

Apple Valley Heights County Water District Water Enterprise Rate Analysis



Prepared by:
Mary Fleming

Rural Community
Assistance Corporation
3120 Freeboard Drive, Suite 201
West Sacramento, CA 95691

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California State Water
Resources Control Board

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February 15, 2024

Emma Blankenship
Small Community Technical Assistance
Division of Financial Assistance
State Water Resources Control Engineer
1001 I St. 16th Floor
PO Box 944212
Sacramento, CA 95814

Subject: Apple Valley Heights County Water District Rate Study A.R. #6891

Dear Emma:

Enclosed please find the printed final report for Apple Valley Heights County Water District water rate study.

Rate adjustment options were presented to the Apple Valley Heights County Water District board and general manager on Nov. 7, 2023. From a number of options, the board selected one they feel will best fit their community. The Prop 218 hearing is scheduled for Feb. 21, 2024.

If you have any additional questions, feel free to contact Mary Fleming at 916/549-6338 or Kimberley Bennett at 916/508-3031.

Sincerely,

Kimberley Bennett

Kimberley Bennett

RCAC, Regional Field Manager
Community & Environmental Services

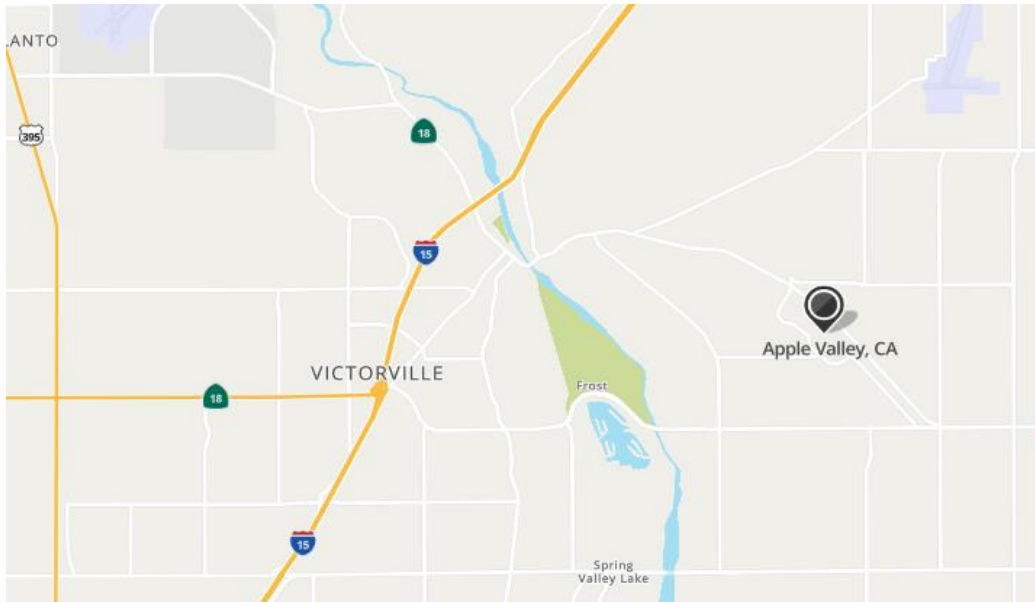
Enclosure: Apple Valley Heights County Water District Rate Study

CC: Apple Valley Heights County Water District

1. Apple Valley Heights County Water District

Community

The Town of Apple Valley is an incorporated area encompassing 78 square miles in Victor Valley in San Bernardino County, California. It is located east of Victorville and Hesperia along State Route 18 (SR-18).



Water district

Apple Valley Heights County Water District (AVHCWD), a special district of the state of California, was formed in 1957 to provide potable water service to the population within its service area. AVHCWD does not serve within the limits of the Town of Apple Valley. The water utility is located within Victor Valley of the unincorporated western San Bernardino County, less than 0.5 miles southeast of the Town of Apple Valley and covering an area of approximately 1.4 square miles. AVHCWD is governed by a five-member board of directors elected by the voters within the district for four-year terms.

At the time of this analysis the existing water system served 313 residential service connections. All water service connections are metered using 1" meters. There are no commercial or industrial connections within the service area.

Water system

AVHCWD owns, operates, and maintains its water supply, storage and distribution systems. The system does not have water system deficiencies that are the result of inadequate attention or capabilities of AVHCWD's operators or management.

Ground water supply

AVHCWD owns, operates and maintains two permitted production wells, Wells Nos. 3 and 4. The wells are both located on the same AVHCWD owned property. Well No. 3 was drilled in 1990 to a depth of 500-feet and has a static water level of 270 feet. Well No. 3 has a pumping rate of approximately 200 gallons per minute (gpm). Well No. 4 was drilled in 2003 to a depth of 504 feet and has a static water

level of 273 feet with a pumping rate of approximately 190 gpm. Well Nos. 3 and 4 pump directly to AVHCWD's distribution system, with excess water entering the Mesa Vista storage tanks, located approximately 1.5 miles south of the wells. AVHCWD, was approved by the California Division of Drinking Water (DDW) to provide chlorination to its groundwater sources in 2012. Both wells are metered using ultra-sonic flowmeter. The wells are in generally good operating condition. The pumps/motors of the wells were replaced in 2013. The well screens were cleaned and videoed at the same time as the pump/motor replacements. Water produced from the wells does not contain regulatory contaminants at levels near drinking water MCLs.

Water storage tanks

The AVHCWD system has four existing bolted steel potable water storage tanks. AVHCWD has a combined storage capacity of 260,000 gallons. The storage tanks pressurize AVHCWD's distribution system pressure zones while the system's wells are off. The tanks are located on two separate properties owned by the Bureau of Land Management. The Mesa Vista Tank Site is located at the southern terminus of Mesa Vista Street and has an approximate elevation of 3,440 feet above mean sea level. The Mesa Vista Tank Site has three storage tanks that each have a maximum storage capacity of 20,000 gallons and serve AVHCWD's Lower Zone. As previously described, the system's wells supply water directly to the distribution system, with excess capacity filling the Mesa Vista tanks. When water demands exceed the supply from the wells, the tank level drops. The Central Tank Site is located at the southern terminus of Central Road and has an approximate elevation of 3,645 feet above mean sea level. The Central Tank Site has one bolted steel storage tank that has a maximum capacity of 200,000. An abandoned tank is also located at the site. The Central Tank serves AVHCWD's Upper Zone. The Central Tank is delivered water from the Lower Zone via the Roundup Booster Station. The Lower Zone pumps water to the Upper Zone, with excess supply filling the Central Tank. The Central Tank is able to deliver water through the Upper Zone back to the Lower Zone through a combination pressure reducing/pressure sustaining valve located at the Roundup Booster Station.

