California Department of Water Resources
2004 Water Use Efficiency Program
Section A: Implementation Project

Lake Arrowhead Community Services District

Automatic Meter Reading System Project

January 11, 2005

1.0 Project Information Form

2004 Water Use Efficiency Proposal Solicitation Package - Project Information Form

Applying for:	√ Urban ❑ Agricultural
1. (Section A) Urban or Agricultural Water Use Efficiency Implementation Project	√ (a) implementation of Urban Best Management Practice, # Includes elements of BMP's 1, 2, & 4. ❑ (b) implementation of Agricultural Efficient Water Management Practice, #_____ ❑ (c) implementation of other projects to meet California Bay-Delta Program objectives, Targeted Benefit # or Quantifiable Objective #, if applicable _____
2. (Section B) Urban or Agricultural Research and Development; Feasibility Studies, Pilot, or Demonstration Projects; Training, Education or Public Information; Technical Assistance	❑ (d) Specify other: _____ ❑ (e) research and development, feasibility studies, pilot, or demonstration projects ❑ (f) training, education or public information programs with statewide application ❑ (g) technical assistance ❑ (h) other
3. Principal applicant (Organization or affiliation):	Lake Arrowhead Community Services District
4. Project Title:	Automatic Meter Reading System Project

5. Person authorized to sign and submit proposal and contract:	Name, title	Marvin Shaw General Manager
	Mailing address	PO Box 700 Lake Arrowhead, CA 92352
	Telephone	(909) 337-8555
	Fax.	(909) 337-3165
	E-mail	admin@lakearrowheadcsd.com

6. Contact person (if different):	Name, title.	Marc Lippert Water Conservation Coordinator
	Mailing address.	PO Box 700 Lake Arrowhead, CA 92352
	Telephone	(909) 337-8555
	Fax.	(909) 337-3165
	E-mail	mlippert@lakearrowheadcsd.com

7. Grant funds requested (dollar amount): *(from Table C-1, column VI)*	$431,325
8. Applicant funds pledged (dollar amount):	$431,325
9.Total project costs (dollar amount): *(from Table C-1, column IV, row n)*	$862,650

10. Percent of State share requested (%)
    (from Table C-1) — 50%

11. Percent of local share as match (%)
    (from Table C-1) — 50%

12. Is your project locally cost effective?
    Locally cost effective means that the benefits to an entity (in dollar terms) of implementing a program exceed the costs of that program within the boundaries of that entity.
    (If yes, provide information that the project in addition to Bay-Delta benefit meets one of the following conditions: broad transferable benefits, overcome implementation barriers, or accelerate implementation.)
    - √ (a) yes
    - ❑ (b) no

11. Is your project required by regulation, law or contract?
    If no, your project is eligible.
    If yes, your project may be eligible only if there will be accelerated implementation to fulfill a future requirement and is not currently required.
    Provide a description of the regulation, law or contract and an explanation of why the project is not currently required.
    - ❑ (a) yes
    - √ (b) no

12. Duration of project (month/year to month/year):	12/05 to 12/17
13. State Assembly District where the project is to be conducted:	59
14. State Senate District where the project is to be conducted:	31
15. Congressional district(s) where the project is to be conducted:	41
16. County where the project is to be conducted:	San Bernardino County
17. Location of project (longitude and latitude)	-117.19288 34.25196
18. How many service connections in your service area (urban)?	7,600
19. How many acre-feet of water per year does your agency serve?	3,150

20. Type of applicant (select one):

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

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

(Provide supporting documentation.)

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

2.0 Signature Page

2004 Water Use Efficiency Proposal Solicitation Package Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

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

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

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

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

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

_____ _____

Signature Date

_____

Name and Title

3.0 Statement of Work

3.1 Relevance and Importance

3.1.1 Introduction

The Lake Arrowhead Community Services District (District) provides water and wastewater services to the community of Lake Arrowhead located in Township 2 North, Range 3 West in the San Bernardino National Forest, 28 miles north, northeast of the City of San Bernardino. The water service area covers approximately 4,900 acres and includes the geographic area known as Arrowhead (see Appendix A, Figure 1: Location Map). The District's certificated water and wastewater boundaries are shown on Figure 2 of Appendix A. The topography of the District's water service area consists of rugged, mountainous terrain with about 40% of the land having slopes with a greater than 30% grade. The surface is underlain by dense, fractured and jointed granite. The District maintains 18 water storage reservoirs, 9 pressure tanks, 19 water-pumping stations, and approximately 250 miles of water main lines.

The District's water service area has elevations ranging from 4,000 to 6,000 feet, with an average elevation of 5,500 feet. Data collected by National Weather Service Station #044671 at an elevation of 5,204 feet indicates that the average annual high and low temperatures since 1948 are 62.9 (F) and 40.4 (F), respectively. The average high and low temperatures for the month of July are 81.4 (F) and 56.3 (F), respectively, and the average high and low temperatures for the month of January are 45.5 (F) and 29.0 (F), respectively. Total annual precipitation for the area averages 41.6 inches. Ninety-seven percent of precipitation occurs between the months of November and April. Due to the elevation of the area, much of this precipitation is in the form of snow.

The District enjoys a favorable, steady small growth environment. The exact population of the District is difficult to estimate, as a large percentage of the homes in the area are part time residences. As a result, during seasonal and holiday periods the population in the area can increase significantly (this is particularly true during the summer months, especially summer holiday weekends). As such, it is estimated that the permanent population of the area is roughly 12,000 residents, with holiday weekend populations exceeding 30,000.

For the past six years, the Lake Arrowhead community has faced severe recurring drought conditions in addition to the ongoing bark beetle infestation that has affected the majority of the San Bernardino Mountains. These conditions have resulted in increased risk of catastrophic forest fire and have caused Lake Arrowhead, historically the community's sole source of potable drinking water, to decline to its lowest levels.

