



Grizzly Flats

GRIZZLY FLATS

Founded in 1966, the Grizzly Flats Community Services District (GFCSD) provides domestic water service to 611 residential customers in a geographically remote foothill community in El Dorado County. The system is classified as a “Small Community Water System” by the Department of Health Services. While not officially a disadvantaged community, the median income of the community is only \$3000 higher than the disadvantaged level. Consequently, the district has extremely limited financial resources.

The community is served by a small two-source water system constructed in the mid 1960’s through the mid 1970’s. Water for the community is derived from two local creeks, North Canyon and Big Canyon, which are tributaries to the Cosumnes River. These creeks are diverted and the water is transported roughly two miles via pipeline to a storage reservoir prior to treatment.

The system is extremely vulnerable to low flows as there are only two surface water sources – both of which drain relatively small watersheds. The longer the dry season extends, the lower the base flow drops. The five-month period (July 1–December 1), when stream flows are typically lowest and treated water demand is high, is the most critical period.

The community is entirely dependent on the local reservoir to capture and store water for domestic and fire flow uses. Seasonal and operational storage is limited, in part, to the poor embankment conditions of the existing reservoir lining. In its current state, the reservoir provides limited operational storage and no seasonal carry-over storage.



The lack of seasonal storage and carryover storage puts the residents at risk of water shortages when stream flows are low in the late summer and fall or when an undetected line break or tampering in the distribution system occurs. Additionally, the domestic water system is used for structural fire fighting and the raw water reservoir is available and has been used in the past for wildfire suppression.

The GFCSD water system consists of approximately five miles pipeline that delivers water to over 600 residential accounts, much of which is original piping. The main lines are primarily asbestos cement and the service lines are thin-walled PVC with inadequate pressure ratings.

Attachment 3 Work Plan

The pipelines were constructed with native backfill, without the benefit of engineered pipe zone material. As a result, point loads are a common cause of the ever increasing trend of waterline leaks and breaks, with three to five service or main line breaks per year.

Grizzly Flat has long been a community concerned with water conservation due to the constraints of supply that affects the district. In partnership with the El Dorado Irrigation District and the El Dorado County Water Agency, the GFCSD prepared a Drought Action Plan in late 2007. This plan will serve as the template for the communities of Nevada City and Washington (project sponsors within this Proposal) as they prepare similar plans.

The Grizzly Flats project package includes three projects. They are listed below in the same order they can be found in the following pages.

Grizzly Flats Projects:

- ◆ Reservoir Relining
- ◆ Leak Detection and Repair
- ◆ Integrated Water Shortage Contingency, Drought Preparedness, and Comprehensive Water Conservation Planning Program





**GRIZZLY FLATS COMMUNITY SERVICES DISTRICT
RESERVOIR RELINING
Infrastructure Reliability, Conservation, and Efficiency Program**

Overview

The purpose of this project is to improve system reliability for residential customers, fire suppression and drought protection, protect water quality and achieve a more sustainable water supply for the Grizzly Flats community by reducing water loss in the reservoir, improving security, and monitoring the water system.



Founded in 1966, the Grizzly Flats Community Services District (GFCSD) provides domestic water service to 611 residential customers in a geographically remote foothill community in El Dorado County. The system is classified as a “Small Community Water System” by the Department of Health Services.

The major water infrastructure components of GFCSD were constructed in the mid 1960’s through the mid 1970’s and the sole source of water for the community include two local creeks, North Canyon and Big Canyon, which are tributaries to the Cosumnes River. These creeks are diverted and the water is transported roughly two miles via pipeline to a storage reservoir prior to treatment. The North Canyon diversion has a 9.4 acre-feet per month (70 gpm) estimated available minimum base flow, while the Big Canyon diversion has a 1.3 acre-feet per month estimated available minimum base flow, making the North Canyon diversion the District’s most important source of supply. The longer the dry season extends, the lower this base flow drops. The five-month period (July 1–December 1) when stream flows are typically lowest and treated water demand is high, is the most critical period.

A water treatment facility and 25,248 feet of piping, ranging in size from one-inch to eight-inch, deliver water to households in the Grizzly Flats Subdivision. The reservoir itself currently has a total of 22.81 acre-feet in usable storage; 27.32 acre-feet including dead storage. In its current state, the reservoir provides limited operational storage and no seasonal carry-over storage.



Reservoir erosion resulting from degradation of current lining.

Seasonal and operational storage is limited, in part, to the poor embankment conditions of the existing reservoir lining.

Project Need

The lack of seasonal storage and no carryover storage puts the residents at risk of water shortages when stream flows are low in the late summer and fall or when an undetected line break or tampering in the distribution system occurs. Additionally, the domestic water system is used for structural fire fighting and the raw water reservoir is available and has been used in the past for wildfire suppression. The following paragraphs provide further descriptions of these issues.

Condition of Reservoir

Extensive analyses of the reservoir leakage are described in two reports entitled "*Reservoir Studies for the Grizzly Flats Community Services District - Report on Inspection of the Drained Reservoir*" dated September 1997, and "*Reconnaissance Investigation of Off-Stream Storage*" dated May 1998. These reports describe the instability and poor embankment condition of the existing reservoir that establish the need for lining the reservoir. The reservoir has poor foundation conditions, low-density embankment materials, stability considerations, seepage losses, operating head considerations, and its storage capacity is underutilization (Increasing Active Storage Capacity of the Raw Water Reservoir, 2009, page 1). Based on the recommendations outlined in these reports, GFCSD has operated at a reduced capacity to avoid stressing the embankment. This limitation results in reduced seasonal and operational storage even in wet years. Average water loss is currently estimated at 16.2 acre-feet per year, and when the water supply is fully utilized, water loss is estimated at 35 acre-feet per year. Lining the reservoir will eliminate the water loss.

These reservoir-related issues, the recent finding that the CSD's biggest diversion (North Canyon) is reduced 30 percent because of root intrusion at multiple points along its raw water pipeline, and climate change predictions of lower instream flows put the CSD at risk of severe water shortages.

Threat of Drought

Furthermore, recent drought planning efforts in El Dorado County indicate the susceptibility of the GFCSD water supply to drought at current demand levels. GFCSD is facing an estimated shortfall of 45 acre-feet in the second and third year of a design drought that uses 1976, 1977, and a repeat of 1977 hydrology. More efficient use of current water supplies will reduce the impacts of drought.

With limited seasonal storage, the critical issue facing the GFCSD is meeting domestic water demand and fire suppression needs in the late summer and fall months when stream flows are at their lowest stages. The small storage volume in the pretreatment reservoir is compounded by considerable seepage from the partially lined earthen reservoir. Lining the reservoir with a synthetic liner will make that water available to meet existing demands and fire suppression needs.

Seasonal Demand for Fire Suppression

Grizzly Flats' lack of adequate water supply contributes to significant fire exposure. It has been identified in the Federal Register as a "Community at Risk" and was the location of one of seven Healthy Forests Initiative Environmental Assessment Demonstration Projects in the

United States. Past fire history indicates the high likelihood of a major fire threatening Grizzly Flats in the future. Therefore, it is a priority to set aside adequate water and improve the reliability of the system to deliver water for fire suppression.

Monitoring and Security

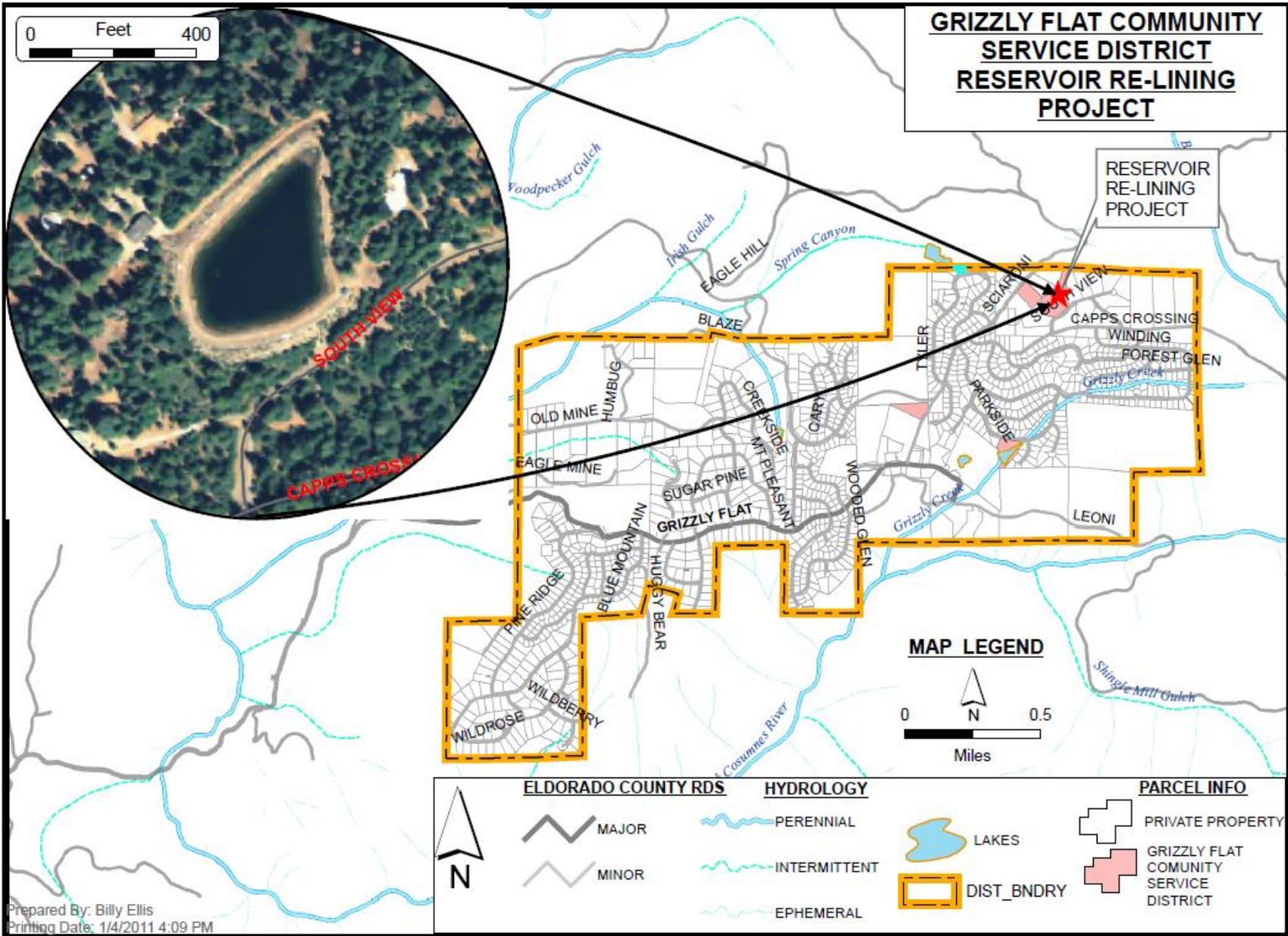
The Grizzly Flats Reservoir is vulnerable to significant water loss in the distribution system that, if left unchecked, could drain the system and impact the sustainability of the water supply through the late summer and fall. System monitoring at the treatment plant and in the distribution system is needed to detect large-scale water losses resulting from line breaks.



Present degraded state of Grizzly Flats Reservoir lining







Work Plan Tasks

The scope of this project is to improve system reliability for the District by increasing the reservoir's storage capacity through the installation of a 60-mil HDPE liner over the complete interior of the reservoir, and the installation of a 200-gallons-per-minute (gpm) pump station at the reservoir outlet to address operation head considerations and underutilization of storage capacity. Ultimately, this project will increase the reservoir's active storage capacity by 33.5 percent (5.07 acre-feet annually) and eliminate seepage, saving 16.2 acre-feet annually under current conditions and 35 acre-feet (Carlton 2009) annually when the water supply is fully utilized. These savings, together with increased storage, increase the CSD's supply yield by approximately 36 acre-feet (URS 2009).

A Supervisory Control and Data Acquisition (SCADA) control system will be installed to monitor and control the water treatment process and distribution system and to improve operational performance of the treatment plant. The SCADA system will include a Human-Machine Interface (HMI) apparatus, a supervisory computer system to gather and acquire data, Remote Terminal Units (RTUs), Programmable Logic Controller (PLCs), and a communication infrastructure to connect the system to the RTUs.

Budget Category (a): Direct Project Administration Costs

Task 1: Administration and Management

The tasks for this budget category will include all non-construction project administration activities performed by Grizzly Flats CSD and CABY staff throughout the duration of the project and will include: development and completion of contractual paperwork, maintenance and reporting of expense documentation, oversight of project scheduling and contract/agreement compliance and final invoice.

Deliverables:

- ◆ Preparation of invoices and other deliverables as required.

Task 2: Labor Compliance Program

Grizzly Flats CSD has entered into a contract with North Valley Labor Compliance Services (Identification #2005.00466) to provide labor compliance consulting services for all CABY project sponsors and relevant projects.

Deliverables:

- ◆ Adherence to requirements of Labor Code Compliance Program including, but not limited to: review of certified payroll records, site monitoring, receipt of claims/complaints by workers, investigation of irregularities or claims, post-compliant audits (if necessary), reporting to DWR via the CABY monthly status reports, and any required withholding of contract payments.

Task 3: Reporting

The tasks for this budget category will include all activities necessary to support quarterly reporting, monthly invoicing and associated status reports, quarterly status reporting to the CABY IRWMP-RWVG, and submittal of final report. These activities will include: tracking

of the specific status of each project task, documentation of task status in an easy-to-understand and track format, and creation of quarterly financial reports for the project (including percent complete of project activities).

Deliverables:

- ♦ Submission of quarterly, annual, and final reports as specified in the Grant Agreement.
- ♦ Submission of quarterly reports to the Nevada City Project Manager and to the CABY-RWMG to enable their tracking of project status.

Budget Category (b): Land Purchase/Easement

Land Easements

No land easements are required for project implementation.

Budget Category (c): Planning/Design/Engineering/Environmental Documentation

Assessment and Evaluation (Planning)

A preliminary engineering report (PER) was completed by Carlton Engineering in December 2009 (see below). The PER analyzed various project alternatives and made recommendations for final design. A number of other planning documents, studies, and investigations of the reservoir relining project have been previously prepared which provide the engineering planning background required to successfully implement the project. These evaluations are summarized in the following reports:

- 1) Borcalli and Associates Inc. 1998. *Reconnaissance Investigation of Off-Stream Storage for Grizzly Flats Community Services District.*
- 2) GFCSD. September 1997. *Reservoir Studies for the Grizzly Flats Community Services District - Report on Inspection of the Drained Reservoir.*
- 3) Brown and Caldwell. December 2007. *Drought Plan for Grizzly Flats Community Services District.*
- 4) El Dorado County Water Agency. 2007. *Water Resources Development and Management Plan.*

Engineering and Design

The engineering designs for the Grizzly Flats Reservoir Relining Project were completed by Carlton Engineers in 2010. These designs include reservoir lining, pump station, and SCADA equipment needed to upgrade the Grizzly Flats reservoir. The graphic illustrating the reservoir improvement was prepared as part of this work effort (see below). These designs include:

- 1) Final civil design;
- 2) Final mechanical design;
- 3) Final electrical design;
- 4) Complete set of drawings;
- 5) Complete specification set; and
- 6) Basis for itemized cost estimate.

The plans and specifications are bid ready.

Environmental Documentation

A CEQA Categorical Exemption was prepared in 2010. A Notice of Exemption was prepared and sent to the County Clerk's office on April 16, 2009 (see Exhibit 1).

Task 4: Permitting

With the exception of a Stormwater Pollution Protection Plan (SWPPP), no permits are required to install or operate the reservoir relining project.

Internal Deliverables:

- ◆ Prepare a Stormwater Pollution Prevention Plan.

Budget Category (d): Construction/Implementation

Task 5: Pre-Construction Contracting – Request for Proposal through Notice to Proceed
GFCSD has established procedures and protocols for advertising, opening, and evaluating bids for construction services, as well as for awarding and developing contracts with construction companies. These policies and procedures will be used to identify the construction company selected to construct the reservoir relining project.

Project management activities include coordination with the construction manager on impacts to normal operations such as shut downs, bypasses, and customer notifications, review and approval of pay requests, attendance at construction meetings, and budget management.

Internal Deliverables:

- ◆ Advertisement for bids; pre-bid contractors meeting; evaluation of bids; award contract.

Task 6: Mobilization and Site Preparation

Mobilization and site preparation will consist of creating a construction staging yard, purchasing and delivering construction materials and equipment to the site, finalizing the construction schedule and work plan, drawing down the reservoir to enable replacement of the liner and construction of the pump station, and establishing a construction headquarters.

6.1 Water Level Drawn Down

In order for construction to commence, water levels within the reservoir must be drawn down to the maximum extent possible. Every attempt will be made to time this effort with lowest season of water needs by District customers.

Internal Deliverables:

- ◆ Site preparation and construction staging.
- ◆ Reservoir draw-down.

Task 7: Construction/Installation of Reservoir Lining, Pump Station, and SCADA Equipment

This task will result in the installation of the reservoir lining, the pump station, and SCADA equipment in accordance with the construction plans and specifications. Following is a detailed description of the steps needed to complete the project.

