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Commissioner	:	Michael Picker
Administrative Law Judges	:	Rafael Lirag Douglas Long
ORA Witnesses	:	Eric Duran Julia Ende

OFFICE OF RATEPAYER ADVOCATES
CALIFORNIA PUBLIC UTILITIES COMMISSION

REPORT ON DEMAND-RELATED ISSUES, RATE DESIGN AND CONSERVATION

Golden State Water Company
Test Year 2016 General Rate Case
A.14-07-006

San Francisco, California
March 6, 2015

MEMORANDUM

This report is prepared by Eric Duran and Julia Ende of the *Office of Ratepayer Advocates (ORA) - Water Branch,* and under the general supervision of Program and Project Manager Danilo Sanchez, and Program and Project Supervisor Lisa Bilir. Mr. Duran's and Ms. Ende's Statement of Qualifications can be found in ORA's Company-Wide Report on the Results of Operations in this proceeding, A.14-07-006. Shanna Foley and Kerriann Sheppard serve as ORA legal counsels.

Report on Demand-Related Issues, Rate Design and Conservation

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Chapter 1: EXECUTIVE SUMMARY

1. INTRODUCTION

This report presents ORA's analysis and recommendations on GSWC's demand-related estimates and rate design for all 9 of GSWC's ratemaking areas.

a. Sales

ORA examined many different regression model variations and found that no single sales forecasting model or method was able to consistently predict sales accurately. ORA agrees with many of GSWC's sales and number of customer forecasts with minor modifications. (Chapter 2)

b. Courtesy Adjustments

Recorded courtesy adjustments, which are goodwill paid by ratepayers, have increased dramatically since 2011 when GSWC made an accounting change that affects this cost category. (Chapter 3)

c. Rate Design and Special Request 8

ORA's rate design ensures equity among customers by ensuring that non-residential and residential customer classes pay the same amount on average for each unit of water consumed and revenue requirements are allocated across customer classes based on the volume of water sales in each class. For residential customers, ORA recommends increasing the price signal for water conservation by increasing the percentage difference between tier prices in the highest tiers and accepting GSWC's proposal to implement four tier rate designs in Simi Valley, Santa Maria, Region 2 and Region 3. ORA accepts GSWC's tier width changes for residential customers in Region 3. (Chapter 4)

d. Affordability

The Commission should increase the discount for qualifying customers in GSWC's low-income rate assistance program "California Alternative Rates for Water" to 20% off an average bill. Additionally, the average bill should be calculated for each ratemaking area rather than for each Region to reflect local usage information. (Chapter 5)

e. Special Request 4

The Commission should adopt ORA's recalculated surcharge for the AEROJET memorandum account that is based on the updated June 30, 2014 balance in the account and on ORA's recommended revenue requirement, number of metered and unmetered connections and sales. (Chapter 6)

f. Special Request 7

The Commission should grant GSWC's proposed pilot program for Special Facilities Fee in Santa Maria and Connection Fees in Bay Point and Clearlake reflecting ORA's modifications and require GSWC in its next GRC to report on the pilot program. (Chapter 7)

g. Special Request 9

GSWC is currently providing recycled water to three customers free of charge without Commission authorization. GSWC cannot include any costs or lost revenues associated with these three customers in the WRAM/MCBA prior to Commission authorization. (Chapter 8)

h. Special Request 12 and 13

The Commission should approve GSWC's proposed Fees for Cross Connection Control and Fire Flow Testing and should require GSWC to present a proposed tariff explaining the details of the fees.

The Commission should approve GSWC's proposed Reconnection Fee increase. However, the Commission should require that before completing the reconnection work after hours, GSWC should be required to inform customers requesting a reconnection of the associated fee, the fee difference between regular business and after-hour reconnections, and the option to wait and receive the reconnection service during regular business hours at the lower fee. (Chapter 9)

i. Conservation Programs

ORA recommends that the Commission adopt a conservation budget of $746,604 for each year of the rate case cycle in order to address the impact of the drought and to meet the State's water use reduction goals. This will achieve the same water savings as GSWC's proposal but at a lower cost. ORA recommends that GSWC implement a social norm messaging pilot program to enhance water conservation as well as require GSWC to continue to track conservation expenses in a capped one-way balancing account for the three years of this GRC cycle. (Chapter 10)

j. Special Request 3

GSWC's request to include chemical costs in the Modified Cost Balancing Account (MCBA) should be denied because chemical costs are small percentage of the revenue requirement compared to the other variable supply costs captured in the MCBA, there is no simple direct or inverse relationship between chemical costs and water production, and it is better for ratepayers to continue to incentivize minimizing chemical costs. (Chapter 11)

k. Special Request 6

ORA opposes GSWC's request for a Sales Reconciliation Mechanism, because it is overly complex to implement and does not benefit ratepayers. (Chapter 12)

Chapter 2: CUSTOMER AND SALES FORECASTS

A. INTRODUCTION

This chapter presents ORA's analysis and recommendations regarding GSWC Test Year 2016 forecasts for number of customers and water sales per customer.[1] Both GSWC and ORA develop customer and sales forecasts for all seven Customer Service Areas (CSAs) in Region 1, the consolidated ratemaking area Region 2, and for each of the nine CSAs in the consolidated Region 3. ORA's forecasts as discussed herein are reflected in its Results of Operations Tables 2.1 through 2.4 (for each respective ratemaking area) in ORA's Executive Summary Report.[2]

Appendix Sales-A (Customer and Sales Forecasts) of this report describes in detail ORA's forecast method for sales per customer for each CSA/ratemaking area.

B. SUMMARY OF RECOMMENDATIONS

In forecasting number of customers and water sales per customer, ORA and GSWC both adhered to the methods outlined in the Revised Rate Case Plan (RRCP) adopted in D.07-05-062. In response to Commission guidance in GSWC's prior General Rate Case (GRC), ORA provides additional methods for sales forecasting and reports on this effort in Appendix Sales-A. The result of this effort allows for greater transparency in sales forecasts, and a better understanding of local trends in water sales that can help determine forecasts. ORA recommends that the Commission uphold the methods outlined in the RRCP by adopting ORA's sales forecast as each forecast is justified and based on the detailed analysis presented in Appendix Sales-A.

During discovery, ORA confirmed that GSWC provides contracted water service to customers at levels other than the authorized tariff rates, and whose water usage is not included in its billing system data which GSWC and ORA use for regression analysis. ORA recommends that the

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[1] In this chapter, customers and connections (or service connections) are used interchangeably.

[2] Number of customers and sales per customer forecasts, in conjunction with estimated water loss rates, are used to developed total water supply requirements (See ORA's Results of Operations Table 2-3 for each respective ratemaking area). The water supply requirements are in turn used to develop supply expense forecasts (e.g., purchased water, purchased power and pump tax expenses.)

Commission require GSWC to update its billing system to include the usage information for these customers as well as to conduct a legal analysis as to whether it is appropriate to continue billing these customers at levels other than the authorized tariff rates.

C. DISCUSSION

GSWC uses the five-year average annual rate of change for customer forecasts, and applies this rate to the most recent recorded year (2013) to obtain a 2014 forecast, and so on until it obtains the Test Year 2016 forecast. This is done for all residential and non-residential customer classes in all seven CSAs in Region 1, the consolidated ratemaking area Region 2, and for each of the nine CSAs in the consolidated Region 3.

GSWC uses a linear regression to obtain sales forecasts for residential and commercial customer classes. Though this method is used to calculate a forecast, GSWC proposes instead to use a combination of five-year averages and the most recently recorded sales per customer to forecast sales in Test Year 2016. For all other non-residential customer classes (industrial, irrigation, public authority, etc.), GSWC uses a five-year average of the recorded sales per customer.

1. Number of Customers by Customer Class

ORA and GSWC forecast the number of customers for every customer class using a five-year average of the annual change in the number of customers by customer class.[3] GSWC's implementation of this methodology for all customer classes is reasonable except for the Arden Cordova CSA's residential flat-rate and metered customer classes.

The Arden-Cordova CSA is the only GSWC service area with residential flat rate connections. Urban water suppliers are required per Assembly Bill (AB) 2572 to achieve 100% metered connections by January 1, 2025.[4] As of the end of June 2014, GSWC recorded 3,385 flat rate connections,[5] or 24% of all residential connections in Arden-Cordova.

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[3] Per Revised Rate Case Plan adopted in Decision 07-05-062.

[4] California Water Code Section 527(a)(1)

[5] GSWC Response to ORA Data Request ED3-001.

GSWC proposes a flat-to-metered conversion rate of 313 connections per year (313/year). Based on ORA's calculations, that rate would not allow GSWC to complete the conversion by January 1, 2025. GSWC would fall short of the target by 136 connections.

ORA estimates that GSWC needs to convert an average of 322/year to meet the AB 2572 deadline. ORA calculates its recommended rate of 322/year using a more recent number of flat rate connections. ORA uses 3,385 (recorded end of June 2014) as an approximation to the average number of flat rate connections in 2014. Using the same methodology as proposed by GSWC in its workpapers and the updated average of 3,385 flat rate connections for 2014, ORA calculates the required average number of conversions per year allowing GSWC to convert all of its flat rate connections by January 1, 2025. The result is an average rate of 322/year. ORA's residential metered and flat rate connection forecasts for Arden Cordova reflect this 322/year conversion rate.

Table 2-A and **Table 2-B** present Test Year 2016 forecasts for residential and commercial customer classes, respectively.

Table 2-A: Residential Service Connection Forecasts, Test Year 2016

Average No. of Residential Customers	GSWC	ORA	GSWC > ORA
Arden-Cordova, metered	10,917	10,935	(18.00)
Arden-Cordova, converted to metered	313	322	(9.00)
Arden-Cordova, flat rate	2,973	2,946	27.00
Arden-Cordova Total	14,203	14,203	-
Bay Point	4,833	4,833	-
Clearlake	2,063	2,063	-
Los Osos	3,047	3,047	-
Ojai	2,437	2,437	-
Santa Maria	12,977	12,977	-
Simi Valley	12,204	12,204	-
Region 1 Total	**51,764**	**51,764**	**-**
Region 2 Total	**73,466**	**73,466**	**-**
Apple Valley	2,844	2,844	-
Barstow	7,608	7,608	-
Calipatria	1,017	1,017	-
Claremont	9,760	9,760	-
Morongo Valley	902	902	-
Orange County	37,539	37,539	-
San Dimas	14,680	14,680	-
San Gabriel	10,405	10,405	-
Wrightwood	2,669	2,669	-
Region 3 Total	**87,424**	**87,424**	**-**
TOTAL COMPANY	**212,654**	**212,654**	**-**

1 **Table 2-B: Commercial Service Connection Forecasts, Test Year 2016**

Average No. of Commercial Customers	GSWC	ORA	GSWC > ORA
Arden-Cordova	1,031	**1,031**	-
Bay Point	227	**227**	-
Clearlake	94	**94**	-
Los Osos	122	**122**	-
Ojai	346	**346**	-
Santa Maria	555	**555**	-
Simi Valley	771	**771**	-
Region 1 Total	**3,146**	**3,146**	**-**
Region 2 Total	**25,136**	**25,136**	**-**
Apple Valley	75	**75**	-
Barstow	1,020	**1,020**	-
Calipatria	93	**93**	-
Claremont	764	**764**	-
Morongo Valley	53	**53**	-
Orange County	3,796	**3,796**	-
San Dimas	990	**990**	-
San Gabriel	1,773	**1,773**	-
Wrightwood	76	**76**	-
Region 3 Total	**8,640**	**8,640**	**-**
TOTAL COMPANY	**36,922**	**36,922**	**-**

2 ## 2. Sales Forecast by Customer Class

3 ### *1. Procedural Background and GSWC's Sales Forecast Method*

4 In D.13-05-011 (GSWC's previous GRC decision), the Commission reviewed GSWC's
5 WRAM/MCBA and conservation rate pilot programs. The Commission found that "[l]arge
6 WRAM balances result from inaccurate sales forecasts that over-estimate consumption."[6] The
7 Commission concluded that "[l]arge WRAM under-collections are the result of over-estimated
8 sales forecasts but over-estimated sales forecasts result from underestimating reductions in

[6] Decision 13-05-011, Finding of Fact 17.

consumption from factors such as weather, the economy, drought declaration, or conservation rates"[7] and that "[t]he sales forecasts must be improved in order to reduce WRAM balances."[8]

The Commission ordered GSWC and ORA (then Division of Ratepayer Advocates) to meet to consider modifications to the sales forecasting methodology. Ordering Paragraph 49 of D.13-05-011 states:

> Golden State Water Company (Golden State) and the Division of Ratepayer Advocates (DRA) must meet to consider modifications to the sales forecasting methodology set forth in the Revised Rate Case Plan (RRCP) adopted in Decision 07-05-062 that would improve the accuracy of Golden State's sales forecasts under conservation rates, and the estimated costs to implement any proposed modifications. In the next general rate case, Golden State and DRA must, jointly or separately, report on this effort, including a discussion of any recommended modifications to the sales forecasting methodology set forth in the RRCP and any limitations that prevent improvements to the methodology.

Additionally, the Commission ordered that "[a]ny potential modifications to the sales forecasting methodology discussed in this decision that may be proposed by parties in the next GRC should apply only to Golden State."[9]

On January 9, 2014, ORA and GSWC met in accordance with Ordering Paragraph 49 of D.13-05-011. During this meeting, GSWC stated that it was working on sales forecasts for presentation in the GRC but that changes in the methodology to sales forecasting is an industry-wide issue and it would prefer to address it in an industry-wide proceeding.

In this GRC filing, GSWC provided results from its regression analysis using the methodology set forth in Standard Practice No. U-25 (SP U-25) for Residential and Commercial customer classes. Overall, GSWC provides very limited explanation to its methodology. GSWC states that it "found that use of regression usually gave us a lower usage per customer than currently adopted" and that "GSWC does not believe that the downward regression trend is sustainable; therefore GSWC used the five year average or the 2013 recorded level, as this reflects our

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[7] D.13-05-011, Conclusion of Law 76.

[8] D.13-05-011, Conclusion of Law 77.

[9] D.13-05-011, Conclusion of Law 86.

anticipated usage more closely."[10] GSWC did not elaborate further on its reasons for selecting the 2013 recorded level versus the five-year average in each Ratemaking Area.

m. ORA's Sales Forecast Method

ORA agrees with GSWC that an industry-wide proceeding would be an appropriate platform to implement changes in sales forecasting methodology in the RRCP. ORA does not propose changes to the rate case plan's sales forecasting methodology here. This is consistent with the Commission's direction in D.13-05-011 which states that "[a]ny potential modifications to the sales forecasting methodology discussed in this decision that may be proposed by parties in the next GRC should apply only to Golden State."[11] Here, ORA complies with D.13-05-011 by reporting on ORA's efforts to consider modifications to sales forecast methodology set forth in the RRCP that would improve the accuracy of GSWC's sales forecasts under conservation rates. ORA estimates no cost to implementing changes to the sales forecasts. Furthermore ORA's approach is consistent with the RRCP because the New Committee Method detailed in the Supplement to Standard Practice U-25 allows the analyst to use the New Committee Method results if reasonable, but if not, utilize alternatives.[12] As discussed further below, the most recent 10 years of consumption data includes several unusual factors that influence water usage including the global financial crisis of 2008, a switch from uniform to tiered rates in many ratemaking areas, and drought.

ORA evaluated the result of the regression analysis outlined in the RRCP,[13] evaluated additional regression equations and examined the possible addition of an unemployment variable as an indicator of economic conditions. ORA's regression equations are explained in detail in Appendix Sales-A. ORA calculated the 2013 recorded year, two-, three-, and five-year averages

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[10] Prepared Testimony of Eva Orozco, July 2014, p. 5, lines 7 - 11.

[11] D.13-05-011, Conclusion of Law 86.

[12] Exhibit M, Recommendation of the Basic Method of Water Consumption Estimation, p. 6-4.

[13] The RRCP directs utilities to prepare a multiple regression analysis for estimating residential and commercial customer annual consumption per customer consistent with the "New Committee Method," per the Supplement to Standard Practice U-25. The New Committee Method instructs utilities to use monthly consumption, temperature, and rainfall data for the last ten years to generate a regression analysis establishing a relationship between water consumption and weather. [D.07-05-062, p. A-23]

for consumption per customer in the residential and commercial customer classes. ORA considered these results in addition to the results of the regression equations and adopted levels of consumption from D.13-05-011. Additionally, ORA graphed average consumption per customer per month, unemployment, rainfall, and temperature in each ratemaking area for residential and non-residential customer classes over the past 10 years and examined trends visually. Appendix Sales-A includes an illustrative subset of these graphs.

As a result of this work, ORA observed several general patterns that are discussed here. Exceptions to these patterns as well as specific patterns observed for each ratemaking area are discussed in Appendix Sales-A. As GSWC highlighted, the RRCP regression forecasts usually have lower usage per customer than currently adopted. The largest contributor to these low forecasts is that the most recent 10 years of consumption data includes several unusual factors that influence water usage: the global financial crisis of 2008, a switch from uniform to tiered rates, and the declared drought in 2008. These factors influenced sharp declines in consumption over 2008-2011 seen in many ratemaking areas and customer classes, although it remains unquantified how much each factor influenced water consumption. By extrapolating regression results to Test Year 2016, these sharp declines in consumption are incorporated into the forecasts. ORA, like GSWC, suspects that this regression trend is not sustainable.

Many important factors such as drought, economic conditions, weather, prices, and price structure can influence water consumption. In the following discussion, ORA addresses the sensitivities of consumption to economic conditions and price structure. Holding all other factors equal helps simplify the analysis of consumption trends over the past ten years. ORA understands that this analysis is only a representation of the factors influencing consumption and not the entire picture. Yet there are important observations to be made that are easily understood if the analysis focuses in on these two factors – economic conditions and price structure.

The following graphs show average residential sales per customer per month for two different CSAs in Region 1. **Figure 2-A** shows this for Ojai, while **Figure 2-B** shows this for Bay Point. In both graphs there is a clear decline in sales starting in 2007 – 2008 and reaching a minimum point in 2010 – 2011.

Figure 2-A: 12-Month Rolling Average of Monthly Sales per Customer in Ojai

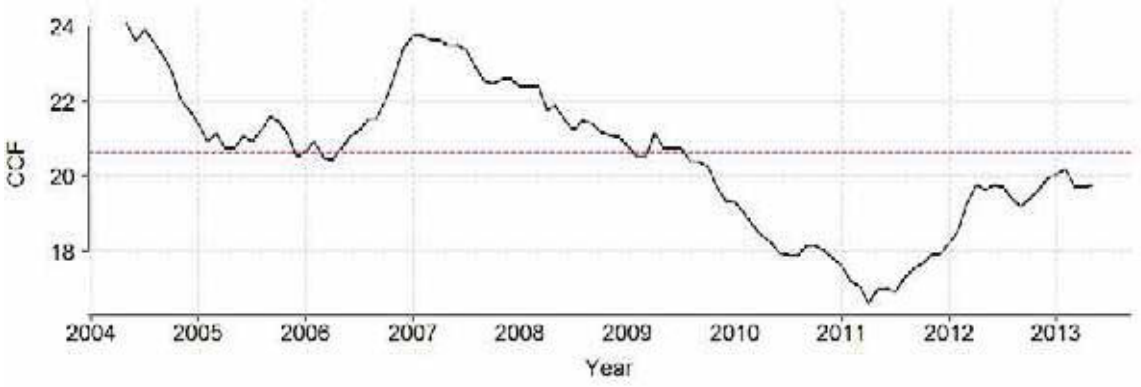
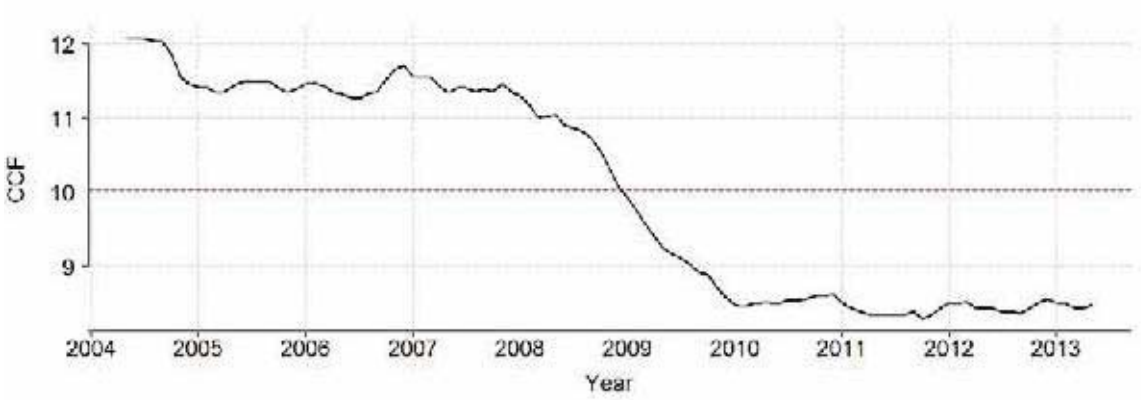


Figure 2-B: 12-Month Rolling Average of Monthly Sales per Customer in Bay Point



If the declines in consumption recorded in 2008 through 2011 were entirely due to economic conditions, holding all else equal, there would be a corresponding increase to water consumption as the economy recovers back to pre-recession levels. However, if the decline was entirely due to price structure changes, then barring any significant policy change to conservation pricing, there would be no increase in consumption per customer. **Figure 2-A** (Ojai) depicts a scenario where consumption may be returning to previous levels, while **Figure 2-B** (Bay Point) depicts the no increase after the decline. Nevertheless, in many ratemaking areas, ORA observed an increase in consumption per customer (or a "bounce-back" effect) beginning in 2011 and continuing through 2013, although not to pre-recession levels in most cases. The likely scenario is that the decline in consumption was impacted by both economy and price structure, as well as weather, drought and other factors. Forecasting the effects of the economy, drought, and conservation pricing

determinants on future consumption would likely lead to forecasts in between the two differing consumption levels, high pre-2008 and low post-2008.

In addition to the regression model outlined by the RRCP, ORA explored other regression equations described in Appendix Sales-A. ORA found that these modified linear regressions also generally produce lower than reasonably anticipated forecasts, and therefore did not use the forecasts from these models. ORA did however use the statistical results from these models to evaluate trends. ORA found that due to the significant declines between 2008 and 2011, forecasting using any linear regression yielded inconsistent results. Therefore, ORA uses a combination of the five-year average and the latest adopted, or most recent recorded year as forecasts depending on the characteristics of a ratemaking area's sales trend. ORA followed general observations for determining which of these forecasted amounts was appropriate for each ratemaking area. These observations help inform sales forecasts, but are not deterministic of the method chosen. ORA's analysis used these observations in conjunction with other trends and statistical results to obtain an appropriate forecast.

Five-year Average:

ORA used the five-year average to forecast sales when (1) consumption patterns indicate a bounce back effect during 2012 and 2013 after the sharp declines from 2008-2011, or (2) when consumption remained fairly flat over the most recent years. The reasons for this are: (1) the five-year average incorporates consumption levels for the most recent year, the bounce back effect, and the declines of 2008-2011 and is representative of these changes; (2) the five-year average is also representative if consumption has remained fairly flat. Consumption data for the residential classes in Morongo Valley and Bay Point provide a representative example of these two instances (see Appendix Sales-A).

Most Recent Recorded Year:

The five-year average would not be representative of a consumption pattern that stabilizes on a consumption amount if that convergence occurs during the most recent months. In this case, the five-year average would overstate any of the patterns occurring prior to convergence. Additionally, a uniform consumption trend, such as gradual increases/decreases without any evidence of stabilizing, would not be represented well by the five-year average as it would

understate the current trend. Rather, the most recent recorded data or previously adopted forecasts are more appropriate forecasts in these situations.

ORA used the most recent recorded year to forecast consumption when consumption patterns indicate stabilization around the most recently recorded consumption compared to wide variances in the past. This was observed by slow changes in consumption trends, whether increasing or decreasing, with little evidence that suggests consumption will continue trending in any given direction. Consumption data for the San Dimas commercial class provides an example of this observation (see Appendix Sales-A).

Latest Adopted:

Lastly, ORA used the latest adopted consumption forecast in the cases where ORA determined that neither the five-year average nor the most recent recorded consumption would result in an appropriate forecast. The adopted sales forecasts were obtained through the regression model detailed in the RRCP. ORA used the latest adopted consumption forecast when a customer class displayed a trending convergence in sales during the most recent recorded years to a level similar to the latest adopted level. This occurred in instances where the most recent usage was trending upward and therefore historical levels of usage used to develop the latest adopted consumption forecast are an indicator of the end point of the recent upward trend. The five-year average and the most recent recorded year may not incorporate this upward trend and provide inconsistent forecasts. Consumption data for the Ojai residential class provides an example of this observation (see Appendix Sales-A).

3. Results of Analysis

Table 2-C and **Table 2-D** below outline ORA's and GSWC's proposed sales per connection for the residential and commercial customer classes. GSWC forecasted sales for all other non-residential customer classes using a five-year average of total sales for each respective class. Because Arden-Cordova is experiencing flat-to-metered conversions, both GSWC and ORA developed three separate residential forecasts: (1) currently metered service, (2) metered service – converted from flat rate (i.e., newly metered), and (3) flat rate service; each has its own unique level of consumption and trends. The currently metered residential connections are evaluated similarly to other residential connections. The flat rate customer sales forecast is obtained with a five-year average. The newly metered customer sales forecast is obtained by calculating the

proportionate reduction in consumption when a customer is converted from flat-rate service to metered service. This is based on historical data on customers who have already experienced this conversion. The average reduction percentage is then applied directly to the flat rate customer forecast. ORA used supplemental data[14] to obtain its percentage reduction. Further discussion of the each residential sales forecast for Arden Cordova is included in Appendix Sales-A.)

Table 2-C: Residential Sales per Connection Forecasts for Test Year 2016

Sales/ Residential Customer (ccf/year)	GSWC	ORA	GSWC > ORA
Arden-Cordova, metered	246.14	**246.14**	-
Arden-Cordova, converted to metered	297.94	**270.41**	27.53
Arden-Cordova, flat rate	396.60	**408.96**	(12.36)
Bay Point	103.13	**103.13**	-
Clearlake	68.09	**68.09**	-
Los Osos	104.90	**104.90**	-
Ojai	241.11	**248.40**	(7.29)
Santa Maria	238.37	**238.37**	-
Simi Valley	168.48	**175.44**	(6.96)
Region 2	133.82	**133.82**	-
Apple Valley	141.46	**141.46**	-
Barstow	148.39	**148.39**	-
Calipatria	205.67	**205.67**	-
Claremont	269.18	**269.18**	-
Morongo Valley	120.59	**120.59**	-
Orange County	160.05	**160.05**	-
San Dimas	195.97	**197.00**	(1.03)
San Gabriel	151.33	**151.33**	-
Wrightwood	81.87	**83.21**	(1.34)

[14] GSWC response to ORA Data Request ED3-003 and information provided in a September 30, 2014 email from Eva Orozco of GSWC to Eric Duran of ORA.

Table 2-D: Commercial Sales per Connection Forecasts for Test Year 2016

Sales/ Commercial Customer (ccf/year)	GSWC	ORA	GSWC > ORA
Arden-Cordova	1,896.31	**2,025.30**	(129.00)
Bay Point	948.10	**948.10**	-
Clearlake	191.14	**191.14**	-
Los Osos	432.94	**440.16**	(7.23)
Ojai	646.49	**646.49**	-
Santa Maria	860.29	**860.29**	-
Simi Valley	905.93	**950.72**	(44.79)
Region 2	502.82	**510.02**	(7.20)
Apple Valley	685.80	**685.80**	-
Barstow	891.93	**891.93**	-
Calipatria	890.67	**890.67**	-
Claremont	1,577.20	**1,620.07**	(42.86)
Morongo Valley	278.75	**278.75**	-
Orange County	839.14	**868.26**	(29.13)
San Dimas	1,618.16	**1,647.46**	(29.30)
San Gabriel	483.40	**483.40**	-
Wrightwood	232.07	**232.07**	-

4. Special Contract Customers

ORA determined that GSWC provides contracted water service to customers in the Bay Point, Ojai, and Santa Maria CSAs of Region 1. The recorded and forecasted sales of these customers are not explicitly included in GSWC's filing. In its regression analysis GSWC uses billing data that does not include the usage levels of these customers, contributing to the resulting lower than reasonable forecasts GSWC observed. Further, GSWC provides water service to these customers at levels other than the authorized tariff rates.[15] Additional discussion is provided in Appendix Sales-A. ORA recommends that the Commission require GSWC to update its billing system to include the usage information for these customers as well as to conduct a legal analysis as to whether it is appropriate to continue billing these customers at levels other than the authorized tariff rates.

D. CONCLUSION

In Arden-Cordova, the flat-to-meter conversion rate directly impacts forecasts for the residential class. ORA used GSWC's methodology but updated the number of conversions (as of June 2014) to calculate the conversion rate that will allow GSWC to comply with Assembly Bill 2572. ORA applied its calculated conversion rate to adjust the residential and flat rate customer forecasts accordingly.

In forecasting water sales per customer, ORA followed to the methods outlined in the Revised Rate Case Plan (RRCP), the Supplement to Standard Practice U-25, and Ordering Paragraph 49 of D.13-05-011. Additionally, ORA provides justification for each of the sales forecasts made and includes a report on this effort to improve sales forecasts in Appendix Sales-A. For all non-residential customer classes other than commercial, GSWC used the five-year average of recorded sales to develop the sales forecast for each respective class; ORA agrees with GSWC's methodology for these customer classes. With regard to Arden-Cordova's flat-to-metered conversion process, ORA's percentage rate of reduction in water use due to the conversion

[15] Phone conversation between Eric Duran of ORA and Eva Orozco of GSWC, on 1/23/15 and informal data request response via email on January 26, 2015, included as Appendix Sales-B (Special Contracts).

differs from GSWC's; this results in differing total sales forecasts for the "newly metered" subcategory in the residential metered class. This is further discussed in Appendix Sales-A.

ORA recommends that the Commission adopts ORA's forecasts as presented herein because they are supported by detailed analysis and justifications. Further, ORA recommends the Commission require GSWC to provide justification for each of the sales forecasts made for all ratemaking areas, in addition to continue reporting on the results of the sales forecasts determined in this rate case similar to the requirement of D.13-05-011 Ordering Paragraph 48.[16]

ORA recommends that the Commission require GSWC to update its billing system to include the usage information for all customers whether classified as customers on authorized tariffs or not as complete data likely would improve future regression analyses. Further, the Commission should conduct a legal analysis as to whether it is appropriate to continue billing these customers at levels other than the authorized tariff rates.

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[16] Ordering Paragraph 48 states, "Golden State Water Company must submit with its next rate case application an analysis comparing, beginning in 2007 through the period where then-current data is available, the actual consumption by ratemaking area by year, the consumption forecast by ratemaking area by year using the current revised rate case plan methodology, and the consumption forecast by ratemaking area by year based on negotiations. The analysis should compare the differences and percent difference between forecasts and actuals, and include graphs that display the comparisons."

Chapter 3: REVENUES

A. INTRODUCTION

GSWC generates revenue from both residential and non-residential customer classes through rates comprised of quantity rates and service charges. This section reviews GSWC's revenue requirement at present rates methodology and includes a discussion of customer courtesy bill adjustments that impact the revenue requirement used to design rates.

B. SUMMARY OF RECOMMENDATIONS

ORA recommends the following for all ratemaking areas: (1) no change to GSWC's proposed method of calculating revenues at present rates, and (2) adoption of ORA's forecasted amount of courtesy adjustments.

C. DISCUSSION

1. Revenue at Present Rates

GSWC includes the calculation of revenues at present rates with its application. Revenues at present rates are revenues generated through GSWC's current rates (effective July 1, 2014) given GSWC's Test Year 2016 forecasted number of customers and sales. This calculation provides the basis for comparison between revenues at proposed rates and present rates and can be used to determine the percentage increase in revenues.

GSWC uses current quantity rates multiplied by the sales forecast to arrive at the total quantity revenue at present rates. To obtain service revenues at present rates, GSWC multiplies the present service rate by the forecasted number of customers served by the corresponding meter sizes. Together, the quantity revenue at present rates and the service revenues at present rates comprise the total revenue at present rates. ORA reviewed GSWC's workpapers on revenues at present rates and makes no modifications to GSWC's methodology. Differences in GSWC's estimated revenues at present rates and ORA's estimates are due to differing Test Year forecasts for number of customers and sales, as presented in Chapter 2 – Customer and Sales Forecasts, in this report.

2. Courtesy Adjustments

A courtesy adjustment is a monetary credit made to a customer's bill to compensate the customer for service issues and/or as an act of goodwill when a customer experiences service issues.[17] Examples of service issues include emergency shut downs, dirty water, late or missed appointments by GSWC representatives, or a failure to notify a customer of a leak.[18] In addition, GSWC will provide customers who experience leaks with a one-time adjustment based on the amount of water leaked upon verification that the customer has repaired the leak.[19]

In 2011, GSWC implemented a change in accounting of courtesy adjustments - from an expense Account 7730 – Courtesy Adjustments to a revenue Account 5540 – Other Sales, as a negative revenue amount.[20] By subtracting courtesy adjustments from the rate design process, GSWC is effectively increasing the amount of revenue collected from rates by exactly the dollar amount of courtesy adjustments forecasted.[21]

In this GRC, GSWC proposes to use recorded courtesy adjustment amounts to develop its forecasts for Account 5540 – Other Sales. Specifically, GSWC proposes to use a two-year (2012-2013) average as an estimate for this account in all ratemaking areas, except for Arden-Cordova and Clearlake CSAs in Region 1. For the Arden-Cordova and Clearlake CSAs, GSWC proposes to use a five-year (2009-2013) average.[22]

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[17] GSWC's Customer Service Procedures Adjustments No. 31, see **Figure 3-B**

[18] Ibid.

[19] Ibid.

[20] Per conference call on November 20, 2014, GSWC cited an external auditors report indirectly suggesting courtesy adjustment amounts be tracked as a revenue rather than expense. GSWC provided the relevant section of this report – see Appendix Revenues-A (Courtesy Adjustment).

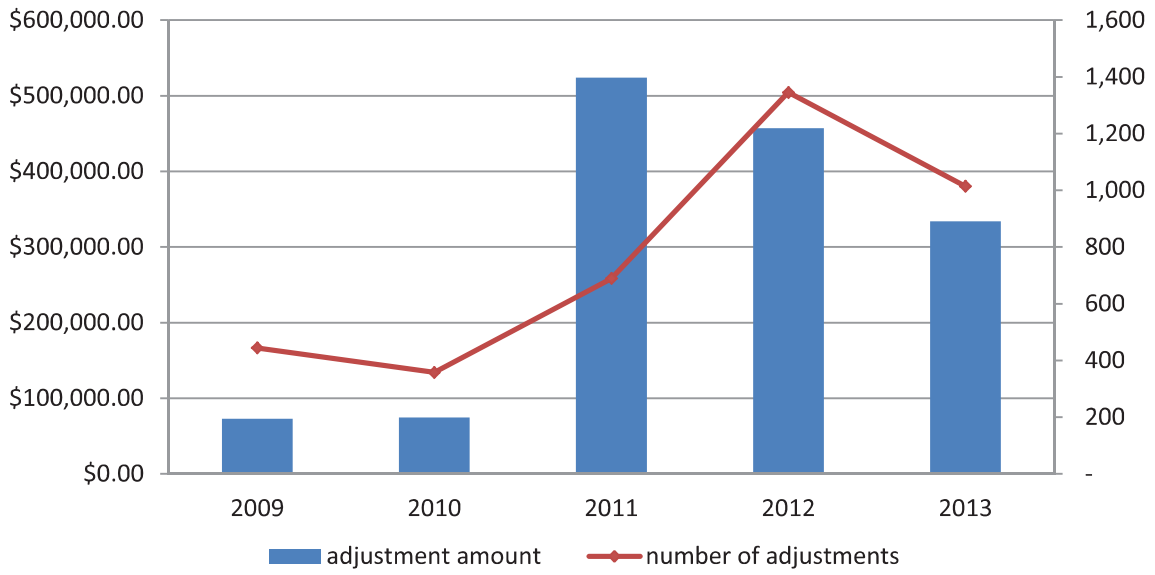
[21] Revenue workpapers for each ratemaking area. For the purposes of rate design, GSWC reduces its revenue requirement by revenue from other appropriate sources. By reducing the revenue requirement by the negative value of courtesy adjustments, GSWC is effectively increasing the amount of revenue to be collected through rates.

[22] Prepared Testimony of Eva Orozco, p. 12 and 11/24/14 email from Eva Orozco of GSWC to Eric Duran of ORA.

a. Courtesy Adjustments have increased drastically since 2011

In response to ORA's inquiry, GSWC provided recorded data on courtesy adjustment amounts and the number of adjustments by ratemaking area.[23] As shown in **Figure 3-A**, the total adjustment amounts and the number of adjustments increased drastically since the accounting change in 2011.[24]

Figure 3-A: Recorded Total Courtesy Adjustment Dollar Amounts and Number Issued



GSWC's internal policies detailed in the Customer Service Procedures - Adjustments No. 31 (presented in **Figure 3-B**) allow for courtesy adjustments of high billed use due to leaks. Thus, some of the increase in courtesy adjustment total dollar amounts and number issued may be due to the large number of meter conversions occurring in the Arden-Cordova CSA. This could have led to an increase in adjustments due to leaks, as customers who receive volumetric billing are more likely to be aware of leaks compared to customers who receive a flat rate bill. However, other Region 1 CSA's as well as Regions 2 and 3, also experienced significant increases in their total dollar amount of adjustments and the number issued. Yet, these regions did not experience meter conversions as in Arden-Cordova. **Table 3-A** shows the five-year percentage change

[23] 11/24/14 email from Eva Orozco of GSWC to Eric Duran of ORA.