Pipelines

AVHCWD's distribution system consists of pipelines, standpipes, valves, meters and other appurtenances. It is estimated that AVHCWD has approximately 13 miles of water pipelines, which range in size between four to eight inches in diameter. The majority of the pipelines are concrete lined steel. The system does contain limited sections of PVC piping, mainly from repairs. Per the California DDW 2010 Sanitary Survey, the distribution system operates at pressures ranging from 40-60 pounds per square inch (psi). AVHCWD's water system pressure exceeds the minimum standard pressure of 20 psi. The pipeline system is generally looped but does contain multiple dead ends. AVHCWD has designated sample stations located in its distribution system.

AVHCWD's steel pipelines were generally installed in 1958 and have recently become prone to failure, causing system outages and water losses. Numerous water outages due to breaks in the transmission/distribution line along Mesa Vista Street occurred between July 2013 and November 2014. This section of pipeline is one of the primary alignments connecting AVHCWD's wells to the rest of its potable water system.

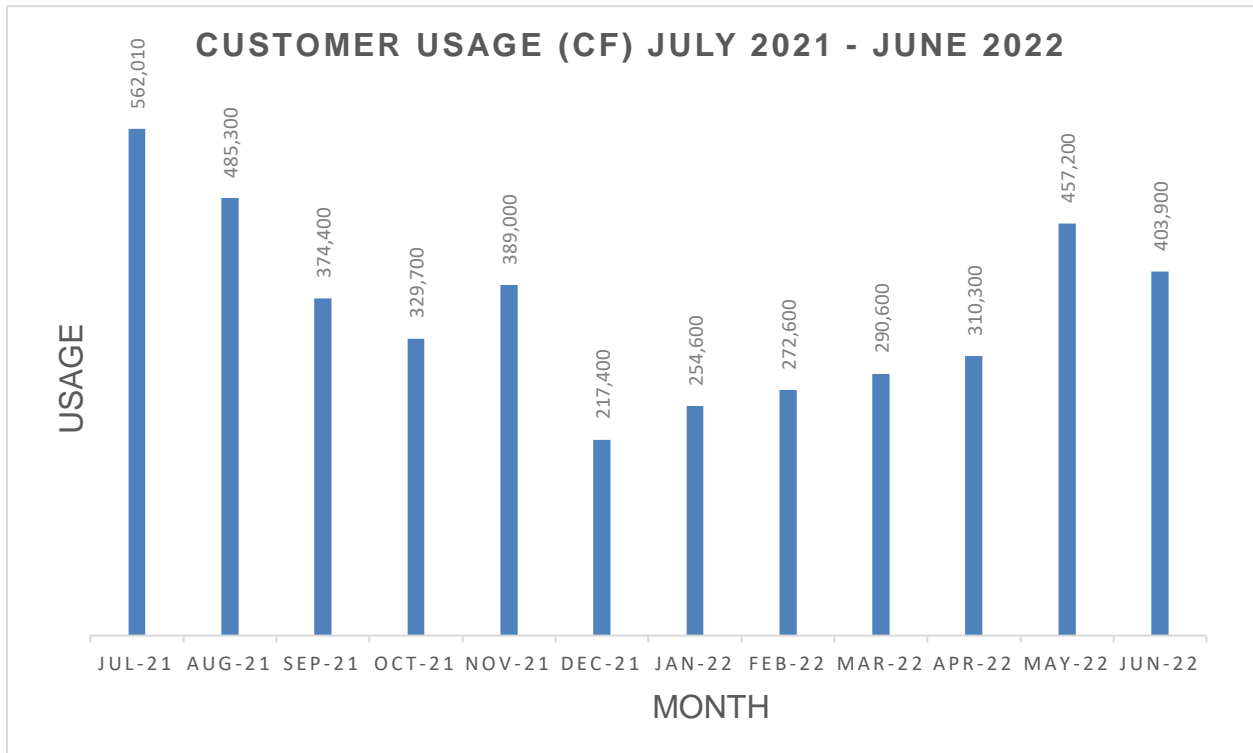
Pump station

AVHCWD operates the Roundup Booster Station. The booster station is housed within a small wood frame building located north of Roundup Way between Buena Vista Street and Central Road. The site is enclosed by a chain-link fence topped with barbed wire and is accessible through a man-gate. The pump station was rehabilitated in 2014. As mentioned previously, the booster station conveys water from the Lower Zone to the Upper Zone, with excess supply filling the Central Tank. The booster station operates on a simple on/off SCADA system based on the water level in the Central Tank.

Water meters

Each active customer connection is metered and manually read monthly. In 2013 a meter replacement program was initiated replacing 280 water meters. The common lifespan of residential water meters is +/-10 years and in 2021 a water service line and meter replacement project began. This program consists of replacing all 313 water service connections that are over 15 years old, upgrading each water service connection to 1" with a 1" water meter, check valve, and courtesy valve (customer side shut-off valve). The water district is going hi-tech using the Master Meter's Sonata residential ultrasonic water meter with Master Meter's 3G Mobile AMR drive-by technology. Utilizing advanced ultrasonic flow measurement, the Sonata greatly improves low flow measurement compared to residential mechanical meters. This makes it an ideal solution for addressing Non-Revenue Water (NRW). Benefiting from the full capabilities of the new Master Meter's Sonata residential ultrasonic water meter and Master Meter's 3G Mobile AMR software will give both the district and its customers the water management tools necessary to combat water waste. Future plans involve a customer web portal with smartphone integration. The online application allows for convenient access to up-to-date hourly usage information. The chart view allows for daily, monthly and yearly review of water usage and also shows a comparison to the user for real accountability. This full-featured water portal allows the user to set up alerts for on-premises leak detection, over-budget notifications, and gives the ability to set vacation periods to be notified of unusual, unauthorized usage while a customer is away.

Customer usage



Based on recent data graphed above (in cubic feet), the water system saw the highest water usage during the months of May through November. Sixty-nine percent of the annual water usage happened during those months. Water usage declined in the months of December through April.