Task 7.1 Construct Pump Station

The existing pump house will be disassembled and relocated to an area outside of the reservoir lining area. Low head pumps and Filter Plant Nos. 1 & 2 upgrades are necessary to sufficiently restore the designed treatment capacity of 200 gpm for each filter. Historic inefficiencies within the filter plant operations and the limitations of gravity operation during low water levels in the reservoir during drought conditions or end-of-summer periods are addressed and restore the ability for each filter plant to process the designed capacity of 200 gpm each. Filter Plant No. 1 improvements will also address the excessive corrosion and other items associated with the aged facility.

Task 7.2 Excavate/Compact Reservoir

As identified in the December 2009 Preliminary Engineering Report (PER), it was determined that the compaction of the top portion of the reservoir was necessary to allow the level maintained in the reservoir to be increased an additional 1.5 to 2.0 feet depending on the maintaining sufficient freeboard. This project provides for compaction of the reservoir bottom and the construction of a smooth, compacted layer for the reservoir liner. All materials will be compacted to a minimum of 90 percent of ASTM D1557 and tested during construction. Excavation is required to remove sediments around intake, remove and replace three feet of embankment, and remove and relocate pump house.

Task 7.3 Construct Reservoir Liner

Approximately 120,000 square feet of reservoir liner will be installed over the compacted bottom. A cushion layer of eight-ounce geotextile fabric will be installed over the compacted subgrade to protect the HDPE liner. A 60-mil HDPE geomembrane liner will be placed over the cushion layer and the HDPE seams will be fusion welded with a certified HDPE seam welder and apparatus. All of the reservoir reliner work will be inspected during construction.

Task 7.4 Pour Concrete Curb and Install Chain-Link Fence

A concrete curb and access stairway and handrail will be constructed to improve access and reduce erosion. Approximately 1,450 lineal feet of new security chain-link fence will be installed around the reservoir.

Task 7.5 Install Reservoir Influent Flow Meter Improvements

An ultrasonic flow meter will be installed to replace the exiting propeller meter.

Task 7.6 Install SCADA Equipment and Test

SCADA System includes all labor, material, and equipment to provide new radio/antenna/SCADA PC at filter plant including, but not limited to: Control Cabinet/Antenna/Solar panels at Reservoir Influent Flowmeter; Control Cabinet/Antenna/Sensors at Tyler Drive.; Control Cabinet/Antenna/Sensors at Winding Way; Radio/Antenna/Sensors at Forest View; associated conduits at all sites; PLC programming at all sites; Wonderware license and programming at filter plant; and startup at all sites.

Task 7.7 Train Operators

District operators will be trained in the appropriate methods, techniques, tasks, and procedures for fully implementing, running, checking, reporting, and otherwise performing the required duties related to the new District infrastructure.

Internal Deliverables:

- ◆ Constructed infrastructure improvements.
- ◆ “As-built” construction drawings, specifications, and documentation.

Task 8: Demobilization

Task 8.1 Monitoring Plan

Prior to operation of installed components, the GFCSD will gather, collate, and evaluate pre-project reservoir water loss data to create an accurate accounting of water losses and operational characteristics. Operational characteristics, water consumption, and water losses will be estimated for the post-project condition prior to final system installation. These calculations will be reviewed following a full calendar year operation to confirm initial estimates. A final report on water saved through the new supply infrastructure will be given to the Board as well as to CABY members, and made available on the CABY website.

Task 8.2 Final Inspection to Determine Deficiencies

The inspection will be conducted on a schedule mutually determined by the contract manager and the contractor. The duration of the inspection will be a consequence of the punch list and inspection criteria. If necessary, subcontractors will also be present to ensure that all aspects of system performance are evaluated and deficiencies noted. This inspection will cover all aspects of system installation and operation to ensure that all infrastructure and facilities were constructed and installed per contract standards and construction drawings, including change orders and field orders. A final list of deficiencies will be developed jointly by the contract manager and contractor, and a specific work plan for accomplishing remedial action will be developed and approved by both parties (per initial contract).

Task 8.3 Contractor Demobilization and Erosion Control

Following completion of construction, the contractor will formally demobilize the site. As a result of these activities, the staging area will be cleared, equipment and debris removed, surplus construction materials removed, and the required erosion control measures employed.

Task 8.4 Eleven-Month Warranty Inspections (Within First Year of Installation)

The construction manager will conduct a formal 11-month warranty inspection. The inspection will be conducted to determine that all equipment is operational and no defects have surfaced since final inspection.

Task 8.5 Deficiencies Corrected by Contractor

The contractor will remedy all listed deficiencies in a manner, and within a timeframe, acceptable to the contract manager. Seasonal considerations may affect the timing of remediation efforts. However, these constraints will be factored into the final repair/remediation schedule.

Internal Deliverables:

- ◆ Executed contract, material submittal, installed reservoir lining, pump stations and SCADA system; 11-month warranty repairs.
- ◆ Post-project Demobilization Inspection Report (prior to final contractor payment).

- ◆ Pre- and post-project water loss will be calculated to monitor and evaluate the efficacy of the project.

Deliverables to DWR:

- ◆ Post-project Demobilization Inspection Report (prior to final contractor payment).

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Environmental Compliance/Mitigation/Enhancement

This project is a minor modification of an existing facility and is exempt from CEQA and requires no mitigation other than that provided for through industry standard construction practices and adherence to State Water Resources Control Board general requirements associated with storm water discharges. A SWPPP will be prepared and implemented prior to construction. No environmental monitoring or mitigation is required.

Budget Category (f): Construction Administration

Task 9: Direct Construction Administration

To ensure successful completion of the contract, the District will advertise for and retain a construction manager whose responsibility will be to oversee the project from contract initiation through final progress reporting. The consulting engineer's responsibilities will include inspection work through all phases of construction, the facilitation of regular construction meetings, and preparation of meeting minutes. Additional responsibilities will include: managing contractor communications (prepare and process change orders and field orders and respond to requests for information from the contractor); preparation of schedule of values for progress payments; review and approval of progress payments and recommendations for payment; maintenance of a set of drawings that record changes to the contract drawings for use in preparing "as-built" drawings; and oversight of the 11-month warranty inspection and document deficiencies for GFCSD. Below is a bulleted list of major duties and responsibilities of the construction manager.

- ◆ Inspect work through all phases of construction.
- ◆ Plan, facilitate, and prepare minutes for regular construction meetings.
- ◆ Manage contractor communication.
- ◆ Preparation of schedule of values for progress payments.
- ◆ Review and approve progress payments
- ◆ Maintain record drawings
- ◆ Conduct 11-month warranty inspection
- ◆ Monthly financial and progress reporting

Deliverables:

- ◆ The tasks for this budget category would include all construction contract management, staff construction supervision, and direct construction work including: Project Manager(s) duties such as preparation of schedule of values, meeting minutes, direct supervision of all construction activities, daily inspection reports, 11-month warranty inspection report.

- ◆ GF Project Manager(s) coordination of project/contract activities.

Budget Category (g): Other

Task 10: Develop and Maintain CABY Project-specific Webpage

The goal of this task is to ensure that all CABY members and members of the public have access to updated and thorough information about the implementation and characteristics of the project. Every CABY project which is implemented will be integrated into the CABY website through the creation of a project-specific webpage. Project plans, specifications, progress photographs, reports, status updates, and other similar materials will be posted or linked to this webpage. The webpages will be designed and brought online (activated within the first month after contract agreement). The page will be updated monthly.

Internal Deliverables:

- ◆ Development, activation, and maintenance of project-specific webpage within the CABY website as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69-72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57).
- ◆ Post-project information through the existing CABY SWIM Database (as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69-72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57).
- ◆ Submittal of project-specific data to the CABY Technical Advisory Committee tasked with screening project-specific data for submittal to and inclusion in state databases (as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69-72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57).

Task 11: Data Management

The goal of this task is to ensure that all data gathered and developed as a result of the project is made available to state databases as well as CABY members and the interested public using data management and monitoring deliverables that are consistent with the IRWM Plan Standards and Guidance (as stipulated in the August 2010 IRWM Guidelines, page 20). In this case, the appropriate approach is identified in the CABY Planning Grant submittal which will direct the IRWMP data collection efforts, regardless of whether the planning grant is funded or not. Data will be made available to all CABY members and the general public through the existing CABY SWIM Database. Material will be uploaded as it becomes available, however most of the data will be posted upon completion of the primary project activities. The CABY technical committee will evaluate project-related data to determine its appropriateness for upload to relevant state databases.

Internal Deliverables:

- ◆ Development, activation, and maintenance of project-specific webpage within the CABY website as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69-72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57).

- ◆ Post-project information through the existing CABY SWIM Database (as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69-72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57).
- ◆ Submittal of project-specific data to the CABY Technical Advisory Committee tasked with screening project-specific data for submittal to and inclusion in state databases (as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69-72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57).

DWR Deliverables:

- ◆ Inventory of all data submitted to relevant/applicable state agencies.

Budget Category (h): Construction /Implementation Contingency

A five percent standard contingency is already included in the construction budget and it is calculated based on industry norms.

**GRIZZLY FLATS COMMUNITY SERVICES DISTRICT
RESERVOIR RELINING**

EXHIBITS

1. CEQA Documentation --- Categorical Exemption

Grizzly Flats Community Services District
4765 Sclaroni Road / P.O. Box 250
Grizzly Flats, CA 95636
Ph: 530/622-9626 Fax: 530/622-4806



Resolution No. 2009-3

WHEREAS, the Grizzly Flats Community Services District desires to enhance the provision and protection of the drinking water supplied to the consumers of Grizzly Flats water system with the Grizzly Flats CSD Reservoir Improvements project and;

WHEREAS, this project will install an impermeable material liner in an existing raw water reservoir, construct a small booster pump station at the reservoir outlet, modify existing elevations of the reservoir outlet and spillway piping as determined by an engineer, and install an ultrasonic reservoir level monitoring device to eliminate seepage losses and neutralize the potential effects of subsurface erosion, poor foundation conditions, low density embankment materials, and stability considerations and;

WHEREAS, the project is categorically exempt under section 15301- Existing Facilities and section 15302- Replacement or Reconstruction, therefore;

BE IT RESOLVED by the Grizzly Flats Community Services District that, the Grizzly Flats CSD Reservoir Improvements Project is categorically exempt from CEQA and;

BE IT FURTHER RESOLVED that the President of the Board of Directors and the General Manager of said Grizzly Flats Community Services District is hereby authorized and directed to cause the necessary data to be prepared and the exemption to be signed and filed with the State of California Office of Planning and Research and the Recorder Clerk of El Dorado County.

Passed and adopted at a regular meeting of the Grizzly Flats Community Services District Board of Directors on the 13th of April, 2009

AYES: *Engelhard, Ball, Kelley*

ABSENT:

NO: *Legand, Davidson*

ABSTAIN:

NO:

Mel Kelley

Mel Kelley, President
Board of Directors
Grizzly Flats Community Services District

I hereby certify that the foregoing resolution was duly and regularly adopted at the Regular Meeting of the Board of Directors of the Grizzly Flats Community Services District held on this 13th day of April, 2009.

Jodi Leuther

Jodi Leuther
Secretary to the Board
Grizzly Flats Community Services District

Notice of Exemption

FILE COPY

Form D

To: Office of Planning and Research
P.O. Box 3044, Room 212
Sacramento, CA 95812-3044

From: (Public Agency)
Grizzly Flats Community Services District
PO Box 250 / Grizzly Flats, CA 95636

County Clerk
County of El Dorado
360 Fair Lane
Placerville, CA 95667

(Address)

FILED

APR 16 2009

Project Title: Grizzly Flats CSD Reservoir Improvements Project

WILLIAM E. SCHULTZ, Recorder-Clerk
By [Signature]

Project Location - Specific:
4765 Sciaroni Road

Project Location - City: Grizzly Flats Project Location - County: El Dorado

Description of Nature, Purpose and Beneficiaries of Project:

This project will install an impermeable material liner in an existing raw water reservoir, construct a small booster pump station at the reservoir outlet, modify existing elevations of the reservoir outlet and spillway piping as determined by an engineer, and install an ultrasonic reservoir level monitoring device to eliminate seepage losses and neutralize the potential effects of subsurface erosion, poor foundation conditions, low density embankment materials, and stability considerations. GFCSO customers are the beneficiaries of this project.

Name of Public Agency Approving Project: Grizzly Flats Community Services District

Name of Person or Agency Carrying Out Project: Grizzly Flats Community Services District

Exempt Status: (check one)

- Ministerial (Sec. 21080(b)(1); 15268);
Declared Emergency (Sec. 21080(b)(3); 15269(a));
Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
Categorical Exemption. State type and section number: Existing Facilities- Section 15301 and Replacement or Reconstruction-Section 15302
Statutory Exemptions. State code number:

Reasons why project is exempt:

Installation of an impermeable material liner over an existing clay liner to eliminate seepage and address reservoir physical conditions and installation of a reservoir level monitoring device are Class 1 activities under Section 15301. Construction of a small booster pump station at the reservoir outlet is a replacement/reconstruction of an existing utility system/facility involving negligible or no expansion of reservoir capacity. This is a Class 2 activity outlined under Section 15302.

Lead Agency Contact Person: Robert Hovland, General Manager Area Code/Telephone/Extension: (530) 622-9626

If filed by applicant:

- 1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? [X] Yes [] No

Signature: [Signature] Date: 4/16/09 Title: GFCSO General Manager

- [X] Signed by Lead Agency Date received for filing at OPR:
[] Signed by Applicant

Revised 2005



State of California—The Resources Agency
DEPARTMENT OF FISH AND GAME

2009 ENVIRONMENTAL FILING FEE CASH RECEIPT

RECEIPT# **388791**

STATE CLEARING HOUSE # (if applicable)

SEE INSTRUCTIONS ON REVERSE. TYPE OR PRINT CLEARLY

LEAD AGENCY Grizzly Flats Community Services Dist. DATE 4-16-09
 COUNTY/STATE AGENCY OF FILING EDC Recorder clerk DOCUMENT NUMBER PO9-65
 PROJECT TITLE Grizzly Flats CSD Reservoir Improvements Project
 PROJECT APPLICANT NAME Robert Howland PHONE NUMBER 530 (622) 9629
 PROJECT APPLICANT ADDRESS PO Box 250 CITY Grizzly Flats STATE CA ZIP CODE 95636
 PROJECT APPLICANT (Check appropriate box): Local Public Agency School District Other Special District State Agency Private Entity

CHECK APPLICABLE FEES:

- Environmental Impact Report
- Negative Declaration
- Application Fee Water Diversion (State Water Resources Control Board Only) \$2,768.25
- Projects Subject to Certified Regulatory Programs \$1,993.00
- County Administrative Fee \$850.00
- Project that is exempt from fees \$941.25
- Notice of Exemption \$50.00
- DFG No. Effect Determination (Form Attached)
- Other

PAYMENT METHOD:

- Cash
- Credit
- Check
- Other

TOTAL RECEIVED \$ 0

SIGNATURE

Kristina Vohell

TITLE

deputy

WHITE - PROJECT APPLICANT

YELLOW - DFG/ASB

PINK - LEAD AGENCY

GOLDEN ROD - COUNTY CLERK

FG 763.5a (Rev. 7/05)

GRIZZLY FLATS COMMUNITY SERVICES DISTRICT
LEAK DETECTION AND REPAIR
Infrastructure Reliability, Conservation, and Efficiency Program

OVERVIEW

The proposed project would reduce the amount of water loss due to undetected leaks in the treated-water distribution systems in the community of Grizzly Flats with the installation and monitoring of data logging leak correlators. Frequent interrogation and downloading of the data loggers will reduce the amount of time between when the leak occurs and when it is detected and repaired. Timely detection and repair of water leaks will reduce treated-water losses, increasing water use efficiency and optimizing the use of water resources.

With limited seasonal storage, the critical issue facing the GFCSD is meeting domestic water demand and fire suppression needs, especially in the late summer and fall months when stream flows are at their lowest stages. Leak detection and repair will make more efficient use of existing water infrastructure and ensure that water is available to meet existing demands and fire suppression needs (see the GFCSD Leak Detection and Repair Map, below, which illustrates the district's boundaries, line sizes and parcelization).