[24] GSWC Prepared Testimony of Eva Orozco, p. 12

(2009-2013) in total dollar amount and number of courtesy adjustments issued for all ratemaking areas.

Table 3-A: Five-Year Percentage Change (2009 – 2013) in the Total Dollar Amount of Courtesy Adjustments and the Number of Courtesy Adjustments Issued

Ratemaking Area	5-Year Percentage Change In	
	Total Amount	Number Issued
Arden	610%	244%
Bay Point	1176%	529%
Clearlake	-86%	-27%
Los Osos	418%	200%
Ojai	854%	185%
Santa Maria	534%	218%
Simi	133%	93%
Region 2	332%	108%
Region 3	290%	116%
Total	**357%**	**128%**

Therefore, it is likely that the change in accounting is linked to the dramatic increases in courtesy adjustments. The increases are a cause for concern as the benefits of the courtesy adjustments only apply to a small number of customers (1,014 in 2013), while the costs are applied to all ratepayers. Further, it is unclear whether GSWC has made any effort to contain the increases.

b. GSWC is using courtesy adjustments to buy goodwill

ORA requested and received GSWC's instructions to its customer service representatives regarding the issuance of courtesy adjustments.[25] **Figure 3-B** presents GSWC's Customer Service Procedures Adjustments No. 31.

[25] 11/24/14 email from Eva Orozco of GSWC to Eric Duran of ORA.

1 **Figure 3-B: Customer Service Procedures, Adjustment No. 31**

Golden State Water Company

Guidelines, Continued

Courtesy Adjustments

All courtesy adjustments are approved by the Superintendent.

Goodwill

The company will consider a courtesy adjustment to resolve a customer complaint. Courtesy adjustments may help reduce the number of CPUC complaints. Listed below are some examples:

- Emergency shut down
- Dirty water
- Late or missed appointment
- Meter change-water not turned back on
- Failure to notify-customer leak
- Unexplained high consumption

For the situations listed above, the suggested amount of the adjustment should range from $5.00 to $25.00.

It will be necessary to thoroughly investigate a customer's account for any information that may pertain to the complaint.

Leaks

The company will ***consider*** a onetime per year courtesy adjustment to customers with a high bill due to a leak. Prior to issuing a courtesy adjustment, the following is required:

- Leak must be repaired an verified by field representative
- Copy of repair bill must be submitted for proof of repairs

The copy of the repair bill may be submitted to the appropriate CSA or faxed to the CSC at (909) 592-2038. Upon receipt, the repair bill will be kept on file for a period of twelve (12) months from the date of the courtesy adjustment.

Continued on next page

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As clearly stated in GSWC's internal procedures (above), courtesy adjustments are used to "reduce the number of CPUC complaints" and to generate "[g]oodwill." GSWC should focus on improving operational performance to reduce the number of CPUC complaints, rather than using courtesy adjustments, funded by all ratepayers, to remedy customer complaints. It is conceivable that this goodwill-boosting policy has led to the dramatic increase in the number of courtesy adjustments issued (see **Figure 3-A**).

Moreover, while GSWC's own procedures suggest an adjustment amount ranging between $5 and $25 per adjustment (for non-leak related complaints), the average adjustment amounts reached as high as $3,192.41 in Arden-Cordova for 2011, and a company-wide five-year (2009 – 2013) average of $360 per adjustment.[26] At the current rate of $1.4130 per Ccf in Arden-Cordova, an adjustment of $3,192.41 reflects 2,259.31 Ccf (or 5.19 acre-feet) of usage or nine times the recorded 2013 metered residential usage for the entire year.[27] Assuming all adjustments made were leak-related, this average scenario would have had to occur on 109 occasions in order for GSWC to record a total of $347,973.05 in courtesy adjustment expenditures for 2011. Even after accounting for possibly higher adjustments due to leak-related adjustments, the recorded amounts are not consistent with GSWC's suggested $5 to $25 range. Note that GSWC's written Customer Service Procedures - Adjustments No. 31 specifies that all courtesy adjustments are to be approved by the Superintendent. Large adjustments inconsistent with Customer Service Procedures, Adjustment No. 31 have therefore been approved and possibly promoted by GSWC management, to reduce the number of complaints to the CPUC.

As presented above, GSWC's recorded courtesy adjustments have increased drastically and unreasonably in the past few years and been used to buy goodwill for the company and to reduce customer complaints to the CPUC. Ratepayers should not have to fund the company's effort to maintain or increase goodwill through the liberal issuance of courtesy adjustments. GSWC should reduce its customer complaints by improving its operational performance, and not by issuing bill adjustments. The quadrupling of the total adjustment amount and doubling of the

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[26] Ibid.

[27] 2013 metered residential usage is recorded at 246 Ccf, Arden-Cordova sales workpapers.

number of adjustments issued from 2010 to 2013 are indications of potential misuse of courtesy adjustments at the expense of all ratepayers. Finally, ratepayers should be indifferent to any accounting changes GSWC implements. The dramatic increase in courtesy adjustments following the accounting change does not indicate ratepayer indifference.

ORA recommends that the Test Year 2016 forecast for Account 554 – Other Sales be based on recorded data from 2010, the year before the dramatic increase and the change in accounting. This will provide GSWC a proper incentive to address its customer complaints through improving its operations and to ensure that the forecast does not reflect possible misuse of courtesy adjustments. **Table 3-B** provides a comparison between GSWC's and ORA's estimates for Account 554.

Table 3-B: Test Year 2016 Courtesy Adjustment Forecasts

CSA/Region	GSWC	ORA	GSWC > ORA	%
Arden-Cordova	$107,829	$5,914.98	$101,914	95%
Bay Point	$1,968	$222.99	$1,745	89%
Clearlake	$2,367	$1,194.31	$1,173	50%
Los Osos	$6,884	$1,211.47	$5,672	82%
Ojai	$47,800	$7,238.61	$40,561	85%
Santa Maria	$103,015	$24,380.29	$78,634	76%
Simi Valley	$130,630	$29,831.50	$100,798	77%
Region 2	$8,996	$2,661.17	$6,335	70%
Region 3	$3,789	$1,934.15	$1,855	49%
Total	**$413,276**	**$74,589**	**$338,687**	**82%**

D. CONCLUSION

ORA recommends no change to GSWC's method of calculating revenues at present rates. ORA also recommends forecasting courtesy adjustments using recorded data from 2010, the year prior to the change in accounting and the dramatic increase in courtesy adjustments. This avoids forecasting 2016 courtesy adjustments with data reflecting the potential misuse of adjustments.

Chapter 4: RATE DESIGN & SPECIAL REQUEST #8

A. INTRODUCTION

GSWC designs volumetric and service charges for each customer class to recover authorized variable and fixed costs (together making the authorized *revenue requirement* for each ratemaking area). The process of designing rates involves assigning a price to every hundred cubic feet (Ccf) of sales determined through the sales forecast and assigning service charges to each customer included in the customer forecast. With the implementation of tiered rates, the price of every Ccf is varied and is no longer uniform.

GSWC's non-residential customers do not have tiered rates except for the Ojai CSA. GSWC's rate design is structured to recover the revenue requirement based upon the sales forecast, number of customers, and anticipated sales in each tier (when applicable).

Following ORA's Summary of Recommendations is a section on GSWC's rate design methodology providing an overview for the concepts and terminology GSWC uses in its rate design calculations.

B. SUMMARY OF RECOMMENDATIONS

ORA recommends the following for all ratemaking areas except for the Arden-Cordova, Clearlake, and Ojai CSAs. ORA's rate design recommendations in item 3 below are in response to GSWC's Special Request #8

1) Modify GSWC's rate structure by linking non-residential quantity rates to the effective residential tiered rate to allocate revenue requirements among customer classes based on the volume of water sales in each class.

2) For Bay Point and Los Osos, retain the 15% tier differential between tiers 1 and 2 and modify the tier differential between tiers 2 and 3 from 15% to 20%.

3.a) For Simi Valley, Santa Maria, Region 2, and Region 3, adopt GSWC's proposed 4th tier that would only apply to 5% of total sales in the respective ratemaking area.

3.b) Modify the 15% differential between tiers 1 and 2 to 10%, retain the 15% tier differential between tiers 2 and 3, and add a 20% tier differential between tiers 3 and 4.

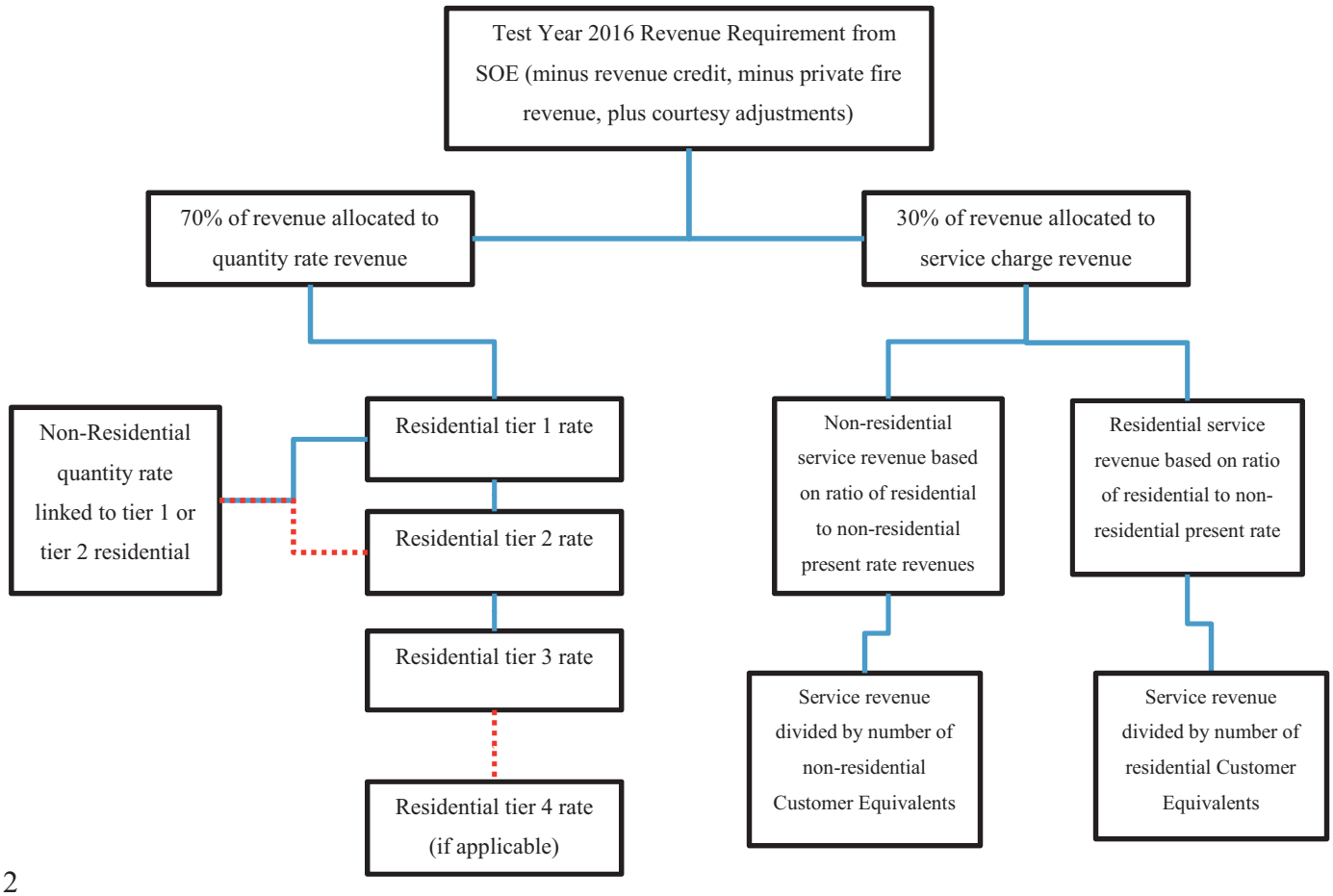
3.c) Adopt GSWC's proposed tier widths that are generally based on winter and summer month consumption and adopt GSWC's proposal to create a distinction between "Foothill-Orange County" CSAs and "Mountain-Desert" CSAs for the purposes of defining tier widths in Region 3. GSWC should report on this proposal's effectiveness in improving affordability through the first tier rate and promoting conservation through the fourth tier rate its next GRC.

4) ORA proposes no change to GSWC's rate design in the Arden-Cordova, Clearlake, and Ojai CSAs. However the Commission should require GSWC to consider tiered rate structures in Arden-Cordova and Clearlake in its next GRC. Specifically, GSWC should consider either two or three tiers for these areas. Further, in Ojai, ORA recommends that GSWC incorporate, in their next GRC, fixed tier differentials, similar to the residential tiered structure, into its non-residential tiered rate structure. Currently the differential between tier rates is based on the allocation of sales in each tier allowing the possibility of tier differentials being insignificant or unexpectedly large.

C. OVERVIEW OF GSWC'S RATE DESIGN METHODOLOGY

GSWC begins its tiered rate design process with the ratemaking area's revenue requirement. From here, revenue requirement is split between service and quantity, and again between residential and non-residential. **Figure 4-A** below provides an outline for this process. All ratemaking areas that have tiered rates (except Arden-Cordova and Clearlake) follow this process. The dashed line is only applicable to ratemaking areas where GSWC is proposing a 4th tier (the Santa Maria and Simi Valley CSAs of Region 1, and Regions 2 and 3).

Figure 4-A: GSWC Rate Design Methodology Flow Chart



As shown in **Figure 4-A**, GSWC starts with its proposed ratemaking-area-specific revenue requirement for 2016, then subtracts the ratemaking area's estimated revenue credits and private fire protection revenues, and adds forecasted courtesy adjustments. GSWC then splits up the net revenue requirement into 70%[28] to be recovered through the quantity rates (left side of **Figure 4-A**) and 30% to be recovered through the service charges (right side of **Figure 4-A**). Up to this point, there has been no consideration of revenue allocation to customer classes.

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[28] California Urban Water Conservation Council's Best Management Practice 1.4's ratio of 30% of revenues to recovered through the service charge and 70% of the revenues to be recovered through the quantity charge ("30/70"). Decision 13-05-011 adopting settlement agreement "Settlement Agreement Between Golden State Water Company, the Division of Ratepayer Advocates of the California Public Utilities Commission, and The Utility Reform Network" filed July 21, 2011, p. 165.

Focusing on the service charge side of **Figure 4-A** (right side), GSWC calculates the proportion of 'present rate revenues'[29] from the residential customer class. Using Bay Point CSA as an example, the result is that 61% of total present rate revenues are generated by the residential class. Therefore, 61% of the revenue requirement that was allocated as service charge revenue is due to the residential customer class. This service charge revenue due to the residential class is then divided by the "Customer Equivalent" (which is the forecasted number of customers at each meter size divided by a weighting factor to account for differences in meter size) to get the service charge per Customer Equivalent. Once the service charge per Customer Equivalent is determined, it is set equal to the service charge for residential customers with a 5/8 x ¾ inch meter. This charge is multiplied by the meter size factors outlined in Commission's Standard Practice U-7-W[30] to calculate the service charge for customers with larger meter sizes.

The remaining 39% of total service revenues in Bay Point (100% total service charge revenue less the 61% residential service charge revenue), is allocated to the non-residential service charges. The service charges for each non-residential meter size are determined using the same methodology as the residential class.

Switching to the quantity revenue side of rate design (left side of **Figure 4-A**), GSWC's first step is to calculate the residential tier 1 rate. GSWC incorporates the proportion of forecasted sales in each tier based on the 2013 recorded proportion of sales in each tier. GSWC then uses the tier differentials to give weight to each unit of water (in Ccf) it forecasts to sell for residential in each tier and for non-residential. The tier differential is the percentage increase in the lower tiered rate to the subsequent higher tier. GSWC uses a 15% tier differential in Bay Point, Los Osos, and Ojai between all three tiers. For ratemaking areas covered in Special Request #8 (Santa Maria, Simi Valley, Region 2, and Region 3), GSWC proposes 10% differentials between all four proposed tiers. Equation 1 below provides GSWC's calculation for the residential tier 1 rate for ratemaking areas with three tiers under GSWC's proposal (Bay Point, Los Osos, and Ojai).

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[29] Present rate revenues: revenues based on forecasted sales and number of customers and the then effective rates. ORA uses the same present rates from GSWC's A.14-07-006 filing.

[30] Standard Practice U-7-W sets the rate design for water and sewer system utilities, including master metered facilities.

Equation 1: GSWC's Calculation of the Residential Tier 1 Rate

$$\frac{\text{70\% of net revenue requirement}}{\text{non-residential sales + residential (tier 1 sales + tier 2 sales * (1+15\%) + tier 3 sales * (1+15\%) * (1+15\%))}}$$

The denominator in Equation 1 is the total residential and non-residential sales weighted by the forecasted sales volume and price. The tier 1 rate is determined by dividing the 70% of the net revenue requirement by the weighted number of units of water. Once the tier 1 rate is set, GSWC uses the following fixed relationship between the tier rates: (tier 2 = 1.15 times tier 1 rate) and (tier 3 = 1.15 times tier 2 rate). For ratemaking areas included in Special Request 8, GSWC follows a similar approach to calculate the quantity rates. However, the factor GSWC proposes between consecutive tiers is 1.10 and there are four tiers instead of three.

To determine the non-residential quantity rate for ratemaking areas with tiered rates not included in Special Request #8, GSWC links the non-residential quantity rate to the tier 1 residential rate (Bay Point, Los Osos and Ojai). To determine the non-residential quantity rate for ratemaking areas included in Special Request #8 (Santa Maria, Simi Valley, Region 2, and Region 3), GSWC links the non-residential quantity rate to the tier 2 residential rate.

Once the rates are identified, GSWC multiplies these rates by the residential quantity sales forecast in each tier to arrive at the total residential quantity charge (volumetric) revenue. For quantity charge revenue, the result of this for residential tiered rate design is that residential customers in Bay Point contribute 58% of the quantity charge revenue.

For Arden-Cordova and Clearlake, GSWC bases its proposed quantity rates on a single quantity volumetric charge that is calculated by taking 70% of the net revenue requirement divided by total sales (in Ccf) to arrive at the same dollar per Ccf rate for both residential and non-residential customers.

D. ORA'S ANALYSIS

1. Linking of Non-Residential Rates to Residential Rates and Quantity Revenue Allocation Based on Sales

As part of the settlement in the previous GRC, ORA and GSWC agreed that rates would be designed to be revenue neutral to ensure "that the proposed three-tier rates will result in a sales revenue that is equal to what a single rate generates given the same amount of fixed and variable costs allocated to the volumetric charges."[31] In addition to generating revenue neutrality in terms of total revenues under tiered quantity rates compared to total revenues under a Single Quantity Rate (**SQR**), it is important to maintain revenue neutrality across customer classes relative to what the customer classes would have paid under an SQR. The proportion of revenues generated from each customer class is an important measure to assess proposed changes to rate design.

For Bay Point and Los Osos, GSWC proposes to keep the existing non-residential rate calculation method of linking the non-residential rate to the tier 1 residential rate. For Santa Maria, Simi Valley, Region 2 and Region 3, GSWC proposes to link the non-residential rate to the tier 2 residential rate. However, linking the non-residential rate to the tier 1 or 2 residential rate creates a discount of the uniform rate structure for the non-residential customers, which in turn results in an unintended subsidy to the non-residential class by the residential class.

Rather than linking the non-residential quantity rate to the tier 1 or tier 2 residential rates, the non-residential quantity rate should equal the SQR calculated in the following way. Conceptually, the SQR is the uniform rate that all metered customers (both residential and non-residential) would pay for each Ccf consumed, in the absence of a tiered rate structure. The SQR would allow GSWC to recover its authorized revenue requirement. The SQR is calculated by taking 70% of the ratemaking area's total revenue requirement net of revenue credit, private fire protection revenue and courtesy adjustments as described above, divided by the total forecasted

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[31] Decision 13-05-011 adopting settlement agreement "SETTLEMENT AGREEMENT BETWEEN GOLDEN STATE WATER COMPANY, THE DIVISION OF RATEPAYER ADVOCATES OF THE CALIFORNIA PUBLIC UTILITIES COMMISSION, AND THE UTILITY REFORM NETWORK" filed July 21, 2011, p. 170.

sales in the ratemaking area (both residential and non-residential revenue requirement). This ensures the price is set so that both residential and non-residential customers would pay a rate that would generate the revenue requirement (net of revenue credit, private fire revenue, and courtesy adjustments) when forecasted sales are achieved.

GSWC instead calculated the SQR as the residential revenues generated through the proposed rate design divided by the total sales in the residential class. This approach leads to an SQR that only accounts for the revenues generated through the residential tiered rate design, and therefore does not produce the SQR that would have been in effect for both residential and non-residential customers under uniform rate design. Although GSWC does not propose using its calculated SQR for any purposes in rate design, ORA uses the SQR to implement changes in the linking of non-residential rates to residential rates.

Linking the non-residential quantity rate to the SQR, calculated using ORA's method described above, results in non-residential customers paying the same quantity charge they would have paid under a uniform rate structure. However, it is important to note that if the non-residential quantity rate is linked to the SQR calculated in accordance with ORA's method, the residential tiered rate design must also be changed or the revenues generated overall would be in excess of the authorized revenue requirement. This is because revenues from the non-residential class would increase and revenues from residential customers would remain constant, relative to the present rate structure. In order to maintain revenue neutrality in the rate design, the residential "effective tiered rate" should be set equal to the SQR as well. The residential effective tiered rate is the weighted average rate of the residential tiered rates. This can be calculated by taking the sum of the rate in each residential tier multiplied by the proportion of forecasted sales in each associated tier. **Table 4-A** provides a simplified hypothetical numeric example:

Table 4-A: Example Calculation of the Residential Effective Tiered Rate

Residential Tier Rates:	
Tier 1 rate	$2.00/Ccf
Tier 2 rate	$2.25/Ccf
Tier 3 rate	$2.50/Ccf

Percentage of Residential Sales in each Tier:	
Tier 1	70%
Tier 2	20%
Tier 3	10%

Calculation of Residential Effective Tiered Rate:	($2.00/Ccf x 70%) + ($2.25/Ccf x 20%) + ($2.50/Ccf x 10%)

Residential Effective Tiered Rate:	= $2.10/Ccf

In other words, the residential effective tiered rate is the average price of a unit of water in the residential class, given the forecast of sales and weighed by the proportion of sales in each tier. GSWC provides the proportion of sales in each tier, which is based on the 2013 recorded proportion of sales in each tier. For ratemaking areas where GSWC is proposing a 4th tier, the allocation of sales in the 4th tier is 5% of total sales. Using Santa Maria as an example, allocation of sales would be 48% for Tier 1, 33% for Tier 2, 14% for Tier 3, and 5% for Tier 4. Under GSWC's proposal, the ratio of revenues from quantity rates for residential and non-residential customer classes is not proportional to the sales volume in those customer classes. In the case of Bay Point, under GSWC's proposal, the proportion of quantity revenues from residential customers is 59.13% whereas only 57.79% of sales volumes are from residential customers.

Under uniform pricing, the proportion of quantity revenues from residential customers would exactly equal the proportion of sales from residential customers, as each unit of water would be priced the same.

By linking the residential effective rate to the non-residential rate, ORA's proposal holds the non-residential quantity rate equal to the average residential quantity rate, simulating the revenue allocation that would be achieved under a uniform rate design. This ensures an equitable rate design for residential and non-residential customers.

The proportion of quantity revenue due to the residential customer class relative to the non-residential customer class in ORA's proposed rate design using Bay Point as an example is 57.79%. This equals exactly the proportion of sales forecasted for the residential customer class relative to the non-residential customer class. The effects of this proposal are as follows:

(1) The total quantity revenue generated for all customer classes is the same as GSWC's proposed quantity revenue,

(2) Residential customers on whole contribute less to overall quantity revenues proportional with usage, and

(3) The non-residential rate increases proportional to usage.

Table 4-B shows the effects of ORA's proposed changes for the example of Bay Point, while **Table 4-C** compares bill impacts. To calculate ORA-proposed rates in all rate or bill comparison illustrations in this chapter, ORA uses GSWC's proposed total revenue requirement amounts. ORA's proposed rates resulting from ORA's recommended revenue requirement and rate design will necessarily differ from (and be generally lower than) those presented herein.

1 **Table 4-B: Rate Design Comparison for Bay Point**

All Rates at GSWC's Proposed Revenue Requirement		GSWC, at Present Rates*	GSWC, at Proposed Rates	Single Quantity Rate (SQR)	ORA, at Proposed Rates
RESIDENTIAL	Quantity Revenue ($000)	$2,373	$2,393	$2,339	$2,339
Sales (KCcf / year)	Tier 1	354.49	354.49	354.49	354.49
	Tier 2	93.04	93.04	93.04	93.04
	Tier 3	43.46	43.46	43.46	43.46
	Total:	490.99	490.99	490.99	490.99
Rates ($ / Ccf)	SQR	$4.74	$4.76	$4.76	$4.76
	Effective (Tiered) Rate	$4.83	$4.87	$4.76	$4.76
	Tier 1 Rate	$4.57	$4.61	$4.76	$4.51
	Tier 2 Rate	$5.26	$5.30	$4.76	$5.18
	Tier 3 Rate	$6.05	$6.10	$4.76	$5.96
Tier Differentials	Tier 1-2 Differential	15%	15%	0%	15%
	Tier 2-3 Differential	15%	15%	0%	15%
NON-RESIDENTIAL	Quantity Revenue ($000)	$1,640	$1,654	$1,708	$1,708
Sales (KCcf / year)	Sales	358.65	358.65	358.65	358.65
Rates ($ / Ccf)	Uniform Rate	$4.57	$4.61	$4.76	$4.76
	Total Quantity Revenue ($000)	$4,013	$4,047	$4,047	$4,047
	Residential Quantity Revenue Proportion	59.13%	59.13%	57.79%	57.79%
	Non-Residential Quantity Revenue Proportion	40.87%	40.87%	42.21%	42.21%

2 **Present rates are those at effective at the time of GSWC's filing of A.14-07-006, July 2014*

3 **Table 4-C: Bill Comparison for 5/8 x 3/4 –inch Meter for Bay Point**

Based on Rates at GSWC's Proposed Revenue Requirement (bill/month)	GSWC, at Present Rates*	GSWC, at Proposed Rates	Single Quantity Rate (SQR)	ORA, at Proposed Rates
Residential Bill (8 Ccf average monthly usage for Bay Point)	$56.78	$55.43	$56.65	$54.59
Non-Residential Bill (16 Ccf avg monthly usage for Bay Point)	$108.52	$114.05	$116.48	$116.48

4 **Present rates are those effective at the time of GSWC's filing of A.14-07-006, July 2014*

5 **Table 4-B** shows that under a single quantity rate structure the non-residential quantity rate
6 would be equal to the residential quantity rate. GSWC's proposal links the non-residential
7 quantity rate to the residential tier 1 rate. ORA's proposal links the non-residential rate to the
8 single quantity rate, which is also linked to the residential tiered effective rate. The result of this
9 is that the revenue allocation between residential and non-residential quantity revenues in ORA's

proposal is equal to the allocation under a single quantity rate structure (57.79% for residential and 42.21% for non-residential). This implies that no customer class is penalized simply due to the type of rate structure implemented.

Table 4-C shows that under ORA's proposed rate design, the average residential bill would be lower than under GSWC's proposed rate design, while generating the same amount of total authorized revenue. This reduction is due to an increase in the average non-residential bill.

2. Modification of Tier Differentials

Tier rate differentials measure the increase in rates from one tier to the next. Currently, GSWC implements a 15% tier differential between tiers 1 and 2, and between tiers 2 and 3 (i.e., tier 2 rate is 115% of tier 1 rate). The 15% differential applies to ratemaking area with 3 tiers in their rate structure. For Special Request #8, GSWC proposes to change the current 15% tier differential to a 10% tier differential between tiers 1 and 2, between tiers 2 and 3, and between tier 3 and the proposed tier 4. GSWC proposes to implement this change in four ratemaking areas - Santa Maria, Simi Valley, and Regions 2 and 3, which combined have about 186,000 residential customers.

For GSWC's remaining Ratemaking Areas with tiered rates, ORA does not object to GSWC's 15% tier differentials between tiers 1 and 2 and between tiers 2 and 3, with the following caveat. ORA proposes to modify the tier differentials for Bay Point, Los Osos, and Ojai residential customers to retain the tier differential at 15% between tiers 1 and 2 and to increase the differential to 20% (from 15%) between tiers 2 and 3. This reduces the first tier rate and increases the third tier rate (assuming the same revenue requirement). This approach promotes conservation efforts at a low cost by increasing the third tier rate, and by also reducing the first tiered rate, the affordability of non-discretionary water use improves.

Table 4-D presents the effects of these modifications in Bay Point.

Table 4-D: Effects of ORA's Proposed Tier Differential Change in Bay Point

All Rates at GSWC's Proposed Revenue Requirement		GSWC	ORA*
RESIDENTIAL	Quantity Revenue ($000)	$2,393	$2,339
Sales (KCcf / year)	Tier 1	354.49	354.49
	Tier 2	93.04	93.04
	Tier 3	43.46	43.46
	Total:	490.99	490.99
Rates ($ / Ccf)	SQR	$4.76	$4.76
	Effective (Tiered) Rate	$4.87	$4.76
	Tier 1 Rate	$4.61	$4.49
	Tier 2 Rate	$5.30	$5.16
	Tier 3 Rate	$6.10	$6.19
Tier Differentials	Tier 1-2 Differential	15%	15%
	Tier 2-3 Differential	15%	20%
NON-RESIDENTIAL	Quantity Revenue ($000)	$1,654	$1,708
Sales (KCcf / year)	Sales	358.65	358.65
Rates ($ / Ccf)	Uniform Rate	$4.61	$4.76
TOTAL	Quantity Revenue ($000)	$4,047	$4,047
Bill Impact	Residential (avg 8 Ccf/ month)	$55.43	54.42
	Non-Residential (avg 16 Ccf/month)	$114.05	$116.48

**ORA's Proposal: 15% Differential between tiers 1 and 2, and 20% between tiers 2 and 3*

Using Bay Point as an example in **Table 4-D** under ORA's proposal relative to GSWC's proposal, there is a reduction in the first tier rate from $4.61 to $4.49, a reduction in the second tier rate from $5.30 to $5.16, and an increase in the third tier rate from $6.10 to $6.19 (assuming GSWC's proposed revenue requirement). Overall, ORA's proposal reduces tier 1 and 2 rates in Bay Point by a combined $0.26 from GSWC's proposal, while increasing the tier 3 rate by $0.09 from GSWC's proposal. These changes increase the affordability of non-discretionary water use through the first tier pricing, and provide a greater conservation signal of discretionary water use through the highest tier pricing.

3. Special Request #8: Addition of Tier 4 in Santa Maria, Simi Valley, Region 2, and Region 3

a. GSWC's Proposed Tier 4

GSWC proposes to add a fourth tier and adjust the tier widths in the Santa Maria, Simi Valley, Region 2, and Region 3 ratemaking areas. The new tier 4 would only apply to the top 5% of total sales in the respective ratemaking areas. The tier width changes involve allocating the first 10 Ccf of usage/per month to tier 1, setting the top of tier 2 as the average residential monthly usage for the four summer months within the applicable ratemaking area, setting the top of the 3rd tier as the minimum amount of usage that would qualify a customer to be in the top 5% of residential sales, while the new tier 4 would apply to usage above this.[32]

For tier rate design purposes, GSWC proposes to divide Region 3 into two distinct areas – Foothill-Orange County and Mountain-Desert – to define tier widths specific to each area. GSWC cites the distinct geographic conditions and usage patterns that exist in Region 3 service areas as the logic behind developing differing tier widths between the two areas.[33] The "Mountain-Desert" group would include five CSAs: Apple Valley, Barstow, Calipatria/Niland, Morongo Valley, and Wrightwood. The "Foothill-Orange County" group would include the Claremont, San Dimas, San Gabriel, and Orange County service areas. **Table 4-E** shows a comparison with present tier widths and GSWC's proposed tier widths for the ratemaking areas covered under Special Request #8.

Table 4-E: Comparison of Tier Width Changes in GSWC's Special Request #8

In Ccf	Santa Maria		Simi Valley		Region 2		Region 3 (Mountain-Desert)		Region 3 (Foothill-Orange Co.)	
Tier	Present	Proposed	Present	Proposed	Present	Proposed	Present	Proposed	Present	Proposed
1	0 - 15	0 - 10	0 – 13	0 - 10	0 - 11	0 - 10	0 - 13	0 - 10	0 - 13	0 - 10
2	16 - 27	11 - 25	14 – 20	11 - 15	12 - 15	11 - 13	14 - 21	11 - 15	14 - 21	11 - 19
3	28 & up	26 - 52	21 & up	16 - 22	16 & up	14 - 24	22 & up	16 - 45	22 & up	20 - 45
4	-	53 & up	-	23 & up	-	25 & up	-	46 & up	-	46 & up

[32] GSWC Prepared Testimony of Keith Switzer, p. 11 lines 1 - 10

[33] GSWC Prepared Testimony of Keith Switzer, p. 14.

ORA recommends approval of GSWC's proposal under the following conditions:

(1) GSWC also applies the same methodologies of linking non-residential rates and the effective tiered residential rate to the single quantity rate (as described earlier in this chapter), and

(2) GSWC adjusts the tier differentials to 10% between tiers 1 and 2, 15% between tiers 2 and 3, and 20% between tiers 3 and 4, as discussed earlier in this chapter.

b. GSWC's Proposed Tier Differentials

Under GSWC's proposal, Simi Valley, Santa Maria, Region 2 and Region 3 would each have tier differentials set at 10% between consecutive tiers. ORA recommends increasing the tier differentials in the higher tiers in order to promote conservation. Increasing tier differentials also has the added benefit of increasing the affordability of water as the lower tiers rates are reduced. ORA recommends that GSWC retain the 10% tier differential between tiers 1 and 2 and modify the differential between tiers 2 and 3 from 10% to 15% and use a 20% tier differential between tiers 3 and 4. **Table 4-F** shows a bill comparison for low- and high-use customers under GSWC's present rates and rate design, proposed modification (and revenue requirement), and ORA's proposed modification (assuming same revenue requirement).

Table 4-F: Residential Bill Comparison for 5/8 x 3/4 –inch Meter for Ratemaking Areas subject to Special Request #8

Ratemaking Area	Use Type (Ccf/Month) *	GSWC, at Present Rates & Rate Design **	GSWC's Proposed Modification	ORA's Proposed Modification ***
Santa Maria	Low Use (18 Ccf)	$50.78	$53.29	$52.85
	High Use (100 Ccf)	$253.41	$258.82	276.23
Simi Valley	Low Use (13 Ccf)	$63.02	$61.50	$61.46
	High Use (30 Ccf)	$132.05	$127.85	$133.61
Region 2	Low Use (11 Ccf)	$60.19	$56.83	$57.22
	High Use (30 Ccf)	$154.52	$139.94	$147.30
Region 3 Mountain-Desert	Low Use (11 Ccf)	$51.50	$50.87	$49.20
	High Use (50 Ccf)	$210.82	$199.14	$198.21
Region 3 Foothill-Orange County	Low Use (15 Ccf)	$65.33	$64.61	$62.28
	High Use (50 Ccf)	$210.82	$197.42	$195.75

** "Low Use" is the ratemaking area average usage, "High Use" is usage applicable with tier 4.*
***Present rates are those effective at the time of GSWC's filing of A.14-07-006, July 2014.*
**** Using ORA's proposed rates at GSWC's proposed revenue requirement*

In Santa Maria, Simi Valley, and Region 3, ORA's low-use bill amount is less than GSWC's proposed. This is a result of the reduction in the tier 1 rate as the result of the increase in the tier differential between tiers 2 and 3 and between tiers 3 and 4. This shift improves affordability by producing the lowest tier rate. The tier 1 rate for Region 2 is also reduced as the result of increasing the higher tier differentials. However, since the non-residential class in Region 2 presently pays less than the SQR that would have been in effect under uniform rates, ORA's rate design modifications as discussed earlier raise the tier 1 rate compared to GSWC's proposal and this effect outweighs the reduction due to increasing tier differentials.

In Santa Maria, Simi Valley, and Region 3, ORA's high-use bill amount is greater than GSWC's proposed. This is a result of the increase in tier 4 from increasing the tier differential between tiers 2 and 3 and between tiers 3 and 4, which creates a greater conservation pricing signal through the highest tier. In Region 3, ORA's high-use bill amount is less than GSWC's. However, this is due to the combined effect of ORA's rate design changes discussed earlier.

c. GSWC's Proposed Tier Widths

In response to ORA's Data Request ED3-007, GSWC provided 2013 customer billing data and the number of customer bills at each specific Ccf of usage. ORA used this dataset to verify GSWC's proposal of its tier widths and found the data to support the proposal. ORA confirmed that the tier 4 width captures 5% of the total sales as proposed by GSWC. ORA confirmed this by tallying the customer bills in each ratemaking area for 2013 and determining the number of Ccf that corresponds to the 95% of sales for the ratemaking areas total residential sales. ORA confirmed that this Ccf amount was the number of Ccf GSWC used as the lower tier boundary for tier 4.

GSWC also proposes to reduce the tier 1 width across all ratemaking areas (see **Table 4-D**). GSWC's proposed upper boundary to tier 1 is 10 Ccf per customer per month. This is consistent with prior discussions of determining essential indoor (non-discretionary) water use.[34] Further,

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[34] D.14-10-047, Attachment A, p.11: "ORA in its workshop presentation and Cal Water suggest looking at a usage criterion for affordability of 10 Ccf per month or less. This figure does not account for household size and may be very generous in certain situations and borderline in other areas. A 10 Ccf per month usage correlates to approximately 60 gallons per day per capita for a household of four people."