Faced with the impacts of these adverse conditions on the water supply, the District Board of Directors began in January 2003 to intensively scrutinize its water management practices and investigate the development of water supplies alternative to the lake. As a result of it investigations, in FY 2003/2004 the

District commissioned the Lake Arrowhead Community Services District Water Demand & Supply Final Report (WDSFR). This report identifies three milestones consisting of programs and capital improvement projects designed to reduce and ultimately eliminate reliance on the lake as the community's sole source of water supply. This does not mean that the District proposes to stop using lake water outright. During wet and normal conditions the District will continue to rely on the lake as a source of drinking water for the community, as it is the lowest cost, best quality and most reliable water supply available. However, during periods of drought it is the District's goal to supply water from alternative sources.

In July 2003 the District established the Stakeholders' Advisory Group (SAG) to obtain informed and balanced input from the Lake Arrowhead Community. The SAG reviewed the WDSFR and presented its findings and recommendations to the District Board of Directors. One of these recommendations called for the commissioning of a public opinion survey of District customers. The purpose of this survey was to learn, among other things, the general public's preferences regarding alternative water management solutions and their willingness to pay for such solutions. The final results of this survey are available for review at the District office or on the District's web site at http://www.lakearrowheadcsd.com.

On October 14, 2003, the Board (a) accepted as complete the WDSFR, (b) accepted the SAG recommendations and (c) authorized District staff to implement Milestone I and II programs and capital improvement projects. Below is a summary of the WDSFR Milestone I & II programs and projects the District has implemented or is in the process of implementing, as well as the estimated acre-feet per year ("AFY") savings for each. Upon completion, these programs and projects will reduce draw on the lake by approximately 48% or 1,517 AFY.

Milestone I Programs & Capital Improvements	Acre Feet Per Year
Treatement Plant Efficiency Improvements	150
Water Conservation	745
Groundwater Development, Phase I	150
CLAWA Supplemental Supply of SWP Water	745
Total, Milestone I	1,107 (35%)

Milestone II Programs & Capital Improvements	Acre Feet Per Year
Recycled Water Program, Phase I	200
Groundwater Development, Phase II	210
Total, Milestone II	410 (13%)
Total, Milestones I & II	1,517 (48%)

Of special note is the proposed short-term (10-15 year) water purchase from the San Bernardino Valley Municipal Water District (SBVMWD), which will be treated and transported through the Crestline-Lake Arrowhead Water Agency (CLAWA) to supply up to 1,500 acre feet of water per year to District customers. This water purchase will occur during development of Milestone III projects. In addition, certain portions of

the "Arrowhead Woods" area overlap with the CLAWA service area and as a result, pay into the SWP and received SWP water at an estimated 62 AFY.

The District's progress to date in implementing WDSFR Water Management Programs and Capital Improvements is summarized in Figure 1, below:

Figure 1: Water Management Programs & Capital Improvements, Implementation to Date

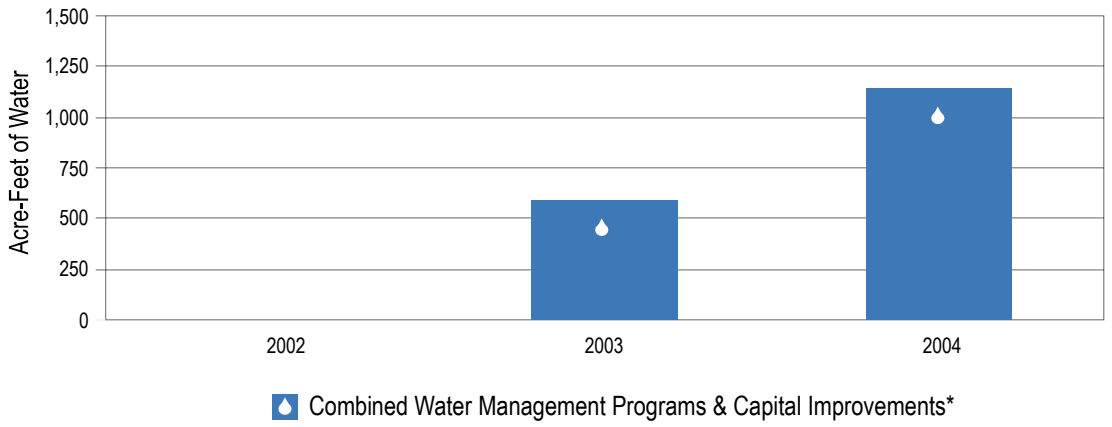
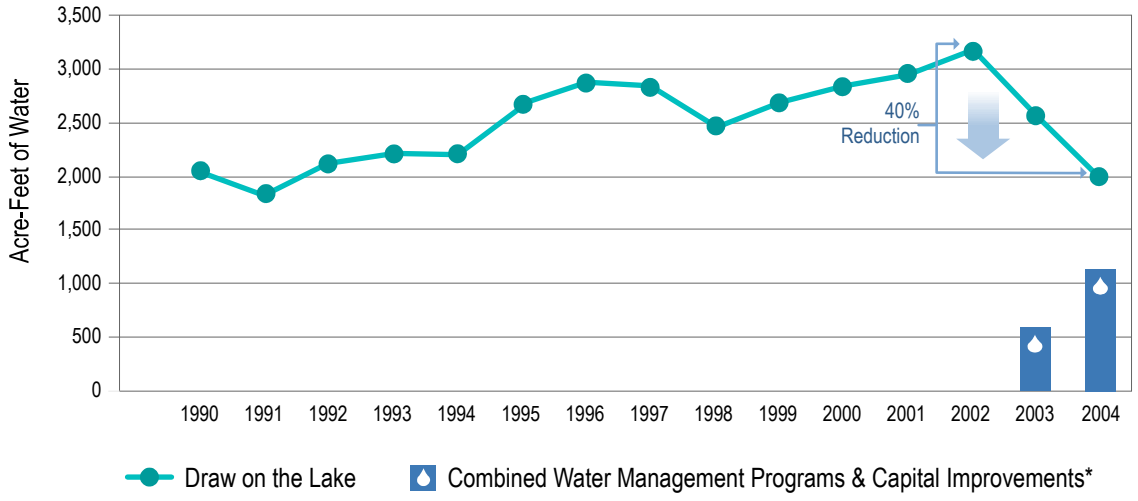


Figure 2, below, illustrates how combined District water management programs and projects have resulted in a 40% reduction (approximately 1,242 acre-feet) of annual draw since the 2002 base year.