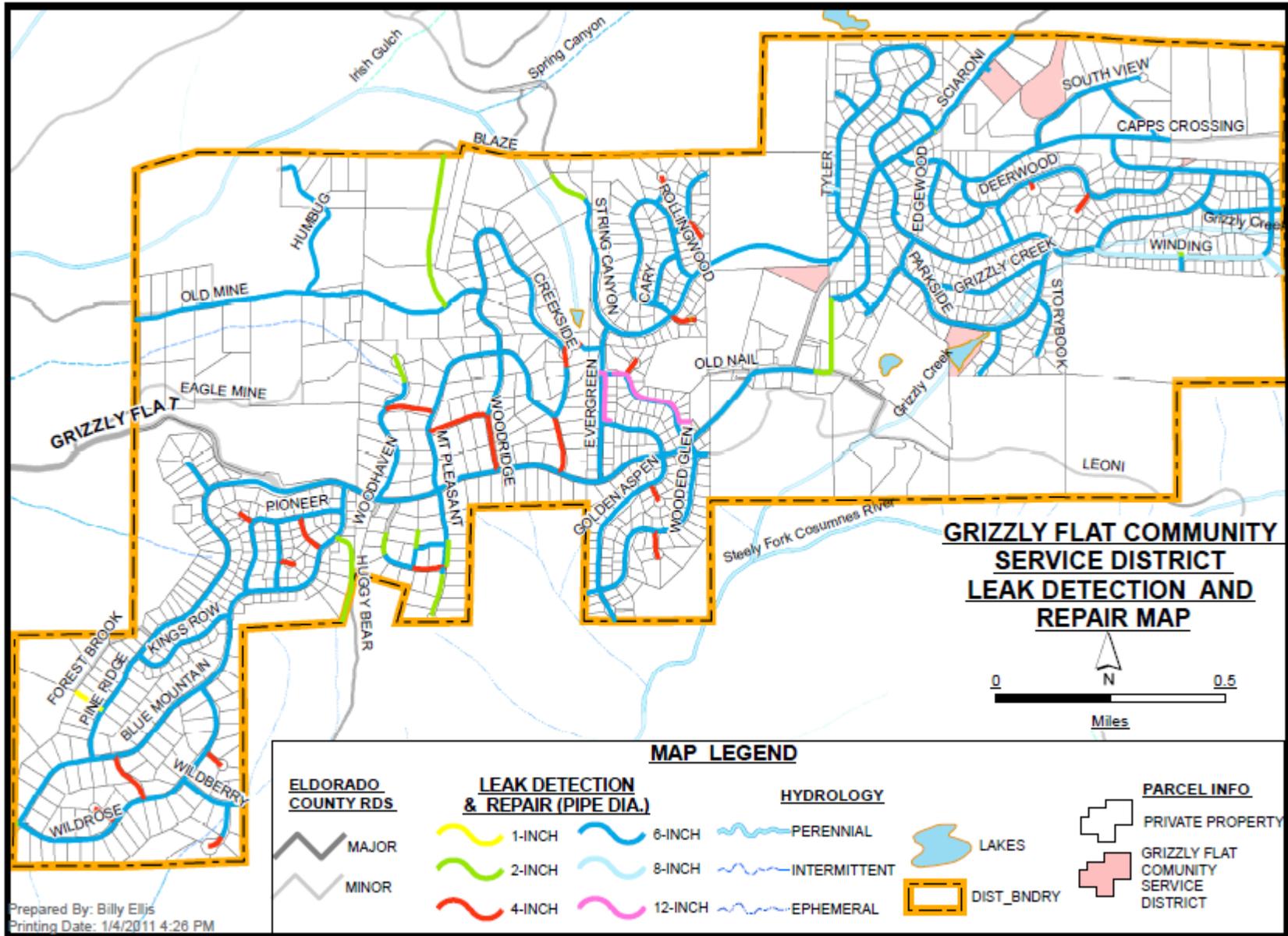
The current GFCSD distribution system has been partially but not entirely mapped using Autocad. An updated and comprehensive electronic database and mapping system is needed in order to develop all types of future planning as well as implementation projects including capital improvement needs assessments and drought preparedness.

Condition of Piping System

The GFCSD water system is over 40 years old and consists of 25,248 feet, or approximately five miles, of one-inch to eight-inch pipeline that delivers water to over 600 residential accounts. The main lines are primarily asbestos cement and the service lines are thin-walled PVC with inadequate pressure ratings (less than Schedule 40). The pipelines were constructed with native backfill, without the benefit of engineered pipe zone material. As a result, point loads are a common cause of the ever increasing trend of waterline leaks and breaks, with three to five service or main line breaks per year. Based on a Las Vegas Valley Water District leak detection summary report, leakage can range from one gallon per minute (gpm) for valve and meter leaks to 30 gpm or more for mainline breaks. Just ten meter/ service line leaks at one gpm equates to 16 acre-feet per year of lost water.

Threat of Drought

Recent drought planning efforts in El Dorado County indicate the susceptibility of the GFCSD water supply to drought with current demand levels. GFCSD is facing an estimated shortfall of 45 acre-feet in the second and third year of a three-year design drought that uses 1976, 1977, and a repeat of 1977 hydrology. More efficient use of current water supplies will reduce the impacts of drought.



Grizzly Flats Leak Detection & Repair

WORK PLAN TASKS

The scope of this project is to improve system efficiency and reliability for the District by reducing water loss due to currently undetected leaks. The proposed project will involve an investigation into leak detection equipment procurement based on the needs of the GFCSD. Staff will be trained how to use and operate the equipment purchased by GFCSD for long-term benefits. An initial leak detection survey will be performed by either the leak detection equipment provider's technical staff or a qualified consultant, while training District staff on the use of the equipment. The survey will identify and locate leaks so that a priority list or "strategy" can be developed to repair the leaks. The high-priority leak repairs will be conducted by private contractors through a bidding process. District crews will make the remaining repairs through their ongoing normal maintenance activities.

After the detected leaks are repaired, annual system surveys will be conducted by District staff, with the grant-purchased equipment, to identify newly developing leaks and reduce the amount of time between when a leak occurs and when it is detected and repaired. With the District's limited operations staff, the surveys and repairs will be done on a five-year rotating schedule. In other words, one fifth of the system will be surveyed and repaired each year. Timely detection and repair of water leaks will reduce treated-water losses, increasing water use efficiency and optimizing the use of water resources.

The GIS component of the project will allow GFCSD to contract with a professional GIS consultant to conduct in-field mapping and data collection of the basic water system infrastructure using Global Positioning Systems (GPS) and ArcPad. The proposed ArcPad software is compatible with the existing Autocad system that display various infrastructure components. ArcPad includes advanced GIS and GPS capabilities for capturing, editing, and displaying geographic information quickly and efficiently and it will develop a comprehensive database by building off and updating the existing Autocad database currently used by Nevada City staff. Using AutoCad, critical data can be checked in and out of a multi-user or personal geodatabase. ArcPad is part of an enterprise GIS solution and integrates directly with ArcGIS Desktop and ArcGIS Server. ArcView is a geographic information system software used for visualizing, managing, creating, and analyzing geographic data. ArcView enhances the ability to understand the geographic context of data, allowing the reader to see relationships and identify patterns in new ways.

Budget Category (a): Direct Project Administration Costs

Task 1: Administration and Management

The objective of this task is to keep the project on time and within budget, keep all participants informed of project progress and status of deliverables, establish and maintain reliable and accurate billing and recordkeeping, ensure that all requirements of the agreement with the DWR are met, and generally ensure smooth project implementation. The tasks for this budget category will comprise all non-construction project administration activities performed by GFCSD and CABY staff throughout the duration of the project and will include: development and completion of contractual paperwork, maintenance and

reporting of expense documentation, oversight of project scheduling and contract/agreement compliance, preparation of monthly invoices, and completion of the final invoice.

Deliverables:

- ◆ Preparation of invoices and other deliverables as required.
- ◆ Accurate and accessible records

Task 2: Labor Compliance Program

GFCSD will enter into a contract with North Valley Labor Compliance Services (Identification #2005.00466) to provide labor compliance consulting services for all Proposal project sponsors and relevant projects. The provided services are itemized in detail in the Introduction to the CABY Program.

Deliverables:

- ◆ Adherence to requirements of Labor Code Compliance Program including, but not limited to: review of certified payroll records, site monitoring, receipt of claims/complaints by workers, investigation of irregularities or claims, post-compliant audits (if necessary), reporting to DWR via the CABY monthly status reports, and any required withholding of contract payments.

Task 3: Reporting

The tasks for this budget category will include all activities necessary to support quarterly reporting, monthly invoicing and associated status reports, quarterly status reporting to the Nevada City Council (as project applicant) and the CABY IRWMP-RWVG, and submittal of the final report. These activities will include: tracking of the specific status of each project task, documentation of task status in an easy-to-understand and track format, creation of quarterly financial reports for the project (including percent complete of project activities), and preparation of all necessary reports (including the final report) per the format stipulated in the DWR Grant Agreement.

Deliverables:

- ◆ Submission of quarterly, annual, and final reports as specified in the Grant Agreement.
- ◆ Submission of quarterly reports to Nevada City and to the CABY-RWVG to enable their tracking of project status.

Budget Category (b): Land Purchase/Easement

Land Easements

No land easements are required for project implementation. With the exception of one section of pipeline connecting two units of the subdivision, all of the District's facilities are within either dedicated waterline easements or road and public utilities easements. If any repairs are required along the section of pipe that does not lie within an easement, District crews will make the repair under their prescriptive easement authority. Survey work along this section of line can be done from areas that are within easements.

Budget Category (c): Planning/Design/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation (Planning)

Grizzly Flats CSD proposes to purchase leak detection equipment and train staff in its use. In this way the District can both proactively and reactively identify leak locations and more efficiently utilize the existing water system infrastructure. The District has determined that developing the capacity to detect leaks will be more cost-efficient than subcontracting an annual leak survey. Furthermore, the capacity to respond immediately to potential leaks will reduce the aggregated cost of leak repair.

The District has conducted preliminary investigations of leak detection equipment and believes that, due to cost and its relatively small system, portable sounding and listening equipment is appropriate. Fluid Conservation Systems has a portable system that includes a Soundsens self-contained correlators, data logger, and Windows-based software that processes data and can play back the audio signals and superimpose the approximated leak location on a map (*see Exhibit 1 for the specifications and capabilities of this system*). The final equipment selection will be determined within this task.

The following tasks outline the steps needed to plan the leak detection program.

Task 4.1: Identify Technical Needs and Requirements

This task will involve a review of the existing water system infrastructure to determine the type of leak detection equipment best suited for the GFCSD.

Task 4.2: Distribute Specifications, Request Proposals, and Negotiate Equipment Purchase Contract

This task will involve an assessment of various manufacturers and negotiation of a contract to purchase leak detection equipment, provide survey services, and train staff.

Task 4.3: Train Staff to Use Equipment

This task will involve District staff receiving classroom and field training as the leak detection contractor surveys the system for leaks.

Task 4.4: Compile Electronic GIS Database of Water System Infrastructure

This task will involve a review of existing data, drawings and maps and consolidating and organizing the existing data as needed. GIS equipment will be purchased that is compatible with existing Autocad files so it can be converted to ArcView and vice-versa, as needed. This task will also collect GPS data of basic water system infrastructure such as distribution lines and water treatment facility using ArcPad software. Data will be manipulated and digitized to create a comprehensive database of the existing infrastructure. The database/maps will be field-verified and updated, as necessary.

Deliverables:

- ◆ Final list of technical needs and requirements for system leak detection.
- ◆ System specs and RFP.
- ◆ Equipment purchase contract.
- ◆ Staff training records and meeting notes.

Select Design Plans for Grizzly Flats Leak Detection and Repair Program

The exact characteristics of each leak are not yet known; therefore, the District will use the El Dorado Irrigation District's "Water, Sewer, and Recycled Water Design and Construction Standards" for use by leak repair persons when repairing designated leaks. This document covers a range potential leak types, and therefore will be useful on the Grizzly Flats system. These drawings and specifications will be used as appropriate to direct repair activities. In addition, the engineers and other experts who compiled this information are included in a collaborative water use efficiency group of which GFCSD is a member (the El Dorado County Drought Interagency Coordination Council, or DICC), so any interpretation help needed will be available to the district.

Deliverables:

- ◆ Completed EID Water Sewer, and Recycled Water Design and Construction Standards document.

Task 5: Environmental Documentation

A Categorical Exemption for the project has been prepared and will be filed immediately upon negotiation of the contract agreement.

Deliverables:

- ◆ Approved and filed CEQA documentation for all projects (Categorical Exemption)

Permitting

No permits are required to detect and repair leaks on the GFCSD system.

Budget Category (d): Construction/Implementation

Task 6: Pre-Construction Contracting for all Projects - Bid Advertisement, Award, Project Management

GFCSD has established procedures and protocols for advertising, opening, and evaluating bids for construction-related services, as well as for awarding and developing contracts with construction companies. These policies and procedures will be used to identify the construction company selected to construct the repairs.

Pre-construction activities include, but are not limited to: developing technical specifications to support publication of the bid materials, a pre-bid meeting to respond to contractor questions (as required), review of submitted materials for completeness and qualifications/experience, and award of the contract in accordance with the applicable Public Contract Codes.

Deliverables:

- ◆ Advertisement for bids.
- ◆ Notes from the pre-bid contractors meeting (if appropriate).

- ◆ Records indicating bid evaluation process.
- ◆ Board meeting notes with contract award records.

Task 7: Mobilization and Site Preparation

The intent of this task is to initiate the implementation of the leak detection and repair program by purchasing the leak detection equipment and completing the training required for staff to use it. GFCSD staff will have already determined the type and quantity of equipment that will be required to implement the project as part of Task 4.

Task 7.1: Equipment Procurement

The equipment procurement will consist purchasing the equipment that was bid in Task 8.

Task 7.2: System Surveyed

The goal of this task is for the leak detection contractor to fully survey the system to identify and pinpoint the location of leaks using portable listening and correlation equipment. The contractor will magnetically attach correlation pods to fittings within the pipeline network. Data gathering begins after a preset interval; units are then downloaded and processed. In more difficult locations, night work may be required. Data can be downloaded to a laptop in the field or an office PC. The software automatically compares and grades results to produce areas of interest and indicates these on a pipe schematic. The manufacturer's software and water main base maps will be installed on the computer. Monitoring sites need to be determined and located with a GPS unit. When possible, and at least four hours within the grant period, GFCSD staff will attend the leak detection sessions in order to learn how to use the equipment.

Deliverables:

- ◆ Leak detection equipment delivered.
- ◆ Data logger software delivered and installed.
- ◆ Spreadsheet of each monitoring site with GIS location, site number, and correlator on site.
- ◆ Data gathering software installed on field laptop.
- ◆ Correlators deployed.
- ◆ All location information entered into software.
- ◆ System analysis report.
- ◆ Timesheet or calendar records of staff spending at least 4 hours with the contracted system surveyor.

Task 8: Implement Leak Detection and Repair Program

After the initial system analysis/survey is conducted, the leak detection contractor can begin collecting data to determine if there are any leaks within the system.

Task 8.1: Download Logger Records onto Leak Detection Software

To do this, the operator will download the data at the correlator site, analyze the data using the software, and then cue the loggers to find the exact location of any identified leaks.

Task 8.2: Prioritize Detected Leaks

Every leak encountered will be reported, and will include location, date of discovery, type of pipe, and estimate of loss volume. The order that detected leaks are repaired is dependent on the severity of the leak and the cost/benefit analysis completed. A better cost/benefit ratio (higher benefits than costs) will indicate a higher repair priority.

Task 8.3: Repair High-Priority Leaks

High-priority leaks will be repaired by a contractor within the grant scope of work and per the EID Water Sewer, and Recycled Water Design and Construction Standards document. Repair information will be submitted as a component of the quarterly reports. The leaks not repaired as “priority” within this evaluation system will be repaired by District crews as part of their normal maintenance activities, and as schedule permits.

Deliverables:

- ◆ Records of system components/locations surveyed.
- ◆ A record of all leaks detected, including location, date located, approximate size of leak, and where it is in the priority for repair.
- ◆ Data detailing the cost/benefit analysis and ratio for each leak.
- ◆ Spreadsheet listing all leaks repaired, including date, cost, and type of repair.
- ◆ Leak repair reports.

Task 9: Demobilization, Program Evaluation and Reporting

An ongoing program of evaluation and reporting will be undertaken to determine the impact the leak detection program. This program will consist of an annual water audit (to assess the performance of the system and the leak detection equipment and software) using the free AWWA software performance indicators of “gallons per day per service connection” and “gallons per day per mile of water main,” evaluation of leak reports to determine the efficacy of the program, and an annual system status report to quantify both leaks repaired and ongoing system maintenance requirements (*see Exhibit 2 at the end of this section for examples of the Leak Detection and Repair reporting forms that will be used by PCWA during project implementation*).

GFCSD will perform annual water audits by utilizing the AWWA Water Audit worksheet. Water audits will be performed prior to project implementation and each year thereafter to assess the performance of each water distribution system. Because the Grizzly Flats system is too small for the AWWA Water Audit to provide an Infrastructure Leakage Index (ILI) value and Unavoidable Annual Real Loss (UARL) calculations, performance indicators are the gallons of loss per service connection per day and gallons of loss per mile of water main per day. The annual audit will be prepared and supplied to CABY for review.

As part of Task 10, reports for each leak repair will be created identifying the location of the leak, estimated leakage rate, pipe material, type of leak (i.e., water main, service lateral, meter connection, etc.), date leak was repaired, estimated water loss, and the labor and materials required to repair the leak. These incidental reports will then be summarized in an Annual Leak Repair Report (ALRR), which will also be provided to CABY for review. The ALRR will serve as an important source for planning future infrastructure projects, analyzing the effectiveness of the project, quantifying the water saved, and as a model for agencies contemplating the suitability of portable data collection equipment.

