FAIR OAKS WATER DISTRICT

WATER RATE STUDY

November 12, 1998

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EXECUTIVE SUMMARY

INTRODUCTION

Because of recent developments from regional, state, and federal policies and actions to require full water metering, the Fair Oaks Water District (District) decided to study water metering and metered water rate issues in detail. In the fall of 1997, the District contracted with Hilton Farnkopf & Hobson, LLC (HF&H)[1] to perform a study whereby the Board of Directors could consider issues and make decisions regarding flat water rates, metered water rates, water metering, and a variety of other rate and fee issues. A second study is currently underway to develop plan to install water meters on all remaining residential service connections.

The approach to the water rate study initially had two distinct phases. The first phase was to explore the policy, financial, institutional, technical, and public acceptance issues with the Board of Directors, and to solicit policy direction and consensus on various issues. A series of public workshops were held for this purpose. The second phase of the study was to perform the detailed cost of service analyses and develop rate structure alternatives to best achieve stated policy objectives and the goals of the Board. A third phase of the project was added to incorporate the study's recommendations with the District's proposed 1999 budget. The three sections of this report generally follow the developments during each phase of the project.

The purpose of the water rate study was to perform analyses relative to the cost of providing water service to the District's customers, and to develop and explore rate and fee alternatives that will most equitably and effectively distribute and allocate costs to customers. Rate setting objectives identified by the District included:

- Rates should reflect the cost of providing water service to customers
- Rates should be technically sound, yet as simple and straight-forward as possible
- Costs should be allocated equitably among customers and customer classes
- Rates should encourage water conservation without penalizing reasonable water usage
- Rates should provide long-term revenue sufficiency and stability
- District customers should support rates.

In 1997, California voters reaffirmed a desire to have a say in the level of taxes, assessments, and fees imposed on them. While the impact of Proposition 218 on water rates is still unclear, the

[1] The Reed Consulting Group assisted Hilton Farnkopf & Hobson during this project.

electorates' message is clear – fees and charges should be based on the cost of providing service, and should not include hidden costs or components for other purposes. The District understands customers' concerns and undertook this study with the purpose of ensuring that all customers will bear no more than a fair share of water system costs.

WATER METERING AND METERED WATER RATES

The District has long recognized the importance of water meters. The reasons meters are important were reviewed and discussed by the Board to reaffirm the District's position. The primary reasons that water meters are important include:

- Meters provide the means to charge customers based on actual water usage which is considered to be a far more equitable means of charging for water service. The rate equity issue is of growing importance to customers.

- Water meters have been shown to result in reduced water use of 20 percent or more for single family customers (independent of rate structure changes or other factors). While it is difficult to estimate how metering will affect customer demand within Fair Oaks, it is almost certain to result in a significant reduction in water usage.

- Reduced water demands may reduce the District's cost of operations, including water purchase and pumping costs. These cost savings will offset cost increases resulting from meter maintenance, meter reading, and metered billing.

- The ability to monitor customer demands will improve the District's water management capabilities. Meters will enable the District to identify its largest water users, to target water conservation efforts, and to monitor the effectiveness of various water conservation measures.

- More than ever before, water is viewed as a valuable and limited (though renewable) resource. Competing pressures for the State's water resources are placing ever-increasing demands for responsible use of water. Through water metering and improved water management practices that metering allows, the District will be better able to demonstrate that it is a responsible steward of the State's water resource.

The Board of Directors reaffirmed that water metering is *the right thing to do*. In addition, the District recognizes that: (1) water meters are a requirement of all new construction, (2) the Water Forum process has resulted in an agreement to meter all customers, and (3) the U.S. Bureau of Reclamation's (USBR) contracts for Central Valley Project (CVP) water include requirements to make a good faith effort to meter all connections by 2005. While the District does not have a contract directly with the USBR, it does obtain a portion of its water from the CVP through the San Juan Water District.

In 1998, the Board of Directors represented to the USBR that it would make a good-faith effort to complete metering of all customers by 2005. While the District has supported metering efforts for many years, this would require an accelerated effort with respect to residential metering.

About 25 percent of the District's customers are currently metered. Those customers with water meters include:

- All new construction since 1988
- Nearly all commercial and many multi-family customers (commercial and multi-family metering is expected to be complete in 1999)
- All services along water mains which have been replaced in recent years, as well as customer with service lines that have needed to be repaired or replaced to correct leaks
- Any customer that has voluntarily requested a water meter.

With the completion of commercial and multi-family metering in sight, and with a commitment to expand efforts to meter remaining residential customers, the District felt it necessary to explore metered water rate issues in detail. As a result, much of this water rate analysis study focused on metering and metered water rate issues.

This water rate study focused primarily on rate structure issues and the requirements for 1998 and 1999. The District recently embarked on a more extensive Metering Implementation Plan project to explore in greater detail the technical, financial, and public acceptance aspects of the planned residential metering program. That project, scheduled for completion in early 1999, will provide the District with a multi-year plan and strategy for achieving metering goals, as well as meeting other operational, capital program, and debt service obligations.

MAJOR FINDINGS AND RECOMMENDATIONS

The remainder of this Executive Summary summarizes the major findings and recommendations resulting from this study. The body of the report contains more extensive discussion of these and other issues.

Existing Flat Rates

- The District's existing system of flat rates appears reasonable and generally provides as much equity as any system of flat rates can provide. We recommend that the District continue using the existing system of flat rates (with annual rate adjustments) until metered rates can be fully implemented, with two exceptions.
- The District's 1993 water rate study identified several customer classes whose flat rates are out of line with the cost of service analysis. That rate study recommended gradual adjustments to those rates to bring them into line with the cost of service analysis. The District has been making annual rate adjustments for these customer classes for this purpose, we recommend that those adjustments continue as previously recommended.
- The District's flat rate for large single family customers includes a surcharge for parcels larger than 1 acre. We recommend a that this surcharge for large parcels be a function of

the size of the parcel, rather than a flat amount regardless of parcel size. For 1999, the large parcel excess use surcharge would be $57.10 per acre (for the portion above 1 acre).

Metered Water Rates

- The District's water rate revenue requirement for 1999 is about $4.11 million. This is about 18 percent higher that the 1998 water rates. The primary reasons for the increase include: (1) increased operating costs, including the cost of water purchases, (2) debt service coverage requirements, (3) a shift towards funding of capital improvement from current revenues rather than from reserves[2].

- A majority of the District's costs are fixed and not a function of water consumption. Therefore, a metered water rate structure should include both a fixed service charge component and a variable commodity charge component.

- The District's operating, capital program, and debt service costs can be segregated into customer, capacity, and commodity components. Customer and capacity costs should be included in fixed service charges and commodity costs included in a commodity rate. Customer costs should be allocated equally to all customers, while capacity costs should be allocated to customers based on the potential demand that could be placed on the water system (as reflected by meter size).

- Based on a cost of service analysis for 1999, about 75.5 percent of the District's rate revenues should be derived from fixed service charges with the remaining 24.5 percent derived through commodity charges. The metered water rate schedule for 1999 would include a uniform commodity rate of $0.17/CCF[3] plus the following monthly service charges[4]:

Meter Size	Serv. Chrg.	Meter Size	Serv. Chrg.
3/4"	$12.00	4"	$141.00
1"	$16.55	6"	$279.00
1 1/2"	$30.40	8"	$445.00
2"	$46.95	10"	$693.00
3"	$91.15		

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2 In recent years the District has utilized reserves (including debt proceeds) to fund capital improvements. Most of the available reserves have been depleted. Therefore a significant portion of capital improvement costs will now be funded on a pay-as-you-go basis using current revenues.

3 CCF = 100 cubic feet = 748 gallons

4 The 1999 budget does not reflect the additional operational costs associated with large-scale meter reading, metered billing, and meter maintenance.

Implementation of Metered Rates

- The District should offer all customers the option to be billed on a bi-monthly billing cycle beginning in 1999 as a convenience for customers and in preparation for metered billing. In addition, all installed water meters should be read on a bi-monthly basis.

- Mandatory metered water rates should be implemented for commercial and multi-family customers as soon as all customers within these classes are metered (by the year 2000). Bi-monthly billing is a prerequisite to charging customers on the metered water rates. Therefore bi-monthly billing will be required for all commercial and multi-family customers when metered rates go into effect. The availability of bi-monthly billing to customers makes voluntary use of metered rates possible.

- Mandatory metered billing for residential customers should not begin until all residential meters are installed (possibly by 2005). However, voluntary metered rate billing should be made available to any customer that has a water meter.

- The District is developing a multi-year financial plan to evaluate the current level of water rates and consider the financial and cash flow needs associated with: (1) conversion to bi-monthly billing, (2) transition to metered water rates, (3) the planned accelerated metering program, (4) other capital improvement needs, and (5) potential restructuring of the District's outstanding debt. The multi-year financial plan is being prepared as part of the development of the Metering Implementation Plan.

Water Shortage Rates

- The District should adopt single family shortage tier water rate structures for various stages of water shortage. The shortage tier structures would provide an additional water conservation incentive during periods of limited water availability. The proposed shortage tier structures would also help ensure that water rate revenues would be sufficient to cover costs, even at a time of reduced water use.

- Once additional meter data are available, the District should consider developing water shortage tier rate structures for multi-family (on a per dwelling unit basis) and irrigation (on a per acre basis) accounts.

- The proposed water shortage tier structures should be incorporated into the District's water shortage guidelines and procedures. Water shortage rates should be reviewed each year as part of the rate-setting process.

Other rate and fee issues are discussed and explored in the body of the rate study report. Some of the other rates and fees evaluated during the study include lifeline rates, outside-of-District rates, charges for interties, private fire service charges, construction water use rates, and connection fees.

I. WATER METERING AND WATER RATES: POLICY ISSUES

BACKGROUND

The District provides retail water service to approximately 12,750 customers. All customers are currently billed for water service based on a schedule of flat water rates. The term *flat water rate* is used to describe the system of charges, which is independent of measured water use, but relies upon estimates of water use for each class of customers. The District's schedule of flat water rates includes about 40 different customer categories. Each customer is charged for water service based on customer category, and a corresponding estimate of water use.

Most water utilities in California, and throughout the United States, install meters on all customer connections and charge customers based, at least in part, on the amount of water actually used. The Fair Oaks Water District has long recognized the importance of water metering. However, the cost to retrofit a water system with meters is costly and time consuming. About two years ago, the District embarked on a meter retrofit program for its commercial customers and a voluntary metering program for residential customers[5]. In addition, State law has required that all new construction include a water meter on each new water service connection since 1990.

To date, about 3,300 water meters have been installed on customer service connections[6]. Recent developments in the Sacramento region have placed greater emphasis on metering issues. These developments include:

- The Water Forum process[7] has identified water conservation as one of the critical elements necessary to provide a reliable and safe water supply for the Sacramento region's economic health and planned development, as well as the protection of environmental, recreation, and aesthetic values of the Lower American River. Central to water conservation efforts is the need to measure water use. Water meters and charging customers based on the quantity of water used are essential to meeting water conservation goals. Indeed, many water conservation measures will be less effective without metering. The proposed Water Forum Agreement calls for metering all residential customers within the next 30 years.

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5 The District's current definition of commercial customer includes multi-family accounts (i.e., apartments, triplexes, fourplexes, etc.). Residential customers include single family, condominiums (with individual connections), and duplexes. We recommend that the District begin to distinguish between multi-family and commercial customers. This report and the detailed rate analyses contained herein reflect this distinction.

6 Meters are being read on a regular basis, however, customers are not yet billed based on actual water use.

7 The Sacramento Area Water Forum is providing a community-based approach to addressing the region's water needs. Water Forum stakeholders include business interests, environmental interests, public interests, and water interests.

- Historically, water metering has been a sensitive issue in the Sacramento region[8]. The low cost and relative abundance of water from the American and Sacramento Rivers made it difficult to justify water meters. However, recent efforts by other utilities in the Sacramento region to install residential meters have met with less resistance than expected. In fact, as the cost of water service has increased, customers have sought fairer approaches to charges for water service. Charging based on the amount of water they use allows customers some control over their own water costs.

- Water agencies receiving water from the Central Valley Project (CVP), including the District (via the San Juan Water District), will be required to be fully metered under the terms of water supply contracts with the U.S. Bureau of Reclamation (USBR).

- The Fair Oaks Water District is a signatory water district of the California Urban Water Conservation Council's (CUWCC) Memorandum of Understanding Regarding Water Conservation Best Management Practices (MOU). As a signatory, the District has committed itself to implement a broad range of water conservation best management practices (BMPs) including the metering of all customers and implementation of a conservation-oriented commodity-based water rate structure.

Because of these developments, the District has taken a closer look at the costs and implications of metering existing customers. These issues are closely related to water rate issues because metering allows the District to implement a metered water rate structure, and to gradually phase out the system of flat rates.

The workshops held by the District's Board of Directors on September 30, October 28, and November 25, 1997 provided the opportunity to discuss many of the issues related to water meters and both metered and flat rate structures in detail. The remainder of this section summarizes the results, conclusions, and decisions of these workshops, and provides direction for detailed rate analyses.

WATER METERS AND METERING

The Importance of Water Meters

The District has long recognized the importance of water meters. The reasons meters are important were reviewed and discussed by the Board to reaffirm the District's position. The primary reasons that water meters are important include:

[8] The City of Sacramento has a City Charter prohibiting mandatory meter retrofits.

- Meters provide the means to charge customers based on actual water usage which is considered to be a far more equitable means of charging for water service. The rate equity issue is of growing importance to customers[9].

- Water meters have been shown to result in reduced water use of 20 percent or more for single family customers (independent of rate structure changes or other factors). While it is difficult to estimate how metering will affect customer demand within Fair Oaks, it is almost certain to result in a significant reduction in water usage.

- Reduced water demands may reduce the District's cost of operations, including water purchase and pumping costs. These cost savings will offset cost increases resulting from meter maintenance, meter reading, and metered billing.

- The ability to monitor customer demands will improve the District's water management capabilities. Meters will enable the District to identify its largest water users, to target water conservation efforts, and to monitor the effectiveness of various water conservation measures.

- Having a better understanding of customer water demands may also enable the District to improve water system operations and water conservation efforts.

- More than ever before, water is viewed as a valuable and limited (though renewable) resource. Competing pressures for the State's water resources are placing ever-increasing demands for responsible use of water. Through water metering and improved water management practices that metering allows, the District will be better able to demonstrate that it is a responsible steward of the State's water resource.

The Board of Directors reaffirmed that water metering is *the right thing to do*. In addition, the District recognizes that: (1) water meters are a requirement of all new construction, (2) the Water Forum process will likely result in an agreement to meter all customers, and (3) the U.S. Bureau of Reclamation's (USBR) contracts for Central Valley Project (CVP) water include requirements to make a good faith effort to meter all connections by 2005. While the District does not have a contract directly with the USBR, it does obtain a portion of its water from the CVP through the San Juan Water District.

Cost of Installing Water Meters

For many years the District has been installing water meters on commercial and multi-family connections. A few years ago the District expanded this effort with the goal of completing the meter retrofit program for commercial and multi-family connections within five years. In addition, the District has metered up to about 50 residential customers each year on a voluntary

[9] A citizens advisory committee working on rate issues for the Carmichael Water District recently unanimously supported a recommendation for the District to aggressively pursue the installation of water meters. This recommendation was supported primarily for the rate equity benefits.

basis. Through these efforts the District has developed information on the cost to install water meters on existing service lines[10]. The experience of other utilities involved in meter retrofit programs was also reviewed to develop cost estimates related to the District's meter retrofit efforts.

Exhibit 1 summarizes a preliminary estimate of the capital cost to install water meters on all of the District's unmetered connections[11]. The costs in this table are general estimates based on recent experience and cost information provided from multiple sources. The total cost to install meters on all remaining customers is estimated to be about $6.3 million. The estimated cost to complete the current commercial and multi-family metering program is about $160,100. District staff now estimates that metering of commercial and multi-family customers will be complete in 1999, slightly ahead of schedule.

The District's metering efforts to date have been funded from reserves. Reserves are sufficient to complete the metering of commercial and multi-family customers, but would not be sufficient to meter residential customers. In order to finance the residential metering program the District could either increase water rates to cover the cost of installations, or seek alternative financing.

At a pace of $150,000 per year (in current dollars), it would take the District about 42 years to meter all remaining customers. Because this time period for metering is not realistic, the District will need to raise water rates and possibly issue new debt to finance an accelerated meter installation effort. Even if the District obtains financing for the meter retrofit program, water rates will need to support debt service payment obligations.

Three financing options have been identified which could assist the District in paying for the meter retrofit program.

First, Proposition 204, passed by California voters in November 1996, includes provisions for State Revolving Fund (SRF) loans to be used for water conservation projects, such as meter retrofit programs. The Department of Water Resources is implementing the program and applications for SRF loans are now available to interested local agencies. The District is currently reviewing loan program requirements, and will likely seek a low-interest loan. The SRF loans are available for qualified projects at an interest rate equal to one-half of the State's General Obligation bond rate. This is the same type of program that the City of Davis used to finance their meter retrofit program (Davis' SRF loan was funded under Proposition 82).

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[10] The cost of installing water meters on existing service lines is significantly more than the cost of installation during new construction.

[11] A more comprehensive evaluation of the costs associated with metering the District's residential customers is currently underway.

Exhibit 1
Fair Oaks Water District
Estimated Costs to Install Water Meters on Existing Unmetered Services (1)

	3/4"	1"	1 1/2"	2"	3"	4" Comp.	6" Comp.	10" Comp.	Total
Unit Costs									
Meter Installation (2)	$ 500	$ 600	$ 1,100	$ 1,350	$ 2,500	$ 4,000	$ 8,000	$ 12,000	
Water Services									
Existing Commercial Meters	1	134	88	149	-	9	3	2	386
Existing Residential Meters	8	2,691	204	52	-	-	-	-	2,955
Total Existing Meters (3)	9	2,825	292	201	-	9	3	2	3,341
Commercial Accts. to Be Metered (4)	-	120	65	50	5	5	5	-	250
Cost of Metering	$ -	$ 72,000	$ 71,500	$ 67,500	$ 12,500	$ 20,000	$ 40,000	$ -	$ 283,500
Residential Accts. to Be Metered (4)	-	8,750	500	150					9,400
Cost of Metering	$ -	$ 5,250,000	$ 550,000	$ 202,500	$ -	$ -	$ -	$ -	$ 6,002,500
Total Accounts	9	11,695	857	401	5	14	8	2	12,991
Total Costs	$ -	$ 5,322,000	$ 621,500	$ 270,000	$ 12,500	$ 20,000	$ 40,000	$ -	$ 6,286,000
Avg. Cost/New Mtr.									$ 651
Unit Costs From Other Agencies									
Fair Oaks WD (5)		$ 575	$ 980	$ 1,225					
Carmichael WD (6)	$ 600	$ 700	$ 1,400	$ 1,650	$ 2,500	$ 3,000	$ 4,000		
City of Davis (7)		$ 563							

Notes

(1) This table reflects general estimates based on data from several sources, including service installation contract bid, meter manufacturer pricing, and staff estimates and experience.
(2) Estimated average cost of adding meter to existing service, including Touch Read technology.
(3) From District records as of July 1997.
(4) Estimates based on number of accounts, installed meters, and expected sizing.
(5) Based on discussions with District staff and 1998 budget estimates.
(6) Estimates based on information from District staff, meter manufacturers, and service installation bid documents.
(7) Based on contract installation of about 8,000 residential meters at a cost of $4.5 million.

Second, revenue bond or certificates of participation financing may also be an option available to the District, although these options would have more traditional interest rates associated with them. The California Municipal Utilities Association (CMUA) has established a Joint Powers Authority (JPA) to finance resource efficiency projects for local agencies. This JPA, the Financing Authority for Resource Efficiency of California (FARECal), issues revenue bonds for multiple qualified projects to gain economies of scale in issuing debt. The Association of California Water Agencies (ACWA) has a similar program with a variable interest rate.

Finally, the District is planning to restructure its existing long-term debt to reduce its annual debt service obligations and thereby generate some additional funds. While debt restructuring appears to be advantageous, restructuring alone will not provide sufficient funds to fully support the District's residential metering program.

The District's Planned Metering Program

During workshops in the fall of 1997, the District's Board of Directors reaffirmed its intent to complete the metering of commercial and multi-family accounts within the planned five-year schedule. At the completion of this effort the District intends to shift its effort to retrofitting residential customers. District staff now estimates that the commercial and multi-family metering program will be complete in 1999.

Residential meter retrofits could likely be accomplished on a pay-as-you-go basis over a 12 to 15 year period at a cost of about $500,000 per year using either District forces or contracting out the installations. This level of effort is about 3 times the current level of effort, and would require an increase in water rates to support the program. The District's 1998 water rates will generate about $3.5 million per year. Therefore, a $500,000 increase in water rates would require a 14 percent increase in water rates (the rate increase could be phased in over several years).

Alternatively, the District might seek some form of financing. Financial assistance would make it possible to install meters in a shorter period of time (assuming that most or all of the installations were performed under contract). It is conceivable that all residential customers could be retrofitted with meters in a 3 to 5 year time frame. Such an aggressive program would not, however, be possible without financial assistance. Even if the District obtains financial assistance from outside sources, any loans or long term debt would need to be paid back with interest. Furthermore, such an aggressive metering program may not be well accepted by customers.

The District is currently evaluating in greater detail various meter installation and financing alternatives. Key decisions will likely be made in early 1999. One way or the other, water rates will eventually need to be increased to pay for the metering program[12]. Estimates of cost to fund

[12] Conceivably, customers could choose to pay directly for their own meter at time of installation, rather than include the cost of meter installation in the rates. However, this would likely lead to a dual system of rates that pose other significant administrative issues, and is not advised.

the accelerated metering program on a per-customer basis range generally in the range of $2.50 to $4.00 per month for customers with a standard 1" meter[13].

WATER RATES FOR METERED CUSTOMERS

Slightly more than one-quarter of the District's customers currently have water meters. With a significant share of the District's customers metered, the Board has begun to consider water rates that are based on actual water use.

Nearly all other water districts in the Sacramento area have metered water rates for at least some of their customers. Most local agencies have already fully metered their commercial customers. In most cases, metered water rates apply to metered commercial customers. Many Sacramento area water agencies have all or at least some of their residential customers metered, and it is common for metered rates to apply to those customers with meters. For those agencies in the process of installing residential water meters, the approach for imposing metered water rates differs. Some water districts apply metered water rates only to new connections, or at the time accounts change hands (e.g., sale of a house). Other water districts provide metered customers with the option of being on a flat or metered water rate. In these cases, the option is one-way. That is, once a customer chooses a metered water rate they can not revert back to the flat rate.

There are a variety of water rate structure issues to be addressed in developing and implementing metered water rates. Many of these issues have been discussed with the Board of Directors. In some instances decisions were made and rates will be calculated accordingly. On other issues, decisions could not be made without further analysis. The remaining part of this section describes many of the water rate issues and the direction proposed for the District. Section II of this report describes the analyses and rate calculations related to these issues based on conditions in 1998. Issues that were not fully addressed with the Board are explored in greater detail in Section II which was prepared as part of the technical evaluation phase of the study.

Section III of this report presents metered rate calculations based on the proposed budget and revenue needs for 1999.

Water Rate Structure Options

The District has wide latitude on how it sets its charges for water service, and there are a number of types of water rate structures available for metered water systems. The water rate structures most commonly include some type of fixed service charge as well as a commodity charge. The service charge typically varies in amount based on the size of the water meter. Commodity

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[13] The range of costs is a result of assumptions related to the pace of meter installations, financing methods, and interest costs. Rough estimates of increased operating costs were only generally considered in the analysis. The District may also realize cost savings due to reduced water consumption, which could offset operational cost increases. The net impact to the District's operating and maintenance costs due to metering is not yet known.

charges are usually determined based upon metered water use and applicable commodity rates. The primary types of water rate structure components are described below.

Service Charge Components

- *Fixed Service Charge* -- This type of charge is usually charged to all customers regardless of water usage. Frequently the charge recovers the fixed costs of the utility's annual revenue requirement. These are costs that would generally be incurred regardless of the total amount of water produced and sold by the utility. Costs to be recovered through fixed service charges may include customer-related costs and capacity-related costs. Customer costs are those costs that are basically the same for all customers. Meter reading and billing costs are good examples. Capacity costs are those costs that are related to the size and capacity of the water system. These costs tend to be allocated to customers based on the potential demand that each customer places on the water system. This is most commonly achieved by allocating capacity costs in proportion to the capacity of each meter size. In more sophisticated cost allocation methodologies, capacity costs may be allocated to different customer classes based on demand characteristics of each class, and then allocated to various meter sizes within each class.

- *Minimum Charge* -- This type of charge is similar to the fixed service charge but includes a base amount of use. For example, customers might pay a minimum bill for water service including up to 10 CCF[14] of water, with additional commodity charges for use in excess of 10 CCF. The minimum charge includes a service charge component as well as a charge for 10 CCF of water, whether the customer uses that much water or not. Minimum charges are used less often than in the past, due in part to the lack of conservation incentive for customers using less than the base quantity.

Commodity Rate Components

- *Uniform Commodity Rate* -- The simplest and most common commodity rate structure is the uniform rate in which all water is priced at the same amount. Commodity rates are normally designed to recover all variable costs associated with the provision of water service. Frequently semi-variable or fixed costs are also included in commodity rates to provide a greater conservation incentive. Variable costs are those costs that are directly related to the amount of water produced and distributed by utilities. Water purchase costs, treatment costs, and pumping costs are examples. Semi-variable costs are those which may vary with water production and distribution, but not as directly (or immediately) as variable costs. Examples include pump or treatment plant maintenance, production or treatment staffing, etc. It is not uncommon, as a matter of policy discretion, to design water rate structures such that 80 percent or more of the rate revenues are generated through commodity rates even though most costs would be considered fixed.

[14] 1 CCF = 100 cubic feet = 748 gallons.

- *Declining Block Rate* -- This type of structure includes commodity rates that decrease with increasing use. At one time this type of rate structure was one of the predominate structures in the water industry. This structure is rarely seen in California or other western states due to the perceived disincentive to conserve water (the more water you use, the cheaper it gets). A declining block rate structure is not acceptable under the California Urban Water Conservation Council's (CUWCC) water conservation best management practices (BMPs) to which the District subscribes.