ORA verified that all Special Request #8 ratemaking areas' average winter consumption[35] was either near 10 Ccf per customer per month or less. ORA does not propose any modifications to GSWC's proposed tier widths.

In Region 3, GSWC is proposing separating the ratemaking area into two distinct groups for the purposes of calculating tier widths. The "Foothill-Orange County" group and "Mountain-Desert" group will have the exact same rates but their tier widths will differ as GSWC uses the average consumption in the summer for each group to construct the tier 2 widths, and uses the top 5% of sales for each group to construct the tier 4 usage levels. As mentioned previously, GSWC cites differences in geography and water consumption between the two groups. ORA acknowledges that these differences translate to distinct sales patterns. Namely, the Foothill-Orange County group has higher sales per customer than the Mountain-Desert group. ORA does not oppose GSWC's proposed division of Region 3 for tier rate design purposes. However, ORA recommends that GSWC be required to report on this proposal's effectiveness in improving affordability and promoting conservation in its next GRC.

4. Region 1 CSAs Excluded from ORA's Rate Design Modifications

ORA excludes Arden-Cordova, Clearlake, and Ojai from rate design modifications. In each of these CSAs, unique circumstances prevent the implementation of ORA's proposal.

The Arden-Cordova CSA does not currently have tiered rates. GSWC states that this is due to "the large number of unmetered residential customers."[36] ORA agrees with this justification but recommends that GSWC propose tiered rates in the next GRC as there will be fewer flat rate customers,[37] making implementation more feasible.

GSWC states that the Clearlake CSA is an area with affordability constraints and where customers consume little water (on average 6 Ccf per month).[38] Due to this low consumption, GSWC finds a single volumetric rate more appropriate. ORA agrees that a single volumetric rate

[35] A proxy for indoor water use.

[36] GSWC Prepared Testimony of Keith Switzer, p. 10.

[37] Discussed in Appendix Sales-A of this report.

[38] GSWC Supplemental Testimony of Keith Switzer filed 12/22/2014, p. A – 3.

is appropriate at this time, however GSWC should submit in its next GRC a thorough evaluation and proposal of a two-tier rate design should the rate design address and improve affordability in the Clearlake CSA.

In Ojai, the non-residential customer class has tiered rates. ORA's modifications to rate design are based on a single volumetric quantity charge for non-residential customers. Similar results could be achieved when the effective tiered rate is equal across residential and non-residential tiered rates. However, limitations to GSWC's non-residential tiered rate design exist. Currently, the non-residential tiered rate design is dependent on the amount of revenues and sales in each tier to create differences between tier rates. Should the allocation of revenues or sales in each tier change, the rate differences may not be significant or may even reverse order (the tier 1 rate could potentially be larger than the tier 2 rate). In its next GRC, GSWC should propose a non-residential tiered rate design where the higher tier rate is dependent on the lower tier rate to ensure an appropriate difference between the two.

E. CONCLUSION

ORA reviewed GSWC's rate design proposal and proposes the following three key changes for all ratemaking areas except Arden-Cordova, Clearlake, and Ojai:

(1) Link the non-residential rates to the effective residential tiered rate in order to ensure revenue by customer class is proportionate to sales volume by customer class.
(2) Retain the 15% tier differential between tier 1 and 2 and modify the tier differential between tiers 2 and 3 from 15% to 20%, for Bay Point and Los Osos.
(3) For Simi Valley, Santa Maria, Region 2 and Region 3, modify the 15% tier differential between tiers 1 and 2 to 10%, retain the 15% tier differential between tiers 2 and 3, and use a 20% tier differential between tiers 3 and 4.

These changes encourage conservation of water while increasing the affordability of non-discretionary water. Additionally, the Commission should approve GSWC's request for tier widths based generally on winter and summer month consumption for two distinct areas within Region 3 – Foothill-Orange County and Mountain-Dessert. However, GSWC should report on this proposal's effectiveness in improving affordability through the first tier rate and promoting conservation through the fourth tier rate in its next GRC filing.

Chapter 5: AFFORDABILITY & CARW PROGRAM

A. INTRODUCTION

D.13-05-011 adopted the settlement agreement between GSWC and ORA,[39] where the parties agreed that GSWC and ORA meet and confer prior to the filing of this GRC to discuss the preparation of an affordability study. Subsequently, on January 9, 2014 GSWC and ORA met to discuss the conditions outlined in Section 16.3 of the settlement adopted by D.13-05-011 on the practicality of conducting a water rate affordability study. This chapter will address the issues presented at the meeting, the collaborative outcome, and ORA's own recommendations on improving GSWC's water rate affordability. This chapter will also directly address GSWC's low income program, the California Alternative Rates for Water (CARW) program. The CARW program provides qualifying customers with a 15% discount off of an average bill. GSWC proposes to keep this discount and the mechanics of the program intact except for updating the surcharge used to fund the program. The CARW surcharge is based on the sales forecast, program credit, forecast of CARW participants, and the CARW Balancing Account.

B. SUMMARY OF RECOMMENDATIONS

ORA recommends that the Commission:

(1) Support the outcome of the affordability meeting between ORA and GSWC in which both parties agree that at this time there is no need for expenditures on an affordability study,

(2) Adopt ORA's methodology for calculating a CARW customer's monthly credit using average use for each ratemaking area rather than for each Region,

(3) Adopt a 20% CARW discount off a ratemaking area's average CARW bill,

(4) Adopt ORA's methodology of calculating the 2016 Test Year estimates for the number of CARW customers, and

[39] The Office of Ratepayer Advocates was known as the Division of Ratepayer Advocates (DRA) at the time of the settlement.

(5) Adopt ORA's calculated CARW surcharge.

C. DISCUSSION

1. Affordability/Affordability Study

Section 16.3 of the settlement agreement adopted by the Commission in D.13-05-011 states that:

> GSWC and DRA agreed to meet and confer prior to GSWC filing its next GRC (July of 2014,) to discuss the preparation of an Affordability Study to potentially be included in GSWC's next GRC filing. At that meeting GSWC and DRA will discuss the content of the affordability study and set an agreed upon cap on the cost.

Section 16.3 also states under "GSWC's Request and DRA's Position" in part:

> GSWC noted that it had completed rate studies similar to the affordability study recommended by DRA in its previous GRCs and that DRA had recommended the Commission disallow recovery for the cost of the studies in previous GRCs.

On January 9, 2014 GSWC and ORA met and conferred via teleconference. During the meeting, ORA recommended that GSWC not repeat its rate comparison studies that it conducted in 2008-2009, attached as Appendix Affordability-A (Affordability Study). GSWC confirmed that it had no plans to repeat those studies. GSWC mentioned that it did not submit these studies in a past GRC, but did request recovery for the costs.

During the same meeting, ORA suggested that GSWC provide data on district income levels, usage levels, rate base per customer, availability of public loan funds, and average bills in each district. GSWC informed ORA that some of this data had been provided in OIR 11-11-008.[40] GSWC provided this filing to ORA (see Appendix Affordability-B [Affordability Data]).

This data shows that most ratemaking areas' average bills are within the 2.5% of median household income as recommended for water rate affordability by the U.S. Environmental Protection Agency.[41] The California Department of Public Health (CDPH) recommends a stricter threshold of water rate affordability of average bills not exceeding 1.5% of median

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[40] OIR 11-11-008 is addressing the Commission's Water Action Plan objective of "Setting Rates that Balance Investment, Conservation, and Affordability for the Multi-District Water Utilities…"

[41] D.14-10-047, Attachment A, p.12.

household income.[42] When looking only at the CARW customers' average bills, no ratemaking area was above the 2.5% threshold, and Clearlake was the only area above the 1.5% threshold.[43]

2. GSWC's Supplemental Testimony on Affordability

On December 22, 2014, GSWC submitted supplemental testimony in accordance with D.14-10-047, which directed GSWC to provide a district-based rate review for high-cost and/or affordability issues. ORA reviewed GSWC's testimony and workpapers and agrees that Clearlake and Los Osos are two ratemaking areas that are considered high-cost areas. GSWC determined that these were high-cost ratemaking areas by calculating the average Revenue Requirement per Ccf (RR/Ccf) sold in these areas and noting that this measure is above 150% of the company-wide average RR/Ccf. GSWC states this is a metric used by Telecommunications for its High-cost A Fund.[44] GSWC also reports that Clearlake and Calipatria are two areas that have potential affordability issues based on the average annual bill in both areas that exceed the CDPH's recommended threshold of 2.5% of median household income.[45]

ORA addresses the issue of affordability by making improvements to GSWC's CARW program. These improvements are discussed in further detail below.

3. California Alternative Rates for Water (CARW)

The CARW program is a residential ratepayer assistance program which provides a credit to qualified low-income ratepayers on their water bill. In this GRC, GSWC requests to keep the CARW program in its current form. GSWC calculates a CARW credit for each CSA in Region 1, and Regions 2 and 3. The credit is determined as 15% of an average CARW bill for each Region. Average CARW bills are calculated by multiplying the quantity rate for each ratemaking area by average CARW consumption for the Region, and then adding the 5/8" x 3/4" meter service charge for each ratemaking area. In Region 1, the credits for each ratemaking area

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[42] http://www.pacinst.org/wp-content/uploads/2013/01/water-rates-affordability.pdf, accessed 2/25/15, p.1.

[43] Average winter bill compared to the CDPH threshold of 1.5% of median household income.

[44] GSWC Supplemental Testimony of Keith Switzer, p. A – 6.

[45] D.14-10-047, Attachment A, p. 12.

are determined for each using average usage for the Region. Average usage, used in the calculation, for Regions 1, 2, and 3 is 12, 12, and 13 Ccf, respectively. **Table 5-A** below summarizes GSWC's proposed CARW credit for each ratemaking area.

Table 5-A: GSWC Proposed and Current Monthly CARW Credit

Ratemaking Area	Proposed Credit *	Current Credit[46]
Arden Cordova (Metered service)	$4.00	$3.00
Arden Cordova (Flat rate service)	$9.00	$9.00
Bay Point	$11.00	$11.00
Clearlake	$19.00	$17.00
Los Osos	$17.00	$14.00
Ojai	$12.00	$11.00
Santa Maria	$6.00	$5.00
Simi Valley	$9.00	$9.00
Region 2	$9.00	$9.00
Region 3	$9.00	$8.00

**Credit reflects GSWC proposed Revenue Requirement for each ratemaking area.*

GSWC requests to update the surcharge applied to CARW customers to fund the CARW program to reflect the proposed credits. The recalculation of the surcharge includes the costs of providing credits to additional CARW customers, administrative costs, and the residual balance of the CARW Balancing Account (**CARWBA**). ORA provides the following analysis on the calculation of the CARW program's costs and surcharges.

It is important to ensure continued eligibility of CARW participants. GSWC stated that it can request proof of low-income status at any time from customers enrolled in the CARW program, and it has a requalification process for participants every two years.[47] ORA recommends that GSWC report on its efforts to requalify and verify CARW participant eligibility. This report should be included in GSWC's next GRC and contain information on the total number of new CARW customers, requalifying customers, and customers who no longer qualify.

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[46] Advice Letter No. 1564-W.

[47] Telephone conversation between Eva Orozco, Ronald Moore, and Jenny Darney-Lane of GSWC and Eric Duran of ORA, 11/6/2014.

a. Average CARW Usage Should Be Calculated By Ratemaking Area Not by Region

The credit in Region 1 should be calculated using CSA-specific usage levels rather than the Region's average usage to reflect the needs of all low-income customers. GSWC states that the "regional average to calculate the CARW discount helps Clearlake CARW customers to receive a higher discount."[48] However, GSWC's method of using the regional average to calculate the discount for each CSA establishes a credit in which equally-qualifying low-income customers are precluded from receiving a 15% discount whereas other customers, such as those in Clearlake, receive a larger than 15% discount.

As it currently exists, the CARW program provides a fixed credit based on the assumption of 12 ccf/month of usage for each CSA in Region 1. This means there is a larger than 15% credit to CSAs where the average consumption is less than 12 Ccf/month (Bay Point, Clearlake, Los Osos, and Ojai). This larger than 15% credit for the four aforementioned CSAs comes at the cost of a lower than 15% credit for CARW customers where the CSA average usage per month is greater than 12 Ccf (Arden-Cordova, Santa Maria, and Simi Valley). Varying local conditions may impact CARW customers average water use, and therefore CSAs with larger than average usage should not be penalized for it through reduced CARW discounts.

GSWC cites low income conservation programs as one solution to the affordability issue in Clearlake.[49] ORA supports low income conservation programs as a means to address affordability issues in Clearlake. For a discussion on low income conservation programs see Chapter 10 of this report.

b. CARW Credits Should Reflect a 20% Discount

Currently the CARW discount is based on a 15% discount from the average CARW bill. ORA recommends that this be increased to the higher of the current dollar discount or 20% of the average CARW bill calculated at the individual CSA level of Region 1. **Table 5-B** outlines ORA's proposed CARW discounts. ORA's credit at 15% calculated at the individual CSA of Region 1 results in a lower credit for Bay Point. The other CSAs in Region 1 receive either an

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[48] GSWC Supplemental Testimony of Keith Switzer, p. A – 19.

[49] Ibid., p. A – 20.

equal or higher credit. A 20% discount would improve affordability in these areas and would increase or keep equal the credit from the current amount in all ratemaking areas. Under ORA's proposal, this is also done at a lower cost to ratepayers as explained in Sections 4 and 5. In Clearlake, ORA's proposal would pass the CARW-specific primary affordability screening – CDPH's recommended threshold of annual bills less than 2.5% of median household income.

Table 5-B: Monthly CARW Credit Comparison

Ratemaking Area	Current Credit[50]	GSWC Credit *	ORA Credit at 15%*	ORA Credit at 20%*
Arden Cordova	$3.00	$4.00	$4.00	$6.00
Arden Cordova (Flat)	$9.00	$9.00	$9.00	$12.00
Bay Point	$11.00	$11.00	$9.00	$12.00
Clearlake	$17.00	$19.00	$17.00	$18.00
Los Osos	$14.00	$17.00	$14.00	$14.00
Ojai	$11.00	$12.00	$11.00	$15.00
Santa Maria	$5.00	$6.00	$6.00	$8.00
Simi Valley	$9.00	$9.00	$10.00	$13.00
Region 2	$9.00	$9.00	$9.00	$12.00
Region 3	$8.00	$9.00	$9.00	$12.00

**Dependent on Revenue Requirements, and Rate Design. Credit reflects GSWC proposed Revenue Requirement and Rate Design. ORA's proposed credit may change as a result of approved Revenue Requirements and Rate Design. The 15% discount is only for illustrative purposes as ORA recommends the 20% discount.*

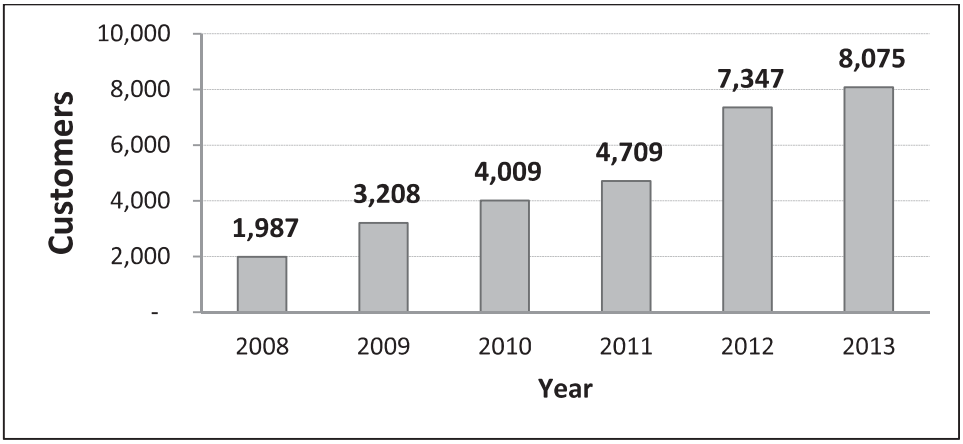
c. CARW Customer Growth Should Be Estimated Based on the Most Recent Recorded Year

The two main determinants of the CARW program's costs are the credit amount, discussed above, and the number of CARW participants. ORA and GSWC also differ on the estimated number of CARW participants in Test Year 2016. GSWC forecasts the number of CARW participants using a four- or five-year average change in the CARW customer program, and for all Region 1 CSAs (except Arden-Cordova) escalates 2013-recorded customers by the average change in customers from 2008 to 2009. However, the four- or five- year average change estimates overstate CARW customer growth. This is due to increased CARW enrollment as a result of recent data sharing between energy and water IOUs of customers enrolled in the CARE

[50] Advice Letter No. 1564-W

program (California Alternative Rates for Energy).[51] The 2008 – 2009 growth method applied to all ratemaking areas in Region 1 (except Arden-Cordova) could still be somewhat overstated if the increase in customer CARW participation was in part due to the economic recession. However, it provides a better estimate of growth in CARW participation than the years directly following the implementation of data sharing. In the year immediately following this sharing of data, the CARW program experienced larger than average growth. **Figures 5-A** through **5-C** show the growth in CARW customers from 2008 through 2013 in the three regions. As shown, the CARW program in Region 1 experienced 56% growth in number of customers in 2012, but the growth fell back to 10% in 2013. Similarly in Region 2, 2012 saw 40% growth that fell to 7% in 2013. In Region 3, there was 30% growth in 2012, and only 8% in 2013.

Figure 5-A: Region 1 Recorded Year End Number of CARW Customers



[51] Data sharing was authorized by Decision 11-05-020 in Rulemaking 09-12-017.

Figure 5-B: Region 2 Recorded Year-End Number of CARW Customers

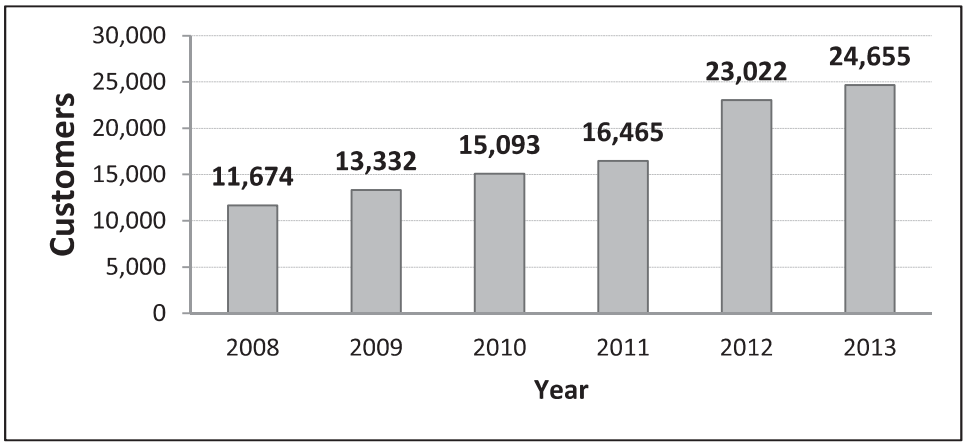
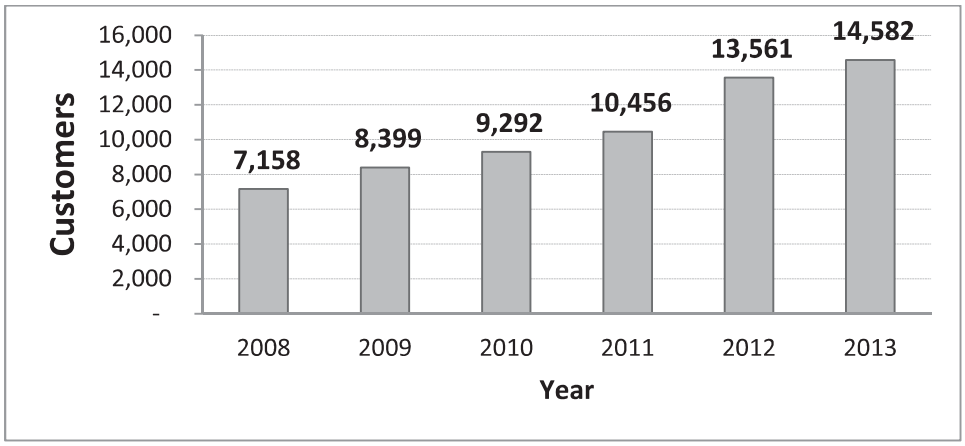


Figure 5-C: Region 3 Recorded Year-End Number of CARW Customers



GSWC's methods for forecasting customer participation in the CARW program are inconsistent throughout all ratemaking areas and overstate growth. **Table 5-C** summarizes the results of GSWC's and ORA's estimation. ORA calculates its estimated 2016 number of CARW customers based on the most recent 2013 ratio (percentage) of CARW customers to all residential customers in the ratemaking area. This ratio is then applied to the forecasted total number of residential customers in each ratemaking area (presented in Chapter 2 – Customer and Sales Forecast in this report).

Table 5-C: Estimated Number of CARW Customers for 2016 and Recorded End of Year 2013 Number of Enrolled CARW Customers

Ratemaking Area	GSWC Method	GSWC, 2016 No. of CARW Customers	ORA, 2016 No. of CARW Customers	Recorded 2013 No. of CARW Customers	Recorded 2013 No. of Residential Customers *	Ratio of 2013 No. of CARW Customers to Total No. of Residential Customers *
Arden Cordova	5-year average	4,214	1,350	1,370	14,207	9.64%
Bay Point	2008-2009 growth	2,019	1,362	1,311	4,653	28.18%
Clearlake	2008-2009 growth	784	512	514	2,072	24.81%
Los Osos	2008-2009 growth	586	439	439	3,048	14.40%
Ojai	2008-2009 growth	438	317	321	2,464	13.03%
Santa Maria	2008-2009 growth	3,205	2,206	2,170	12,763	17.00%
Simi Valley	2008-2009 growth	2,772	1,926	1,950	12359	15.78%
Region 2	4-year average	33,147	24,849	24,655	14,207	33.82%
Region 3	4-year average	19,219	14,641	14,582	4,653	16.75%

**For Arden-Cordova, the % includes both metered and flat rate CARW customers compared to the sum of residential metered and flat rate customers.*

Table 5-D shows the estimated percentage growth from 2013 recorded to 2016 Test Year CARW customers.

Table 5-D: Estimated Growth in CARW Customers from 2013 to 2016

Ratemaking Area	GSWC % Growth 2013-2016	ORA % Growth 2013-2016
Arden Cordova	207.6%	-1.5%
Bay Point	54.0%	3.7%
Clearlake	52.5%	-0.4%
Los Osos	33.5%	0.0%
Ojai	36.4%	-1.3%
Santa Maria	47.7%	1.6%
Simi Valley	42.2%	-1.2%
Region 2	34.4%	0.8%
Region 3	31.8%	0.4%

GSWC's 2013-2016 growth estimates ranging from 32% to 208% reflected in GSWC's CARW estimates are unrealistic as customer enrollment is not accelerating in the most recent years. The dramatic increases in enrollment seen in 2012 are explained by the one-time increase in

enrollment due to the implementation of low-income discount eligibility data sharing with energy utilities. ORA's growth in CARW customers is independent of that one-time increase. It is based on the ratio of recorded 2013 number of CARW customers to the recorded 2013 total residential customers. Another indication that GSWC's estimate is overstated and not logical is that for Arden-Cordova its estimated 2016 number of flat rate CARW customers (2,961)[52] is nearly equal to 100% of its 2016 estimated number of flat rate customers (2,973).[53] In effect, GSWC estimates that 100% of its flat rate customers will be CARW customers in 2016 – this simply is not a reasonable result considering GSWC must not add additional flat rate (unmetered) customers.[54] In December of 2013, Arden-Cordova recorded 448 metered CARW bills.[55] The total number of flat-rate CARW customers was therefore 922 (1,370 total recorded minus 448 metered recorded). ORA's methodology applies the ratio of flat-rate CARW customers to total CARW customers to estimate the split in total customers in 2016. ORA's overall reduction in the number of CARW customers is a result of the overall reduction in residential (both metered and flat rate) customers forecasted for 2016.

d. ORA's calculated CARW surcharge

Both GSWC's and ORA's proposed surcharge recovers the cost of implementing the CARW program from non-participating CARW ratepayers. ORA's surcharge is based on credits derived from the average CARW bill calculated for each ratemaking area in Region 1, an updated estimated number of CARW customers for Test Year 2016, and a 20% equivalent discount on the average CARW bill for all ratemaking areas. **Table 5-E** presents the difference between GSWC's and ORA's proposed CARW credit estimates and the respective impacts on program costs and surcharges.

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[52] GSWC's CARW workpaper "R1 2016 CARW Estimate."

[53] GSWC's Arden-Cordova Sales workpaper "ACSALE14."

[54] Assembly Bill 2572, requires all urban water suppliers to install water meters on all their connections on or before January 1, 2025.

[55] GSWC Response to ORA Data Request ED3-004, workpaper "CARW R1."

Table 5-E: CARW Program Costs and Surcharges for 2016

Ratemaking Area	GSWC CARW Cost*	GSWC Surcharge	ORA CARW Cost*	ORA Surcharge
Arden-Cordova (metered)	$60,144	$0.11/Ccf	$31,752	$0.08/Ccf
Arden-Cordova (flat)	$319,788	$3.78/month	$130,896	$2.75/month
Bay Point	$266,508	$0.11/Ccf	$196,087	$0.08/Ccf
Clearlake	$178,752	$0.11/Ccf	$110,542	$0.08/Ccf
Los Osos	$119,544	$0.11/Ccf	$73,728	$0.08/Ccf
Ojai	$63,072	$0.11/Ccf	$57,147	$0.08/Ccf
Santa Maria	$230,760	$0.11/Ccf	$211,813	$0.08/Ccf
Simi Valley	$299,376	$0.11/Ccf	$300,385	$0.08/Ccf
Region 1 (Total)	$1,584,011	-	$1,158,416	-
Region 2	$4,792,773	$0.24/Ccf	$4,791,197	$0.24/Ccf
Region 3	$2,881,559	$0.12/Ccf	$2,914,225	$0.12/Ccf
Total Company	**$9,258,342**	**-**	**$8,863,837**	**-**

** CARW costs for individual CSA's in Region I do not include administrative costs or residual CARWBA balances. The "Region 1 (Total)" cost does include administrative costs and residual CARWBA balances. The surcharge for each ratemaking area reflects administrative costs and residual CARWBA balances.*

The Commission should adopt ORA's calculated CARW credits and surcharges because they reflect more realistic customer enrollment in the CARW program and more equitable CARW credit. ORA's estimates result in a net reduction from GSWC's proposed program cost while providing an equal or larger credit.

4. Region 2 Surcharge Calculation

Region 2 experienced a dramatic increase in the CARW surcharge over the course of the past four years. However, this is due to a combination of two effects: the surcharge to recover the costs of the CARW program tracked in the CARW Balancing Account (CARWBA) from when the program was first implemented, and the surcharge that recovers forecasted CARW costs from 2010 forward. Section 11.01 of the settlement agreement adopted in D.07-11-037, dated November 16, 2007 states:

> GSWC requested recovery of the accumulated balance of the cost of its low income program in Region II through a rate surcharge. As of December 31, 2005 the balance was $1,310,645. DRA did not address this item in their report, but following discussions between the parties it was agreed that when the balance reaches 2% of adopted Region II revenues GSWC is permitted to file an advice letter to recover the accumulated balance through a surcharge.

On February 26, 2010, GSWC filed Advice Letter (AL) 1378-W, which was subsequently rejected by the Commission's Division of Water and Audits (DWA) on March 3, 2010 due to insufficient supporting documentation for the surcharges. On May 7, 2010, GSWC filed AL 1400-W, which DWA accepted and became effective June 7, 2010. The surcharges GSWC implemented were as follows: "$0.09298 per Ccf in Tier 1, $0.10693 per Ccf in Tier 2 for residential metered customers and $0.08471 per Ccf for non-residential customers for a 12-month period to recover the under-collection."[56]

D.10-11-035 and AL 1416-W authorized GSWC to recover a "[s]urcharge to offset future CARW discounts."[57] In Region 1, GSWC had received approval from the Commission to apply the surcharge on a prospective basis so that non-CARW customers would be charged at the time program costs were incurred rather than a delayed surcharge. In Region 2, this surcharge, set on a prospective basis, was set to $0.0056 per Ccf.

D.13-05-011 and AL 1518-W established an additional CARWBA surcharge of $0.156 per Ccf as a single residential and non-residential surcharge. Together, the current effective surcharge is $0.1616 per Ccf. The dramatic increase of the CARWBA surcharge to collect balances exceeding 2% of revenue requirement from $0.0056 to $0.156 per Ccf is not explained. This large increase in the surcharge is due to accumulating balances most likely caused as a result of the volumetric surcharge not meeting forecasted CARW revenues during this period. This is a result of forecasted sales being higher than actual sales. This corresponds to the decline in sales during this period that was not accurately estimated in sales forecasts, which in turn are used to create the prospective-based CARW surcharge.

In this GRC, GSWC proposes to roll the CARWBA balance into the surcharge determined on a prospective basis, which includes the forecasted costs of the CARW program. GSWC's proposed amount is $0.240 per Ccf. ORA also recommends $0.240 per Ccf using the same CARWBA balance and providing a 20% credit to CARW customers. However, ORA used a lower estimate for 2016 CARW customers as explained above.

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[56] Advice Letter 1400-W.

[57] GSWC's CARW workpaper "CARW2014est."

D. CONCLUSION

Due to the sharing of low-income eligibility information by energy utilities, the CARW program experienced an atypical rate of growth between 2011 and 2012. Therefore, GSWC's use of four- and five-year average rates of growth are inappropriate, and overstate expected CARW customer growth. ORA's estimating methodology uses the most recent recorded ratio of CARW customers to total residential customers to estimate CARW customer growth. This estimate is appropriate as it is not dependent on the one-time event in 2012 (data sharing leading to large increase in enrollment) but rather on more recent conditions of the CSA.

ORA's recommendation to calculate the CARW credit for Region 1, based on the individual CSA's average consumption, allows for a more equitable credit among GSWC's CARW customers. ORA also recommends that in GSWC's next General Rate Case, the company report on the process of CARW requalification including a breakdown of the number of customers who no longer qualify and newly added CARW customers. This data could be used to formulate a more accurate CARW customer participation rate for future use.

Chapter 6: SPECIAL REQUEST #4

A. INTRODUCTION

Special Request 4, addressed in GSWC's Prepared Testimony of Jenny Darney-Lane, proposes to recalculate the surcharge associated with the AEROJET Memorandum Account.

GSWC's testimony provides the following background regarding the account linked to the special request:

> In D.05-07-045 the Commission authorized the amortization of the Aerojet Water Litigation Memorandum Account in the Arden Cordova CSA. The memorandum account tracked costs incurred by Golden State Water Company (then Southern California Water Company) to resolve the groundwater contamination lawsuits in Arden Cordova. The Decision authorized GSWC to collect the balance, $21,298,491, through a rate surcharge, which will continue for no longer than 20 years from the decision.[58]

The balance in the Aerojet Water Litigation Memorandum Account (AEROJET) as of June 30, 2014 was $14,302,164, which is 112.5% of GSWC's proposed revenue requirement in Arden Cordova for Test Year 2016.[59] This is a substantial balance for ratepayers to pay over the 11 years remaining as of June 30, 2014. As part of the lawsuit settlement agreement with Aerojet General Corporation (Aerojet), Water Availability Funds (WAF) would reimburse litigation fees in the AEROJET account.[60] WAF payments made by Aerojet would be deliverable upon successful sale of contaminated lands adjacent to the Arden Cordova service area.[61] As of GSWC's June 2014 annual "Authorized Balancing Accounts Summary" reported to the Commission, GSWC did not report any WAF payments made into the AEROJET account.[62]

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[58] Prepared Testimony of Jenny Darney-Lane, p. 10, lines 9 – 15.

[59] GSWC's proposed Test Year 2016 revenue requirement for Arden Cordova is $12,712,800, A.14-07-006, p. 3

[60] D.13-05-011, pp. 59-60.

[61] D.13-05-011, p. 60

[62] GSWC's 2013 Annual Report, Schedule E-1 "Balancing and Memorandum Accounts" also shows no offset revenues made into the account.

D.05-07-045, Ordering Paragraph 2, requires adjustments to the amortization of the AEROJET account be consistent with the results shown in Appendix A of the decision. Footnote 2 of that appendix states:

> The surcharge amounts will be recalculated once every rate case cycle, or more frequently if any year the receipt of the Water Availability Fee (WAF) monies will permit a reduction in the Utility's Tariff Schedule AC-2 monthly bill of $0.50 or more.

D.13-05-011, Ordering Paragraph 47, allowed GSWC to continue and recalculate the surcharge to fund the AEROJET account including interest.

GSWC's proposed recalculation of this surcharge results in a decrease in the present surcharges for both flat rate and metered customers, from $6.72/month and $0.200/Ccf to $6.61/month and $0.194/Ccf respectively.[63] This surcharge is based on the balance of the AEROJET account as of May 31, 2014.[64]

B. SUMMARY OF RECOMMENDATIONS

In D. 13-05-011, Ordering Paragraph 47, the Commission endorsed GSWC's methodology for recalculating the AEROJET surcharge and ORA does not dispute that calculation here. However, ORA recommends that the Commission adopt ORA's proposed surcharges as the calculation uses an updated account balance, which is $14,302,164 as of June 30, 2014.[65] Additionally, ORA's updated surcharge calculation incorporates ORA's forecasted metered and unmetered connections which reflect the rate of conversion of unmetered to metered connections in the Arden-Cordova CSA, 322 meters per year.[66] Using ORA's recommended revenue requirement, the number of metered and unmetered connections, sales, and the June 30, 2014 memorandum account balance of $14,302,164, surcharges should be $6.66 for flat rate customers and $0.189 per Ccf for metered customers.

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[63] Prepared Testimony of Jenny Darney-Lane, p. 10, lines 23 – 24 and Schedule 3 attached to the Prepared Testimony of Jenny Darney-Lane.

[64] Prepared Testimony of Jenny Darney-Lane, p. 11, lines 3 – 4.

[65] GSWC Response to ORA Data Request PR1-001, workpaper "PR1-001 Q. 1, Balancing Account Response – Revised."

[66] See Chapter 2 – Customer and Sales Forecasts in this report.

C. DISCUSSION

ORA conducted a detailed review of the calculation presented by GSWC in support of its request to recalculate the surcharge related to the AEROJET account in workpaper "2014 Aerojet Amortization – RECALIBRATION." GSWC's calculation comports with D.13-05-011.

However, ORA proposes modifications to the calculation by updating the account balance as of June 30, 2014 and to use ORA's forecasted number of metered and unmetered connections and forecasted sales (see further discussion in Chapter 2 – Customer and Sales Forecasts in this report). Updating the AEROJET Memorandum Account balance to reflect the most up-to-date balance requires updating the remaining time period to recover the uncollected balance by one month from GSWC's proposed surcharge. ORA's methodology appropriately reflects this change in its annual amortization calculation and is consistent with the calculation accepted by the Commission in D.13-05-011. The calculation is further explained in the Prepared Testimony of Jenny Darney-Lane, p. 11 lines 1 – 6:

> The outstanding balance in the Memorandum Account, as of 5/31/14 was divided into the time remaining of the original 20 years maximum recovery period to determine an average annual amortization. The balance of the Memorandum Account as of 5/31/14 is $14,418,792 and the time remaining of the original 20 years is eleven (11) years and three (3) months. Dividing the balance by the remaining time derives an annual amortization of $1,281,670.

ORA's proposed surcharges use the balance as of June 30, 2014 of $14,302,164 and the remaining time (from June 30, 2014) of the original 20 years of eleven years and two months. Using these parameters, ORA obtains the annual amortization of $1,280,791.

This annual amortization amount is then allocated between flat rate and metered customers in Arden-Cordova. This is a process that depends on the forecasted amount of revenue requirement, forecasted metered and unmetered connections, and forecasted sales. ORA recommends that the allocation of the annual amortization amount between flat rate and metered connections be based on ORA's forecasted amounts.

D. CONCLUSION

GSWC's proposed AEROJET surcharge recalculation comports with the method approved in D.13-05-011. However, the Commission should adopt ORA's proposed surcharges which are based on the updated AEROJET Memorandum Account balance as of June 30, 2014, and ORA-

1 recommended revenue requirement, number of metered and unmetered connections, and sales.
2 Using ORA's recommended revenue requirement, the number of metered and unmetered
3 connections, sales, and the June 30, 2014 memorandum account balance of $14,302,164,
4 surcharges should be $6.66 for flat rate customers and $0.189 per Ccf for metered customers.

Chapter 7: SPECIAL REQUEST #7

A. INTRODUCTION

Special Request #7, presented in GSWC's Prepared Testimony of John Garon, proposes to establish a pilot program of special facilities and connection fees and is the corollary to Special Request #10. Special Request #10 proposes to incorporate the settlement agreement between GSWC and ORA in the rehearing of D.10-11-035.

Since the time GSWC filed this GRC, A.14-07-006 on July 6, 2014, the Commission has since adopted the settlement agreement on the rehearing of D.10-11-035 in D.14-09-009 on September 11, 2014. The settlement terms include: (1) the establishment of special facilities fees and/or connection fees on a prospective basis to new developments in the Santa Maria CSA, and (2) to identify, evaluate, and determine if GSWC needs to establish new facilities and/or connection fees in any other ratemaking areas that would apply on a prospective basis to new developments.[67] Special Request #7 addresses this item of the settlement agreement by proposing to modify GSWC's Rule 15 with a new special facilities fee in the Santa Maria CSA, and new connection fees in the Bay Point and Clearlake CSAs as a non-permanent pilot program "to be re-evaluated in GSWC's next GRC".[68]

In Santa Maria, GSWC proposes a special facilities fee for collecting advances on water supply facilities serving new developments to cover the cost of additional well production and storage capacity for new developments. GSWC states that its proposed fee is based upon the calculation method agreed to in a settlement between ORA and California Water Service Company in Application 06-07-017 and adopted in D.07-12-055. GSWC proposes a fee of $1,300 for a meter service size of 1-inch or less and the fee scales up depending on the meter equivalent size.[69]

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[67] Prepared Testimony of John Garon, p. 44, lines 12 – 17.