AVHCWD customer usage by tier

Month	up to 900	1,000 - 1.900	2,000 - 3,500	Over 3.500	Total
Jul-21	211,600	115,200	92,810	142,400	562,010
Aug-21	195,600	99,700	79,600	110,400	485,300
Sep-21	188,400	84,900	54,700	46,400	374,400
Oct-21	178,800	72,500	37,800	40,600	329,700
Nov-21	168,400	74,800	53,900	91,900	389,000
Dec-21	150,100	36,100	11,400	19,800	217,400
Jan-22	165,900	43,300	19,500	25,900	254,600
Feb-22	161,700	46,600	20,300	44,000	272,600
Mar-22	180,900	63,000	26,700	20,000	290,600
Apr-22	174,300	58,700	33,600	43,700	310,300
May-22	205,600	99,400	69,800	82,400	457,200
Jun-22	190,600	87,000	61,800	64,500	403,900
Total Annual Usage	2,171,900	881,200	561,910	732,000	4,347,010

AVHCWD number of connections in each tier of usage

Month	up to 900	100 - 1.900	2,000 - 3,500	Over 3.500	Total
Jul-21	147	81	41	42	311
Aug-21	176	67	35	35	313
Sep-21	194	65	35	19	313
Oct-21	201	66	36	10	313
Nov-21	204	60	28	21	313
Dec-21	245	53	10	5	313
Jan-22	233	57	17	6	313
Feb-22	239	45	23	6	313
Mar-22	209	66	31	7	313
Apr-22	229	49	23	12	313
May-22	167	83	36	27	313
Jun-22	195	58	41	19	313

When analyzing water rates, it is important to understand existing patterns of consumption among the system's customers. A large portion of customers may use a small percentage of water and a small portion of customers may use a large percentage. Understanding how customers use water is important when examining seasonal operational needs, infrastructure replacement and water use efficiency, to name a few considerations.

Because AVHCWD must pay for the water it provides to its customers on an increasing block basis, analyzing customer water usage is even more critical. As demonstrated in the table below, 85% of customers used 70% of the water while 15% used 30%.

	Up to 900 CF	1,000 - 1,900 CF	2,000 – 3,500 CF	Over 3,500 CF	Total
Average # Customers	203	63	30	17	313
Average Monthly Usage	180,992	73,433	46,826	61,000	362,251
% of Customers	65%	20%	9%	6%	100%
% of Usage	50%	20%	13%	17%	100%

Current rates

All AVHCWD customers have 1” meters. Customers are billed a base rate of \$30.75 plus a capital replacement reserve fee of \$10.00 and a surcharge for well maintenance of \$5.00 monthly. Water use is measured and billed in units of 100 cubic feet (CCF). One hundred cubic feet is equal to 748 gallons.

Monthly Base Rates			
Base Rate	Monthly Surcharge	Capital Improvement Reserve Fund	Total Monthly Base Rate
\$ 30.75	\$ 5.00	\$10.00	\$45.75

Usage Rates	
Usage	Rate
Up to 900 CF	\$ 3.70
1,000 – 1,900 CF	\$ 3.81
1,000 – 3,500 CF	\$ 4.82
Over 3,500 CF	\$6.51

Additional fees

In addition to monthly water rates, AVHCWD also currently has the following fees:

Fee Type	Fee Amount
Late fees	\$20.00
Non-Payment Red Tag - Month	\$50.00
Customer Request Turn Off	\$25.00
Customer Request Turn On	\$25.00
Returned check fee	\$25.00
Customer Account Deposit	\$180.00
Standby Assessments – per acre	\$30.00

Proposed rate structure

RCAC offered several rate adjustment options for AVHCWD’s consideration. The AVHCWD’s Board of Directors determined to keep the base rate and the usage rate for the first 800 cubic feet as it is

currently for the first year. Increases of \$1.50 per hundred cubic feet will be implemented to offset the additional cost of \$650.00 per acre foot (one acre foot = 43,560 cubic feet. \$650.00 divided by 43,560 cubic feet = \$0.015 per cubic foot times 100 = \$1.50 per hundred cubic feet). The tier levels were set at the number of units that the board felt would best serve both the water enterprise and the community. Annual increases to both the base rates and the usage rates in the amount of the higher of the annual Consumer Price Index (CPI) or 2.6% will be implemented subsequent to the first year.

	Year #1	Year #2	Year #3	Year #4	Year #5
Base Rate	\$ 45.75	\$ 46.94	\$ 48.16	\$ 49.41	\$50.70
Usage Rates Per 100 Cubic Feet					
Up to 800 CF	\$ 3.70	\$ 3.80	\$ 3.89	\$ 4.00	\$ 4.10
900 – 3,500 CF	\$ 5.20	\$ 5.34	\$ 5.47	\$ 5.62	\$ 5.76
3,501 – 8,000 CF	\$ 6.70	\$ 6.87	\$ 7.05	\$ 7.24	\$ 7.42
Over 8,000 CF	\$ 8.20	\$ 8.41	\$ 8.63	\$ 8.86	\$ 9.09

2. Guiding principles of this rate study

Sustainability

Water rates should cover the costs to the water utility to allow it to provide water services for the foreseeable future.

Fair

Water rates should be fair to all rate payers. No single rate payer or group of rate payers should be singled out for different rates. Therefore, the proposed rates do not make any distinction between domestic, commercial or agricultural users. The rates are the same for all.

The water enterprise should not charge more for water than the cost to provide the water. However, the costs should include operations, repairs, reserves and all other costs related to the production, treatment and distribution of potable water now and in the foreseeable future.

Conservation

Water rates should promote conservation. Water is a limited resource and should be conserved.

Justifiable

Water rates must be based on the actual financial needs of the water enterprise. Revenue generated from water rates cannot be used for anything except to pay for the costs of procuring, treating and distributing water within its service area, plus any administrative costs and reserves.

Therefore, the proposed rates are based on AVHWCD's capital replacement program and a sales forecast.

Purpose of this study

The purpose of this study is to provide AVHWCD with recommended rates. The water system must be able to build reserves to cover emergencies, periods of low cash flow and the inevitable need to replace all components of the operation.

Board decision

While this document recommends certain rates, the ultimate decision rests with AVHCWD's board. However, the board has a fiduciary responsibility to set the rates at such a level that the water enterprise will be able to continue to operate in the future, including providing funds to replace all parts of the system as they wear out.