- *Inclining Block Rate or Tiered Commodity Rate* -- This rate structure is gaining increased prominence among California water utilities. The rate structure includes commodity rates that increase with increasing use. Two- and three-tier rate structures are most common, although more tiers are possible. Tier rate structures are more difficult to design, and when improperly designed can be viewed as punitive by customers. Tier structures should be designed around the water use patterns of a relatively homogeneous customer class. Single family customers tend to be a homogeneous customer class exhibiting a *normal* range of water use. Multi-family customers (when viewed on a per-dwelling-unit basis) are also a homogeneous class, although frequently with different use characteristics than single family. Non-residential customers typically do not exhibit homogeneous water use patterns, and the design of tier structures is more problematic. Many utilities will develop tier structures for residential customers and use uniform or seasonal rates for non-residential customers. When tier structures are developed for non-residential customers they are often based on meter size, water budget, or lot size (for irrigation uses). In some cases, tier rates can be based on cost analyses (e.g., reflecting the marginal costs of different water supply sources). However, it is also common for tier rates to be based simply upon multipliers (e.g., 25 percent rate differential between tiers) without any economic rationale.

  Proposition 218, passed by California voters in 1997, has raised some questions regarding the use of tiered pricing for water rates. It appears that tiered pricing based on cost of service analyses would be acceptable. However, a tier rate structure that is not supported by cost of service analyses (e.g., percentage multiplier) may be subject to a higher risk of legal challenge.

- *Seasonal Rates* -- Commodity rates can also be designed to vary with the season of the year. Seasonal rates are often used either when costs vary significantly between seasons or when capacity constraints during peak seasons create a need to encourage greater conservation during peak periods. Uniform or tiered rate structures can be used with seasonally adjusted rates. Some utilities have a uniform rate in winter and a tiered structure in summer. Design considerations in establishing seasonal rates include determining the seasonal periods, identifying seasonal costs, and addressing issues related to billing during the transition from one season to the next.

- *Shortage Tier Rates* – As a result of the large variation in the annual availability of water supplies within California many water utilities have developed procedures to implement shortage rates during period of limited water availability. By defining various stages of water shortage utilities can design shortage rates to accommodate the water supply/

demand constraints and encourage additional water conservation, as well as address the financial needs of the utility under various water supply situations. In many cases, water shortage rates may include implementing a tiered water rate structure during shortage periods, or modifying existing tier structures to reflect needs of the utility. Shortage rates provide water utilities additional flexibility in meeting the needs of customers in both normal and water shortage conditions, and past experience has shown that customers are willing to except an alternate rate structure during periods of water shortage. The District may be able to meet its water management and water conservation objectives through the implementation of a shortage rate structure when water supply conditions dictate such a need.

The transition from flat water rates to metered water rates is significant. For the first time customers will have water bills that change with changing use. For example, water bills in the summer are likely to be larger than winter bills. Customers' water use patterns are likely to change somewhat with the metered rate structure. The exact amount is unknown, but is likely to be related to the type of rate structure put into place.

A uniform water rate structure with a fixed service charge (by meter size) is recommended for the District as an introduction to metered water rates. The fixed service charge will provide a stable source of revenues and a uniform rate is easiest to administer and frequently perceived as the most fair by consumers. Ultimately some form of tiered rate structure may be appropriate for the District during normal supply conditions; however, appropriate design of a tier structure requires a greater understanding of water use characteristics of each customer class. That understanding is not currently available in the absence of full metering and a history of metered use data for each class.

Calculating Metered Water Rates

Metered water rates have been developed for the District based on the 1998 budget and water rate revenue requirement (see Section II)[15]. **Exhibit 2**, on the following page, summarizes the 1998 water rate revenue requirement. The revenue requirement is the total annual amount of revenue that must be generated from water rates to cover the District's operating, debt service, and capital improvement program costs, net of other revenues and the use of available fund and/or reserve balances. The revenue requirement calculations presented in this report do not reflect anticipated increased costs associated with the planned expanded residential metering program. Those additional costs will be identified and incorporated in a multi-year financial plan as part of the development of the District's Metering Implementation Plan.

[15] Section III was added to the report to present metered water rates based on the proposed 1999 budget.

Exhibit 2
Fair Oaks Water District
1998 Budget Summary and Revenue Requirement Determination*

	1998 Budget
GENERAL FUND	
Beginning Fund Balance (Unrestricted)	$ 1,731,000
Operation & Maint. Expenditures	
Administration	$ 861,750
Board of Directors	$ 81,000
Maintenance & Construction	$ 794,210
Operations	$ 1,120,580
	$ 2,857,540
Debt Service & Long-Term Notes	
1989 COPs	$ 412,355
1991 COPs	$ 361,929
Cooperative Transmission Pipeline	$ 295,910
Trustee Fees	$ 7,500
	$ 1,077,694
Capital Improvements	
Administration Dept.	$ 178,000
Maintenance Dept.	$ 324,873
Operations Dept.	$ 1,093,100
Equipment	$ 110,250
	$ 1,706,223
Transfers To/(From) Reserves	
Emergency Reserve	$ 45,000
Facility Upgrade Reserve	$ 50,000
	$ 95,000
Miscellaneous Revenues	
Redemptions	$ 85,000
Irrigation Charges	$ 17,160
Fees for Service	$ 20,000
Connection Fees	$ 6,000
Interest Income	$ 425,000
Other Revenue	$ 7,500
	$ 560,660
Water Rate Revenues	**$ 3,503,376**
Ending Fund Balance (Unrestricted)	$ 58,579
Change in Fund Balance	$ (1,672,421)
EMERGENCY RESERVE	
Beginning Fund Balance	$ 754,515
Transfers From/(To) General Fund	$ 45,000
Ending Fund Balance	$ 799,515
FACILITY UPGRADE RESERVE	
Beginning Fund Balance	$ 200,000
Transfers From/(To) General Fund	$ 50,000
Ending Fund Balance	$ 250,000

* The revenue requirement does not reflect the cost of an expanded metering program.

The commercial and multi-family metering program has been funded from existing reserves. The annual costs of the residential metering program will be determined in upcoming months, and may include the issuance of new long-term debt. Funding the residential metering program on a pay-as-you-go basis over 12 to 15 years could cost about $500,000 per year. This would represent an increase in the annual revenue requirement of about 14 percent from 1998 levels[16]. The cost of the residential metering program may be mitigated through a combination of debt and/or low interest loans, gradual increases to the water rates, alternate phasing of the metering program, and possibly other means. The District will address these issues in the upcoming months with the development of a Metering Implementation Plan.

A relatively simple cost allocation and rate design procedure is recommended for the District. The recommended approach has the advantage of resulting in defensible water rates that categorize costs into customer, capacity, and commodity categories. Customer and capacity related costs are recovered through the service charge and commodity costs are recovered through the uniform commodity rate. The rate calculation model can be easily updated with each year's budget and customer base.

The District's flat water rate structure has an apparent advantage of providing very stable and predictable revenues. Metered water rates will result in revenues that change with changing water demand. Frequently water utilities are concerned about revenue volatility associated with changing water demands. For this reason there is a desire to tie commodity rates strictly to costs that are directly variable such that fluctuations in cost due to changes in demand are matched by changes in revenues. In reality the problem of revenue volatility is less significant than generally feared. In fact, the District's flat rates pose a similar (but opposite) problem. Under the system of flat rates, revenues do not change with changing water demands. During hot, dry years when use rises the District's costs increase due to increases pumping and water purchases. Revenues, however, are static and do not rise with greater water use.

Metered water rates are calculated in Section II based on a cost of service analysis that considers which costs are fixed and which are variable. In reality some costs (what we have referred to as semi-variable costs) are neither purely fixed nor purely variable, and some judgment is required as to whether they are included in the service charge or commodity rate. Rates were proposed based on rate setting experience and judgment in the allocation of costs, and then presented to the Board of Directors for discussion and acceptance.

We recommend that the District's water rates initially take a fairly conservative view of fixed and variable costs (emphasis on classifying costs more as fixed than variable). This is recommended to minimize the revenue volatility during this initial period when the District does not have complete knowledge of customer water use characteristics, or know how customers' water demand will change due to metering and metered billing. Over time, we suspect that customers (as well as the District) will prefer greater emphasis on the commodity rate (i.e., lower service

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[16] Additional operating and maintenance costs will also result from metering and metered billing. The costs are not reflected herein and may, at least partially, be offset by reduced water purchase and pumping costs as customers use less water under metered rates.

charges) thus enabling them to have greater control over the amount of their water bills. A gradual shift of costs to the commodity rate can occur over time.

Other Rate Issues

The Board of Directors expressed interest in reviewing a number of additional water rate issues in greater detail. As part of the technical evaluation of water rates, the following rate issues were analyzed in greater detail and reported back to the Board (see Section II).

Lifeline Overlay

The Board of Directors discussed the possibility of including a lifeline rate as part of the District's water rate structure. There are mixed feelings as to whether this type of subsidized water rate is necessary or desirable. The requirements of Proposition 218 also raised some questions regarding the use of lifeline rates. The Board requested that the lifeline rates be explored further as a possible overlay to the water rates developed during this study.

Marginal Cost of Future Water Supplies

One of the possible approaches to setting commodity rates is to reflect the marginal cost of providing water service. If the cost to the District to provide additional water in the future is greater than current average costs, this future cost may also be an appropriate commodity rate. The purpose of using marginal cost information is to provide customers with a price signal that reflects the true cost of producing additional water to meet additional customer demands. When marginal pricing is included in rate design, it is often incorporated as one or more of the tier rates.

The next section examines the relative costs of the District's current and potential future water sources and examines the suitability and applicability to using the marginal cost information in setting the District's commodity rates, either now or at some point in the future. Because we believe it is premature for the District to consider adopting a tiered water rate structure for normal water supply conditions, it is also early to consider adopting a marginal cost-based tier structure. Nevertheless, having an understanding of the relative costs of existing and potential future water supplies can influence future decision making.

Water Rates during Periods of Water Shortage

The Board of Directors expressed concern regarding the loss of water rate revenues that may result from reduced water sales during a drought or water shortage. During the last extended drought in California many water utilities found that they needed to repeatedly increase water rates to cover costs as demand declined. Many customers felt they were penalized by the higher rates that resulted in higher bills even though they meet demand reduction targets. In many instances the problems were a result of customer perceptions which could have been handled with better public information and education efforts. Nevertheless, poor rate design can also contribute to the financial instability that many utilities experienced.

The District has a water conservation plan that defines various water supply availability stages with specific levels of severity and corresponding response actions. As part of the detailed rate analyses (in Section II), we recommend an approach to adjusting water rates through the various stages of water supply availability with the purpose of avoiding revenue shortfalls and minimizing customer criticism. While we recommend that the District not implement a tiered water rate structure for normal periods (Stage 1 conditions), a tier structure should be considered as part of a response program in stages of water supply deficiency. Indeed, many water utilities had their first exposure to tiered rate structures during water shortage situations. The rate concept for periods of water shortage presented in Section II includes a tier structure for single family customers. We also consider the applicability of a rate stabilization fund to help mitigate the potential impacts of revenue volatility.

Private Fire Service Charges

Many water utilities have separate service charges associated with private fire service connections. These connections are often required by fire officials to provide on-site fire fighting capabilities (e.g., on-site hydrants, sprinkler systems, etc.). Costs included in the private fire service charges can reflect the cost of providing fire flow capacity, as well as maintaining appurtenant equipment (e.g., check valves, flow detection meters, etc.). The District provides fire flow capacity to public fire hydrants throughout the service area. The costs of public fire fighting capabilities are included in the rates paid by all customers. On-site fire fighting capabilities reduce the risk of fire-related property damage, reduce the total water used to extinguish fires, and reduce the fire fighting water demand for sprinklered facilities. Therefore, the District believes that the private fire service charges should reflect only the costs of installing and maintaining appurtenant equipment, but not distribution capacity costs.

Private fire service charge analyses and recommendations presented in Section II.

Construction Water Rates

Construction contractors frequently request temporary water service during construction of their development projects. Landscape maintenance firms also periodically request temporary water service to mix pesticides/fertilizes in mobile tank vehicles. Many utilities provide temporary construction meters that can be attached to fire hydrants to provide the temporary water service. In most cases the District does not provide a meter to measure temporary water service. Instead it relies upon four different schedules to estimate water usage and assess a flat fee. A fifth option available to District staff is to provide a temporary meter and charge for actual use at a rate of $1.60/1,000 gal. ($1.20/CCF). The issue to be addressed is what is the appropriate method and water rate to charge for temporary construction water service.

Rates for Interties to Other Agencies

The District is currently studying the capabilities of the water system to continue to provide water service in the event of an emergency. One of the issues identified in this effort is a need to have additional intertie connections between the District and adjacent water districts. These

interties could provide emergency and non-emergency water supplies in either direction. The connections must be sized sufficiently large to meet potential water demands.

The Board would like to consider the approaches available to share the cost of constructing interties between agencies, and for charging for water which is transferred between agencies. Ultimately, these issues will need to be negotiated by the affected agencies. However, Section II explores the options available and the potential costs involved (capital cost of installation, and operating cost to provide water through the interties), and offers findings and recommendations.

Rates for Outside of District Customers

The District serves a few customers that are outside of the District's service area boundary. The Board of Directors asked that the District's current policies and practices regarding the rates applicable to these customers be reviewed and recommendations made for serving outside of District customers.

Many public water utilities charge customers that lie outside their service area boundaries rate and charges in excess of those charged to customers inside the service area boundary. Section II of this report describes this practice from a rate-setting perspective and provides recommendations for the District.

Connection Fees

The Board requested that the District's current connection fees be reviewed to determine whether there is a need to update either the amount of the fees or the calculation methodology. The current fee methodology was reviewed, as well as the cost basis for fee calculations, during the technical evaluation phase of the study. Findings and recommendations regarding connection fees are contained in Section II.

Implementation of Metered Water Rates

The decision to implement a metered water rate structure is significant because it will require the District to consider many related issues. One of the more significant issues to address is billing practices. The District currently bills customers on an annual basis. Water bills are sent to all customers in the fall of each year to cover the cost of water service for the following calendar (and fiscal) year. Water bills may be paid in two installments due in December and June.

As the District moves to metered water rates two important changes will occur. First, billing will need to be more frequent. Most utilities bill either monthly or bi-monthly (every two months). Because of the time and expense involved in meter reading and billing, bi-monthly billing tends to be a preferred approach, and is the apparent preference of the District[17]. The second, possibly

[17] The preference for bi-monthly billing is not the result of formal analysis but general consensus among the Board, staff, and the consultant. This preference is based, in part, on the practices of other local utilities and the sensitivity to the increased costs associated with more frequent billing (as well as meter reading). Customers

more significant change is that with current annual billing the District is paid for water service in advance of the service being provided. With metered water rates billing is in arrears (a customer is billed for past water use). This change could have an impact on the District's cash flow when billing practices are changed, particularly if a large percentage of customers are converted from annual to bi-monthly billing at the same time.

In theory the conversion from flat rates to metered rates can be made at any time. However, the conversion from annual billing to bi-monthly billing is best made at the beginning of a fiscal year (this avoids the need to prorate and apply credits for water service paid in advance).

We recommend that the District offer bi-monthly billing to all customers (as an option) at the beginning of the next fiscal year (January 1, 1999). Then, beginning in 2000 all commercial and multi-family customers would be converted to bi-monthly billing in conjunction with metered water rates for those customers. Bi-monthly billing would continue as an option for residential customers. These recommendations are discussed in greater detail in Section III of this report.

By converting customers from annual to bi-monthly billing in advance of switching to metered water rates the District has greater flexibility to convert customers to metered rates. Once customers are billed on a bi-monthly basis the switch to metered rates can occur at any time.

The District should study the financial impact of converting customers from annual to bi-monthly billing, particularly as it relates to cash flow during the transition period.

We recommend that the District adopt a metered water rate structure as part of this water rate study. Customers with water meters could be permitted to switch to the metered rates on a voluntary basis as soon as bi-monthly billing is implemented. Once all commercial and multi-family customers are metered, a mandatory conversion to metered rates should occur. Decisions regarding the conversion of residential customers to metered rates (beyond a voluntary program) can be made a few years from now, after the commercial and multi-family conversion has been completed.

WATER RATES FOR UNMETERED CUSTOMERS

The last comprehensive water rate study conducted for the District was in 1993. At that time, a detailed cost of service analysis resulted in recommendations for the District's current flat system of water rates. Several of the customer categories used in assessing flat rates were identified as being charged too little for water service, based on the cost of service analyses. The District has been gradually bringing these categories into line with larger annual rate adjustments (relative to other customer categories). These rate adjustments should continue until all customer classes are brought into balance or until metered water rates are implemented.

During policy workshops with the District's Board of Directors the current flat rate structure was reviewed and discussed. It was concluded that the current system of flat rates (including the

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frequently cite meter reading and billing costs as reasons to maintain the status quo. While bi-monthly billing will cost more than annual billing, it will be less than monthly billing.

gradual adjustments discussed above) are fair and reasonable, and that no dramatic changes are warranted, particularly because metered water rates for commercial and multi-family customers will be implemented in the near future.

Board members also discussed the current flat rates for single family customers. Currently all single family customers pay $221.45 per year for water service. In addition, single family accounts larger than one acre are charged an annual irrigation charge of $165.55. This flat charge is applied regardless of lot size (anything over one acre). The metered water use data available from the District's metered customers indicates that water use does vary with lot size[18]. In addition, evidence suggests that customers' perception of fairness with flat water rates is that lot size should be a factor in estimating a customer's water use, and therefore their water bills[19]. Because the District will continue to impose flat water rates for residential customers for a number of years, the Board determined that alternative approaches to residential flat water rates should be considered. Board members felt that the current approach for lot sizes less than one acre is probably adequate (most single family customers will fall into this group), but that the irrigation charge for parcels larger than one acre might be revised to be a function of each customer's lot size. The detailed rate analysis examined water use characteristics of single family water use and develop recommendations related to this issue.

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[18] The correlation of water use to lot size is far from perfect but it is stronger than other possible water use factors (e.g., area of house, no. of rooms, no. of bedrooms, no. of bathrooms, etc.).

[19] This was a significant conclusion of a citizens advisory committee addressing water rate issues for the Carmichael Water District.

II. WATER RATES: TECHNICAL ANALYSES

This section of the report describes the technical evaluation and analyses performed as part of Phase II of the water rate study. The primary focus of the technical evaluation was to develop recommendations for a metered water rate structure. In addition, the section describes calculations for a revision to the flat water rates charged to single family customers with parcels larger than one acre[20], as well as presenting analyses, findings, and recommendations regarding the range of special water rate and metering issues identified in the previous section.

Water rate calculations consist of a three-step process, each of which is described herein. The first step is a determination of the annual revenue requirement. Metered water rates were calculated based on 1998 revenues needs. The current annual water rate revenue requirement was discussed with the Board of Directors during the workshops, and was presented in Section I of this report. Approximately $3.50 million dollars are generated through the current water rates. The second step is to allocate costs for various functional categories. As described previously, we are recommending an approach that categorizes costs into customer, capacity, and commodity components. Customer and capacity costs are generally fixed costs to be recovered through bi-monthly service charges. Commodity costs are generally variable costs that are recovered through the commodity rate based on actual water use. The third step is water rate design. We recommend a uniform water rate with service charges that vary with the size of a customer's water meter. The reasons that we are recommending this structure are described in further detail herein.

Before performing the cost allocation and rate design calculations it is first necessary to define the customer base being served by the District, as well as determine the amount of water being used by each customer class.

CUSTOMER ACCOUNT DATA

For purposes of the water rate analyses contained herein we have defined four classes of customers. These class definitions are somewhat different than the District's current structure that includes more than 30 specific classifications (for flat rate purposes), or simply a residential or commercial classification. The class definitions we recommend for the District include:

- Single Family -- This includes all single family, duplex, and condominium (with individual water connections) connections.
- Multi-family -- This includes triplex and larger multi-family housing.

[20] This is the only modification proposed for the current system of flat water rates, although the District should continue rate adjustments to achieve equity among the various customer classes.

- Commercial -- All businesses, institutional, industrial, and other uses not otherwise classified.

- Irrigation -- Connections dedicated exclusively for irrigation purposes, even though these connections may be associated with customers who have other connections for indoor water use.

One reason that we recommend these customer classes is that the water use characteristics differ between each customer class. At some future point in time the approach to rate setting for each class might also be different. The USBR is encouraging CVP contractors to implement tiered water rates as a means of encouraging water conservation, when it is appropriate. Tier rate structures are best designed around homogeneous customer groups that have similar water use characteristics. Single family customers meet these criteria very nicely, as do multi-family customers when considered on a per-dwelling-unit basis. An increasingly common approach to tiered pricing for irrigation accounts is to consider the evapotranspiration (ET) water requirements of landscapes. The ability to segregate irrigation accounts from a general commercial or multi-family category is therefore convenient.

For purposes of developing metered water rates for the District, it is necessary to know (or to estimate) the number of customer connections by customer class and by meter size. The District customer billing records provide accurate information regarding the number of customers within each customer class. However, not all customers have water meters. While the District has been able to provide meter size information on connections that now have water meters, it has been necessary to make some general assumptions for unmetered connections, for rate setting purposes.

We discovered that in some instances what is currently a single *account* (e.g., an apartment complex) actually has several water service *connections* (generally one for each building, and possibly a separate irrigation service). Under metered rates, each metered service connection should be a separate account, and have a separate water bill[21]. Currently, the District serves fewer than 40 apartment complexes. However, these complexes include nearly 2,400 dwelling units and may be served by as many as 300 separate connections.

Exhibit 3 summarizes the estimated number of customer connections that would be present if all accounts could be metered today. The connections that currently have meters are tabulated by meter size. An estimate of the number of unmetered connections (which is somewhat different than unmetered accounts, as described in the previous paragraph) is also provided.

[21] It is possible that multiple bills for a single customer could be combined on a single bill statement. This is a billing issue, rather than a rate structure issue, and therefore beyond the scope of this study.

Exhibit 3
Fair Oaks Water District
Summary of Metered and Unmetered Customer Connections*

	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	10"	Unmetered **	Total **
Connection/Meter Data											
Single Family, Condo, Duplex	8	2,664	203	53	1	-	-	-	-	9,413	12,342
Multi-Family		18	11	53	-	-	-	-	-	218	300
Commercial	1	97	65	61	-	3	3	-	2	168	400
Irrigation		19	12	35	-	6	-	-	-	128	200
Total Connections	**9**	**2,798**	**291**	**202**	**1**	**9**	**3**	**-**	**2**	**9,927**	**13,242**

* Based on meter data as of July 1997. Some accounts include more than 1 service connection.
** Estimates based on current number of accounts, and potential for accounts to have more than one service connection.

The rate calculations contained herein are based on estimates of the total number of meters of various sizes that will exist when all existing water service connections are metered. Because the metering program will take many years to fully implement, we recommend that the District review and update the estimated tabulation of customer connections by class and meter size at least annually. This can be performed each year during the budget and rate review process.

ESTIMATED ANNUAL WATER USE

In order to calculate water rates for the District it is necessary to estimate the total amount of water used by the District's customers. The District has good data regarding the total quantity of water entering the water system, either through purchases from San Juan Water District or pumped groundwater. However, there are always losses within the distribution system so not all water is actually used by customers. Starting with an estimated annual water production of 14,800 AF (which is believed to be representative of *normal* water use conditions), we have attempted to balance the amount of water entering the water system with use by customer class, with an allowance for system losses. Water use by each customer class was estimated as described below.

- *Single Family* -- Regression analyses were performed using data from over 2,300 metered single family accounts within the District. The results of these analyses were presented to the Board during the first rate study workshop. Average monthly water use was correlated with parcel size. While the correlation between parcel size and water use is not as strong as we would like, it does provide a reasonable basis for estimating water use. Two separate regression curves were found to provide a reasonable fit with the data. These are:

  Lots up to 0.5 Acre: Avg. Monthly Use (CCF) = 1.77 x Area (TSF) + 9.25

  Lots over 0.5 Acre: Avg. Monthly Use (CCF) = 0.65 x Area (TSF) + 34.16

  TSF = 1,000 sq. ft.

  As an example, the regression relationship suggests that a 10,000 sq. ft. parcel would have an average monthly water use of about 27 CCF (1.77 x 10 + 9.25). The regression relationships were then used to estimate water use for all of the District's single family customers. The average monthly water use by all metered single family customers was

determined to be 32 CCF. The average water use of all single family customers, based on the regression relationships, was also determined to be 32 CCF.

- *Condominiums* -- Evaluation of individually metered condominiums indicated an average monthly water use of 6 CCF. This average water use factor was used to estimate total condominium water use.

- *Duplexes* -- Evaluation of metered duplexes indicated an average monthly water use of 17 CCF/duplex (both dwelling units). This average water use factor was used to estimate total duplex water use.

- *Multi-Family* -- Evaluation of metered multi-family accounts (triplex and larger) indicated an average monthly water use of 6 CCF/dwelling units. This average water use factor was used to estimate total multi-family water use.

- *Commercial* -- Water use by commercial customers is the most difficult to estimate due to the wide variety of types and sizes of businesses. The District provided a 12-month use history on nearly one-quarter of the commercial accounts. However, due to the diverse range of commercial use it is not practical to extrapolate this data to all commercial accounts. As an alternative approach, we utilized the water use factors developed during the previous water rate study[22] to estimate commercial water use. More than 20 categories of commercial account had been defined, each with water use factors. These commercial categories are consistent with the current flat rate structure; therefore the calculation was straight-forward.

- *Irrigation* -- Irrigation water use by customers with separate irrigation connections (including parks, schools, common areas, etc.) was estimated based on water use and parcel data for 45 metered irrigation accounts. The data were used to estimate an average monthly water use of 39 CCF/acre, or about 1.1 inch per month. This is about 25 percent of annual water requirements for landscaping. We can not explain the apparent low water use rate, except we note that entire parcels may not be irrigated. Nevertheless, we used this application rate and applied it to the total acreage of all irrigation accounts.