[68] Prepared Testimony of John Garon, p. 48, lines 2 – 5.

[69] Prepared Testimony of John Garon, p. 46, lines 12 – 15.

In Bay Point and Clearlake, GSWC proposes connection fees of $2,050 and $2,500, respectively, for a meter service size of 5/8 x 3/4-inch. GSWC estimates the proposed connection fees based on the average rate base per hundred cubic foot of water (Ccf) times the average annual usage by a residential customer with a 5/8 x 3/4-inch meter and adds an income tax gross up factor.[70] GSWC states this is the same method adopted by the Commission in D.90-02-020 for GSWC's Service Connection Fee in the Desert District.[71]

B. SUMMARY OF RECOMMENDATIONS

The special facilities fee for Santa Maria must be set to fund the entire cost of capital investment to serve new customers to ensure that rates do not increase for existing ratepayers as a result of new development. Additionally, GSWC's meter size ratios for the special facilities fee and connection fees should be corrected. GSWC requests the special facilities fee in Santa Maria and the connection fees in Bay Point and Clearlake be established as a pilot program. As such, the Commission should require GSWC to report the following information in its next GRC: the number of fees assessed, revenues recorded each year, recorded costs of associated new special facilities or connections, and any under- or over-collection in revenues (compared to costs) generated from the fees to fund these projects, as well as the impacts to affordability.[72]

C. DISCUSSION

Special facilities and connection fees serve similar purposes. Both are fixed fees used to cover costs associated with providing new water service to new connections.[73] Special facilities fees are used to provide water service to new connections requiring additional offsite facilities such as storage and/or production.[73] Connection fees are used to provide water service to new

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[70] Prepared Testimony of John Garon, p. 47, lines 8 – 19.

[71] Prepared Testimony of John Garon, p. 47, lines 1 – 3 and 15 – 19.

[72] Connection fees were identified as "reducing the high infrastructure cost in the Clearlake ratemaking area." Supplemental Testimony of Keith Switzer filed to this proceeding December 22, 2014, p. A-20.

[73] Data Request Response "ED3-005 Partial Response #1", response to question 3(b).

connections that may not require additional offsite facilities.[74] The following discussion will address each fee individually.

1. Special Facilities Fee in Santa Maria

GSWC calculates its proposed special facilities fee based on the estimated cost to add additional well production and storage capacity for new developments.[75] GSWC estimated this cost using data from an existing well production project in Santa Maria, as well as the estimated storage cost per service for an existing tank project in Los Osos.[76] GSWC then subtracts the 2013 adopted rate base per customer from the total supply cost per service to arrive at the proposed "revenue neutral fee per service."[77] The main difference in GSWC's and ORA's approach is in the final step.

The current adopted rate base per service connection should not be subtracted from the total supply cost per service connection as it would indirectly create a subsidy to developers. The current adopted rate base per customer is dependent on the cost of providing service to existing customers. By not subtracting current adopted rate base per service connection from the calculation of the proposed special facility fee, new customers will pay the full cost of new projects to serve those customers.

This is consistent with the Commission's direction in D.05-12-020, Apple Valley Ranchos Water Company's 2006 GRC, which states:

> Construing all the provisions of Apple Valley's Rule 15, we conclude that the cost of all necessary facilities to serve new customers, including wells, tanks and treatment facilities, when clearly attributable to new customers, should be recovered in the facilities charge, and not imposed on the existing customer base.[78]

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[74] Ibid.

[75] Prepared Testimony of John Garon, p. 44, lines 24-25.

[76] Prepared Testimony of John Garon, p. 45, lines 1-19.

[77] Prepared Testimony of John Garon, p. 45, lines 19-21.

[78] D.05-12-020, p. 18.

Thus, the special facilities fee must be set to fund the entire cost of projects to serve new customers. In GSWC's current and proposed modification of Rule 15,[79] (see Appendix SR#7-A [Special Facilities] of this report) GSWC includes the same provisions that led to the Commission's determination of Apple Valley Ranchos Water Company's facilities cost in D.05-12-020.

GSWC states that the Commission has reviewed the methodology of reducing the total cost of facilities per service by the current adopted rate base per connection before and that the methodology was "agreed to by California Water Service Company and ORA in settlement in California Water Service Company Application 06-07-012 and adopted in Decision 07-12-055."[80] However, the Commission should afford this argument no weight because while this methodology was proposed by California Water Service Company in its Application, the settlement does not include a determination as to which methodology was used to develop the fee. Rather, California Water Service Company and ORA reached agreement "after reviewing the positions of both Parties in settlement."[81] The settled amount lies between ORA's and California Water Service Company's proposals. Therefore the methodology was not agreed upon in settlement and no determination was made by the Commission.

ORA Data Request ED3-002 (Special Facilities Fees), Question 10 requested that GSWC update the Special Facilities & Connection Fees workpaper to include data and calculations needed to arrive at the numbers provided in multiple columns of the well cost calculation, including the Well Capacity, Land Cost, Well Cost, and Treatment Cost. The updated workpaper GSWC provided in response showed the updated "revenue neutral fee" amount reduced from the original amount of $1,300 to $1,000. However, GSWC does not propose to revise its requested $1,300 to $1,000. Under the updated calculations, the total supply cost per connection is reduced from

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[79] GSWC Response to ORA Data Request ED3-005 (Connection Fees).

[80] GSWC Prepared Testimony of John Garon, p. 46, lines 3-4.

[81] A.06-07-017 Joint Motion to Approve Settlement Agreement, "Settlement of California Water Service Company (U-60-W) and the Division of Ratepayer Advocates and Notice of Open Issues", filed 2-27-2007, p. 26.

$3,650 to $3,350. ORA's recommended facilities fee uses the updated workpaper and the full cost of special facilities, which is $3,350.

2. Connection Fees in Bay Point and Clearlake

GSWC states that its proposed new connection fees in Bay Point and Clearlake are based on the methodologies used to calculate Service Connection Fee in its Desert District (authorized in D.90-02-020 on a trial basis). GSWC describes the basic method:

> SoCalWater calculated the average dollar amount of Rate Base per Ccf of water sold then multiplied that amount times the average annual usage in Ccf by a typical residential customer with a 5/8 x 3/4-inch meter to arrive at the average Rate Base per customer. Then, after adding an income tax gross up factor, rounded the amount off to the nearest $50.[82]

GSWC proposes fees of $2,050 and $2,500 plus any applicable gross up for income taxes for Bay Point and Clearlake, respectively.[83] GSWC does not directly state why it did not reduce the total cost of connection fees by the ratemaking area's 2013 adopted rate base. However, GSWC does state that "[a] connection fee would offset the cost of existing rate base reducing the burden on all customers."[84]

ORA reviewed GSWC's calculation methodology and the parallel methodology used in the Desert District and agrees with GSWC's proposal as it reflects the calculated full cost of the service.

3. Meter Ratio Factor Correction for Special Facilities and Connection Fees

ORA Data Request ED3-005 (Connection Fees) requested that GSWC provide its proposed Rule 15, which also includes the meter ratios for customers requesting larger than the 5/8 x 3/4-inch meter size used in the calculation of fees. The corresponding workpaper incorrectly applies the meter ratio factor to the 3/4-inch meter (rather than the 5/8 x 3/4-inch meter) to obtain these fees. The corrected fees are included in Appendix SR#7-A (Special Facilities) and SR#7-B

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[82] GSWC Prepared Testimony of John Garon, p. 47, lines 9 – 13.

[83] GSWC Prepared Testimony of John Garon, p. 47, lines 23 – 25.

[84] GSWC Response to ORA Data Request ED3-005 (Connection Fees).

(Connection Fees) of this report, which is ORA's corrected version of GSWC's proposed Rule 15.

D. CONCLUSION

The Commission should grant GSWC's proposed pilot program for Special Facilities and Connection Fees reflecting ORA's modifications and require GSWC to include in its next GRC information on the number of fees assessed, revenues recorded each year, costs of new special facilities or connections, any under or over collection in revenues generated from the fees to fund these projects, and information on the impacts to affordability. The special facilities fee in Santa Maria should be $3,350, which is based on the estimated full cost to provide new customers water service.

Chapter 8: SPECIAL REQUEST #9

A. INTRODUCTION

In Special Request #9, GSWC is proposing implementation of a "new tariff applicable to all metered recycled (non-potable) water service for irrigation and/or industrial customers except those already covered under R3-1-R."[85] R3-1-R is the tariff schedule number for residential general metered customers in Region 3.[86] This tariff would only apply to customers in the "San Gabriel CSA (and vicinity), Los Angeles County"[87] of Region 3. According to GSWC, this new tariff is intended to cover the cost of purchasing recycled water from Upper San Gabriel Valley Municipal Water District (USGVMWD).[88] USGVMWD plans on expanding its recycled water system service (which overlaps GSWC service area), potentially providing additional recycled water to customers in GSWC's service area.[88] GSWC plans to purchase the recycled water from USGVMWD at a price set to 80% of the Main San Gabriel Basin Watermaster's Replacement Water Assessment Rate and proposes that this new tariff rate be a 15% discount from the non-residential potable water rate of $2.921 per hundred cubic foot of water (Ccf).[89]

B. SUMMARY OF RECOMMENDATIONS

ORA does not oppose this special request.[90] However, the Commission should require GSWC to continue to provide cost-based discounts for recycled water in future rate cycles consistent with

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[85] GSWC Prepared Testimony of Eva Orozco, p.12 lines 4 – 5 and proposed rate schedule.

[86] On February 6, 2015, GSWC filed Advice Letter (AL) 1592-W requesting the Commission authorize the same tariff. On February 26, 2015 ORA filed a protest to AL 1592-W on the grounds that, among other issues, the request is pending approval before the Commission in a formal proceeding. On March 2, 2015 the Division of Water and Audits approved AL 1592-W effective March 8, 2015.

[87] GSWC Table 5-A page 9 of 18, proposed "Schedule No. R3-RCW Non-Residential Recycled Water Service."

[88] GSWC Prepared Testimony of Eva Orozco, p.12 lines 9 – 13.

[89] GSWC Prepared Testimony of Eva Orozco, p.12 lines 16 – 19.

[90] On March 2, 2015, The Division of Water and Audits sent ORA a letter explaining its acceptance of AL 1592-W and stated: "While the Commission appreciates ORA's attempt to save it from unnecessary

California Water Code Section 13580.8 (d). Further, GSWC is currently providing recycled water to three customers free of charge without Commission authorization. GSWC cannot include any costs or lost revenues associated with these three customers into the WRAM/MCBA accounts.

C. DISCUSSION

1. GSWC's Proposed 15% Discount on Recycled Water

California Water Code (Water Code) Section 13580.8 (d) states:

> The commission shall, as appropriate, provide a discount from the general metered rate of the water utility for potable water by either of the following means:
>
> (1) Passing through to the customer the net reduction in cost to the water utility in purchasing and delivering recycled or nonpotable water as compared to the cost of purchasing and delivering potable water.
>
> (2) Granting to the customer a uniform discount from the water utility's general metered potable water rate when the discount in paragraph (1) is determined to be an insufficient incentive for the customer to convert to the use of recycled or nonpotable water. If the commission provides for a discount pursuant to this paragraph that is greater than the water utility's reduction in cost, the commission shall authorize the water utility to include the aggregate amount of that discount in its revenue requirements to be applied to, and recovered in, rates that are applicable to all general metered customers.

GSWC did not present supporting evidence of the cost-based discount as outlined in the Water Code in its application. GSWC also did not provide any rationale behind the 15% discount from the non-residential potable water rate for recycled water at the time of filing.

On January 10, 2013, GSWC filed Advice Letter No. 1509-W requesting authorization to provide recycled water service for irrigation and/or industrial purposes under Schedule No. R3-SGRCW. On February 13, 2013, the Commission's Division of Water and Audits (DWA) notified GSWC that "DWA has determined that Golden State's Schedule No. R3-SGRWC (Cal. P.U.C. Tariff Sheet 6515-W) lacks justification for the recycled water quantity rate discount of

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duplicative efforts, this goal can be achieved by granting the AL proposed and directing GSWC to withdraw its Special Request #9 from its pending GRC."

15%."[91] DWA further advised GSWC that it must update the recycled water tariff to reflect a 7.5% discount on the non-residential potable water rate.[91] GSWC did not submit a supplement to Advice Letter No. 1509-W incorporating the amendment specified by DWA. Therefore, DWA rejected the Advice Letter and corresponding tariff sheets on March 29, 2013.[92]

During a phone conversation between ORA and GSWC on November 24, 2014, GSWC indicated that it chose the 15% discount based on the discount provided by other water purveyors in the San Gabriel vicinity. ORA found that this practice of creating a discount for recycled water is consistent with prior Commission Decisions - D.12-04-009 and D.13-05-027 for Suburban Water Systems, and D.14-05-001 and D.14-06-001 for San Gabriel Valley Water Company, both of whom serve the San Gabriel area. Suburban Water Systems' recycled water rate ranges from $2.313/Ccf to $2.483/Ccf depending on area, while San Gabriel Valley Water Company's is $2.2467/Ccf.[93] GSWC is proposing a rate of $2.732, which is a discount of $0.482/Ccf on the non-residential potable water rate.[94]

GSWC also provided workpapers showing the pass-through cost savings associated with the proposed recycled water tariff.[95] GSWC calculates that the savings per Ccf obtained from purchasing recycled water from USGVMWD at a 20% discount is $0.466/Ccf. The $0.466/Ccf is 14.5% of the proposed non-residential potable water rate of $3.214/Ccf. GSWC uses this to verify that the proposed discount of 15% is in line with the pass-through savings of 14.5%. ORA does not oppose the methodology used to determine the pass-through savings.

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[91] Letter sent by the Commission's Division of Water and Audits to Ronald Moore of GSWC on February 13, 2013.

[92] Rejection of AL 1509-W, letter sent by the Commission's Division of Water and Audits to Ronald Moore of GSWC on March 29, 2013.

[93] Suburban Cal. P.U.C. Tariff Sheet 1455-W and San Gabriel Valley Water Company Cal. P.U.C. Tariff Sheet 2427-W.

[94] GSWC Response to ORA Data Request ED3-010 (Recycled Water Workpapers) workpaper "ED3-010 Q.1.a GSWC Recycled water."

[95] GSWC Response to ORA Data Request ED3-010, Q. 1(a) (Recycled Water Workpapers.)

2. Recycled Water Customers

Currently GSWC has three customers receiving recycled water from USGVMWD.[96] However, because GSWC does not have an authorized recycled water tariff in the San Gabriel CSA of Region 3, these customers are not charged for the water consumed since GSWC installed meters to measure recycled water delivery, as early as September 2011.[97] GSWC stated that:

> Absent an approved recycle water tariff for this service area GSWC has not been billing these customers for the recycled water being delivered to these customers through the Upper San Gabriel Municipal Water District recycled water system. Therefore GSWC is not currently providing recycled water service to the three customers identified.[98]

GSWC also stated that:

> Under GSWC's Special Request #9, adopted levels for recycled water revenues and supply costs and potable water revenues and supply costs will be established in the GRC for 2016 – 2018. The WRAM and MCBA will be calculated based on these values. To the extent that the actual recorded amounts differ from those adopted they will be captured in the WRAM and MCBA as appropriate.[99]

ORA does not object to the above treatment on a going forward basis once GSWC receives authority to provide recycled water service.

All costs associated with providing the recycled water and lost potable water revenues due to potable water customers switching to recycled water service should not be paid for by ratepayers until such time that the tariff is approved and GSWC's recycled water service has begun (currently expected to be January 1, 2016 per the Rate Case Plan schedule) should the Commission approve this Special Request.

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[96] Customers identified in GSWC's email response to ORA (Recycle Water.xlsx) on 12/3/2014 to ORA's inquiry, and GSWC Response to ORA Data Request ED3-010 (Recycled Water Workpapers) question 1(g).

[97] GSWC Response to ORA Data Request ED3-010 (Recycled Water Workpapers) workpaper "ED3-010 Q.1.a GSWC Recycled water." One customer began receiving recycled water service in September 2011, and two others began receiving same service since February 2012.

[98] GSWC Response to ORA Data Request ED3-010, Q. 1(g) (Recycled Water Workpapers).

[99] GSWC Response to ORA Data Request ED3-010, Q. 1(h) (Recycled Water Workpapers).

ORA recommends all incurred costs and lost revenues from the three customers having received recycled water for free be excluded from recovery through rates and through the WRAM/MCBA. Including any costs associated with GSWC installing facilities (meters and onsite connections[100]) used to provide these customers with recycled water in rates or including any lost revenues associated with potable water customers switching to recycled water service in WRAM/MCBA is inappropriate since GSWC does not have Commission authorization for providing this service.

D. CONCLUSION

Considering GSWC has provided the applicable evidence supporting the pass-through savings of near 15%, ORA does not oppose the 15% discount from the non-residential potable water rate to determine the recycled water rate. However, GSWC should continue to provide cost-based discounts for recycled water in future rate cycles consistent with California Water Code, Section 13580.8 (d). Further, GSWC should not include any costs in rates or lost revenues in WRAM/MCBA where those costs or lost revenues were incurred prior to the effective date of this proposed tariff associated with the three customers currently receiving recycled water for free into the WRAM/MCBA accounts.

[100] In ORA's phone conversation with GSWC on November 24, 2014, GSWC indicated these were the costs associated with its recycled water service in the San Gabriel CSA.

Chapter 9: SPECIAL REQUESTS #12 & #13

A. SPECIAL REQUEST #12 – CROSS CONNECTION CONTROL FEES, FIRE FLOW TESTING FEES, RECONNECTION FEES

GSWC's Special Request 12, addressed in the Prepared Testimony of Keith Switzer, requests Commission authorization to "implement new fees for fire flow testing and a Cross Connection Control fee, and to increase its reconnection fees."[101] The following provides a discussion and ORA's recommendation for each fee.

1. CROSS CONNECTION CONTROL FEES (SR #12)

a. Introduction

GSWC conducts surveys, administers backflow prevention device installations, and administers annual testing of backflow prevention devices as part of its cross-connection control program to protect the public water supply from contamination.[102] In Special Request 12, GSWC proposes "to implement a new fee-based revenue mechanism, called the 'Cross Connection Control Fee.'"[103] GSWC explains that "[t]his Fee will cover administrative costs to run the program and will be charged on a per backflow prevention device basis."[104]

GSWC's proposed fee is based on the cost of conducting surveys, administering backflow prevention device installations, and annual testing, which includes primarily labor expenses for the forecasted number of backflow prevention devices. GSWC proposes the annual fee amount of $23.79 (monthly fee amount of $1.98) per device tested.[105]

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[101] A.14-07-006, p. 31.

[102] GSWC details the scope of duties related to cross connection control it has identified to comply with Title 17 "California Regulated Related to Drinking Water," Section 7584 and Rule No. 16. C. "Cross Connections" as described in the Prepared Testimony of Keith Switzer, July 2014, pp. 15 – 17.

[103] GSWC Prepared Testimony of Keith Switzer, July 2014, p. 15.

[104] Ibid.

[105] GSWC Prepared Testimony of Keith Switzer, July 2014, Schedule 3, Table KS-2.

b. Summary of Recommendations

ORA does not oppose GSWC's proposed Cross Connection Control Fee. However, GSWC should present a proposed tariff explaining the details of this fee.

c. Discussion

GSWC's proposal to implement a flat rate fee to cross connection control device owners is consistent with its Rule 16. C. 3, "Type and Expense of Backflow Preventers," which states: "Backflow preventers shall be tested, repaired, or replaced at the expense of the customer."[106] GSWC has a legal obligation "to protect the public water supply from contamination by implementation of a cross-connection control program" per Title 17 of the California Code of Regulations.[107]

Customers that have backflow prevention devices are required to test, repair, and replace those devices at their own expense. GSWC developed the Cross Connection Control Fee by estimating the administrative costs of ensuring that customers have tested their devices and are keeping records of the testing, as well as conducting surveys to determine the customers that need to install backflow prevention devices and to ensure that those customers install the devices where needed.

GSWC estimates the total annual cost of the cross connection control program is $223,859 for both the survey and installation administration, and the annual testing administration components.[108] GSWC calculates its proposed fee of $1.98/month based on an estimated 9,408 customers that need to have backflow prevention devices tested.[109] GSWC then estimates a Test Year 2016 revenue from the Cross Connection Control Fee of $275,167 company-wide.[110] Annual costs are estimated at $223,859 which results in net revenue of $51,308 compared to

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[106] http://www.gswater.com/rates-schedules-and-tariffs/, accessed 2/12/2015.

[107] Title 17, California Code of Regulations § 7584.

[108] GSWC workpaper CCCP Cost Estimate V7X.

[109] Ibid.

[110] GSWC workpaper Backflow New Revenue V4X.

estimated program costs.[111] In its next GRC filing, GSWC should report actual revenues collected from the Cross Connection Control Fee together with recorded costs of implementing the administrative aspects of the program. Any discrepancies in the revenues and costs should be corrected and used to develop an updated fee in that GRC.

GSWC includes the revenue from this fee in the proposed 2016 revenue requirement (see line item 611.00 Misc. Service in Table 4-E of the revenues workpapers for each ratemaking area). GSWC appropriately excludes estimated revenue from this fee in the proposed 2016 rate design calculation of general metered service rates (and flat service rates for Arden Cordova).

GSWC's application does not contain a proposed tariff for the Cross Connection Control Fee. GSWC should present a proposed tariff outlining its proposed fee and conditions.

d. Conclusion

ORA does not oppose GSWC's proposed Cross Connection Control Fee. However, GSWC should present a proposed tariff explaining the details of this fee. GSWC should be required to present recorded revenues and costs of the program and adjust the fees to ensure that there are no discrepancies between the program's revenues and costs.

2. FIRE FLOW TESTING FEES (SR #12)

a. Introduction

GSWC proposes a new Fire Flow Testing Fee to cover the cost of testing fire hydrants to ensure proper flow when requested by a customer or developer for proposed construction.[112] Currently the costs associated with this service are spread across all ratepayers. Under GSWC's proposal, the customer/developer requesting the fire hydrant test would pay the fire flow testing costs. GSWC is proposing an introductory fee of $300 per fire flow test, which GSWC claims consists

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[111] GSWC workpaper CCCP Cost Estimate V7X.

[112] GSWC Prepared Testimony of Keith Switzer, pp. 20-21.

of 97.4% labor costs and 2.6% non-labor costs.[113] GSWC estimates total fee revenues of $137,700 from all nine ratemaking areas.[114]

b. Summary of Recommendations

ORA does not oppose GSWC's request to implement the Fire Flow Testing Fee.

c. Discussion

ORA reviewed the methodology GSWC used to estimate costs and revenues associated with this fee, and found no issues of concern. The fee will appropriately charge the cost of conducting fire flow tests to the customer/developer requesting the test. GSWC is proposing to implement this fee as an introductory fee. The Commission should require GSWC to provide recorded cost and revenue data associated with the new Fire Flow Testing Fee in GSWC's next GRC in order to re-evaluate the fee amount.

GSWC includes the revenue from this fee in the proposed 2016 revenue requirement (see line item 611.00 Misc. Service in Table 4-E of the revenues workpapers for each ratemaking area). GSWC appropriately excludes estimated revenue from this fee in the proposed 2016 rate design calculation of general metered service rates (and flat service rates for Arden Cordova).

GSWC's application does not contain a proposed tariff for the Fire Flow Testing Fee. GSWC should present a proposed tariff outlining its proposed fee and conditions.

d. Conclusion

The Fire Flow Testing Fee provides appropriate cost recovery of the fire flow testing service. Costs are directly incurred for services to a single customer or developer, and therefore should be applied to that customer or developer in order to avoid burdening all ratepayers of the cost associated with the service.

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[113] GSWC Prepared Testimony of Keith Switzer, Schedule 4 (Table KS-3).

[114] GSWC Prepared Testimony of Keith Switzer, Schedule 5 (Table KS-4).

3. RECONNECTION FEES (SR #12)

a. Introduction

GSWC re-calculates the Reconnection Fees to cover the cost of both reconnection and disconnection services. GSWC proposes to increase this fee from $25.00 to $40.00 for regular hour services, and from $37.50 to $120.00 for after-hour service.[115] The increase is due to additional considerations in the cost calculation including the disconnection trip component, and administrative time as detailed in GSWC's testimony.[116]

b. Summary of Recommendations

ORA does not oppose GSWC's request to increase the reconnection fees. However, the Commission should require that before completing the reconnection work after hours, GSWC inform customers requesting a reconnection of the associated fees, the fee difference between regular business and after-hour reconnections, and the option to wait and receive the reconnection service during regular business hours at the lower fee (than that for after-hour service). In addition, GSWC should be required to avoid disconnection of service on Fridays and days prior to holidays in order to avoid the likelihood that a customer would be without water service over a prolonged period should they prefer a regular-hours reconnection.

ORA recommends that the Commission require GSWC to modify the relevant portions of its Rule 11 "DISCONTINUANCE AND RESTORATION OF SERVICE," in order to reflect the additional days of disconnection avoidance and the requirement to inform customers of fees and options to reconnection.

c. Discussion

ORA reviewed GSWC's proposal and supporting workpapers and does not oppose this request as it leads to proper allocation of reconnection costs to customers who require these services. The two largest components of the fee increase are: (1) accounting of the disconnection trip made by the utility's field operator, and (2) all administrative time including that of the customer service representatives.

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[115] GSWC Prepared Testimony of Keith Switzer, p. 23, lines 18-19.

[116] GSWC Prepared Testimony of Keith Switzer, Schedule 6, Table KS-5.

GSWC includes the revenue from this fee in the proposed 2016 revenue requirement (see line item 611.00 Misc. Service in Table 4-E of the revenues workpapers for each ratemaking area). GSWC appropriately excludes estimated revenue from this fee in the proposed 2016 rate design calculation of general metered service rates (and flat service rates for Arden Cordova).

Section B.1(g) of GSWC's Rule 11 states:

> Service will not be discontinued by reason of delinquency in payment for service on any Saturday, Sunday, legal holiday, or at any time during which the business offices of the utility are not open to the public.

In addition to these days, ORA recommends GSWC not discontinue service on Fridays and days prior to holidays. This would allow the customer to request an immediate reconnection and avoid the after-hours reconnection fee. At the time of disconnection the customer should receive notice of the reconnection fees for both regular- and after-hours reconnection.

GSWC's application does not contain proposed Rule 11 modifications for the Reconnection Fees. GSWC should present proposed tariff changes outlining its proposed modifications to the reconnection fees.

d. Conclusion

GSWC's request to increase its Reconnection Fees is consistent with cost of service ratemaking. However, the Commission should require GSWC before performing any reconnection work after hours to clearly and fully inform the requesting customer of the fees for reconnection during business hours and after business hours, and the option to receive the reconnection service during regular business hours at a lower fee. In order to avoid prolonged discontinuance of service, GSWC should be required to avoid disconnection of service on Fridays and days prior to legal holidays allowing ample time for a willing customer to request reconnection at the lower regular business hour fee.

B. SPECIAL REQUEST #13 – NON-RESIDENTIAL MANIFOLD & DUAL-PURPOSE METER RATES

1. Introduction

In Special Request # 13, GSWC is seeking Commission approval for (1) service charges for non-residential customers with manifold meter settings,[117] and (2) service charges for non-residential customers who have dual-purpose meters. Dual-purpose meters are single meters that provide general metered water service but are sized larger than normal to meet fire protection service requirements.[118]

2. Summary of Recommendations

ORA does not oppose GSWC's proposed tariff rates for non-residential customers with manifold meter settings. ORA also does not oppose GSWC's methodology to calculate dual-purpose non-residential meter service charges as it is consistent with GSWC's prior request and Commission approval of dual-purpose meter service charges for residential customers.[119]

3. Discussion

a. Manifold Meter Settings

GSWC proposes incorporating meter service charges into its Schedule of Tariffs for customers with multiple meters on the customer's premises based on a meter equivalent methodology.[120] The meter equivalent methodology for each ratemaking area and the resulting service charges are included in Schedule 3 of the Prepared Testimony of Patrick Scanlon.

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[117] An individual customer with multiple meters.

[118] A.14-07-006, p. 31.

[119] D.13-05-011.

[120] GSWC Prepared Testimony of Patrick Scanlon, p. 3 lines 1 – 4.

The methodology GSWC uses to determine the single monthly service charge for customers with multiple meters is based on three components: (1) the "Equivalent Diameter," (2) the "Nearest Standard Meter Size," and (3) the "Factor To Apply."[121]

The Equivalent Diameter is the diameter of a hypothetical meter with the combined flow volume of the multiple meters specific to the customer. After determining the Equivalent Diameter for a particular customer with a combination of meters, GSWC determines the Nearest Standard Meter Size most similar in size to the Equivalent Diameter. The Nearest Standard Meter Size has established tariffs. GSWC uses the ratio of the equivalent Diameter to the diameter of the Nearest Standard Meter Size to calculate the Factor To Apply. A Factor To Apply equal to 1 indicates that there is no size difference between the Equivalent Diameter and the Nearest Standard Meter Size. A Factor To Apply greater than 1 indicates the Equivalent Diameter is larger than the Nearest Standard Meter Size, and a Factor To Apply less than 1 indicates the Equivalent Diameter is smaller than the Nearest Standard Meter Size. GSWC then scales the tariff rate for the Nearest Standard Meter Size by the Factor To Apply in order to calculate the proposed monthly service charge for the Equivalent Diameter meter.

ORA does not oppose this methodology for this GRC cycle. However customers billed under this methodology may in some cases pay less than they would have if they had to pay the full tariff rate for each of their multiple meters. Thus, implementing this methodology into the Schedule of Tariffs may have some significant impacts on the total revenues recorded from these customers compared to revenues from the individual billing of meters, as well as possible changes to the number of customers with manifold meter settings, and the corresponding sales.

In its next GRC, GSWC should be required to report the revenue difference due to these service charges and the number of customers and sales per customer for customers with manifold meter settings broken down by the combination of meters before and after the implementation of these tariffs.

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[121] GSWC Prepared Testimony of Patrick Scanlon, Schedule 3.

b. Dual Purpose Meters

GSWC's proposed methodology for calculating the service charges for dual purpose meters is based on the previously approved methodology to incorporate this same concept in the residential class that was adopted via a settlement in D.13-05-011.[122] The methodology was developed by the Commission's Division of Water and Audits. The methodology calculates the higher carrying charge and installation cost for a larger than normally appropriate meter to provide fire protection for non-residential customers.[123] GSWC calculates these costs specific to each ratemaking area and meter combination. ORA reviewed the methodology implemented by GSWC and did not find any issues or discrepancies from the methodology outlined by the Division of Water and Audits' service charge calculation.

An example of the proposed service charge and how it is calculated is illustrated in **Table 9-A**, reproduced from GSWC Prepared Testimony of Nanci Tran. The table shows the additional monthly service charge for a non-residential customer switching from a 1-inch to a 3-inch meter. The percentage increase over the single 1-inch meter service charge varies based on the ratemaking area.

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[122] GSWC's prior GRC Decision.

[123] The methodology is discussed in Standard Practice U-7-W "Rate Design for Water and Sewer System Utilities Including Master Metered Facilities, Section 8 and outlined in Appendix B of Standard Practice U-7-W.

Table 9-A: Example of GSWC's Proposed Dual-Purpose Meter Service Charge Calculation

Burden	44.23%
2016	
Overhead	17.42%

	1-inch	3-inch	
Price of Materials	$ 70.27	$1,465.93	
Sales Tax	$ 6.32	$ 131.93	
Cost of Installation			
Labor: $/person/hr	$ 25.43	$ 25.43	
# of Hours	0.6	4.0	hour
Labor Cost	$ 15.44	$ 101.72	
Benefits	$ 6.83	$ 44.99	
Subtotal	$ 98.86	$1,744.57	
Overhead	$ 12.24	$ 255.37	
Total Cost	$ 111.10	1999.94	
Product Life (Years)	15	6	
Depreciation Expense	7.41	$ 333.32	
Average Return on Investment			
Adopted ROR	8.34%		
Net-to-gross	1.8		
Revenue Requirement	0.15012		
	$ 8.34	$ 150.12	
Annual Cost	$ 15.75	$ 483.44	
Difference in Cost		$ 467.69	
Per Month		$ 38.97	

	1 inch rate	Percent Surcharge
AC	$ 22.48	173%
BY	$ 100.67	39%
CL	$ 101.81	38%
LO	$ 91.57	43%
OJ	$ 84.65	46%
SM	$ 41.04	95%
SV	$ 51.08	76%
R2	$ 58.42	67%
R3	$ 57.54	68%

4. Conclusion

ORA accepts the methodology GSWC used to determine the manifold meter service charges and recommends that the Commission require GSWC to report in its next GRC the recorded revenues from manifold meter customers, as well as the number of customers and sales per customer for customers with manifold meter settings.

ORA also accepts the methodology GSWC used to calculate the service charges GSWC proposes for dual-purpose meters in the non-residential class as they are based on the Commission-approved methodology for the residential class in GSWC's last GRC, D.13-05-011.

Chapter 10: CONSERVATION PROGRAMS

A. INTRODUCTION

This report presents ORA's analysis and recommendations on Golden State Water Company's (GSWC) proposed conservation budget for Test Year 2016 and Escalation Years 2017 and 2018 for Regions 1, 2, and 3.

B. SUMMARY OF RECOMMENDATIONS

1. Conservation Budget and ORA Recommendation

GSWC requests a total conservation budget of $237,283 for Region 1, $389,511 for Region 2, and $443,954 for Region 3 for Test Year 2016. For Escalation Years 2017 and 2018, GSWC requests that the adopted 2016 conservation expenses be escalated by an inflation factor.[124]

ORA recommends that GSWC's conservation budgets be excluded from escalation in calculating the allowed revenue requirement for Escalation Years 2017 and 2018. ORA recommends that the Commission authorize a conservation budget of $203,974 for Region 1, $209,816 for Region 2, and $332,814 for Region 3 for each year of the rate case cycle. **Table 10-A** shows a comparison between GSWC's Proposed Budget and ORA's Recommended Budget broken down by region for Test Year 2016.

[124] The inflation rate applied to each expense category is in accordance with Commission Decision No. 04-06-018, the Interim Order Adopting Rate Case Plan. Escalation of Labor and Non-Labor Expenses appears in page 14 of the PDF version of the decision. The inflation rates include a composite inflation rate, a labor inflation rate, and the CPI-U (previous 12 months). The compensation per hour and non-labor inflation rates used in the composite inflation rate, as well as the labor inflation rate are published by the ORA, Energy Cost of Service, and Natural Gas Branch.

Table 10-A: Conservation Budget Comparison[125]

Ratemaking Area	2016 GSWC Proposed	2016 ORA Proposed	GSWC>ORA
Region 1	**$237,283**	**$203,974**	**$33,309**
Northern District			
Arden Cordova	$107,488	$79,027	$28,461
Bay Point	$12,252	$12,247	$5
Clearlake	$4,143	$3,870	$273
Coastal District			
Los Osos	$8,964	$7,764	$1,200
Ojai	$9,559	$8,790	$769
Santa Maria	$47,830	$45,842	$1,988
Simi Valley	$47,047	$46,434	$613
Region 2	**$389,511**	**$209,816**	**$179,695**
Central District		$104,908	
Southwest Distict		$104,908	
Region 3	**$443,954**	**$332,814**	**$97,807**
Foothill District		$113,157	
Mountain/Desert District		$106,501	
Orange County District		$113,157	
Total	**$1,070,748**	**$746,604**	**$310,811**

In addition to the budgets that balance implementation constraints and the cost burden to ratepayers, ORA recommends the following:

1. Continuation of the conservation expense one-way balancing account;
2. Continuation of caps on certain program expense categories;
3. Conservation expenses presented as a separate line item in GSWC's Summary of Earnings and Operations & Maintenance Expense tables and workpapers;
4. Enhanced annual reporting requirements;
5. Implement a social norm messaging pilot program for the Claremont System to facilitate 20x2020 water use compliance;[126]

[125] GSWC and ORA developed budgets for Regions 2 and 3 at the ratemaking level. However, for accounting purposes in Regions 2 and 3, conservation budget amounts are included in the Allocated District Office Expenses. ORA has maintained the ratios adopted in A.11-07-017, Settlement Agreement, p. 113 to allocate the total budgets for Regions 2 and 3 to the relevant districts.

6. Remove conservation expenses from escalation.

C. DISCUSSION

1. Impact of Drought Conditions

a. Timeline of Drought-Related Activities

According to the US Drought Monitor, as of December 2, 2014, 80% of California is in extreme drought and nearly 60% is in exceptional drought, the most severe category.[127] Seven of California's twelve major reservoirs are at or below 30% capacity and all are below historic averages, including the state's largest: Shasta Reservoir (25%) and Lake Oroville (29%).[128] Major events and measures undertaken statewide to address the drought in 2014 include:

- January 17, 2014: Governor Brown declared a statewide drought state of emergency;
- February 27, 2014: The Legislature passed a $687 million emergency drought relief package;
- April 18, 2014: The State Water Project and Central Valley Project announced record low deliveries for 2014;
- April 24, 2014: The Governor called on Californians to reduce water use by 20% and followed his drought declaration with a more detailed executive order;
- July 15, 2014: The State Water Resources Control Board passed emergency regulations prohibiting certain outdoor water uses and requiring water agencies to file monthly reports on water use and production;
- September 30, 2014: Water Year 2014 (Oct. 1, 2013 through Sept. 30, 2104) ends as the fourth-driest water year on record following two consecutive dry years;

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[126] Social norm messaging is a strategy of motivating behavioral changes based on perceptions of what is normal or typical. Social comparison theory argues that people validate the appropriateness of their behavior through comparisons to others, so that if people are shown their behavior is outside the norm or that their perception of what is normal is incorrect, they will be motivated to change so that their behavior more closely resembles the norm.

