project(s))	Performance Indicators (measures to evaluate change that is a direct result of the project being built)	Measurement Tools & Methods (to effectively track performance)
<ul style="list-style-type: none"> • Stabilize hydrologic function in Bloomer Lake Meadow, Bluff Meadow, Groundhog Meadow, and Coyote Meadow to provide for full meadow ecosystem benefits. • Restore hydrologic function in Leland Gully, Upper Three Meadow, and Middle Three Meadow to provide for full meadow ecosystem benefits. • Reroute trail out of Coyote Meadow • Restore 40 at-risk culverts to proper designed operating condition. 	<ul style="list-style-type: none"> • Maintain and restore the connections of floodplains, channels, and water tables to distribute flood flows and sustain diverse habitats. • Maintain and restore the physical structure and condition of streambanks to minimize erosion and sustain desired habitat diversity. • Effects of former recreational use ameliorated. • Reduce culvert impacts to streams and aquatic habitat. 	<ul style="list-style-type: none"> • 78 Acres of meadow habitat protected and restored. • Vegetation indicates strong native component and/or a reduction in bare ground. • Headcuts & gullies reduced and stabilized. • Water table raised and stream geomorphology remains stable. • Coyote Meadow trail segment fully decommissioned and returned to natural meadow condition. • Culverts are not plugged or damaged. • Culverts pass water, debris and sediment during high flows. 	<ul style="list-style-type: none"> • Indicator criteria for: <ul style="list-style-type: none"> ○ Channel Form ○ Floodplain Connectivity ○ Water Table Alteration ○ Herbaceous Plant Community • Evidence of recreational use in decommissioned trail segment • Failure risk criteria for culverts 	<ul style="list-style-type: none"> • Meadow Hydrologic Function Assessment Protocol (Frazier 2010). • Photographic monitoring to evaluate stream geomorphology & vegetative conditions. • Photographic monitoring of vegetation recovery • Qualitative assessment of recreation use. • Drain structure protocol in Motorized Road and Trail Condition Inventory (Grant et al. 2011).

Monitoring System:

The Stanislaus National Forest will collect and maintain information specific to stream geomorphology, erosion, vegetation, road culverts, and other project related information. As part of the reporting task for this grant, collected data will be compiled and analyzed, and results will be used to assess progress toward project objectives. This information will also contribute to quarterly and/or final IRWM Grant reports.

Data Management and Analyses:

The Stanislaus National Forest will use photographic monitoring to assess the stability and recovery of stream morphology, erosion, and vegetation communities. Additionally, assessments of channel form and vegetation community will be collected and culverts and the trail reroute at Coyote Meadow will be visited to qualitatively assess functionality. Data will be maintained in spreadsheets, hard-copy field forms, and digital photographs. Information will be collected before and after project implementation to assess change and/or stability over time. Results will be compared to project objectives and goals to evaluate project success.

Monitoring for IRWM Plan Goals and Objectives:

The Data Management and Analyses findings will be compared against the goals and objectives of the Tuolumne-Stanislaus IRWM Plan, as denoted below:

Tuolumne-Stanislaus IRWM Primary Objectives:

- B. Reduce contamination in groundwater, natural streams, raw water conveyance systems, and reservoirs from the negative impacts of stormwater, urban runoff, and nuisance water.
- D. Improve watershed health in support of increased water yield and ecosystem function.
- E. Improve the condition and ecosystem function of meadows.
- F. Assist in the protection and recovery of sensitive special status, threatened, culturally sensitive, and endangered native aquatic and other water dependent species in the region.
- G. Identify, preserve, and promote the regeneration and restoration of wetlands, vernal pools, and native plant riparian habitat; reduce invasive species.
- M. Develop sufficient reliable and affordable water supplies to meet regional demands of existing and projected water supply needs under a multi-year drought now and into the future.
- N. Improve integrated land use and natural resource planning to support watershed management actions that restore, sustain and enhance watershed functions.

References:

Grant, S.L., T. Durston, J.W. Frazier, F. Kuramata, August 2011. Motorized Road and Trail Condition Inventory, Version 3.1. USDA Forest Service, Stanislaus National Forest, Resource Management Program Area. Sonora, CA, 44 pp.