Exhibit 4 summarizes the estimation of current annual water use by the District's current customers. **Exhibit 5** provides detail on the commercial water use estimate. Water use estimates by customer class result in a total annual water demand of about 13,792 AF. This leads to an unaccounted for loss rate of about 1,008 AF or 6.8 percent of the annual water production. This is within the range of loss rates that should be expected for the District's water system. Water rate calculations contained in the remainder of this report are based on customers' normal annual water use of 13,792 AF, or 6,008,000 CCF.

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[22] Fair Oaks Water District, Water Cost of Service Study and Rate Proposals, Final Report, Public Utility Rate Consultants, September 15, 1993.

Exhibit 4
Fair Oaks Water District
Estimate of Current Annual Water Use*

Customer Class	Current No. of Accounts	Estimated No. of Conn.**	No. of Dwelling Units	No. of Acres	Estimated Annual Water Use (CCF)	Estimated Annual Water Use (AF)
Single Family	10,952	10,952	11,043	4,243	4,637,977	10,647
Condominium	1,066	1,066	1,066		76,752	176
Duplex	324	324	652		66,504	153
Multi-Family	36	300	2,377		171,144	393
Commercial	311	400			840,339	1,929
Irrigation	73	200		465	215,295	494
Total	12,762	13,242	15,138	4,708	6,008,012	13,792
Unaccounted For Water Losses				6.8%	438,868	1,008
Total Production					6,446,880	14,800

* Based on current land use and development.
** Values for multi-family, commercial, and irrigation are estimates based on the completion of the current metering program.

The term *account* is used herein to represent the number of customers that receive a water bill. In some cases, an account may represent service to multiple users (e.g., an apartment complex or shopping center). In addition, under flat water rates, an account may include more than one service connection (we recommended that once meters are installed that a separate account be established for each metered connection).

ANNUAL REVENUE REQUIREMENT AND COST OF SERVICE ANALYSIS

Revenue Requirement

The District's 1998 budget and our revenue requirement determination were presented in Exhibit 2 of this report. The District's annual operating costs, including debt service obligations, currently total about $3.94 million. Water rate revenues total about $3.50 million and other revenues total about $560,000 for total annual revenues of about $4.06 million. This provides only about $120,000 for capital improvements and reserve contributions. The District is currently funding an emergency reserve and a facility upgrade reserve. The emergency reserve will have an $800,000 balance at the end of 1998, following a $45,000 contribution this year. The facility replacement reserve will have about $250,000 at the end of 1998, following a contribution of $50,000.

Exhibit 5
Fair Oaks Water District
Estimate of Commercial Water Use

	Commercial Category	No. of Users	Basic Use (CCF/Mo.)	Irrigation Use (CCF/Mo.)	Annual Water Use (CCF)
		(1)	(2)	(3)	
A	Small Bank and Bars	15	17.75	17.75	6,390
B	Large Banks and Businesses	10	35.50	53.25	10,650
C-1	Florist, Boat Service, Vet	8	35.50	35.50	6,816
C	Beauty Shop, Pet Grooming,	32	21.00	31.50	20,160
	Dentist	39	24.50	30.63	25,799
D	Barber Shops	4	6.00	6.00	576
E	Business & Offices	634	16.00	24.00	304,320
F	Used Car Lots	2	48.00	48.00	2,304
G	Garages	14	17.75	17.75	5,964
Q	Riding Stable	1	240.00	240.00	5,760
R	Restaurants-limited service	36	27.50	27.50	23,760
R-1	Restaurants-full service	16	27.50	27.50	10,560
S	Small Market (Under 5,000 SF)	18	17.75	17.75	7,668
	Large Market (Over 5,000 SF)	2	200.00	200.00	9,600
U	Rest Homes	7	48.00	48.00	8,064
V	Car Wash - Self Serve	1	2,250	2,250	54,000
V-1	Car Wash - Full Serve	1	2,250	2,250	54,000
X	Schools (no. of students)	9,832	0.27	0.41	79,639
Y	Churches	15	27.00	40.50	12,150
Y	Fitness Center	1	406.65	406.65	9,760
Y	Cemetary	2	200.00	200.00	9,600
P	Water Purification	1	0.00	0.00	-
Y	Parkway	3	2,400	2,400	172,800
Y	Misc	3	0.00	0.00	-
Y	SMUD Stations	4	0.00	0.00	-
Total Commercial Water Use (4)		**869**			**840,339**

NOTES:
(1) Some accounts include multiple users.
(2) Basic water use factor for interior water use from 1993 water rate study.
(3) Irrigation water use factor from 1993 water rate study.
(4) Total number of users excludes students.

The District plans to expend about $1.71 million on capital improvements in 1998. However, because current revenues will be used either for operations, debt service, or reserve contributions, essentially all of the capital improvement expenditures will need to come from the existing fund balance. The District's general operating fund had a beginning (unrestricted) balance of about $1.73 million but will end the year with about $59,000. In effect, the District will use up nearly all of its unrestricted reserves in 1998 and will not be able to sustain the current level of capital expenditures in the future without a significant rate increase. Furthermore, the District may wish to consider establishing some form of cash or operating reserve to ensure adequate working capital during a conversion from annual to bi-monthly

billing, as well as the transition from flat to metered water rates. These later issues are discussed in more detail later in this report.

While the current level of the water rates is sufficient for 1998, a significant rate increases may be needed to meet capital program and debt service needs in 1999. An assessment of the future operating and capital needs of the District, as well as projections of future water rates, is outside the current scope of the water rate study. However, an estimate of the 1999 revenue requirement based on the District's proposed budget is provided in Section III of this report. That section also presents a calculation of metered water rates based on the 1999 revenue requirement. As part of the development of the Metering Implementation Plan, the District will be developing a multi-year financial plan and rate projection to evaluate how future capital improvements can be funded with the least impact on customer water rates.

It is likely that water rate increases will be needed in upcoming years to offset inflation, increased water costs, new or restructured debt service obligations, planned capital improvement projects (including the expanded metering program), and the transition to bi-monthly billing and implementation of metered water rates.

Cost of Service Analysis

The District incurs certain types of costs associated with making water service available to customers. Other costs are incurred as a direct result of customer water usage. A cost of service analysis is intended to allocate the costs of providing water service to customers in proportion to the extent to which each customer causes the costs to be incurred. The cost of service analysis contained herein is based on the District's 1998 budget and the revenue requirement determination shown in Exhibit 2. There are many approaches to cost of service analyses; some are more complex than others are. We have selected a relatively simple, but effective, approach to cost allocation for the District. Primary reasons for this approach include:

- The District is a relatively homogeneous residential community with modest commercial development. The District does not serve any large industrial users or other customers that may warrant a more detailed analysis.

- Cost of service approaches, to varying degrees, rely on water system and customer water use characteristic data. Because the District has limited data on customer water use characteristics, other more complicated approaches are not suitable.

- Some approaches, such as marginal cost based approaches, are not appropriate for the District at the present time.[23]

[23] Marginal cost analysis can provide an excellent basis for tiered water rate structures. If at some future point in time the District considers developing a tiered water rate structure, consideration of marginal costs may be warranted.

- Simpler cost allocation methodologies can result in simpler rates that are (1) easier to explain to customers, (2) easier to update and modify, (3) less burdensome administratively, and (4) likely to be more predictable and stable over time.

The cost allocation approach used to develop the water rates does not distinguish between different types of customers. Therefore, the resulting rate structure will be the same for each class of customer. The cost allocation methodology assigns all costs to one of three different categories. The cost allocation process is performed at the highest level of detail available in the District's budget and accounting documents. The three cost categories include:

- *Customer costs*, such as meter reading and billing costs, are fixed costs that tend to vary as a function of the number of customers being served. Customer costs are allocated to customers based on the number of accounts. That is, every customer will pay an equal share of customer-related costs.

- *Capacity costs* are also fixed costs; however, these tend to vary in relation to the capacity of the water system. Customers that place greater or lesser burdens on the capacity of the water system should bear greater or lesser shares of these costs. The sizing of the water system is based on the potential demand that each customer could place on the water system. Capacity costs are allocated to customers based on the size (hydraulic capacity) of the water meter (or service connection). The hydraulic capacity reflects the potential demand that a customer could place on the water system at any given time. A customer with a larger water meter will bear a larger allocation of fixed capacity-related costs than one with a smaller water meter. Capacity costs include costs associated with the water system's capacity including debt service, maintenance costs, capital outlay items, meters, public fire hydrants, etc.

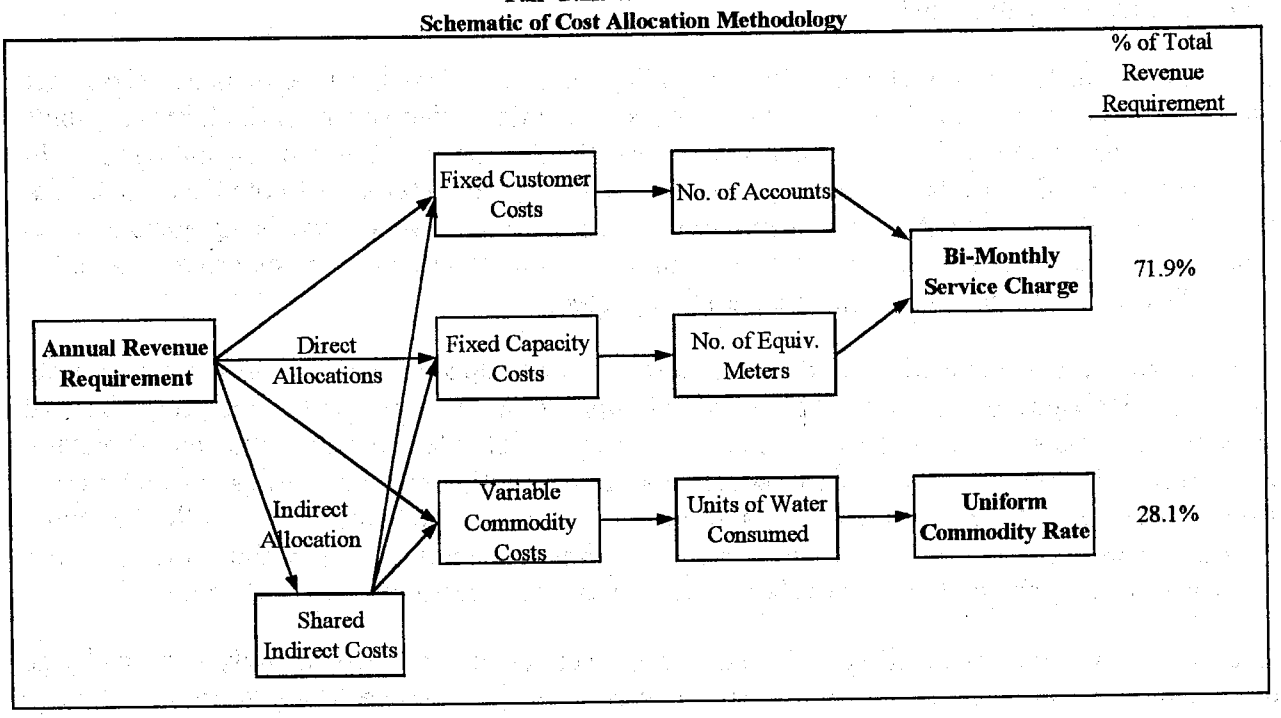
- *Commodity costs* are variable costs that vary with the amount of actual use. Water purchase and pumping costs are the two largest examples. Commodity costs are recovered from customers based on actual water usage.

The determination of the amount of customer, capacity, and commodity costs was made based on a line-item by line-item review of the District's water system budget. Each line item was allocated to one category or another. Not all costs fall clearly into one category or another. Here judgment is used to assign costs to a particular category. Some general cost items in the budget were not allocated to a single cost category, but instead allocated to a shared or mixed category. These shared costs were subsequently re-allocated to the three main categories based on the relative proportion of costs directly allocated in each category. The cost allocation resulted in the distribution of costs shown in **Exhibit 6**. Details of the cost allocation are presented in the **Appendix A** of this report.

Once costs are allocated as described above, they are included in various rate components based on appropriate cost drivers. Customer costs are allocated to all customers equally. Capacity costs are allocated to customers based on the hydraulic capacity of the water meter. Meter hydraulic capacity factors are used to determine the total number of 1" equivalent meters served by the District. Commodity costs are recovered based on actual or estimated water use.

The allocation of costs to various categories requires judgment and experience. Allocation of more costs to the commodity category results in higher commodity rates, and relatively lower service charges. This is often consistent with water conservation objectives since higher commodity rates provide customers with greater incentive to conserve. The results of the cost allocation analysis places about 28 percent of the annual revenue requirement in the commodity rate, with the remaining 72 percent in bi-monthly service charges.

Exhibit 6
Fair Oaks Water District
Schematic of Cost Allocation Methodology



DEVELOPMENT OF METERED WATER RATE STRUCTURE

There are many ways to design water rates. The task is constrained somewhat by the rate setting objectives identified by the District, as well as by administrative, technical, and legal considerations. We recommend the Board adopt a uniform water rate structure with a fixed service charge. It would not be prudent to implement a conventional tiered water rate structure without a clearer understanding of water use characteristics, which is not available in the absence of full metering. Also, Proposition 218 has created some uncertainty with respect to the implementation of conventional tiered rates.

Water rate design was accomplished by creating a water rate structure consisting of two calculations--the service charge calculation and uniform commodity rate calculation. These calculations are designed to generate revenue equal to the revenue requirement based on number of customer accounts, number of meters of various sizes, and total water use.

Service Charge Calculation

To calculate monthly service charges, it is necessary to assume meter sizes for the District's unmetered connections. Actual meter size data were used for accounts with meters. For each customer class, we assume that the unmetered water service connections will likely involve a mix of water meter sizes similar to those connections that already have water meters. Therefore, most unmetered single family connections will ultimately have 1" meters, but a few will have 1-1/2" and 2" meters. Similarly, multi-family connections are predominately served by 2" meters, however other sizes also exist.

The assumption that new meter installations will generally follow the mix of meter sizes that already exist is a reasonable one for rate purposes at this time. However, as the District refines its metering program and installs new water meters, the data used in the rate calculations should also be updated. During the transition period from flat rates to metered rates the District should, at least annually, review the rate calculations to ensure that revenue are being generated as expected. Another advantage of the cost allocation and rate design methodologies recommended for the District is that the calculations are easily updated.

Service charges are intended to recover the customer and capacity costs identified through the cost of service analyses. Service charges would apply to all customer water bills, regardless of the amount of water actually used. The service charge is intended to reflect the cost of making water service immediately available to customers. In calculating service charges, customer costs are allocated to each customer equally, and capacity costs are allocated based on the hydraulic capacity of each meter. For example, a customer with a 2" meter will pay the same customer costs but a greater share of capacity related costs relative to a customer with a 1" meter.

Exhibit 7 shows the service charge calculations for each meter size. The monthly service charge for the standard (1") single family meter would be $13.45. Service Charges are designed to annually generate $2,520,120 based on the revenue requirement and cost allocation. Using the example above, the calculation indicates that a customer with a 2" meter would pay a service charge almost three times what a customer with a 1" meter would pay. As mentioned previously, the revenue requirement for these rate calculations does not include the cost of metering.

Uniform Commodity Rate Calculation

The uniform commodity rate is calculated simply by dividing the commodity costs by the estimated volume of water sold to customers. However, in order to make this calculation, water use estimates were needed for each customer class. The 3,300 metered connections, which represent approximately 28 percent of the District's connections, do not provide adequate data to perform the calculation without assumptions regarding water use for the remaining 72 percent of customers. As described previously and summarized in Exhibit 5, total annual customer water usage was estimated to be 6,008,000 CCF.

Exhibit 7
Fair Oaks Water District
Service Charge Calculations

	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	10"	Unmetered	Total
Connection/Meter Data											
Single Family, Condo, Duplex	8	2,664	203	53	1	-	-	-	-	9,413	12,342
Multi-Family	-	18	11	53	-	-	-	-	-	218	300
Commercial	1	97	65	61	-	3	3	-	2	168	400
Irrigation	-	19	12	35	-	6	-	-	-	128	200
Total Connections	**9**	**2,798**	**291**	**202**	**1**	**9**	**3**		**2**	**9,927**	**13,242**
No. of 1" Equivalent Meters											
Single Family, Condo, Duplex	5	2,664	406	170	6	-	-	-	-	10,460	13,712
Multi-Family	-	18	22	170	-	-	-	-	-	557	767
Commercial	1	97	130	195	-	30	60	-	100	376	989
Irrigation	-	19	24	112	-	60	-	-	-	382	597
Total No. of Equiv. Meters	**6**	**2,798**	**582**	**646**	**6**	**90**	**60**	-	**100**	**11,776**	**16,064**
Hydraulic Capacity Factor	0.67	1.00	2.00	3.20	6.40	10.00	20.00	32.00	50.00	varies*	
Monthly Service Charges											
Customer Costs	$ 2.20	$ 2.20	$ 2.20	$ 2.20	$ 2.20	$ 2.20	$ 2.20	$ 2.20	$ 2.20	$ 2.20	
Capacity Costs	$ 7.54	$ 11.26	$ 22.51	$ 36.02	$ 72.05	$ 112.57	$ 225.14	$ 360.23	$ 562.86	Varies	
Total Charge (Rounded)	**$ 9.75**	**$ 13.45**	**$ 24.70**	**$ 38.25**	**$ 74.25**	**$ 115.00**	**$ 227.00**	**$ 362.00**	**$ 565.00**	**Varies**	
Annual Service Charge Revenue											
Single Family, Condo, Duplex	$ 936	$ 429,970	$ 60,169	$ 24,327	$ 891	$ -	$ -	$ -	$ -	$ 1,661,873	$ 2,178,166
Multi-Family	$ -	$ 2,905	$ 3,260	$ 24,327	$ -	$ -	$ -	$ -	$ -	$ 81,037	$ 111,529
Commercial	$ 117	$ 15,656	$ 19,266	$ 27,999	$ -	$ 4,140	$ 8,172	$ -	$ 13,560	$ 55,201	$ 144,111
Irrigation	$ -	$ 3,067	$ 3,557	$ 16,065	$ -	$ 8,280	$ -	$ -	$ -	$ 55,017	$ 85,985
Total	**$ 1,053**	**$ 451,597**	**$ 86,252**	**$ 92,718**	**$ 891**	**$ 12,420**	**$ 8,172**	**$ -**	**$ 13,560**	**$ 1,853,128**	**$ 2,519,791**

Summary of Fixed Costs**	
Customer Costs	$ 350,041
Capacity Costs	$ 2,170,079
Total Fixed Costs	$ 2,520,120

* For unmetered accounts, the number of meter equivalents is estimated based on the number of unmetered accounts, as well as the mix of meter sizes present among metered accounts within each customer class.

** Does not include the cost of metering which, in future years, may be on the order of $500,000 per year if funded on a pay-as-you-go basis.

The cost allocation process previously described resulted in $983,258 of the total annual revenue requirement being allocated to the commodity cost category. These represent the costs to be recovered through the District's commodity rate. The amount includes all costs of purchasing water from the San Juan Water District, even though these costs are subject to take-or-pay provisions. The cost of purchasing water from San Juan Water District (SJWD) is expected to increase in the future as SJWD passes along its higher costs of water.

With the above water use estimates and the allocation of commodity costs, a uniform commodity rate of $0.16/CCF was obtained. It is designed to generate $983,258 annually based on water sales of 6,008,000 CCF. The uniform commodity rate could be applied to all customer classes. The uniform commodity rate calculation is shown in **Exhibit 8**.

Exhibit 8
Fair Oaks Water District
Commodity Rate and Revenue Calculations

	Estimated No. of Connections*	Estimated Ann. Water Use (CCF)	Water Rate ($/CCF)	Annual Revenues ($)
Water Usage and Commodity Rates				
Single Family	10,952	4,637,977	$ 0.16	$ 759,041
Condominiums	1,066	76,752	$ 0.16	$ 12,561
Duplexes	324	66,504	$ 0.16	$ 10,884
Multiple Family	300	171,144	$ 0.16	$ 28,009
Commercial	400	840,339	$ 0.16	$ 137,528
Irrigation	200	215,295	$ 0.16	$ 35,235
Totals	**13,242**	**6,008,012**		**$ 983,258**
		13,792	AF	
Summary of Variable Costs				
Commodity Costs	$ 983,258			
Total Variable Costs	$ 983,258			

* No. of connections to be metered has been estimated for multi-family, commercial, and irrigation.

REVISION TO SINGLE FAMILY FLAT RATE FOR LARGE PARCELS

Currently single family accounts that are on parcels larger than one acre are charged a flat irrigation charge of $165.55 in addition to the standard single family rate of $221.45 per year. The irrigation charge applies regardless of parcel size in excess of one acre. While the correlation between water use and parcel size is not perfect, water use does vary with lot size based on the metered water use data available from the District's metered customers. During workshops with the Board of Directors, it was decided that the flat rate irrigation charge for parcels in excess of one acre should be based on lot size.

As previously described, we used regression analyses to estimate single family water use based on parcel size. The regression relationship developed includes a usage factor of 0.65 CCF per month per 1,000 square feet applicable to the parcel sizes greater than 0.5 acre. Converting to

different units, this represents about 340 CCF per year per acre. This quantity is not very much water if one considers the water requirements of landscape irrigation. The 340 CCF is equivalent to about 9.4 inches of water spread over an acre. Evapotranspiration water requirements for a year are about 48 to 50 inches. The relatively low water use estimate is the result of the regression analyses which in turn is based on single family meter data that shows a wide variation in actual water use practices for larger parcels.

The flat rate irrigation charge for large single family parcels was developed based on the uniform commodity rate, the estimated total water use for large parcels, and the number of acres over 1.0 acre. The cost for additional water usage was determined to be $55.60/acre, which would generate revenues of $27,265 annually based on the revenue requirement and the cost allocation. The calculations are shown in **Exhibit 9**.

Exhibit 9
Fair Oaks Water District
Irrigation Surcharge for Large Parcels*

	No. of Excess Acres	Estimated Ann. Water Use (CCF)	Water Rate ($/CCF)	Surcharge Per Acre ($/Acre)	Annual Revenues ($)
SF Large Parcels	490	166,600	$ 0.16	$ 55.60	$ 27,265

* Excess usage of 340 CCF/yr/acre is based on regression analysis.

We recommend that this large parcel irrigation surcharge be applied to single family flat rate accounts larger than one acre. The surcharge should be applied to the actual acreage in excess of one acre, on a pro rata basis. By changing the single family irrigation charge from a flat amount for all parcels over one acre to a variable amount based on actual parcel size, the charge should be fairer to affected customers. Any customer with a parcel from 1.0 to about 4.0 acres will benefit from the change, while customers with parcels larger than about 4.0 acres will pay more under this approach.

Modification of surcharge for residential parcels larger than 1 acre is the only change to the District's current flat water rate structure that is recommended at this time. The District should continue, however, to adjust rates for certain customer classes to bring them into line with previous cost of service analyses. We believe, however, that the District and its customers will be better served by moving towards the use of metered water rates, rather than attempting to improve upon the current system of flat rates any further.

SPECIAL RATE ISSUES

The District identified several issues during the Phase I workshops to be further studied during the Phase II technical evaluation part of the study. Each of these special issues is described below with appropriate findings and recommendations.

Water Shortage Rate Calculations

The District is concerned about the potential affects that a water shortage situation may have on the District's water rates and revenues. As a result, additional water rate analyses were performed to evaluate how the District might adjust the water rate structure during increasingly stringent stages of water shortage.

As described previously, the District's Water Conservation resolution (Resolution 9710) defines five stages of water supply availability. Each stage indicates the percentage of normal demands that can be met by the District's available water supplies. At the highest level of severity (Stage 5) the District may have only 50 percent of normal water supplies available to customers.

There are two issues related to water rates during period of water shortage that need to be considered. First, with metered water rates water sales revenues will decline with reduced water use. Of course, some of the District's costs (e.g., purchased water costs) may also decline with reduced use[24]. The District's water rates need to generate sufficient revenues to cover costs. Therefore, some modifications to the water rate structure may be necessary during various stages of water shortage, particularly if the period of shortage becomes extended. Second, the water rate structure can be used as an effective tool to encourage additional water conservation during shortage situations. While public education and information programs should be used to encourage additional conservation during shortage periods, the water rate structure can be used as an incentive mechanism.

During a water shortage a tiered rate structure can be an effective means of encouraging additional water conservation consistent with shortage cutbacks, without penalizing customers for reasonable water use. The District has insufficient water use data for us to recommend a tiered water rate structure for normal periods at this time. Sufficient data are available to perform analyses at a conceptual level to illustrate how a shortage tier structure could be implemented during a period of water shortage. In the event of an actual water shortage, the District should update the calculations presented herein. The update should be based on actual conditions and then-available account and water use data.

Single Family Water Use Characteristics

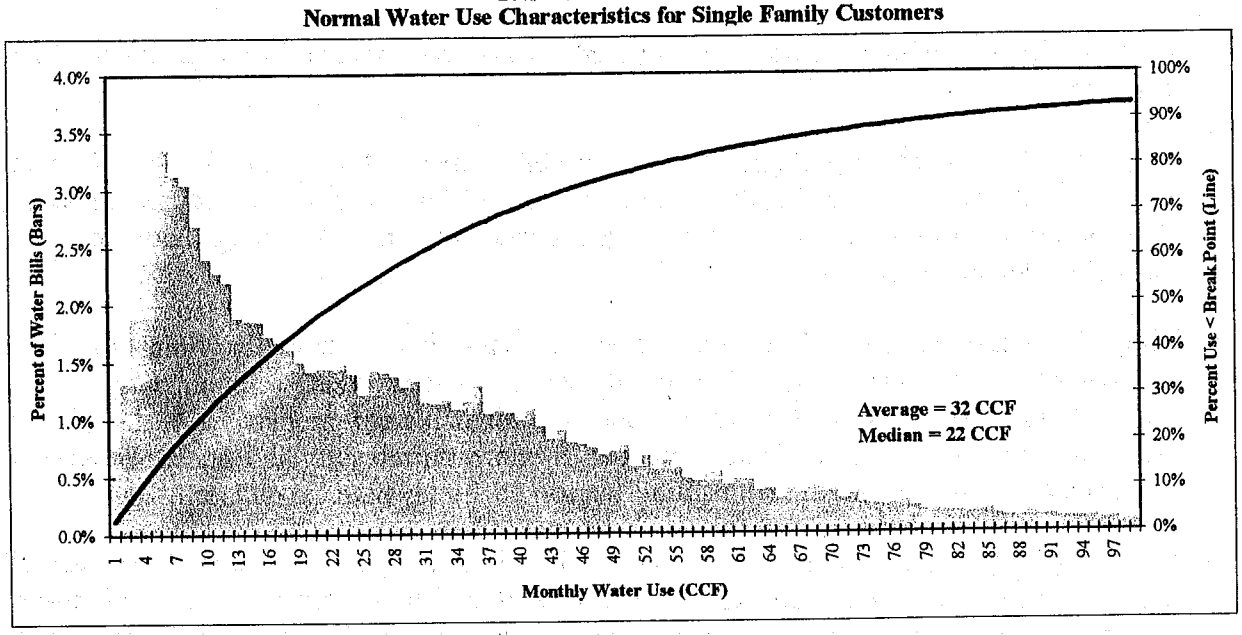
Shortage tier water rates are described herein for single family customers of the District. Water shortage rate options for multi-family, commercial, and irrigation customers are described more fully later in this section.