Deliverables:

- ◆ Annual AWWA water audit report.
- ◆ Percent loss calculation.
- ◆ Annual Leak Repair Report.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Environmental Compliance

This project is anticipated to be categorically exempt, and therefore will not require associated environmental compliance or mitigation measures to be implemented. Because GFCSD cannot know for sure the leaks that will be discovered in the system, if any environmental compliance is found to be necessary for leak repair, it will be completed at that time.

Budget Category (f): Construction Administration

Task 10: Direct Construction Administration

Senior GFCSD staff will serve as construction managers for the process, as they have for similar projects successfully completed by the district. Supervision activities will include: on-site observations and inspections, inspection of materials prior to installation, conducting construction progress meetings as required, review of project status (percent complete versus percent spent), and in-field problem solving during construction in response to unexpected field or system conditions.

Deliverables:

- ◆ Schedule of values, meeting minutes, inspection reports, 11- month warranty inspection report.

Budget Category (g): Other

Task 11: Develop and Maintain CABY Project-specific Webpage

The goal of this task is to ensure that all CABY members and members of the public have access to updated and thorough information about the implementation and characteristics of the project. Every CABY project implemented will be integrated into the CABY website through the creation of a project-specific webpage. Project plans, specifications, progress photographs, reports, status update and other similar materials will be posted or linked to this webpage.

Deliverables:

- ◆ Project webpage hosted on CABY website, updated with all current project information.

Task 12: Data Management

The goal of this task is to ensure that all data gathered and developed as a result of the project is made available to state databases as well as CABY members and the interested public using data management and monitoring deliverables that are consistent with the IRWM Plan Standards and Guidance (as stipulated in the August 2010 IRWM Guidelines, page 20). In this case, the appropriate approach is identified in the CABY Planning Grant submittal which will direct the IRWMP data collection efforts, regardless of whether the planning grant is funded or not.

Internal Deliverables:

- ◆ Development, activation, and maintenance of project-specific webpage within the CABY website as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69-72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57).
- ◆ Pos- project information through the existing CABY SWIM Database (as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69-72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57).
- ◆ Submittal of project-specific data to the CABY Technical Advisory Committee tasked with screening project-specific data for submittal to and inclusion in state databases (as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69-72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57).

Budget Category (h): Construction /Implementation Contingency

A 15 percent standard contingency is included in the budget and it is calculated based on industry norms.

GRIZZLY FLATS COMMUNITY SERVICES DISTRICT
LEAK DETECTION AND REPAIR
Infrastructure Reliability, Conservation, and Efficiency Program

EXHIBITS

1. Data Logger Description and Specifications
2. Correlating Noise Loggers Description and Specifications
3. Annual Leak Detection and Repair Summary Form

LoLog

Data Logger

ENVIRONMENTAL MONITORING
PRESSURE CONTROL
LEAK DETECTION
DATA LOGGING
FLOW MEASUREMENT



KEY BENEFITS

- Low cost.
- 5 year battery life in normal use.
- Reed switch type sensors.
- PD10 with inline battery box.
- Uni and Bi-directional flow.
- Internal or external pressure sensor.
- Local data download, via InfraRed interface into Laptop, PC or PDA.
- Rugged metal loaded plastic case.
- Fully sealed & submersible, IP68.

LoLog is highly flexible yet simple and economical data logger designed to provide information on the performance of water supply networks. Highly portable, it can be applied to virtually any data logging application in minutes.

Once installed, LoLog can operate unattended until you need the data. It is ideal for harsh applications. LoLog is available with a single input channel (flow or pressure) and is completely waterproof, submersible and battery powered. Downloaded data can be analysed using supplied software to show data trends, make comparisons, create reports and keep archives.

Typical Applications

Customer Metering Diagnostics

LoLog can be quickly applied when it is necessary to carry out an urgent investigation. Programmed in minutes, LoLog can be attached to any pulse output meter and will immediately start logging.

Demand Management Assessments

LoLog is widely used to help planners assess demand in residential areas. The logger is small and light and fits easily into boundary boxes.

District Monitoring

LoLog is highly economical and is well suited to connection to distribution networks where telemetry is not desirable or appropriate.



For more information call (513) 831-9335
or visit www.fluidconservation.com

A HALMA COMPANY

LoLog

Data Logger

FLOW MEASUREMENT DATA LOGGING LEAK DETECTION PRESSURE CONTROL ENVIRONMENTAL MONITORING

Sensor Input Options	Digital	Uni- or Bi-directional pulse.
		Reed switch contact closure type or equivalent sensors including Kent LRP & PU10 pulse heads, Aquamag/Magmaster.
		Up to 64 pulses per second.
or Analogue		Internal Pressure Transducer
		0-20 bar / 0-200 metres head / 0-300 psig, repeatability <0.1%.
		4-20mA from isolated sensor.
Logging Features	Memory	Recording 16,000 readings in continuous (cyclic) operation.
	Frequency	Sample Periods
		In 1 second increments from 1 to 60 seconds.
		Then 1 minute increments from 1 to 60 minutes.
		Then 1 hour increments from 1 to 24 hours
	Logger ID	Up to 8 alphanumeric characters.
	Site ID	Up to 127 alphanumeric characters.
Clock	On board 24 hour real time clock with date facility.	
Count and Event Logging Modes.	Count and Event (PIT) logging modes, with bi-directional capability	
Communication	Serial	RS232 by infra-red port for connection to a PDA hnd held computer,
		laptop, or desktop PC 9,600 Baud..
Physical	Dimensions	4.5"H x 2.6"W x 1.2"D (115mm H x 67mm W x 35D mm D)
	Construction	Rugged metal loaded plastic enclosure.
	Weight	0.5 lb (210g).
	Operating Temp	-5 to +160°F (-20 to +70°C)
	Ingress protection	IP68 submersible
	Power	Lithium battery operational for 5 years under normal operating conditions.

FCS reserve the right to change the specification of any product without prior notice.

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SoundSens "i"

Correlating Noise Loggers

FLOW MEASUREMENT DATA LOGGING LEAK DETECTION PRESSURE CONTROL ENVIRONMENTAL MONITORING



KEY BENEFITS

- User can setup loggers and download data without using PC.
- Quick setup for day or night recordings.
- Custom recording setup available.
- Multiple downloads of data can be stored.
- USB communications with PC.
- Infra-Red wireless connection with loggers.
- Simultaneous communications with all loggers for fast recording setup and data download.
- LCD screen with backlight.
- Push button interface.
- Battery LED indicates when battery is running low.
- 5 year battery life for loggers.
- Multiple cases can link together to set up and download.

The new Soundsens "i" system of correlating loggers and the latest software has been designed for high performance, versatility and speed of operations in the field.

Operators can set up and download data without a PC if preferred. The unit can store up to a weeks survey data before downloading to a PC, thereby making field operations more flexible.

Loggers are downloaded via infra-red signal and so there is no requirement for direct physical connection via wires. This makes deployment and downloading much faster.

Boxes of loggers can be connected together to allow simultaneous programming and downloading of data from all loggers. This, combined with a USB connection for easy communication with a PC means that leak detection is quick and efficient.

With a typical five year battery life, LCD screen with backlight and simple push button interface, the Soundsens "i" is ready for action day or night.



For more information call (513) 831-9335
or visit www.fluidconservation.com

A HALMA COMPANY

SoundSens "i"

Correlating Noise Loggers

ENVIRONMENTAL MONITORING
PRESSURE CONTROL
LEAK DETECTION
DATA LOGGING
FLOW MEASUREMENT

Sensor Input		Internal High Performance Accelerometer to pickup audible noise in pipeline
	Attachment of logger/sensor	Powerful magnetic coupling to attach Correlator Pod to pipework / valve
Logging Features	Memory	Recording 650,000 readings. (memory expandable to 1.35 million readings on request) Individual measurements can be pre-programmed into a series of 32 separate recordings
	Sample Rate	User adjustable
	Delayed start	Either start at a nominated time, or after set delay period, e.g; for unmanned night-time correlation
	Logger ID	Factory set Logger ID number Also user can enter another logger Identity number to simplify recognition for operators
	Clock	On board 24 hour real time clock with date facility.
	Software	Compatible with Radcom "SoundSens" analysis software
	Communications	Case to PC
Case to Pods		Simultaneous communication from case to pod via infra red
Case to Case		Via 9 pin RS232
Physical	Dimensions	Individual Advanced Correlator Pod now with reduced dimensions: 6.3" H x 2.6" D (160mm H incl Magnet x 67mm D)
	Construction	CPod: Die-cast aluminium enclosure, powdercoat spray painted Carry Case: Rugged construction with Aluminium Cladding
	Weight	Individual Correlator Pod: 1.54 lb (0.7 kg)
	Carry Case	Supplied in 2 - 4 pod case or 6 - 8 pod case (Any number of cases can be connected together)
	Operating temp	14 to +122°F (-10 to +50°C)
	Water protection	Individual Correlator Pods: IP68 submersible
	Power	Correlator pod has Lithium-ion cell operational for 5 years under normal operating conditions. Carry Case interface unit contains NiCad battery which typically requires charging monthly or less. 240 /110v switch mode charger supplied in kit with mains lead.
<p>FCS reserve the right to change the specification of any product without prior notice.</p>		

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Grizzly Flats

Integrated Water Shortage Contingency, Drought Preparedness, and Comprehensive Water Conservation Planning Program

As discussed in the introduction and sponsor description, Grizzly Flats is a small community in Nevada County with aging infrastructure delivering water from a single small stream. This supply infrastructure, in many cases, is functionally obsolete.

Integrated Water Shortage Contingency and Conservation Planning

Residents of the Sierra Nevada generally depend on surface water from the watersheds of the mountain range for their water supply. Typically, precipitation in the form of snow is the primary source of water, as the Sierra snowpack serves as natural storage for most of the region's annual precipitation. The Sierra watersheds experience wide variations in annual precipitation and therefore in annual water supply. The region has experienced significant droughts in the past and climate change predictions indicate a potential for wide variability in the future. Population growth in the region will serve to amplify the severity of drought impacts. Without careful planning, small, rural, and disadvantaged water purveyors will be unable to respond to future precipitation variability.



Strategic use of conservation can help extend the value and life of infrastructure assets used in water supply (and wastewater treatment), while also extending the beneficial investment of public and ratepayer funds. Small and disadvantaged water systems can benefit from efficiency and conservation as well as larger systems. In fact, the potential for eliminating, downsizing, or postponing capital improvement projects through strategic supply and demand management may be more important for smaller systems given their unique financial and capacity constraints. At the same time, small systems' ability to devote resources to conservation and efficiency planning may be limited. The demand management component of this project is essential for allowing Grizzly Flats Community Services District the flexibility necessary to deal with realities of climate change and water supply constraints.

The Integrated Water Shortage Contingency and Conservation Plan components, in the case of Grizzly Flats CS, include: 1) integrating the already in-place Grizzly Flats CSD Drought Action Plan with capital improvement planning, and 2) enhancing customer conservation options and behavior. It is the goal of the project management team that the planning activities will be nested, and seek to provide the District with the capacity to use adaptive management

strategies for future water year scenarios. That is, the Customer Water Use Efficiency Implementation Plan, wherein customers work with water agency staff and the project management team to identify best practices to emphasize in the community into the future, will feed priorities into the evolving Drought Action Plan. The Grizzly Flats CSD Drought Action Plan, wherein District priorities for managing water scarcity from climate- or infrastructure-induced shortages are identified and described, will feed into the Capital Improvement Plan (CIP). The CIP is the document that will examine the multi-year, higher-cost projects for water supply management.

The integrated nature of these plans emphasize conservation, customer involvement, reducing vulnerability to climate change, and providing clear and prioritized steps to mitigate the impacts of drought. Successful conservation efforts can also curb peak system demand, deferring the need for construction of new treatment, storage, and conveyance facilities, as well as reducing energy costs and usage and wastewater infrastructure demands, allowing districts to focus on replacement or rehabilitation of older existing infrastructure.

The updated system-wide GIS mapping (described as a component of the Leak Detection workplan) is a necessary precursor to integrating this effort with the Capital Improvement Plan (see below).

Customer Water Use Efficiency Initiative

Although not an Urban Water Agency, Grizzly Flats CSD has determined that meeting the 20% \times 2020 goals, as well as those articulated in AB 1420 (demand management measures corresponding with the Best Management Practices (BMPs) in the CUWCC) is a desirable and appropriate goal for the District, within its fiscal constraints. To achieve this goal, the District has determined that the preparation of a Water Use Efficiency Plan is a critical activity. The Customer Water Use Efficiency Initiative (Initiative) will include public outreach, education and workshop activities, distribution of retrofit kits, and preparation of an action plan to guide implementation of ongoing conservation activities.

Public Outreach

The Capital Improvement Plans (above) will focus on creating a nexus between conservation, drought response, and infrastructure planning. The Conservation Plans will focus on demand management by reducing water consumption through education and outreach in the local communities. The California Urban Water Conservation Council (CUWCC) foundational Best Management Practices, while designed for implementation by urban water providers, provide reasonable targets for smaller jurisdictions based on their individual context and resources. The goal of this program would be to reduce water consumption on a per capita basis through the provision of information shared with the public to encourage the conservation of the shared resource as a habit, as well as in response to identified drought stages (as defined in the drought action plan above). Effective conservation outreach efforts focus on bridging the gap between thought and action to induce adoption of new behaviors. The American Water Works Association has produced an excellent *Water Conservation Communications Guide* to help water agencies in communicating the conservation message with customers. It is available online:

(<http://www.awwa.org/Resources/Waterwiser.cfm?ItemNumber=55474&navItemNumber=55644>), along with print resources for mailing information, news article writing, and examples of other successful programs around the nation (AWWA, 2010). See Exhibit 1 for examples of the materials available to Grizzly Flats.

This task will include, at a minimum, the dispersal of print materials in customer bills, available at grocery stores and other high-traffic community gathering places, and the production and dispersal of at least two news releases on the Grizzly Flats CSD water conservation effort.

Education and Workshop Activities

Several workshops will be provided to the customers of Grizzly Flats CSD. These workshops will include topics such as irrigation efficiency, options for water conservation in the home, and the proper maintenance and installation of distributed plumbing fixtures. Options such as turf removal, car and driveway washing disincentives, use of smart irrigation controllers, and general options for conservation will all be considered as part of the local outreach. The AWWA has developed an extensive set of materials in support of conservation. These materials, in the *Water Conservation Communication Guide* (AWWA, 2010), will be used in support of a concerted outreach campaign.

NID has delivered irrigation efficiency workshops throughout their service area since 2008. These materials will be refined to respond to the needs of the CSD service area and customers. The goal of this consumer outreach is to measurably reduce summer irrigation water use and year-round residential water consumption through a series of at least three irrigation and indoor water use efficiency workshops, as well as the offering of lectures, customer-focused Board meetings, and the involvement of customers in planning water use efficiency activities.

Distribution of Retrofit Kits and Toilet Rebates

Within the Grizzly Flats CSD service area, upgrades to original plumbing fixtures usually occur only upon actual failure as opposed to ongoing fixture malfunction (e.g., drips and leaks). There are current State and national standards for plumbing fixtures that result in increased water savings when compared to older fixtures, even when applied/installed in older homes. Water agencies throughout the state often have the dispersal of “retrofit kits” as a component of their water conservation education/outreach efforts. This is even a component of the CUWCC’s Best Management Practices (for more information, see the CUWCC website, programmatic BMP 3 [residential]: <http://www.cuwcc.org/mou/bmp3-residential.aspx>). Grizzly Flats has not done this type of outreach, and therefore has a large capacity for indoor residential water conservation. The table below shows what items will be included in a retrofit kit, and what savings are associated with those items.

Table 1.

Conservation Measure	Savings Effect (gallons per day per household)
Low-flow showerheads	5.8
Information regarding how to displace toilet reservoir water	4.2
Faucet aerators (2-3)	1.5
Toilet leak detection tablets	7.8

* Information taken from Chesnutt, T.W. et al, 1996

A side benefit of these water conservation fixtures is that their installation and use also results in corresponding energy savings from decreased water treatment, conveyance, and heating (Osann and Young, 1998).

The management team for this project will work with Grizzly Flats CSD to develop the specific methods for kit and information distribution. Best methods will be identified in collaboration with the community through the Public Outreach Program.

Toilet rebates have never been offered in the Grizzly Flats area. Accordingly, the potential for water conservation from this effort is broad. Most of the homes served by the Grizzly Flats CSD were built prior to 1992, and so water-conserving fixtures were not installed during the construction process. This proposal includes a request for 50 toilet rebates of \$175 apiece. According to the California Urban Water Conservation Council, this size of program will save approximately 1000 gallons per day within the GFCSD service area¹.

Water Use Efficiency Implementation Plan

The goal of this plan is to provide demand-based strategies, methods, and options and District policies and practices for ongoing and durable conservation. The project team will be working with the Board of Directors and the customer base to identify the desired water conservation strategies most appropriate for the District to implement over time.

¹ CUWCC. 2000. BMP Costs and Savings Study. Sacramento, CA. July 2000.

The successes of the activities described above (i.e., public outreach, workshops and education efforts, and the distribution of retrofit kits), will be tracked as they are implemented. The observed and quantified outcomes of these efforts will be integrated with water conservation methods and strategies selected by the Board and customer base in Grizzly Flats for inclusion in the Water Use Efficiency Implementation Plan. The product of this work effort will be a concise, readily implementable description of appropriate policies and implementation actions. The implementation actions will be provided in a format that supports easy, low-cost, and reliable implementation.