[127] http://droughtmonitor.unl.edu/data/pdfs/20141202/20141202_CA_trd.pdf

[128] http://www.californiadrought.org/wp-content/uploads/2014/06/reservoir-conditions-12-9.jpg; http://www.californiadrought.org/drought/past-updates/

- November 4, 2014: Proposition 1, a ballot measure authorizing $7.12 billion in general obligation bonds for state water supply infrastructure projects, including drought relief, was approved by voters;
- February 3, 2015: The State Water Resources Control Board announced that year-over-year monthly residential water savings statewide increased to 22.2 percent in December, up substantially from 9.9 percent in November, likely due in part to a wet end of the year.[129]

b. New Drought Procedures Adopted via Resolution No. W-4976 and Standard Practice U-40

On February 27, 2014, the Commission approved Resolution No. W-4976, which adopted drought procedures for water conservation, rationing and service moratoria, and revised Standard Practice U-40 (SP 40). The revised SP 40 prescribes the process to establish Tariff Rule 14.1, by which water utilities can introduce voluntary conservation measures, and Schedule 14.1, which provides for mandatory rationing if voluntary measures do not yield the necessary reduction in consumption, or in circumstances of prolonged or severe drought.

GSWC filed Advice Letter No. 1563-W on March 28, 2014 to establish the 2014 Water Conservation Memorandum Account to track all expenses incurred to activate both Rule 14.1 voluntary conservations and Schedule 14.1 mandatory rationing efforts that have not been considered in a GRC or other proceeding. GSWC filed Advice Letter No. 1565-W on May 5, 2014 to update its existing Rule No. 14.1, Water Conservation and Rationing, to incorporate the language adopted in Resolution No. W-4976. GSWC has not at this time activated its Schedule No. 14.1.[130]

c. Water Supply Conditions in GSWC Service Areas

On February 4, 2014 the CPUC's Division of Water and Audits (DWA) hosted a meeting of the 16 largest CPUC-regulated water companies to discuss their current supply conditions and supply-demand management activities in response to the ongoing drought. GSWC provided a

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[129] http://www.swrcb.ca.gov/press_room/press_releases/2015/pr020315_rgcpd_dec.pdf

[130] GSWC Response to Data Request JE6-001, Question 5.

summary of supply conditions in its service areas. In response to an ORA data request, GSWC provided an update on impacts of the drought during this rate case cycle in August 2014, including the following water systems of greatest concern:[131]

Region 1

- Edna Road – 100% groundwater and declining water levels;
- Ojai – declining water levels and likely rationing of purchased water supplies from the Casitas Municipal Water District;
- Nipomo – declining water levels; likely reaching "severe water shortage conditions" per adjudication criteria in April;
- Los Osos – increased chloride and TDS impacts due to sea water intrusion;
- Arden-Cordova – Folsom Reservoir supplies low; Regional Water Authority requesting all purveyors reduce water use by 20 percent.

Region 3

- Wrightwood – 100% groundwater and declining water levels.

2. The Conservation Expense One-Way Balancing Account Should Continue

In D.13-05-011, the Commission adopted a settlement authorizing GSWC to implement a Conservation Expense One-Way Balancing Account (CEOWBA) for conservation program costs from 2013 through 2015 for Regions 2, 3, and the Region 1 CSAs. GSWC and ORA agreed to continue the CEOWBA as a protection for ratepayers to ensure that funds authorized for conservation are dedicated to that purpose.[132] If the Commission had not ordered a one-way balancing account, there would be no assurance that funds authorized for conservation would be spent on water conservation programming.

The terms of the CEOWBA are outlined in GSWC Preliminary Statement FFF. Without reauthorization, the CEOWBA is scheduled to terminate at the end of this rate case cycle, or whenever the surcredit (if generated) expires, whichever is later. GSWC is silent on the

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[131] GSWC Response to Data Request JE6-001, Question 6.

[132] D.13-05-011, Exhibit JP-1 (Settlement Agreement) at p. 137, Section 10.5 One-Way Balancing Account.

continuation of the CEOWBA. ORA recommends that authorized conservation expenses continue to be tracked in a capped, one-way balancing account for each ratemaking area separately. The one-way balancing accounts will track the difference between authorized conservation budgets and actual dollars spent with any unspent funds refunded to ratepayers after the end of the rate case cycle. Within 90 days of January 1, 2019 or the effective date of new rates under the Test Year 2019 GRC, GSWC should be required to file Advice Letters demonstrating the revenues collected, costs, and any over-collection. In the event of an over-collection, GSWC will include a methodology for refunding customers the unexpended funds as well as any interest accrued in the one-way conservation balancing account.

3. Presentation of Conservation Expenses in Results of Operations

GSWC includes conservation expenses in Account 781.00 Other Operation Expenses. For forecasting purposes, GSWC removes the historical conservation expenses from the calculation of the inflation- and customer-growth adjusted five-year average.

GSWC's practice of embedding conservation expenses in Account 781- Other Operation Expenses Account makes it unnecessarily difficult for ORA to track and evaluate conservation programs. GSWC should present conservation program's expenses separately from Other Operation expenses, and should track conservation program expenses in its own sub-account under Account 781. The separate presentation of conservation expenses increases transparency and allows for simpler and more accurate tracking, review, and forecasting during the GRC application process. To begin this process, ORA's Results of Operations tables present conservation as a separate expense line item. ORA recommends that GSWC implement this change in the next GRC.

4. Enhanced Conservation Spending Reporting Requirement

The Commission should require GSWC to provide a breakdown of historical conservation spending for the previous five years as part of each future GRC application. The information and formatting of this breakdown should be based on the Annual Report Schedule E-3 with several enhancements. For conservation devices, such as sprinkler nozzles and indoor

conservation kits, the quantity of units purchased and the quantity distributed should be separated. This is because the number of indoor conservation kits GSWC reported in the Annual Report Schedule E-3 included both purchased and distributed kits.[133] Reporting both purchased and distributed kits or other conservation devices together can be misleading. For example, instances where GSWC orders conservation kits in bulk at the end of the year with plans to distribute in the following year would skew reporting results. It is important to separate these numbers to distinguish GSWC's inventory of a device from the actual distribution of that device to customers for use in conserving water.

In the enhanced report on conservation, GSWC should separate each expenditure by device/program and customer class. For example, GSWC should report Ultra High Efficiency Toilet (UHET) Installation expenses for the commercial and residential classes separately. GSWC should provide its itemized conservation expenses at the outset of the GRC application to enable ORA's analysis of the requested conservation program budget.

In D.11-05-004, Resolving Phase 2 Conservation Goals and Modifying Tracking of Conservation and Low-Income Data, the Commission adopted revised reporting requirements for conservation program information contained in Schedule E-3 of the Annual Report. Beginning with the 2012 Annual Report, the revised Schedule E-3 required Class A water utilities to provide certain specific information concerning conservation programs. For all water conservation programs offered by a water utility, a utility is required to provide detailed responses to the following items:[134]

1. Brief description of each water conservation program provided, by district. This description shall include but not be limited to the type of program offered (such as provision of low-flow plumbing fixtures, leak detection, leak repair, written water conservation tips, or other similar programs to its customers) and length of time it was offered.

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[133] Phone conversation between ORA and GSWC (Edwin deLeon) on November 4, 2014.

[134] CPUC's template for Annual Reports. See: http://www.cpuc.ca.gov/PUC/Water/Annual+Reports.htm

2. Discuss how each water conservation assistance program is funded, for example, through rates charged to all customers, rates charged to customer receiving water conservation assistance, shareholder contribution, community funding, government funding, or other funding method. Explain why this type of funding was used.

3. Cost of each program.

4. The degree of participation in each district by customer group.

Appendix Conservation-A (Enhanced Annual Report Schedule E3 Reporting Requirement) specifies the formatting that the Commission should require to enhance the current Annual Report Schedule E3 reporting.

5. Conservation Budget and Programs

GSWC's Request and Forecasting Methodology

GSWC states that in forecasting the conservation budgets for Regions 1, 2 and 3, the company considered the previous level of adopted conservation dollars, historical averages and trends, conservation activity and programs reported in the most recent CPUC conservation annual report, the most recent conservation costs paid by GSWC, and industry programs and trends used to implement water conservation programs presented by other utility programs.[135] GSWC asserted that regional partners also helped determine the program offerings and funding levels.[136]

GSWC determined that the funding levels authorized in the 2013 – 2015 GRC are adequate to meet conservation goals.[137] To arrive at its recommended conservation budgets, GSWC estimated dollars for water conservation programs in each ratemaking area for the test year and escalation years by escalating the 2013 adopted amounts by the Composite Non-Labor Inflationary Rate and estimated the Customer Growth Rate.[138] Historically, GSWC has offered a significant number of programs to address indoor water use. However, now that market

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[135] GSWC Prepared Testimony of Edwin deLeon, p. 10.

[136] Ibid, p. 10.

[137] Ibid, p. 10.

[138] GSWC Prepared Testimony of Edwin deLeon, p. 20.

transformation has been achieved with the California plumbing codes and significant amounts of indoor products have been provided, GSWC is proposing to reduce program dependency on indoor water devices.[139] GSWC's proposed programs are discussed in more detail for each CSA or Ratemaking Area below under CSA Program and Budget.

6. California Urban Water Conservation Council's (CUWCC) Best Management Practices (BMPs)

GSWC's proposed programs include some or all of the following BMPs as outlined in the CUWCC's Memorandum of Understanding (MOU):[140]

Table 10-B: CUWCC List of BMPs

BMP	Description
BMP 1	Water survey programs for residential customers
BMP 2	Residential plumbing retrofit
BMP 3	System water audits, leak detection and repair
BMP 4	Metering with commodity rates for all new connections and retrofit of existing unmetered connections
BMP 5	Large landscape conservation programs and incentives
BMP 6	High efficiency clothes-washing machine financial incentive program
BMP 7	Public information programs
BMP 8	School education programs
BMP 9	Conservation programs for commercial, industrial, institutional (CII) accounts
BMP 10	Wholesale agency assistance programs
BMP 11	Retail conservation pricing
BMP 12	Conservation coordinator
BMP 13	Water waste prohibition
BMP 14	Residential ultra-low-flush toilet (ULFT) replacement programs

Single-Family Residential Audits (BMP 1)

Single family audits are designed to identify possible indoor and outdoor leaks, recommend water conserving devices, and access irrigation efficiency.[141]

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[139] Ibid, p. 11.

[140] http://www.cuwcc.org/About-Us/Memorandum-of-Understanding

[141] GSWC Prepared Testimony of Edwin deLeon, p. 34.

Large Landscape Audits (BMP 5)

GSWC is currently offering large landscape audits to large water users in certain CSAs.

Commercial Industrial and Institutional Audits (BMP 9)

This program targets the top water users in the CII class that have water usage and/or use cooling towers in their business process. GSWC currently contracts with Aquasave Inc. to perform the audits for all its CSAs.[142]

Water Conservation Kits (BMP 2)

GSWC provides water conservation kits to residential customers through its CSA offices and telephone/online requests. Each conservation kit includes one low-flow showerhead (1.5 gallons per minute, or gpm), two low-flow bathroom aerators (1.0 gpm), one low-flow kitchen aerator (1.5 gpm), toilet tummies, leak detection tablets, instructions, and water conservation tips.[143]

School Education Programs (BMP 8)

GSWC contracts with Resource Action Programs (in Region 1) and Discovery Science Center (in Regions 2 and 3) to provide school education programs. These programs include classroom education and the distribution of conservation kits for gradeschoolers between 4th and 6th grade.

High Efficiency Toilet (HET) Rebate Programs (BMP 14)

These rebates are currently being offered in areas where wholesale agencies are not providing the service at $125.00 per rebate in accordance with the A.11-0-017 Settlement Agreement. Going-forward, GSWC plans to provide rebates for the Ultra High Efficiency Toilet (UHET) products that use less than 1 gallon per flush.[144] Customers provide proof of purchase, model number, and indication of age of home and/or retrofitted device.[145]

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[142] Ibid, p. 34.

[143] Ibid, p. 28.

[144] Ibid, pp.29-30.

[145] GSWC Annual Report 2012 Schedule E-3 Description of Conservation Programs.

High Efficiency Clothes Washer (HECW) Rebate Programs (BMP 6)

These rebates are currently being offered at $125 per rebate.[146] HECW must be on the Tier 2 Consortium for Energy Efficiency (CEE) list.

California Alternative Rates for Water (CARW) Toilet Direct Program (BMP 14)

The CARW Toilet Direct Program targets low income customers who are least likely to have funds available to take advantage of rebate or voucher programs as upfront costs are a factor. This program targets customers in remote service areas or areas where HET rebate distributions are not feasible. Customer reservations are screened for 3.5 gpm / pre-1994 toilets. GSWC states that low income profile indicates greater savings opportunity indoors.[147]

Rotating Nozzles for Pop-Up Spray Heads (BMP 5)

GSWC currently offers $3.25/nozzle rebates to residential and CII customers who retrofit their existing pop-up irrigation spray heads with rotating nozzles.

Outdoor Conservation Devices (BMP 5)

Drip irrigation applies water only where it is needed, with less runoff and evaporation. Water saving hose nozzles automatically shutoff and include water saving spray settings enabling more efficiency with less water waste. GSWC is pursuing regional partnership opportunities to offer rebates on these devices.[148]

Miscellaneous and Customer Promotional Items (BMP 7)

Miscellaneous and Customer Promotional Items include newspaper advertisements, bill inserts, reminder bills inserts, literature, and promotional items such as pens, bags, shower timers, etc.

7. ORA's Analysis and Recommendation

ORA analyzed a number of sources in evaluating and developing conservation budgets for GSWC's service areas. These sources included information presented in Mr. deLeon's

[146] http://www.gswater.com/conservation/

[147] GSWC Prepared Testimony of Edwin deLeon, Schedule 4, p. 13.

[148] GSWC Prepared Testimony of Edwin deLeon, p.13.

testimony, GSWC's responses to ORA's data requests, GSWC's Urban Water Management Plans (UWMPs), GSWC's historical spending, testimony, rebuttal testimony and settlement agreements from prior GRCs. ORA reviewed industry trends and published research regarding the cost effectiveness of various conservation programs. In addition, ORA took into consideration conservation guidelines and practices stated in the CPUC's 2005 and 2010 Water Action Plans, the California Urban Water Conservation Council's Best Management Practices, and Decision 11-05-004 Resolving Phase 2 Conservation Goals and Modifying Tracking of Conservation and Low-Income Data. ORA also examined the status of each GSWC system subject to Senate Bill x7-7 (SBx7-7), which establishes new water use reduction goals.

a. Water Conservation Act of 2009 SBx7-7

SBx7-7 or the Water Conservation Act of 2009 amended the State Water Code to require a 20% reduction in urban per capita water use by December 31, 2020. Commonly known as the 20x2020 policy, the new requirements apply to urban water suppliers that meet a threshold level of number of end users or annual volume of potable water supplies[149] subject to the Urban Water Management Planning Act (UWMPA). Water purveyors subject to SBx7-7 requirements must make incremental progress toward the 20x2020 goal. Water purveyors must initially reduce per capita water use by at least 10% on or before December 31, 2015. SBx7-7 requires each urban retail water supplier to develop interim 2015 and 2020 urban water use targets in accordance with specific requirements. Urban retail water suppliers will not be eligible for state water grants or loans unless they comply with SBx7-7's requirements.

Under SBx7-7, an urban water retailer may adopt one of four different methods for determining the 2020 gallons per capita per day (GPDC) target:

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[149] Urban water supplier means a supplier, either publicly or privately owned, providing water to 3,000 or more service connections or supplying 3,000 or more acre-feet of water per year. See the California Water Code Section 10617.

Method 1. 80% of average GPCD for any continuous 10-year period ending no earlier than December 21, 2004, and no later than December 31, 2010;[150]

Method 2. Set the 2020 target as the sum of the following:

a. 55 GPCD for indoor residential water use;[151]

b. 90% of baseline CII water uses, where baseline CII GPCD equals the average for any contiguous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010;[152]

c. Estimated per capita landscape water use for landscape irrigated through residential and dedicated irrigation meters assuming water use efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Section 2.7 of Division 2 of Title 23 of the California Code of Regulations.[153]

Method 3. 95% of the applicable state hydrologic region[154] target, as set forth in the state's 20x2020 Water Conservation Plan (California Department of Water Resources 2010);

Method 4. Set the target using a method based on implementation of indoor residential BMPs plus specified reductions in outdoor residential and commercial and industrial water use.[155]

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[150] If the supplier meets at least 10% of its retail demand with recycled water, it may extend the period for calculating average baseline GPCD by up to an additional five years.

[151] DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use, February 2011, p. 39.

[152] Ibid., p. 47.

[153] This method requires the use of satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas served by residential and dedicated irrigation meters. See DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use, February 2011, p. 40.

[154] California is divided into 10 hydrologic regions. See www.water.ca.gov/floodmgmt/hafoo/csc/.

[155] DWR's 2010 UWMP guidelines (Department of Water Resources 2011).

Additionally, if baseline GPCD is greater than 100 gallons, the 2020 GPCD target can be no greater than 95% of average GPCD calculated over a continuous five-year period ending no earlier than December 31, 2007 and no later than December 31, 2010, irrespective of the target method adopted.

b. GSWC'S SBX7-7 Compliance Strategy

Eighteen of GSWC's thirty-eight systems meet the UWMPA threshold and are required to comply with the SBx7-7.[156] GSWC utilized methods one and three to identify the highest allowable interim and 2020 GPCD targets for each system. GSWC states that it has met the interim 2015 goal of a 10% reduction in GPCD water use in all of its systems subject to compliance.[157] GSWC states that it has also reached the 2020 goal of a 20% reduction in all of its Region 2 water systems. GSWC has not met the 2020 goal in three of its Region 1 systems - Cordova, Orcutt, and Simi Valley - and four of its Region 3 systems - Claremont, Cowan Heights, Placentia, and San Dimas.[158]

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[156] GSWC Prepared Testimony of Edwin deLeon, Schedule 3 Table A-1, column "Water System," systems labeled 1, 2 or 3 are the systems with at least 3,000 service connections and this is shown in Schedule 3, p. 2 – 36.

[157] Ibid, Schedule 3.

[158] Ibid, p. 19.

Table 10-C: Compliance with SBx7-7 Water Conservation Goals

Water System (CSA)	2020 GPCD Goal	GPCD Calculation				GPCD Reduction Needed to Meet Goal	2020 Compliance?
		2010	2011	2012	2013		
Region 1							
Bay Point	105	86	83	78	79	(26)	Yes
Cordova (Arden Cordova)	302	324	308	292	302	<1	No
Orcutt (Santa Maria)	221	229	228	240	243	22	No
Simi Valley	156	154	153	163	164	8	No
Region 2							
Artesia (Central Basin East)	98	100	93	98	96	(2)	Yes
Bell/Bell Gardens (Central Basin West)	Baseline per capita use ≤ 100; in compliance						Yes
Culver City (Culver City)	142	135	135	138	140	(2)	Yes
Florence-Graham (Central Basin West)	Baseline per capita use ≤ 100; in compliance						Yes
Norwalk (Central Basin East)	107	97	100	103	100	(7)	Yes
Southwest	118	106	103	103	96	(22)	Yes
Region 3							
Barstow	209	211	201	196	173	(36)	Yes
Claremont	275	270	272	288	289	14	No
Cowan Heights	448	343	358	385	478	30	No
Placentia	134	124	115	121	136	2	No
San Dimas	185	192	183	195	189	4	No
South Arcadia	124	109	106	111	110	(14)	Yes
South San Gabriel	100	84	81	83	83	(17)	Yes
West Orange	140	129	127	130	129	(11)	Yes

GSWC did not propose any specific programs to address the systems that have not yet met their 2020 GPCD goal. As described in the Social Norm Messaging section, ORA proposes that the company implement a pilot social norm messaging program in the Claremont system to reduce per-capita water usage. In the Santa Maria ratemaking area, GSWC should focus its conservation programs on the Orcutt system to achieve its 20x2020 water reduction target. In Region 3, GSWC should focus conservation programs on Cowan Heights to meet its 20x2020 target.

c. Program Verification

Approaches to water demand management are either price-based or non price-based. Price-based approaches include volumetric pricing, where water use is metered and prices are used to alter behavior. Non price-based approaches alter behavior directly and indirectly. Technological adoption is one non-price program, although it is often coupled with rebates. Water customers are often motivated to adopt technologically efficient devices as a result of environmental attitudes rather than cost savings. Other non-price approaches include: rationing, school education programs, public outreach, and moral persuasion.

A recent study comparing price and non-price approaches to urban water conservation emphasized the point that water savings for rebate programs are often smaller than initially estimated.[159] In some instances, customers do not install the devices they are given or redeem through rebates. GSWC customers have stated several reasons for not installing devices including poor condition of plumbing, lack of tools, and products not matching décor.[160] Another factor impacting estimated water savings is known as the "rebound effect." For example, low flow showerheads result in longer showers, low flow toilets result in more flushing, and front load clothes washers' result in more cycles. Some customers go further and uninstall devices that they think do not provide adequate water pressure or have inferior performance compared to the replaced device. In these cases, there is the potential for greater cost to the company, and ultimately to its ratepayers, because costs invested to provide water efficient devices or rebates ultimately did not produce expected water savings.

Alongside developing programs to promote the efficient use of water, GSWC should also measure the effectiveness of these non-priced based programs by conducting program evaluation. GSWC's conservation team is made up of three employees: a Water Conservation Analyst, a Water Conservation Associate, and a Water Use Efficiency Manager. The job descriptions for these positions suggest GSWC has in-house capacity to monitor conservation program effectiveness. The Water Conservation Analyst position requires a Bachelor's degree

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[159] Olmstead, S. M., and R. N. Stavins (2009), Comparing price and nonprice approaches to urban water conservation, *Water Resour. Res.*, 45, W04301, doi:10.1029/2008WR007227

[160] A.11-07-017 Rebuttal Testimony of Edwin deLeon, April 2012, p. 21.

with preference for a MBA and five-years of water conservation related experience. The job description states that the Analyst: "Prepares and/or reviews statistical and text reports and makes recommendations for water conservation, management and water use efficiency."[161] The Water Conservation Associate job description duties include performing "tracking and monitoring of conservation program activities."[162] Without program evaluation, GSWC and the Commission cannot effectively evaluate the level of success of authorized programs and make the necessary adjustments for future programs.

It is not easy to empirically establish saturation rates for device and appliance usage due to the need to conduct surveys and visits at customer sites. Nevertheless, at a minimum, GSWC conservation staff has the capability to survey the usage of customers who received conservation devices or services, including audits, conservation kits, sprinkler nozzles, irrigation controllers, and direct appliance installations. GSWC can compare water use one year before and one year after implementation to track how much water is being saved on average. Analysis on cost effectiveness is important for meeting 20x2020 goals and to ensure ratepayer-funded dollars are producing the highest possible savings. This information can also be analyzed to determine whether decreases in water use are due to one particular device, behavioral changes, or technological innovation. Assessing conservation program participation and savings gives GSWC the information needed to design effective programs and target users who are likely to participate.

In summary, research shows that the benefits from rebate programs can fall short of initial water saving estimates. Given GSWC's request for over $1,000,000 per year in conservation program funding, the Commission should require GSWC to track the costs and monitor the success of the program and report them to the Commission in the next GRC.

d. Social Norm Messaging

A burgeoning practice among water utilities is the implementation of programs to provide customized usage information to residential consumers. This often takes the form of social norm

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[161] GSWC's Response to ORA's Supplemental Data Request, Attachment #2.

[162] GSWC's Response to ORA's Supplemental Data Request, Attachment #2.

messaging – i.e., providing households and businesses with periodic information on their current water usage and comparing it to their historical consumption, the average consumption of similar households, and the consumption of the most efficient similar household. This data is coupled with actionable information on ways to use water around the home more efficiently. Social norm messaging aims to motivate households to reduce their water use through changes in behavior or adoption of more water efficient technology. Social norm messaging programs have been adopted by energy utilities throughout the United States in recent years, though less prevalent among water utilities.[163]

The State Water Resources Control Board supported social norm messaging regarding water conservation in Resolution No. 2014-0038, stating: "The State Water Board commends water suppliers that have increased conservation messaging and adopted innovative strategies to enhance customer awareness of water use, *such as applications that let customers compare their water use to water use by others…*" [emphasis added].

A 2013 study reviewed the East Bay Municipal Utility District's (EBMUD) pilot of the WaterSmart home reports, and found a 5.6% reduction on average at the end of a one-year pilot study, relative to the control group that did not receive the reports.[164] The study found a greater response by higher water users with no "boomerang effect" whereby the customer increases consumption after receiving a report stating that he uses less water than his neighbors. The study also found that people who had home reports seemed to engage in other efficiency programs, which the evaluation literature refers to as "uplift" or "channeling."[165]

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[163] Mitchell, David and Thomas Chesnutt, 2013. "Evaluation of East Bay Municipal Utility District's Pilot of WaterSmart Home Water Reports." Report to California Water Foundation and East Bay Municipal Utility District.

[164] Baerenklau, K.A., K.A. Schwabe, and A. Dinar, 2013. "Eastern Municipal Water District Water Pricing Study Final Report." Report to Eastern Municipal Water District. April. Department of Environmental Sciences, University of California Riverside.

[165] Mitchell, David and Thomas Chesnutt, 2013. "Evaluation of East Bay Municipal Utility District's Pilot of WaterSmart Home Water Reports." Report to California Water Foundation and East Bay Municipal Utility District. p. 7

A second study sampled 100,000 households in Atlanta using a control group and three treatments: (1) one group just received technical advice on saving water; (2) one group received the same technical advice but also a message from the general manager appealing to them to save water; and (3) one group received the technical advice, but also the social norm comparison.[166] The study found that groups one and two did not change water use at all, but that group three, reduced water use by about 5% the month after the social norm comparison was given. The greater response came from high-volume water users, and was also observed in high-income water users. This impact on high-income water users is significant because high-income water users tend to be less responsive to conservation pricing when it comes to water use.

The study also found some waning effect. This means that after four months, there was a 30% reduction in the initial savings, and after a year there was a 50% reduction. However, the 50% reduction stayed constant over four to six years thereafter. The study concludes that if the utility focused its messaging efforts on customers above the median-volume water user, it would achieve 88% of the savings at 66% of the costs.[167]

In response to a data request regarding a social norm messaging program for residential customers, GSWC indicated that the company had considered implementing such a program.[168] GSWC determined that the company does not have the expertise to perform a social norm analysis internally and therefore has not performed a cost analysis for initiating such a program. GSWC has not assessed the specific operational changes and costs, but determined several anticipated expenses associated with operating the program internally:

- Increased labor costs in order to reprogram customer bills;
- Increased printing costs (space limitations on customers' bills may necessitate more pages);

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166 Ferraro, Paul J., and Michael K. Price. 2009. "Using Non-Pecuniary Strategies to Influence Behavior: Evidence from a Large Scale Field Experiment." http://www2.gsu.edu/~wwwcec/docs/CCWS_2010_revised.pdf.

167 Ibid, p. 20.

168 GSWC Response to ORA Data Request JE6-006, Question 5.

- Increased postage costs;
- Purchase of needed program modules (software);
- Increased staffing to hire a programmer.[169]

GSWC met with the company WaterSmart Software to discuss their social norm messaging products and services. California agencies that use WaterSmart software include the City of Sacramento, East Bay Municipal Utilities District, Alameda County Water District, Marin County Municipal Water District, and Los Angeles Department of Water and Power.[170] WaterSmart estimated an initial cost for a six-month pilot program of 1,000 residential homes to be $20,000.[171] GSWC consulted with other utilities that have already implemented the WaterSmart program and derived the following internal costs and impacts:

- WaterSmart Software Pilot program assessment:
    - Cost per customer/month = $3.33 vendor cost ($20,000 total cost/6 months/1000 customers);
    - WaterSmart estimated savings per customer/month = 5%;
        - 0.85 CCF (Avg. 17 CCF/Customer)
    - Revenue Cost/month = $3.14 (R3 rate Tier 2 at $3.698).

GSWC also developed a list of potential operational changes that have not been assessed for their cost:

- Monthly billing/database generation;
- Verification billing system changes;
- Increase staffing and/or hours to manage various aspects of the program;
- Possibly change service area billing to monthly from bi-monthly;

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[169] GSWC Response to ORA Data Request JE6-006, Question 5.

[170] http://www.yubacity.net/documents/Agendas/2014/07-15-14-council/07-15-14-Agenda-Item-14.pdf

[171] GSWC Response to ORA Data Request JE6-006, Question 5.

- Opt-in program design and marketing;
- Increase in customer service calls responding to inquiries;
- Increase in customer calls dissatisfied with the information provided;
- Increase in customer complaints;
- Increase in service calls for meter checks;
- Increase in water audit requests based on report information;
- Possible need for increase in field staff or contractors; and
- Possible increase in vehicles and equipment.

ORA proposes that the Commission authorize a social norm messaging pilot program for GSWC in the Claremont System. ORA proposes a budget of $20,000 for the six month pilot program offered by WaterSmart Software. As shown in **Table 10-C**, Claremont still needs to achieve a reduction in GPCD water use to reach its 20x2020 goal. Claremont is also a good candidate because it has high volume water users. As described above, the study for EBMUD found evidence that the magnitude of the water savings scales with the level of household water use. Households in the top quartile of water use save 1% more on average, while households in the bottom quartile of water use save 3% less on average than households in between these two categories.[172]

GSWC should quickly develop a pilot program, including designing and identifying the costs and water savings, which can then be evaluated by ORA. ORA is open to discussing the details of the program. Given that this would be a new program with many uncertainties, GSWC should track the costs and monitor the success of the program as well as note any operational issues and report them to the Commission in its next GRC. The report should include, but not be limited to, the program's participation rate, costs, savings, and impact, if any, on water conservation. In the

[172] Mitchell, David and Thomas Chesnutt, 2013. "Evaluation of East Bay Municipal Utility District's Pilot of WaterSmart Home Water Reports." Report to California Water Foundation and East Bay Municipal Utility District, p.iv.

report, GSWC should also discuss if it needs to make further adjustments to the program in order to make it more cost-effective.

8. CSA Programs and Budgets

As described above, Golden State's recommended budgets are derived by escalating the previously authorized budgets for each ratemaking area by an inflation factor to arrive at Test Year 2016 numbers. GSWC then allocates that total number per ratemaking area to various programs.

In many instances, ORA accepts GSWC's level of program implementation, but bases the budget on the actual unit cost for the program or device, rather than escalating the previously adopted budget.

ORA's methodology focused on increasing programs to address outdoor water use. On average, in peak warmer months, outdoor water use contributes to 50 percent of the water used every day by urban residents.[173] Remaining programs that address indoor use are targeted at low-income customers. Additionally, ORA recommends reducing or removing programs without measurable savings. Further, consideration was given to whether program activity levels are higher than can reasonably be achieved given the district's characteristics and past experience. ORA also focused on providing continuity over rate case cycles, so that budgets are not increasing or decreasing by more than 50%, without explanation. ORA recommends that within the rate case cycle, funds that are not used in one year be used in a subsequent year. Budgets should not be transferrable across ratemaking areas.

ORA recommends the continuation of caps on the following areas: School Conservation Education Program, Public Information, and High Efficiency Toilet (HET) Distribution Programs. The numbers proposed below should constitute an annual cap for that programmatic expense.

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[173] http://www.swrcb.ca.gov/press_room/press_releases/2015/pr020315_rgcpd_dec.pdf

a. Region 1

For each ratemaking area, ORA supports school education program where requested. Educating students through classroom instruction benefits customers. School education programs reach the youngest water users at an early age and enforce the need to engage in water conservation as a life-long behavior.[174]

Small differences between GSWC and ORA estimates are due to differences in forecasting methodology. GSWC allocates the total ratemaking area budget to the various programs. GSWC's methodology is a top down approach to budgeting, and its budgets for programs like School Education, Direct Toilet Installation, and Audits are therefore estimates. Unless otherwise noted, ORA accepted GSWC proposed level implementation (e.g., number of students or number of devices) and used the per-unit cost agreed upon in the current contracts to derive the proposed budget.

b. Arden Cordova

GSWC requests a budget of $107,488 for Regional Water Authority Dues, School Education Programs, Water Based Irrigation Controller (WBIC) Rebates, Sprinkler Nozzles, Commercial, Industrial and Institutional (CII) Direct Installs, Large Landscape Audits, CII Audits, and Customer Promotional Items. ORA recommends a budget of $79,027. **Table 10-D** compares GSWC's Budget Request and ORA's Recommendation for Arden Cordova.

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[174] CUWCC BMP 2.2 School Education Programs, http://www.cuwcc.org/Resources/Memorandum-of-Understanding/Exhibit-1-BMP-Definitions-Schedules-and-Requirements/BMP-2-Education-Programs

Table 10-D: GSWC and ORA Proposed Conservation Program Budgets for Arden Cordova

Conservation Programs	Subject to cap	2016 GSWC Proposed	2016 ORA Proposed	GSWC> ORA
Regional Water Authority Annual Dues		$18,265	$0	$18,265
Water Wise School Education Program Based on 270 Students Foundational BMP	X	$6,750	$6,750	$0
Weather Based Irrigation Controllers Rebates (In-House)		$2,000	$2,000	$0
Free Sprinkler Nozzles (Residential)		$8,000	$7,995	$5
Free Sprinkler Nozzles (Commercial)		$12,000	$11,700	$300
Direct Install – CII (HET, Aerators)		$12,717	$3,000	$9,717
Large Landscape Audits		$17,820	$17,820	$0
CII Audits		$27,674	$27,500	$174
Misc. and Customer Promotional Items	X	$2,262	$2,262	$0
Total		**$107,488**	$79,027	$28,461

Historically, customers in the Arden Cordova CSA have not been metered and have been billed at flat rates. GSWC's 2010 Urban Water Management Plan for the Arden Cordova System states: "Currently, GSWC is in the process of installing meters on all service connections as required by AB 2572. Once meters are installed, service connections are billed volumetrically…"[175] As of the end of 2013, there were 11,775 metered customers and 3,912 flat rate customers in Arden Cordova.[176] GSWC estimates unmetered to metered conversion at a rate of 313 customers per year for 2015-2017.[177] Starting at GSWC's estimate of 2,973 flat rate customers in 2015, at the rate of 313 conversions it will take over nine years to convert all flat rate services to metered. In response to ORA Data Request JE6-005 Question 4, GSWC

[175] UWMP Chapter 7.3.1.4 Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections. Assembly Bill 2572 requires urban water suppliers to install water meters on all municipal and industrial water service connections that are located in their service area by January 1, 2025.

[176] GSWC Workpaper "ACSALE14," "Table 4-C" tab.

[177] GSWC Workpaper "ACSALE14," "Customer Forecast" tab.

indicated there is no plan to implement tiered rates in Arden Cordova until all the conversions are finished.[178] Flat rates do not promote water conservation or send the desired price signals to the customer. In areas where flat rates are used, there is no significant price motivation for the customer to conserve.

The importance of meter conversions, or meter retrofits, is highlighted in the Best Management Practices (BMP) listed in the CUWCC Memorandum of Understanding (MOU), to which GWSC became a signatory in 1991.[179] Section 1.3F of the MOU includes a suggested timetable for meter retrofits.

Table 10-E: CUWCC MOU Section 1.3.F – Meter Retrofit Plan

Target Dates for "On Track" Compliance with BMP 4	
Percent of unmetered accounts retrofitted	**Agency signed the MOU prior to December 31, 1997**
10 percent	December 31, 2000
24 percent	December 31, 2002
42 percent	December 31, 2004
64 percent	December 31, 2006
90 percent	December 31, 2008
100 percent	July 1, 2009

GSCW has chosen the Flex Track method of BMP compliance, which allows signatories to implement a set of measures that achieve equal or greater water savings as compared to specific BMP measures. GSWC is not bound by the MOU's target dates for retrofits; however the designation of meter retrofits as a foundational BMP illustrates its importance. MOU Section 1.3.F (formerly BMP 4) states that utilities may "[a]ssume meter retrofits and volumetric rates combined will result in a 20% reduction in demand for retrofitted accounts."[180] In ORA's own

[178] GSWC Response to DR A1407006-ORA-JE6-005 Question 4.

[179] GSWC Prepared Testimony of Edwin deLeon, p. 7.

[180] CUWCC MOU Section 1.3 Metering With Commodity Rates For All New Connections And Retrofit Of Existing Connections, http://www.cuwcc.org/Resources/Memorandum-of-Understanding/Exhibit-1-BMP-Definitions-Schedules-and-Requirements/BMP-1-Utility-Operations-Programs.

review of water use before and after customer meter conversion, average water use reduction is closer to 32% per connection after retrofit.[181]

GSWC requests a budget of $18,265 for Regional Water Authority (RWA) dues. The RWA is an interest group that provides services to partners, and is not a government entity or water agency. There is no evidence GSWC has to pay dues. Rather, it is an optional service that GSWC chooses to use. The RWA Water Efficiency Program (WEP) provides two categories of products and services to water interests. Category 1 Programs are core subscription services that address water efficiency activities common to all participants. The program includes activities such as public information, school education, marketing coordination, grant applications, and technical assistance.[182] WEP members fund Category 1 through annual dues to support direct and labor costs of program implementation. $224,000 of RWA's $448,000 budget for Category 1 programs is spent on WEP labor expenses.[183] ORA does not support this program as GSWC could not quantify the number of its customers that benefitted from these programs and RWA dues, RWA programming is duplicative of GSWC's requested budget, and it provides few additional benefits to GSWC's conservation program.