Frazier, J. W. 2010. Meadow Hydrologic Function Rapid Assessment. Version 2.0. Stanislaus National Forest. Sonora, CA. 15 pp.

Tuolumne County Resource Conservation District Small Parcel Storm Water Pollution Prevention and Landowner Stewardship Program (T-S IRWM Project No. 16)

Project Goals	Desired Outcomes	Targets (measurable targets that are feasible to meet during the life of the project(s))	Performance Indicators (measures to evaluate change that is a direct result of the project being built)	Measurement Tools & Methods (to effectively track performance)
<ul style="list-style-type: none"> Achieve immediate and lasting reductions in nutrient, sediment and pathogen pollution to surface and ground waters through the implementation of BMPs on small acreage livestock facilities located in priority areas in Tuolumne and Calaveras Counties. 	<ul style="list-style-type: none"> Increase the number of small parcel livestock owners/ facilities who implement BMPs to decrease nutrient, sediment and/or pathogen pollution leaving their property. Increase the number of small parcel livestock facility owners who have a written site plan addressing water quality concerns for their property. Increase exposure, build coalitions and develop training materials/programs related to existing livestock program in the area of rangeland management. Increase livestock 	<ul style="list-style-type: none"> Deliver 20 hours of formalized education and outreach services to the small parcel livestock community during the grant term through at least 5 workshops At least 10 individual landowners will participate in each workshop (Total Goal of 50 attendees) Provide a minimum of 10 Technical Assessments per year from 2014 through 2017. (Total Goal of 40 individual Site Assessments) Track that 35% of our Technical Assistance Recipients complete at least one BMP on their property. Reduce sediment, 	<ul style="list-style-type: none"> Conduct 5 Workshops of Technical Trainings throughout the region to address BMP installation for manure management, erosion control strategies, site planning etc and recruit and prepare property owners to apply to become Demonstration/ Implementation Sites. Workshop Attendees will be able to successfully describe, demonstrate and apply workshop class content as delineated by individual course Develop a comprehensive Small Parcel Management “Resources” page on the RCD website that includes all library and outreach materials collected. 	<ul style="list-style-type: none"> Opinion, awareness, skill, and behavior assessment surveys will be conducted before and after at all workshops. Follow-up surveys of ALL workshop attendees completed 9 months after the trainings are complete to determine implementation of BMPs and completion of written site plans. Solicit applications from Workshop program participants to become Demonstration/ Implementation Sites. Photo documentation on 10% of BMPs reported in survey process. Photo documentation will be completed at each technical training. Each Implementation Site owner will be required to

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	<p>owners/facilities awareness of local resources available to them for assistance with BMP implementation and technical assistance</p> <ul style="list-style-type: none"> • Create a network of livestock properties who have implemented BMPs so that people who are interested in implementing BMPs on their property can see first-hand how they work and hear testimony from their peers on the success/challenges of the projects. • Establish a self sustaining Peer Leader network to support water quality protective livestock facility management practices into the future. 	<p>nutrient and pathogen transport from primary sources on the Demonstration/Pilot BMP implementation sites by at least 50%</p> <ul style="list-style-type: none"> • Conduct an implementation site tour open to the public with a minimum of 15 attendees to showcase all completed projects, highlight water quality BMPs and successes. 	<ul style="list-style-type: none"> • Receive at least 10 applications from livestock owners to become Demonstration/ Implementation Sites. • Implement BMP's at at least 5 demonstration sites • Both quantitative and qualitative data will show a marked decrease in potential pollution from Demonstration/ Implementation sites • Assist a minimum of 10 workshop participants, not selected for Demonstration/ Implementation Sites, in completing Water Quality Site Plans • Organize and conduct an implementation site tour open to the public and press to showcase all of the completed projects, highlight water quality BMPs and successes. 	<p>complete a Water Quality Site Plan to address all aspects of their operation and their impact on water quality.</p> <ul style="list-style-type: none"> • Before and after photo documentation will be conducted at each Implementation Site. • Measure and collect information to be used in calculating load reductions from BMP installations at all Implementation Sites, and if possible for all training attendees who were not selected as Implementation Sites but reported installing a BMP. • Where possible and practicable, Tuolumne County RCD Stream Team volunteers will collect quantitative water quality data from surface waters immediately adjacent to demonstration/ implementation sites.
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Monitoring System:

TCRCD anticipates utilizing both qualitative and quantitative measures to monitor success of the Program.