Disclaimer

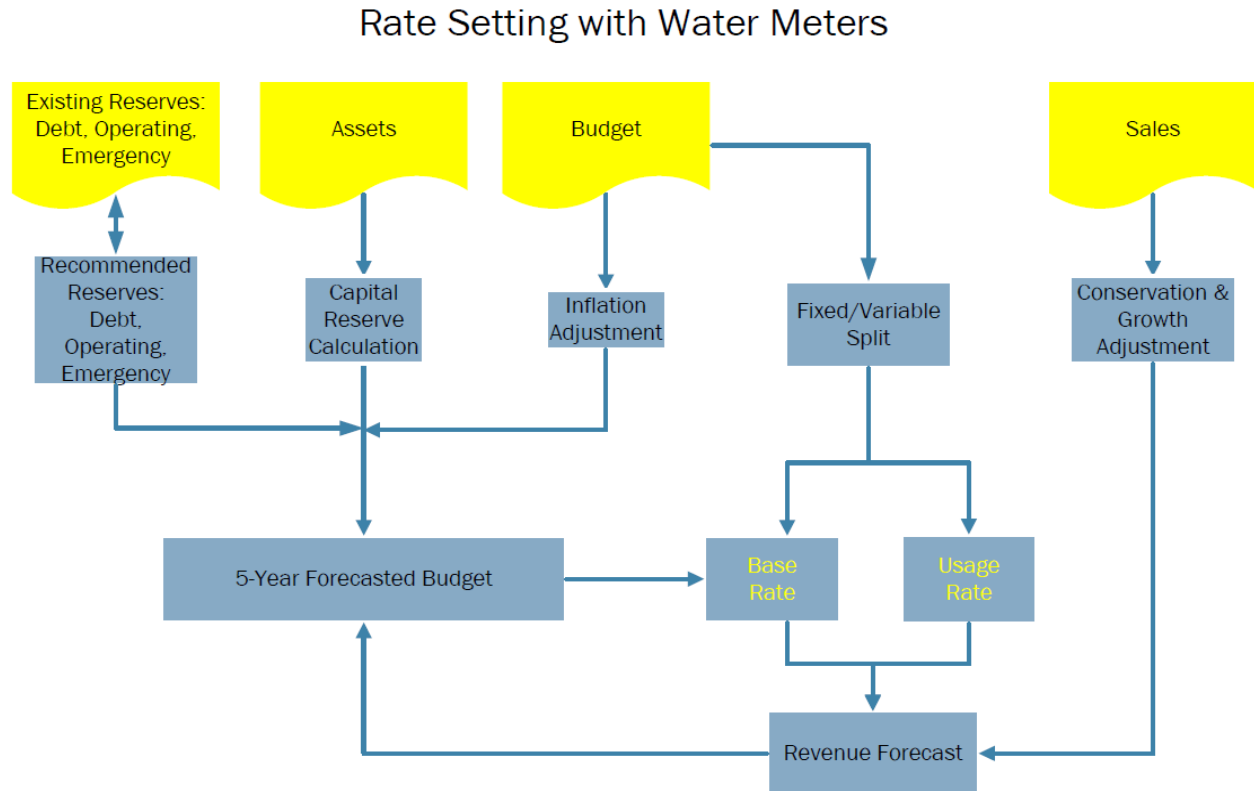
The recommendations contained in this rate study are based on financial information provided to RCAC by AVHWCD. Although every effort was made to ensure the reliability of this information, no warranty is expressed or implied as to the correctness, accuracy or completeness of the information contained herein. The units in each tier were determined by the AVHWCD Board of Directors.

Any opinions, findings, conclusions or recommendations expressed in this material are solely the responsibility of the authors and do not necessarily represent the official views of SWRCB, who funded this rate study.

For accounting advice, a CPA should be consulted. For legal advice, the company should seek the advice of an attorney.

3. Rate study process

The figure¹ below explains the process of setting rates. We begin with the list of all capitalized assets, the current budget and the current sales history as provided by the administration from AVHWCD.



Existing reserves are compared to target reserves and from the list of assets the required reserves are calculated (Section 4 of this report) and fed into a five-year budget projection (Section 5).

The budget is adjusted for inflation, estimated to be 4% per year.

The number of customers is adjusted for unpaying customers, undeveloped lots, future water conservation and community growth reasonably expected to occur in the next five years.

The budgeted expenses are split between fixed and variable costs, which leads to a recommended base rate or meter charge and usage charges. The calculated rates are then applied to the forecasted sales to arrive at a revenue estimate. This process was repeated with recommended reserves.

¹ All yellow fields and cells in the figures of this report are based on external data. All blue fields or cells are calculated.

4. Reserve funding

As of June 30, 2023, AVHCWD water enterprise held \$618,961 in cash and cash equivalents.

AWWA standards recommend a review of four types of reserves:

1. **Debt reserve:** AVHCWD had no debt requiring a debt reserve fund at the time of this analysis.
2. **Operating reserve:** Operating reserves are established to provide the utility with the ability to withstand short-term cash-flow fluctuations. The industry standard calls for 1.5 times the operating expenses during a billing cycle, assuming billing on a monthly basis. AVHCWD had \$39,553 in operating reserves on June 30, 2023, which is considered adequate to carry the utility through unexpected periods of low cash flow.
3. **Emergency reserve:** Emergency reserves are intended to help utilities deal with short-term emergencies, such as mainline breaks or pump failures. An emergency reserve is intended to fund the immediate replacement or reconstruction of the system's single most critical asset. The emergency reserve should be set at the replacement cost of the most expensive component that, if it failed, would result in the inability to provide water to customers. In the case of AVHCWD, it was determined that \$100,000 in emergency reserves would be sufficient. That amount is included in the cash balance as of June 30, 2023.
4. **Capital replacement reserve (CRP):** This reserve is strictly to be used to fund the company portion of any replacement of capital assets that are worn out. AVHCWD had \$437,375 in CRP reserves as of June 30, 2023. Currently, of the AVHCWD monthly base fee of \$45.75, \$10.00 is designated for CRP reserves and \$5.00 for well maintenance reserves.

The table on the following page shows the existing reserves and the reserve targets for each of the four reserve categories.

These reserves have different time horizons. Operating reserves and emergency reserves should be readily available, while CRP funds can be invested with different maturity dates to coincide with the planned need for capital replacements.

These four different reserves should require different policies related to:

- a. Investment terms and vehicles.
- b. What the funds can be used for.
- c. Who can access the funds.
- d. What procedure must be followed to access the funds.

Reserve Type	Existing Reserves	Targeted Reserves over Five-Year Period	Amount to Fund over Five-Year Period
Debt Reserve	\$0	\$0	\$0
Operating Reserve	\$39,553	\$39,553	\$0
Emergency Reserve	\$100,000	\$100,000	\$0
Capital Replacement Reserve	437,375	\$768,352	\$330,977
Total	\$576,928	\$907,905	\$330,977

5. Capital replacement program

Source of the data

The data in the capital replacement program (CRP) comes from the data supplied by the company and AWWA standards.