Figure 2: Impact of Water Management on Lake Use



* Collectively, WDSFR Milestone I & II Programs & Capital Improvement Projects (specifically, Water Conservation, CLAWA Supplemental Supply of SWP Water, and Groundwater Development Phases I & II).

At this time, the majority of District fees and charges are collected through the bi-monthly billing of customers. The total revenue from these fees and charges is not sufficient to fund the cost of a) the aforementioned SWP water purchase and (b) the planning and implementation of Milestone III capital improvement projects as described in the WDSFR. The District has therefore evaluated and initiated three additional sources of revenue to help fund its water management programs and capital improvements:

- First, the District has evaluated and subsequently adopted a proposal to collect a fee (proportionate to water consumption) from all water service customers through the San Bernardino County tax rolls to fund the SWP water purchase[1]. The District implemented the procedures for adoption of the proposed fee under Article 13D, Section 6 of the California Constitution (Proposition 218). On August 7, 2004, the District Board of Directors adopted the proposed fee, with only 900 (13%) of the affected customers protesting the fee.

- Second, the District has implemented a New Construction Supplemental Water Supply Fee for all new residential construction within the District water service area to pay for the development of water sources alternative to the lake for supply of water to new homes.

- Third, the District has adopted a policy that requires the developer of any proposed subdivision within the District's water service boundary to fund the development of a groundwater well or wells capable of producing a sustained water supply to offset the total water demand of the proposed subdivision. This policy a) prevents draw on the lake without prohibiting development of new subdivisions and b) funds the development of groundwater resources within the District.

3.1.2 Project Goals and Objectives

Effective June 1, 2004, the District enacted a mandatory water conservation policy that requires all customers to reduce their water usage by 25% from recorded 2002 usage. Since more than 50% of water is used for landscaping, the District has implemented various policies to assist customers in efficient irrigation of existing landscaping and aid them in meeting their reduction goals. The proposed Automatic Meter Reading (AMR) System Project (Project) will help meet conservation goals.

The goal of the Project is to minimize or eliminate the need to purchase imported Bay-Delta supplies by conserving water using new technologies to extend current water supplies, and improve and maximize the use of water from Lake Arrowhead. .Leaks in residential water systems due to neglect or freezing in the winter can lead to large amount of water loss. By using the Automatic Meter Reading (AMR) technology, it is planned that leaks or other problems in the systems can be detected much earlier than is currently possible. The District's goal is to install and implement as many AMR systems as possible throughout the District's water system.

[1] Pursuant to California Government Code Section 61621 et seq. and Health and Safety Code Section 5470 et seq., the District is authorized to prescribe and collect rates or other charges for the services and facilities furnished by it, and may elect to have such charges collected on the tax rolls.

One of the major objectives of the Project is to increase water use efficiency so as to offset future demands on the proposed State Water Project (SWP) deliveries. Some of the key specific objectives of the Project are:

- Faster Leak Detection: Many homeowners are part time seasonal residents and are not able to monitor water use and leaks. Snow during the winter and rugged terrain make it difficult to detect leaks.
- The AMR System alerts when a meter does not show zero-read at any point during a 24-hour period (i.e., 1 hour/day).
- Conservation Monitoring: Measures such as odd/even watering days are easily monitored and enforcement is expedited.
- Timely and Accurate Billing: Currently, due to snowy weather conditions, the District in unable to read meters for up to six months in some cases, and instead sends estimated bills to customers based on previous years' records
- Dispute Resolution: Technology uses profile data to resolve customer disputes by providing daily data to customers.
- Monthly Billing: The current bi-monthly billing could be increased to monthly.
- Ability to Trend Customers Usage for Water Conservation Purposes.

In addition, the Project would preserve local flexibility of water management decisions. As per the CALFED Record of Decision (ROD), the District desires to maintain the flexibility of implementing water use management and efficiency improvements at the local level while exploring regional programs to maximize benefits, such as future SWP deliveries. The AMR technology will be a valuable tool in water management and future water conservation decision-making processes. The Project will also build on existing water use efficiency programs internal to the District and create positive momentum established by these existing programs.

3.1.3 Project Need

The immediate need of the Project results from a current state of overdraft in Lake Arrowhead. In a study from 2004 entitled "Lake Level Analysis" by Bookman-Edmonston, a long-term safe perennial yield of the lake, based upon historic hydrology, was estimated at 1,500 acre-feet per year. According to the study, this is the level that could be sustained without having an adverse effect on the lake level over the long term. In 2002, consumption reached an all time high of 3,150 AFY. This current demand combined with the annual evaporative losses creates a total demand on the lake that is greater than the last five years of precipitation has been able to meet. Therefore, water conservation of current supplies from the lake and reduction of purchasing future supplies, which would be provided through SWP deliveries, is an immediate priority.

Other stresses on the local water supply include trees dying in large numbers due to beetle infestation. Due to the multi-year drought coupled with the beetle infestation, the area was in immediate danger of fire as the dead and dying trees were a prime fuel. In April 2003, the State of California declared a state emergency in this portion of the San Bernardino National Forest due to the massive tree die off caused primarily by the drought and bark beetle infestation. As predicted later that year, massive fires burned through the Lake Arrowhead region. The recent forest fires threatened large parts of the community and destroyed many buildings. Lake Arrowhead is the major source of water to fight forest fires, and when a fire is burning "all bets are off" and the lake is used for as long as needed for fire suppression. Therefore, during a future fire event the lake could be further overdrawn which would put more of a burden on future SWP deliveries if conservation measures are not in place.