Data tracking for workshops, training and technical assistance tasks will include collecting numbers of attendees at each workshop; opinion, awareness, skill, and behavior assessment surveys prior to and following each workshop; and follow-up surveys with workshop participants and technical assistance recipients.

As described by the Ecology Action Livestock and Land Program, measuring the pollutant load reductions due to BMP implementation on our project sites will be extremely difficult due to the uncontrolled nature and diversity of variables not only on the sites, but also because the target pollutants have other sources upstream from our sites (landslide loading of sediment or upstream septic facility failure for example).

Our objectives for the BMPs at our Implementation Sites are to reduce the exposure of 80% of the manure and 50% of the highly erodible soil, and to reduce potential loads by 30%. We propose to measure pollutant reduction on the 5 project sites using the same approach as the Santa Cruz and Monterey County Livestock and Land program as follows:

1) Load reduction calculations: We will apply load reduction calculations to every project site. To do this we will measure the change in the vulnerability of pollution sources before and after project. Quantifying the change in exposure to rainfall (which is the primary transport mechanism to surface water and groundwater) relies on measuring the aerial extent that manure and sediment are protected from rainfall before and after project implementation. This change will be documented for each of the 14 to 22 project sites and be reported as pollutant vulnerability reduction, PVR. We define PVR as follows:

$$PVR = m (V1-V2)$$

where

V1 = the volume of manure, soiled straw and sediment exposed to the rain before the project

V2 = the volume of manure, soiled straw and sediment exposed to the rain after the project, and

m = the concentration of each nutrient (N or P) or bacteria in samples of manure, soiled straw and sediment.

Concentration data will be measured from a set of representative samples or estimated based on data in scientific literature. PVR will be expressed as the total mass of each nutrient whose transport potential has been effectively eliminated or dramatically reduced. While this approach does not evaluate the delivery ratio to streams of each polluting constituent, it provides an estimate of the relative efficacy of different projects, and quantifies the potential reduction in pollutant loads if that delivery ratio were 100%. A high delivery ratio (though less than 100%) is likely during cold winter months where microbial degradation of nutrients is minimized and rainfall rates are high.

Reductions in pollution load from best management practice sites will also be estimated using data collected from past, present and future TCRC Stream Team monitoring. Quantitative data will be entered into an Excel or Access database and submitted to the State in CEDEN format as required in the Grant Agreement.

Additionally, TCRC will complete a “predictive analysis” worksheet for each demonstration site and technical assistance site. The worksheet was developed for Ecology Action Livestock and Land Program by Fall Creek Engineering. The predictive analysis is designed to be a user-friendly method to document and calculate the estimated effectiveness of best management practices. Manure management, exclusionary fencing, pasture management, drainage controls, and other equestrian BMPs can be implemented to reduce sediment, nutrients, pathogens, and other potential contamination of nearby waterways. This model also allows different runoff treatment options to be selected and analyzed to predict how they will reduce the impacts from equestrian facilities. The treatment BMPs include bioretention swales, filter strips, and vegetated swales. The model uses site specific information to compute annual loads for the amount of manure produced, as well as the primary constituents of concern, nutrients, pathogens, and sediment.

The annual loading of contaminants is calculated first using existing and proposed site conditions to quantify the sediment, pathogen, and nutrient generation at the site. Then, management practices are taken into consideration, applying removal efficiency from published studies to predict the effectiveness of best management practices at the respective site. (FALL CREEK ENGINEERING, INC (2009) Equestrian Facility Best Management Practices, Predictive Analysis. User Guide *For* Manure and Erosion Pollution Prevention Program. Ecology Action, Santa Cruz, California, January 2009)

Measuring Program Effectiveness: Program efficacy will be measured not only by ensuring all work tasks have been completed, but that we have met our targets outlined in the table above, and such additional indicators as percentage of target audience reached, number of BMPs implemented, total acreage of livestock facilities improved, before and after surveys to measure efficacy of technical assistance, and percentage increase in overall program participation as a result of programming, as well as number of new programs implemented as a result of statewide training efforts.