The list of the components, their installation date, and their original costs were all supplied or estimated by the utility. AVHCWD has set the capitalization threshold at \$2,500. The cost of some of the purchases on the list are below the threshold and should, most likely, be expensed rather than recorded as assets.

The normal estimated life is based on AWWA or industry standards. The estimated remaining life is based on the general manager's and operator's best judgments.

Sources of funding

Funding for the replacement of components can only come from cash saved by the company, a grant or a loan.

In reviewing funding options to replace existing equipment, the general manager assumed AVHCWD would be poised to pay cash for equipment up to \$500,000 and would provide cash for 20% of the cost of replacements beyond \$500,000. AVHCWD is hoping to acquire grants to fund the remaining 80% of costs for replacements over \$500,000. RCAC cautions that grants may not be available when the time comes for replacing these assets.

Default funding of CRP

		Cash	Grant	Loan
\$0	\$20,000	100%	0%	0%
\$20,001	\$100,000	100%	0%	0%
\$100,001	\$500,000	100%	0%	0%
\$500,001	\$9,999,999	20%	80%	0%

The CRP provides us with a detail of the reserves needed to replace the existing, funded and future unfunded capital assets. The total line of the CRP table, \$65,264, is the amount the AVHCWD must set aside each year to be able to replace the assets listed when they reach the end of their life expectancy.

TABLE 1: Capital replacement program

Major Equipment & Assets	Year Acquired	Purchase Cost	Estimated Remaining Life	Past Inflation Rate 3%	Future Inflation Rate 4%	Estimated Future Replacement Cost	Existing CIP Reserves	Amount to Fund in Reserves	% to Be Funded through Reserves	Annual CRP Reserve Funding
<i>Description</i>			Yrs			Cost				Required
Well #3 Well Pump w/Motoer, Verticl Turgine, Bowl Setting Depth 360 LF	2019	\$ 69,157	21	3.0%	4.0%	\$182,693	\$34,791	\$147,903	100%	\$7,043
Well #3 -Flowmeter - Ulta Sonic	2019	\$ 5,388	20	3.0%	4.0%	\$13,686	\$13,686	\$0	100%	\$0
Well Site #4 - Well Pump w/Motor, Verticle Turbine, Blow Setting Depth 360 LF	1998	\$ 69,149	21	3.0%	4.0%	\$339,824	\$58,427	\$281,397	100%	\$13,400
Well Site #4 - Flowmeter, Ultra Sonic	2019	\$ 5,388	20	3.0%	4.0%	\$13,686	\$13,031	\$655	100%	\$33
Office - Computers, Laptops	2022	\$ 2,055	4	3.0%	4.0%	\$2,550	\$2,550	\$0	100%	\$0
Office - Building	1980	\$ 111,688	50	3.0%	4.0%	\$2,914,146	\$69,860	\$2,844,286	25%	\$11,377
Office - Printer, Brother, MFC L88900CDW, Copier	2019	\$ 684	3	3.0%	4.0%	\$892	\$892	\$0	100%	\$0
Office - Office Furniture	2019	\$ 7,585	5	3.0%	4.0%	\$10,698	\$10,698	\$0	100%	\$0
Office - SCADA Equipment	2010	\$ 6,123	2	3.0%	4.0%	\$2,000	\$2,000	\$0	100%	\$0
250 Gallon Tank, Propane w/Regulator	2023	\$ 626	1	3.0%	4.0%	\$671	\$671	\$0	100%	\$0
Storage Shed - Building, Prefab	2000	\$ 15,138	25	3.0%	4.0%	\$82,034	\$71,212	\$10,822	100%	\$433
20,000 Gallon Tanks - Bolted Steel	1957	\$ 194,802	50	3.0%	4.0%	\$150,000		\$150,000	100%	\$3,000
Booster Pump Station/Storage - Building	1980	\$ 15,421	50	3.0%	4.0%	\$402,362		\$402,362	100%	\$8,047
Booster Pump Station/Storage - 4" CLA Valve	2015	\$ 3,112	10	3.0%	4.0%	\$6,010	\$6,010	\$0	100%	\$0
Booster Pump Station/Storage -20 HP Pump w/Motor, vertical Boosters, Goulds-46eSV, 200 GPM	2015	\$ 30,072	25	3.0%	4.0%	\$104,600	\$95,603	\$8,997	100%	\$360
South End Central Road - 200,000 GAL Tank, Bolted & Galvanized	1990	\$ 267,568	40	3.0%	4.0%	\$3,509,404	\$57,944	\$3,451,460	25%	\$21,572
Total		\$803,956				\$7,735,258	\$437,375	\$7,297,883		\$65,264

Alternative

AVHCWD's current monthly rate of \$45.75 includes \$10.00 for CRP reserves and \$5.00 for well maintenance reserves. Because the number of connections is projected to increase by 0.5% annually, the rate adjustment options in this analysis do not break out an amount to be charged for CRP and well maintenance reserves. All costs are recovered through one base rate and the usage rates. It should be noted that the CRP reserve calculations assume grants will be available for partial funding of the replacement of two items on the equipment list that are projected to cost over \$500,000. If grants are not available, it will be necessary for AVHCWD to fund the replacements through loans. The amount of grants and/or loans obtained for future projects has a very substantial impact on water rates. Therefore, this study recommends a new rate study every five years or when the new system has been constructed.

6. Budget

Source

All expenses shown on the following page in TABLE 2 were calculated using the 2023 board-approved budget and projecting forward for five years assuming an annual inflation rate of 4%.