These fires can also cause power outages that affect the clocks on many irrigation control boxes. Power outages are frequent in this region due to fires, high winds, and dead trees falling on power lines. When a power outage occurs and the power comes back on, the control boxes default to the factory settings. The settings are usually for the irrigation systems to come back at 10 minutes per station per day. Even if the customer is at the residence, it may take them awhile to realize they are now over irrigating their property and using water inefficiently. The problem is exacerbated when the property owner is the seasonal type, and not monitoring the irrigation system for months at a time. Thousands of cubic feet of water can be wasted due to this phenomenon. Add to that the inability to read the meters during winter, snowy months, a leak or overwatering can go undetected for several months.

A classic example is a seasonal customer complaining about a water bill for over $10,000 because while he was living in his permanent residence, his Lake Arrowhead vacation home's irrigation system was severely over-watering the property landscape. Problems such as these can be alleviated using AMR technology which can detect leaks or over irrigation much earlier than with current technology.

It is currently estimated over 200 AFY is lost through residential leakage or improper meter sizing and possibly another 150 AFY is lost through large landscape customer leakage or improper water use techniques. Because of the rugged terrain and snowfall in the winter, accessing meters at many sites is very difficult and many meters are not monitored during the winter. Depending on the severity of the current year's winter, the sites can be inaccessible for up to 6 months. Currently, if a leak or timer malfunction is occurring, there is a strong probability it will not be detected until the site is accessible in the spring.

Therefore, by implementing and using AMR technology, District staff can remotely make meter readings from a main road or by line of sight. Sites that were not monitored before due to in-climate weather and access issues, can be monitored year round. Since the AMR technology is expensive, start-up costs for the District are a barrier to begin Project implementation; therefore, additional funding is needed.

3.1.4 Plan Consistency

The District strives to manage its water resources wisely. In 2000, the District updated its Urban Water Management Plan (UWMP) along with implementing Ordinance No. 48 establishing water conservation

requirements. Part of these updates and policy changes were to meet the challenges from the ongoing drought, as well as to meet the future challenges for water resource management in general. The District is aware that water conservation and water use efficiency are management tools that will be a permanent part of their resource management strategy and that incorporating larger regional issues such as the CALFED Bay-Delta programs into the District's decision making process will create a more positive and far reaching management vision.

The District published their Final Water Demand Supply Report (WDSR) in 2003. Part of the report dealt exclusively with water demand management programs and projects. Some of these programs are water conservation type programs such as this Project. Technical and economic feasibility studies have been completed or are currently underway for many of the projects and programs planned. The AMR technology project is consistent with current water management planning for the District.

The legal basis for the District's right to draw water from Lake Arrowhead to provide domestic water, is found on the Quitclaim Deed recorded October 10, 1975, Records of San Bernardino County, Book 8795, Page 1053 ff., citing a Deed from Lake Arrowhead Utility Company dated March 28, 1924, recorded on July 31, 1924 in Book 847, Page 176, Records of San Bernardino County. These documents have been interpreted so that the District has the rights to withdraw up to 4,000 gallons per minute on an average annual basis. In terms of annual production, this translates to 6,451 acre-feet per year. While the right exists for this level of diversion, the ability of the Lake to yield that much while protecting its recreational and community values must be considered.

The most recent year's data (2002 is used as the current baseline) indicates a consumption of approximately 3,150 AFY. This current demand combined with the annual evaporative losses creates a total demand on the Lake that is greater than the last five years of precipitation has been able to meet. In addition, according to the "Lake Level Analysis" performed by Bookman-Edmonston in 2004, it is estimated that the safe perennial yield of the lake is 1,500 AFY.

The District has begun a water conservation program that is targeting a reduction in water use by 750 AFY. As part of this effort, the District performed a review of water consumption records that indicate a substantial increase in summer use over winter use, in some cases going up over 350 percent. Correlations between areas experiencing higher levels of water usage are areas that have extensive landscaping. The District has already identified the largest 10 percent of water users and has begun to contact them regarding the potential of developing individual conservation plans.

3.1.5 Implementation of Water Demand Management Activities

Demand Management refers to methods a water supplier may undertake to reduce demand on the water system. The Urban Water Management Planning Act (UWMPA) requires a description of fourteen specified Demand Management measures (known as the Best Management Practices or "BMP's") which are listed in the Memorandum of Understanding (MOU) Regarding Urban Water Conservation in California.

As a signatory to the water conservation MOU in California, the District has stated its intentions to pursue to the best of its ability the implementation of the Best Management Practices (BMPs). There are specific guidelines for implementing and measuring the effectiveness of each measures implementation, which is controlled by the statement, "at least as effective as." This gives District some flexibility to implement particular programs and request exemption from others in its annual filing of its BMP report to the California Urban Water Conservation Council (CUWCC).

The following list documents the implementation of the UWMPA BMP's by the District to date. Note that BMP's 6 and 8 are to be implemented this year (2005). BMP 10 is not applicable to the District.

- BMP's 1 & 2: Residential Survey and Plumbing Retrofits. District staff (with the support of an irrigation and landscape consultant) provide surveys and conservation kits to customers upon request. Staff has made an effort to target the highest 700 water consumers.
- BMP 3: System Water Audits, Leak Detection and Repairs. The District has created a Construction Department to replace all trouble areas within the water distribution system. In 2003 the District performed a water audit of the entire system.
- BMP 4: Metering with Commodity Rates for All New Connections and Retrofit of Existing. The entire District is metered and a tiered conservation rate schedule is in place that escalates with water use. Billing is performed on a bi-monthly basis.
- BMP 5: Large Landscape Conservation Programs & Incentives. The programs that were created for BMPs 1 & 2 also exist for BMP 5.
- BMP 6: High Efficiency Washing Machine Rebates. To be implemented in 2005.
- BMP 7: Public Information Programs. Newsletters, handouts, and other materials regarding water conservation activities are distributed to the public. A "Landscape Guide for Mountain Homes" has been produced and distributed to promote landscape awareness.
- BMP 8: School Education. To be implemented in 2005.
- BMP 9: Conservation Programs for Commercial, Industrial, & Institutional (CII) Accounts. The programs that were created for BMPs 1 & 2 also exist for BMP 9.
- BMP 10: Wholesale Agency Assistance. Not Applicable.
- BMP 11: Conservation Pricing. See BMP 4.
- BMP 12: Conservation Coordinator. There are currently two staff members designated as conservation coordinators.