The District has metered use data from 2,566 single family accounts. These data were used for the tier structure analysis. **Exhibit 10** illustrates the water use characteristics of single family customers. For each customer, 12 monthly use values are included in the data represented in the

[24] In fact, current take or pay provisions in the District's existing agreement with San Juan Water District may cause the District to continue to pay for water, even when it is not available. This aspect of SJWD's water rate structure was recently modified (see shortage rate discussion in Section III).

exhibit. The pattern of water use is not uncharacteristic of single family use. Average monthly water use is 32 CCF, and median water use is 22 CCF. The average use is higher than the median usage due to the long *tail* in the frequency distribution representing high water use. This tail pulls the average higher. The line in the graph reflects how much of the total single family use is accounted for at various usage levels. For example, water use up to 32 CCF accounts for 63 percent of total single family use (this includes the first 32 CCF used by customers using more than this amount). The frequency distribution and cumulative use curve shown in Exhibit 10 is critical to tiered water rate design where it is necessary to estimate water use by each customer.

Exhibit 10
Fair Oaks Water District
Normal Water Use Characteristics for Single Family Customers



To assist in planning for a potential water shortage, additional calculations were prepared to determine how the rate structure could be adjusted to: (1) ensure that the District's revenue needs are met even when the District is faced with extraordinary shortage-related costs, (2) encourage additional water conservation in response to limited water supplies, and (3) avoid being perceived as overly punitive to customers. Water use characteristics play an increasingly important role in these calculations as the tier rates and break points are dependent on them.

To encourage additional water conservation for each of the shortage stages, shortage tier rate structures are recommended for metered single family customers of the District. The recommended tier structure includes two commodity rate tiers that would apply to various levels of use. The high tier rate increases with each successive stage of shortage.

At each stage of shortage, the first tier rate is set equal to the proposed uniform commodity rate previously developed. The water use in this tier will always match or exceed the water required for basic human consumptive and sanitary needs. Additional water is charged at a higher second tier rate, and is reflective of more discretionary uses, such as landscape irrigation. The rate

structure will encourage curtailment of these more discretionary uses of water. As the stages increase in severity as described below, the amount of water use in the first tier decreases and the second tiered rate increases to help ensure that the District's costs are recovered through the rates.

Water Shortage Stages

Five stages of water shortage were adopted by the District in Resolution No. 9710 in accordance with California Water Code Section 10631(e)(3). Upon examination of available water supply data, the needed additional water conservation measures will be determined by the District and are outlined in the following stages as described by the District.

- *Stage 1 - Normal Water Supply:* The District's system can meet all of the demands of its customers.

- *Stage 2 - Water Alert:* The District's system is able to meet 90 percent to 95 percent of its customers normal water demands. Therefore, it will be necessary to reduce customer demand by five to ten percent. For purposes of rate analysis, water usage of 90 percent of normal demand was used.

- *Stage 3 - Water Warning:* The District's water system is able to meet 75 percent to 89 percent of its customers' normal water demands. Therefore, it will be necessary to reduce demand by eleven to twenty-five percent to insure that water is available for basic domestic and health needs of District customers. For purposes of rate analysis 80 percent of normal demand was used.

- *Stage 4 - Water Crisis:* The District's system is able to meet 50 percent to 74 percent of its customers normal water demands. Therefore, it will be necessary to reduce demand by twenty-six to fifty percent, to insure that water is available for basic domestic and health needs of District customers. For purposes of rate analysis 65 percent of normal demand was used.

- *Stage 5 - Water Emergency:* The District is experiencing a major system failure, which threatens the District's ability to provide water for the immediate health and physical well being of District customers. Therefore, it will be necessary to reduce demand by at least fifty percent of normal. For purposes of rate analysis 50 percent of normal demand was used.

As the District moves through various stages of water shortage the District's costs may change on several different levels. For example, increased costs may be incurred in promoting additional water conservation, monitoring customer water use, and explaining conditions to customers. In addition, increased groundwater pumping may take place to offset reduced surface water deliveries.

In order to perform the water shortage rate structure analyses we assumed certain water supply and demand conditions, as well as certain changes to the District's costs and revenue needs. These are summarized below and presented in **Exhibit 11**.

- *Surface Water Purchases* – The most likely water shortage scenario to affect the District is an extended drought with limited availability of surface water from the San Juan Water District (SJWD). In normal years water from SJWD meets nearly all of the District's water needs. For purposes of these analyses, we assumed that the deliveries from SJWD would be curtailed in each stage of water shortage as indicated in Exhibit 11. Currently, the District is obligated to pay for 15,000 AF of water regardless of whether it is actually used. Therefore, the District's water purchase costs will not decline with reduced water availability[25].

- *Groundwater Pumping* – District staff estimate that the energy cost of pumping groundwater into the water distribution system is about $75/AF. In normal years the District relies on groundwater supplies only during peak periods of use. However, during an extended water shortage, the District may rely more heavily upon the groundwater resource to meet customer demands. Exhibit 11 indicates the amount of groundwater that might be used at each stage of water conservation. A cost of $75/AF is assumed throughout the analysis.

- *Additional Water Conservation Costs* -- As the District moves into higher stages of water shortage an expanded level of water conservation activities are likely. The analyses contained herein assume that with each stage of shortage an additional $50,000 per year is expended to expand water conservation activities.

- *Other Operating and Capital Costs* -- During critical drought situations a variety of District activities may be altered. Leak detection activities may increase, customer service costs are likely to increase, and other activities are likely to focus on the water supply situation. In addition, other planned activities or projects may be deferred. Capital projects may be delayed. Overall, while the District's staff and other resources may redirect their efforts the cost of District activities may not change much. For purposes of these analyses, we assumed that with the exception of increased water supply costs and additional water conservation costs described above, that other operational and capital program costs would not change (overall). In reality, the District would likely resort to some cost reductions in critical situations, but in this sense our assumptions are conservative.

- *Customer Water Demands* -- For purposes of these analyses, we assume that customers will generally respond to the District's calls for additional water conservation. Water demands are assumed to be 100 percent, 90 percent, 80 percent, 65 percent, and 50 percent of normal in Stages 1 through 5, respectively. For purposes of tier analysis, we

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[25] The affects of wholesale rate structure changes to go into effect in 1999 are factored into the shortage rate analysis in Section III of this report.

also assumed that single family customers at all levels would adjust water use commensurate with the cutbacks requested (i.e., small and large customers would reduce water use by equal percentages).

Exhibit 11
Fair Oaks Water District
Assumptions for Water Shortage Stages

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
	100%	90%	80%	65%	50%
Water Availability and Costs					
San Juan WD (AF)	14,500	13,020	10,875	8,338	5,800
Groundwater (AF)	300	300	965	1,283	1,600
Total Production (AF)	14,800	13,320	11,840	9,620	7,400
San Juan WD ($/AF)	$ 48	$ 48	$ 48	$ 48	$ 48
Groundwater ($/AF)	$ 75	$ 75	$ 75	$ 75	$ 75
San Juan WD ($) - Note 1	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000
Groundwater ($)	$ 22,500	$ 22,500	$ 72,375	$ 96,188	$ 120,000
Total Water Costs	$ 742,500	$ 742,500	$ 792,375	$ 816,188	$ 840,000
Change in Water Costs		$ -	$ 49,875	$ 73,688	$ 97,500
Other Cost Impacts					
Additional Conserv. Activities	$ -	$ 50,000	$ 100,000	$ 150,000	$ 200,000
Other O&M (Net)	$ -	$ -	$ -	$ -	$ -
Other Capital Program (Net)	$ -	$ -	$ -	$ -	$ -
Total Other Net Cost Impacts	$ -	$ 50,000	$ 100,000	$ 150,000	$ 200,000
Water Rate Revenues					
Service Charges	2,520,120	2,520,120	2,520,120	2,520,120	2,520,120
Commodity Rates	983,258	1,033,258	1,133,133	1,206,945	1,280,758
Total Rate Revenues	3,503,378	3,553,378	3,653,253	3,727,066	3,800,878
Commodity Rate Impacts					
Water Sales (CCF) - Note 2	6,008,012	5,407,211	4,806,409	3,905,208	3,004,006
Uniform Rate ($/CCF)	$ 0.164	$ 0.191	$ 0.236	$ 0.309	$ 0.426
Typ. Monthly SF Water Bill - Note 3	$ 13.51	$ 13.13	$ 12.76	$ 12.19	$ 11.63
Non-Conserv. SF Water Bill - Note 4	$ 19.56	$ 19.56	$ 21.53	$ 27.01	$ 35.93
Typ. Monthly Comm. Wtr. Bill - Note 5	$ 57.45	$ 59.11	$ 62.44	$ 64.90	$ 67.35
Non-Conserv. Comm. Wtr. Bill - Note 6	$ 57.45	$ 62.94	$ 71.87	$ 86.53	$ 109.99

NOTES:
(1) The District is currently required to pay for a minimum of 15,000 AF of water from San Juan WD.
(2) Assumes about a 6% unaccounted for loss rate between water production and consumption.
(3) Assumes 1" meter and 23 CCF/mo. (SF median) normal usage with cutbacks as requested with tier structure.
(4) Assumes 1" meter and 60 CCF/mo. (large user) normal usage with no cutbacks with tier structure.
(5) Assumes 2" meter and 200 CCF/mo. with cutbacks as requested with uniform rate structure.
(6) Assumes 2" meter and 200 CCF/mo. with no cutbacks with uniform rate structure

The proposed metered water rate structure includes both a fixed monthly service charge as well as a uniform commodity rate. During water shortage conditions service charge revenues would

remain the same. However, commodity rate revenues would fluctuate with changes in water demand. The design of the single family shortage tier rate structure was performed such that the amount of single family tier rate revenues should adjust to match a proportionate share of the District's overall cost changes. The fact that the District would be required to continue to pay for surface water, even when less is available means that the commodity rate must increase (water costs are spread over a smaller sales volume). All these factors are taken into consideration in the rate analyses. It is important to recognize, however, that the analyses are dependent on the assumptions used. If the assumptions change (or actual shortage conditions are different than what is assumed herein), then the results of the analyses may be somewhat different as well.

Single Family

Tier rate structures tend to work well with single family customers because there usually is a homogeneous range of typical usage. The single family metered data also provide adequate information to perform the water shortage rate calculations. These two factors promote the tier rate structure for single family under water shortage conditions.

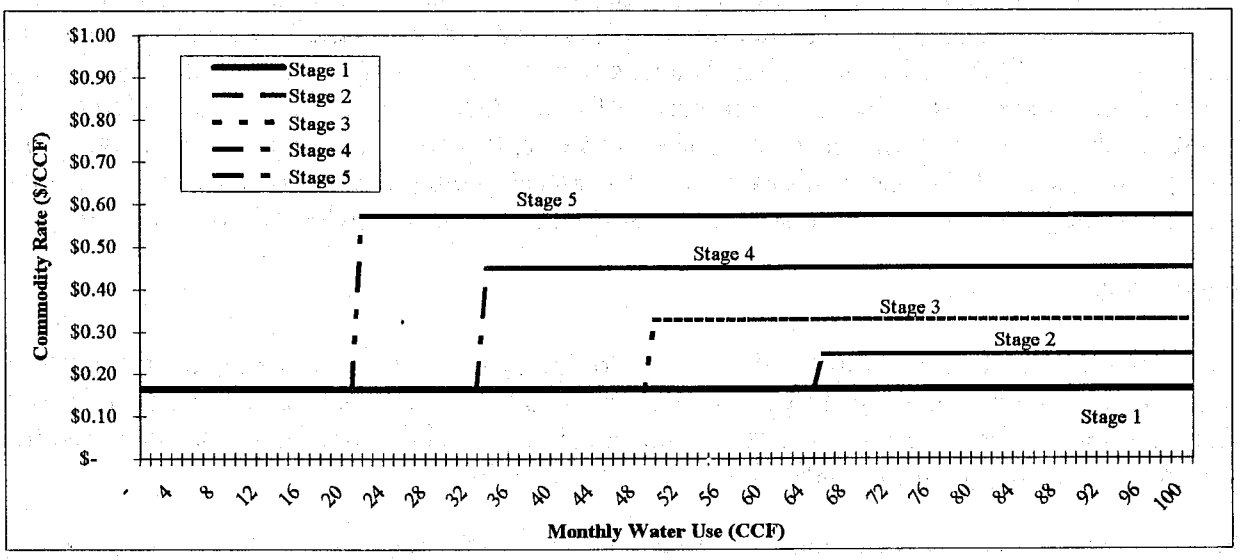
We developed a tier structure that would change with each stage of water shortage. During Stage 1, no tier would be required. During Stage 2 the District would seek modest reductions of up to 10 percent in customer water use. To help encourage this, a second tier is introduced into the single family rate structure. The second tier rate would apply only to water use in excess of 64 CCF per month. This is a sufficiently high tier break point that most customers would be unaffected. Nevertheless, the existence of a second tier will have an impact on customer water use. The second tier rate, during Stage 2, would be 50 percent higher than the first tier rate (which would remain at the level of the normal uniform rate). Both the break point and the tier rate differential were selected such that the total amount of single family commodity rate revenues should change commensurate with changes in the District's costs.

During Stages 3, 4, and 5 the tier break point would be reduced so more use would be subject to the higher tier rate. In addition the tier rate differential would also increase. These changes to the tier structure provide stronger incentives to reduce water use as the severity of the shortage increases. It should be noted, however, that throughout each stage the first tier rate remains at the level of the normal uniform rate. Furthermore, the tier break only decreases to below the normal median level of water use in Stage 5 (most severe conditions), and even then 20 CCF should be ample for basic single family water needs. **Exhibit 12** graphically illustrates the break points and tier rate structure for each stage of water shortage. **Exhibit 13** summarizes the tier rate calculations.

Multi-Family

Tiered water rates can be developed for multi-family accounts provided the tier structure is on a per-dwelling-unit basis. That is, the water use characteristics, and thus the tier structure, are evaluated based on average water use patterns of the dwellings served by the multi-family accounts. This is necessary to obtain a uniform and homogeneous water use pattern among these customers.

Exhibit 12
Fair Oaks Water District
Single Family Water Shortage Tier Rate Structures



The analysis, implementation, and administration of a tiered water rate structure on a per-dwelling-unit basis are more complex than the single family tier structure. Tier break points are expressed on a per-dwelling-unit basis, and therefore tier allocations for each customer are determined based on the number of dwellings served by each account. This has implications for billing system programming and customer service (explaining to customers).

Beyond the administrative complexity, the District does not currently have sufficient data on multi-family customers to perform a tiered rate structure analysis on a per-dwelling-unit basis. As a result, an accurate analysis of a tiered rate structure for multi-family is not possible at this time. However, the analyses and resulting rate structure would be similar to that developed for single family customers, except, or course, that it would be expressed on a per-dwelling-unit basis. The tier break points would also be much lower than the single family tier break points since average per dwelling multi-family use is a fraction of single family use.

Because of the lack of significant multi-family metered data at this time, the tiered rate structure is not advisable due to the importance of meeting the revenue requirement especially under water shortage conditions. Once the District has metered all multi-family accounts and has at least one year of use data tier rate analysis can be performed and the suitability of a tier structure for multi-family water shortage rates can be re-evaluated. Until such time, we recommend that the District plan on using an increasing uniform rate in the event of a water shortage, as described for commercial customers below.

Exhibit 13
Fair Oaks Water District
Single Family Water Shortage Tier Structure Calculations

	Supply Avail.	Tier Step Multiplier	Break Point	Tier 1 Rate ($/CCF)	Tier 1 Wtr. Use (CCF)	Tier 1 Revenue	Tier 2 Rate ($/CCF)	Tier 2 Wtr. Use (CCF)	Tier 2 Revenue	Total Commodity Revenue	Average Rate ($/CCF)
Stage 1	100%	-	-	$ 0.164	4,637,977	$ 759,041	$ -	-	$ -	$ 759,041	$ 0.164
Stage 2	90%	1.50	64	$ 0.164	2,769,888	$ 453,314	$ 0.245	1,404,292	$ 344,735	$ 798,049	$ 0.191
Stage 3	80%	2.00	48	$ 0.164	2,146,448	$ 351,283	$ 0.327	1,563,934	$ 511,900	$ 863,183	$ 0.233
Stage 4	65%	2.75	34	$ 0.164	1,521,536	$ 249,011	$ 0.450	1,493,150	$ 672,005	$ 921,017	$ 0.306
Stage 5	50%	3.50	20	$ 0.164	851,796	$ 139,403	$ 0.573	1,467,193	$ 840,412	$ 979,815	$ 0.423

Commercial

Tier rate structures tend to be problematic for non-residential customers due to the wide variation in use by different non-residential customers, even within the same meter size. Some water utilities have developed non-residential tier structures based on meter size, although the effectiveness of this type of structure from a conservation standpoint is varied. We know of several utilities that have abandoned tiered rate structures for commercial customers because of the difficulty in achieving both equity and water conservation objectives simultaneously.

The District also has a data availability problem associated with trying to develop a tiered water rate structure for commercial customers. As a result, we recommend that the District not consider a tier structure for water shortage situations at this time. Perhaps, following complete metering of commercial accounts and a few years of use data this issue could be re-addressed.

Two alternative approaches to water shortage rate structures for commercial customers could be considered. The first approach is to maintain a uniform water rate, but to adjust the level of that rate based on revenue needs and expected water sales are various stages of shortage. Even though the commodity rate is intended to reflect variable costs, not all of the costs recovered through the commodity rate are purely variable. As a result, reduced use may necessitate an increase in the uniform commodity rate. The Board of Directors has expressed concern about this rate spiral phenomenon due to the past experience of many southern California water utilities during the last extended drought. Increased duration and severity of drought conditions forced some water utilities to continually increase water rates, even as customers achieved demand cutbacks that had been requested. The single family shortage tier structure discussed above is designed to avoid this situation because the first tier rate remains the same, customers meeting cutback requirements should be able to avoid the higher tier rate. Because most of the District's customers are single family customers the existence of a tier structure should avoid many of the problems encountered by other utilities.

Increased uniform rates for commercial customers could be subject to the same criticism that other water utilities faced in prior drought events. However, businesses are generally less sensitive to rate changes than are single family customers, plus they represent a small portion of the total customer base. In addition, if commercial customers reduce their water use in accordance with target reductions, they may not see an increase in their total monthly water bill, in spite of the fact that the commodity rate has increased.

A second approach, which many water utilities have utilized in drought situations, is to develop a customized tier structure based on each customer's historical water use. For example, during a Stage 2 situation commercial customers could be subject to a two-tier structure in which 90 percent of their historical usage would be available at the first tier rate, with excess usage charged at the higher second tier rate. The rate for the second tier, as well as the tier break point, could be adjusted for successively higher stages of shortage in a manner similar to the single family tier structure (except percent reductions from historical usage could be used instead of specific CCF break points). This type of rate structure has obvious billing and customer service implications which complicate the situation since every customer will have a unique tier

structure, and a number of special situations (e.g., new accounts with no use history) would have to be addressed. However, with a relatively small number of commercial accounts this approach could be implemented. One of the criticisms of this approach, however, is that it tends to penalize customers whose past water use has been conservation oriented.

Near the bottom of Exhibit 11 are estimates of the uniform water rates that might be required during each stage of water shortage based on the assumed costs and revenue needs described previously. The uniform water rate structure may need to increase from a Stage 1 level of $0.164/CCF to as high as $0.426/CCF by the time the District reaches Stage 5 conditions. The potential bill impact these rates would have on commercial customers is illustrated at the bottom of Exhibit 11. In general, customers who reduced water use commensurate with required cutbacks of each stage would avoid major increases in their water bills, though some increase is likely. Customers not reducing their water use would pay substantially more for water service.

Irrigation

Irrigation customers frequently fall into the commercial category, and are subject to the same issues with respect to rate structures as commercial accounts. This need not be the case, however. An alternative approach to tier rate design, which has gained in popularity in recent years, is a water budget-based approach. While this approach has potential application for commercial accounts, it is almost exclusively used with irrigation accounts.

The term water budget reflects the fact that some determination has been made regarding a customer's water needs. In the case of irrigation accounts, this has generally included consideration of the landscape area being irrigated, as well as the evapotranspiration (ET) requirements of the landscape. ET is an indicator of the amount of water required by plants to make up for water lost through evaporation and transpiration. This water must be replaced through natural precipitation or irrigation in order to sustain the health of plants. ET is measured in inches and represents the depth of water that should be applied to landscapes over a given period of time (i.e., day, week, month, or year).

The Department of Water Resources (DWR) has established and maintains a network of weather stations to provide ET data on a daily, weekly, and monthly basis. The California Irrigation Management Information System (CIMIS) network extends throughout the State. One site is located in Fair Oaks and has been operational for about one year.

Using ET and landscaped area data, tier structures can be designed for each irrigation account reflecting the water needs of each landscape. Water budget-based rates have gained popularity because irrigation water use is seen as an area where significant water savings are possible.

The District could devise a tiered water rate structure for each stage of water shortage based on water budget concepts. This would require information on the area irrigated by each irrigation account. ET data for Fair Oaks is readily available, and can be obtained over the internet. Because the water requirements of landscaping vary significantly during the year, the irrigation tier structure would most likely include seasonal variation of the break points. Many water utilities adjust tier break points on a monthly basis.

The development of a water budget-based tier rate structure for the District's irrigation accounts is premature at this time since water meters are still being installed. However, this approach might be suitable for the District both in normal and water shortage conditions. Under water shortage conditions, the tier structure and rates could be adjusted with each stage in a manner similar to the single family structure described previously.

Conclusions and Recommendations

The preceding discussion of water shortage rate structures demonstrates how the District could modify its water rates during various stages of water shortage. While we performed specific calculations to develop a single family shortage tier rate structure that would generate a certain level of revenues, we did so with a number of assumptions. Our intent in performing this analysis is to illustrate for the District how a tiered water rate structure could be implemented during a period of water shortage. We are not suggesting, however, that the rates calculated herein would be the correct rates to apply in some future situation.

Tiered water rates can be an effective means of encouraging additional water conservation, though this is not always the case. Past experience throughout the State indicates that during times of crisis, customers are willing to reduce water use commensurate with supply limitations. It is important that customers understand the water supply situation, and believe that a real shortage exists, and therefore public information and education efforts are critical. Shortage tier water rates provide a means to further encourage customers to reduce water use. Tier structures tend to place a heavier burden on high water users, but this is often the area where the more discretionary uses of water take place.

While the tier structure calculations contained herein are for single family customers, we would suggest that the District also consider a similar approach for multi-family (on a per-dwelling-unit basis) and irrigation (based on irrigated area) customers at such time that sufficient data are available to perform these analyses. While tiered water rate structures can be developed for commercial customers it has been our experience that the diversity of water use patterns among businesses make tiered rates more problematic, and less effective as a conservation tool than other approaches.

The financial needs of the District during any particular water shortage will depend on the situation at hand. The District's financial situation at the outset of the shortage, the duration and magnitude of the shortage, as well as extraordinary costs incurred during the shortage will all affect the District's revenue needs during a shortage. In addition, the District's course of action with respect to water rates will vary depending upon the status of the District's metering program, the implementation of metered water rates, and the availability of water use data.

Even with the most careful planning, water shortage situations are by their very nature periods of uncertainty. Nobody can predict how long or severe a shortage may be. Therefore prudent financial planning is often the norm. The District currently has an Emergency Reserve that should have a balance of about $800,000 by the end of 1998. Maintaining such a reserve is a prudent action to help strengthen the financial condition of the District. One potential use of the Emergency Reserve may be to offset some of the revenue volatility that may be associated with

water shortage cutbacks. The $800,000 represents about 20 percent of the District's annual operating costs, including debt service, and should be adequate for rate and revenue stabilization purposes during a water shortage, although there are no guarantees.

We recommend that the District implement a two-tier water rate structure for single family customers similar to the one developed herein for automatic implemenation in the event of a water shortage. Shortage tier rate calculations should be reviewed each year and updated as more metered consumption data become available, or as the cost assumptions for each stage of shortage are refined. The District should also consider developing additional consumption data for multi-family customers (per dwelling unit) and irrigation customers (per acre) so water shortage tier rates could also be considered for those customer classes as well. We recommend that during a water shortage the water rates for commercial customers change with each stage of the shortage, but that a uniform rate structure be maintained.

Lifeline Rates

The Board of Directors discussed the possibility of including a lifeline rate as part of the District's water rate structure. This issue has been explored in greater detail, and we provide the following findings, options, and recommendations.

Lifeline rates are common among various types of utilities (i.e., electricity, gas, telephone, etc.) and are generally intended to maintain the affordability of a basic level of service for those customers who may be financially constrained. For public health and welfare reasons public policy decisions frequently provide access to basic essential services at lower rates. Water is clearly an essential service, and many water utilities have lifeline aspects to their rate structures. As the overall cost of water service increases, the need for lifeline rates also increases.