	Drought Action Plan	Capital Improvement Plan	Customer Conservation	Organizational Audit	Comment
Nevada City	X	X	X		Nevada City currently has no formal drought response policies or plan. Existing CIP addresses ongoing infrastructure improvement, but does not consider drought preparedness. No formal customer conservation, education, or fixture program currently exists.
WCWD	X	X	X	X	No drought action planning has been undertaken. The District does not currently have a CIP. No formal customer conservation, education, or fixture program currently exists. Evaluation of the sustainability and long-term viability of the District to provide adequate service to Washington residents is required. Evaluation will include possible rate structures, revised financial management policies, assessment of operational status of system infrastructure, evaluation of administrative and management systems, etc.
Grizzly Flats		X	X		The Grizzly Flats Drought Action Plan will serve as a model for Nevada City and WCWD. No additional planning is required. Existing CIP addresses ongoing infrastructure improvement, but does not consider drought preparedness. No formal customer conservation, education, or fixture program currently exists.
Alta and Colfax			X		PCWA has included Alta and Colfax in their long-term drought preparedness planning, so no additional planning is required. Likewise, PCWA has integrated CIP and drought response planning. However, no formal customer conservation and education programs currently exist.

Grizzly Flats

Integrated Drought and Conservation Planning Project

Budget Category (a): Direct Project Administration Costs

Task 1: Administration and Management

The goal of this task is to keep the project on-time and on-budget, keep all staff members and project participants informed of the billing procedure and timeline, and generally ensure smooth project implementation. Administrative tasks will include monthly billings to DWR, gathering appropriate documentation and support materials as required by DWR invoicing procedures, monitoring percent spent versus percent complete for each project task, and ensuring compliance with other requirements identified in the grant agreement.

Deliverables:

- ◆ Preparation of invoices and other deliverables, as required.

Task 2: Labor Compliance Program

Because there is no construction activity associated with this project, there is no requirement for a Labor Compliance Program.

Task 3: Reporting

In order to track the project's implementation and achievement of performance measures, reports will be prepared to provide DWR with details regarding the project's progress. The content and schedule for these reports will be identified and agreed upon with DWR through the grant agreement. The information compiled as part of the monthly invoice process will be consolidated and augmented as necessary during preparation of the quarterly reports. The final report for this project will be prepared based on the administrative record and the deliverables identified below. The final report will also include any components identified in the grant agreement.

Deliverables:

- ◆ Quarterly and final reports.

Budget Category (b): Land Purchase/Easement

This category is not applicable to this project.

Budget Category (c): Planning/Design/Engineering/Environmental Documentation

Because of the nature of this project, tasks implementing this project are listed under Budget Category (g): Other Costs, to maintain the programmatic integrity of budget and timeline.

Environmental Documentation

No environmental documentation is required for this project.

Permitting

No permits are required to implement this project.

Budget Category (d): Construction/Implementation

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

This category is not applicable to this project.

Budget Category (f): Construction Administration

Because the project will not result in construction activities, there is no need for construction administration.

Budget Category (g): Other Costs

A key component of the CABY strategy in outreach to rural and disadvantaged communities has been the provision of technical assistance and capacity building to each project sponsor. The goal of this assistance is to ensure that each of the project sponsors has a developed capacity to plan for chronic water shortages; to integrate water shortage contingency priorities into their long-term infrastructure planning; to provide customer-based conservation, and outreach and education, all resulting in measurable conservation outcomes. The tasks have intentionally been developed to progressively identify and refine an integrated, long-term water conservation and water shortage contingency planning capacity.

Task 4: Integrated Customer Water Use Efficiency Initiative

Though Grizzly Flats CSD is not an Urban Water Agency, the Board of Directors has determined that meeting the 20%x2020 goals, as well as those articulated in AB 1420 (demand management measures corresponding with the Best Management Practices (BMPs) in the CUWCC) is a desirable and appropriate goal for the District, within its fiscal constraints. To achieve this goal, the District has determined that the preparation of a Water Use Efficiency Plan is a critical activity. The Customer Water Use Efficiency Initiative (Initiative) will include public outreach, education and workshop activities, distribution of retrofit kits, and preparation of an action plan to guide implementation of ongoing conservation activities.

Task 4.1: Public Outreach

The goal of this task is to create a meaningful avenue of communication between Grizzly Flats water customers, the City Council, and project management team. This task will include the handout of printed educational materials, as well as providing a venue to receive public comments and questions. Because the Grizzly Flats community is so small, it is possible to conduct “town hall” style meeting events in key locations throughout the city. The focus of these meetings will be to provide a conceptual understanding of the various project components, to gather opinions and insights from City customers, to form an advisory committee to assist in completing the various plans and recommendations, and to provide a venue for big-picture water conservation and system operation strategies.

Deliverables:

- ◆ Handouts and printed materials.
- ◆ Two community “town hall” style meetings.
- ◆ Memoranda summarizing public questions and input.

Task 4.2: Education and Workshop Activities

This task is aimed at developing the customer conservation program components including the educational workshops and the water conserving fixture program. The goal of this task will be to deliver a series of workshops addressing irrigation efficiency and opportunities for residential water conservation.

Deliverables:

- ◆ Workshop agendas, materials, scheduling, logistics, and advertising materials.
- ◆ Post-workshop surveys.
- ◆ Two water conservation workshops.

Task 4.3: Distribution of Retrofit Kits and Toilet Rebates

The goal of this task is to distribute retrofit kits, which will include: low-flow showerheads, toilet leak tablets, two or three faucet aerators, and information on how to displace toilet reservoir water. Toilet rebates are also a component of this task. The management team for this project will work with Grizzly Flats to develop the specific methods for kit and toilet rebate distribution. Best methods will be identified in collaboration with the community through the Public Outreach Program, and implemented accordingly.

Deliverables:

- ◆ 150 plumbing fixture retrofit kits purchased and distributed (one for each residence plus extra for larger homes).
- ◆ 50 ultra low flow toilets purchased by GFCSD customers, installed, and rebated by GFCSD staff.

Task 4.4: Comprehensive Drought and Conservation Action Plan

The goal of this plan is to provide demand-based strategies, methods, and options and District policies and practices for ongoing and durable conservation. The project team will be working with the Board of Directors and the customer base to identify the desired water conservation strategies most appropriate for the District to implement over time.

Deliverables:

- ◆ Draft Water Use Efficiency Implementation Plan.
- ◆ Town hall meeting to discuss the Plan with notes summarizing meeting outcome.
- ◆ Final Water Use Efficiency Implementation Plan, including a specific process for implementing the Water Use Efficiency Implementation Plan.

Task 5: Develop and Maintain CABY Project-specific Webpage

The goal of this task is to ensure that all CABY members and members of the public have access to updated and thorough information about the implementation and characteristics of the project. Every CABY project implemented will be integrated into the CABY website through the creation of a project-specific webpage. Project plans, specifications, progress photographs, reports, status update and other similar materials will be posted or linked to this webpage. The webpages will be designed and brought online (activated within the first month after contract agreement). The page will be updated monthly.

Deliverables:

- ◆ Project webpage hosted on CABY website, updated with all current project information.

Task 6: Data Management

The goal of this task is to ensure that all data gathered and developed as a result of the project is made available to state data bases as well as CABY members and the interested public using Data Management and Monitoring Deliverables that are consistent with the IRWM Plan Standards and Guidance (as stipulated in the August 2010 IRWM Guidelines, page 20). IN this case the appropriate approach is identified in the CABY Planning Grant submittal which will direct the IRWMP data collection efforts, regardless of whether the planning grant is funded or not. Data will be made available to all CABY members and the general public through the existing CABY SWIM Database. Material will be uploaded as it becomes available, however most of the data will be posted upon completion of the primary project activities. The CABY technical committee will evaluate project-related data to determine its appropriateness for upload to relevant state databases.

Deliverables:

- ◆ Development, activation and maintenance of project-specific web page within the CABY website (as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69 – 72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57)
- ◆ Post project information through the existing CABY SWIM Database (as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69 - 72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57)
- ◆ Submittal of project-specific data to the CABY Technical Advisory Committee tasked with screening project-specific data for submittal to and inclusion in state databases (as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69 - 72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56 - 57)

Budget Category (h): Construction /Implementation Contingency

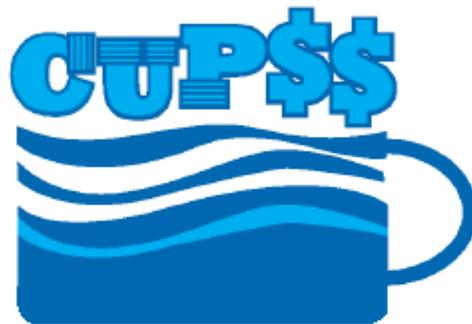
This budget category is not necessary for this project.

Grizzly Flats
Integrated Water Shortage Contingency, Drought Preparedness, and
Comprehensive Water Conservation Planning Program

EXHIBITS

1. Examples of AWWA and EPA resources available to Grizzly Flats

User's Guide



Check Up Program for Small Systems

Release 1.3.5

February 2010



EPA 816-R-010-003
February 2010
Office of Water (4606M)
epa.gov/safewater



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TECHNOLOGY & PRACTICE

Free AWWA software makes water audits quick and easy

The [AWWA Water Loss Control Committee's Water Audit Software v.4.0](#) is now [available for free download](#), boasting some big new features.

Although the software is not intended to provide a full and detailed water audit, it allows utilities to quickly compile a preliminary audit in the standardized and transparent manner advocated by AWWA, its creators say.

The software includes ten worksheets in Microsoft Excel spreadsheet file. Most of the data is entered on the second worksheet, which prompts the user to enter standard water supply information such as supplied water volume, customer consumption, distribution system attributes and loss quantities. Because many utilities don't typically tabulate all this data, the software allows the user to enter either known or estimated values, then calculates a variety of performance indicators useful for comparisons among utilities.

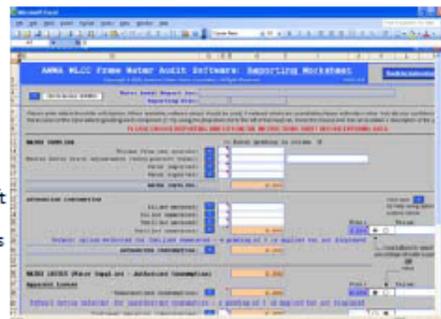
The biggest new feature of Version 4.0 is its "data grading" capability, which provides a basic validation of results. The user can assign a grading value, ranging from 1 to 10, to each piece of information he or she inputs. A 10 represents highly reliable, well validated data, while a grade of 1 reflects very crude data, such as rough estimates. Once all the grading cells have been filled in, a composite grading score is calculated and displayed at the bottom of the worksheet. The grading is based upon a scale of 100, and this score can be used as a basic validation for the audit.

The auditor can determine the status of the utility's data quality by reviewing the Loss Control Planning Worksheet, which provides planning guidance to the water utility. Utilities with a lower composite grading can focus program efforts on data collection and validation until their overall data quality becomes more reliable.

An additional new function is a priority listing of the most important three variables to target to improve the validity of the water audit data.

The AWWA Water Loss Control Committee's [Free Water Audit Software Version 4.0](#) is available for download from AWWA's new Water Loss Control Web pages on AWWA's [WaterWiser](#) site.

Posted: 05/12/2009



Version 4.0 of AWWA's free Water Audit Software allows utilities to see which of their data collection efforts need improvement.

M36, Third Edition (2009)

Unlock the Secrets of Water Loss Control with AWWA's M36 Water Audits and Loss Control Programs, Third Edition

AWWA is proud to release the much anticipated Third Edition of its popular M36 guidance manual on conducting water audits and implementing proactive water loss control programs.

Water Loss Control Links

[WLC Basics](#)
[WLC Terms Defined](#)
[Apparent & Real Losses](#)
[Water Audit Method](#)
[Free Water Audit Software](#)

What does M36, Third Edition provide?

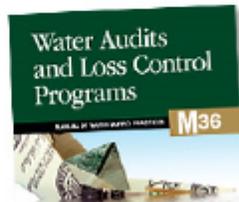
- Clear steps to compile the water audit according to the [new standard method](#) co-developed by the International Water Association (IWA) and the American Water Works Association (AWWA)
- [Rational terms, definitions](#) and performance indicators that give water utilities objective ways to assess their water loss standing and reliably plan loss control activities
- Worksheets, sample calculations and references to [AWWA's Free Water Audit Software](#)
- Techniques to capture more revenue by controlling [apparent losses](#) in customer metering and billing operations, as well as unauthorized consumption
- Innovative technologies to move from reactive, "break and fix" leakage response to proactive leakage management featuring component analysis, pressure management, leak noise logging and other advanced technologies: successful approaches to minimize unnecessary source water withdrawals and excessive water production costs
- Structured guidance on planning the loss control program
- Considerations for small water utilities
- Case study accounts from small, medium and large water utilities

Why do water utilities need M36, Third Edition?

- High quality source water supplies are dwindling while populations are expanding and shifting
- Every day in the United States over six billion

gallons of water withdrawn from rivers, lakes and wells never reaches a billed customer!

- Over 250,000 water main ruptures occur in the United States every year
- Worldwide the value of lost water and revenue is \$15 billion annually
- Water utilities continually need to find ways to supply safe, efficient water and manage costs
- The Third Edition of the M36 is the first publication in North America to provide detailed and comprehensive instructions on the IWA/AWWA Water Audit Method
- Regulatory agencies have begun to focus on water utility efficiency in addition to water conservation by consumers
- Customers deserve value for their money; high losses compromise service and indirectly inflate water rates



[Order your copy from the AWWA Bookstore](#)

Who wrote M36, Third Edition?

- AWWA's [Water Loss Control Committee](#) is responsible to maintain the M36 publication and rewrote the Third Edition
- The Committee has many active members who are involved in water auditing, leakage management and revenue protection programs for water utilities across the world



Alta / Colfax

**COMMUNITIES OF ALTA AND COLFAX
LEAK DETECTION AND REPAIR
Infrastructure Reliability, Conservation, and Efficiency Program**



OVERVIEW

The small foothill communities of Alta and Colfax are located roughly 29 and 16 miles northeast of Auburn, respectively. These small communities receive water deliveries from Placer County Water Agency (PCWA). Accordingly, PCWA has invested in improvements to these systems, including performing soil identification studies (service areas overlaid on a soil map and types of soils surrounding canals noted), traditional leak detection surveys, and system monitoring. Now PCWA, with the communities of Alta and Colfax, proposes to install a network of correlating leak detection data loggers in these two communities to reduce water losses in the treated-water distribution systems.

These information gathering efforts have shown that the communities are located on cobbly loam soils, which readily absorb water from leaking treated-water lines typically without any above-ground indications. PCWA's metering system allows the agency to observe when water usage trends change; but these changes often do not become evident for several months, and some may have been present for years. In 2007, PCWA analyzed the District's water losses utilizing the American Water Works Association's (AWWA) water audit worksheet and discovered approximate annual treated-water losses of 38.3 percent in Alta and 28.1 percent in Colfax (55.2 and 170.6 acre-feet, respectively). In addition, previous grant projects have resulted in research and bidding regarding the type of data loggers, and the number of data loggers has been calculated. Grant funds are needed now because the cost of the equipment versus the economic cost of the water make the project prohibitive for the agency to implement on its own. Though a substantial amount of water will be saved by the timely detection and repair of leaks, the cost of the lost water compared to the cost of the equipment is prohibitive. Once a

leak (as evidenced by a change in water usage) is observed, it takes significant labor, survey, and construction costs for PCWA to identify the actual location of the leak.

The proposed project will allow PCWA to identify previously undetected leaks with increased accuracy and decreased labor and materials costs. Rather than having to perform a time- and labor-intensive traditional leak survey with a ground microphone and correlators, the proposed system will allow PCWA operators to remotely identify leaks with great accuracy (typically to within one foot of the leak). Once the network of correlating leak detection data loggers are installed, the loggers detect noises in the system on a nightly basis, log the information, and notify operators if leaks are “heard.” The estimated annual treated-water savings associated with this project is 80 acre-feet per year.

Base maps have already been constructed for this project. However, during the course of this project, GIS maps with the logger locations will be overlaid onto the existing base map. The project will also identify the exact locations for the loggers, prepare the monitoring locations, deploy the loggers, install the software on a laptop to coordinate/correlate the loggers’ data, and conduct ongoing monitoring of the network to identify leaks within a maximum time of two weeks.

The implementation of this project will have two primary outcomes: 1) reducing water loss and 2) increased system data. The project will reduce water loss because the loggers will provide PCWA with an increased ability to detect (and then repair) leaks within Alta and Colfax within a short time of occurrence. The project will increase data because the loggers will provide additional information on the Alta and Colfax water systems and the specific types of leaks occurring. While leak detection and analysis have been completed in the Sierra previously (within the El Dorado Irrigation District service area), it is seldom, if ever, completed on small urban systems (less than 3,000 acre-feet delivered or less than 3,000 connections). From this project, the suitability of the data loggers as a leak detection program on small urban water systems in the Sierra will be assessed and possibly implemented within other service areas with similar challenges of history, topography, and geology.