- BMP 13: Water Waste Prohibitions. Established in the District Water Conservation Ordinance No. 48 and in subsequent drought declaration ordinances, specific water waste prohibitions have been set forth along with a penalty and enforcement structure.

- BMP 14: Residential Ultra Low Flush Toilet (ULFT) Replacement Program. The District established a ULFT exchange program in 2004. 1,000 high-flow toilets were replaced with ULFT's.

Implementation of these BMP's will conserve water and therefore reduce demand on Lake Arrowhead. While there will be costs to the District for implementation, savings will accrue to the District through lower pumping, treatment and wastewater disposal costs. Additional savings will accrue to District customers through lower energy use associated with low flow plumbing fixtures and installation of high-efficiency washing machines.

Water conservation measures, which have been under implementation or recommended for implementation in 1999 under the Lake Arrowhead Community Services District Water Awareness Program can be found in Appendix C of the District's UWMP and are summarized in Table 1 of Appendix B in this proposal.

In addition to these BMP's, State law requires land use planning jurisdictions to enact a landscape water conservation ordinance consistent with the State Model Landscape Ordinance, that uses a water budget approach, or that has rules and regulations without tracking usage. The District lies within the jurisdiction of San Bernardino County, which maintains a landscape conservation ordinance. District Ordinance No. 48 provides requirements promoting efficient landscape design limits, irrigation hours, and specifies turf application limitations.

The AMR Project will help customers adhere to the landscape conservation ordinance by discovering problems with their water supply and irrigation systems much earlier than currently possible. By creating a more efficient accounting and billing system for customer's better analysis of their water use and efficiency practices can be accomplished.

3.2 Technical/Scientific Merit, Feasibility

3.2.1 Feasibility and Technical Adequacy

Many water agencies and water districts in the southwest are using AMR technology. Pilot and research programs are well documented in various industry periodicals such as WATER WORLD (September 2003) and ELECTRIC ENERGY T&D Magazine (July-August 2003). Also the Montgomery Research website http://www.utilitiesproject.com/ has links to articles such as "AMR - More Than Reading a Meter" by Martiza Jackson, President of the Automatic Meter Reading Association. Her article shows the 10-year development of the technology and how current computer science and wireless networking advances have helped AMR systems become a valuable tool in water use conservation and efficiency.

The AMR Implementation project will consist of merging new AMR technology with the District's current meter data collection and billing infrastructure. Much of this work will be done in the field at each meter site and some will take place in the District's main office where the database, server, and other billing and data storage devices are located. The vendor will temporarily partner with the District to ease the transition and to train District staff to use the new technology. Because much of the infrastructure exists, much of the new AMR technology is simply added on by vendor staff experts. These tasks are expanded below in the outline of the AMR Implementation Program.

The District desires to implement an AMR system to create greater water efficiency in its service area. The vendor's tasks during implementation services include the following:

Pre-installation Configuration Support and Services for:

- PC/Server Hardware
- Operating System
- Software
- Network
- Database
- Handheld Communications

Support for Billing System Interface Development includes:

- Comprehensive Training
- PC Operator/Supervisor
- Meter Reader
- AMR Installation/System Optimization

Partnership

A successful implementation will involve partnership between the vendor and the District, where shared responsibilities are fulfilled in a timely, professional manner.

Vendor responsibilities will include:

- Appointing an Implementation Coordinator to schedule and oversee all aspects of the system installation.
- Providing file layout documentation and support for the development of the Billing System interface.
- Configuration support for all system hardware and software.
- Evaluation of District test data files transmitted between the Host and the PC. Note: Onsite training is not scheduled until the Billing System interface has been successfully tested.

District responsibilities will include:

- Appoint team of individuals responsible for the Billing System interface/PC operations and AMR field/meter issues.
- Select system parameters to tailor RouteSTAR to manage the District's operation. (All options are detailed in the documentation and reviewed with the Vendor Implementation Coordinator.)
- Furnish samples of meters designated for AMR retrofit, if necessary.
- Furnish phone lines for remote data transfers if required.
- Create the transmission file (download) to the PC and the file received by the Host (uploaded) from the PC.
- Select a file transfer package.
- Select firm to install units.
- Begin collecting monthly data.
- Monitoring and Assessment
- Final and Quarterly Reporting

Vendor Training

Effective onsite training is critical to the initial success of a new project. Vendor Trainers bring extensive field experience and proven teaching methods to the District facility with the goal of creating onsite experts able to get the most out of the District's Vendor system. Training times are tailored to the needs of the District. Typical AMR-only installations can be thoroughly trained in three days. AMR training is generally done at a later date to allow customers to first become completely comfortable with the foundational aspects of the system.

Training Programs

- ROADRUNNER handheld training
- RouteSTAR MVP operations training
- RouteSTAR MVP administration training
- FIREFLY AMR system optimization
- Certified FIREFLY Installer™
- Quarterly Supplemental Training

The District will provide some of their own workforce with installation contractors for AMR installation. It is vitally important that those installers be trained in all aspects of FIREFLY installation, system optimization and customer service. From handheld and software training, from RouteSTAR MVP administration to FIREFLY AMR installation, the vendor will perform the training services that will ensure that everyone associated with the AMR project is fully equipped to be successful.
If funding is granted for the Project, the District is ready to proceed almost immediately from the December 2005 DWR anticipated funding decision date (see Table 4: Project Schedule). Once a vendor is selected, the Project will move forward quickly with installation and implementation of the AMR technology.