TABLE 2: Five-year projected budget

	Budget 6/30/2023	Projected 6/30/2024	Projected 6/30/2025	Projected 6/30/2026	Projected 6/30/2027	Projected 6/30/2028
Operating Expenses						
Purchased Water	\$ 15,000	\$ 15,600	\$ 16,224	\$ 16,873	\$ 17,548	\$ 18,250
Plant Power	\$ 24,500	\$ 25,480	\$ 26,499	\$ 27,559	\$ 28,662	\$ 29,808
Salaries & Wages	\$ 123,182	\$ 128,109	\$ 133,234	\$ 138,563	\$ 144,106	\$ 149,870
Lab Fees	\$ 5,500	\$ 5,720	\$ 5,949	\$ 6,187	\$ 6,434	\$ 6,692
Payroll Taxes	\$ 11,000	\$ 11,440	\$ 11,898	\$ 12,374	\$ 12,868	\$ 13,383
Directors' Fees	\$ 3,750	\$ 3,900	\$ 4,056	\$ 4,218	\$ 4,387	\$ 4,562
Rent	\$ 5,400	\$ 5,616	\$ 5,841	\$ 6,074	\$ 6,317	\$ 6,570
Dues & Subscriptions	\$ 4,800	\$ 4,992	\$ 5,192	\$ 5,399	\$ 5,615	\$ 5,840
Insurance	\$ 14,283	\$ 14,855	\$ 15,449	\$ 16,067	\$ 16,710	\$ 17,378
Miscellaneous	\$ 4,000	\$ 4,160	\$ 4,326	\$ 4,499	\$ 4,679	\$ 4,867
Office Supplies	\$ 10,000	\$ 10,400	\$ 10,816	\$ 11,249	\$ 11,699	\$ 12,167
Professional Fees	\$ 9,000	\$ 9,360	\$ 9,734	\$ 10,124	\$ 10,529	\$ 10,950
Training	\$ 1,500	\$ 1,560	\$ 1,622	\$ 1,687	\$ 1,755	\$ 1,825
Repairs & Maintenance	\$ 57,345	\$ 59,639	\$ 62,024	\$ 64,505	\$ 67,086	\$ 69,769
Travel & Mileage	\$ 9,590	\$ 9,974	\$ 10,373	\$ 10,787	\$ 11,219	\$ 11,668
Utilities	\$ 4,000	\$ 4,160	\$ 4,326	\$ 4,499	\$ 4,679	\$ 4,867
Permits & Licensing	\$ 550	\$ 572	\$ 595	\$ 619	\$ 643	\$ 669
Election Costs	\$ 500	\$ 520	\$ 541	\$ 562	\$ 585	\$ 608
Dig Alert	\$ 350	\$ 364	\$ 379	\$ 394	\$ 409	\$ 426
Total Operating Expense	\$ 304,251	\$ 316,421	\$ 329,077	\$ 342,241	\$ 355,930	\$ 370,167
Reserves:						
Debt Reserves (assumes no Debt)						
Operating Reserves (Assumes Operating reserves are fully funded already)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Emergency Reserves (Assumes Emergency Reserves are already fully funded)	\$ -	\$ -	\$ -	\$ -		
Reserves - Well Maintenance	\$ 18,480	\$ 18,480	\$ 18,480	\$ 18,480	\$ 18,480	\$ 18,480
CIP Reserves (Depreciation)	\$ 36,960	65,264	65,264	65,264	65,264	65,264
Total Reserve Funding	\$ 55,440	\$ 83,744	\$ 83,744	\$ 83,744	\$ 83,744	\$ 83,744
Total Costs	\$ 359,691	\$ 400,165	\$ 412,821	\$ 425,985	\$ 439,674	\$ 453,911

Sales adjustments

Higher water rates may cause a reduction in the quantity of water sold as customers adjust their consumption to the new rates. The AVHCWD president and general manager indicated no change in customer use habits is anticipated. A small increase in the number of connections each year is expected.

Sales adjustment over base year	Year 1	Year 2	Year 3	Year 4	Year 5
Conservation factor	0.0%	0.0%	0.0%	0.0%	0.0%
Growth factor	0.5%	0.5%	0.5%	0.5%	0.5%
Total sales adjustment	0.5%	0.5%	0.5%	0.5%	0.5%

AVHCWD expects that most, if not all, delinquent accounts are collectible. A minor dollar amount of uncollectible accounts was assumed in this rate analysis.

Receivable Write-Off (% of Billing)	Year 1	Year 2	Year 3	Year 4	Year 5
	0.50%	0.50%	0.50%	0.50%	0.50%

Alternatives

If the utility does not fund its budget by setting appropriate water rates, it does not mean that the enterprise cannot pay its bills. It simply means that the enterprise is not providing for future replacement of the capital assets and will not be able to guarantee the continuing operation of the water system.

The utility and board have a fiduciary responsibility to set rates to a level where the system can continue to operate and provide clean, safe water for the foreseeable future.

7. Fixed versus variable expenses

TABLE 3: Fixed/variable costs

OPERATIONS & MAINTENANCE EXPENSES	5 - Year Average	% Fixed	\$ Fixed	\$ Variable
Purchased Water	\$ 16,899	0%	\$ -	\$ 16,899
Plant Power	\$ 27,602	0%	\$ -	\$ 27,602
Salaries & Wages	\$ 89,724	100%	\$ 89,724	\$ -
Lab Fees	\$ 6,196	100%	\$ 6,196	\$ -
Salaries & wages	\$ 49,052	100%	\$ 49,052	\$ -
Payroll Taxes	\$ 12,393	100%	\$ 12,393	\$ -
Directors' Fees	\$ 4,225	100%	\$ 4,225	\$ -
Rent	\$ 6,084	100%	\$ 6,084	\$ -
Dues/Subscriptions	\$ 6,027	100%	\$ 6,027	\$ -
Insurance	\$ 16,092	100%	\$ 16,092	\$ -
Miscellaneous	\$ 4,506	100%	\$ 4,506	\$ -
Office Supplies	\$ 11,266	100%	\$ 11,266	\$ -
Professional Fees	\$ 10,139	100%	\$ 10,139	\$ -
Election Costs	\$ 563	100%	\$ 563	\$ -
Dig Alert	\$ 394	100%	\$ 394	\$ -
Training	\$ 1,690	100%	\$ 1,690	\$ -
Repairs & Maintenance	\$ 64,605	75%	\$ 48,454	\$ 16,151
Travel & Mileage	\$ 10,804	100%	\$ 10,804	\$ -
Utilities	\$ 4,506	100%	\$ 4,506	\$ -
Total Operation and Maintenance Expenses:	\$ 342,767		\$ 282,116	\$ 60,652
GENERAL & ADMINISTRATIVE EXPENSES				
Reserve Funding for Well Maintenance	\$ 18,480	100%	\$ 18,480	\$ -
Replacement of Existing Capital Assets	\$ 65,264	100%	\$ 65,264	\$ -
Total General and Administrative Expenses:	\$ 83,744		\$ 83,744	\$ -
Total All Expenses	\$ 426,511		\$ 365,860	\$ 60,652
Fixed-Variable as % of all Expenses			86%	14%

Source

A careful review of the budget was conducted between the operator and RCAC to determine which of the costs were fixed and which were variable.

Description

Some of the expenses vary by the volume of water sold. For example, electricity costs will go up when more water is processed.

Other expenses are fixed. For example, insurance costs remain the same whether water is sold or not. Percentages are used to estimate the ratio of fixed to variable because many expenses are somewhere in between.