The need for the District to have a lifeline rate is clearly a policy issue for the Board to decide. However, if a lifeline rate is desired two basic approaches are possible. The first approach would require customers to qualify for the program by meeting some income or financial criteria. This approach would have administrative consequences and would likely require customers to provide personal information to the District (e.g., tax returns). Some water utilities have relied upon other utilities (e.g., PG&E) to qualify customers for a lifeline program. For example, the District might allow customers to qualify for a lifeline rate simply by demonstrating that they have qualified for PG&E's lifeline program. This could be accomplished by providing a copy of their PG&E bill.

Qualified customers could be given a special rate for water service. In the case of the existing flat rate structure the lifeline rate might take the form of a reduced rate. Under a metered water rate structure it is common to reduce or eliminate the service charge while still charging for actual water use. This preserves the water conservation incentive embodied in the water rate structure.

A second approach to lifeline rates does not require any pre-qualification or application process; thus the administrative burden is much lower. However, this approach involves creating a tier structure with a low first tier rate for basic water needs. All customers (or possibly all residential

customers) would be subject to the low tier rate for initial usage. The revenues lost from a lower first tier rate could be recovered through increased high-tier rate(s). This approach is administratively simpler than the previous approach because all customers (or residential customer) would be subject to the lower initial tier rate and no application or administrative process is necessary. This approach, however, does require the District to have a tiered rate structure in affect. In addition, it assumes that customers with limited financial means also use a limited amount of water. This assumption may or may not be true.

At this time the District does not have sufficient information regarding customer water use characteristics for us to recommend a tiered rate structure for any customer class. Therefore, this lifeline approach may not be practical until some point in the future.

There is also one potential concern regarding any lifeline rate structure. A lifeline rate may be perceived as a subsidy for a select group of customers. Proposition 218 calls for strict adherence to cost of service principles. While the applicability of Proposition 218 to water rates is still unclear, consideration of the potential legal ramifications is warranted. While lifeline rates have clearly passed legal tests in the past based on public policy objectives, Proposition 218 may have created more limitations.

At this time, we recommend that the Board of Directors not consider a lifeline water rate structure for the District unless there is a strong and compelling public policy interest. Even then, we would suggest that the District seek advice regarding the legal basis for such rates.

Marginal Cost of Water Supplies

The District currently obtains most of its water from the San Juan Water District. SJWD obtains its water through water rights on the American River and through contracts for additional American River water from the Placer County Water Agency (PCWA) and the USBR. The District supplements its purchased water supply with groundwater, particularly during peak summer months. The District's agreement with SJWD calls for the District to pay for 15,000 AF of water regardless of whether the District actually uses this amount. The District's 1998 rate for water from SJWD is about $48/AF. At present the District is only using about 14,500 AF of water from SJWD. About 300 AF of groundwater is pumped for peak periods. District staff indicate the energy cost of groundwater pumping is about $75/AF.

As a result of the current rate structure for SJWD water the District's marginal cost of water is $0/AF, at least until the full minimum take or pay quantity is utilized. If the District finds it necessary to use the groundwater during peak periods (due to delivery capacity limits of the SJWD supply), then the marginal cost of peak water is $75/AF. These cost differences could be used to justify a seasonal water rate structure[26].

[26] A seasonal water rate structure was not recommended at this time because we believe the transition from flat rate billing to metered billing should be made with a simple rate structure in place (i.e., a uniform rate).

Effective in 1999, SJWD will be changing its water rate structure to eliminate the minimum charge structure. In its place will be an annual fixed service charge, plus a uniform commodity rate (similar to the metered rate structure proposed for FOWD). Under the new SJWD rate structure the uniform water rate will be $34.88/AF in 1999. Therefore, the marginal cost for additional water supply purchases from SJWD will be $34.88/AF.

The marginal cost estimates provided above are based on current cost structures and an assumed incremental change in demand. Over the long-term, the marginal cost of water may be more significant. While it appears that the water supply situation for the District is adequate, any changes affecting the long-term availability of water from SJWD (i.e., changes in USBR or PCWA contract requirements) could lead to substantial new costs to secure an alternative source of supply. The evaluation of long-term water supply costs is beyond the scope of this study.

Marginal Cost-Based Water Rates

Some traditional cost allocation procedures commonly used in the water industry result in a declining block rate structure in which the cost per unit falls as use increases. These embedded cost approaches[27] are appropriate when existing water supplies and facilities are adequate to meet future needs or when the cost of adding the next increment of supply or capacity is not significantly different from the existing cost. Historically, this has been the case in much of the United States. However, environmental concerns, limited availability of new water supplies, increased competition over existing supplies, regulatory requirements, and other factors have increased the cost of developing or otherwise obtaining new supplies or additional system capacity.

Although many water utilities have moved to inclining block or tiered water rates, partially because of the conservation incentive they can provide, traditional cost allocation approaches often do not adequately support such rate structures. Embedded cost approaches have been used to identify seasonal and peak cost responsibility. However, they do not provide a very satisfying means of reflecting the future cost consequences of increased usage.

An alternative to the embedded cost approach to cost allocation is a marginal cost approach. Electric and gas utilities commonly use marginal costs to establish utility rates, and use of marginal costs is growing among water utilities. Where applicable, water rates developed using marginal costs will typically result in a tiered rate structure. This occurs because marginal costs are often higher than average costs, and a uniform rate structure set at the marginal cost would result in an over-collection of revenues. To avoid this, the marginal cost is used as the high tier rate, and then a low tier rate is calculated based on balancing revenues with expenditures.

A marginal cost-based approach is appropriate when resources or system capacity is limited and the cost of increasing supply, capacity, or both will be higher than historical costs. When the water utility determines the cost of delivering the next unit of water and uses this in the rate

[27] Embedded cost approaches to cost allocation rely upon historical, average costs in the analysis. The rate calculations performed during the study for the District follow an embedded cost approach.

structure, customers receive a price signal of the actual cost and can then decide whether to use more water based on the cost of providing it.

Some of the differences between the embedded cost and marginal cost approaches are summarized in **Exhibit 14**. Water utilities that have adopted marginal cost pricing have done so for the following reasons:

- The marginal cost approach provides a sound *cost of service* justification for tiered water rates.
- Marginal costs reflect the actual cost for obtaining and delivering additional water to meet customer demand.
- Marginal cost pricing provides customers with a price signal that reflects the actual cost of water service, thus reducing the likelihood of over- or under-utilization of water.
- When water is priced at the marginal cost, demand can indicate when consumers are willing to pay the price of acquiring additional water supplies.

Exhibit 14
Fair Oaks Water District
Comparison of Cost Allocation Approaches

Factor	Marginal Cost	Embedded Cost
Perspective on Water Rates	Economic incentive.	Equitable allocation of costs.
Need for Approach	Resource or capacity constraints or both limit water service.	Unlimited supply/capacity, or new costs are similar to existing average costs.
Cost Basis	Cost of providing additional (next increment) water service.	Costs of serving customers are less for large customers because of economies of scale.
Historical Utility Practices	Relatively new in practice for water industry, but discussed extensively in the literature; embraced by electric utilities in the 1970s.	Most common approach in water industry for 20-30 years; created problems in recent years.
Price Signal	Sends a conservation price signal of the current and future effect of current consumption decisions.	Does not provide consumers with information about how consumption decisions influence future costs.
Use in Rate Design	Provides basis for setting tiers and seasonal rate differentials.	Results in declining block rates if properly applied (can be modified to result in uniform rates).
Normal Supply Versus Shortage	Can provide a basis for adjusting high tier rates during periods of water shortage.	Avoids spiraling rates with a high fixed service charge to cover costs as sales are reduced.
Calculation Requirements	More complex calculations required initially: once embraced, marginal costs can be determined routinely and used in management decisions.	Well-established calculation procedures; requires some subjective decisions; typically performed on a periodic basis.

Applicability of Marginal Cost Pricing to the District

At present, the District has adequate water supplies to meet customers' water needs. In addition, the District's service area has fairly limited growth potential, so demand is not expected to increase dramatically. In fact, with the implementation of water conservation BMPs, as well as the installation of water meters and metered billing for water service, the District may see its total water use diminish over time. With most of the District's water system capacity in place, the additional capacity cost of serving new customers also appears limited. As a result, the Fair Oaks Water District does not appear to be a strong candidate for marginal cost pricing.

District staff were asked what the future costs of the District's water supplies are likely to be. The San Juan Water District recently completed a wholesale water rate study to estimate water rates for the next five years. Modest annual rate increases are expected over the next five years. As part of the Regional Water Master Planning process much of the Sacramento region is considering more centralized management of the groundwater basin and conjunctive water use. This may result in a pump tax being charged for each AF of groundwater extracted. Again, the amount of such a charge is not known at this time. Additional surface water supplies, if they are needed, may range from $60 to $100 per AF, but precise estimates are not immediately determinable. The District's water conservation program should, in effect, create new water supplies for the District. Therefore, it might be possible to use water conservation costs (and associated water savings) as a basis for determining the marginal water supply cost.

Should the District desire to develop tiered water rates for normal (Stage 1) conditions at some point in the future, a marginal cost analysis could prove useful in establishing the amount of the tier rates. Embedded cost approaches typically do not provide a direct cost basis for higher tiers (usually some type of multiplier is applied along with a revenue balancing calculation). In the District's situation a marginal cost could be determined for each source of supply. Marginal water distribution costs would be included in the cost of both supply sources. One rate design approach would be to develop a summer tier structure to reflect the higher cost of groundwater pumping to meet peak demands. A uniform rate could apply during the winter season. The marginal cost summer tier structure would convey the District's cost of serving peak demands, and encourage customers to evaluate their use of water in relation with this cost.

A detailed marginal cost analysis is more complex to perform, at least initially, than traditional cost of service analyses. A marginal cost analysis was not envisioned as part of this study, and would be best considered by the District once metered rates are in effect (at least for the commercial, irrigation, and multi-family customers). Even then, if the District's water use continues to be less than the take or pay provisions in the water supply agreement with SJWD, it is uncertain that a marginal cost analysis would result in dramatically different rates for the District, unless some for of seasonal pricing were desirable.

Outside of District Water Rates

The District provides water service to a few customers located outside of the District's service area boundary. Most recently, the District has been negotiating with the Northridge Country

Club regarding interruptible water service. The District does not currently have any specific water rate policies regarding water service to customers outside the District.

Establishing a premium on water rates for customers outside a water utility's service area boundary is a fairly common practice. The rationale and approach to such calculations are described in a water rate manual published by the American Water Works Association[28]. That manual states:

> "Many government-owned utilities recognize in their rate structures the differences in costs of serving water users located outside the corporate limits of the supplying city or jurisdiction compared with those located within the corporate limits. A government-owned utility may be considered to be the property of the citizens within the city. Customers within the City are owner customers, who must bear the risks and responsibilities of utility ownership. Outside-city customers are non-owner customers and, as such, bear a different responsibility for costs than do owner customers.
>
> The costs to be borne by outside-city (non-owner) customers are similar to those attributable to the customers (owners) of an investor-owned utility. Such costs include operation and maintenance (O&M) expense, depreciation expense, and an appropriate return on the value of property devoted to serving the outside-city customers."

There may be a variety of direct costs associated with serving outside-of-district customers, such as pipeline extensions, pipeline maintenance, pumping, billing costs, etc. These costs may be quantifiable and provide a basis for rate differentials. In addition, historically many municipal water utilities have been funded, as least in part, by property tax revenues. Since the passage of Proposition 13, most cities have weaned municipal enterprises from general property tax revenues, and special districts generally receive very little, if any, property tax support. However, to the extent that existing infrastructure was or is paid for with property tax revenues paid by District customers, outside-of-district customers may have an advantage unless rates are adjusted to reflect the fact that outside-of-district customers have not paid property taxes to the district[29].

In working with water utilities throughout the State, we have found that rate differentials (or premiums) on outside-of-district water rates typically vary from 25 to 50 percent. Not all water utilities charge outside-of-district customers higher rates, and there are some (though a relative few) who charge rate differentials of 100 percent or more.

Conditions of Service to Customers Outside the District

The District receives water from two primary sources: local groundwater pumped from the District's wells and water purchased from the San Juan Water District. Both of these supply

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28 *Water Rates*, AWWA Manual M1 Fourth Edition, American Water Works Association, 1991.

29 Some utilities charge outside-of-district customers a fee in-lieu of property taxes at the time of connection to make up for property taxes not paid.

sources are limited. In fact, CVP water purchased from San Juan Water District is subject to cutbacks in accordance with CVP contracts. Because the District's water supply is limited it has taken steps to encourage efficient water use by its customers. In addition, the District has included provisions in contracts with outside-of-District customers that permits termination within 60 days without cause. This provision enables the District to discontinue water service in the event of a water shortage.

Some utilities have established higher rates for outside-of-district customers, in part, as a means to encourage annexation into the district. Annexation into the district is a way to avoid the higher rates. The District may wish to consider the implications of such an incentive.

Cost of Service Issues

It is clear that a different rate structure for outside-of-district customers could be justified if the rates are based on clear and quantifiable cost of service differences. However, even if cost differentials can be identified they are often difficult to quantify. Indeed, the District's system of cost accounting may not be sufficiently detailed to track or separately identify costs associated with serving outside-of-District's customers. Furthermore, the cost of such tracking may not justify the practice.

If a cost of service analysis is desirable then the following steps should be considered:

- Allocate distribution system costs based on length of pipe inside and outside the District, with outside-of-District customers solely responsible for all costs of lines outside the service area.
- Identify additional travel costs associated with field crews (line maintenance, meter reading, etc.) having to travel to more distant outside-of-city service locations. This is probably negligible in the District's situation.
- Allocate the cost of the more expensive sources of water (groundwater) to outside-of-District customers following the assumption that District customers will have the first claim to less expensive imported water.
- Apply any property tax revenues of the District to the revenue requirement for District customers, but not to outside-of-District customers.
- Evaluate the extent to which the existing water system was financed through past property tax revenues paid for by customers within the District's service area.
- Consider calculating water rates for outside-of-District customers on a utility basis (similar to that used by private utilities) which would include a return on the rate base for the District's investment in the water system.

Many water utilities that have higher rates for outside-of-District customers have established them based on a conceptual understanding of cost differences. Because the incremental revenues

generated by higher outside-of-District rates are usually minor (as in the case of the District), it is difficult to justify an extensive cost analysis. However, even if quantification is not practical, it is still important to recognize that there are cost differences and to acknowledge this fact when establishing rates. Rates can be justified through a reasonable evaluation and assignment of costs; precision is not a requirement.

Legal Considerations

In municipal rate setting it is not necessary for the rate structure to be perfect, but rates should bear a reasonable relationship to a legitimate government interest. A number of cases have held that discrimination in rate setting is not unjust, but that only unreasonable discrimination renders a rate or charge objectionable.

A basic tenet involving municipal rate setting is that rates established in a lawful manner are presumed reasonable and fair. A presumption of reasonableness places a heavy burden of proving that the rates charged are unjustly discriminatory and therefore unreasonable. The mere fact that rates are not the same is by itself insufficient to establish that rates are unreasonable. To be objectionable, the discrimination must "draw an unfair line or strike an unfair balance between those in like circumstances having equal rights and privileges. It is only unjust or unreasonable discrimination which renders a rate or charge unreasonable."[30]

A utility's first duty is to its own customers who have invested in, paid for, and accepted the risks of the utility's existence. District customers therefore have a preferred claim to the benefits resulting from public ownership. Upon this reasoning courts have held that municipalities, in the absence of legislative limitations, may discriminate as to rates based solely on the political boundaries of the municipality. Courts have noted several cost-related factors that justify different rates to residents outside of the service area. These include:

- Greater distance and/or elevation from central facilities (i.e., a treatment plant)
- Lower density in outlying areas necessitating greater costs per customer
- Risk associated with long-term debt with repayment obligations ultimately resting with customers (owners) of the utility
- An expectation of a return on investment made by customers (owners) of the utility.

Courts have also recognized the difference in the relationships between a city and its residents, and a city and outside entities. Within its boundaries a city has exclusive authority and an obligation to provide services to its residents. In fulfilling its obligations a city is allowed to set rates for its services. The recipients of municipal service have no choice as to service provider and only limited input to the rate-setting process. City residents therefore have an expectation that rates and charges will be reasonable and just. The situation is different for entities outside of

[30] *Durant v. City of Beverly Hills*, 39 Cal. App. 2d 133 (1940).

the city. Residents outside the city are not obligated to receive services from the city, and can seek other service providers. Furthermore, the city is not required to provide service outside its boundaries. In this situation, the request for and the provision of service is provided on a voluntary basis. The relationship between the city and the outside customer must be viewed as mutually acceptable with respect to rates, as well as other conditions of service. Under these conditions, the relationship between the city and customer is contractual in nature, terms of service are negotiated, and standard requirements for reasonableness in rate setting do not apply.

While the above discussion focuses on municipal enterprises, a similar analogy applies to a special district and its customers. That is, in instances where the District provides a special service to customers outside of the District's own service area there exists a different relationship between the District and outside-of-District customers.

It is important in designing water rates to consider all factors which create differences among classes of customers (e.g., inside-of-district versus outside-of-district). These factors, including cost of service and policy objectives, should be articulated in the resolution that authorizes the rate structure. As utility rates become a larger portion of a customer's monthly budget, more attention will be focused on the procedural and substantive techniques for establishing utility rates. Thus it becomes even more important for the governing body to clearly articulate and explain the rationale for any rate differentials.

We recommend that the District establish a formal position regarding water service to customers outside of the District's service area. However, we do not believe that a formal cost of service justification is necessary or warranted in order to establish an outside-of-District water rate at something higher than normal inside-of-District rates.

We recommend that the District adopt an outside-of-District water rate that is 150 percent of inside-of-District rates. This rate differential can be based on the following findings: (1) additional costs are incurred by the District to provide water service outside of the District's service area boundary, (2) the District is not obligated to provide water service outside of its service area boundaries, (3) in providing service outside its boundaries it expects a return on its investment in the water system for the benefit of inside of District customers, and (4) the District wishes to encourage annexation to the District in instances where permanent long-term water service by the District is requested.

Intertie Water Rates

The District has a number of intertie connections between the District's water system and those of neighboring water districts. These interties provide backup reliability within the water distribution systems of the water districts. Most recently, in the spring of 1997, the Fair Oaks Water District provided water and system pressure to the Carmichael Water District when facilities damaged by winter floods had not been repaired prior to the onset of summertime water demands.

Recent engineering studies performed for the District indicate that additional interties could prove beneficial to the District as a means of providing additional system reliability at modest

cost. At issue as part of this rate study is how the District should approach establishing rates, charges, and agreements for interties with neighboring water districts.

The construction, operation, and maintenance of intertie connections will require some form of agreement between affected water districts. The specific terms of these agreements, including cost sharing arrangements, will be negotiated by the parties. What we hope to provide here is a discussion of the issues to be considered in developing agreements covering intertie connections and the extension of water service through them.

Specific issues to be considered related to intertie connections are listed below, followed by a discussion of each.

- What is the nature of the expected use of the intertie connection?
- What are the expected relative benefits to each party to be derived from the intertie?
- What capital costs are involved in the intertie connection?
- What ongoing maintenance costs are involved in the intertie connection?
- What operating costs, including cost of water delivered, are involved in the intertie connection?
- Who will be responsible for the construction, maintenance, and operation of intertie facilities?
- What are the conditions or limits of service through the interties?

Expected Use of the Intertie Connection

Interties between neighboring water districts are fairly common, and serve many purposes. In most cases an intertie connection is established to provide an emergency backup of the water system, possibly in terms of water supply, system pressure, or peak capacity. In some instances interties are a means of moving water through a water system as the most cost effective conveyance mechanism. This occurs when service area boundaries, topography, or other conditions make it difficult to provide service to a portion of a service area. Going beyond the physical interconnection between independent water systems, frequently multiple water utilities will share capacity in joint facilities (e.g., distribution storage tank), and therefore the water systems are interconnected.

If the purpose of establishing an intertie is to provide mutual aid in the event of some type of emergency, then both parties are motivated by the same reliability benefits and convenience. Each district envisions themselves on both side of the arrangement, and mutually satisfactory terms are likely achieved. If, on the other hand, a district's purpose in establishing an intertie differs from that of the other district, then motivations are different and the structure of the intertie arrangement would reflect the specific purpose in mind.

It is our understanding that the District is considering the use of interties both for emergency purposes and possibly for ongoing operations (i.e., Citrus Heights Irrigation District). A distinction between the nature of service through an intertie may have legal and regulatory implications. For example, place of use restrictions on water use may not be significant issues during declared emergencies, whereas in other times they might pose significant obstacles. The District should seek a legal opinion as to potential restrictions on the delivery of water to other service areas[31].

Interties may also be used for other purposes such as providing a more permanent means of providing water supplies to others, perhaps on a wholesale basis. Recently, water quality problems associated with the Rancho Cordova service area of the Arden-Cordova Water Service Company (ACWS) have sparked interest in the District providing water to ACWS on an on-going basis. This type of intertie differs from the short-term emergency situation described above. The ACWS situation is more akin to wholesale water service whereby the District would need to consider the long-term impacts on its water system (i.e., operational impacts, capacity utilization, capital replacement, etc.) of providing on-going water service to a neighboring water utility. While the issues described in this section on emergency interties may have a bearing on long-term wholesale water service connections, other issues would also need to be considered.

Expected Benefits

In most instances interties between districts are likely to support mutual aid of one district by the other. The need for such support may differ (risks may be different), or the physical conditions (e.g., different system pressures) may mean actual benefits would be unilateral. These issues would be considered in developing any kind of intertie agreement, and may impact how cost sharing is handled.

We suggest that cost sharing provisions of an agreement be based on the anticipated benefits to be derived from the intertie. This determination could reflect the relative level of risk or potential need for aid. The District might also consider provisions whereby cost-sharing arrangements may change in the future as a result of actual benefits being different than those originally anticipated.

Capital Costs

Intertie connections may be relatively simple and involve a short section of pipeline bridging the two water systems, valving, and a water meter. In some cases, intertie connections may involve additional pumping or reliance on distribution storage capacity. In either case, the required capital facilities should be identified and accurate costs determined. Cost sharing options could be varied, but we suggest that the cost sharing arrangement be based upon the anticipated benefits to be derived from the intertie. Financing costs should be considered in the cost sharing

[31] Place of use restrictions are not likely issues with other members of the San Juan family of water districts. However, limitations may exist with other districts.

arrangement, but if one party requires financing to pay for their share of the facilities, that financial cost should only be borne be that party.

If capital costs associated with an intertie are very significant, such that long-term financing is desirable, debt service payment obligations could be assigned to each party, rather than the direct capital cost.

Maintenance Costs

Intertie connections will require some minimal level of ongoing maintenance, even if they are never used. Maintenance may include exercising valves, maintaining meters, inspecting for and repairing leaks, etc. The district responsible for the maintenance of the intertie facilities should establish specific tasks and jobs using available maintenance management systems to track activity and costs directly. Again, a cost sharing arrangement may be a function of anticipated benefits, or adjusted based on actual benefit history. The responsibility for maintaining interties facilities should be clearly assigned, and maintenance tasks and schedules developed. The district responsible for maintaining connection facilities could be reimbursed based on actual cost, using an agreed upon cost allocation formula.

Operating Costs

The purpose of an intertie is to allow the delivery of water from one district to the other. The water provided is not without some cost associated with it. If the intertie is used simply to wheel water from the source to the ultimate user then operational costs are likely to be minimal. If one district must provide some of its own water to the other district then a rate should be charged for actual water deliveries based on the cost of the water, as well as delivery costs (e.g., pumping).

What are the costs of water that should be included in the intertie rate? In the District's situation the cost should include, at a minimum, the cost of purchasing water from SJWD, as well as any costs to pump the water to the point of delivery. It is our opinion, that if the intertie is intended for infrequent emergency situations, then the District should seek to recover it's direct variable costs associated with providing the water, and not be concerned with factoring a share of the cost of owning and maintaining the entire water system. On the other hand, if an intertie was intended to provide for ongoing (or even intermittent) water service then the District might view the provision of water service more along the lines of an outside of District customer (as previously discussed).

If interties are established for mutual aid there should be recognition that the cost of providing water from one district to the other may be different when reversed. While the rates charged for water may differ, they should be based on the same cost principles (e.g., include only the directly variable costs of purchasing, treating, and delivering water).

Responsibilities, Conditions, and Limits of Service

Intertie agreements should clearly specify who would be responsible for the construction, maintenance, and operation of intertie facilities. These responsibilities may vary for each of

these components of costs. In addition, agreements should specify under what conditions the interties might be operated. For example, it may be advantageous for an agreement to specify that an emergency exists before water is provided through the intertie. This may help to satisfy various legal or regulatory concerns over the provision of water service. In addition, consideration should be given to defining system pressures, flow rates, periods and duration of use, and other operational parameters.

It should be noted that agreements for long-term water service to neighboring water utilities would likely need to address a broader range of issues than the emergency intertie agreements that are the subject of this section.

Recommendations for Intertie Rates

Working in conjunction with affected water districts, the District should develop a formal operating and cost sharing agreement for each of its interties. We recommend a separate agreement for each intertie, even though provisions may be similar. The agreements should reflect the needs and expectations of each district and address the issues raised above. Cost sharing should be based on the relative share of expected benefits from each intertie. If the benefits are expected to be mutual, a 50/50 cost sharing arrangement should be utilized. The District should give consideration to agreement provisions that would permit modification of the cost sharing formulas based on actual benefits received. With respect to various interties costs:

- Capital costs should be borne directly by each agency based on an appropriate cost allocation, financing costs should be borne individually, unless shared financing is preferred, in which case each district should be responsible for a specified share of debt service payments.

- Maintenance costs should be borne directly by each agency based on an appropriate cost allocation (which may be different from the capital cost allocation). Actual costs should be used as the basis for maintenance costs, although set monthly (or quarterly, or annually) charges based on estimated costs could be used, with a reconciliation at the end of the year for actual costs. Maintenance management systems used by many utilities provide an ideal means of tracking costs associated with the maintenance of specific facilities.

- Each district should establish a commodity rate for actual water delivered through the intertie connection. Each district should establish its own rate, but these rates should be based on the same cost components. Rates should include direct variable costs associated with providing water service from surplus sources. For interties between the District and other members of the San Juan family of districts the intertie right should be based on the cost of purchasing water from SJWD (plus any distribution costs such as pumping). Interties between the District and other Districts (e.g., Carmichael Water District) should be based on the cost of groundwater.