3.2.2 Task List and Schedule

The following presents the Project Work Plan by task and deliverables. A detailed Project Task List and Preliminary Schedule is included in Table 2 of Appendix B.

Task 1: Project Administration

1.1 Draft Board Items to adopt Resolution
1.2 Environmental Documentation such as Notice of Exemption

Task 1 Deliverables

- Formal Draft of Resolution to Proceed
- Environmental documents to State and County

Task 2: Public Outreach and Communication

2.1 Marketing: Update District website to include Program description and benefits (monthly billing, early leak detection, etc.)

Task 2 Deliverables

- Web site updates
- Mass mailings to customers
- Project brochures

Task 3: AMR Equipment Purchases

3.1 Select vendor via RFP process
3.2 Purchase AMR technology

Task 3 Deliverables

- RFP solicitations
- Purchase agreement with costs

Task 4: Automatic Meter Reading Technology Installation and Implementation

4.1 Vendor onsite training prior to installation
4.2 Installation of technology using vendor or subcontractors and District staff
4.3 Implementation of technology using vendor training support and District staff

Task 4 Deliverables

- Vendor Training Plan
- Post Installation Report. This will be included in the overall Project reporting in Task 6

Task 5: Monitoring and Assessment

5.1 Baseline compilation
5.2 Data collection from AMR meter readings
5.3 Physical monitoring during site visits
5.4 Data entry
5.5 Data analysis

Task 5 Deliverables:

- Monitoring and Assessment Plan documentation
- Database with baseline and current AMR system data entered
- Site visit observation forms
- Assessment Report documenting findings and potential success of the Project. This will be included in the overall Project reporting in Task 6

Task 6: Final and Quarterly Reporting

6.1 Draft Final Report after the initial implementation and installation of system
6.2 Quarterly reports to show progress and current cost benefits

Task 6 Deliverables:

- Project Final Report
- Ongoing Project Quarterly document progress and cost benefit analysis

3.2.3 Preliminary Plans and Specifications and Certification Statements

The proposed Project is an Implementation Project; therefore, preliminary plans, specifications, and/or certification statements are not necessary.

3.2.4 Environmental Documentation

The Project is introducing new technology to already existing water delivery infrastructure and therefore this project should be considered Categorically Exempt under CEQA. A Notice of Exemption will be prepared and submitted to the California Office of Planning and Research and the County of San Bernardino.

Based on interpretation of Title 14, California Code of Regulations, Chapter 3: Guidelines for Implementation of the California Environmental Quality Act. Article 19 Categorical Exemptions, Sections 15300 to 15333; the following interpretation is cited as basis for considering this Project Categorically Exempt.

15301. Existing Facilities

(h) Maintenance of existing landscaping, native growth, and water supply reservoirs (excluding the use of pesticides, as defined in Section 12753, Division 7, Chapter 2, Food and Agricultural Code)

The District will prepare a Notice of Exemption for submittal to the California Office of Planning and Research and the County of San Bernardino.

3.3 Monitoring and Assessment

3.3.1 Baseline Determination

Pre-Installation water meter readings for the selected area will be analyzed and stored in a project database. Most of this data already exists in database format due to the existing infrastructure. Previous attempts have been made to quantify the amount of leakage that occurs in the service area. The current accepted value of 200 AFY will be used as a reference. Care will be given to use true water use data from actual meter readings and not to use the estimated water use values.

3.3.2 Monitoring Methodologies

Monitoring tasks will include the actual meter readings using the new AMR technology. The meters can be read from a vehicle using a device or probe that uses wireless technology to communicate with the automatic meter reader. The data is then sent and recorded into a mobile receiving unit that stores the data. Proper field documentation will include site conditions, equipment status and any other external factors noted during monitoring that may influence results. The data will be downloaded in the District's computers for analysis and customer billing.

3.3.3 Success Evaluation

The overall goal of success evaluation is to measure the success of the entire project through quantitative and qualitative data analysis. The District will compile and analyze water use data to measure the success of entire project for the selected areas where AMR technology was installed.

<u>Quantitative analysis of the Project area will include:</u>

1) Level of participation in the program,

2) Amount of water conserved in the site areas, and

3) An estimation of avoided water losses in the area due to early leak or over-watering detection. Results of the analysis are expected to demonstrate a reduction in domestic and irrigation water use.

3.3.4 External Factors

The AMR system should actually take external factors out of the monitoring equation. The whole purpose of the system is to overcome difficulties collecting meter data due to poor weather conditions and impassable sites during winter and to detect zero usage during 24-hour periods to ensure against leaks.

3.3.5 Information Handling

The AMR technology is state of the art when it comes to handling and storing data. Flexibility and multi use analysis software is included with the system purchase. Data will be downloaded into District computers and databases. Reports to DWR and other interested parties will be delivered in both hardcopy and electronic formats. Also, a large amount of Project data will be uploaded for display on the District's website.

3.3.6 Estimated Costs

As shown in Table 2 of Appendix B and Table C-1 of Appendix C, Monitoring and Assessment tasks have been allocated an estimated budget of $32,000. It is projected that 120 hours of staff labor will go into drafting and implementing a Monitoring and Assessment Plan for a total of $6,000. The remaining task budget will be for actual staff for site visits and report writing.

4.0 Qualifications of the Applicants and Cooperators

4.1 Resume of Project Manager

The resume of Project Manager Marc Lippert is included with this proposal (see Attachment A).

4.2 Role of External Cooperators

There are no external cooperators associated with the proposed Project.

4.3 Previous Water Use Efficiency Grant Project Experience

In 2003, the District was successful in obtaining a water use efficiency grant from the United States Bureau of Reclamation Authority (USBR) for ET Controller implementation. The success of this pilot project depended on the use of the District's Water Conservation Stakeholder Group, which consisted of members of the community, landscape, forestry and flood control professionals, conservation experts, District staff and consultants. For this pilot project, the District solicited participants from the District's top 10% of water use customers. These participants were responsible for the installation of the controllers using qualified installers, a list of which was provided to the participants. District staff then monitored the controllers and irrigation usage at each project site for four months to ensure settings were properly calibrated, making corrections where necessary.