In AVHCWD's case, 86% of all expenses are fixed and only 14% are variable. It is not unusual for smaller water systems to have a high percentage of fixed costs.

Alternatives

While fixed expenses should be covered by the base rate (the same every month), variable costs should be covered by the usage rate (based on the quantity sold). Should fixed costs not be recovered by the base rate, but by variable income (usage charges), there may be seasonal shortfalls in cash-flow of the company, and the company will have to dip into its operating reserves. AVHCWD management and board selected a base rate that will recover only 47% of the fixed costs.

The split between fixed and variable expenses is not germane to the overall balancing of the budget. It is only relevant to cover seasonal cash flows of the utility.

8. Rate calculation

Theoretical base rate calculation

In theory, fixed expenses should be covered by fixed income (base charges) and variable expenses should be covered by variable income (usage charges). This is accomplished by using the total fixed cost and allocating it between total customers, based on the customer's potential demand as approximated by meter size.

The theoretical base rate is calculated by determining the maximum demand for each meter according to AWWA’s safe maximum operating capacity, multiplying by the number of meters of that size in the system, and determining the percentage of total fixed costs that are allocated by meter size. This calculation results in the following:

TABLE 4: Theoretical base rate calculation

Meter Size in "	Decimal Size	Number of Meters	AWWA Safe Maximum Operating Cap. (GPM)	Max Demand (GPM)	% Of Max Demand by Meter Size	Total Fixed Costs Allocated by Meter Size	Theoretical Base Rate by Meter Size per Q
A	B	C	D	E= D * C	F= % of total	G= % * total	H=G/C/4
1"	1.00	313	50	15,650	100.00%	\$365,860	\$97.41

Base rate calculation – rate adjustment

Because full recovery of all the fixed costs in the base rate created a rate structure the board felt would be too onerous for the community, the rate adjustment was set to recover 47% of fixed costs in the base rate in the first year. Subsequent years will require a 2.6% increase to fully fund targeted reserves over the five-year period and to offset the impact of increased costs due to inflation, estimated to be 4% annually. The goal was to set a tiered rate in such a way that it generates enough revenue to balance the budget. AVHCWD is cautioned that by setting the base rate so low, if usage declines, recovering all fixed costs may not be possible.

TABLE 5: Base rate calculation

Meter Size	Theoretical Monthly Base Rate by Meter Size	Base Rate as % of Theoretical Rate	Existing Base Rate	Proposed Base Charge for Year 1	Year 2	Year 3	Year 4	Year 5
1.00	\$97.41	47%	\$45.75	\$ 45.75	\$ 46.94	\$ 48.16	\$ 49.41	\$ 50.70

In the rate adjustment selected by AVHCWD, the base rates have remained at the current level and will recover only 47% of fixed costs. This would be followed by an annual increase of 2.6% to both the base rates and the usage charges starting in the second year. In the rate adjustment, full funding of reserves will not be possible in the final two years unless the anticipated increase in connections occurs. If increases in connections do not occur, the shortages in reserve funding will be recovered in the first three years so that the average annual funding target in the amount of \$65,264 will be recovered over the five-year period.

Usage rate calculation

AVHCWD’s water usage is under the jurisdiction of the Mojave Basin Area Watermaster (MWA). MWA was appointed as watermaster in 1993 pursuant to the California Supreme Court (the Court) judgement, which adjudicated the rights to pump groundwater in the Mojave Basin Area. The watermaster’s main responsibilities are to monitor and verify water production for approximately 1,700 wells, collect required assessments, conduct studies and prepare an annual report of its findings and activities to the court.

AVHCWD purchases water from various sources based on availability and cost. Each year, less water is available to sell and produce. Water usage in excess of 63-acre feet is charged an additional fee per acre foot. The amount of the fee varies from year to year. In the fiscal year 2021 – 2022, it was set at \$584. In the fiscal year 2022 – 2023 it was set at \$650. And, in the fiscal year 2023 – 2024 it has been set at \$658. The \$650 rate was assumed in this rate analysis.

Because the base rate adjustment will not fully recover fixed costs, AVHWD will rely heavily on the usage rates to balance the budget. The usage rate for Tier #1 will remain the same as it currently is in the first year. While the usage rates for Tiers #2 through #4 must increase in order to balance the budget, it provides a little more control to the property owner by allowing them to reap the financial benefits of conserving water.

Annual Acre Feet in Tier #1	Annual Cubic Feet in Tier #1	Monthly Cubic Feet Tier #1	# Connections	Per Connection Usage in Tier #1
63	2,744,280	228,690	313	731

Because AVHCWD reads meters in 100 cubic feet, it was determined to allow 800 cubic feet in Tier #1. Tiers #2 through #4 will each increase by \$1.50 per hundred cubic feet to recover the increased cost of purchased water:

$$\$650 / 43,560 = \$0.015 \text{ per cubic foot}$$

$$\$0.015 \times 100 \text{ cubic feet} = \$1.50$$

The board-proposed tier units are indicated in Table #7.

TABLE 7: Adjusted usage rates

Usage Rate per one hundred cubic feet	Year 1	Year 2	Year 3	Year 4	Year 5
Up to 800 CF	\$3.70	\$3.80	\$3.89	\$4.00	\$4.10
900 – 3,500 CF	\$5.20	\$5.34	\$5.47	\$5.62	\$5.76
3,600 – 8,00 CF	\$6.70	\$6.87	\$7.05	\$7.24	\$7.42
Over 8,000 CF	\$8.20	\$8.41	\$8.63	\$8.86	\$9.09

Seasonal cash flow

By setting the base rate to less than the theoretical rate and relying on usage charges to balance the budget, seasonal cash flow issues may occur, particularly in the event of drought restrictions.

Subsequent to the first year, an annual increase of 2.6% for all rates is recommended to provide sufficient revenue to fund targeted reserves and to reduce the need for drastic rate changes in the future. This will also ensure the rates are keeping up with increasing costs within the system.

Estimated profit and loss with new rates

The revenue generated by the adjusted rates is compared against projected expenses (as shown in the budget) and discloses the estimated profit/loss. Included in the calculations are the estimated annual contributions to the reserves.