An intertie agreement may be approached and structure differently if the intended purpose of the intertie is something different than mutual aid in the event of an emergency.

Private Fire Service Charges

As previously discussed, many water utilities have separate service charges associated with private fire service connections. Private fire service charges can reflect the cost of providing fire flow capacity, as well as maintaining appurtenant equipment (e.g., check valves, flow detection meters, etc.). The District provides fire flow capacity to public fire hydrants throughout the service area. The costs of public fire fighting capabilities are included in the rates paid by all customers, and all customers benefit from the fire flow capabilities of the water system. On-site fire fighting capabilities reduce the risk of fire-related property damage, and sprinkler systems in particular significantly reduce both the peak demand and the total amount of water used for fire fighting purposes.

The District believes that the private fire service charges should reflect only the costs of maintaining appurtenant equipment, but not distribution capacity costs. Distribution capacity provides fire flow capacity to public fire hydrants. Because commercial customers will pay a share of public fire flow capacity costs through their standard water service connections, it would not be appropriate to charge for that system capacity in a private fire service charge (this might be considered double charging). Therefore, the only costs that would be included in the private fire service charge would be those associated with maintaining appurtenant equipment.

Fire line service laterals generally range in size from 2" to 10", although most of the fire lines within the District are believed to be 4". Based on data provided by the Sacramento County Fire Protection District, plus District data related to newer service connections, there are about 78 private fire line connections within the District. The District has a shut-off valve on each line, but does not own or have responsibility for maintaining check valves, detection meters, or other equipment (on the customer's side of the shut-off valve). State regulations require check valves and/or detection meters on fire service lines. Because the District is not responsible for any appurtenant equipment on private fire service lines the only real maintenance cost is associated with the pipeline lateral, and this cost is negligible[32].

Because the District does not incur costs to maintain appurtenant equipment, read detection meters, or even maintain fire service accounts, there is very little basis for private fire service charges at this time. If the District decides to install appurtenant equipment and assume responsibility for the maintenance there would then be a basis for establishing a service charge. That is, any monthly charge for a private water service connection should be based on the cost associated with providing service to that connection (installation and maintenance of service lines and appurtenances). However, even then, the District may wish to consider, as a policy matter, whether implementing a service charge for fire service lines which provide community-wide fire protection benefits, as well as reduce the total amount of water needed for fire fighting is desirable. Because of the relatively small number of private fire service lines, these charges would never amount to a significant source of revenues for the District.

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[32] Estimates of average cost to maintain the service lateral, using conservative assumptions, range from $0.16 to $3.00 per month.

It is important to note that as the District meters water service connections it will become increasingly important to monitor water use through private fire lines. Hence, the consideration of private fire service issues is becoming increasingly urgent.

The District should reassess its practices with respect to private fire service connections and consider:

- Installing flow detection meters on all private fire service connections to ensure that water is used only for fire protection purposes.
- Implementing a monthly service charge for private fire service connections and a commodity charge for unauthorized water use.

Water Rates for Temporary Construction Uses

Currently District staff has five options available for charging for temporary water use[33]. These include:

- Schedule A (lot, parcel) $16.00/lot
- Schedule B (trench excavation) $3.50/100 CY of excavation
- Schedule C (grading, compacting) $2.80/100 CY of material
- Schedule D (acreage) $80.00/acre
- Schedule E (metered usage) $1.60/1,000 gal. ($1.20/CCF)

A minimum charge of $16.00 applies to each temporary water use permit. According to staff, the current fee structure works reasonably well. Flat fees for estimated water use reduce administrative burden of verifying that the meters are actually used, as well as the cost of meters (including maintenance and repairs). If a water use estimate can not be developed for a particular use (or the estimate appears inappropriate) then a meter can be issued and charges assessed based on actual water use.

The water rate for temporary construction of $1.60 per 1,000 gallons is about 7.5 times higher than the commodity rate calculated in this report. However, the temporary water service does not include a monthly service charge (though a one-time minimum charge applies). In addition, these services are normally of short duration and have a relatively high administrative cost associated with them. Therefore, a higher commodity rate is not unusual in the industry.

Temporary water is normally provided through a public fire hydrant. One of the issues that the District should consider is that the policies and practices should not be unreasonably complex or

[33] Temporary water use is primarily for construction purposes (e.g., dust control, compaction, etc.), but the District also provides water for mixing pesticides by a landscape maintenance firm.

costly so as to encourage theft of water. The District's procedures should encourage users to obtain the proper permit and pay fees for water use. District staff reports that current procedures are generally acceptable to users.

As a result of this brief review of the District's current rates and practices regarding temporary water use, we recommend that the District continue using the existing fee schedule without change. We recommend, however, that any temporary water use not satisfied with the flat fee based upon the estimate of water use be allowed the opportunity to use a temporary hydrant meter and pay for the water based on actual use (still subject to the $16.00 minimum charge). Finally, the District does not have any type of penalty or charge for unauthorized use of water (theft). The District should consider establishing some form of charge for unauthorized use as a means of encouraging users to obtain the appropriate permits and approvals.

REVIEW OF CONNECTION FEES

The Board of Directors requested that the District's current connection fees be reviewed to determine whether there is a need to update either the amount of the fees or the calculation methodology. The term connection fee, as used herein, refers to the one-time charge to new development for costs associated with providing capacity in the water system. Connection fees are frequently referred to as capacity charges or development impact fees. The term connection fee is also occasionally used to refer to charges for the installation of a service lateral and water meter. That fee, sometimes referred to as a tap fee, is not addressed in this report.

The District's connection fees were last formally updated in February 1994, although the fee schedule was revised again in 1997. Connection fees were originally calculated to comply with Government Code Sections 66000 et seq. in 1988 using cost estimates and growth data from the 1988 Water Master Plan. The 1994 update revised the fee calculations by: (1) revising the estimated demand of single family dwelling unit (EDU), and (2) updating the cost of planned capital improvements. The 1997 update include revisions to cost estimates and a revised fee schedule for various meter sizes based on hydraulic meter capacity, rather than pipe area.

Legal Requirements for Connection Fees

Before proceeding with the review of the District's connection fees, it is important to gain a background understanding into the general legal framework for this type of fee[34]. Connection fees are intended to recover an equitable share of the cost of capacity in the facilities that are (or will be) available to serve new customers of the water system.

The District has broad authority to charge users for capital facilities. The limitations of that authority are encompassed by the requirements that exactions on new development bear a *reasonable relationship* to the needs created by, and the benefits accruing to that development.

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[34] HF&H is not a law firm and therefore can not provide legal advice. The information provided is based upon our understanding of the legal requirements and provides the basis for the fee methodologies.

California courts have long used the reasonableness standard or *nexus* test to evaluate the constitutionality of exactions, including capital facilities fees.

Within California, statutory requirements codified as Government Code §66000 et seq. (commonly referred to as AB 1600) provide specific requirements for fees established or imposed as a condition of development approval. The substantive provisions of AB 1600 were intended by the California Legislature to explicitly define requirements for meeting the reasonable relationship standard. Because the District does not have development approval authority (this is granted to cities and counties), the specific requirements of AB 1600 do not apply to the District. However, the procedural elements of the statute, which relate to the purpose and use of the fees, nexus relationships, time of collection, time limits for expenditure, accounting, reporting and refunding should provide guidance to the District on how the courts might interpret the capital facilities fees in light of the reasonable relationship standard. Many water districts have followed the requirements of AB 1600 as a means of demonstrating reasonableness.

In addition to the provisions of AB 1600 there is an additional Government Code section which specifically applies to connection fees for new water connections. Government Code §66013(a) states:

> Notwithstanding any other provision of law, when a local agency imposes fees for water connections or sewer connections, or imposes capacity charges, those fees or charges shall not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed...

Government Code §66013 requires that the District's connection fees not exceed the estimated reasonable cost of providing water service to new customers[35].

In developing the capital facilities fees for the District we have given consideration to the following criteria which would likely be considered by a court in evaluating the validity of the fees:

- *Need* -- The connection fees may be imposed only on development that will need capacity in facilities provided by the District (i.e., development with a water service connection).

- *Benefit* -- Improvements to be funded (or reimbursed) by the fees must satisfy the water service needs related to the development on which the fees are imposed (i.e., new development is served by the facilities paid for by the fees).

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[35] SB 1760 signed into law in September 1998 modifies Section 66013 and creates additional requirements for the accounting and reporting of capacity charge revenues and expenditures.

- *Amount* -- The amount of the fees must reflect the reasonable cost of providing water service capacity, and the share of the costs attributable to the service needs of new development (i.e., the fees should reflect a proportionate share of costs).

Applying these criteria to the District's situation requires an understanding of how improvement needs are established, how capacity is provided to new development, and how costs are estimated and allocated.

Methodology for Calculating Capital Facilities Fees

There are numerous methodologies for calculating capital facilities fees. The number has proliferated with the fees' growing popularity. Various methodologies have evolved to meet changing public policy, legal requirements, and the unique or special circumstances of each local agency. Within all of the available methodologies there are two primary approaches. Other methodologies are usually some variation or combination of these two methods. The two primary methods include:

System Buy-In Method

The buy-in method is based on the average investment in the water system by current customers. Raftelis[36] describes the system buy-in methodology as follows: "Under this approach, capital recovery charges are based upon the 'buy-in' concept that existing users, through service charges, tax contributions, and other up-front charges, have developed a valuable public capital facility. The charge to users is designed to recognize the current value of providing the capacity necessary to serve additional users. The charge is computed by establishing fixed asset value under a historical or reproduction cost basis and deducting relevant liabilities (long-term debt, loans, etc.) from this amount. The number of units of service is then divided into this difference (considered to be the utility's equity) to establish the capital recovery charge."

AWWA Manual M26 suggests that a system buy-in charge be calculated by taking the net equity investment (net investment less depreciation) and dividing by the number of customers (or equivalent customers). Once new customers have paid their fee, they become equivalent to existing customers and share equally in the responsibility for existing and future facilities.

The system buy-in methodology has three distinct advantages:

- The buy-in methodology is a common and well-accepted methodology for calculating capacity charges. The method is popular with developers because it can result in lower fees than other methods (depending on valuation methods used).

- The buy-in methodology includes only the cost of existing facilities and excludes the costs of future or planned facilities.

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[36] Comprehensive Guide to Water and Wastewater Finance and Pricing, George A. Raftelis.

- The buy-in methodology does not necessarily depend on an assessment of existing capacity availability, and therefore does not require the more detailed analyses required to justify fees based on other methodologies.

Incremental Cost Method

The incremental cost methodology is a fairly common approach for connection fees. This is the approach used for the District's current connection fees. The approach is based solely on the cost of future water facilities. The cost of growth-related future facilities is allocated to the new development to be served by the facilities. No allowance is made for existing capacity that may also serve new connections. Under this approach, new customers pay only for the incremental investment necessary for system expansion. The incremental approach is most commonly applied when extensive new facilities are required to provide capacity for new development. The method is less attractive in situations where most of the water system is in place, and limited capacity expansion is required.

When new customers connect to the water system they use either reserve capacity available to existing customers (which then needs to be replaced), or they require new capacity which must be added to the system. The goal of this method is to minimize or eliminate the need to raise rates in order to provide for water system expansion. Consequently, new customers pay fully for additional capacity in new facilities to avoid imposing a burden on existing customers.

The incremental cost methodology requires a more detailed analysis in order to satisfy nexus requirements. First, the capacity requirements for new development must be defined. Service level standards are most often expressed in average daily use rates, but may also include rates of peak use. Second, the amount of capacity provided by new facilities must be determined. Taking total capacity and dividing by the capacity required for a single unit of service results in a determination of the number of units that can be served. Third, existing system deficiencies must be considered. To the extent that existing capacity does provide the specified level of service to current customers, new facilities must first be used to correct these deficiencies before it can be applied to meeting growth needs. As a result, it is common for only a faction of new capital facility costs to be included in connection fee calculations. All of these more detailed determinations are avoided with the buy-in method which is simply seeking to estimate the relative investment in the water system on a per customer basis.

Frequently, aspects of both the system buy-in and incremental cost methodologies are combined when calculating connection fees. This might occur when the water system has excess capacity in some elements (e.g., water treatment) but insufficient capacity in other elements (e.g., distribution storage). Under this example, a combined approach might include the cost of existing treatment capacity in a buy-in component and the cost of distribution storage through an incremental cost component.

Current Connection Fees

As mentioned above, the District's current connection fees have been calculated based upon the incremental cost methodology. The connection fees are based on the cost of planned capital

improvements identified in the 1988 Water System Master Plan intended to increase system capacity. These costs are divided by the total number of additional EDUs that could be served with the new capacity. Capital improvements included in the 1997 update in the fee's calculation include:

- Distribution facilities $721,000
- Upper pressure zone tank and pump station $400,000
- New San Juan supply piping $1,140,000
- Additional emergency supply $356,000

The new facilities were estimated to provide an additional 1.7 mgd of capacity available to serve new customers. The 1994 connection fee study revised the estimate of single family water use from 1,000 gpd/EDU to 1,224 gpd/EDU based on recent estimates of water demands within the Sacramento metropolitan area. Therefore, the 1.7 mgd of additional capacity was estimated to serve an addition, 1,390 EDUs (1,700,000 divided by 1,224). The total capital improvement cost of $2,617,000 (total of projects listed above) was reduced by $614,220 to reflect connection fees collected through the end of 1993, and then divided by the 1,390 EDUs to arrive at a value of $1,440, which was rounded to the current connection fee of $1,500/EDU.

The current fee methodology while straight-forward and generally correct could be improved upon in a number of ways. First, the incremental cost calculations, as performed by the District, do not need to reflect the amount of connection fee revenue received, unless there is also a corresponding adjustment in the capacity that is available for new development. Prior year connection fee collections were included in the calculation while an adjustment of the remaining capacity was not. We recommend that both adjustments be excluded, rather than both included, for fee stability purposes. This District's calculation resulted in an understatement of the connection fees.

Second, in our opinion, there is insufficient documentation in either the 1997 update calculation, the 1994 connection fee evaluation, or the 1988 Water System Master Plan to provide an adequate nexus between the cost of included capital improvements and the amount of capacity that will be provided. The defensibility of any connection fee calculation is directly related to the strength of the nexus relationships. This is particularly true of incremental cost approaches where new customers are being asked to pay for specific increments of new capacity.

Third, we suspect that the water use estimates for single family connections could be reduced significantly. Metered water use data used during this water rate study indicates that average single family use in the District is about 800 gpd, rather than over 1,200 gpd. In addition, the installation of water meters and implementation of metered water rates are likely to reduce average use such that capacity requirements of new development will be even lower. As a result, the planned capital improvements will likely be able to serve many more new connections than currently assumed, and a lower connection fee might be appropriate.

We noted that the updated connection fee schedule for 1997 included a refinement of the calculation of the connection fee for different size connections. The revised schedule uses hydraulic capacity factors associated with various meter sizes, rather than area relationships for various pipe sizes. This change is an improvement to the fee calculation.

New legal requirements contained in SB 1760 will make maintaining the District's current connection fees problematic; providing the District with another reason for updating the fee's calculation.

Connection Fee Recommendations

As the previous discussion of connection fee methodologies suggests, the incremental cost method requires a much greater level of analytical detail to support the fees. It is our opinion that the District's current fee calculations fall somewhat short on adequately demonstrating the required nexus relationships. In addition, the incremental cost methodology is most often used with water utilities that have significant expansion-related capital improvement needs. The District, however, is largely built out and the number and size of capital improvements needed to provide additional system capacity are likely fairly limited. Most of the capital projects identified in the Master Plan are upgrade and replacement projects. The incremental cost method fails to take into consideration that the existing water system provides capacity for the benefit of new development. As the water system approaches build out conditions new development will be relying more and more on existing capacity, rather than new capacity.

We recommend the District consider using the system buy-in methodology to calculate connection fees. The recalculation of connection fees was not included within the scope of this rate study. However, based on the direction provided by the Board of Directors on this issue, it would be possible to calculate connection fees using the system buy-in approach in conjunction with the completion of the rate study. The system buy-in approach requires less technical precision, can be easily updated on an annual basis, and better reflects the value of system capacity in a largely built out water system. It is also considered to be more conservative and, we believe, more widely acceptable to the development community. One of the major advantages of the system buy-in approach is that it does not rely on a specific assessment of water system capacity or the definition of service level standards. Therefore, it does not need to be updated if capital improvement plans change. There are also new benefits in the system buy-in methodology created by the requirements of SB 1760.

The calculation of connection fees using a system buy-in approach could be developed using the District's fixed asset records. The required data are typically maintained for financial reporting and audit purposes. Ideally, the fixed asset records would include the historical cost, year of construction, and service life (depreciation life), of all major water system components. When actual historical cost records are not available other valuation techniques and estimates can be used. The value of water system assets is determined by escalating historical cost of facilities to current dollars (most frequently using an ENR construction cost index) to arrive at a reproduction cost. This amount is then depreciated based on the remaining useful life of each asset to reflect that facilities are no longer new. Past financing costs can be considered in the valuation analysis, and any outstanding debt should also be considered. The total value of the

water system is then divided by the current number of connections (expressed in EDUs) to arrive at an average investment per connection.

When new customers pay a connection fee based on the system buy-in methodology they are buying into the equity of the water system on an equal basis as existing customers. The fee represents a reimbursement to existing customers for past investments into the water system that will then provide benefits to the new customer. Because the fee is a reimbursement to existing customers there are no restrictions as to how the fund are expended (this aspect of the system buy-in approach is even more pronounced under new requirements included in SB 1760). Buy-in connection fee revenues are often applied toward capital improvement expenditures, but they could be used to offset operational costs as well. However, we advise the District to restrict the use of connection fee revenues to capital improvements.

An additional advantage of the system buy-in approach is that there is no need to evaluate the capacity of the water system for excess or deficient capacity, or to define the specific service level standards for new development. New customers are buying into the water system as-is, with any excess or deficient capacity that exists. From that point forward, all customers contribute equally, through rates, towards additional improvements to the water system. To the extent that improvements are made which provide more capacity for future growth, these investments are recovered with future buy-in connection fees.

III. WATER RATES FOR 1999

INTRODUCTION

As the District approached consensus on the broad range of policy and technical issues regarding water rates and other charges it also entered into its annual budget process to develop operating and capital program budgets for 1999. Prior to completing the water rate study, the District Board of Directors asked that water rate recommendations developed in the previous section be updated to reflect the proposed 1999 budget. This recalculation of the metered water rates is important for several reasons, including:

- The proposed budget indicates that a significant increase in the water rates will be required in 1999. The increase is necessary to cover increased operating costs, meet debt service coverage requirements, and provide funding for continued capital program needs.

- The District has begun development of a Metering Implementation Plan to determine the most efficient and cost-effective means of metering residential customers. Part of this effort is to assess public opinions and concerns regarding metering. As a result, customers are beginning to ask questions about metered water rates. The District plans to adopt a metered water rate schedule for 1999. In addition, there will likely be increased customer interest in what the metered rates would be like, and how a change to the metered rates could affect customers' water bills.

- SJWD recently changed the manner in which it charges for water service. The implication of wholesale rate changes for 1999 also deserves attention.

The remaining part of the Section summarizes the 1999 budget and revenue requirement, presents a calculation of 1999 metered water rates, presents a schedule of water shortage rates for each stage of water shortage[37], and outlines suggestions for gradually implementing metered water rates.

1999 BUDGET AND REVENUE REQUIREMENT

Metered water rates were calculated based on the proposed 1999 budget and water rate revenue requirement. **Exhibit 15** summarizes the 1999 water rate revenue requirement. The revenue requirement is the total annual revenue that must be generated from water rates to cover the District's operating, debt service, and capital improvement program costs, net of other revenues and the use of available fund and reserve balances.

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[37] The water shortage rates are presented for information purposes, they can not be implemented until single family customers are metered.

Exhibit 15
Fair Oaks Water District
1999 Budget Summary and Revenue Requirement Determination*

		1998 Budget
GENERAL FUND		
Beginning Fund Balance (Unrestricted)	$	487,200
Operation & Maint. Expenditures		
Administration	$	1,097,100
Operations & Maintenance	$	2,039,500
Board of Directors	$	73,600
Reduction in Discretionary Expenditures	$	(143,000)
	$	3,067,200
Debt Service & Long-Term Notes		
1989 COPs	$	432,800
1991 COPs	$	357,600
Savings from Refunding COPs	$	(28,500)
Cooperative Transmission Pipeline	$	294,900
Trustee Fees	$	8,000
	$	1,064,800
Capital Improvements		
Administration	$	127,500
Operations & Maintenance	$	76,000
Metering Implementation	$	218,900
Facilities & Equipment	$	234,600
	$	657,000
Transfers To/(From) Reserves		
Operating & Emergency Reserve	$	45,000
Facilities Upgrade Reserve	$	(190,000)
COP Reserve (Restricted)	$	58,200
	$	(86,800)
Miscellaneous Revenues		
Redemptions & Delinquencies	$	53,000
Irrigation Charges	$	30,000
Fees for Service	$	10,000
Connection Fees	$	10,000
Interest Income	$	220,700
Other Revenue	$	20,000
	$	343,700
Water Rate Revenues	**$**	**4,110,000**
Ending Fund Balance (Unrestricted)	$	238,700
Change in Fund Balance	$	(248,500)
OPERATING & EMERGENCY RESERVE		
Beginning Fund Balance	$	754,515
Transfers From/(To) General Fund	$	45,000
Ending Fund Balance	$	799,515
FACILITY UPGRADE RESERVE		
Beginning Fund Balance	$	190,000
Transfers From/(To) General Fund	$	(190,000)
Ending Fund Balance	$	-

* The 1999 revenue requirement does not reflect the cost of the expanded residential metering program that is scheduled to begin in 2001.

The District's anticipated annual operating costs total about $3.07 million after a reduction in discretionary expenditures of $143,000. Debt service requirements are expected to be $1.06 million assuming that favorable interest rate can be obtained with the refunding of the District's existing COPs. Capital program costs are expected to be $657,000, but these costs will be offset with existing reserves and revenues from other sources. As shown in Exhibit 15, the 1999 water rate revenue requirement is calculated to be $4.11 million. This revenue requirement represents an increase of about 18 percent over the current 1998 water rates. Even with $4.11 million in water rate revenues the District will need to utilize $190,000 from the Facilities Upgrade Reserve and $249,000 from the unrestricted reserves to cover all operating, debt service, and capital program obligations.

The District is nearing completion of its 1988 Master Plan projects. In 1998 about $2.15 million was expended on capital projects. Much of these expenditures were funded from reserves (including remaining debt service proceeds). Capital expenditures for 1999 will be dramatically lower, although the District plans to expend about $160,000 to complete the commercial and multi-family metering program. To date meter installation costs have been absorbed from reserves. However, in 1999, the District will need to fund meter installations from current revenues. With the development of the Metering Implementation Plan the District will seek low-interest state revolving fund loans to help finance the residential metering program.

The revenue requirement calculations presented in this report do not reflect anticipated increased costs associated with the planned expanded residential metering program. Those additional costs will be identified and incorporated in a multi-year financial plan as part of the development of the District's Metering Implementation Plan.

The District is currently proceeding with plans to refund its existing long-term debt to take advantage of lower interest rates. This refunding, which may be complete before the end of 1998, is estimated to save the District about $28,500 per year in annual debt service payments.

Once the 1999 revenue requirement was determined the next step in the rate process is the allocation of costs to customer, capacity, and commodity components. The cost allocation methodology was described in Section II of this report. **Appendix B**, at the end of this report, provides the details of the cost allocations. The cost analysis resulted in the following allocation of costs to the various cost components:

• Customer Costs	$438,842	10.7%
• Capacity Costs	$2,663,075	64.8%
• Commodity Costs	$1,008,401	24.5%
• Total Revenue Requirement	$4,110,000	100.0%

Comparison of the 1998 and 1999 cost allocation reveals that most of the new costs included in the revenue requirement have been allocated to the capacity component. This is primarily due to the fact that continuing capital projects will be funded from current rate revenues, rather than

from reserves. Commodity and customer cost components also increased modestly due to increased purchase water costs and increased customer service costs, respectively.

1999 METERED WATER RATES

The 1999 metered water rates presented in **Exhibits 16 and 17** are designed to generate $4.11 million in annual revenues. The rate calculations are based on the same customer and water use data as the 1998 water rate calculations. The District has not had any significant growth in the number of customer served, and normal water use patterns are expected for 1999. The 1999 rate calculations are summarized below. Section II includes additional information on the calculation methodology.

Monthly Service Charge Calculation

Service charges are intended to recover the customer and capacity costs identified through the cost of service analyses. Service charges would apply to all customer water bills, regardless of the amount of water actually used. The service charge is intended to reflect the cost of making water service immediately available to customers. In calculating service charges, customer costs are allocated to each customer equally, and capacity costs are allocated based on the hydraulic capacity of each meter. For example, a customer with a 2" meter will pay the same customer costs but a greater share of capacity related costs relative to a customer with a 1" meter.

Exhibit 16 shows the service charge calculations for each meter size. The monthly service charge for the standard (1") single family meter would be $16.55. Service Charges are designed to annually generate $3,101,599 based on the revenue requirement and cost allocation. Using the example above, the calculation indicates that a customer with a 2" meter would pay a service charge almost three times what a customer with a 1" meter would pay. As mentioned previously, the revenue requirement for these rate calculations does not include the cost of the planned expanded residential metering program.

Uniform Commodity Rate Calculation

The uniform commodity rate is calculated simply by dividing the commodity costs by the estimated volume of water sold to customers. Total annual customer water usage was estimated to be 6,008,000 CCF. The cost allocation process previously described resulted in $1,008,401 of the total annual revenue requirement being allocated to the commodity cost category. These represent the costs to be recovered through the District's commodity rate. The amount includes all costs of purchasing water from the San Juan Water District, even though a portion of these costs will be included in a fixed annual service charge under SJWD's new wholesale rate structure[38].

[38] While the amount of the service charge is fixed each year it will vary from one year to the next based on FOWD's total annual water usage relative to SJWD's other wholesale customers.