The first year of this pilot project has recently been completed, and a report has been filed with the USBR identifying a total reduction in irrigation water usage of 33% for program participants. Marc Lippert, the District's Water Conservation Coordinator, was responsible for administration and monitoring of this pilot project.

4.4 Disadvantaged Community

The District does not meet the definition of a disadvantaged community.

5.0 Outreach, Community Involvement, and Acceptance

5.1 Public Outreach

The District remains committed to the public outreach process as fundamental to the decision making process for the development of future projects. The District has a website devoted to customers and the public. The hyperlink to the District's website is: http://www.lakearrowheadcsd.com/index.html. This website has links to many topics such as current and proposed project information, customer FAQs, billing and payments, upcoming Request for Proposals, and also includes links to various District reports such as the very informative 2003 the District Water Demand and Supply (WDSF) Final Report and the "Lake Level Analysis" performed by Bookman-Edmonston.

The District plans to implement a similar public outreach process for the AMR project as conducted for the WDSF Final Report. Since the Project involves accessing residence properties to install the AMR technology and change in billing from bi-monthly to monthly, the District will prepare and send letters to District customers, project brochures, website updates, and articles in the local newspaper, which will precede the implementation of this project. The following describes the public outreach process conducted for the WDSF Final Report.

In preparing the WDSF Final Report, the District defined their public outreach program. In WDSF Section 7, Public Comments, shows how the District's Board followed a schedule that included public workshops and four public Board meetings to review the alternatives and recommendations in the Draft Report and to obtain both comments and suggestions.

The District provided all customers with a written summary of the Draft Report and published a summary in the local newspaper (Mountain News) prior to the workshop. In addition, the District reconvened the Stakeholder Advisory Group (SAG) to review the Draft Water Demand Management and Supply Report with their constituents.

The District made copies of the Draft Report available to any interested member of the public either by providing them for review at District offices and in several other public locations or by providing, free of charge, a CD-ROM of the report upon request. The Draft Report was also posted on the District's website. Copies of the full report were made available for the cost of reproduction. The Final Report summarizes all comments received as a part of the public process. It is organized into four sections:

- Results of the public workshop held August 28, 2003
- Summary and response to written public comments
- Summary and response to oral public comments made at District Board workshops and meetings
- Results of SAG meetings

As stated this process will be followed for planning and implementation of the AMR Project.

6.0 Innovation

Mobile wireless data retrieval ability for AMR technology is evolving and becoming more efficient than ever. As more advances are made in computer science, especially with regards to the cost of non-volatile memory, the capability to collect and store large amounts of water use interval data at the customers meter has increased. This will allow the District to perform increased data analysis on customer usage data.

The proposed automatic meter reader is marketed as a breakthrough in AMR technology because it is the first to deliver true meter independence and integrated usage profiling in an affordable package. This means usage profiling can be achieved at District defined intervals. For example, if you set the meter to 60 minute intervals you can hold hourly consumption data for each meter for over 74 days. Previously to achieve this level of usage information, profiling the meter would have to be equipped with a costly flow monitor. In addition, the meter activates an alert when it has not returned a zero reading during a 24-hour period (which can be indicative of leaks).

7.0 Benefits and Costs

Total costs for the Project are currently estimated at $816,300. The majority of the costs displayed in Table 2 of Appendix B and Table C-1 of Appendix C are direct labor or equipment purchases. Labor costs included in Project administration tasks include such activities as preparing items for submission to the District's Board of Directors for approval of a Resolution to Proceed, and documentation of environmental compliance. Project and Grant administration labor costs are embedded in Tasks 4, 5, and 6 to more efficiently and effectively manage each Project task. In this way, each task has an administrative sub component factored into it and budget funds can be adjusted to administrative duties as they arise.

Other direct labor costs are embedded in Tasks 4 and 5, and will include staff hours and labor for, but not limited to, the following:

- Training for implementation of technology
- Installing and troubleshooting new software and hardware
- Communicating with vendor during troubleshooting and installation
- Visiting the sites collecting automatic meter readings
- Office tasks such as data entry, reporting, and water use analysis.

The majority of the Project costs are allocated to purchasing and installing of the AMR system equipment. The equipment will include the actual automatic meter readers that attach to existing meters in the field and the software and hardware to retrieve store and analyze the data. Also included in the Installation and Implementation tasks is the onsite training by the AMR vendor that will be vital to merge the AMR technology with the District's existing infrastructure.

Cost and Benefit tables are included in Tables C-1, C-2, C-3, C-5, C-6, C-7, and C-8 of Appendix C.

7.1 Narrative for Tables C-1, C-2 & C-3:

No O&M costs are calculated for the Project because the costs will be absorbed into existed operations and maintenance duties inherent to the existing water delivery and administrative billing and tracking infrastructure.

7.2 Narrative for Table C-5:

The Project will immediately give a direct benefit to the local service area and the Bay-Delta by increasing water supplies by detecting leaks in the water supply system earlier than currently is possible. It is anticipated up to 350 AFY may be conserved or saved to early leak detection. For planning purposes, the District will use a conservative value of 200 AFY potential savings based on previous calculations. This 200 AFY would immediately come from Lake Arrowhead or at the time of Project implementation from the SWP.

As previously stated, the District is in the process of formalizing a purchase agreement with a State Water Contractor (MUNI) to purchase up to 1,500 AFY (beginning as early as mid to late 2005).

Factors such as the current drought extending into another water year make the amount of SWP deliveries subject to change literally according to the weather. If the drought continues and the District has to purchase SWP supplies immediately, then this project will directly benefit the State as water conservation will be taking place and at least 200 AF of deliveries will not be required. If the drought is broken by a wet year and no SWP supplies are immediately required, then the Project will have a more direct benefit to local supplies and a more indirect benefit to the State as future deliveries will be offset by at least 200 AFY. As a result, it is difficult to quantify the benefits to the Bay-Delta system, except to state that the Project has the potential for both indirect and direct benefits both locally and statewide.