ORA supports GSWC's proposed budget of $6,750 (270 students at $25/each) for classroom education.

ORA recommends reducing CII HET Direct Install from the requested $12,717 to $3,000 (10 installations at $300/each). GSWC did not spend any money on CII HET Direct Install in 2012 or 2013 and has not provided evidence that demand exists for this service. As Arden Cordova has not yet met its 20x2020 goals, ORA proposes to instead focus funding on addressing outdoor water use.

Large Landscape and CII audits can be a beneficial and cost effective program to large water users if audit recommendations are implemented. For example, CII audits can identify indoor and outdoor leaks. Similarly, Large Landscape audits can help determine whether an efficient

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[181] ORA's testimony on Customer and Sales Forecasts (Chapter 2 of this report).

[182] GSWC Prepared Testimony of Edwin deLeon, pp.28-29.

[183] GSWC Prepared Testimony of Edwin deLeon, Schedule 6, p. 41.

irrigation system is in place, among other things. ORA recommends a budget of $17,820 (12 audits at $1,485/each) for Large Landscape Audits and $27,500 (11 audits at $2,500) for CII Audits.

ORA recommends that GSWC's Public Outreach Program costs continue to be subject to a cap of $0.75 per customer. GSWC requests an outreach budget of $2,262, which equates to a cost of $0.14 per customer using GSWC's estimated 2016 customer forecast of 16,190. ORA supports an outreach budget of $2,262.

c. Bay Point

GSWC requests a budget of $12,252 for School Education and Public Outreach. ORA recommends a budget of $12,247. **Table 10-F** compares GSWC's budget request and ORA's recommendation.

Table 10-F: Proposed Conservation Program Budgets for Bay Point

Conservation Programs	Subject to cap	2016 GSWC Proposed	2016 ORA Proposed	GSWC>ORA
Water Wise School Education Program Based on 304 Students	X	$10,037	$10,032	$5
Program Marketing (CCWD Programs and GSWC info)	X	$2,215	$2,215	$0
Total		**$12,252**	**$12,247**	$5

ORA recommends a budget of $10,032 for School Education Programs (304 students at $33/each).

GSWC partners with the Contra Costa Water District to offer various conservation programs such as rebates to purchase and install water efficient products.[184] GSWC requests a budget of $2,215 for Program Marketing. Using GSWC's estimated 2016 customer forecast of 5,071, this equates to a cost of $0.44 per customer. ORA supports GSWC's budget of $2,215 as a cap on Program Marketing.

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[184] http://www.gswater.com/bay-point/download/conservation_rebates/Bay%20Point%20Conservation%20Rebates.pdf

As Bay Point has met its 20x2020 goals, ORA supports a budget of $12,247 for School Education and Marketing Programs.

d. Clearlake

GSWC requests a budget of $4,143 for School Education and a Toilet Direct Install program for California Alternative Rates for Water customers (CARW Toilet Direct Install). ORA recommends a budget of $3,870. **Table 10-G** compares GSWC's budget request and ORA's recommendation.

Table 10-G: GSWC and ORA Proposed Conservation Program Budgets for Clearlake

Conservation Programs	Subject to cap	2016 GSWC Proposed	2016 ORA Proposed	GSWC>ORA
Water Wise School Education Program Based on 30 Students	X	$976	$990	$(14)
CARW Toilet Direct Install		$3,167	$2,880	$287
Total		**$4,143**	**$3,870**	**$281**

ORA recommends a budget of $990 for School Education Programs (30 students at $33/each). ORA supports the toilet direct installation program targeted at CARW customers. ORA recommends a budget of $2,880 (12 toilets at $240/each) for toilet installation. As Clearlake does not have significant landscape usage and has met its 20x2020 goals, ORA supports a budget of $3,870 for School Education and CARW Toilet Direct Install program.

e. Los Osos

GSWC requests a budget of $8,964 for School Education, Outdoor Conservation Devices, and a CARW Toilet Direct Install program.

Table 10-H: Proposed Conservation Program Budgets for Los Osos

Conservation Programs	Subject to cap	2016 GSWC Proposed	2016 ORA Proposed	GSWC>ORA
Water Wise School Education Program Based on 68 Students	X	$2,259	$2,244	$15
Conservation Devices – Outdoor		$1,030	$0	$1,030
CARW Toilet Direct Install		$5,675	$5,520	$155
Total		**$8,964**	**$7,764**	**$1,200**

ORA recommends a budget of $2,244 for School Education Programs (68 students at $33/each).

ORA supports the CARW Toilet Direct Install program. ORA recommends a budget of $5,520 (23 toilets at $240/each) for toilet installation.

GSWC requests $1,030 for outdoor conservation devices. GSWC spent an average of $288 per year between 2011-2013 on outdoor conservation devices. ORA supports a budget of $7,767 for School Education and CARW Toilet Direct Installation.

f. Ojai

GSWC requests a budget of $9,559 for School Education, Outdoor Conservation Devices, and Residential Sprinkler Nozzles. ORA recommends a budget of $8,790.

Table 10-I: Proposed Conservation Program Budgets for Ojai

Conservation Programs	Subject to cap	2016 GSWC Proposed	2016 ORA Proposed	GSWC>ORA
Water Wise School Education Program Based on 105 Students	X	$1,898	$1,890	$8
Conservation Devices – Outdoor		$400	$400	$0
Free Sprinkler Nozzles (Residential)		$7,261	$6,500	$761
Total		**$9,559**	**$8,790**	**$769**

ORA recommends a budget of $1,890 for School Education Programs (105 students at $18/each).

ORA recommends a budget of $400 for outdoor conservation devices and $6,500 (2000 nozzles at $3.25/each) to address outdoor water usage in Ojai.

g. Santa Maria

GSWC requests a budget of $47,830 for School Education, sprinkler nozzles for residential and commercial customers, and a CARW Toilet Direct Install program. ORA recommends a budget of $45,842 for the same programs.

Table 10-J: Proposed Conservation Program Budgets for Santa Maria

Conservation Programs	Subject to cap	2016 GSWC Proposed	2016 ORA Proposed	GSWC>ORA
Water Wise School Education Program Based on 394 Students	X	$13,012	$13,002	$10
Free Sprinkler Nozzles (Residential)		$6,052	$5,850	$202
Free Sprinkler Nozzles (Commercial)		$3,024	$2,990	$34
CARW Toilet Direct Install		$25,742	$24,000	$1,742
Total		**$47,830**	**$45,842**	**$1,988**

ORA recommends that GSWC focus its conservation efforts within the Santa Maria ratemaking area on the Orcutt system in order to meet the 20x2020 water use goal. Keeping a similar total budget as authorized in the last rate case cycle, but shifting focus toward outdoor water use, will achieve the same amount of savings for less cost.

ORA recommends a budget of $13,002 for School Education Programs (394 students at $33/each).

ORA recommends a budget of $5,850 (1,800 at $3.25/each) for residential sprinkler nozzles and $2,990 for commercial sprinkler nozzles (920 at $3.25/each) to address outdoor water use.

ORA supports the CARW Toilet Direct Install program. ORA recommends a budget of $24,000 (100 toilets at $240/each) for toilet installation.

h. Simi Valley

GSWC requests a budget of $47,047 for School Education, Outdoor Conservation Devices, sprinkler nozzles for residential and commercial customers, large landscape audits, and marketing. ORA recommends a budget of $46,434. **Table 10-K** compares GSWC's budget request and ORA's recommendation.

Table 10-K: Proposed Conservation Program Budgets for Simi Valley

Conservation Programs	Subject to cap	2016 GSWC Proposed	2016 ORA Proposed	GSWC>ORA
Water Wise School Education Program Based on 608 Students	X	$10,946	$10,944	$2
Conservation Devices – Outdoor		$4,148	$4,148	$0
Free Sprinkler Nozzles (Residential)		$8,195	$8,125	$70
Free Sprinkler Nozzles (Commercial)		$8,746	$8,450	$296
Large Landscape Audits		$9,155	$8,910	$245
Marketing and local partnerships	X	$5,857	$5,857	$0
Total		**$47,047**	**$46,434**	**$613**

As shown in **Table 10-C**, Simi Valley has not yet reached its 20x2020 GPCD water reduction target. In the previous GSWC GRC, a large part of Simi Valley's budget was allocated for HET rebates and public information outreach. Keeping a similar total budget in this rate case cycle, but shifting focus toward outdoor water use will help Simi Valley in meeting the 20x2020 GPCD target.

ORA recommends a budget of $10,944 for School Education Programs (608 students at $18/each).

ORA supports GSWC requested budget of $4,148 for outdoor conservation devices.

ORA recommends a budget of $8,125 (2,500 units at $3.25/each) for residential sprinkler nozzles and $8,450 (2,600 units at $3.35/each) for commercial sprinkler nozzles. ORA supports GSWC's proposed six Large Landscape Audits. Based on a historical cost of $1,485 per audit, ORA proposes a budget of $8,910 for Large Landscape Audits.

Based on a cost of $0.44 per customer, and GSWC's estimated 2016 customer forecast of 13,368, ORA supports GSWC requested $5,857 budget as a cap for program marketing and partnerships.

i. Region 2

GSWC requests a budget of $389,511 for School Education, Outdoor Conservation Devices, CARW customers Toilet Direct Install, CII Direct Install, Sprinkler Nozzles for Residential and Commercial customers, Large Landscape and CII Audits, Community Partnership Events, Regional Partner Programs, and Public Outreach. ORA recommends a budget of $209,816. **Table 10-L** compares GSWC's budget request and ORA's recommendation.

Table 10-L: Proposed Conservation Program Budgets for Region 2

Conservation Programs	Subject to cap	2016 GSWC Proposed	2016 ORA Proposed	GSWC>ORA
Discovery Science Center School Education Program Based on 6,000 Students	X	$96,000	$48,000	$48,000
Conservation Devices – Outdoor		$12,257	$0	$12,257
CARW UHET Direct Install		$56,678	$55,200	$1,478
Direct Install – CII (HET, UHET, Aerators)		$115,215	$30,000	$85,215
Free Sprinkler Nozzles (Residential)		$8,000	$7,800	$200
Free Sprinkler Nozzles (Commercial)		$15,000	$14,950	$50
Large Landscape Audits – 12 @ $1,485 per audit. (Estimated Average cost)		$34,498	$17,820	$16,678
CII Audits		$15,000	$27,500	-$12,500
Community Partnership Events		$4,453	$0	$4,453
Regional Partner Programs		$20,360	$0	$20,360
Marketing	X	$8,546	$8,546	$0
Misc. and Customer Promotional Items	X	$3,504	$0	$3,504
Total		**$389,511**	**$209,816**	**$179,695**

GSWC contracts with Discovery Science Center to educate fourth, fifth, and sixth grade students in Regions 2 and 3 on water conservation practices. The following table presents the breakdown of costs for Discovery Science Center's programs in Region 2 in 2013.

Table 10-M: Discovery Science Center Proposal for Classroom Education 2013[185]

Grade	Students	Booklets ($2 each)	Student kits ($12.16 each)	Program Cost ($10/student)	Total
4th	2,000	$4,000	$24,230	$20,000	$48,230
5th/6th	4,000	$8,000	--	$40,000	$48,000
Total	**6,000**	**$12,000**	**$24,320**	**$60,000**	**$96,320**

Fourth grade students are given a water conservation kit as part of Discovery Science's program. The water conservation kits consists of one 1.5 gpm showerhead, one 1.5 gpm kitchen aerator, a 1.0 gpm bath aerator, one shower timer with logo, one packet of leak detection tablets, and one roll of plumber's tape, all packed in a flow-test bag. GSWC has not provided any data or survey results estimating the level of installation of the items in the kits. Further, the conservation kits are already available to all GSWC customers through Schedule 14.1. GSWC distributed an average of 5,873 indoor water conservation kits per year in Region 2 between 2011-2013. ORA recommends offering the program to 2,000 fourth graders and 2,000 sixth graders including the $2/student booklets, and eliminating the distribution of kits. ORA recommends a budget of $48,000 (4,000 students at $12/each).

ORA supports the CARW Toilet Direct Install program. ORA recommends a budget of $55,200 (230 toilets at $240/each) for toilet installation.

ORA recommends a budget for CII Direct Installations of $30,000 (100 installations at $300/each). GSWC spent an annual average of $34,056 on CII Direct Installs between 2011-2013. Given that Region 2 has exceeded its water conservation targets in all systems subject to 20x2020 compliance, and that CII direct installs benefit a proportionately small number of customers and result in lower savings than outdoor water devices, ORA recommends reducing GSWC's requested budget from $115,215 to $30,000.

ORA recommends a budget of $7,800 (2,400 at $3.25/each) for residential sprinkler nozzles and $14,950 (4,600 at $3.25/each) for commercial sprinkler nozzles to continue to encourage outdoor water use savings.

[185] GSWC Prepared Testimony of Edwin deLeon, Schedule 4.

As stated earlier, Large Landscape and CII audits can be a beneficial and cost effective program to large water users if audit recommendations are implemented. ORA recommends a budget of $17,820 (12 audits at $1,485/each) for Large Landscape Audits and $27,500 (11 audits at $2,500) for CII Audits.

ORA recommends removing GSWC's requested budget for regional and community partnerships and for promotional items. GSWC has not supported this request with any evidence that these expenditures result in water savings or reduced customer bills.

Based on a cost of $0.08 per customer and GSWC's estimated 2016 customer forecast of 101,140, ORA supports GSWC's request for $8,546 for its marketing budget.

j. Region 3

GSWC requests a budget of $443,954 for School Education, Outdoor Conservation Devices, CARW Toilet Direct Install, CII Direct Install, Sprinkler Nozzles for Residential and Commercial customers, Large Landscape and CII Audits, Turf Removal Inspection, Marketing, Conservation Printing and Mailing, Demonstration Garden Maintenance, Event Sponsorship, and Supplies.

Table 10-N: Proposed Conservation Program Budgets for Region 3

Conservation Programs	Subject to cap	2016 GSWC Proposed	2016 ORA Proposed	GSWC>ORA
Discovery Science Center School Education Program Based on 6,000 Students	X	$96,320	$48,000	$48,320
Conservation Devices – Outdoor		$13,200	$13,200	$0
CARW UHET Direct Install		$60,726	$60,000	$726
UHET Direct Install – Res		$49,286	$0	$49,286
Direct Install – CII (HET, UHET, Aerators)		$60,000	$45,000	$15,000
Free Sprinkler Nozzles (Residential)		$22,164	$22,100	$64
Free Sprinkler Nozzles (Commercial)		$15,000	$14,950	$50
Large Landscape Audits		$28,699	$28,215	$484
CII Audits		$45,227	$45,000	$227
CII Large Landscape Audits		$18,734	$30,000	-$11,266
Turf Removal Inspection		$5,000	$5,000	$0
Marketing	X	$11,407	$11,407	$0
Conservation Printing & Mailing	X	$1,775	$1,775	$0
Demonstration Garden Maintenance		$3,509	$1,000	$2,509
Event Sponsorship		$10,687	$0	$10,687
Event & Tour Supplies		$2,220	$500	$1,700
Social Norm Messaging Program		$0	$6,667	-$6,667
Total		**$443,954**	**$332,814**	**$97,807**

For the same reason described in ORA's testimony regarding Region 2, ORA recommends a school education budget of $48,000. ORA supports offering school education programs through Discovery Science Center to 2,000 fourth graders and 2,000 sixth graders at a cost of $12 per student ($10/each for programming and $2/each for materials).

ORA supports the toilet direct program targeted at CARW customers. ORA recommends a budget of $60,000 (250 toilets at $240/each) for toilet installation.

ORA recommends a budget of $22,100 (6,800 nozzles at $3.25) for residential sprinkler nozzles and a budget of $14,950 (4,600 at $3.25) for commercial sprinkler nozzles. These programs

have shown significant customer participation in recent years and will help GSWC reduce outdoor water use to reach its 20x2020 goals.

ORA supports a budget of $45,000 for CII Direct Installations. This estimate is consistent with the 2011-2013 three year average of recorded CII Direct Installation expenses in Region 3 of $45,754.

As mentioned earlier, ORA recommends a budget of $28,215 (19 audits at $1,485/each) for Large Landscape Audits, $45,000 (18 audits at $2,500) for CII Audits, and $30,000 (12 audits at $2,500) for CII Large Landscape Audits. ORA accepts GSWC's proposed number for each type of audit, and bases the budget on the current cost per audit.

As discussed in the section on social norm messaging, ORA recommends a budget of $20,000 to implement a six-month pilot program in the Claremont system. ORA divides this cost evenly over the three year rate case cycle to arrive at an annual budget of $6,667. The budget for social norm messaging should be capped at $20,000 for three years and is not transferrable across other programs.

D. CONCLUSION

For GSWC, an aggressive conservation program at this time is not necessary, particularly in ratemaking areas where 2013 GPDC results exceeded or are on track to meeting 20x2020 goals. At the same time, a basic cost effective conservation program is necessary to support continued conservation behavior. Extending Golden State's adopted conservation expenses from the last GRC, with appropriate adjustments, to arrive at an average three year budget will provide adequate funding for all necessary and cost-effective conservation activities.

Chapter 11: SPECIAL REQUEST #3 – CHEMICAL COSTS IN MCBA

A. INTRODUCTION

In D.08-08-030 and D.09-05-005, the Commission adopted settlement agreements between ORA and GSWC creating the company's current revenue decoupling mechanism. Contained within a larger and continuing pilot program, the decoupling mechanism consists of a Water Revenue Adjustment Mechanism (WRAM) and a Modified Cost Balancing Account (MCBA). WRAM permits recovery or crediting of the difference between actual and adopted quantity charge revenues and MCBA tracks the difference between actual and adopted variable costs for purchased power, purchased water, and pump tax. In this proceeding, GSWC's Special Request #3 requests to broaden the MCBA to track the difference between actual and adopted chemical costs.

B. SUMMARY OF RECOMMENDATIONS

The Commission should not approve GSWC's Special Request #3. Chemical costs are only a small percentage of the revenue requirement compared to the other variable supply costs captured in the MCBA, there is no simple direct or inverse relationship between chemical costs and water production, and it is better for ratepayers to continue to incentivize minimizing chemical costs.

C. DISCUSSION

GSWC's forecasted total company variable costs currently tracked in the MCBA (purchased power, purchased water, and pump tax) total to over 26% of the company's proposed 2016 revenue requirement. In contrast, GSWC's forecasted total company chemical costs for 2016 add to less than 1%.[186]

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[186] GSWC's Report on Results of Operations and SOE Workpapers, Table 4-B. MCBA Variable Costs / Revenue Requirement = (54,318.3 + 11,192.8 + 20,292.7) / 321,024.2 = 26%; Chemicals / Revenue Requirement 2,913.8 / 321,024.2 = 0.9%.

1 **Table 11-A** below provides a comparison between GSWC's various expense estimates and
2 requested total revenue requirement, by ratemaking area and for Test Year 2016.

3 **Table 11-A: GSWC's Test Year Expenses, and Revenue Requirement**

Ratemaking Area	Test Year 2016, GSWC Proposed ($000)				
	Purchased Water	Purchased Power	Pump Tax	Chemicals	Revenue Requirement
Arden Cordova	0	863	0	100	12,713
Bay Point	1,919	102	0	3	5,824
Clearlake	26	78	0	37	2,201
Los Osos	0	171	0	260	4,459
Ojai	486	322	28	40	5,427
Santa Maria	61	1,676	0	50	11,063
Simi Valley	8,883	168	0	2	15,061
Region 2	26,256	2,774	10,438	843	138,390
Region 3	16,690	5,039	9,827	1,579	125,887
Total	**54,321**	**11,193**	**20,293**	**2,914**	**321,025**

4 Other Class A water utilities do not have balancing account treatment for chemical costs and
5 GSWC has never had balancing account treatment for chemical costs.[187]

6 GSWC identifies chemicals as a "part of the variable costs directly resulting from well water
7 production."[188] However, unlike the variable costs that are currently permitted to be tracked in
8 the MCBA (purchased power, purchased water, and pump tax), the costs associated with water
9 treatment chemicals are generally determined in competitive markets. Approving this request
10 and allowing the recorded cost of treatment chemicals to be tracked in the MCBA would assure
11 dollar-for-dollar recovery of such costs, and therefore diminish the utility's incentive to procure

[187] GSWC Response to ORA Data Request JE6-003, Q.3.

[188] GSWC Prepared Testimony of John Garon, p. 23. Note that Chemicals are also used to treat purchased raw surface water. GSWC uses surface water in the Arden Cordova and Clearlake ratemaking areas.

chemicals for the lowest costs. ORA requested examples of operational decisions GSWC made to control chemical costs. GSWC's examples included: "Where economically practical flow pacing equipment is installed so that chemical dosages automatically adjust as flows change, which prevents unnecessary use of chemical when flow decreases,"[189] and "Chlorine orders are maximized to take advantage of bulk pricing discounts and reduce minimum deliveries whenever possible."[190] It is in the interest of ratepayers that GSWC continue to take such action to control chemical costs. The incentive to keep chemical costs down will be entirely removed if chemical costs are subject to balancing account treatment.

In support for its request to include chemical costs in the MCBA, GSWC makes the following assertion:

> An increase in groundwater production would result in a **proportional** increased chemical costs that would not be covered in rates. If the related increase in Chemical costs is not recovered through the MCBA, in the same way as the increase in purchased water costs is, it is a disincentive for GSWC to use more well water than was previously adopted in rates.[191] [Emphasis added.]

According to this statement, as groundwater production (well production) increases, there will be an increase in chemical costs, and conversely, if groundwater production decreases, the company will experience a decrease in chemical costs. However, an examination of historical chemical costs for two of GSWC largest ratemaking areas – Region 2 and Region 3 – demonstrates that chemical costs do not necessarily track with groundwater production. **Table 11-B** below shows recorded annual groundwater production volumes and chemical costs for Region 2.

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[189] GSWC Response to ORA Data Request JE6-003, Q.4a.

[190] GSWC Response to ORA Data Request JE6-003, Q.4a.

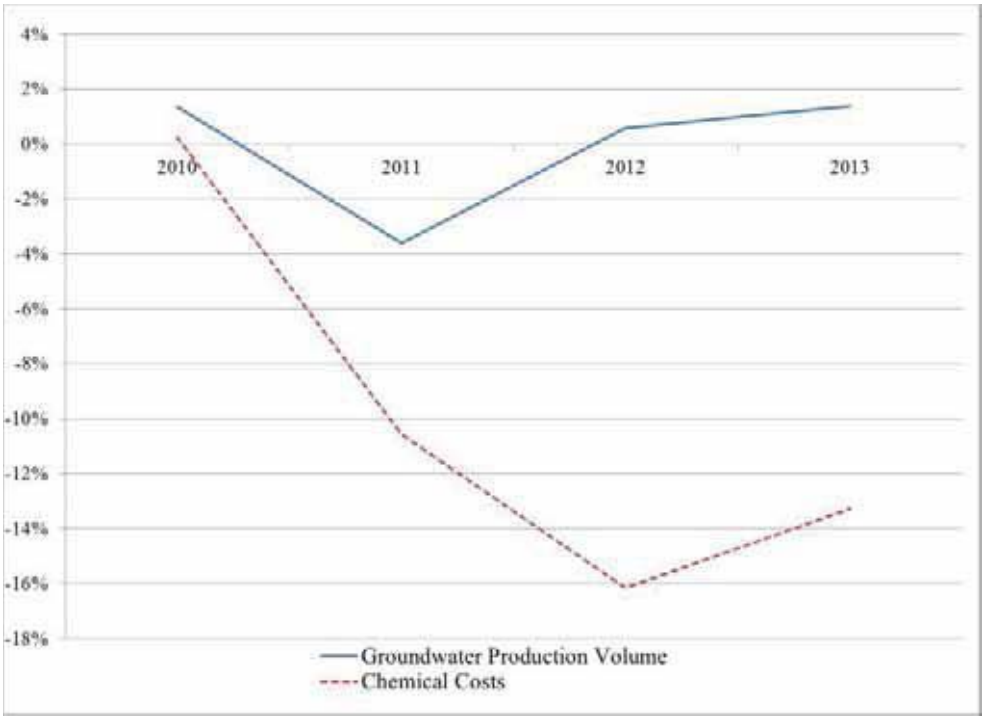
[191] GSWC Prepared Testimony of John Garon, pp. 23-24.

Table 11-B: Groundwater Production Volume and Chemical Expense - Region 2

Description	2008	2009	2010	2011	2012	2013
Groundwater Production (kccf)[192]	14,899	16,097	15,315	14,966	15,487	15,386
Chemicals ($)[193]	905,901	1,072,651	910,857	862,789	624,323	665,500

The chart below shows a rolling two-year average percent change in groundwater production volume and chemical costs, using data from the above table. Counter to GSWC's assertion that chemical costs increase proportionally with groundwater production, chemical costs decreased significantly between 2011 and 2012 even as groundwater production increased.

Figure 11-A: Two-Year Rolling Average Percent Change in Groundwater Production Volume & Chemical Costs - Region 2

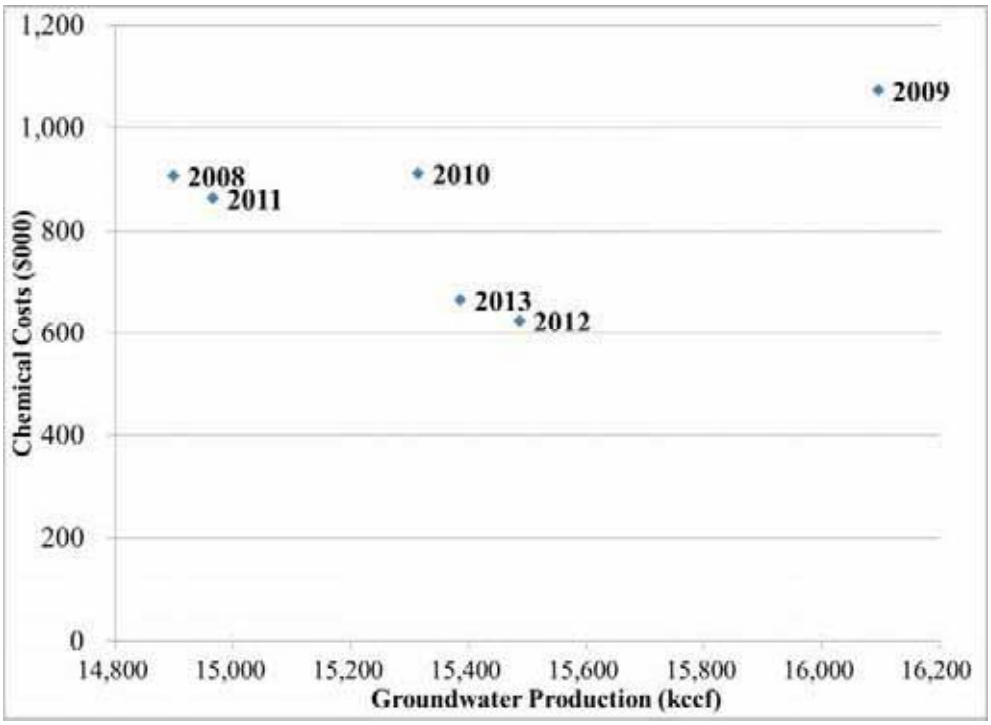


[192] Region 2 - GSWC Supply Workpapers, "5yr History" tab.

[193] Region 2 - GSWC SOE Workpapers, Table 4-A.

The following chart further shows that groundwater production and chemical costs do not exhibit the relationship of proportional change asserted by GSWC. For example, in Region 2, in 2010 and 2013 the utility produced a similar quantity of groundwater (15,315 kccf and 15,386 kccf, respectively) and experienced very different chemical costs ($910,857 and $665,500, respectively).

Figure 11-B: 2008-2013 Well Water Production Volume vs. Chemical Costs - Region 2



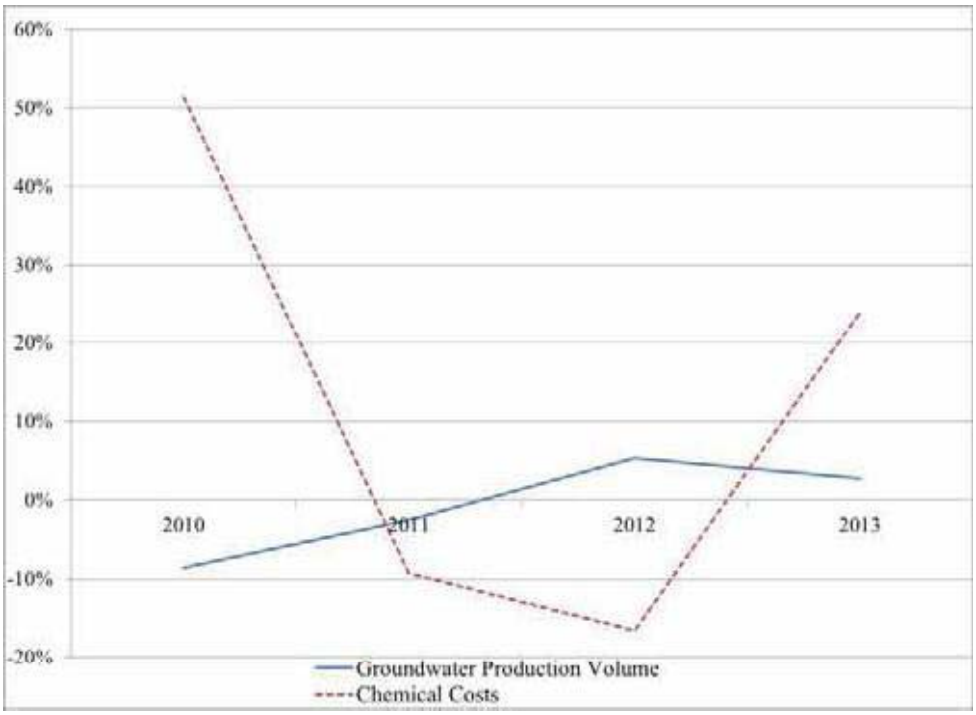
Similarly, in Region 3, changes in chemical costs do not track changes in groundwater production, as shown in **Table 11-C** and **Figures 11-C** and **11-D** below.

Table 11-C: Groundwater Production Volume and Chemical Expense – Region 2

	2008	2009	2010	2011	2012	2013
Groundwater Production (kccf)[194]	20,178	18,816	16,817	17,917	18,655	18,907
Chemicals ($)[195]	696,549	1,070,572	1,604,335	822,450	1,202,473	1,305,000

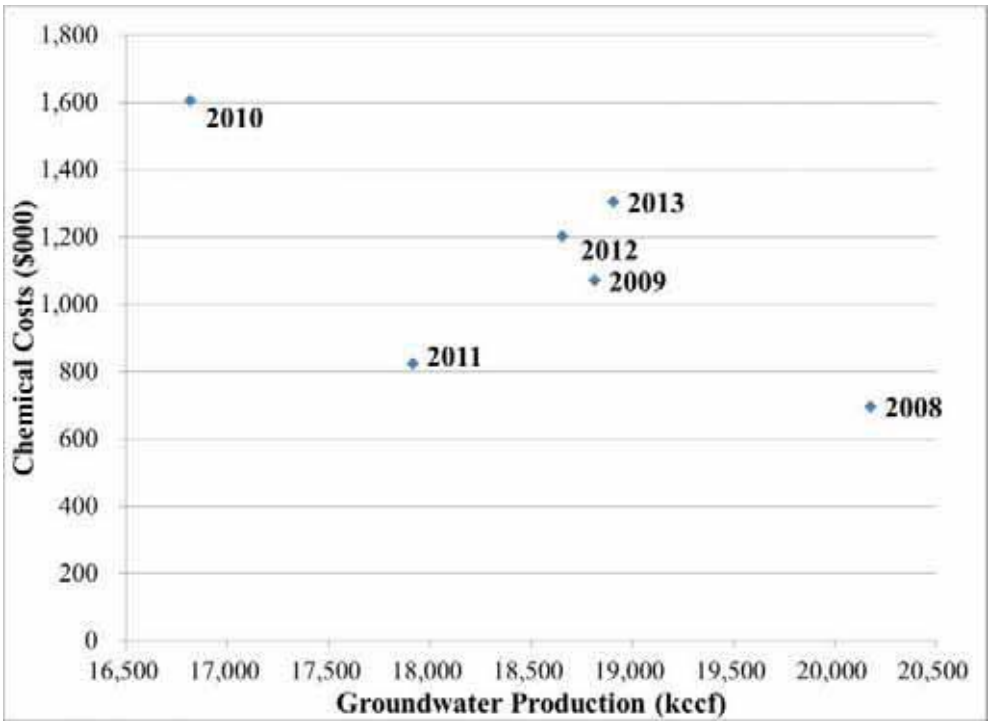
[194] Region 3 - GSWC Supply Workpapers, "5yr History" tab.

Figure 11-C: Two-Year Rolling Average Percent Change in Groundwater Production Volume & Chemical Costs - Region 3



[195] Region 3 - GSWC SOE Workpapers, Table 4-A.

Figure 11-D: 2008-2013 Well Water Production Volume vs. Chemical Costs - Region 3



It is evident from the above data that there is no simple direct or inverse relation between chemical costs and water production. The data suggests the a utility can treat the same amount of water (see 2009, 2012, and 2013 data points above) at varying levels of total chemical costs. This may be an indicator of some level of control of this expense, or at the very least lack of a direct correlation between groundwater production and chemical costs. The changes in chemical costs may be due to a variety of other factors, including changes in vendors, and technological innovation. Therefore, it would be inappropriate to allow dollar-for-dollar recovery of this expense.

GSWC's claim that the lack of a chemical cost balancing account provides a disincentive to the company and prevents it from using "more well water than was previously adopted in rates" is surprising and concerning.[196] GSWC is bound by the settlement agreement adopted by the

[196] GSWC Prepared Testimony of John Garon, p. 24.

Commission to maintain the least-cost water mix.[197] Specifically, GSWC has agreed to the following: "GSWC stipulates that it will exercise due diligence in ensuring the least-cost mix of its water sources and will track significant changes in water purchases."[198] The Commission should reject GSWC's Special Request #3 and remind the company that it must exercise due diligence in ensuring the least-cost mix of water supply.

D. CONCLUSION

Chemical costs are much smaller in magnitude relative to purchased water, purchased power, and pump tax costs that are currently tracked in the MCBA. Furthermore, chemical costs do not trend with water production. To ensure the company controls chemical expenses, costs should continue to be excluded from the MCBA.

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[197] D.08-08-030, Decision Resolving Phase 1b Settlement Agreements and Return on Equity Adjustment, p. 15.

[198] Ibid.

Chapter 12: SPECIAL REQUEST #6 – NEW SALES RECONCILIATION MECHANISM

A. INTRODUCTION

In Special Request #6 Golden State Water Company (GSWC) requests Commission authorization for a new rate adjustment mechanism called the Sales Reconciliation Mechanism (SRM) in ratemaking areas with a Water Revenue Adjustment Mechanism (WRAM).[199] The SRM would be applied if triggered during the escalation years of the general rate case period. The SRM would be triggered if recorded WRAM-related sales volumes in any ratemaking area for the twelve months ending the September before the escalation year varies by more than 5% from the adopted WRAM-related sales volumes for the current year. As a result of SRM triggering, GSWC will:

(1) Adjust adopted sales volumes for the upcoming escalation year by 50% of the variance in the calculation of rates for that escalation year;

(2) Adjust adopted production costs for the escalation year proportionally to match the adjusted sales volume in the calculation of revenue requirement and rates for that escalation year;[200]

(3) Present these adjustments to the Commission for approval together with the escalation filing if there is an escalation filing for that ratemaking area. Otherwise, these adjustments would be presented in a stand-alone advice letter filing due at the same time as escalation filings.

B. SUMMARY OF RECOMMENDATIONS

The Commission should not approve an SRM mechanism for GSWC because it is overly complex to implement, introduces potential for errors, and does not benefit ratepayers. Since

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[199] The WRAM Balancing Account and Modified Cost Balancing Account (MCBA) apply to all ratemaking areas within GSWC Service Areas, except Clearlake (GSWC's Preliminary Statement W.)

[200] GSWC Prepared Testimony of Jenny Darney-Lane, p. 16.

GSWC filed its application, the Commission issued Decision (D.) 14-08-011. In D.14-08-011, the Commission adopted a "drought SRM" pilot program for California Water Service Company (CWS) and authorized CWS to open a drought Sales Reconciliation Mechanism Balancing Account to track any changes in rates associated with the SRM.[201] This drought SRM is similar in function to GSWC's proposed SRM. As such, ORA analyzed CWS's advice letter filings to learn how the mechanism was being implemented in the first escalation year for CWS.

There are two major differences between the CWS's drought SRM and GSWC's proposed SRM. GSWC is not proposing to add drought to the name of the mechanism nor to implement an associated balancing account. Nevertheless, ORA's review of CWS's preliminary drought SRM advice letter filings with a focus on the function of the mechanism demonstrates implementation complexities, the potential for errors, and a lack of any benefit to ratepayers.

However, in the event the Commission disagrees and authorizes an SRM for GSWC, ORA recommends that the Commission not authorize an SRM balancing account, that the SRM mechanism only be authorized as a pilot program given the current drought situation, and that GSWC track and report to the Commission on the effectiveness of the mechanism.