Map of Project Locations



WORK PLAN TASKS

Budget Category (a): Direct Project Administration Costs

Task 1: Administration and Management

The goal of this task is to keep the project on-time and on-budget, keep all staff members and project participants informed of the billing procedure and timeline, and generally ensure smooth project implementation. The tasks for this budget category will include all non-construction project administration activities performed by PCWA and CABY staff throughout the duration of the project and will include: development and completion of contractual paperwork, maintenance of expense documentation, oversight of project scheduling/budget and contract/agreement compliance, and final invoice.

Deliverables:

- ◆ Final contract and any contract changes as agreed to with DWR
- ◆ Prepared invoices with supporting documentation
- ◆ Up-to-date project schedule
- ◆ Current tracking of expenses and project status.

Task 2: Labor Compliance Program

PCWA currently complies with California Labor Code statutes and regulations in all of its operations. As this project will be implemented under PCWA's operational structure, California Labor Codes will be followed. The applicability of prevailing wage law has been reviewed and is reflected in the project budget.

Deliverables:

- ◆ Submittal of Labor Compliance Program

Task 3: Reporting

This task includes all activities necessary to support quarterly reporting, monthly invoicing and associated status reports, quarterly status reporting to the CABY IRWMP-RWMG, and submittal of final report. These activities will include: tracking of the specific status of each project task, documentation of task status in an easy-to-understand and track format, and creation of quarterly financial reports for the project (including percent complete of project activities). The final content and schedule for these reports will be identified and agreed upon with DWR through the grant agreement.

Deliverables:

- ◆ Submission of quarterly reports to the PCWA General Manager and to the CABY-RWMG to enable their tracking of project status and reporting to DWR per the final grant agreement.

Budget Category (b): Land Purchase/Easement

Task 4: Water Line Easement Confirmation

In order to implement the project, it will be necessary to conduct an easement determination. As described further in Task 5, 50 monitoring stations and 117 loggers will be installed. The installation locations will be identified as part of the design process (see Task 5). Once the locations have been identified, a right-of-way specialist will then conduct an easement determination to clarify whether an existing easement can be used, new easements are required, or expansions of existing easements are necessary.

Deliverables:

- ◆ Easement determination.
- ◆ Easement acquisition (if required).

Budget Category (c): Planning/Design/Engineering/Environmental Documentation

Task 5: Finalize Design of Leak Detection and Repair Program

The goal of this task is to finalize the design of the leak detection and repair program and prepare for the construction of monitoring stations and the deployment of the data loggers. In pursuit of this goal, GIS maps of the water system infrastructure will be finalized and an installation plan for the data loggers and monitoring locations will be completed.

Many of the planning efforts associated with this project have already been completed by PCWA. For example, the required equipment and type of loggers (Gutermann Zonescan 800) have already been identified. These data loggers have been chosen by competitive bid process because the equipment serves two purposes: data logging and correlation (Gutermann loggers are also correlators, which means that they can be programmed and downloaded without removing them from their monitoring locations).

Previous surveys of the Alta and Colfax water systems measured the lengths of water mains and created a base map. In addition, recent engineering work by PCWA staff identified the total length of mains in both Alta and Colfax (20,888 feet and 12,393 feet, respectively) and the number of loggers needed: 117 total: 55 in Alta and 62 in Colfax.

Task 5.1: Finalize and Confirm Maps of the Water System Infrastructure

While base maps of the Alta and Colfax systems exist, the system components must be physically confirmed. This will ensure that the project is implemented as effectively as possible with the minimum amount of ground disturbance. Once the base maps are confirmed and/or updated as necessary, they will be used for the installation of the loggers and monitoring stations, as well as the repair of detected leaks. For this reason, it is imperative that they are accurate. For example, if a water main runs along a long stretch of sparsely developed land, or the distances between established listening points (valves) exceed manufacturer recommendations, the alignment of the water main will need to be determined and a monitoring location constructed. These base maps will be augmented with a GIS layer identifying the installation locations of the loggers and monitoring stations.

Deliverables:

- ◆ Confirm and mark water line locations for inclusion in GIS database and maps.
- ◆ Final GIS infrastructure system map.

Task 5.2: Finalize Installation Plan for Data Loggers and Monitoring Stations

This task involves identifying, confirming, and mapping the locations for the loggers and monitoring stations, finalizing the equipment list, and determining the appropriate leak repair specifications (*see Exhibit 1 at the end of this section for a description of the standards and specifications for the Zonescan LNC Correlating Radio Loggers and a description of the equipment choice rationale*).

While preliminary locations for the loggers and monitoring sites have been identified using manufacturing specifications, these locations need to be finalized. The base maps completed in Task 5.1, as well as manufacturing specifications, will be used for this effort. It is estimated that a total of 50 monitoring sites will be installed: 25 in Alta and 25 in Colfax. The other 67 loggers will be installed as additional data/reference points along the water mains throughout the two communities, per manufacturer instructions and recommendations.

The PCWA staff project engineer will review the proposed locations for all of the loggers and monitoring stations. The engineer's review will focus on ensuring that the designs meet the specifications proposed by the manufacturer (Gutermann International), take into account system elements (e.g., main material, location of valves, etc.), and are feasible (i.e., address environmental concerns, easement issues, and construction access).

Once the logger and monitoring station installation locations have been confirmed, the equipment list will be finalized.

Deliverables:

- ◆ Map of logger and monitoring station locations.
- ◆ Engineer confirmation of logger and monitoring station locations.
- ◆ Final equipment list.
- ◆ List of appropriate leak repair specifications.

Task 6: Environmental Documentation

The project plan has been reviewed by PCWA's environmental specialist and a Categorical Exemption has been filed. It was adopted by the PCWA Board of Directors and a Notice of Determination is attached (*see Exhibit 2 at the end of this section for copies of the environmental documentation*). Any other documentation necessary for the repair of discovered leaks will be completed as necessary.

Deliverables:

- ◆ CEQA Categorical Exemption document as filed.
- ◆ Additional environmental documentation as required.

Task 7: Permitting

No permits are required to implement this project in the communities of Alta and Colfax.

Budget Category (d): Construction/Implementation

Task 8: Equipment Procurement, Installation, and Testing

The intent of this task is to initiate the implementation of the leak detection and repair program by purchasing, installing, and testing the equipment.

PCWA staff has already determined the type and quantity of equipment that will be required to implement the project. This determination was based on previous experience with various types of leak detection equipment, including the specific correlators that will be used for this project. After assessing the needs of the system and compatibility with in-place infrastructure, PCWA identified the Gutermann International company as providing the most effective and efficient equipment at the most competitive price (other manufacturers' equipment will detect a leak, but must use separate equipment to correlate the location).

Task 8.1: Equipment Procurement

The equipment procurement will consist of going out to bid for the loggers and related equipment, purchasing the Gutermann Zonescan 800 startup kit, which comes with 40 loggers and the software to map, receive, and analyze data from the loggers; 77 additional Zonescan loggers¹; a Toughbook laptop for the field, to receive the data from the loggers and run the software; and a pipeline locator to locate the water mains and deploy the loggers.

Deliverables:

- ◆ Leak detection equipment purchased and delivered.
- ◆ Field laptop purchased and delivered.
- ◆ Data logger software purchased and delivered.
- ◆ Pipeline locator purchased and delivered.

Task 8.2: System Installation and Testing

The goal of this task is to fully install the leak detection equipment and analyze it to ensure it is working properly. PCWA intends to install 50 monitoring stations: 25 in Alta and 25 in Colfax. The project manager determined that the most efficient implementation of this project would be to monitor only metal water mains. Generally, if an AC or PVC water main leaks, it is a large leak from the start, where metal water mains tend to develop small leaks that run for long periods of time before they are detected.

The monitoring stations will consist of an eight-inch PVC riser tube, valve box, and lid, which will be constructed before the deployment of the loggers. The valves and installed monitoring stations will be marked or otherwise identified in a manner that will inform PCWA personnel

¹ The total number of loggers purchased will be 117, per calculations completed as part of Task 5. However, due mainly to time constraints, installation of 25 of these in Alta and 25 in Colfax will represent the implementation of this project as a first (study) component of the activity.

that this is a monitoring location and to exercise caution when removing the loggers to prevent damage to the logger. The stations will be placed at specific locations along the water main, as specified by Gutermann and confirmed in the engineer's design. Each monitoring site will be given a number corresponding with the system it is on and its place within the system. This will enable the project engineer to better communicate with other project partners, including those non-technical partners and other stakeholders.

Once the monitoring stations are installed, the Zonescan system must be set up. This involves deploying the loggers, installing the software, and performing follow-up fieldwork for both Alta and Colfax.

Prior to the deployment of the loggers, the manufacturers' software and water-main base maps will be installed on the laptop computer per manufacturer instructions and PCWA computer policy. This will be done in accordance with manufacturer's instructions.

Before the loggers are installed, the monitoring sites need to be prepared and installed, the loggers configured, and the monitoring sites located with a GPS unit; then the loggers will be deployed. During this time, a Gutermann representative will train those PCWA personnel who are designated to download and configure the loggers.

In order to effectively track specific information about each logger, the placement of the loggers, the distances between them, and the pipe material and size at each logger location will be recorded in the Toughbook laptop while the loggers are being deployed. As discussed above, the corresponding number of the monitoring site will be recorded onto the digital project base map.

Once all of the loggers are deployed and the set up of the software is complete, the system can be run, evaluated, and then improved as necessary. An operator will be required to drive by each of the logger locations and download the data to determine if the system is running properly and that each logger is reporting. Challenges in logger recording or communication will be met with the appropriate one of several checks: 1) monitoring site location, construction, and installation of loggers will be checked with the manual; 2) the loggers will be reprogrammed or software updated; and/or 3) distances will be re-measured.

Deliverables:

- ◆ Equipment installation timeline and implementation for Alta.
- ◆ Equipment installation timeline and implementation for Colfax.
- ◆ Spreadsheet of each monitoring site with GIS location, site number, and data logger on site.
- ◆ Data gathering software installed on field laptop.
- ◆ Data loggers deployed.
- ◆ All location information entered into laptop software.
- ◆ System testing analysis report.

Task 9: Implement Leak Detection and Repair Program

After the initial system analysis is conducted, the operator can begin collecting data to determine if there are any leaks within the system. To do this, the operator will drive to the logger site, download the data, analyze the data using the software, and then cue the loggers to find the exact location of any identified leaks. The Gutermann Zonescan software allows the operator to choose loggers and correlate the leak in real time from the vehicle, without the need to perform a traditional leak survey with a ground microphone and correlators. These may be used, however, if a leak proves particularly difficult to find; PCWA already has these tools on hand and they will be made available if needed. The data will be downloaded and analyzed every two weeks by the operator throughout the first year of the project.

Task 9.1: Prioritize Detected Leaks

Nearly all leaks that are found will be repaired by PCWA staff, with very few exceptions. Staff will track their labor, equipment, and materials costs for each leak; this information will be submitted within the quarterly reports. If a new leak is detected by the correlator, operators will be able to calculate water losses to a more accurate amount. This information will aid in increasing the accuracy of estimates regarding the length of time the leak was running before repair. Estimates of the amount of water loss will be made for each leak repaired.

Every leak encountered will be reported, and will include location, date of discovery, type of pipe, and estimate of volume of loss. The order that detected leaks are repaired is dependent upon staffing and workload. When a repair is completed, the data regarding the type of repair, date, location, and approximate cost will be recorded. See Task 7.2 for more detail.

Deliverables:

- ◆ Spreadsheet listing all leaks detected.
- ◆ Data regarding the cost/benefit analysis for each leak.

Task 9.2: Repair High-Priority Leaks

Once a suspected leak is detected, this typical process will begin:

- 1) The leak will be pinpointed using the loggers' correlating capabilities;
- 2) A work order for the repair will be issued;
- 3) An Underground Service Alert (USA) will be created to identify and mark all nearby utilities;
- 4) Crews will expose the water main or service;
- 5) Crews will determine the leakage rate, pipe material, pipe size, and any other information;
- 6) Crews will repair the leak with appropriate materials, tools, and equipment;
- 7) Crews will fill the hole and place temporary asphalt over the repair site if required. A paving contractor will return at a later date to make permanent repairs if asphalt was removed;
- 8) Leak repair paperwork will be completed that meets the grant's requirements;
- 9) All information will be placed on the work order; and
- 10) The work order will be closed out.

Deliverables:

- ◆ Leak repair reports.
- ◆ Spreadsheet listing all leaks repaired, including date, cost, and type of repair.
- ◆ Ongoing leak detection utilizing purchased loggers and software.

Task 10: Program Evaluation and Reporting

An ongoing program of evaluation and reporting will be undertaken to determine the impact of the installed loggers. This program will consist of an annual water audit (to assess the performance of the system and the leak detection equipment and software) using the free AWWA software performance indicators of “gallons per day per service connection” and “gallons per day per mile of water main” evaluation of leak reports to determine the efficacy of the program, and an annual system status report to quantify both leaks repaired and ongoing system maintenance requirements.

PCWA will perform annual water audits in Alta and Colfax by utilizing the AWWA Water Audit worksheet. Water audits will be performed prior to project implementation and each year thereafter to assess the performance of each water distribution system. Because both the Alta and Colfax systems are too small for the AWWA Water Audit to provide an Infrastructure Leakage Index (ILI) value and Unavoidable Annual Real Loss (UARL) calculations, performance indicators are the gallons of loss per service connection per day and gallons of loss per mile of water main per day. The annual audit will be prepared and supplied to CABY for review.

Reports for each repair will be created identifying the location of the leak, estimated leakage rate, pipe material, type of leak (i.e., water main, service lateral, meter connection, etc.), date leak was repaired, estimated water loss, and the labor and materials required to repair the leak. These incidental reports will then be summarized in an Annual Leak Repair Report (ALRR), which will also be provided to CABY for review. The ALRR will serve as an important source for planning future infrastructure projects, analyzing the effectiveness of the project, quantifying the water saved, and as a model for agencies contemplating the suitability of the data logger network in their own district.

Deliverables:

- ◆ Annual AWWA water audit report.
- ◆ Percent loss calculation.
- ◆ Annual Leak Repair Report.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

This project is anticipated to be categorically exempt, and therefore will not require associated environmental compliance or mitigation measures to be implemented. Because PCWA cannot know for sure the leaks that will be discovered in the system, if any environmental compliance is found to be necessary for leak repair, it will be completed at that time (see Task 6).

Budget Category (f): Construction Administration

Task 11: Direct Construction Administration

Senior City staff will serve as construction managers for the process, as they have for similar projects successfully completed by the City. Supervision activities will include: on-site observations and inspections, inspection of materials prior to installation, conducting construction progress meetings as required, review of project status (percent complete versus percent spent), and in-field problem solving during construction in response to unexpected field or system conditions.

Deliverables:

- ◆ Schedule of values, meeting minutes, inspection reports, 11- month warranty inspection report.

Budget Category (g): Other

Task 12: Develop and Maintain CABY Project-specific Webpage

The goal of this task is to ensure that all CABY members and members of the public have access to updated and thorough information about the implementation and characteristics of the project. Every CABY project that is implemented will be integrated into the CABY website through the creation of a project-specific webpage. Project plans, specifications, progress photographs, reports, status updates, and other similar materials will be posted or linked to this webpage. The webpages will be designed and brought online (activated within the first month after contract agreement). The page will be updated monthly.

Deliverables:

- ◆ Project webpage hosted on CABY website, updated with all current project information.

Task 13: Data Management

The goal of this task is to ensure that all data gathered and developed as a result of the project is made available to state databases as well as CABY members and the interested public using data management and monitoring deliverables that are consistent with the IRWM Plan Standards and Guidance (as stipulated in the August 2010 IRWM Guidelines, page 20). In this case, the appropriate approach is identified in the CABY Planning Grant submittal which will direct the IRWMP data collection efforts, regardless of whether the planning grant is funded or not. Data will be made available to all CABY members and the general public through the existing CABY SWIM Database. Material will be uploaded as it becomes available, however most of the data will be posted upon completion of the primary project activities. The CABY technical committee will evaluate project-related data to determine its appropriateness for upload to relevant state databases.

Deliverables:

- ◆ Development, activation, and maintenance of project-specific webpage within the CABY website (as stipulated by the CABY Planning Grant Application submittal)

9/28/10, pages 69–72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57).

- ◆ Post-project information through the existing CABY SWIM Database (as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69-72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57).
- ◆ Submittal of project-specific data to the CABY Technical Advisory Committee tasked with screening project-specific data for submittal to and inclusion in state databases (as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69-72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57).

Budget Category (h): Construction /Implementation Contingency

A 15 percent standard contingency is included in the budget and it is calculated based on industry norms.