Exhibit 16
Fair Oaks Water District
Service Charge Calculations for 1999

	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	10"	Unmetered	Total
Connection/Meter Data											
Single Family, Condo, Duplex	8	2,664	203	53	1	-	-	-	-	9,413	12,342
Multi-Family	-	18	11	53	-	-	-	-	-	218	300
Commercial	1	97	65	61	-	3	3	-	2	168	400
Irrigation	-	19	12	35	-	6	-	-	-	128	200
Total Connections	**9**	**2,798**	**291**	**202**	**1**	**9**	**3**		**2**	**9,927**	**13,242**
No. of 1" Equivalent Meters											
Single Family, Condo, Duplex	5	2,664	406	170	6	-	-	-	-	10,460	13,712
Multi-Family	-	18	22	170	-	-	-	-	-	557	767
Commercial	1	97	130	195	-	30	60	-	100	376	989
Irrigation	-	19	24	112	-	60	-	-	-	382	597
Total No. of Equiv. Meters	**6**	**2,798**	**582**	**646**	**6**	**90**	**60**	-	**100**	**11,776**	**16,064**
Hydraulic Capacity Factor	0.67	1.00	2.00	3.20	6.40	10.00	20.00	32.00	50.00	varies*	
Monthly Service Charges											
Customer Costs	$ 2.76	$ 2.76	$ 2.76	$ 2.76	$ 2.76	$ 2.76	$ 2.76	$ 2.76	$ 2.76	$ 2.76	
Capacity Costs	$ 9.26	$ 13.81	$ 27.63	$ 44.21	$ 88.41	$ 138.15	$ 276.29	$ 442.07	$ 690.73	Varies	
Total Charge (Rounded)	**$ 12.00**	**$ 16.55**	**$ 30.40**	**$ 46.95**	**$ 91.15**	**$ 141.00**	**$ 279.00**	**$ 445.00**	**$ 693.00**	**Varies**	
Annual Service Charge Revenue											
Single Family, Condo, Duplex	$ 1,152	$ 529,070	$ 74,054	$ 29,860	$ 1,094	$ -	$ -	$ -	$ -	$ 2,045,785	$ 2,681,016
Multi-Family	$ -	$ 3,575	$ 4,013	$ 29,860	$ -	$ -	$ -	$ -	$ -	$ 99,594	$ 137,042
Commercial	$ 144	$ 19,264	$ 23,712	$ 34,367	$ -	$ 5,076	$ 10,044	$ -	$ 16,632	$ 67,856	$ 177,095
Irrigation	$ -	$ 3,773	$ 4,378	$ 19,719	$ -	$ 10,152	$ -	$ -	$ -	$ 67,602	$ 105,624
Total	**$ 1,296**	**$ 555,683**	**$ 106,157**	**$ 113,807**	**$ 1,094**	**$ 15,228**	**$ 10,044**	**$ -**	**$ 16,632**	**$ 2,280,837**	**$ 3,100,777**
Summary of Fixed Costs**											
Customer Costs	$ 438,524										
Capacity Costs	$ 2,663,075										
Total Fixed Costs	$ 3,101,599										

* For unmetered accounts, the number of meter equivalents is estimated based on the number of unmetered accounts, as well as the mix of meter sizes present among metered accounts within each customer class.

** Does not include the cost of metering which, in future years, may be on the order of $500,000 per year if installed over a 12 to 15 year period on a pay-as-you-go basis.

With the above water use estimates and the allocation of commodity costs, a uniform commodity rate of $0.17/CCF was obtained. The uniform commodity rate could be applied to all customer classes with meters. The uniform commodity rate calculation is shown in Exhibit 17.

Exhibit 17
Fair Oaks Water District
Commodity Rate Calculation for 1999

	Estimated No. of Connections*	Estimated Ann. Water Use (CCF)	Water Rate ($/CCF)	Annual Revenues ($)
Water Usage and Commodity Rates				
Single Family	10,952	4,637,977	$ 0.17	$ 778,451
Condominiums	1,066	76,752	$ 0.17	$ 12,882
Duplexes	324	66,504	$ 0.17	$ 11,162
Multiple Family	300	171,144	$ 0.17	$ 28,725
Commercial	400	840,339	$ 0.17	$ 141,045
Irrigation	200	215,295	$ 0.17	$ 36,136
Totals	**13,242**	**6,008,012**		**$ 1,008,401**
		13,792 AF		
Summary of Variable Costs				
Commodity Costs	$ 1,008,401			
Total Variable Costs	$ 1,008,401			

* No. of connections to be metered has been estimated for multi-family, commercial, and irrigation.

Irrigation Surcharge for Large Parcels

As discussed in Section II, current flat rates for single family customers on parcels larger than one acre are subject to a flat irrigation charge of $165.55. This charge applies regardless of parcel size in excess of one acre. We recommended that this charge be modified such that the irrigation surcharge is based on the area of the parcel. **Exhibit 18** summarizes the calculation of the surcharge based on the 1999 water rate revenue requirement. This calculation is more fully described in Section II of this report.

Exhibit 18
Fair Oaks Water District
Irrigation Surcharge for Large Parcels*

	No. of Excess Acres	Estimated Ann. Water Use (CCF)	Water Rate ($/CCF)	Surcharge Per Acre ($/Acre)	Annual Revenues ($)
SF Large Parcels	490	166,600	$ 0.17	$ 57.10	$ 27,963

* Excess usage of 340 CCF/yr/acre is based on regression analysis.

This is the only change to the District's current system of flat water rates that is recommended at this time. The District should continue to adjust the current flat rates on an annual basis based on

annual revenue needs. The District should also continue equity adjustments for certain flat rate customer classes, consistent with the District's previous water rate study.

1999 WATER SHORTAGE RATES

Section II of this report described in detail the development of a tiered water rate structure that could be implemented during stages of water shortage. The tier structure would apply to metered single family customers and provide an incentive for the additional water conservation needed during period of limited water supplies. Similar tier structures could be developed for multi-family and irrigation customers once more complete water consumption data become available.

The water shortage rates are recalculated in this subsection to reflect the revenue needs of 1999. More importantly, however, changes to SJWD's wholesale water rate structure have a significant impact on the District's revenue needs during an extended water shortage. Up until now SJWD's wholesale rates included a minimum take or pay provision whereby the District was required to pay for its entire allocation of water whether it is used or not. Recent changes in the wholesale rate structure have resulted in an annual service charge intended to cover SJWD's fixed costs and an uniform commodity rate to cover variable costs. Therefore, during a water shortage the cost of water purchases (commodity charge) will decline as water deliveries decline. The fixed service charge would remain, however, even with reduced water usage.

Exhibits 19, 20, and 21 are similar to Exhibits 11, 12, and 13 except they reflect the larger revenue requirement for 1999, as well as the affect of SJWD's new wholesale water rate structure.

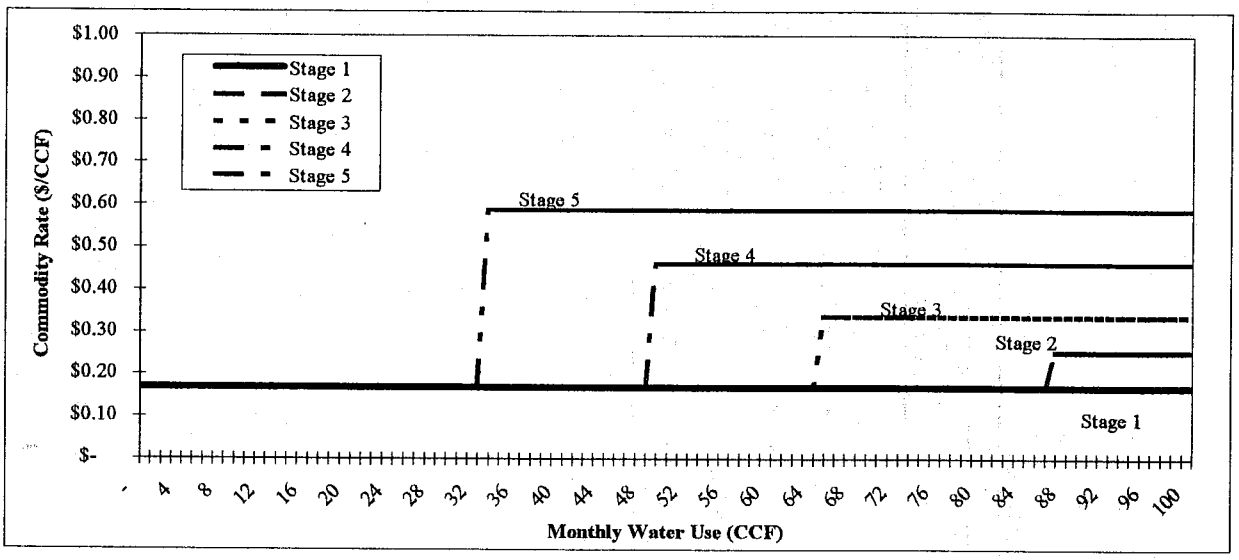
Because the commodity cost component of the 1999 revenue requirement is not much different from the 1998 calculation, most of the changes in these exhibits are due to the wholesale rate structure change. In the absence of the minimum take or pay provisions in the wholesale rate structure, the District's water purchase costs will vary, to some degree, with actual water deliveries. As a result, there will be less of a disconnect between the District's costs and rate revenues than the scenario presented in Section II. With a closer link between costs and revenues, the water shortage tier structure can have higher break points at each stage of shortage, while still meeting revenue needs. Higher break points will mean that the structure will be less restrictive and punitive for customers.

Exhibit 19
Fair Oaks Water District
Assumptions for Water Shortage Stages

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
	100%	90%	80%	65%	50%
Water Availability and Costs					
San Juan WD (AF)	14,500	13,020	10,875	8,338	5,800
Groundwater (AF)	300	300	965	1,283	1,600
Total Production (AF)	14,800	13,320	11,840	9,620	7,400
San Juan WD ($/Yr) - Serv. Chrg.	$ 237,258	$ 237,258	$ 237,258	$ 237,258	$ 237,258
San Juan WD ($/AF)	$ 35	$ 35	$ 35	$ 35	$ 35
Groundwater ($/AF)	$ 75	$ 75	$ 75	$ 75	$ 75
San Juan WD ($) - Note 1	$ 744,758	$ 692,958	$ 617,883	$ 529,071	$ 440,258
Groundwater ($)	$ 22,500	$ 22,500	$ 72,375	$ 96,188	$ 120,000
Total Water Costs	$ 767,258	$ 715,458	$ 690,258	$ 625,258	$ 560,258
Change in Water Costs		$ (51,800)	$ (77,000)	$ (142,000)	$ (207,000)
Other Cost Impacts					
Additional Conserv. Activities	$ -	$ 50,000	$ 100,000	$ 150,000	$ 200,000
Other O&M (Net)	$ -	$ -	$ -	$ -	$ -
Other Capital Program (Net)	$ -	$ -	$ -	$ -	$ -
Total Other Net Cost Impacts	$ -	$ 50,000	$ 100,000	$ 150,000	$ 200,000
Water Rate Revenues					
Service Charges	3,101,599	3,101,599	3,101,599	3,101,599	3,101,599
Commodity Rates	1,008,401	1,006,601	1,031,401	1,016,401	1,001,401
Total Rate Revenues	4,110,000	4,108,200	4,133,000	4,118,000	4,103,000
Commodity Rate Impacts					
Water Sales (CCF) - Note 2	6,008,012	5,407,211	4,806,409	3,905,208	3,004,006
Uniform Rate ($/CCF)	$ 0.168	$ 0.186	$ 0.215	$ 0.260	$ 0.333
Typ. Monthly SF Water Bill - Note 3	$ 15.88	$ 15.49	$ 15.10	$ 14.52	$ 13.95
Non-Conserv. SF Water Bill - Note 4	$ 22.09	$ 22.09	$ 22.09	$ 25.61	$ 33.84
Typ. Monthly Comm. Wtr. Bill - Note 5	$ 63.96	$ 63.90	$ 64.72	$ 64.22	$ 63.72
Non-Conserv. Comm. Wtr. Bill - Note 6	$ 63.96	$ 67.62	$ 73.31	$ 82.44	$ 97.06

NOTES:
(1) Beginning in 1999 the District will pay SJWD an annual service charge plus about $35/AF for each AF of water used.
(2) Assumes about a 6% unaccounted for loss rate between water production and consumption.
(3) Assumes 1" meter and 23 CCF/mo. (SF median) normal usage with cutbacks as requested with tier structure.
(4) Assumes 1" meter and 60 CCF/mo. (large user) normal usage with no cutbacks with tier structure.
(5) Assumes 2" meter and 200 CCF/mo. with cutbacks as requested with uniform rate structure.
(6) Assumes 2" meter and 200 CCF/mo. with no cutbacks with uniform rate structure

Exhibit 20
Fair Oaks Water District
Single Family Water Shortage Tier Rate Structures



IMPLEMENTATION OF METERED WATER RATES

Implementation of metered water rates is a significant decision for the District and will require changes in current practices. The process will occur over time as new customers are metered. Sometime in 1999 the District expects to have all commercial and multi-family customers metered. In addition the District should have more consumption data in excess of a year for most of those customers. Beginning in 2000 the District will be in position to implement metered water rates for all commercial and multi-family customers.

We recommend the following actions in adopting metered water rates for the Fair Oaks Water District.

- The District should adopt fixed bi-monthly water service charges based on the size of the water meter for all customers. The metered water rates would be available to customers for rate comparison purposes (flat vs. metered rates). In addition, prior to full metering, the District should consider making the metered rates available to customers on a voluntary basis. The service charge would apply regardless of water use but would not entitle customers to any water without additional charges. The ***bi-monthly*** charge for the typical (1") residential water meter based on the calculations contained herein for 1999 would be $33.10. A uniform water rate of $0.17/CCF should apply to all water used by a customer under the metered rate schedule, based on the rate calculations contained herein.

- The District should offer all customers the option to be billed on a bi-monthly billing cycle beginning in 1999 in preparation for metered billing. In addition, all installed water meters should be read on a bi-monthly basis.

Exhibit 21
Fair Oaks Water District
Single Family Water Shortage Tier Structure Calculations

	Supply Avail.	Tier Step Multiplier	Break Point	Tier 1 Rate ($/CCF)	Tier 1 Wtr. Use (CCF)	Tier 1 Revenue	Tier 2 Rate ($/CCF)	Tier 2 Wtr. Use (CCF)	Tier 2 Revenue	Total Commodity Revenue	Average Rate ($/CCF)
Stage 1	100%	-	-	$ 0.168	4,637,977	$ 778,451	$ -	-	$ -	$ 778,451	$ 0.168
Stage 2	90%	1.50	86	$ 0.168	3,265,745	$ 548,132	$ 0.252	908,434	$ 228,711	$ 776,843	$ 0.186
Stage 3	80%	2.00	64	$ 0.168	2,659,399	$ 446,361	$ 0.336	1,050,983	$ 352,800	$ 799,161	$ 0.215
Stage 4	65%	2.75	48	$ 0.168	2,041,485	$ 342,648	$ 0.462	973,200	$ 449,198	$ 791,846	$ 0.263
Stage 5	50%	3.50	32	$ 0.168	1,418,306	$ 238,052	$ 0.587	900,683	$ 529,106	$ 767,158	$ 0.331

- Mandatory metered water rates should begin for commercial and multi-family customers as soon as all customers within these classes are metered (expected to be complete in 1999). Bi-monthly billing is a prerequisite to charging customers on the metered water rates, therefore bi-monthly billing will be required when metered rates go into effect. The availability of bi-monthly billing makes use of voluntary metered rates possible. Once an account is converted to the metered rate structure a switch back to the flat rate should not be permitted.

- The District should assess the cash flow implications associated with a conversion from annual billing to bi-monthly billing. Because the District receives much of its revenues in advance of services being provided, the transition to bi-monthly billing (in arrears) may require use of a significant amount of the District's existing reserves. These cash flow issues could be addressed as part of a multi-year financial plan.

- The District should review and modify customer account and billing procedures in anticipation of metered customer billing. In particular, current account data appears based on the customer being served rather than a specific service connection. Under a metered rate structure, each connection will be a separate account. It appears that some current customers are served by multiple service connections. In addition, the District's meter data and use records are not integrated with the customer billing data. These are two separate databases. The integration of meter and use data into customer billing records is critical to metered billing. Due to the large number of accounts, this is not a trivial task.

- The District is developing a multi-year financial plan to evaluate the current level of water rates and consider the financial and cash flow needs associated with: (1) conversion to bi-monthly billing, (2) transition to metered water rates, (3) the planned accelerated metering program, (4) other capital improvement needs, and (5) potential restructuring of the District's outstanding debt.

Benefits of the recommended metered water rates include:

- The costs of providing water service to customers would be fairly and proportionately distributed to each customer class consistent with cost of service principals. Both fixed and variable costs would be properly reflected in the water rate structure.

- The metered rate structure provides an incentive for all customers to conserve water and an opportunity for all customers to reduce the amount of their water bills.

- Water rate revenues should more closely match actual expenditures since under the flat rate structure increased water use (and higher water purchase costs) does not result in increased rate revenues.

- Implementation of metered water rates will assist the District in meeting the requirements of water conservation best management practices and satisfying the USBR's demands.

APPENDIX A

FAIR OAKS WATER DISTRICT

1998 BUDGET AND COST ALLOCATION

Appendix A
Fair Oaks Water District
1998 Budget and Cost Allocation

	Customer Costs (Fixed)	Capacity Costs (Fixed)	Comodity Costs (Variable)	Shared Costs (Reallocated)	1998 Budget & Revenue Requirement
BUDGET SUMMARY					
Operation & Maintenance					
Administration	$ 212,685	$ 569,603	$ 21,462	$ 58,000	**$ 861,750**
Board of Directors	$ 81,000	$ -	$ -	$ -	**$ 81,000**
Maintenance & Construction	$ -	$ 794,212	$ -	$ -	**$ 794,212**
Operations	$ 48,433	$ 156,400	$ 915,747	$ -	**$ 1,120,580**
Debt Service & Long Term Notes					
1989 COPs	$ -	$ 412,355	$ -	$ -	**$ 412,355**
1991 COPs	$ -	$ 361,929	$ -	$ -	**$ 361,929**
Cooperative Transmission Pipeline	$ -	$ 295,910	$ -	$ -	**$ 295,910**
Trustee Fees	$ -	$ 7,500	$ -	$ -	**$ 7,500**
Capital Improvements					
Administration Dept.	$ 60,000	$ 100,000	$ -	$ 18,000	**$ 178,000**
Maintenance Dept.	$ -	$ 324,873	$ -	$ -	**$ 324,873**
Operations Dept.	$ 18,100	$ 1,020,000	$ 55,000	$ -	**$ 1,093,100**
Equipment	$ -	$ 109,500	$ -	$ 750	**$ 110,250**
Transfers To/(From) Reserves					
Emergency Reserve	$ -	$ -	$ -	$ 45,000	**$ 45,000**
Facilities Upgrade Reserve	$ 25,000	$ 25,000	$ -	$ -	**$ 50,000**
Change in Fund Balance	$ (78,100)	$ (1,594,321)	$ -	$ -	**$ (1,672,421)**
Subtotal	**$ 367,119**	**$ 2,582,961**	**$ 992,209**	**$ 121,750**	**$ 4,064,038**
Less Misc. Revenues	$ (20,000)	$ (431,000)	$ (17,160)	$ (92,500)	**$ (560,660)**
Water Rate Revenue Requirement	**$ 347,119**	**$ 2,151,961**	**$ 975,049**	**$ 29,250**	**$ 3,503,378**
%Prior To Shared	10%	61%	28%	1%	
Allocate Shared Costs	$ 2,923	$ 18,118	$ 8,209		
Rate Model Cost Allocation	**$ 350,041**	**$ 2,170,079**	**$ 983,258**		
% of Revenue Requirement	10%	62%	28%		

Appendix A
Fair Oaks Water District
1998 Budget and Cost Allocation

BUDGET DETAIL	Customer Costs (Fixed)	Capacity Costs (Fixed)	Comodity Costs (Variable)	Shared Costs (Reallocated)	1998 Budget & Revenue Requirement
Administration					
Labor					
Auto and mileage	$ -	$ 3,000	$ -	$ -	$ 3,000
Overtime	$ -	$ 2,000	$ -	$ -	$ 2,000
Salaries	$ 88,571	$ 221,429	$ -	$ -	$ 310,000
Materials & Services					
Community Events					
Public and customer relations	$ 5,000	$ -	$ -	$ -	$ 5,000
Insurance					
Auto and general liability insurance	$ -	$ 45,000	$ -	$ -	$ 45,000
Bonds	$ -	$ 1,500	$ -	$ -	$ 1,500
Dental insurance	$ 2,230	$ 14,452	$ 1,318	$ -	$ 18,000
FICA and FICA-medical	$ 8,918	$ 57,808	$ 5,274	$ -	$ 72,000
Health insurance	$ 12,386	$ 80,289	$ 7,325	$ -	$ 100,000
Life insurance	$ 372	$ 2,409	$ 220	$ -	$ 3,000
Employer PERS	$ 5,574	$ 36,130	$ 3,296	$ -	$ 45,000
Property insurance	$ 867	$ 5,620	$ 513	$ -	$ 7,000
Unemployment insurance	$ 1,239	$ 8,029	$ 732	$ -	$ 10,000
Vision care	$ 619	$ 4,014	$ 366	$ -	$ 5,000
Workers compensation	$ 4,088	$ 26,495	$ 2,417	$ -	$ 33,000
Printing and Postage					
Legal notices	$ 5,000	$ -	$ -	$ -	$ 5,000
Other printing	$ 3,500	$ -	$ -	$ -	$ 3,500
Printing and mailing	$ 32,000	$ -	$ -	$ -	$ 32,000
Maintenance Services					
Metroscan, janitorial, air conditioning	$ 5,000	$ 5,000	$ -	$ -	$ 10,000
Memberships					
Dues and subscriptions	$ -	$ -	$ -	$ 38,000	$ 38,000
Non-categorized					
Unanticipated programs	$ -	$ -	$ -	$ 10,000	$ 10,000
Office supplies	$ -	$ -	$ -	$ 10,000	$ 10,000
Professional Services					
Annual audit	$ 8,750	$ -	$ -	$ -	$ 8,750
General computer support	$ 10,000	$ -	$ -	$ -	$ 10,000
Legal fees	$ 10,000	$ 20,000	$ -	$ -	$ 30,000
Training					
Team building	$ 1,429	$ 3,571	$ -	$ -	$ 5,000
Training and travel	$ 7,143	$ 17,857	$ -	$ -	$ 25,000
Utilities					
Phone, power, alarms	$ -	$ 15,000	$ -	$ -	$ 15,000
Subtotal Administration	$ 212,685	$ 569,603	$ 21,462	$ 58,000	$ 861,750
Board of Directors					
Labor					
Directors fees	$ 35,000	$ -	$ -	$ -	$ 35,000
Materials & Services					
Fees					
Election expense	$ 11,000	$ -	$ -	$ -	$ 11,000
Training					
Training, conferences, and travel	$ 35,000	$ -	$ -	$ -	$ 35,000
Subtotal Board of Directors	$ 81,000	$ -	$ -	$ -	$ 81,000
Maintenance and Construction					
Labor					
Salaries	$ -	$ 482,158	$ -	$ -	$ 482,158
On-call	$ -	$ 25,000	$ -	$ -	$ 25,000
Overtime	$ -	$ 10,000	$ -	$ -	$ 10,000
In-house CIP reimbursement	$ -	$ (44,375)	$ -	$ -	$ (44,375)

Appendix A
Fair Oaks Water District
1998 Budget and Cost Allocation

	Customer Costs (Fixed)	Capacity Costs (Fixed)	Comodity Costs (Variable)	Shared Costs (Reallocated)	1998 Budget & Revenue Requirement
Materials & Services					
Consumable					
Aggregate	$ -	$ 20,000	$ -	$ -	$ 20,000
Consumable supplies and tools	$ -	$ 35,000	$ -	$ -	$ 35,000
Office supplies	$ -	$ 2,000	$ -	$ -	$ 2,000
Gas and oil	$ -	$ 17,000	$ -	$ -	$ 17,000
Parts inventory	$ -	$ 30,000	$ -	$ -	$ 30,000
Cutback	$ -	$ 5,000	$ -	$ -	$ 5,000
Sand	$ -	$ 4,000	$ -	$ -	$ 4,000
Fees					
County fees	$ -	$ 600	$ -	$ -	$ 600
Fuel tank permit	$ -	$ 600	$ -	$ -	$ 600
Haz-mat permit	$ -	$ 1,000	$ -	$ -	$ 1,000
Tipping (dump) fees	$ -	$ 22,000	$ -	$ -	$ 22,000
Refuse collection	$ -	$ 1,350	$ -	$ -	$ 1,350
Maintenance Services					
Facility maintenance	$ -	$ 6,000	$ -	$ -	$ 6,000
Office equipment maintenance	$ -	$ 2,500	$ -	$ -	$ 2,500
Paving	$ -	$ 45,000	$ -	$ -	$ 45,000
MMS system support (Sussex)	$ -	$ 3,054	$ -	$ -	$ 3,054
Small equip. repair & maint.	$ -	$ 10,525	$ -	$ -	$ 10,525
Rentals					
Equipment, barricade, and tool rental	$ -	$ 8,000	$ -	$ -	$ 8,000
Training					
AWWA/State certification	$ -	$ 600	$ -	$ -	$ 600
DMV physicals	$ -	$ 1,850	$ -	$ -	$ 1,850
Team building	$ -	$ 4,000	$ -	$ -	$ 4,000
Training and travel	$ -	$ 14,500	$ -	$ -	$ 14,500
Uniforms					
Safety boots	$ -	$ 4,100	$ -	$ -	$ 4,100
Safety supplies	$ -	$ 4,000	$ -	$ -	$ 4,000
Uniforms	$ -	$ 6,800	$ -	$ -	$ 6,800
Utilities					
Communications	$ -	$ 6,250	$ -	$ -	$ 6,250
Utilities (SMUD)	$ -	$ 5,000	$ -	$ -	$ 5,000
Vehicle Maintenance					
Routine maintenance	$ -	$ 26,500	$ -	$ -	$ 26,500
Repairs and overhauls	$ -	$ 34,200	$ -	$ -	$ 34,200
Subtotal Maint. and Construction	$ -	$ 794,212	$ -	$ -	$ 794,212
<u>Operations</u>					
Labor					
Salaries	$ 37,183	$ 111,550	$ 74,367	$ -	$ 223,100
Overtime	$ -	$ 4,000	$ -	$ -	$ 4,000
Materials & Services					
Conservation					
Advertising	$ -	$ -	$ 3,000	$ -	$ 3,000
Community promotions	$ -	$ -	$ 4,000	$ -	$ 4,000
Uniforms	$ -	$ -	$ 1,000	$ -	$ 1,000
Dues and subscriptions	$ -	$ -	$ 4,000	$ -	$ 4,000
Fees					
DOHS fees	$ -	$ 9,500	$ -	$ -	$ 9,500
Printing and Postage					
Printing, mailing (conservation)	$ 10,000	$ -	$ -	$ -	$ 10,000
Professional Services					
Backflow contr. - Sac. Co & SAWWA	$ -	$ 7,500	$ -	$ -	$ 7,500
Testing					
Water quality testing and sampling	$ -	$ 18,000	$ -	$ -	$ 18,000
Special water quality testing	$ -	$ 1,000	$ -	$ -	$ 1,000
Well testing through SAWWA	$ -	$ 1,100	$ -	$ -	$ 1,100