Documenting Performance: All assessment will be documented and reported in the following ways:

- Before and after satisfaction and awareness increase surveys
- Report of follow up phone survey results to assess BMP implementation
- Before and after photo documentation of implementation sites
- All monitoring and measurement data will be reported as well as uploaded into statewide compatible databases.

Data Management and Analyses:

The data collected on load reductions for each property will be entered into an Excel/Access file for reporting electronically and hard copy to DWR. Specifically, aggregated and per BMP type load reduction data can be provided while protecting the privacy of private landowners

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participating in the program. Confidentially, GIS data location of contracted implementation sites, their associated BMPs and ultimate load reduction outcomes will all be provided in final reporting to DWR.

The outcomes of the projects will be communicated and celebrated with our TAC so that they can improve their knowledge of the effectiveness of various BMPs, as well as the community so they can understand the benefits of implementing BMPs and increase participation and support in the program.

Monitoring for IRWM Plan Goals and Objectives:

The Data Management and Analyses findings will be compared against the goals and objectives of the Tuolumne-Stanislaus IRWM Plan, as denoted below:

Tuolumne-Stanislaus IRWM Primary Objectives:

IRWM PLAN OBJECTIVES		Monitoring Technique
B	Reduce contamination in groundwater, natural streams, raw water conveyance systems, and reservoirs from the negative impacts of stormwater, urban runoff, and nuisance water.	Qualitative and Quantitative analysis of pollutant loads pre- and post implementation
D	Improve watershed health in support of increased water yield and ecosystem function.	Photo documentation of BMP Installation. Workshop Survey Results and Follow-up Survey Results
F	Assist in the protection and recovery of sensitive special status, threatened, culturally sensitive, and endangered native aquatic and other water dependent species in the region.	Photo documentation of Demonstration Site adjacent riparian habitats
H	Reduce the risk of localized flooding in urban areas.	Photo documentation of stormwater catchment, dispersal and/or retention BMP's installed
N	Improve integrated land use and natural resource planning to support watershed management actions that restore, sustain and enhance watershed functions.	Photo documentation of BMP Installation; qualitative and quantitative analysis of pollutant loads pre- and post implementation

Amador Tuolumne Community Action Agency Home-Level Water Conservation for the DAC (T-S IRWM Project No. 17)

Project Goals	Desired Outcomes	Targets (measurable targets that are feasible to meet during the life of the project(s))	Performance Indicators (measures to evaluate change that is a direct result of the project being built)	Measurement Tools & Methods (to effectively track performance)
<ul style="list-style-type: none"> • To reduce or stabilize the cost a given low-income household must spend on water. • To cost-effectively reduce the pressure on water agencies to develop new supplies. 	<ul style="list-style-type: none"> • To minimize water use and waste. • Individuals and families improve their financial self-sufficiency by stabilizing or reducing water costs. Minimize the waste water sent to septic systems of treatment facilities. 	<ul style="list-style-type: none"> • Perform water usage and waste assessments at 240 homes. • Install cost-effective conservation measures in 192 homes. • Perform quality assurance post inspection on a minimum of 38 of those homes (20%). 	<ul style="list-style-type: none"> • Number of homes where water conservation measures have been implemented. • Number of fixtures and appliances installed. 	<ul style="list-style-type: none"> • Contracts, records, and post inspection documentation.

Monitoring System:

Monitoring for this project will occur on several overlapping levels.

- 1) A minimum of 20% of all homes will have a formal post-inspection conducted, which repeats most diagnostic testing that was conducted during the assessment. This inspection includes QA of all measures installed in addition to comments, photos and explanations of why other measures were not installed. This post-inspection is well documented and a copy is kept in each client's file.
- 2) The Program Supervisor and the Director of the Energy and Conservation Department both review all files for completeness and accuracy after the file has been completed and the billing has been prepared. Action is taken on missing info, improper documentation, inconsistencies between photos, test results and work completed/not completed. The Program Supervisor and Director both sign off on every file.
- 3) ATCAA undergoes an annual 3rd-party auditing that will include this project and all documentation.
- 4) ATCAA undergoes an annual monitoring by the California Department of Community Services and Development (CSD). CSD will not monitor the deliverables for this project, but because the measures proposed here will be combined with Energy conservation measures that are overseen by CSD, CSD will inspect these files for appropriate leveraging activity with DOE & HHS grants.
- 5) As part of the reporting task for this project, ATCAA will submit quarterly invoices and reports detailing all work completed as well as adherence to the goals and deliverables.
- 6) As part of the reporting task for this grant, collected data will be compiled and analyzed, and results will be used to assess progress toward project objectives, as described in Attachment 3 – Work Plan. The data will also be presented as part of the IRWM Grant quarterly and final report.