COMMUNITIES OF ALTA AND COLFAX LEAK DETECTION AND REPAIR

EXHIBITS

1. Leak Detection Equipment Description
2. Annual Leak Detection and Repair Project Summary Form
3. CEQA Documentation --- Notice of Exemption
4. Colfax Leak Detection and Repair Survey Area Map
5. Alta Leak Detection and Repair Survey Area Map

Exhibit 1

EQUIPMENT DESCRIPTION

The Gutermann Zonescan system is a Correlating Radio Logging system that “listens” to the water main each night at a specified time and assigns a “leak value” to the sounds. A leak value is calculated by the logger, based upon the frequency of the sound and the intensity (loudness) of the sound. A high leak value indicates the presence of a possible leak. The Zonescan loggers can store up to 180 days of leak values and 30 days of noise level distribution data (how intense the noise was and at what frequency) for an operator to use when evaluating the presence of a leak.

The Zonescan loggers were chosen for this project because each logger can be download and/or programmed without the need to remove them from their monitoring location, 5-year battery life (typical), the operator can stop the download, wirelessly connect to a logger and listen to the water main in real time to confirm the presence or absence of a leak, the operator can also stop the download and pinpoint the location of a suspected leak between two loggers without the need of additional equipment.

Each download (leak survey) is expected to take a total of three hours to complete, one and a half hours in each community. Initially downloads will be performed every two weeks with detected leaks repaired within two weeks.

WATER LEAK REPAIR PROCEEDURE

Upon the detection and marking of a possible leak, PWCA treated water maintenance crews will begin the following Leak Repair Procedures:

- Work request (WF) to be generated with Field Services.
- Water main will be located utilizing maps, pipe locators and knowledge of the area.
- Outline the area of excavation with white paint for Underground Service Alert (USA).
- Notify Underground Service Alert with location and date of proposed excavation to notify other utilities to locate their facilities that may interfere or otherwise be impacted from excavation.
- Existing valve maintenance program insures that all isolation valves are exercised and are readily accessible.
- Pipe material and diameter will be confirmed in the field. Repair parts are issued from (PCWA) warehouse.
- All needed equipment and supplies are present on treated water service repair trucks.
- Areas needing traffic control will be set up to divert any vehicular and pedestrian traffic away from construction area.
- Water main will be left in service with positive pressure, to prevent dirt and other debris from entering exposed water main.
- Asphalt and /or concrete will be removed to provide access to leak. Area will be saw-cut by outside contractor for clean edges and repaving at a later date.
- Surrounding leak area will excavated to remove soil from around the water main and placed away from excavation or hauled off for disposal.
- Portable water pumps are utilized to remove water from the excavation.
- The section of water pipe to be repaired is then prepped to produce a clean surface.
- Pipe is then wiped off to remove all other debris and leak clamp installed.

- All pertinent information will be recorded on the work request (WF).
- Excavation will be backfilled according to all AWWA standards and following all City, County, or State encroachment requirements and PCWA Standard Specification Section "T".
- No less than two inches of temporary asphalt is placed and compacted on top of the excavation.
- A completed work request is returned and recorded. Permanent asphalt repairs will be made by Agency sub-contractors.
- If a section of water main is to be replaced the new section of pipe, all fittings will be swabbed with a chlorine mixture 200mg/l of available chlorine as per AWWA Standards for disinfecting water mains (ANSI / AWWA C651-92) Sections 4.5 Cleaning and Swabbing, 9.1 Connections, and 10.0 Disinfection procedures when cutting into or repairing existing mains. New section(s) of pipe will be installed per PCWA Standard Specifications Section "T".

ZONESCAN LNC

CORRELATING RADIO LOGGER



Product Overview

Deployed at regular intervals throughout the water pipeline network (attached to valves or fire hydrants via the integrated magnetic base), ZoneScan 'leak intelligence units' continuously monitor and analyse noise characteristics within the pipe network and can detect and identify the presence and location of a leak. Once ZoneScan has confirmed the presence of a leak, its precise position can be pinpointed between the two ZS units. The data retrieved from each ZS unit is automatically archived in the ZoneScan PC software database, and can be used to provide detailed reports for repair teams, or a total historic analysis for future pipeline replacement policies. The leak data can also be integrated with GPS and GIS operating systems.

ZoneScan loggers "wake up" to take recordings at user programmable times and also when interrogated by the host software (via a PC, rugged PDA device or automated web browser programme). At all other times the loggers remain "asleep" to conserve the battery life. Based on typical operational patterns, ZoneScan loggers will operate continuously for 5 years before requiring battery replacement. Based on typical operational patterns, ZoneScan units will operate continuously for 5 years before requiring battery replacement, which can be performed locally by an Authorized Distributor or Service Centre.

A Fully Programmable Acoustic Logger

ZoneScan loggers can be individually or collectively programmed to suit each and every different location and environment. The 'industry standard' setting of 02:00am to 04:00am at 3 second sampling is easily achieved or ZoneScan can log up to 23 hours and 59 minutes at any sampling rate from 1 to 180 seconds. These results are then presented in an easy to read format by the Windows based host software, or via a web browser (when used with ALPHA remote GPRS Comm. Links).

By utilising longer recording periods combined with rapid sampling, the ZoneScan equipped water leak Engineer eliminates the phenomenon of "ghost leaks" or "false positives", and avoids wasting considerable time attempting to pinpoint leaks that don't exist.

Drive-By / Vehicle Patrol:

Once in range of a ZoneScan logger, a patrol operator will receive automatic notification from the systems voice embedded host software, first identifying the unit, before announcing the presence or probability of a leak at that point in the water network. If audible confirmation of the leak noise is desired, the operator can, at any time, listen directly to the digitally transmitted leak noise from his vehicle without the need for any physical connection with the loggers.

Advanced Features:

GPS positioning & GIS integration

The ZoneScan is available with fast, simple & precise GPS plotting of each logger at time of deployment. Additionally, the data from the entire ZoneScan project (including full leak pinpointing) can be sent by GPRS, to be automatically integrated to a GIS or satellite mapping program (such as 'Google Earth' or 'Yahoo Maps').

The Smallest, Robust & Highly Portable Logger

At only 120mm high, with a flexible carrying handle that houses the aerial, and with an all round alloy casing, the ZoneScan logger is the smallest, lightest and most robust logger available. Other radio loggers that have either fixed plastic aerials or plastic



ZONESCAN - Correlating Radio Logger Specifications Summary:

Casing:	Aluminum, with magnetic attachment
Sensor:	High sensitivity piezo-ceramic sensor
Dimensions:	120 x 40 mm diameter (4.7 x 1.6" diameter)
Weight:	400 gr (0.9lb)
Protection:	IP68, fully submersible to 2m
Power:	Replaceable Lithium battery cell
Battery Life:	Typically 5 years (depending upon operation)
Memory:	180 days leak value for each logger (most recent) 30 days of leak analysis and histogram for each logger (most recent)
Temperature range:	-20 to +55 deg C (-4 to +131 deg F)
Radio Type:	Transceiver for interactive communication
Radio Output:	100mW

housings, or both, are prone to operational damage e.g. when chamber covers are replaced and press down on the aerial, or when leak inspectors accidentally puncture the logger casing with listening sticks. Weighing less than 0.4kg each, ZoneScan loggers are easily transported and deployed by one engineer.

Exhibit 2

ANNUAL LEAK DETECTION AND REPAIR PROJECT SUMMARY										
								Year:		
Agency: Placer County Water Agency										
Report Prepared By:										
LEAK DETECTION SURVEY										
Total Number of Days Leak Surveys Were Conducted:										
First Survey Date:					Last Survey Date:					
Number of Suspected Leaks:					Number of Pinpointed Leaks:					
Survey Time:		Hours								
Pinpointing Time:		Hours								
Total number of visible leaks reported from other sources (not discovered during leak detection survey)										
LEAK REPAIR SUMMARY										
First leak repair made:					Last leak repair made:					
Number of Repairs		Number of Repairs			Total Number of					
Needing Excavation:		Not Needing Excavation:			Repaired Leaks:					
Total Water Losses		Total Water Losses from			Total Water					
From Excavated Leaks:		gpm	Non-Excavated Leaks:		gpm	Losses:		gpm		
Excavated Leak		Nonexcavated Leak			Total					
Repair Costs		Repair Costs			Repair Costs					
Materials		Materials			Materials					
Labor		Labor			Labor					
Equipment		Equipment			Equipment					
Other		Other			Other					
Subtotal		Subtotal			Total					



MEMORANDUM

TO: Board of Directors and General Manager
 FROM: Brian Martin, Director of Technical Services *BM*
 DATE: June 7, 2010 FILE NO.: CEQA
 RE: Colfax Area Leak Detection and Repair Project, Notice of Exemption

BACKGROUND

PCWA will install leak detection dataloggers (flow monitoring devices) on selected treated water transmission mains within areas of aging pipelines at various locations in the Colfax area within PCWA Zone No. 3. The purpose of this project is to monitor pipelines in order to pinpoint leaks for repair and initiate repair of those leaks utilizing best management practices. Where possible, existing valves will be used as monitoring locations, but a total of 50 additional sites could be needed (25 in Alta and 25 in Colfax). These additional sites will be excavated using a vacuum trailer and a piece of plastic pipe will be installed with a valve cap.

Staff is seeking a grant through CABY for this project. PCWA and its customers will benefit from this project due to increased water system reliability and operational efficiencies.

This project does not require further environmental assessment because it will not result in significant environmental impacts and it is categorically exempt from the California Environmental Quality Act.

RECOMMENDATION

Staff recommends Board authorization for the Clerk to the Board to file the Notice of Exemption.

BCM:HT:ns

Enclosure

2/16/CEQA, Colfax Leak Detection, 7-1-10

w a t e r • e n e r g y • s t e w a r d s h i p

Notice of Exemption

Form D

To: Office of Planning and Research
PO Box 3044, 1400 Tenth Street, Room 222
Sacramento, CA 95812-3044

From: Placer County Water Agency
P.O. Box 6570
Auburn, CA 95603
(Public Agency and Address)

County Clerk, County of: Placer

Project Title: Colfax Area Leak Detection and Repair Project

Project Location - Specific: Various locations in Colfax area, PCWA Service Area Zone 3, Placer County, California

Project Location - City: Colfax area **Project Location - County:** Placer

Description of Project: PCWA will install leak detection dataloggers (flow monitoring devices) on selected treated water transmission mains within areas of aging pipelines at various locations in the Colfax area within PCWA Zone No. 3. The purpose of this project is to monitor pipelines in order to pinpoint leaks for repair and initiate repair of those leaks utilizing best management practices. Where possible, existing valves will be used as monitoring locations, but a total of 50 additional sites could be needed (25 in Alta and 25 in Colfax). These additional sites will be excavated using a vacuum trailer and a piece of plastic pipe will be installed with a valve cap.

PCWA and its customers will benefit from this project due to increased water system reliability and operational efficiencies.

Name of Public Agency Approving Project: Placer County Water Agency

Name of Person or Agency Carrying Out Project: Placer County Water Agency

Exempt Status: *(check one)*

- Ministerial (Sec. 21080(b)(1); 15268)
- Declared Emergency (Sec. 21080(b)(3); 15269(a));
- Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
- Categorical Exemption. State type and section number: Class 1 (b), Section 15301
- Statutory Exemption. State code number: _____

Reasons why project is exempt: The project consists of the maintenance, or minor alteration of existing public facilities involving no expansion of use beyond that previously existing. (Guidelines Article 19, Section 15301 (b))

Lead Agency Contact Person: Mike Nichol, Director of Field Services **Area Code/Telephone/Extension:** 530-823-4886

If filed by applicant:

- 1. Attach certified document of exemption finding.
- 2. Has a Notice of Exemption been filed by the public agency approving the project? Yes No

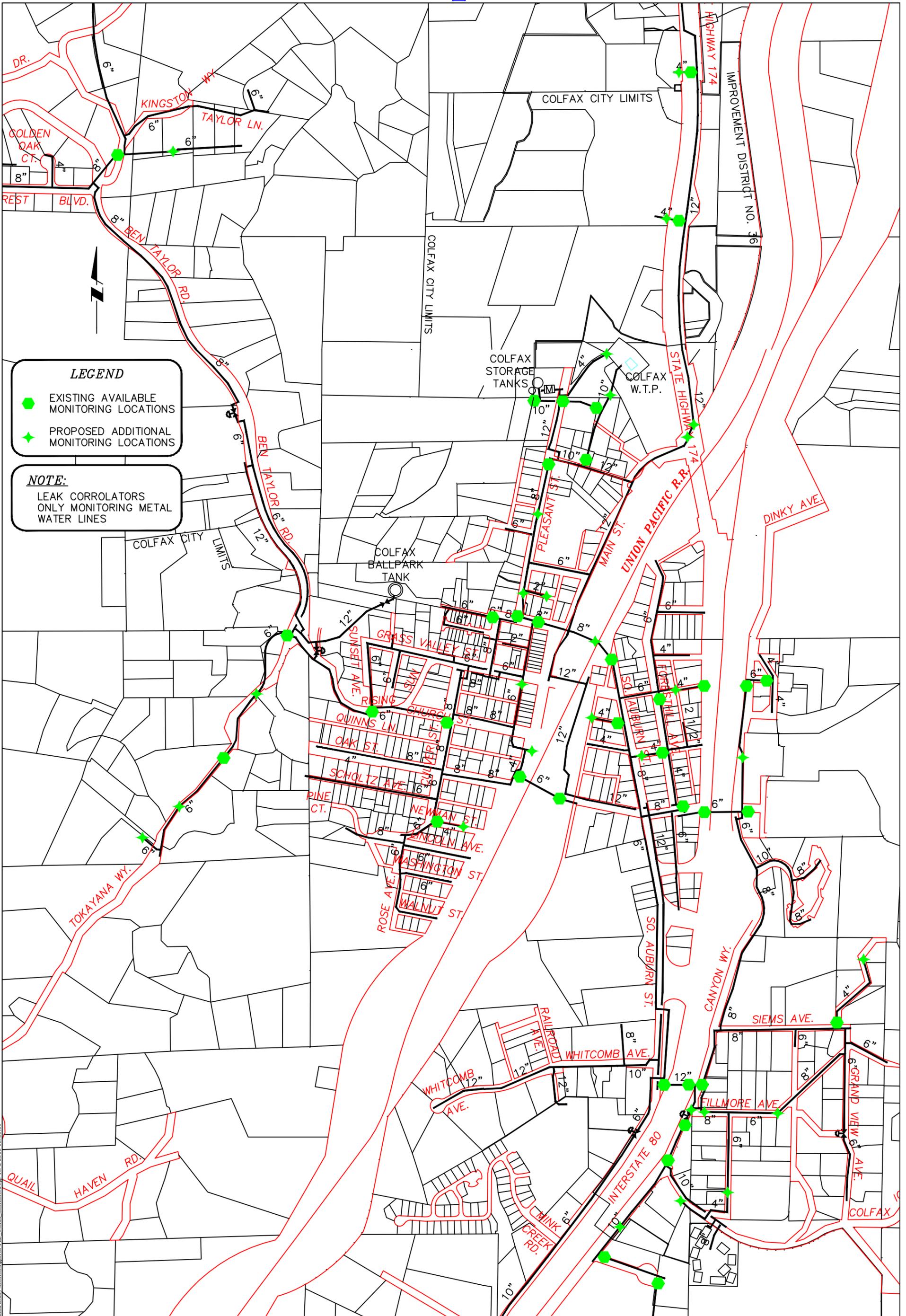
Signature: Heather Trejo Date: 6/21/10 Title: Environmental Specialist
Heather Trejo

Signed by Lead Agency

Date received for filing at OPR: _____

Signed by Applicant

2/16/08 CBQA Colfax leak detection 7-1-10



PROJECT GRANT	DISCIPLINE GENERAL	TITLE
PLACER COUNTY WATER AGENCY		

**LEAK DETECTION AND REPAIR
COLFAX SURVEY AREA**

REFERENCES	DRAWN BY: S. DOWDEN	REV. NO.
	CHECKED BY: R. COX	0
	DATE DRAWN SCALE 10/01/09 N.T.S.	
	NO. DATE REV. REVISION DESCRIPTION	CHK.

Y:\Drawings\Facilities\Colfax\FacilityMonitoring\Struc\FID_Colfax_Monitors.dwg, 10/06/2009 08:09:51



CABY Water Trust

CABY WATER TRUST



OVERVIEW

The overall goal of this project is to set up an institutional structure in the CABY region that will be able to purchase water rights or water leases from willing sellers and rededicate them to instream flow needs.

In the past ten years, water trusts have emerged across the western United States as a viable, effective, and innovative way to preserve and restore freshwater ecosystems while at the same time providing water diverters such as farmers and ranchers with more flexibility in their operations. In 1991, the State of California amended the California Water Code by adding section 1707, which permitted the transfer and dedication of all or part of a water right specifically for environmental purposes. Trust or environmental water is defined as an amount of water that has voluntarily been reclassified to boost instream flows. Trust water can also be acquired through buying, trading or leasing water for instream flows. Obtaining water rights through acquisition is one of the most effective ways to get water when and where it is needed and is used extensively in Oregon and Washington.

Specific objectives in support of the overall project goal include:

- Assess and address opportunities and constraints to establishing a CABY Water Trust;
- Increase capacity to understand and use this non-regulatory approach to instream-flow protection;
- Develop and implement institutional arrangements for launching a CABY Water Trust; and
- Identify strategic reaches in need of flow augmentation.