Appendix A
Fair Oaks Water District
1998 Budget and Cost Allocation

	Customer Costs (Fixed)	Capacity Costs (Fixed)	Comodity Costs (Variable)	Shared Costs (Reallocated)	1998 Budget & Revenue Requirement
Training					
Backflow and specialized training	$ -	$ -	$ -	$ -	$ -
Seminars, conferences, and travel	$ 1,167	$ 3,500	$ 2,333	$ -	$ 7,000
Tuition/book reimbursement	$ 83	$ 250	$ 167	$ -	$ 500
Utilities					
Energy cost, UPZ tank	$ -	$ -	$ 34,000	$ -	$ 34,000
Energy cost, wells	$ -	$ -	$ 65,000	$ -	$ 65,000
Water Supply					
Surface water supply, San Juan	$ -	$ -	$ 722,880	$ -	$ 722,880
Tank chemicals	$ -	$ -	$ 5,000	$ -	$ 5,000
Subtotal Operations	$ 48,433	$ 156,400	$ 915,747	$ -	$ 1,120,580
Debt Service & Long Term Notes					
1989 COPs	$ -	$ 412,355	$ -	$ -	$ 412,355
1991 COPs	$ -	$ 361,929	$ -	$ -	$ 361,929
Cooperative Transmission Pipeline	$ -	$ 295,910	$ -	$ -	$ 295,910
Trustee fees	$ -	$ 7,500	$ -	$ -	$ 7,500
Subtotal Debt Service	$ -	$ 1,077,694	$ -	$ -	$ 1,077,694
Capital Improvement Program					
Administration Dept.					
Computer system upgrade Phases I-III	$ 10,000	$ -	$ -	$ -	$ 10,000
Comp. system upgrade portions of Phase II	$ 25,000	$ -	$ -	$ -	$ 25,000
Rate study public relations support	$ 25,000	$ -	$ -	$ -	$ 25,000
Rate study	$ -	$ -	$ -	$ 18,000	$ 18,000
Regional Water Resources Impl. Plan	$ -	$ 100,000	$ -	$ -	$ 100,000
Subtotal - Administration Dept. CIP	$ 60,000	$ 100,000	$ -	$ 18,000	$ 178,000
Maintenance Dept.					
Maintenance Services					
Contract trucking	$ -	$ 8,000	$ -	$ -	$ 8,000
Pipeline Replacements					
Heidi Court	$ -	$ 59,795	$ -	$ -	$ 59,795
Siesta Lane	$ -	$ 122,000	$ -	$ -	$ 122,000
Ballard Lane	$ -	$ 6,328	$ -	$ -	$ 6,328
Special Projects					
Meters for service replacements	$ -	$ 35,000	$ -	$ -	$ 35,000
Voluntary residential metering program	$ -	$ 13,750	$ -	$ -	$ 13,750
Commercial metering	$ -	$ 80,000	$ -	$ -	$ 80,000
Subtotal - Maintenance Dept. CIP	$ -	$ 324,873	$ -	$ -	$ 324,873
Operations Dept.					
CAD/GIS system	$ -	$ 65,000	$ -	$ -	$ 65,000
Vulnerability assessment and emerg. plan	$ -	$ 15,000	$ -	$ -	$ 15,000
Meter reading system conversion/upgrade	$ 18,100	$ -	$ -	$ -	$ 18,100
Well repairs and upgrades	$ -	$ -	$ 55,000	$ -	$ 55,000
Telemetry/SCADA project	$ -	$ 190,000	$ -	$ -	$ 190,000
1997/98 contracted pipeline replacements	$ -	$ 500,000	$ -	$ -	$ 500,000
30" Pipeline rehab project	$ -	$ 200,000	$ -	$ -	$ 200,000
Vulnerability assmt. project contingency	$ -	$ 50,000	$ -	$ -	$ 50,000
Subtotal - Operations Dept. CIP	$ 18,100	$ 1,020,000	$ 55,000	$ -	$ 1,093,100
Equipment					
Depreciable					
JD 410E backhoe (replaces 1 unit)	$ -	$ 83,000	$ -	$ -	$ 83,000
Steel plates	$ -	$ 2,000	$ -	$ -	$ 2,000
Pipe tapper	$ -	$ 700	$ -	$ -	$ 700
Lowell rockets	$ -	$ 800	$ -	$ -	$ 800
PD-4 hydraulic pipe pusher	$ -	$ 6,000	$ -	$ -	$ 6,000
Computer equipment	$ -	$ 7,000	$ -	$ -	$ 7,000
Small storage shed	$ -	$ 2,000	$ -	$ -	$ 2,000

Appendix A
Fair Oaks Water District
1998 Budget and Cost Allocation

	Customer Costs (Fixed)	Capacity Costs (Fixed)	Comodity Costs (Variable)	Shared Costs (Reallocated)	1998 Budget & Revenue Requirement
Training monitor and VCR	$ -	$ -	$ -	$ 500	$ 500
Two-way radios (2 each)	$ -	$ 1,500	$ -	$ -	$ 1,500
Backflow management software	$ -	$ -	$ -	$ -	$ -
Pool vehicle	$ -	$ -	$ -	$ -	$ -
Small meter tester	$ -	$ 1,800	$ -	$ -	$ 1,800
Groundwater level meter	$ -	$ 900	$ -	$ -	$ 900
Computer equipment	$ -	$ -	$ -	$ -	$ -
Portable digital chlorine analyzer	$ -	$ 300	$ -	$ -	$ 300
Non-depreciable					
Communication equipment	$ -	$ -	$ -	$ 250	$ 250
Safety signs and cones	$ -	$ 2,000	$ -	$ -	$ 2,000
Small tools & safety equipment	$ -	$ 1,500	$ -	$ -	$ 1,500
Subtotal Equipment	$ -	$ 109,500	$ -	$ 750	$ 110,250
Transfers To/(From) Reserves					
Emergency Reserve	$ -	$ -	$ -	$ 45,000	$ 45,000
Facilities Upgrade Reserve	$ 25,000	$ 25,000	$ -	$ -	$ 50,000
Miscellaneous Revenues					
Redemptions	$ -	$ -	$ -	$ 85,000	$ 85,000
Irrigation Charges	$ -	$ -	$ 17,160	$ -	$ 17,160
Fees for Service	$ 20,000	$ -	$ -	$ -	$ 20,000
Connection Fees	$ -	$ 6,000	$ -	$ -	$ 6,000
Interest Income	$ -	$ 425,000	$ -	$ -	$ 425,000
Other Revenue	$ -	$ -	$ -	$ 7,500	$ 7,500
Subtotal Misc. Revenues	$ 20,000	$ 431,000	$ 17,160	$ 92,500	$ 560,660

APPENDIX B

FAIR OAKS WATER DISTRICT

1999 BUDGET AND COST ALLOCATION

Appendix B
Fair Oaks Water District
1999 Budget and Cost Allocation

	Customer Costs (Fixed)	Capacity Costs (Fixed)	Comodity Costs (Variable)	Shared Costs (Reallocated)	1999 Budget & Revenue Requirement
BUDGET SUMMARY					
Operation & Maintenance					
Administration	$ 325,489	$ 674,880	$ 27,531	$ 69,200	**$ 1,097,100**
Operation & Maintenance	$ 41,753	$ 975,842	$ 993,205	$ 28,700	**$ 2,039,500**
Board of Directors	$ 73,600	$ -	$ -	$ -	**$ 73,600**
Reduction in Discretionary Expenditures	$ -	$ -	$ -	$ (143,000)	**$ (143,000)**
Debt Service & Long Term Notes					
1989 COPs	$ -	$ 432,800	$ -	$ -	**$ 432,800**
1991 COPs	$ -	$ 357,600	$ -	$ -	**$ 357,600**
Savings from Refunding COPs	$ -	$ (28,500)	$ -	$ -	**$ (28,500)**
Cooperative Transmission Pipeline	$ -	$ 294,900	$ -	$ -	**$ 294,900**
Trustee Fees	$ -	$ 8,000	$ -	$ -	**$ 8,000**
Capital Improvements					
Administration	$ -	$ 100,000	$ -	$ 27,500	**$ 127,500**
Operations & Maintenance	$ -	$ 76,000	$ -	$ -	**$ 76,000**
Metering Implementation	$ -	$ 218,900	$ -	$ -	**$ 218,900**
Facilities & Equipment	$ -	$ 137,000	$ -	$ 97,600	**$ 234,600**
Transfers To/(From) Reserves					
Operating and Emergency Reserve	$ -	$ -	$ -	$ 45,000	**$ 45,000**
Facilities Upgrade Reserve	$ -	$ (190,000)	$ -	$ -	**$ (190,000)**
COP Reserves (Restricted)	$ -	$ 58,200	$ -	$ -	**$ 58,200**
Change in Fund Balance	$ -	$ (248,500)	$ -	$ -	**$ (248,500)**
Subtotal	**$ 440,842**	**$ 2,867,122**	**$ 1,020,736**	**$ 125,000**	**$ 4,453,700**
Less Misc. Revenues	$ (10,000)	$ (250,700)	$ (30,000)	$ (53,000)	**$ (343,700)**
Water Rate Revenue Requirement	**$ 430,842**	**$ 2,616,422**	**$ 990,736**	**$ 72,000**	**$ 4,110,000**
%Prior To Shared	10%	64%	24%	2%	
Allocate Shared Costs	$ 7,682	$ 46,652	$ 17,665		
Rate Model Cost Allocation	**$ 438,524**	**$ 2,663,075**	**$ 1,008,401**		
% of Revenue Requirement	**10.7%**	**64.8%**	**24.5%**		

Appendix B
Fair Oaks Water District
1999 Budget and Cost Allocation

BUDGET DETAIL	Customer Costs (Fixed)	Capacity Costs (Fixed)	Comodity Costs (Variable)	Shared Costs (Reallocated)	1999 Budget & Revenue Requirement
Administration					
Labor					
Salaries	$ 93,057	$ 232,643	$ -	$ -	**$ 325,700**
Auto and mileage	$ -	$ 6,000	$ -	$ -	**$ 6,000**
Overtime	$ -	$ 3,000	$ -	$ -	**$ 3,000**
Materials & Services					
Community Events					
Public and customer relations	$ 30,000	$ -	$ -	$ -	**$ 30,000**
Insurance					
Auto and general liability insurance	$ -	$ 40,000	$ -	$ -	**$ 40,000**
Bonding	$ -	$ 1,100	$ -	$ -	**$ 1,100**
Dental insurance	$ 2,496	$ 16,502	$ 1,501	$ -	**$ 20,500**
FICA	$ 8,184	$ 54,096	$ 4,920	$ -	**$ 67,200**
Medicare	$ 1,985	$ 13,121	$ 1,193	$ -	**$ 16,300**
Health insurance	$ 13,225	$ 87,423	$ 7,952	$ -	**$ 108,600**
Life insurance	$ 256	$ 1,690	$ 154	$ -	**$ 2,100**
Employer PERS	$ 5,480	$ 36,225	$ 3,295	$ -	**$ 45,000**
Employee PERS	$ 8,537	$ 56,430	$ 5,133	$ -	**$ 70,100**
Property insurance	$ 621	$ 4,105	$ 373	$ -	**$ 5,100**
Unemployment insurance	$ 1,717	$ 11,350	$ 1,032	$ -	**$ 14,100**
Vision care	$ 487	$ 3,220	$ 293	$ -	**$ 4,000**
Workers compensation	$ 2,801	$ 18,515	$ 1,684	$ -	**$ 23,000**
Printing and Postage					
Notices	$ 3,400	$ -	$ -	$ -	**$ 3,400**
Recording fees	$ 500	$ -	$ -	$ -	**$ 500**
Other printing (invoices)	$ 10,000	$ -	$ -	$ -	**$ 10,000**
Printing	$ 33,800	$ -	$ -	$ -	**$ 33,800**
Water Currents: printing, mailing, consi	$ 27,000	$ -	$ -	$ -	**$ 27,000**
Proposition 218 programs, etc.	$ 20,000	$ -	$ -	$ -	**$ 20,000**
Postage	$ 10,000	$ -	$ -	$ -	**$ 10,000**
Office supplies and other					
Office supplies	$ -	$ -	$ -	$ 24,200	**$ 24,200**
Office equipment & maintenance	$ 500	$ 500	$ -	$ -	**$ 1,000**
Dues, subscriptions, & organization fees	$ -	$ -	$ -	$ 45,000	**$ 45,000**
Miscellaneous (metroscan)	$ 5,000	$ 5,000	$ -	$ -	**$ 10,000**
Professional Services					
Annual audit	$ 8,800	$ -	$ -	$ -	**$ 8,800**
General computer support	$ 10,500	$ -	$ -	$ -	**$ 10,500**
Legal fees	$ 8,333	$ 16,667	$ -	$ -	**$ 25,000**
Investment advisor	$ 3,667	$ 7,333	$ -	$ -	**$ 11,000**
Training					
Training, travel, and expenses	$ 10,857	$ 27,143	$ -	$ -	**$ 38,000**
Employee recognition program	$ 4,286	$ 10,714	$ -	$ -	**$ 15,000**
Utilities					
Phone, power, alarms	$ -	$ 22,100	$ -	$ -	**$ 22,100**
Subtotal Administration	$ 325,489	$ 674,880	$ 27,531	$ 69,200	**$ 1,097,100**
Operations and Maintenance					
Labor					
Salaries	$ 40,000	$ 646,900	$ 80,000	$ -	**$ 766,900**
Auto and mileage	$ -	$ 1,000	$ -	$ -	**$ 1,000**
On-call	$ -	$ 18,200	$ -	$ -	**$ 18,200**
Overtime	$ -	$ 30,700	$ -	$ -	**$ 30,700**
In-house CIP reimbursement	$ -	$ (64,000)	$ -	$ -	**$ (64,000)**

Appendix B
Fair Oaks Water District
1999 Budget and Cost Allocation

	Customer Costs (Fixed)	Capacity Costs (Fixed)	Comodity Costs (Variable)	Shared Costs (Reallocated)	1999 Budget & Revenue Requirement
Materials & Services					
Water Supply					
Surface water supply, San Juan	$ -	$ -	$ 743,000	$ -	**$ 743,000**
Tank chemicals	$ -	$ -	$ 3,000	$ -	**$ 3,000**
DOHS fees	$ -	$ -	$ 9,500	$ -	**$ 9,500**
Testing	$ -	$ -	$ 17,100	$ -	**$ 17,100**
District Facilities Maintenance & Repairs					
Storage tank	$ -	$ 4,000	$ -	$ -	**$ 4,000**
Well repairs and upgrades	$ -	$ -	$ 28,000	$ -	**$ 28,000**
Landscape maintenance	$ -	$ -	$ -	$ 14,000	**$ 14,000**
Refuse collection	$ -	$ -	$ -	$ 1,500	**$ 1,500**
Janitorial, air conditioning	$ -	$ -	$ -	$ 8,400	**$ 8,400**
Project Maintenance & Professional Services					
Equipment, barricade, and tool rental	$ -	$ 5,000	$ -	$ -	**$ 5,000**
Contract trucking	$ -	$ 5,000	$ -	$ -	**$ 5,000**
CTP O&M (San Juan)	$ -	$ 7,500	$ -	$ -	**$ 7,500**
Paving	$ -	$ 60,000	$ -	$ -	**$ 60,000**
Small equip. repair & maint.	$ -	$ 8,000	$ -	$ -	**$ 8,000**
Backflow contr. - Sac. Co & SAWWA	$ -	$ 7,900	$ -	$ -	**$ 7,900**
MMS system support (Sussex)	$ -	$ 3,200	$ -	$ -	**$ 3,200**
Consumable					
Aggregate, sand & cutback	$ -	$ 20,000	$ -	$ -	**$ 20,000**
Consumable supplies and tools	$ -	$ 45,000	$ -	$ -	**$ 45,000**
Gas and oil	$ -	$ 18,000	$ -	$ -	**$ 18,000**
Parts inventory replenishment	$ -	$ 25,000	$ -	$ -	**$ 25,000**
Safety signs & cones	$ -	$ 3,700	$ -	$ -	**$ 3,700**
Fees					
County fees	$ -	$ 1,200	$ -	$ -	**$ 1,200**
Fuel tank permit	$ -	$ 1,000	$ -	$ -	**$ 1,000**
Haz-mat permit	$ -	$ 600	$ -	$ -	**$ 600**
Tipping (dump) fees	$ -	$ 12,000	$ -	$ -	**$ 12,000**
SAWWA cross-connection program	$ -	$ 3,800	$ -	$ -	**$ 3,800**
Utilities					
Energy cost, UPZ tank	$ -	$ -	$ 32,000	$ -	**$ 32,000**
Energy cost, wells	$ -	$ -	$ 50,000	$ -	**$ 50,000**
Communications	$ -	$ 8,800	$ -	$ -	**$ 8,800**
Utilities (SMUD)	$ -	$ 5,000	$ -	$ -	**$ 5,000**
Conservation					
Advertising	$ -	$ -	$ 1,600	$ -	**$ 1,600**
Community promotions	$ -	$ -	$ 8,500	$ -	**$ 8,500**
Water audit supplies	$ -	$ -	$ 8,000	$ -	**$ 8,000**
Office Supplies					
Office equipment maintenance	$ -	$ -	$ -	$ 1,500	**$ 1,500**
Office supplies	$ -	$ -	$ -	$ 3,300	**$ 3,300**
Training					
DMV physicals	$ 83	$ 1,350	$ 167	$ -	**$ 1,600**
Training, travel, and expenses	$ 1,398	$ 22,606	$ 2,796	$ -	**$ 26,800**
Uniforms					
Safety supplies	$ 271	$ 4,386	$ 542	$ -	**$ 5,200**
Uniforms	$ -	$ -	$ 9,000	$ -	**$ 9,000**
Vehicle Maintenance					
Routine maintenance	$ -	$ 25,000	$ -	$ -	**$ 25,000**
Repairs and overhauls	$ -	$ 45,000	$ -	$ -	**$ 45,000**
Subtotal Operations & Maintenance	$ 41,753	$ 975,842	$ 993,205	$ 28,700	**$ 2,039,500**

Appendix B
Fair Oaks Water District
1999 Budget and Cost Allocation

	Customer Costs (Fixed)	Capacity Costs (Fixed)	Comodity Costs (Variable)	Shared Costs (Reallocated)	1999 Budget & Revenue Requirement
Board of Directors					
Labor					
Directors fees	$ 35,000	$ -	$ -	$ -	**$ 35,000**
Materials & Services					
Fees					
Election expense	$ -	$ -	$ -	$ -	**$ -**
Bond insurance	$ 600	$ -	$ -	$ -	**$ 600**
Training					
Training, conferences, and travel	$ 38,000	$ -	$ -	$ -	**$ 38,000**
Subtotal Board of Directors	$ 73,600	$ -	$ -	$ -	**$ 73,600**
Debt Service					
1989 COPs	$ -	$ 432,800	$ -	$ -	**$ 432,800**
1991 COPs	$ -	$ 357,600	$ -	$ -	**$ 357,600**
Refunding of 1989 & 1991 COPs (savings)	$ -	$ (28,500)	$ -	$ -	**$ (28,500)**
Cooperative Transmission Pipeline	$ -	$ 294,900	$ -	$ -	**$ 294,900**
Trustee fees	$ -	$ 8,000	$ -	$ -	**$ 8,000**
Subtotal Debt Service	$ -	$ 1,064,800	$ -	$ -	**$ 1,064,800**
Projects and Metering					
Special Projects & CIP					
Administration					
Computer system upgrade Phases I-III	$ -	$ -	$ -	$ -	**$ -**
Comp. system upgrade portions of Pha	$ -	$ -	$ -	$ -	**$ -**
Rate study public relations support	$ -	$ -	$ -	$ -	**$ -**
Rate study	$ -	$ -	$ -	$ -	**$ -**
Meter Implementation Study	$ -	$ -	$ -	$ 27,500	**$ 27,500**
Regional Water Master Plan	$ -	$ 100,000	$ -	$ -	**$ 100,000**
Subtotal - Admin.	$ -	$ 100,000	$ -	$ 27,500	**$ 127,500**
Operations & Maintenance					
CAD/GIS system	$ -	$ -	$ -	$ -	**$ -**
Vulnerability assessment and emerg. p	$ -	$ 22,000	$ -	$ -	**$ 22,000**
Public Relations Plan	$ -	$ -	$ -	$ -	**$ -**
Meter reading system conversion/upgr	$ -	$ -	$ -	$ -	**$ -**
Telemetry/SCADA project	$ -	$ -	$ -	$ -	**$ -**
1997/98 contracted pipeline replaceme	$ -	$ -	$ -	$ -	**$ -**
30" Pipeline rehab project	$ -	$ -	$ -	$ -	**$ -**
Heidi Court	$ -	$ -	$ -	$ -	**$ -**
Siesta Lane	$ -	$ -	$ -	$ -	**$ -**
Ballard Lane	$ -	$ -	$ -	$ -	**$ -**
GPS survey/horz. & vert. Control	$ -	$ 4,000	$ -	$ -	**$ 4,000**
Intertie metering: CHWD	$ -	$ 50,000	$ -	$ -	**$ 50,000**
Subtotal - Operation & Maintenance	$ -	$ 76,000	$ -	$ -	**$ 76,000**
Metering Implementation					
Meters for service replacements	$ -	$ -	$ -	$ -	**$ -**
Voluntary residential metering program	$ -	$ -	$ -	$ -	**$ -**
Commercial metering	$ -	$ -	$ -	$ -	**$ -**
Multi-family metering	$ -	$ 160,100	$ -	$ -	**$ 160,100**
Residential metering (in-house)	$ -	$ 58,800	$ -	$ -	**$ 58,800**
Subtotal - Metering Implementation	$ -	$ 218,900	$ -	$ -	**$ 218,900**
Sub-Total Projects and Metering	$ -	$ 394,900	$ -	$ 27,500	**$ 422,400**

Appendix B
Fair Oaks Water District
1999 Budget and Cost Allocation

	Customer Costs (Fixed)	Capacity Costs (Fixed)	Comodity Costs (Variable)	Shared Costs (Reallocated)	1999 Budget & Revenue Requirement
Equipment					
Computer & office equip.-Phase V	$ -	$ -	$ -	$ 20,000	**$ 20,000**
District remodel	$ -	$ 60,000	$ -	$ -	**$ 60,000**
JD 410E backhoe (replaces 1 unit)	$ -	$ -	$ -	$ -	**$ -**
Pipe tapper	$ -	$ -	$ -	$ -	**$ -**
Lowell sockets	$ -	$ -	$ -	$ -	**$ -**
PD-4 hydraulic pipe pusher	$ -	$ -	$ -	$ -	**$ -**
Small storage shed	$ -	$ -	$ -	$ -	**$ -**
Training monitor and VCR	$ -	$ -	$ -	$ -	**$ -**
Two-way radios (2 each)	$ -	$ -	$ -	$ -	**$ -**
Small meter tester	$ -	$ -	$ -	$ -	**$ -**
Portable digital chlorine analyzer	$ -	$ -	$ -	$ -	**$ -**
Groundwater level meter	$ -	$ -	$ -	$ -	**$ -**
Steel plates	$ -	$ 2,000	$ -	$ -	**$ 2,000**
Well site: Hoover Estates land purcha	$ -	$ 75,000	$ -	$ -	**$ 75,000**
Dump truck (fully equipped)	$ -	$ -	$ -	$ 60,000	**$ 60,000**
Wacker	$ -	$ -	$ -	$ 4,000	**$ 4,000**
Commercial washing machine/dryer	$ -	$ -	$ -	$ 2,000	**$ 2,000**
Drill press	$ -	$ -	$ -	$ 2,200	**$ 2,200**
Visual reader	$ -	$ -	$ -	$ 1,000	**$ 1,000**
Computer equipment & software	$ -	$ -	$ -	$ 6,000	**$ 6,000**
Portable electronic read meter tester	$ -	$ -	$ -	$ 2,400	**$ 2,400**
Diesael generator system (office)	$ -	$ -	$ -	$ -	**$ -**
Subtotal Equipment	$ -	$ 137,000	$ -	$ 97,600	**$ 234,600**
Transfers To/(From) Reserves					
Emergency Reserve	$ -	$ -	$ -	$ 45,000	**$ 45,000**
Facilities Upgrade Reserve	$ -	$ (190,000)	$ -	$ -	**$ (190,000)**
COP Reserves	$ -	$ 58,200	$ -	$ -	**$ 58,200**
Miscellaneous Revenues					
Redemptions and delinquences	$ -	$ -	$ -	$ 53,000	**$ 53,000**
Irrigation Charges	$ -	$ -	$ 30,000	$ -	**$ 30,000**
Fees for Service	$ 10,000	$ -	$ -	$ -	**$ 10,000**
Connection Fees	$ -	$ 10,000	$ -	$ -	**$ 10,000**
Interest Income	$ -	$ 220,700	$ -	$ -	**$ 220,700**
Other Revenue	$ -	$ 20,000	$ -	$ -	**$ 20,000**
Subtotal Misc. Revenues	$ 10,000	$ 250,700	$ 30,000	$ 53,000	**$ 343,700**