C. DISCUSSION

1. SRM is Complex to Implement, Has the Potential for Errors, Does Not Benefit Ratepayers, and Should be Denied

The SRM sounds simple in that it is a change to sales quantities. However, a preliminary review of CWS's advice letters implementing the drought SRM reveals the complexities. For example, CWS adjusts the revenue requirement for the purposes of calculating rates while not actually changing the adopted revenue requirement. As described by CWS (Cal Water):

> Cal Water calculated an alternate revenue requirement that incorporates a change in production costs to reflect the change in sales values. The alternate revenue requirement is used solely to calculate the rates going into effect on January 2, 2015, Cal Water is not proposing to adopt the alternate revenue requirement as its new 'adopted' revenue requirement, or adopt the modified

[201] D. 14-08-011, p. 111.

> production costs as the new values, for the Preliminary Statement M.[202]

It may be difficult and less transparent to true up WRAM/MCBA balances when there is a separate revenue requirement used to calculate rates relative to the adopted revenue requirement. For example, when Commission staff checks the calculations behind the WRAM, it will be overly burdensome to trace the rates used to generate actual quantity revenues as those will be based on a different revenue requirement than adopted.

In the case of CWS, it was controversial to implement the SRM rate changes in the districts that were triggered because of requirements to maintain the service to quantity charge ratios. Changing sales volumes due to SRM triggering while maintaining adopted service to quantity charge ratios resulted in unanticipated flow-through of variable costs to service charges.

It is important for variable costs to all be recovered through the quantity charges. This is because WRAM balances (the difference between adopted and actual quantity revenues) are netted against MCBA balances (the difference between adopted and actual variable costs for purchased water, purchased power and pump tax). If the WRAM does not include all of the variable costs then there could be double-recovery through the MCBA as well as through service charges of the same costs. The same problem could arise for GSWC as it strives to maintain 30:70 service-to-quantity revenue ratios.

One of the issues identified in the Scoping Memo for review in this proceeding is "the economic impact on rates engendered by the Water Revenue Adjustment Mechanism and the Major [sic] Cost Balancing Account."[203] As described in GSWC's testimony, the purpose of the SRM is to reduce the balances accrued in the WRAM/MCBA, and therefore the size of surcharges paid by or surcredits refunded to customers in the future.[204] However, even if the SRM results in lowered WRAM and MCBA balances, it would not actually save ratepayers money. Rather, it

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[202] Advice Letter No. 2150, California Water Service Company, November 12, 2014.

[203] Assigned Commissioner's Scoping Memo and Ruling dated September 24, 2014, p. 4. ORA interprets this as a reference to the Modified Cost Balancing Account.

would allow GSWC to recover revenue sooner through higher rates rather than building up an under-collection, and conversely would require lowering rates sooner rather than building up an over-collection. The connection between this timing difference leading to lowered WRAM/MCBA net balances and improvements in drought is tenuous. The connection may be limited to the extent that customers actively do not conserve due to animosity toward WRAM/MCBA surcharges. With the approval of an SRM, any such animosity may be turned to SRM rate changes rather than being eliminated.

2. SRM Balancing Account Is Unnecessary

In the event the Commission does authorize the SRM for GSWC, ORA recommends that the Commission not authorize a SRM balancing account. GSWC is not requesting a SRM balancing account and ORA agrees that a balancing account is unnecessary. This section addresses the anticipated problems should the Commission consider applying a similar balancing account for GSWC.

CWS's Advice Letter 2154 requests approval of a new preliminary statement for the Sales Reconciliation Mechanism Balancing Account (SRM BA). CWS's request is too broad because it proposes to track changes to both quantity and service charges as a result of the SRM in the balancing account. There should be no changes to the service charges as a result of SRM triggering and therefore, there is no need to track service charges in the balancing account.

Furthermore, any changes in the volumetric revenue that results from the SRM change in quantities are already tracked in the WRAM and MCBA, so there is no need for an additional balancing account. CWS stated this same concept in Advice Letter 2154: "[B]ecause the WRAM/MCBAs already true up billed quantity revenues to authorized quantity revenues, any quantity revenues tracked in the SRM BA are effectively captured in the WRAM/MCBA, and should not be amortized through the SRM BA."[205] Because this is a balancing account that entirely overlaps with what the WRAM and MCBA are tracking and it should never be amortized, a similar balancing account should not be authorized for GSWC.

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[205] CWS Advice Letter 2154 – Sales Reconciliation BA – Preliminary Statement, p. 4.

3. Measuring the Effectiveness of SRM Pilot Program

If the SRM is adopted, the Commission needs measures to assess whether the mechanism is effective. One primary reason the Commission adopted the SRM for CWS was to mitigate against high WRAM balances.[206] In order to review the impact of the SRM, the Commission should require GSWC to calculate and report the impact of the SRM on the net balances of WRAM and MCBA. Specifically, GSWC should track changes in the WRAM by calculating the difference between actual quantity revenue (actual SRM adjusted rates times actual quantity sold), and what the quantity revenue would have been in the absence of SRM (rates that GSWC would have been authorized without the SRM times actual quantity sold). This calculation assumes the same quantity is sold even though the rates are different. Additionally, GSWC should track changes in the MCBA due to the SRM by calculating changes to the variable costs flowing through to the revenue requirement.

The purpose of tracking these items is to allow GSWC and the Commission to compare the impact on net WRAM and MCBA balances with and without the SRM. This will inform decision-making in future general rate cases. However, in the next rate case scheduled to be filed on July 1, 2017, there will only be one potential SRM filing that will be implementing the SRM rates in 2017, the first escalation year of the current rate case cycle.

In order to provide a clean record of the impact of the SRM on WRAM/MCBA net balances, GSWC should provide the calculations tracking the changes in WRAM/MCBA with and without SRM for districts where the SRM triggered as part of its annual WRAM/MCBA advice letter filing requesting amortization beginning with the 2017 escalation filing (scheduled to be filed November 2016). In addition, GSWC should provide the advice letter filings and a summary of the SRM impact on WRAM/MCBA net balances as part of the next GRC application, which is currently scheduled for Test Year 2022.

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[206] D.14-08-011, p. 19.

4. Sales Reconciliation Mechanism Does Not Send A Consistent Message to Conserve Water

The SRM does not send a consistent price message to all ratemaking areas for customers to conserve. The SRM would increase rates when triggered by reduced usage and decrease rates when triggered by usage greater than forecasted. In this way, SRM could lead to decreased water conservation efforts in areas where customers need to conserve due to higher than anticipated usage.

D. CONCLUSION

In conclusion, the Commission should not adopt an SRM for GSWC and should first consider the results of the pilot program implementing a drought Sales Reconciliation Mechanism for CWS once those results become available. However, if the Commission approves an SRM for GSWC, it should be approved only as a pilot program, GSWC should track and report to the Commission on the effectiveness of the mechanism in reducing WRAM/MCBA net balances, and the Commission should not authorize an associated balancing account.

APPENDIX SALES-A (ORA's Forecasting Analysis)

This appendix provides ORA's methodologies used in residential and commercial customer sales forecasting. (58 pages total)

Appendix Sales-A

ORA's Forecasting Methodology

In addition to the regression analysis outlined in SP U-25, ORA used other model specifications to forecast per-connection water consumption. These additional models follow the same linear regression foundation as the New Committee Method regression with added components. The difference between each model depends on the underlying assumptions. Some of the models include an autoregressive term, a differenced term, a moving average component, or different methods of estimating the inputs for extrapolating the resulting equation. This Appendix provides a rationale to the methods implemented.

<u>New Committee Method</u>

The following linear regression equation provides the foundation for the New Committee Method in forecasting monthly water sales per customer (consumption):

1. $$consumption_t = c + \beta_1 \cdot temperature_t + \beta_2 \cdot precipitation_t + \beta_3 \cdot time_t + \varepsilon_t$$

The Betas ($\beta_1, \beta_2, \beta_3$)are the coefficients of estimation for temperature, precipitation and time and subscript "t" refers to the time period. The intercept "c" is a constant, also to be estimated and ε is the error term. When regressing consumption ($consumption_t$) on the independent variables of temperature, precipitation, and time, the regression equation minimizes the sum of squared errors (SSE). The SSE is the sum of all squared deviations of consumption data points ($consumption_t$) from a regression equation line. The deviations must be squared in order to remove the cancelling effect of summing positive and negative deviations.

The resulting equation includes estimates for the coefficients on each independent variable, the intercept, and the error. Forecasting consumption using the New Committee Method consists of extrapolating this equation into the Test Year by using the 30-year average for both temperature and precipitation. ORA used this linear regression equation as the basis for some alternative models that contain additional statistical components and an unemployment variable.

<u>ARIMA Model</u>

ORA selected the Autoregressive Integrated Moving Average (ARIMA) model, due to the model's flexibility in handling time series data. The ARIMA model is an extension of the New Committee Method linear regression that addresses three issues often present in time series

datasets: autocorrelation, stationarity, and seasonality. The model addresses these issues by including three statistical components: the autoregressive model component, the integrated model component, and moving average model component respectively. The following discussion addresses each issue and explains each statistical model component which, when combined, result in the final ARIMA model. The ARIMA model uses the notation ARIMA (p,d,q), where p,d, and q define the extent of each statistical component as a positive number generally ranging from 0-3. The models below use AR(1), I(1), and MA(1), or ARIMA (1,1,1), for illustrative purposes.

Autocorrelation is when the dependent variable in the current time period is correlated with itself in prior time periods and it is taken into account using the "Autoregressive Model". In terms of water consumption, this can be viewed as habitual behavior by the customer. Regardless of other variables changing, the customer will still consume an amount of water based on what they consumed in the past, or what they are accustomed to consuming. This issue is addressed with the inclusion of a lagged dependent variable, $consumption_{t-1}$, where the subscript "$t-1$" indicates the lagged value of consumption by 1 time period, or one month.

Autoregressive Model – AR(p=1)

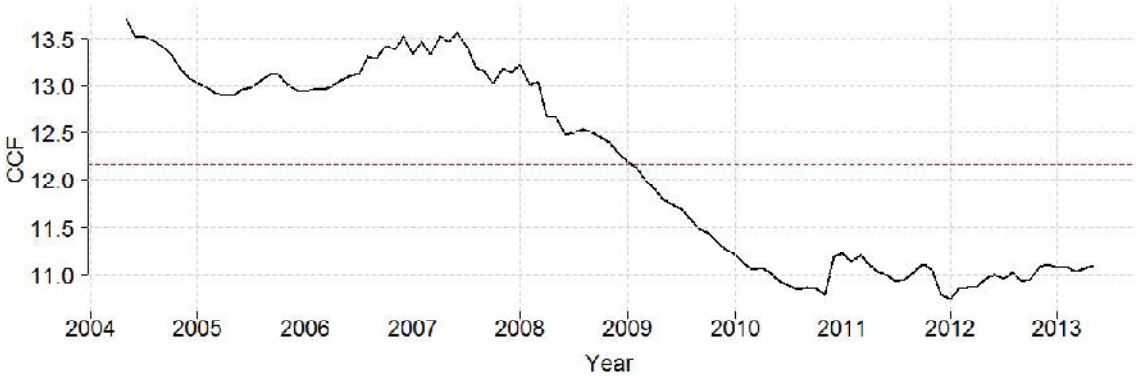
2. $$consumption_t = c + \beta_1 \cdot temperature_t + \beta_2 \cdot precipitation_t + \beta_3 \cdot time_t + \beta_4 \cdot consumption_{t-1} + \varepsilon_t$$

The new coefficient (β_4) can be estimated and used in forecasting consumption by including the prior value of consumption to obtain a current value of consumption.

The integrated model component of the ARIMA model takes account of the issue of non-stationarity. Stationarity (as opposed to non-stationarity) describes when the dependent variable (consumption) varies near a specified mean over time. This is illustrated in Figure 2. Alternatively, plotting non-stationary data will show the dependent variable varying randomly, or with a consistent trend over time (Figure 1). In order for a process to be stationary, short-term fluctuations of consumption should be statistically similar. For almost all of GSWC's consumption data, stationarity is present in the short-term, but over a longer-term, fluctuations are much more varied and show a consistent trend indicative of non-stationarity. This is depicted in the in Figure 1 below which shows the 12-month moving average (which removes seasonal variations) of monthly water consumption of the residential class in Region II over nine years.

The graph can be split into three time periods: (A) 2004-2008, (B) 2008-2011, and (C) 2011-2013. Time periods A and C both display variation around a mean, indicating a stationary process. Contrast this with time period B, which does not vary around a specific mean (the dotted center line is the mean of consumption) and displays a consistent trend indicating a non-stationary process.

Figure 1: 12 Month Rolling Average Monthly Sales per Customer



Non-stationarity is an issue that can bias forecasts, as atypical trends may be replicated in the forecasts. A non-stationary process can be made stationary by differencing the dependent variable with itself in a prior period. The number of differences that should be taken depends on the length necessary for the variation in the dependent variable to become non-random.

Integrated Model – I(d=1)

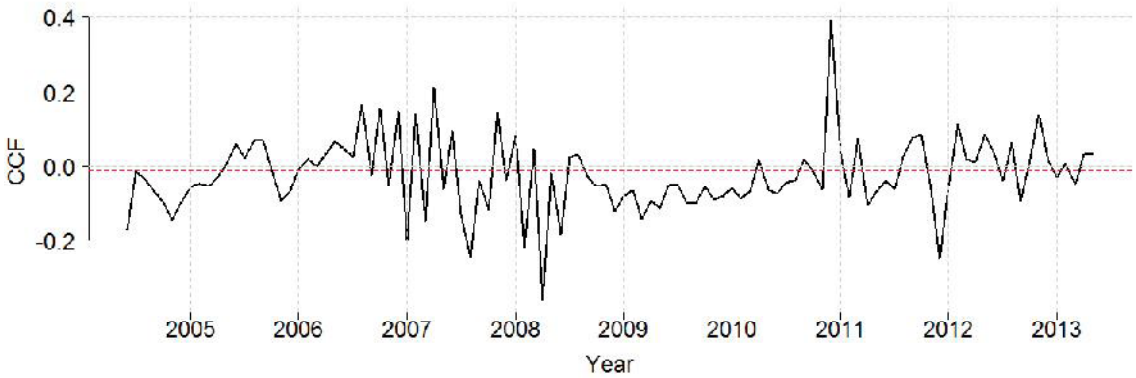
3. $$consumption_t - consumption_{t-1} = c + \beta_1 \cdot temperature_t + \beta_2 \cdot precipitation_t + \beta_3 \cdot time_t + \varepsilon_t$$

Rearranging gives the functional form:

4. $$consumption_t = c + consumption_{t-1} + \beta_1 \cdot temperature_t + \beta_2 \cdot precipitation_t + \beta_3 \cdot time_t + \varepsilon_t$$

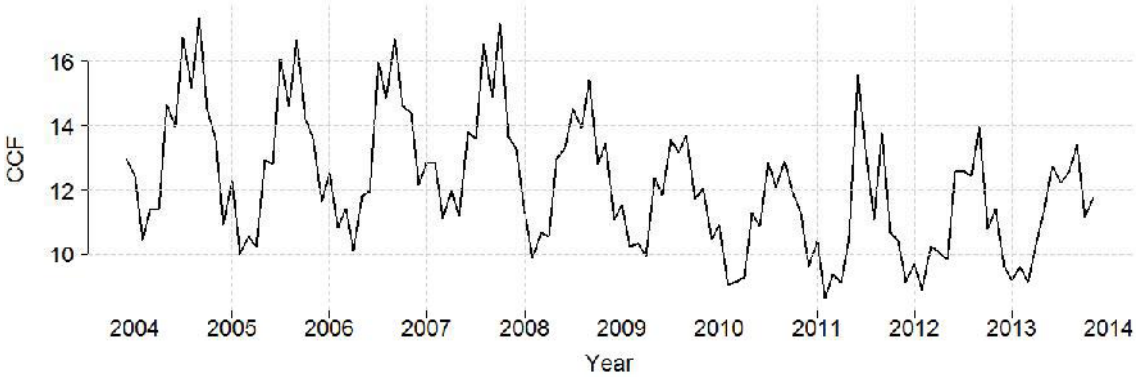
Figure 2 shows the differenced version of the previous graph. The length of the difference is one month, and it is visually apparent that the data varies around its mean (the dotted center line is the mean of the difference of consumption, which can be described as: $consumption_t - consumption_{t-1}$).

Figure 2: Differenced Average Monthly Consumption per Customer



The final component of the ARIMA model is the moving-average which takes account of seasonality. Seasonality is the cyclical fluctuation present in data that is nearly predictable. In water consumption data, this is visually represented by the peaks and valleys over the course of a year. Other variables and the error term determine the non-seasonal fluctuations present in the data. The graph below (Figure 3) plots the average monthly consumption of residential customers in Region II. The trend is that over the summer months average consumption peaks, while average consumption will reach its minimum during the winter months.

Figure 3: Average Consumption per Customer per Month



Accounting for seasonality implies placing significance on unusual (non-seasonal) fluctuations within the data that may provide insight to other interactions with consumption. This can be implemented by using a moving average model that includes additional lagged error terms (ε_{t-1}). This specification assumes that the dependent variable is correlated to prior random fluctuations and therefore it is included in the model as a weighted average of current and previous values of

ε. The random component includes everything we are unable to quantify; income fluctuations, price changes (of other goods), preferences, etc.

Moving Average Model – MA(q=1)

5. $$consumption_t = c + \beta_1 \cdot temperature_t + \beta_2 \cdot precipitation_t + \beta_3 \cdot time_t + \theta_0 \cdot \varepsilon_t + \theta_1 \cdot \varepsilon_{t-1}$$

Combining all three specifications we obtain the Autoregressive Integrated Moving Average model or ARIMA. Below is the statistical composition of the ARIMA model that we use in our analysis.

Final ARIMA Model used in Analysis ARIMA(1,1,1)

6. $$consumption_t = c + consumption_{t-1} + \beta_1 \cdot temperature_t + \beta_2 \cdot precipitation_t + \beta_3 \cdot time_t + \beta_4 \cdot consumption_{t-1} + \theta_0 \cdot \varepsilon_t + \theta_1 \cdot \varepsilon_{t-1}$$

Although this is the full model, variations with a combination of the three components are necessary to a tailored model for the given data. For instance, some data may not exhibit all of the issues (autocorrelation, stationarity, and seasonality) addressed by the ARIMA model and therefore accounting for an issue that is not present will lead to suboptimal results. Additionally, there is flexibility in the model for addressing the extent of a particular issue by increasing the number of lagged values (p), differences (d), or error terms (q). The method of determining the parameters of the model was an iterative process that optimizes a model's relative quality. This is described in detail in the "Statistical Benchmarks and Software" section below.

<u>ARIMA without Independent Variables</u>

An additional model specification is one without any independent variables. This is when consumption is regressed on itself. This specification implies that consumption in the present is solely dependent on consumption in the past, and any deviation from this is captured in the error term. This model allows for an examination of the extent to which consumption is dependent on itself through the error term. This information is useful when the dependent variable itself may not be highly correlated to any other factor besides previous iterations of itself. Therefore, the results from this specification were also considered in ORA's analysis.

Two methods were used to determine the number of parameters to use, one model is fixed at p,d,q=(1,1,1) and the other uses an iterative process to determine this.[1] See section on statistical benchmarks and programs for a full discussion on the iterative process.

7. $$consumption_t = c + \beta_1 * consumption_{t-x} + \varepsilon_t + \theta\varepsilon_{t-x}$$

Forecasting

In order to make a prediction based on the findings of a model we must extrapolate the results using future values of the independent variables used to define the model. The result of the regression analysis is an equation defining consumption based on its behavior over time, dependent on outside factors (the independent variables; temperature, precipitation, unemployment rates, etc.). In order to determine future values of consumption there must be input for all the independent variables during the same future time period. Future values for these independent variables are estimated using an average approach as outlined by the New Committee Method.[2] ORA included models that forecast the independent variables using independent variable-specific ARIMA models without additional variables.[3] Once the future values have been estimated, the resulting regressing equation is used to calculate the forecast for consumption. The resulting regression equations are similar to equations 1, 6, and 7 above.

Statistical Benchmarks and Software

Statistical benchmarks provide a quantifiable method of making comparisons between the multiple models. The statistical benchmarks ORA used were the AIC measure and R^2. The AIC (Akaike Information Criterion) is a measure of the relative quality of a statistical model for a given set of data. The AIC measure can only be used to compare other models that allow for an AIC, so in this analysis the AIC measure can be compared among the ARIMA models. Given a set of models, the model with the minimum AIC value is indicative of the greatest relative statistical quality. The R^2 is a measure of what proportion of statistical variance can be attributed to the independent models chosen. An R^2 value of 1 is an indication that the model provides a good fit of the data available, and may be a proper model for predicting future values. Both the

[1] Throughout this appendix, arima models fixed at p,d,q=(1,1,1) are labeled "arima-fixed" while those using an iterative process to determine p,d,q are labeled "arima".
[2] Models using the average independent variable estimation approach are labeled "arima-meanx" in the tables throughout this appendix.
[3] Models using the arima independent variable estimation approach are labeled "arima-arimax" in the tables throughout this appendix.

AIC and R^2 are automatically calculated and presented as part of the summary report on each model (from the statistical software). Another benchmark includes how divergent a model's prediction of early 2014 consumption is from recorded 2014 consumption. ORA obtained consumption data through June 2014 in response to data request DR ED3-001.

ORA ran the models on the statistical software program R. Any statistical program would be able to recreate this analysis, however R was chosen for its flexibility and cost. A description from R's website:

> "R [is] a freely available language and environment for statistical computing and graphics which provides a wide variety of statistical and graphical techniques: linear and nonlinear modelling, statistical tests, time series analysis, classification, clustering, etc."[4]

R offers the ability of adjusting methods on a company-wide scale quickly and efficiently. R also offers an extensive online repository of information and statistical packages that provide efficiency to the methods employed in ORA's analysis. For example, to select the number of parameters (p,q,d) to use in the ARIMA model, ORA used the auto.arima function that uses iterative elimination of various combinations of parameters in order to achieve the model with the minimum AIC value. Another function of importance is the "forecast" function that allows for independent variable inputs to be used in forecasting consumption. The program code used in this analysis is included as Appendix Sales – C (Forecasting Program).

Unemployment Variable

Along with estimating the new ARIMA models, ORA also included an additional unemployment rate variable that aims to capture the variability in consumption due to socioeconomic conditions.[5] The unemployment rate is listed as one of the "Major Economic Indicators" by the Bureau of Labor Statistics.[6] Although the variable may not perfectly represent all socioeconomic conditions, it represents relative economic conditions.

ORA included the unemployment variable in each model specification that allows for independent variables. In total, ORA estimates eight statistical models to arrive with forecasted consumption. ORA also took into consideration the performance of these models to the overall

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[4] http://cran.r-project.org/, accessed 3/2/15
[5] Models including the unemployment variable will include "w/unemp" when referencing the model.
[6] http://www.bls.gov/bls/newsrels.htm, accessed 3/2/15

average of the data (ten years), the five, three, and two-year averages, as well as the current year (2013) recorded consumption.

Consumption Trends by Ratemaking Area

The process of identifying ORA's proposed forecast relies on a combination of analysis of statistical regression results, visual examination of trends in consumption per customer as well as visual examination of unemployment trends as a measure of economic conditions, and the overall context of sales during the ten-year time frame (including weather, drought, and implementation of tiered rates) in each ratemaking area.

The following discussion details how ORA derived consumption forecasts on a ratemaking area specific basis. ORA followed the same approach as Golden State in developing a forecast for consumption for each of the seven CSAs in Region I, for Region II as a whole, and for Region III at the CSA level, which is then aggregated to the Region III-wide level. This is because Region III is comprised of nine CSAs spread across three distinct geographic districts; Foothill, Orange County, and Mountain/Desert.

Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales

For Ojai, Santa Maria, and Bay Point, ORA completed its regression analysis and historical average use numbers for commercial customers based upon the billing data provided by GSWC in response to ORA data request ED3-001. The results of that analysis are presented in this appendix. However ORA's analysis generated different regression results and different historical average use numbers compared to GSWC's analysis.

ORA noticed hard-coded numbers added to the billing data for 2011, 2012, and 2013 in GSWC's Sales workpapers (Table 4-D). ORA asked GSWC about these hard-coded numbers and GSWC explained that when it changed its billing system in 2011, there some customers under contract with GSWC that are excluded from the billing system and thus excluded from the billing data.[7]

As an example, for Ojai in 2013, GSWC's recorded sales for the commercial class are 251,387 Ccf, which is hardcoded as 181,259 Ccf + 70,128 Ccf (Ojai Sales workpapers, Table 4-D). ORA

[7] Phone conversation between Eric Duran, ORA, and Eva Orozco, GSWC Sales Analyst, on 1/23/15. GSWC provided the contracts with these customers through their response to an informal data request on 1/26/15. These contracts are included as Appendix Sales – B (Special Contracts)

used billing data provided by GSWC in response to ORA data request ED3-001 to arrive at the monthly average sales per customer, which was then summed to arrive at the annual sales per customer. ORA's annual sales per commercial customer for Ojai in 2013 is 181,259 Ccf. Dividing both numbers by 330 (the recorded end of year number of customers) GSWC obtains a per-customer recorded sales of 804.7 Ccf, while ORA's is 549.25 Ccf.

In each instance where this is the case, ORA reluctantly accepts GSWC's forecast of the five-year average for commercial customers since GSWC did not provide accurate data allowing ORA to perform a more detailed regression analysis. The Commission should require GSWC to update its billing system to include the usage information for these customers as well as to conduct a legal analysis as to whether it is appropriate to continue billing these customers at levels other than the authorized tariff rates. Ratepayers should not incur additional costs for the billing system changes and this analysis and GSWC should report on its changes and data in the next GRC.

Another discrepancy is the result of different time frames in the data. For regression analysis, GSWC used, in this rate case and in prior rate cases, data based on the monthly average consumption per-customer beginning in December and ending in November of the following year. For this GRC, the regression analysis begins with December of 2003 and ends with November of 2013 to complete ten years of data as required by the RCP. ORA used the same dataset as GSWC used for its regression analysis and for all calculated metrics such as the five-average and the current year recorded consumption. Therefore, ORA assumes an annual year to be based on the data GSWC provided starting with December and ending in November of the following year. GSWC uses January through December data to calculate the five-year average and current year recorded consumption. Therefore there are differences in ORA's and GSWC's five-year average and current year consumption amounts. The differences are larger for customer classes that have larger variances in their consumption between months, i.e. commercial classes more so than residential classes. In the instances where ORA concludes that the five-year average or current consumption is appropriate, ORA accepts the use of the January through December data in the forecasts provided by GSWC.

Region I

Arden-Cordova - Residential

The biggest driver outside of standard factors (economic conditions, weather, and conservation rates) of total consumption in the residential class is the conversion of unmetered connections. For the purposes of determining total consumption in the residential class, GSWC separates newly converted customers into their own subcategory with their own sales forecast. ORA includes analysis on forecasting sales for unmetered flat rate customers, newly metered customers, and existing metered customers.

Flat Rate Customer Forecast

GSWC currently delays volumetric pricing for customers with new metered connections for one year beginning on the month after following their meter conversion. To obtain the sales forecast for flat rate customers, GSWC uses billing data on the total sales of customers who have been converted but not yet billed at the volumetric rate. GSWC uses a four-year average of 396.60 Ccf per customer per year and mislabels it as a five-year average. The actual five-year average is 408.96 Ccf per customer per year. ORA does not object to the five-year average of 408.96 Ccf per flat rate customer per year.

Newly Metered Customer Forecast

To obtain the sales forecast of the newly converted customers GSWC and ORA compare the reduction in these customers' consumption from the year metered yet not paying a volumetric rate to the year following when customers pay volumetric rates. This analysis assumes the pricing effect of such conversions on sales is present the year after the conversion. GSWC determines this reduction to be approximately 25% for the years 2009-2010. Through additional data[8] ORA determines this reduction rate to be approximately 32% for the years 2009-2013. GSWC and ORA apply these respective reduction rates to the sales forecast for flat rate customers to obtain a forecast for customers who will be converted beginning 2015 and pay volumetrically in 2016. Using the four-year average of 396.60 Ccf as the sales forecast for flat rate customers, GSWC's newly metered customer forecast is 297.94 Ccf per year. ORA uses the

[8] Obtained in Data Request ED3-003 (AC Sales Forecast)

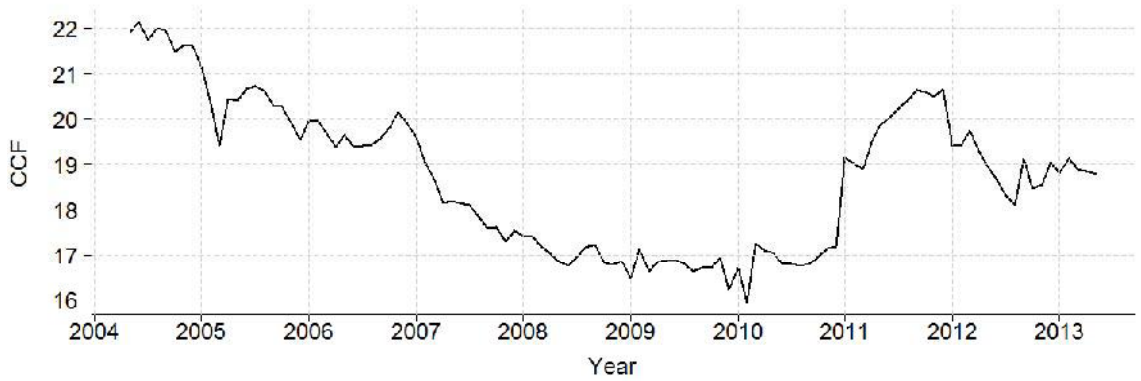
five-year average of flat rate customers sales forecast of 408.96 Ccf and obtains a newly converted customer forecast of 278.84 Ccf per customer per year.

Existing Metered Customer Forecast

CURRENT[9] 246.14 Ccf per customer per year

Consumption for existing metered customers displays a strong bounce-back effect beginning in 2010 (Figure 4). During this bounce-back average consumption reached levels last seen in mid-2005. However since 2012 average consumption dropped to fall within a range of 1.5 Ccf at 18-19.5 Ccf per month (Figure 4). This recent convergence of average consumption makes the most recent recorded average annual consumption an appropriate forecast. The five-year average would overstate the low consumption numbers prior to the bounce-back. Therefore, ORA agrees with GSWC that the Test Year forecast be set at 246.14 Ccf per customer or an average of 20.51 Ccf per customer on a monthly basis.

Figure 4: 12 Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)[10]



[9] Throughout this appendix, "current" means the latest available recorded year, which is 2013.

[10] The dashed line illustrates the 10-year average, the average of the entire dataset for the respective ratemaking area and customer class.

Table 1*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Arden-Cordova Residential Customer Class

AC	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	26.77	10.18	12.45%	220.21
2	arima-meanx	26.77	15.59	19.05%	213.38
3	arima	47.36	7.91	9.67%	221.97
4	arima-fixed	28.23	3.46	4.23%	205.37
5	ncm	0.65	16.60	20.29%	205.06
6	5 yr avg	NA	5.56	6.79%	219.61
7	3 yr avg	NA	7.25	8.85%	230.34
8	2 yr avg	NA	10.55	12.90%	226.21
9	current	NA	15.60	19.06%	229.72
10	arima-arimax w/unemp	24.20	5.95	7.28%	217.98
11	arima-meanx w/unemp	24.20	2.71	3.31%	213.16
12	ncm w/unemp	0.65	13.56	16.57%	197.59

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data.*

Arden-Cordova - Commercial

CURRENT 2025.30 Ccf per customer per year

In the commercial class there is a strong upward trend in consumption beginning in mid-2011. This trend is similar across most Ratemaking Areas. As in the residential class in Arden-Cordova, average commercial consumption has also converged on a small range between 165 – 170 Ccf per customer per month (Figure 5). Similarly, ORA recommends the most recent 2013 sales amount as the test year forecast. The five-year average overstates the low values of consumption that occurred from 2010 through the end of 2011. The most recent recorded annual forecast of 2,025.30 Ccf per customer is a monthly average of 168.78 Ccf per customer.

Figure 5: 12 Month Rolling Average Monthly Sales per Customer & Unemployment Rate

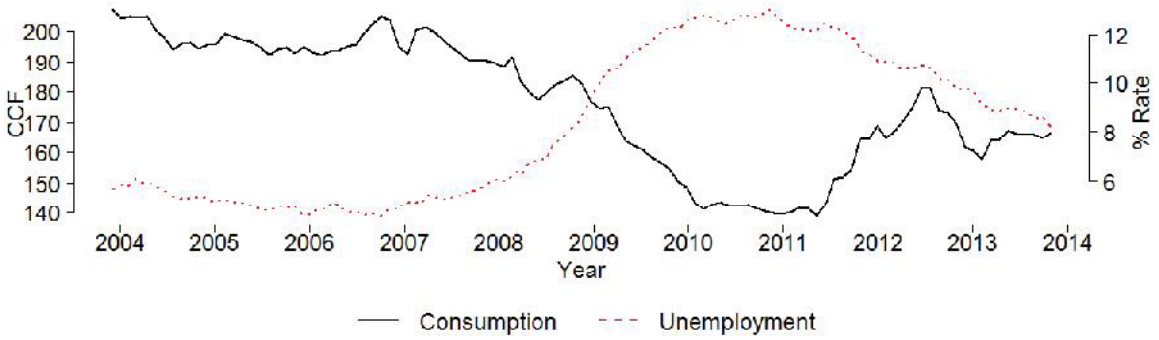


Table 2*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Arden-Cordova Commercial Customer Class

AC	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-80.17	200.82	27.42%	1,873.70
2	arima-meanx	-80.17	210.51	28.74%	1,791.04
3	arima	-17.10	91.35	12.47%	1,642.43
4	arima-fixed	-41.78	180.09	24.59%	1,859.24
5	ncm	0.65	127.02	17.34%	1,616.44
6	5 yr avg	NA	165.18	22.55%	1,909.65
7	3 yr avg	NA	166.95	22.80%	1,965.90
8	2 yr avg	NA	229.05	31.27%	2,037.53
9	current	NA	167.14	22.82%	1,971.33
10	arima-arimax w/unemp	-72.12	252.19	34.43%	1,952.64
11	arima-meanx w/unemp	-72.12	262.32	35.82%	1,845.24
12	ncm w/unemp	0.66	239.23	32.66%	1,892.02

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

Bay Point – Residential

FIVE-YEAR AVERAGE: 103.13 Ccf per customer per year

Average residential consumption in Bay Point of approximately 8-9 Ccf per month varies little over the course of ten years (Figure 6). Since the economic downturn in 2008, consumption has remained consistently between 8 and 9 Ccf per month. Because of this consistent level of usage, the five-year average is an appropriate forecast.

As the peaks in Figure 7 indicate, Bay Point customers have reduced their overall water consumption by reducing their discretionary (outdoor) water use. While the amount of water consumption during the summer months has reduced from a monthly average of 16 Ccf to 11 Ccf, the valleys (or non-discretionary indoor consumption) has remained consistent from 6 – 8 Ccf per month (Figure 7). This implies that Bay Point residential customers do have the flexibility to increase their consumption in the future. The five-year average is slightly larger than the most recent recorded consumption amount, and is consistent with this trend.

GSWC's five-year average consumption of 103.13 Ccf per customer is 8.59 Ccf per customer on a monthly basis. ORA does not object to GSWC's use of the five-year average to forecast sales in the Bay Point residential class.

Figure 6: 12 Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

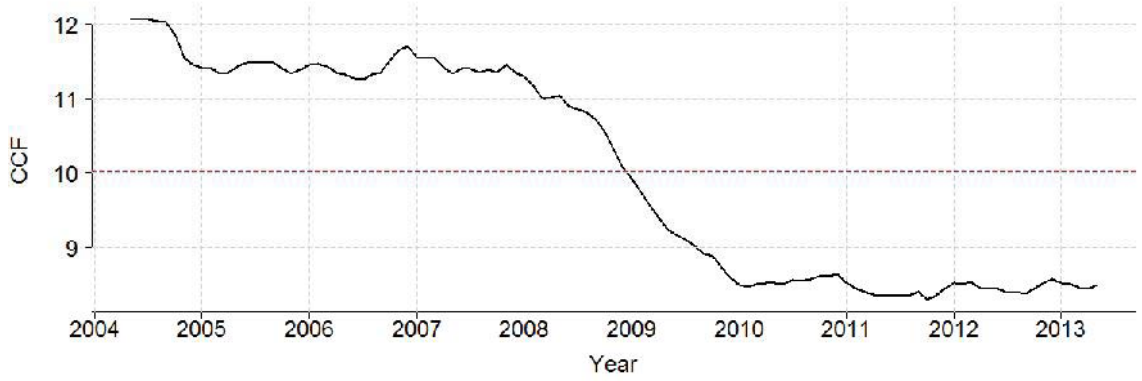


Figure 7: Average Monthly Sales and 12-Month Rolling Average Monthly Sales per Customer (center line)

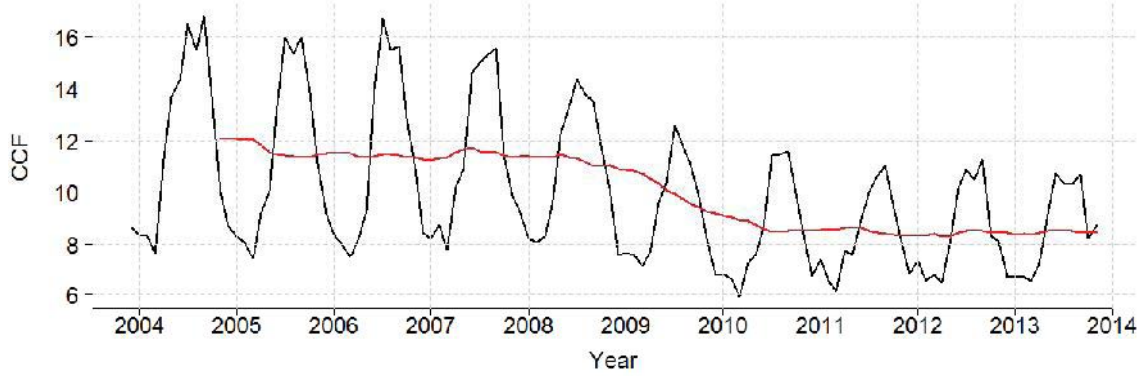


Table 3*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Bay Point Residential Customer Class

BY	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-240.01	0.46	0.91%	84.88
2	arima-meanx	-240.01	0.87	1.72%	84.53
3	arima	-282.08	5.93	11.72%	103.44
4	arima-fixed	-230.89	1.48	2.92%	95.99
5	ncm	0.84	5.63	11.12%	74.81
6	5 yr avg	NA	2.06	4.07%	103.19
7	3 yr avg	NA	1.58	3.12%	101.02
8	2 yr avg	NA	2.22	4.37%	101.51
9	current	NA	3.31	6.54%	102.20
10	arima-arimax w/unemp	-251.63	3.53	6.97%	99.52
11	arima-meanx w/unemp	-251.63	2.02	3.99%	94.00
12	ncm w/unemp	0.86	1.44	2.85%	85.14

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"

**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Bay Point - Commercial

FIVE-YEAR AVERAGE: 948.10 Ccf per customer per year

Sales per commercial customer were relatively low and constant through the years 2010-2012 (Figure 8). Mid-2012 through the present experienced a steady rise in consumption per customer. All else being equal, economic and weather conditions returning to pre-recession levels would push sales per customer toward pre-recession levels. An indication of an increase in future sales is the positive effect of a declining unemployment rate. This is evident in the Test Year forecasts of models without the unemployment variable (1, 2, and 5 in Table 4 below) to those with the variable (11, 12, and 13 in Table 4 below). The consistency present in consumption over the most recent years allows the five-year average to be an adequate forecast.