Ultimately, the net effect of the CABY Water Trust will be increased protection of CABY rivers and streams coupled with the economic benefit to those water rights holders interested in and willing to provide water for instream uses. A market-based water transfer system would be an improvement over existing regulatory programs because the transfers would be voluntary and remunerated instead of imposed and uncompensated. Thus, it is likely to be preferred by vested water right¹ holders simply because it harnesses private property rights rather than seeking to limit or abridge them. This implies less resistance to implementation, which will lower administration and transaction costs.

Properly administered, the market approach also has the virtue of capturing water where it is needed for flow augmentation, instead of wherever in the hydrologic system the regulatory apparatus intervenes to salvage wasted water (for example, by invoking the public trust, by establishing minimum streamflows, or by appropriating available water for the stream). No constitutional issues of uncompensated taking can arise. No political issues regarding the appropriate balance among competing interests or constituencies will emerge.

Because acquisition strategies will tap the least expensive water first, this method of reallocation is economically efficient. It targets water sources that can inexpensively conserve water or that are using water in economically unproductive applications, i.e., irrigation of crops that are the least profitable per unit of water applied. Under market conditions, the water uses that will be displaced will be determined not by temporal priorities, as is the case under prior appropriation system. Instead, they will be determined by the comparative economic and social value of particular water uses.²

The project's primary contributions will be ensuring permanent protection through systematic water acquisitions or shorter term benefits through leasing of water fostering supportive policies, building capacity, facilitating stewardship, and advancing restoration. Measuring and capturing the success of environmental water acquisitions is essential to building momentum for achieving support and funding for future projects.

PROJECT NEED

The Sierra Nevada generates approximately 20 million-acre feet of runoff in the form of river flows each year. These rivers form a natural and engineered water supply network providing approximately 60 percent of the state's water supply. They further support complex instream ecology, which results in the Sierra Nevada ranking as the world's most ecologically rich region for endemic aquatic invertebrates.

¹ David L. Sunding, *Economic Impacts of Market Implementation of Bay/Delta Water Quality Standards*, 1 (May 23, 1994) on file with the Stanford Environmental Law Journal.

² Thomas, G.A. 1996. *Conserving Aquatic Biodiversity: A Critical Comparison of Legal Tools for Augmenting Streamflows in California*. Stanford Environmental Law Journal. January 1996.

However, most of the Sierra's rivers have impaired water quality and almost two-thirds of the region's 67 aquatic habitat types are declining in quality and abundance. In addition, the Sierra, including the foothills, is subject to some of the largest drivers of change—including population growth, intense recreational use, rapid development, and climate change—of any rural region in the United States. These rivers, streams, and creeks are under immense pressure, and unless their ecological needs are integrated into these landscape level changes, the impact on water quality, species diversity and abundance, and general ecosystem health will be felt from the headwaters to the Bay.

Preserving or restoring elements of the unimpaired hydrographs associated with these rivers is an important component in addressing these ecosystem needs. It is estimated that there are at least 10,000 individual holders of water rights in the Sierra Nevada region. Many of these are comparatively small-- 1,000 acre-feet on an American River ranch, 2,000 acre-feet for a small Yuba River powerhouse. However, in total, these claims represent a substantial stress—perhaps the most substantial current stress--to the capacity of Sierra rivers and streams to sustain local aquatic ecosystems and provide beneficial uses to source water and downstream users. If a portion of these water rights could be reclaimed for strategic flow augmentation through community-level efforts to acquire and manage these rights, then river stress could be managed and the ecosystem services protected or restored.

Water rights acquisitions are particularly well suited for headwater rivers, streams and tributaries such as in the CABY Region, where adding even small amounts of additional flows in the right reach at the right time can be critical.

The opportunities to improve river function through trust water are growing, and there is already a demand to acquire water rights in the Sierra. For example, land trusts are often faced with water rights tied to their land transactions. Because they do not have the capacity to acquire and manage these water rights as trust water, they must abandon them and thus forfeit the opportunity of river restoration in conjunction with their land conservation efforts. In addition, citizens and community leaders are eager to improve the condition of their watersheds, but also lack an understanding of how to apply this river restoration tool.

In many cases, the use of restoration approaches such as implementation of Best Management Practices (BMPs), bank stabilization, restoration of riparian vegetation, and removing passage barriers will provide only part of the solution. Without additional flows, these projects may not result in the expected long-term benefits. This CABY Water Trust Project will identify those features of connectivity that must be addressed by additional flows and focus the purchase of water rights in that direction. This integrated approach will lead to sustainable restoration more likely than attempts that don't take into consideration flow augmentation needs. This is also an important consideration with conservation projects such as those included in this proposal. Small water purveyors such as Washington County Water District and the City of Nevada City hold

water rights within the region, and are a resource for contributing to beneficial instream flows that remains untapped. The inclusion of entities such as these in this project will ensure a comprehensive effort to protect and restore waterways in the region.

CURRENT STATUS

The CABY Water Trust is a strategic and critical part of a larger Sierra-wide initiative called the Sierra Water Trust Flow Augmentation Project, which is funded by the US EPA and the Sierra Nevada Conservancy. Partners in this larger effort include American Rivers, Sierra Nevada Alliance, Natural Heritage Institute, Alpine Watershed Group, South Yuba River Citizens League, Nevada Irrigation District, Feather River Land Trust, Friends of Deer Creek, and UC Davis.

The larger Sierra-wide initiative will provide legal and scientific support to the CABY Water Trust Project. In turn, the CABY Water Trust will be the institutional model for acquiring and managing water rights – a model that will be expanded over time throughout the Sierra. Identification and recruitment of the Water Trust Advisory Board, which will serve as the interim governing body for the CABY Water Trust, has already begun. The lessons learned through the implementation of the Sierra Water Trust Flow Augmentation Project will be applied to the CABY Water Trust Project which requires no environmental documentation and is ready to proceed.

PROJECT LOCATION

This project will be implemented across the CABY region.



WORK PLAN TASKS

Budget Category (A): Direct Project Administration Costs

Task 1: Administration and Management

The objective of this task is to keep the project on time and within budget, keep all participants informed of project progress and status of deliverables, establish and maintain reliable and accurate billing and recordkeeping, ensure that all requirements of the agreement with the DWR are met, and generally ensure smooth project implementation. The tasks for this budget category will comprise all project administration activities performed by American Rivers and CABY staff throughout the duration of the project and will include: development and completion of contractual paperwork, maintenance and reporting of expense documentation, oversight of project scheduling and contract/agreement compliance, preparation of monthly invoices, and completion of the final invoice.

Deliverables:

- ◆ Preparation of invoices and other deliverables as required.
- ◆ Accurate and accessible records

Task 2: Labor Compliance Program

As this project does not include construction activities, a labor compliance program is not necessary.

Task 3: Reporting

In order to track the project's implementation and achievement of performance measures, reports will be prepared to provide DWR with details regarding the project's progress. The content and schedule for these reports will be identified and agreed upon with DWR through the grant agreement. The cost of this task is included in the total for Task 1 in the budget.

Deliverables:

- ◆ Quarterly and final reports

Budget Category (B): Land Purchase/Easement

No land purchase or easement activities required by this project.

Budget Category (C): Planning/Design/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation (Planning)

The purpose of this task is to develop the water rights acquisition process and structure of the CABY Water Trust organization. This task involves six main activities: 1) establishing the CABY Water Trust Advisory Board, 2) training advisory board

members, 3) defining the water rights acquisition process, 4) developing water rights selection criteria and water trust principles, 5) identifying priority and strategic reaches, and 6) conducting outreach to build community support and identify willing sellers.

Task 4.1 Establish CABY Water Trust Advisory Board

The CABY Water Trust Advisory Board will be convened to provide guidance during project implementation. This board will be an interim body that will provide management oversight of the formation of a formal CABY Water Trust Board and will disband once the formal board is convened. The advisory board members will be asked to oversee the development of the water trust structure, function, principles, and membership. They will also provide guidance regarding the education and outreach activities necessary to ensure that the full depth and breadth of stakeholder interest is represented in developing the trust.

It will be extremely important to have a diverse range of interests represented on the board. For this reason, a wide range of organizations and entities will be involved. Board members will include large water and power districts (such as NID, PCWA, and PG&E); smaller, rural water purveyors (such as Washington County Water District, Grizzly Flats Community Services District, and the City of Nevada City); land trusts (such as the Nevada County Land Trust and the Sierra Nevada Land Trust Council); farming and economic interests (such as the Regional Council for Rural Counties and the Farm Bureau); environmental interests (such as American Rivers and the Sierra Nevada Alliance); tribal interests; scientific and legal expertise from UC Davis, UC Berkeley, and Stanford University; and representatives with experience from other water trusts such as the National Fish and Wildlife Foundation. Outreach to these entities has already begun, and in some cases, organizations are already participating in the current Sierra Water Flow Augmentation Project.

Deliverables:

- ◆ Establishment of CABY Water Trust Advisory Board

Task 4.2: Train Advisory Board Members

Once the advisory board is established, training sessions will be held to provide information on the fundamentals of water transactions. The trainings provided to Water Trust Advisory Board members will include information on topics such as

- Essential background material for water transactions (water budgets and water math for transactions, water law and water rights)
- Types of water management transactions (e.g., temporary and permanent acreage reductions, diversion reduction agreements, hydrological impacts),
- Preparing the ground and acquisition strategies (e.g., enabling conditions, water acquisition targets and prioritization, collaboration with the water resource community),

- Developing transactions (the water transaction project cycle, identification and due diligence, pricing and appraisal, and financing),
- Price discovery and auctions,
- Completing a transaction (legal aspects, contracting, administrative aspects, monitoring for impact).

These trainings will provide case studies and will be evaluated based on before and after questionnaires to determine increase in knowledge in the subject matter.

Deliverables:

- ◆ CABY-relevant training material
- ◆ Design of training sessions
- ◆ Case studies

Task 4.3: Define Water Rights Acquisition Process

This task will build on the Trust for Public Land's 2001 workshop, entitled: "Environmental Water Acquisition: Roadblocks and Opportunities." The work effort will involve conducting interviews with key stakeholders, identifying barriers to Sierra water acquisitions, identifying benefits and incentives, reviewing experiences from water trust organizations in other western states (e.g., Oregon, Washington, Colorado, and Texas), and the current Sierra-wide initiative (the Sierra Water Trust Flow Augmentation Project), and drafting a "Barriers and Benefits Report" for review and distribution. This report will clearly identify and quantify the benefits of acquiring water rights and dedicating those rights to instream uses in the CABY region and will describe the legal, institutional, economic, and social barriers to water rights acquisition. A PowerPoint presentation will also be developed so that the information can be easily distributed throughout the region (e.g., at IRWMP meetings and gatherings of the advisory board members' organizations).

Deliverables:

- ◆ Stakeholder questionnaire
- ◆ CABY Water Trust Benefits and Barriers Report
- ◆ Benefits and Barriers PowerPoint Presentation

Task 4.4: Develop Water Rights Selection Criteria and Water Trust Principles

The intent of this task is to ensure the accurate and effective identification of willing sellers whose water rights contributions will yield maximum benefit. In order to achieve this goal, selection criteria must be determined and prioritized and principles associated with water rights acquisitions in the region must be articulated.

The selection criteria and principles will be developed using the technical resources of the various advisory board members, as well as project staff. They will also be submitted to technical experts in California and adjoining states for review and comment.

Deliverables:

- ◆ Final Water Rights Acquisition Criteria
- ◆ Final Water Trust Principles

Task 4.5: Identify Priority and Strategic Reaches

Under this task, we will assess the flow augmentation needs for habitat and water quality in the CABY Watershed. We will use the criteria developed in Task 4.4 and will build on assessment methodologies developed by the Nature Conservancy. This task will involve reviewing a range of flow assessment methodologies to determine the most appropriate for application in the CABY region. Once an assessment methodology has been identified, it can be used to determine high priority and strategic reaches for flow augmentation in the CABY region.

Deliverables:

- ◆ CABY watershed maps identifying flow augmentation needs by reach

Task 4.6: Outreach to Build Community Support and Identify Willing Sellers

The goal of this task is to identify potential water rights sellers and build support for the project through a comprehensive outreach program. Outreach activities will be tailored to priority and strategic reaches identified in Task 4.5.

In order to build community support for the project, residents and stakeholders within the CABY region will need to understand or appreciate the issues associated with water transfers, benefits and barriers to water transfers, flow augmentation needs and impact, and the general process for water transfers. This task will involve the creation of materials—including direct mailing materials, brochures, and a PowerPoint presentation—to describe the water trust activities and process. A brochure specifically aimed at potential willing sellers will also be developed and will include a “frequently asked questions” section to address the most common concerns and interests of potential sellers. Advisory board members, as well as the project sponsor, will distribute these materials to targeted individuals or geographic areas. These materials will also serve as the basis for a series of strategic press releases aimed at raising awareness of the water trust throughout the CABY region.

Deliverables:

- ◆ Outreach materials for the general public, including direct mailers, brochures, and a PowerPoint presentation
- ◆ Brochure specifically aimed at potential willing sellers

Budget Category (d): Construction/Implementation

Task 5: Implementation

Project implementation will involve two main tasks: 1) establishing a formal CABY Water Trust and 2) preparing trust water cases.

Task 5.1: Establish CABY Water Trust

Under this task, the formal CABY Water Trust will be established. In order to accomplish this, an appropriate institutional structure will be chosen, governing principles and processes will be determined, an initial governing board will be recruited, and the CABY Water Trust will be staffed for the founding year. This process will build on the recent experience of the Sierra Water Trust Flow Augmentation Project that is currently being implemented by the project sponsor.

The advisory board will identify and recruit board members for the new formal CABY Water Trust, and will provide the new board with draft governing principles and suggested policies and procedures. The advisory board will officially hand over governance of the entity at the initial board meeting of the CABY Water Trust, during which the governing principles, policies, and procedures will be finalized and adopted.

Staff will also provide the new board with a draft strategic plan and diversified fundraising plan for their review, revision, and adoption. This Water Trust governance packet will expedite the new organization's process and will contain draft materials to help expedite the new organization's process.

A part-time water rights acquisition coordinator will also be funded through this grant for the first year, enabling the new board to develop a self-supporting funding mechanism for continued support of this position.

Deliverables:

- ◆ Legal documents filed to establish CABY Water Trust
- ◆ List of governing board members
- ◆ CABY Water Trust governance packet, including draft governing principles and procedures, strategic plan and diversified fundraising plan
- ◆ Job description and hiring of a Water Rights Acquisition Coordinator

Task 5.2 Prepare Trust Water Cases

The overall aim of this task is to identify and begin to facilitate strategic water rights acquisitions where they are most needed (i.e., in the areas identified in Task 4.5). This task will entail the identification of willing sellers and evaluation of water rights for transfer to trust water. Knowing the characteristics of potential water rights (seniority, historic beneficial use, transferable quantity, etc.) will ensure that acquired water rights are more than paper claims. This task will involve legal research of water rights using California's water rights registry database, application files, and statements of water diversion and use. Also, templates for acquisition agreements will be created and an appraisal methodology will be drafted to determine fair market value of the water

rights, as well as the length of time, location, and type of transaction being contemplated. This task will also outline the CEQA process for the water rights identified for transfer.

Deliverables:

- ◆ Willing Sellers identified
- ◆ Evaluation of Legal Aspects of Water Rights
- ◆ Template for Acquisition Agreement
- ◆ Finalized Appraisal Methodology
- ◆ Determination of Fair Market Value of Identified Water Rights
- ◆ Agreement of Price and Details of Transfer
- ◆ Outline of CEQA process

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Environmental Compliance/Mitigation/Enhancement

Although the environmental compliance and enhancement associated with this project will be identified and described in Task 5.2, no on-the-ground activities will be required for project implementation.

Budget Category (f): Construction Administration

Direct Construction Administration

There are no construction activities associated with this project, so no construction administration is required.

Budget Category (g): Other

Task 6: Develop and Maintain CABY Project-specific Webpage

The goal of this task is to ensure that all CABY members and members of the public have access to updated and thorough information about the implementation and characteristics of the project. Every CABY project which is implemented will be integrated into the CABY website through the creation of a project-specific web page. Project plans, specifications, progress photographs, reports, status updates and other similar materials will be posted or linked to this web page.

Task 7: Data Management

The goal of this task is to ensure that all data gathered and developed as a result of the project is made available to state data bases as well as CABY members and the interested public using Data Management and Monitoring Deliverables that are consistent with the IRWM Plan Standards and Guidance (as stipulated in the August 2010 IRWM Guidelines, page 20). In this case, the appropriate approach is identified in the CABY

Planning Grant submittal which will direct the IRWMP data collection efforts, regardless of whether the planning grant is funded or not.

Deliverables:

- ◆ Development, activation and maintenance of project-specific web page within the CABY website as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69 - 72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57).
- ◆ Post project information through the existing CABY SWIM Database (as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69 - 72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57)
- ◆ Submittal of project-specific data to the CABY Technical Advisory Committee tasked with screening project-specific data for submittal to and inclusion in state databases (as stipulated by the CABY Planning Grant Application submittal 9/28/10, pages 69 - 72, developed in response to the IRWM Program Guidelines/August 2010, pages 22 and 56-57)