TABLE 8: Estimated profit/loss with new rates

Estimated Profit/(Loss) after Rate Adjustment	Year #1	Year #2	Year #3	Year #4	Year #5	5-Year Total
Base/Usage Rate Revenue	384,199	394,188	404,437	414,953	425,741	2,023,519
Uncollectible Receivables	(1,921)	(1,9171)	(2,022)	(2,075)	(2,129)	(10,118)
Standby Fees	24,762	24,762	24,762	24,762	24,762	24,762
Total Revenue	407,041	416,980	427,177	437,640	448,375	2,137,213
Operating Costs	316,421	329,077	342,241	355,930	370,167	1,713,836
Reserves for Well Maintenance	18,480	18,480	18,480	18,480	18,480	92,400
Reserves for Replacement of Existing Capital Assets	72,140	69,422	66,457	63,230	59,728	330,977
Total Costs	407,041	416,980	427,177	437,640	448,375	2,137,213

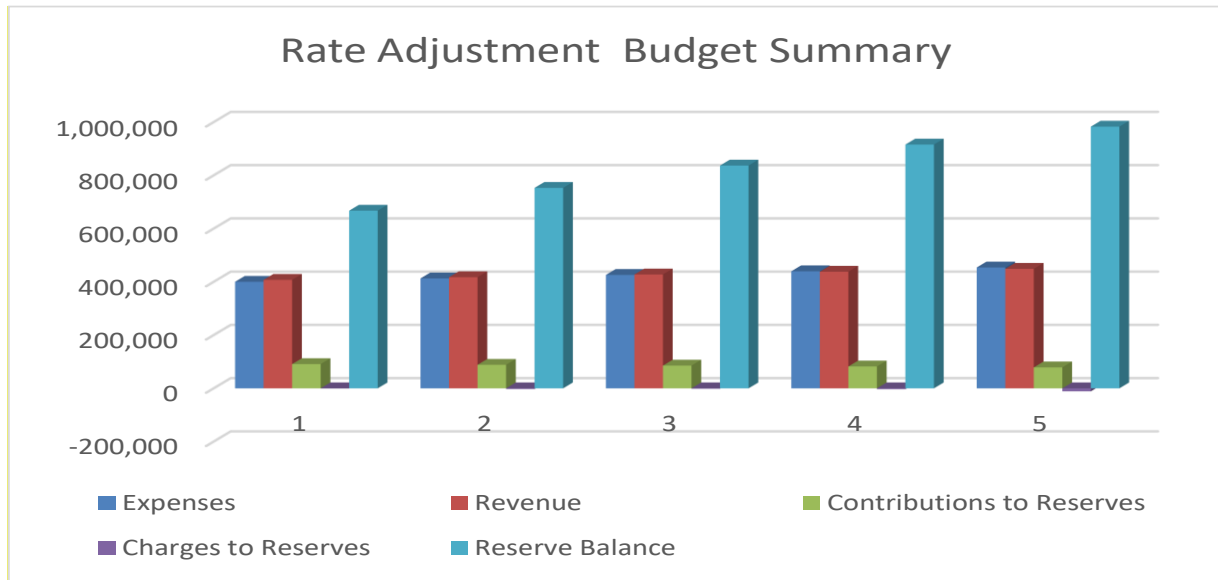
Affordability index

TABLE 9: Affordability index

Year 1	Year 2	Year 3	Year 4	Year 5
2.95%	3.03%	3.11%	3.19%	3.27%

The 2020 United States Census Bureau indicated the median household income for Apple Valley, California of \$41,649. The “affordability index” was calculated by dividing the average annual water bill of all residences by the MHI. While the future rates are necessarily high, any number below 4% is generally considered “affordable.” The proposed rate adjustment results in a relatively high affordability

index. Low-income residents who are served by AVHCWD should reach out to AVHCWD to apply for assistance with their water bills through the California Department of Community Services and Development Low Income Household Water Assistance Program.



Impacts of the rate adjustment

- Expenses (darker blue bar) show a slight increase each year due to inflation.
- Revenue (red bar) climbs each year starting the first year as AVHWCD continues to contribute a fixed revenue to the existing CRP for asset replacement.
- Contributions to reserves (green bar) show a contribution to capital reserves each year targeted at \$330,977 over the five-year period.
- Charges to reserves (purple bar) are the replacement costs of certain assets, according to the CRP. The purple bars indicate the need to dip into reserves.
- The reserve balance (light blue bar) is the amount available to replace the system in future years. The reserve balance shows that an adequate balance to fund replacement of equipment below \$500,000 will be available at the end of the five-year period. Continued contribution to reserves will be necessary to fund partial replacement of equipment over \$500,000 and new equipment as it is put into service.

Estimated quarterly bill with rate adjustment

TABLE 11: Average monthly bill by meter size

Meter Size	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1.00	\$96.20	\$102.29	104.95	\$107.68	\$110.48	\$113.35

9. Proposition 218

California approved Proposition 218 in 1996 requiring agencies to adopt property fees and charges in accordance with a defined public process found in article XIII D or by associated court decision. Water and wastewater rates are user fees under the definition and must meet the following requirements:

- Revenues derived from the fee or charge must not exceed the funds required to provide the property-related service.
- Revenue from the fee or charge must not be used for any purpose other than that for which the fee or charge is imposed.
- No fee or charge may be imposed for general governmental services, such as police, fire, ambulance, or libraries, where the service is available to the public in substantially the same manner as it is to property owners.
- The amount of a fee or charge imposed upon any parcel or person as an incident of property ownership must not exceed the proportional cost of the service attributable to the parcel.
- The fee or charge may not be imposed for service, unless the service is used by, or immediately available to, the owner of the property in question.

Written notice should be given to both the record owners and customers within the area subject to the fee or charge. The notice shall include the following:

- The formula or schedule of charges by which the property owner or customer can easily calculate their own potential charge.
- The basis upon which the amount of the proposed fee or charge is to be imposed on each parcel. An explanation of the costs which the proposed fee will cover and how the costs are allocated among property owners.
- Date, time, and location of a public hearing on the rate adjustment. The public hearing must occur 45 or more days after the mailing of the notice.
- California Senate Bill No. 323 statement, "Any judicial action or proceeding to attack, review, set aside, void, validate, or annul an ordinance, resolution, or motion adopting a fee or charge for water or sewer service, or modifying or amending an existing fee or charge for water or sewer service, shall be commenced within 120 days of the effective date or of the date of the final passage, adoption, or approval of the ordinance, resolution, or motion, whichever is later."

California's Proposition 218 provides that a customer of AVHWCD or owner of record of a parcel or parcels subject to the proposed rate increases may submit a protest against any or all of the proposed rate increases by filing a written protest with AVHWCD at or before the time the public hearing has concluded. Only one protest per parcel is counted. If written protests are filed by a majority of the affected parcels, the proposed rate increases will not be imposed.