Data Management and Analyses:

ATCAA will document all tests conducted during each home assessment, all measures that have been called for in the assessment, the measures installed, and the post-inspection results. Complete demographic data is collected at the time of application that includes name, address, household size, proof of identity, evidence of household income, proof of energy costs, water costs, special circumstances and proof of U.S. citizenship. A priority score will be established for each application and will be included in data reported and analyzed. Data will be maintained and reported regarding the water conserved by installation of each measure and the total of all measures installed in each home.

ATCAA will also collect and maintain data associated with invoicing and reporting for each job. All of these ingredients are packaged into a file for each job and the physical files are secured in ATCAA's archive. All data pertaining to water conservation will also be transmitted to the Grant Administrator for invoicing and reporting purposes.

Data will be maintained and conveyed in spreadsheets, hard-copy, and/or .pdf files. Customer water meter data will be analyzed before and after the assessment and adjustments/improvements have been conducted to assess water use reductions. Water meter data and lists of the adjustments/improvements that were implemented will also be reviewed to evaluate which measures may have been most effective at reducing water use and also to substantiate the attainment of our goals.

Monitoring for IRWM Plan Goals and Objectives:

The Data Management and Analyses findings will be compared against the goals and objectives of the Tuolumne-Stanislaus IRWM Plan, as denoted below:

Tuolumne-Stanislaus IRWM Primary Objectives related to the Home-level Water Conservation for the DAC project:

- A. Improve water supply infrastructure within DAC and urban areas that have declining water quantity/quality or other water system reliability issues (e.g. fireflow, contamination, etc.).
- J. Improve energy efficiency of water and wastewater system infrastructure.
- K. Improve efficiency and reliability of man-made water conveyance systems.
- L. Increase current and future water use efficiency (WUE) by both municipal (residential and commercial) and agricultural end users.
- M. Develop sufficient reliable and affordable water supplies to meet regional demands of existing and projected water supply needs under a multi-year drought now and into the future.

Tuolumne Utilities District Phoenix Lake Preservation and Restoration-Phase 2 (T-S IRWM Project No. 18)

Project Goals	Desired Outcomes	Targets (measurable targets that are feasible to meet during the life of the project(s))	Performance Indicators (measures to evaluate change that is a direct result of the project being built)	Measurement Tools & Methods (to effectively track performance)
<ul style="list-style-type: none"> • Develop complete engineering plans for the lake improvements including; dredging plans, sediment forebay design, and wetland enhancement design. • Complete the necessary environmental review (CEQA and NEPA). • Obtain the required regulatory permits and compliance for Phase 3, lake improvement implementation. 	<ul style="list-style-type: none"> • Complete set of engineered construction documents, including plans and specifications. • CEQA Compliance. • Issuance of the following Permits/Agreements: CWA Section 404, ESA Section 7, NHPA Section 106, Clean Water Act Section 401 Certification, DFG 1602-Lakebed & Streambed Alteration Agreement, DSOD review and compliance. 	<ul style="list-style-type: none"> • Create a full set of construction plans and specifications. • Complete environmental clearance; adopted Initial Study/Mitigated Negative Declaration. • Obtain regulatory permits/agreements 	<ul style="list-style-type: none"> • Readiness to proceed with Phase 3- Construction. 	<ul style="list-style-type: none"> • Verify plans and specifications are complete. • Verify environmental review has been completed. • Permits/agreements in-hand and ready to proceed with construction.

Monitoring System:

Tuolumne Utilities District (TUD) will provide semi-annual progress reports on the Phoenix Lake Preservation and Restoration-Phase 2. The progress reports will identify percent of completeness of the goals listed in Table 1 as well as items listed in the Budget Form and identify the Tasks that are on schedule or behind schedule.