7.3 Narrative for Tables C-6, 7, and 8.

Major benefits to be expected to result from the implementation of the AMR technology are listed as follows:

- Faster Leak Detection: Many homeowners are part time seasonal residents and are not able to monitor water use and leaks. Snow during the winter and rugged terrain make it difficult to detect leaks. AMR's send an alert if no "zero-read" has been returned during a 24-hour period (a sign that a leak may be occurring).
- Conservation Monitoring: Measures such as odd/even watering days are easily monitored and enforcement is expedited.
- Timely and Accurate Billing: Currently, due to snowy weather conditions, the District in unable to read meters for up to six months in some cases, and instead sends estimated bills to customers based on previous years' records.
- Dispute Resolution: Technology uses profile data to resolve customer disputes by providing daily data to customers.
- Monthly Billing: The current bi-monthly billing could be increased to monthly.
- Ability to Trend Customers Usage for Water Conservation Purposes

Appendix C: DWR Benefit and Costs “C” Tables

Table C-1

Applicant:LAKE ARROWHEAD COMMUNITY SERVICE DISTRICT

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

Category (I)	Project Costs $ (II)	Contingency % (ex. 5 or 10) (III)	Project Cost + Contingency $ (IV)	Applicant Share $ (V)	State Share Grant $ (VI)	Life of investment (years) (VII	Capital Recovery Factor (VIII)	Annualized Costs $ (IX)
Administration[1]								
Salaries, wages	$4,000		$4,000	3,000	$1,000	3	0.3741	$1,496
Environmental Compliance	$500		$500	375	$125	1	1.0600	$530
Total Administration Costs	$4,500		$4,500	3,375	$1,125			$2,026
Public Outreach and Communication	$2,800		$2,800	2,100	$700	3	0.3741	$1,047
Purchase AMR System	$619,500	5	$650,475	487,856	$162,619	12	0.1193	$77,602
Installation and Implementation of AMR	$150,000	10	$165,000	123,750	$41,250	3	0.3741	$61,727
Monitoring and Assessment	$32,000		$32,000	24,000	$8,000	5	0.3741	$11,971
Report Preparation	$7,500	5	$7,875	5,906	$1,969	5	0.3741	$2,946
TOTAL	$816,300		$862,650	646,988	$215,663			$157,319
Cost Share -Percentage				75	25			

1- excludes administration O&M.

Applicant: **LACSD**

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

Table C-2: Annual Operations and Maintenance Costs

Operations (1) (I)	Maintenance (II)	Other (III)	Total (IV) (I + II + II)
$0	$0	$0	$0

(1) Include annual O & M administration costs here.

Table C-3: Total Annual Project Costs

Annual Project Costs (1) (I)	Annual O&M Costs (2) (II)	Total Annual Project Costs (III) (I + II)
$157,319	$0	$157,319

(1) From Table C-1, row (n) column (IX)
(2) From Table C-2, column (IV)

Table C-5: Project Annual Physical Benefits (Quantitative and Qualitative Description of Benefits)

Applicant:	**Lake Arrowhead Community Service District**				
Table C-5 Project Annual Physical Benefits (Quantitative and Qualitative Description of Benefits)					
	Qualitative Description - Required of all applicants[1]				**Quantitative Benefits - where data are available [2]**
	Description of physical benefits (in-stream flow and timing, water quantity and water quality) for:	Time pattern and Location of Benefit	Project Life: Duration of Benefits	State Why Project Bay Delta benefit is Direct[3] Indirect [4] or Both	Quantified Benefits (in-stream flow and timing, water quantity and water quality)
Bay Delta	See Narrative for Table C-5	See Narrative for Table C-5	At least 12 years based on the life span of the AMR technology and overall Project success	See Narrative for Table C-5	200 AFY
Local	See Narrative for Table C-5	See Narrative for Table C-5	At least 12 years based on the life span of the AMR technology and overall Project success	**Not applicable.**	200 AFY

[1] The qualitative benefits should be provided in a narrative description. Use additional sheet.

[2] Direct benefits are project outcomes that contribute to a CALFED objective within the Bay-Delta system during the life of the project.

[3] Indirect benefits are project outcomes that help to reduce dependency on the Bay-Delta system. Indirect benefits may be realized ove

[4] The project benefits that can be quantified (i.e. volume of water saved or mass of constituents reduced) should be provided.

Table C-6, C-7, and C-8

Applicant:	Lake Arrowhead Community Service District		
THE TABLES ARE FORMATTED WITH FORMULAS:	**FILL IN THE SHADED AREAS ONLY**		
Table C-6 Project Annual Local Monetary Benefits			
ANNUAL LOCAL BENEFITS	**ANNUAL QUANTITY**	**UNIT OF MEASUREMENT**	**ANNUAL MONETARY BENEFITS**
(a) Avoided Water Supply Costs (Current or Future Source)	200	Acre Feet/year	$500,000
(b) Avoided Energy Costs	0		$0
(c) Avoided Waste Water Treatment Costs	0		$0
(d) Avoided Labor Costs	0		$0
(e) Other (describe)	0		$0
(f) Total [(a) + (b) + (c) + (d) + (e)]			$500,000
Table C-7 Project Local Monetary Benefits and Project Costs			
(a) Total Annual Monetary Benefits [(Table C-6, row (f)]		$500,000	
(b) Total Annual Project Costs (Table C-3, column III)		$157,319	
Table C-8 Applicant's Cost Share and Description			
Applicant's cost share %: (from Table C-1, row o, column V)			**75**
Describe how the cost share (based on relative balance between Bay-Delta and Local Benefits) is derived. (See Section A-7 for descr			
Provide Description in a narrative form.			