Data Management and Analyses:

As discussed above, TUD will ensure performance measures are met by creating semi-annual progress reports that identify completeness of the goals stated in Table 1 and the Budget Form and identify the Tasks that are on schedule or behind schedule.

Monitoring for IRWM Plan Goals and Objectives:

The Data Management and Analyses findings will be compared against the goals and objectives of the Tuolumne-Stanislaus IRWM Plan, as denoted below:

Tuolumne-Stanislaus IRWM Primary Objectives:

- A. Improve water supply infrastructure within DAC and urban areas that have declining water quantity/quality or other water system reliability issues (e.g. fireflow, contamination, etc.).
- B. Reduce contamination in groundwater, natural streams, raw water conveyance systems, and reservoirs from the negative impacts of stormwater, urban runoff, and nuisance water.
- D. Improve watershed health in support of increased water yield and ecosystem function.
- F. Assist in the protection and recovery of sensitive special status, threatened, culturally sensitive, and endangered native aquatic species in the region.
- G. Identify, preserve, and promote the regeneration and restoration of wetlands, vernal pools, and native plant riparian habitat; reduce invasive species.
- K. Improve efficiency and reliability of man-made water conveyance systems.
- N. Improve integrates land use and natural resource planning to support watershed management actions that restore, sustain, and enhance watershed function.

Tuolumne River Trust Tuolumne-Stanislaus Watershed Outreach and Stewardship (T-S IRWM Project No 22)

Project Goals	Desired Outcomes	Targets (measurable targets that are feasible to meet during the life of the project(s))	Performance Indicators (measures to evaluate change that is a direct result of the project being built)	Measurement Tools & Methods (to effectively track performance)
<ul style="list-style-type: none"> • To deliver a unified regional message about the importance of watershed health. • Involve the community in watershed stewardship through volunteer workday activities. 	<ul style="list-style-type: none"> • Increased knowledge and awareness of community watershed health and water supply issues. • Increased community participation in stewardship of local watersheds. 	<ul style="list-style-type: none"> • 6 presentations to local groups. • 120 participants in presentations. • 2 water/environment related events . • 200 participants in events • 6 media placements. • 8 volunteer workdays. • 120 participants in workdays. 	<ul style="list-style-type: none"> • Number of participants in each element. • Number of presentations, events, media placements. • Number of volunteer participant workdays. • Number of workdays organized. 	<ul style="list-style-type: none"> • Sign-in sheets. • Head counts at presentations. • Copies of newspaper, news web articles. • Audio clips of radio stories. • Sign-in sheets.

Monitoring System:

The Tuolumne River Trust will retain sign-in sheets and waiver forms of events and volunteer workdays and maintain notes of head counts of presentations completed. We will also retain copies of media placements from newspapers and the web, and if possible, audio files of any radio placements.

Data Management and Analyses:

Data will be maintained and conveyed in spreadsheets, hard-copy, and/or PDFs.

Monitoring for IRWM Plan Goals and Objectives:

The Data Management and Analyses findings will be compared against the goals and objectives of the Tuolumne-Stanislaus IRWM Plan, as denoted below:

Tuolumne-Stanislaus IRWM Primary Objectives:

- B. Reduce contamination in groundwater, natural streams, raw water conveyance systems, and reservoirs from the negative impacts of stormwater, urban runoff, and nuisance water.
- D. Improve watershed health in support of increased water yield and ecosystem function.
- E. Improve the condition and ecosystem function of meadows.
- F. Assist in the protection and recovery of sensitive special status, threatened, culturally sensitive, and endangered native aquatic and other water dependent species in the region.
- G. Identify, preserve, and promote the regeneration and restoration of wetlands, vernal pools, and native plant riparian habitat; reduce invasive species.
- L. Increase current and future water use efficiency (WUE) by both municipal (residential and commercial) and agricultural end users.

Calaveras County Water District Douglas Flat/Vallecito Storage Pond Project (T-S IRWM Project No. 25)

Project Goals	Desired Outcomes	Targets (measurable targets that are feasible to meet during the life of the project(s))	Performance Indicators (measures to evaluate change that is a direct result of the project being built)	Measurement Tools & Methods (to effectively track performance)
<ul style="list-style-type: none"> • Prepare all design and plans. • All permits acquired, including Title 22. 	<ul style="list-style-type: none"> • Final design requirements and plans. • DHS and RWCQB issues all required permits, including those for recycled water per Title 22 	<ul style="list-style-type: none"> • Approved plans. • Submit permit requests. • DHS and RWCQB issues all required permits. 	<ul style="list-style-type: none"> • Plans completed. • Permits requests submitted. • Permits issued. 	<ul style="list-style-type: none"> • Are plans completed. • Are permit applications complete and submitted. • Are permits issued.

Monitoring System:

The consultant will prepare all designs and plans. District staff will review designs and plans to ensure they meet requirements engineering standards. The District will also monitor and work with consultant on development and submission of required documentation and reports for permit applications and request for Title 22 authorizations from DHS and RWCQB. All documentation, including permits, will be presented as part of the IRWM Grant quarterly and/or final report.

Data Management and Analyses:

The District will use a self reporting model that maintains copies of all designs, plans, reports, applications and permits, when issued. Results will be compared to desired outcomes to ensure the project meets its goals and objectives.

Monitoring for IRWM Plan Goals and Objectives:

The Data Management and Analyses findings will be compared against the goals and objectives of the Tuolumne-Stanislaus IRWM Plan, as denoted below: E. Improve infrastructure to meet wastewater discharge/disposal requirements and drinking water that meets drinking water standards and customer expectations.

Tuolumne-Stanislaus IRWM Primary Objectives:

- B. Reduce contamination in groundwater, natural streams, raw water conveyance systems, and reservoirs from the negative impacts of storm water, urban runoff, and nuisance water.
- C. Improve infrastructure to meet wastewater discharge/disposal requirements and drinking water that meets drinking water standards and customer expectations.

Groveland Community Services District GCSD/BOF (LS#16) Water Quality Protection Project (T-S IRWM Project No. 27)

Project Goals	Desired Outcomes	Targets (measurable targets that are feasible to meet during the life of the project(s))	Performance Indicators (measures to evaluate change that is a direct result of the project being built)	Measurement Tools & Methods (to effectively track performance)
<ul style="list-style-type: none"> The goal/purpose of this project is to provide significant water quality protection for Rattlesnake Creek and Don Pedro Reservoir. 	<ul style="list-style-type: none"> Dramatically reduce the likelihood of a sewer spill into these regional bodies of water. 	<ul style="list-style-type: none"> Zero sewer spills during the life of this reconstructed sewer lift station. 	<ul style="list-style-type: none"> Historically there have not yet been any spills at this lift station, but it's a disaster waiting to happen and anything above zero will not be acceptable. 	<ul style="list-style-type: none"> Pumping information and flow volumes are measured on an on-going basis at this lift station and therefore easily monitored/tracked.

Monitoring System:

The nature of our project does not necessitate an elaborate or detailed monitoring system. Our construction project, which entails replacement of LS#16, involves approximately four (4) months of construction, during which we will have constant construction administration until completion. We anticipate, with successful grant funding, that said construction would take place between March and June 2014.

Data Management and Analyses:

GCSD will keep separate specific records with regard to sewer flows into LS #16, both before and after this reconstruction/rehabilitation project to verify the effectiveness of the improvement. These records will be used to analyze the water quality protection benefits. The expected life of these improvements is 40 years, so we will be keeping data for said period of time, and therefore will be able to have a very long term analysis of the benefits of this proposed project.

Monitoring for IRWM Plan Goals and Objectives:

The Data Management and Analyses findings will be compared against the Goals and Objectives of the Tuolumne-Stanislaus IRWM Plan, as denoted below:

Tuolumne-Stanislaus IRWMP Plan Primary Objectives:

- A. Improve water supply infrastructure within DAC and urban areas that have declining water quantity/quality or other water system reliability issues (e.g. fireflow, contamination, etc.).
- C. Improve infrastructure to meet wastewater discharge/disposal requirements and drinking water that meets drinking water standards and customer expectations.
- D. Improve watershed health in support of increased water yield and ecosystem function.
- F. Assist in the protection and recovery of sensitive special status, threatened, culturally sensitive, and endangered native aquatic and other water dependent species in the region.
- J. Improve energy efficiency of water and wastewater system infrastructure.
- N. Improve integrates land use and natural resource planning to support watershed management actions that restore, sustain, and enhance watershed function.