GSWC's annual average consumption of 948.10 Ccf per customer is 79.01 Ccf per customer on a monthly basis. ORA does not object to GSWC's use of the five-year average in the Bay Point commercial class.

Figure 8: 12 Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

Table 4*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results For the Bay Point Commercial Class

BY	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-191.07	4.47	0.84%	955.74
2	arima-meanx	-191.07	11.29	2.13%	948.84
3	arima	-197.78	46.14	8.72%	1,286.64
4	arima-fixed	-157.04	14.31	2.70%	975.48
5	ncm	0.72	58.50	11.06%	810.33
6	5 yr avg	NA	30.87	5.83%	935.63
7	3 yr avg	NA	30.12	5.69%	931.52
8	2 yr avg	NA	21.44	4.05%	942.83
9	current	NA	11.46	2.17%	976.82
10	arima-arimax w/unemp	-190.87	17.19	3.25%	998.10
11	arima-meanx w/unemp	-190.87	2.88	0.54%	961.82
12	ncm w/unemp	0.73	31.60	5.97%	876.67

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"

**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Clearlake - Residential

FIVE YEAR AVERAGE: 69.09 Ccf per customer per year

For the residential class, the inclusion of the unemployment variable shows a weak negative effect on consumption per-customer indicating that a steady decline in unemployment has not been enough to increase average consumption. This is most likely due to Clearlake's already

high unemployment rate (11.2% in November 2013[11]) and poverty rates (25.0%[12]). Any incremental declines in unemployment will not be enough to outweigh drivers pushing down consumption such as weather, economic conditions, conservation efforts, etc. Figure 10 shows that while unemployment rates have been declining since 2011, consumption has varied little. Due to this slight variability, the five-year average is an appropriate forecast. GSWC's calculated annual average of 69.09 Ccf per customer is a monthly average of 5.76 Ccf. ORA agrees with GSWC's use of the five-year average in the case of the Clearlake residential sales forecasts.

Figure 9: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

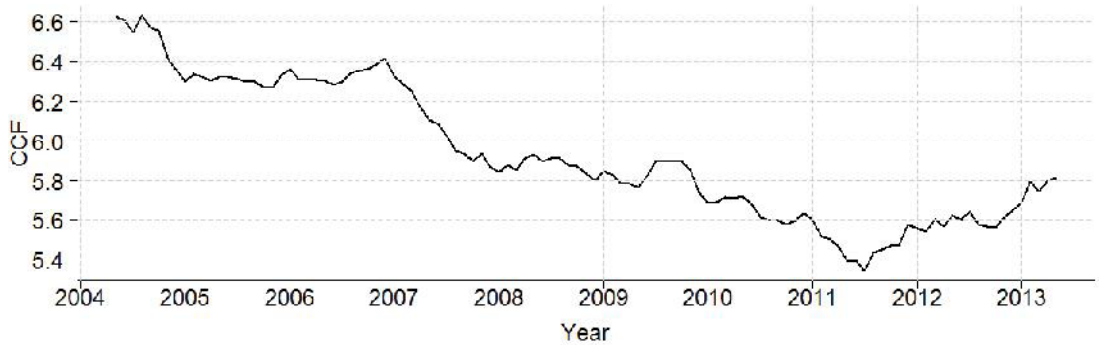
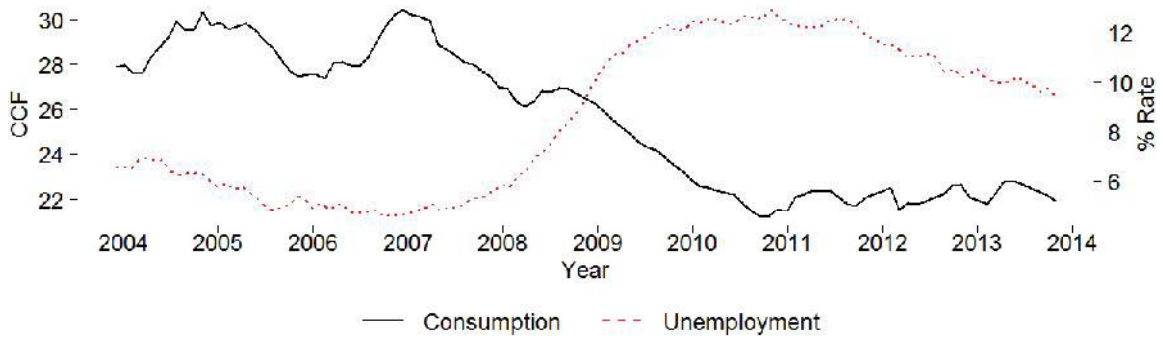


Figure 10: 12-Month Rolling Average Monthly Sales per Customer & Unemployment Rate



[11] CA Employment Development Department, Labor Market Information Division, Lake County Historical Civilian Labor Force obtained via web at (http://www.labormarketinfo.edd.ca.gov) on 8/15/14

[12] Persons below poverty level, percent, 2009-2013 - U.S. Census Bureau: State and County QuickFacts.

Table 5*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results For the Clearlake Residential Customer Class

CL	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-232.54	2.81	8.64%	70.03
2	arima-meanx	-232.54	3.31	10.20%	69.19
3	arima	-182.10	0.59	1.82%	62.62
4	arima-fixed	-212.89	0.89	2.75%	66.47
5	ncm	0.89	0.16	0.50%	61.38
6	5 yr avg	NA	0.55	1.71%	67.92
7	3 yr avg	NA	0.72	2.23%	67.26
8	2 yr avg	NA	1.53	4.71%	68.57
9	current	NA	2.16	6.66%	70.18
10	arima-arimax w/unemp	-230.80	2.75	8.48%	69.54
11	arima-meanx w/unemp	-230.80	3.41	10.51%	69.55
12	ncm w/unemp	0.89	0.04	0.12%	60.90

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"

**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Clearlake – Commercial

FIVE-YEAR AVERAGE: 191.14 Ccf per customer per year

Commercial consumption in Clearlake has not bounced back as quickly as it has in many of the other CSA's (Figure 11). This may be due to the small number of commercial customers (80) still facing high unemployment rates (11.2% as of November 2013[13]) and are therefore price sensitive to the bill impacts of over-consumption. Given the steady economic and weather conditions of recent years the five-year average sales forecast is an appropriate forecast. GSWC's five-year annual average of 191.14 Ccf per customer is a monthly average of 15.93 Ccf. ORA agrees with GSWC's use of the five-year average in the case of the Clearlake commercial sales forecasts.

[13] November 2013 is the last data point in the sales dataset.

Figure 51: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

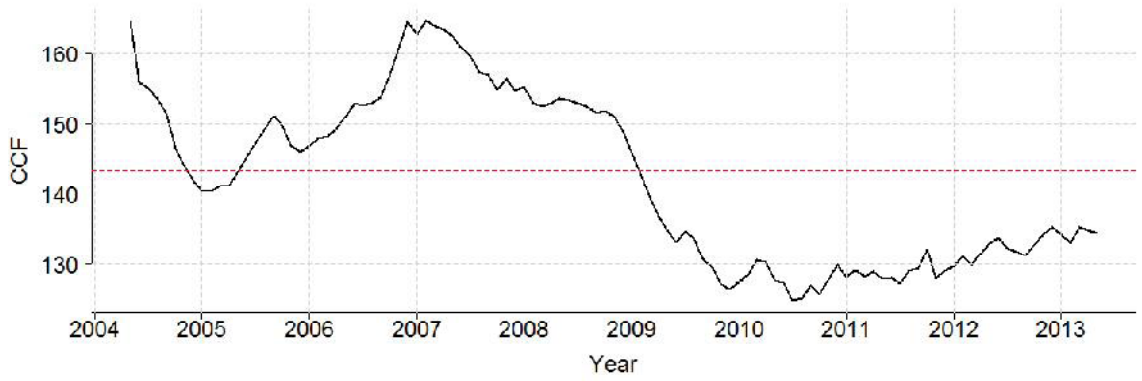


Figure 62: 12 Month Rolling Average Monthly Sales per Customer & Unemployment Rate

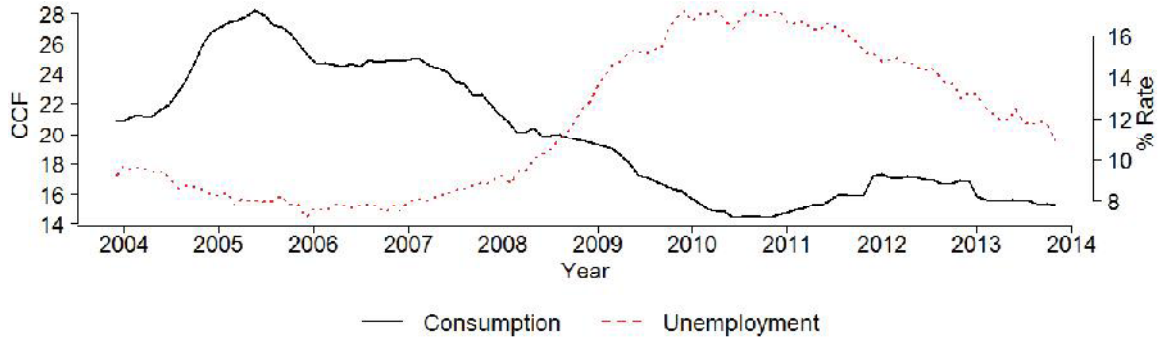


Table 6*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Clearlake Commercial Customer Class

CL	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-82.17	7.06	7.29%	156.46
2	arima-meanx	-82.17	7.55	7.79%	154.94
3	arima	-96.78	5.64	5.82%	161.55
4	arima-fixed	-96.08	7.39	7.63%	158.97
5	ncm	0.67	14.93	15.42%	128.10
6	5 yr avg	NA	2.41	2.49%	190.88
7	3 yr avg	NA	2.80	2.89%	191.53
8	2 yr avg	NA	5.32	5.50%	191.59
9	current	NA	1.90	1.96%	182.11
10	arima-arimax w/unemp	-129.35	1.63	1.68%	190.38
11	arima-meanx w/unemp	-129.35	0.12	0.12%	181.35
12	ncm w/unemp	0.74	9.67	9.99%	186.87

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"

**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Los Osos – Residential

CURRENT: 104.90 Ccf per customer per year

Compared to the other coastal CSAs in Region I (Ojai and Santa Maria), Los Osos has not experienced a similar upward trend in average consumption per customer post-2008. During the years of the recession, consumption in Los Osos experienced a very gradual decline indicating consumers responded slowly to changes in economic conditions. In 2013, the recorded per-customer consumption was 104 Ccf annually, 8.67 Ccf monthly. Accounting for unemployment rates, the statistical models with unemployment as an independent variable (models 10, 11, and 12 in Table 7) show an increase in consumption compared to models without the unemployment variable (models 1, 2, and 5 in Table 7). However with temperature dropping below its 10-year average, and precipitation increasing above its 10-year average (dashed line of Figures 15 and 16), consumption has remained low and not shown the bounce-back effect. The five-year average forecast overstates the higher values of consumption and ignores the convergence of consumption on the most recent recorded amount. Therefore ORA accepts GSWC's use of the most recently recorded consumption amount as the forecast. GSWC's most recent recorded consumption of 104.90 Ccf per customer is an average of 8.74 Ccf per customer per month.

Figure 73: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

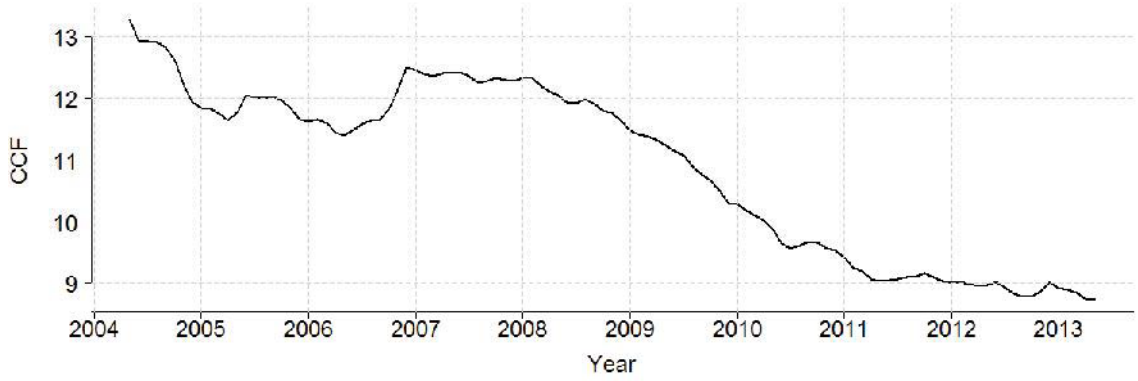


Figure 84: 12-Month Rolling Average Monthly Sales per Customer & Unemployment Rate

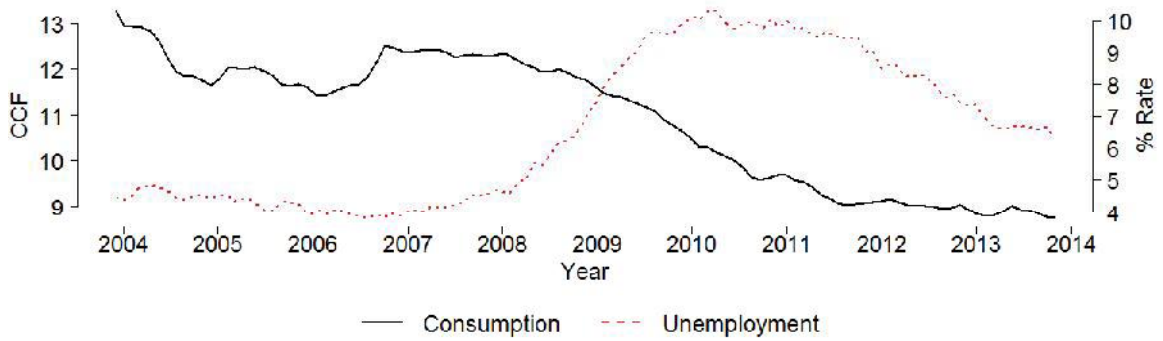


Figure 95: 12-Month Rolling Average Monthly Precipitation & 10-Year Average (dashed line)

Figure 106: 12-Month Rolling Average Monthly Temperature & 10-Year Average (dashed line)

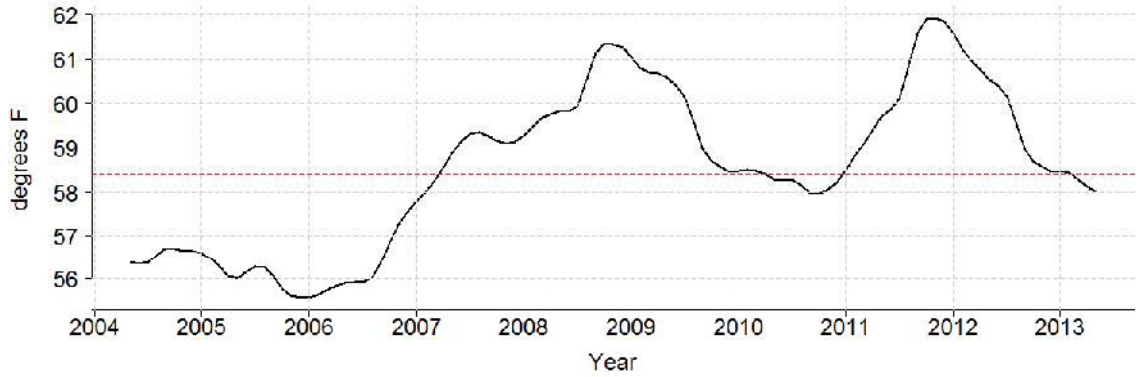


Table 7*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Los Osos Residential Customer Class

LO	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-296.48	8.63	17.02%	88.66
2	arima-meanx	-296.48	2.69	5.31%	81.32
3	arima	-181.84	1.69	3.34%	83.51
4	arima-fixed	-194.34	1.70	3.35%	90.55
5	ncm	0.80	3.82	7.53%	78.74
6	5 yr avg	NA	6.49	12.79%	114.88
7	3 yr avg	NA	2.76	5.44%	106.97
8	2 yr avg	NA	2.88	5.68%	106.27
9	current	NA	3.20	6.32%	104.90
10	arima-arimax w/unemp	-295.47	10.38	20.46%	107.17
11	arima-meanx w/unemp	-295.47	3.87	7.63%	97.57
12	ncm w/unemp	0.80	3.71	7.31%	79.04

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"

**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Los Osos – Commercial

CURRENT: 440.16 Ccf per customer per year

Commercial consumption per-customer exhibits a faster recovery from the economic recession compared to the residential class in Los Osos. However, a low R^2 value for the New Committee Method model including unemployment rates (0.53)[14] and low correlation of unemployment rates to consumption (-0.19)[15] indicates that consumption in this CSA is not as strongly dependent on unemployment rates. In fact, the high correlation of consumption with precipitation (-0.6867) suggests that commercial consumption will likely inversely follow precipitation patterns as is evident in the Figures 17 and 19 below when in 2012, consumption spiked as precipitation dipped. This indicates that a large portion of the Commercial class in Los Osos, uses their water for outdoor irrigation purposes and therefore is sensitive to changes in weather. This is further confirmed by the large seasonal variations in water consumption shown in Figure 18. The five-year average overstates the low consumption which occurred at the tail end of the recession. This results in a forecast that is lower than most recent amount of

[14] Table 8, Model 12

[15] Correlation Coefficients calculated in R (statistical program)

consumption even though the recent trend has been converging toward the most recent amount of consumption. Therefore the most recently recorded amount of sales is an appropriate forecast in the case of the Los Osos commercial class. GSWC's most recent recorded consumption of 440.16 Ccf per customer is a monthly average of 36.68 Ccf.

Figure 117: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

Figure 128: Average Monthly Consumption and 12-Month Rolling Average Monthly Sales per Customer (center line)

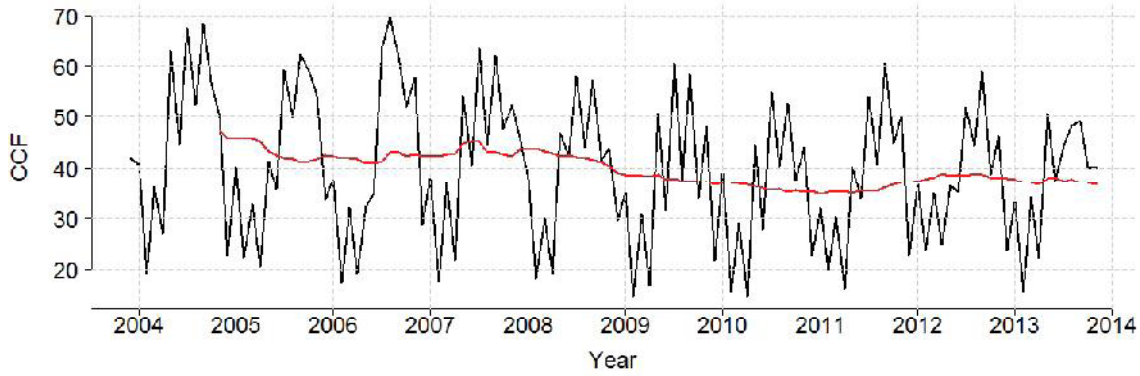


Figure 139: 12-Month Rolling Average Monthly Precipitation & 10-Year Average (dashed line)

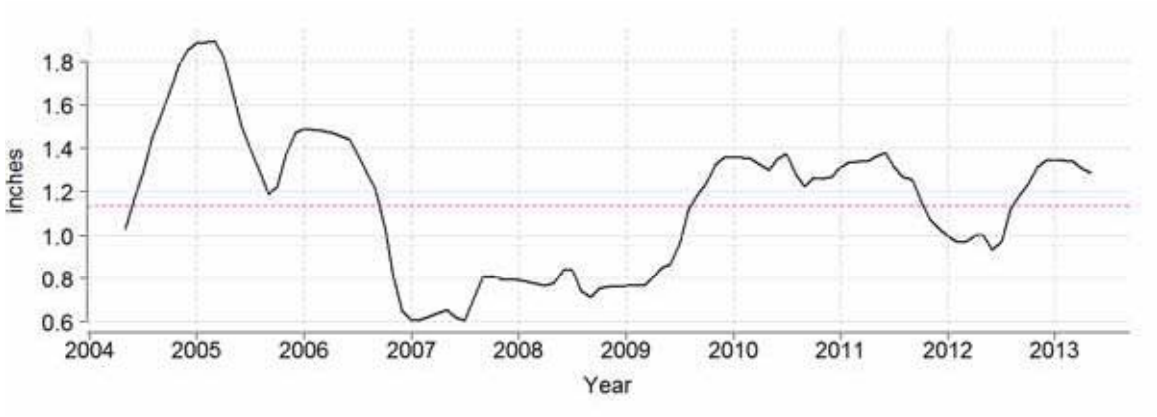


Table 8*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Los Osos Commercial Customer Class

LO	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-91.98	28.04	13.15%	469.75
2	arima-meanx	-91.98	2.10	0.98%	417.76
3	arima	-60.52	18.63	8.74%	397.51
4	arima-fixed	-79.17	16.49	7.73%	395.15
5	ncm	0.52	12.92	6.06%	359.47
6	5 yr avg	NA	7.68	3.60%	441.48
7	3 yr avg	NA	4.40	2.06%	446.02
8	2 yr avg	NA	2.44	1.15%	446.49
9	current	NA	4.82	2.26%	439.79
10	arima-arimax w/unemp	-128.30	18.46	8.65%	452.86
11	arima-meanx w/unemp	-128.30	3.87	1.82%	413.50
12	ncm w/unemp	0.53	3.12	1.46%	385.55

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"

**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Ojai – Residential

ADOPTED: 248.40 Ccf per customer per year

In Ojai, there are large seasonal fluctuations in average monthly residential sales per customer indicating the CSA has high discretionary water consumption during the summer months (Figure 20). Fluctuations in monthly average residential sales per customer of approximately 25 Ccf during the course of a year are common.

Figure 21 shows a decline in the average residential monthly sales per customer in Ojai from 2007 through the beginning of 2011. During this time period, unlike the other CSAs where customers experienced tiered rates for the first time, Ojai customers only experienced modifications to their already-existing tiered rates. Tiered rates had already been in effect in Ojai prior to D.09-05-005 which adopted tiered rates for residential customers in Region I. In Ojai tiered rates for residential customers have been in place since its 1990 GRC Decision (D.90-12-118). Thus, the decline in consumption per-customer during the period of 2007-2011 is not attributable to the implementation of tiered rates.

Figure 21 shows an increase in consumption per-customer beginning in 2011 and continuing through 2013. Considering Ojai's pre-recession levels of water consumption were already influenced by tiered rates, it is reasonable to expect this upward trend to continue until as there is no evidence suggesting that this trend will not continue.

The various regression models result in a wide range of residential forecasts from 195.82 Ccf per customer per month to 251.11 Ccf per customer per month. The New Committee Method results in 216.92 Ccf per customer per month is similar to usage levels during the lowest point of the last 10 years that occurred in 2010-2011.

ORA's inclusion of the unemployment variable in the regression model (as an indicator of economic conditions) has a significant positive effect on the resulting sales per customer. Models including unemployment (lines 10, 11 and 12 of Table 7) show higher forecasted results than compared models omitting the unemployment variable (lines 1, 2, and 5). Due to the relatively modest inverse relation with consumption (Figure 22), and downward trending unemployment, the models including the unemployment variable yield significant increases over those that do not.

Instead of using 2013 recorded consumption per-customer, which is GSWC's proposal, ORA recommends using the currently adopted consumption. This adopted consumption is the regression model used in the previous GRC and represents data prior to 2011. The current upward trend from 215.52 Ccf annually in 2010 to 241.11 Ccf annually in 2013 should continue and the adopted forecast is reflective of this. The data used to obtain the adopted forecast ignores the dip and subsequent bounce-back which in this case is appropriate as tiered rates have already been implemented and the dip was due to other factors such as economic conditions.

The current upward trend has not converged around any point and there is no evidence the current trend should not continue. The currently adopted level of consumption is 248.40 Ccf per customer per year which corresponds to a monthly average use of 20.70 Ccf per customer.

Figure 20: Average Monthly Consumption and 12-Month Rolling Average Monthly Sales per Customer (center line)

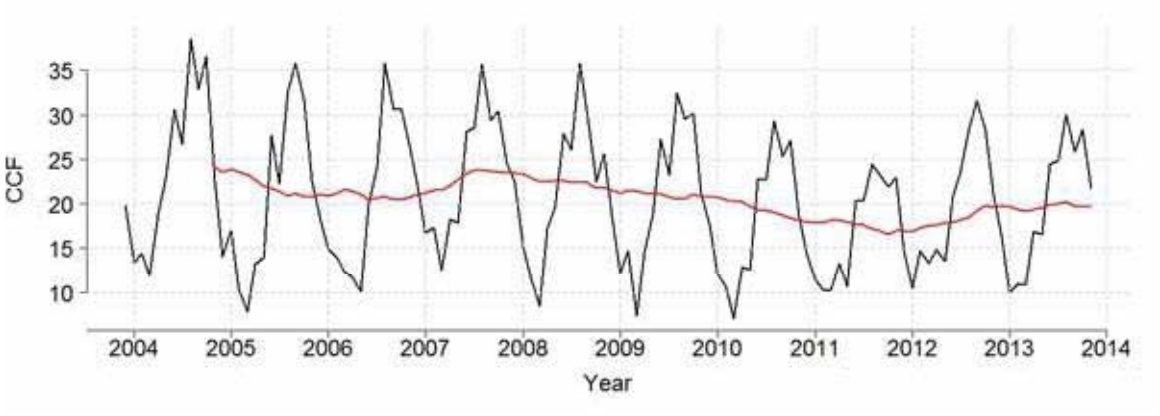


Figure 141: 12 Month Rolling Average Residential Monthly Sales per Customer & 10-Year Average (dashed line)

Figure 152: 12-Month Rolling Average Monthly Sales per Customer & Unemployment Rate

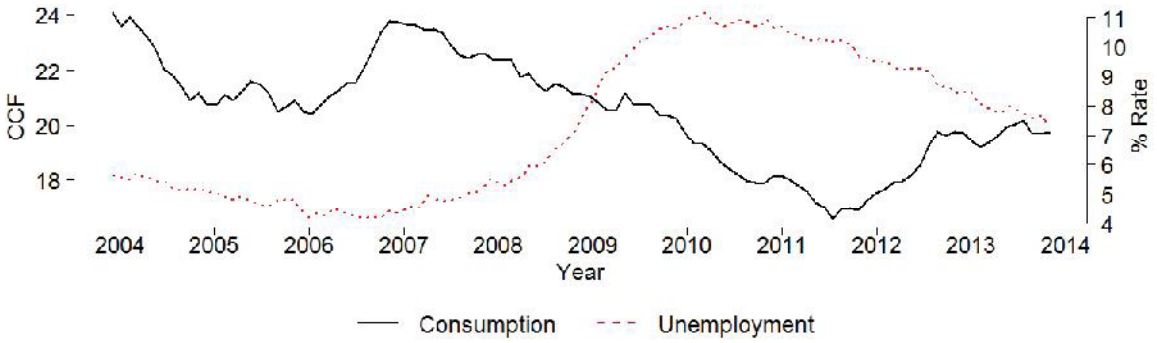


Table 9*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Ojai Residential Customer Class

OJ	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-98.04	1.65	1.38%	240.18
2	arima-meanx	-98.04	0.43	0.36%	240.87
3	arima	-102.35	16.89	14.10%	195.82
4	arima-fixed	-71.37	17.66	14.74%	220.83
5	ncm	0.81	10.91	9.11%	216.92
6	5 yr avg	NA	18.38	15.35%	228.70
7	3 yr avg	NA	20.21	16.87%	225.22
8	2 yr avg	NA	15.65	13.06%	236.19
9	current	NA	9.68	8.08%	241.03
10	arima-arimax w/unemp	-69.48	10.89	9.09%	251.11
11	arima-meanx w/unemp	-69.48	13.14	10.97%	241.12
12	ncm w/unemp	0.82	1.00	0.83%	240.71
13	Adopted	NA	NA	NA	248.40

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"
**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Ojai – Commercial

FIVE-YEAR AVERAGE: 646.49 Ccf per customer per year

The large variability in consumption for the commercial class is indicative of large customers heavily influencing the average (Figure 23). In June of 2014, GSWC recorded 331 commercial

customers in Ojai.[16] Due to the large variances in consumption the five-year average is an appropriate method for forecasting. ORA accepts GSWC's five year average forecast for the commercial class in Ojai of 860.29 Ccf per customer per year which is 53.87 Ccf on a monthly basis.

Figure 163: 12 Month Rolling Average Commercial Monthly Sales per Customer & 10-Year Average (dashed line)

Table 10*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Ojai Commercial Customer Class

OJ	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	51.32	33.81	12.21%	508.69
2	arima-meanx	51.32	4.14	1.50%	536.36
3	arima	70.58	76.52	27.64%	568.42
4	arima-fixed	92.29	20.29	7.33%	544.08
5	ncm	0.54	1.14	0.41%	536.49
6	5 yr avg	NA	39.20	14.16%	528.73
7	3 yr avg	NA	31.59	11.41%	519.91
8	2 yr avg	NA	22.25	8.04%	538.77
9	current	NA	16.07	5.80%	549.25
10	arima-arimax w/unemp	51.29	34.20	12.35%	522.32
11	arima-meanx w/unemp	51.29	5.29	1.91%	537.09
12	ncm w/unemp	0.55	21.87	7.90%	591.73

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"
**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Santa Maria - Residential

FIVE YEAR AVERAGE: 141.46 Ccf per customer per year

[16] Response to Data Request ED3-001

Santa Maria consumption exhibits an upward trend in consumption per-customer in 2011 similar to the other coastal CSA's in Region I. Similar to Ojai, Santa Maria has large seasonal fluctuations in average consumption per-customer. However Santa Maria's tiered rate structure has been in effect since September 2009 per D.09-05-005, implying that consumption per-customer may not return to pre-2009 levels. Warmer temperatures in 2006 (Figure 19) correspond to an increase in consumption per-connection beginning in 2006 (Figure 18). Figure 19 shows a dramatic spike in the average monthly temperature recorded in Santa Maria beginning in 2011, which has likely been a factor in driving the recent upward trend in consumption along with economic recovery. The unemployment variable does not affect consumption forecasts in ORA's statistical models and therefore the current downward trend in unemployment rates should minimally affect sales forecasts. Given this, it is likely that consumption will steadily increase from current consumption levels. GSWC's five-year average provides an appropriate forecast for 2016 of 238 Ccf per customer, which is nearly 20 Ccf per month per customer.

Figure 17: Average Monthly Consumption and 12-Month Rolling Average Monthly Sales per Customer (center line)

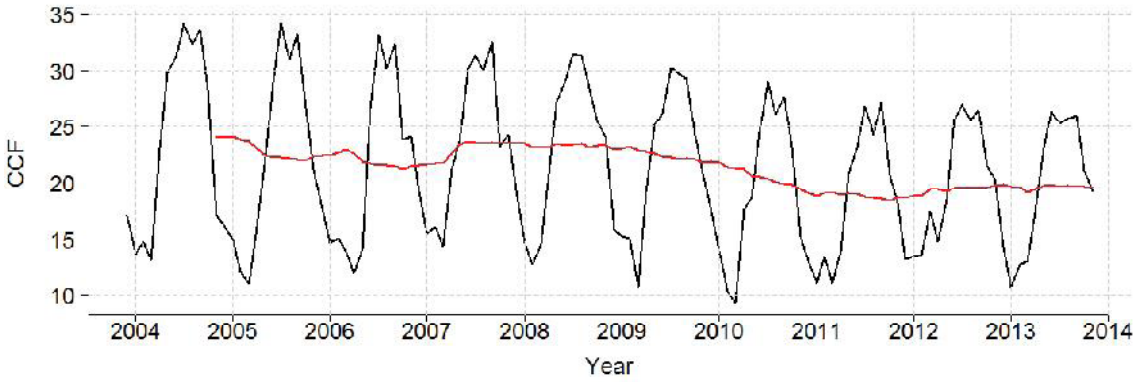


Figure 18: 12 Month Rolling Average Commercial Monthly Sales per Customer & 10-Year Average (dashed line)

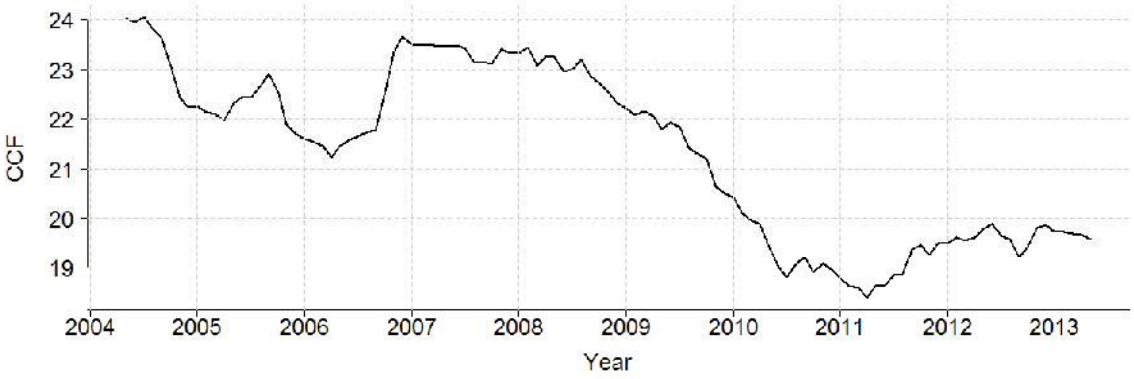


Figure 19: 12 Month Rolling Average Commercial Monthly Temperature & 10-Year Average (dashed line)

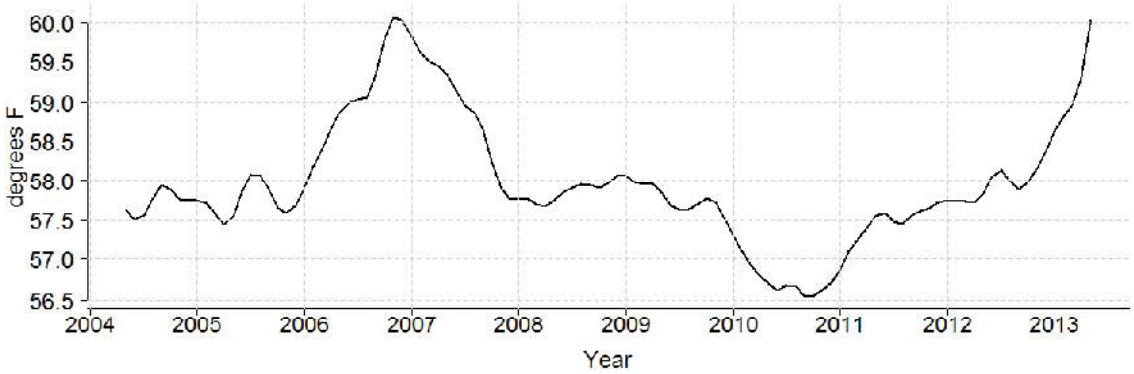


Table 11*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Santa Maria Residential Customer Class

SM	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-194.25	11.83	9.98%	180.52
2	arima-meanx	-194.25	21.66	18.27%	173.04
3	arima	-142.41	14.03	11.84%	172.67
4	arima-fixed	-109.21	7.63	6.44%	219.35
5	ncm	0.79	14.22	11.99%	193.38
6	5 yr avg	NA	2.64	2.23%	238.11
7	3 yr avg	NA	5.07	4.28%	232.03
8	2 yr avg	NA	1.49	1.26%	236.26
9	current	NA	1.52	1.28%	237.58
10	arima-arimax w/unemp	-212.91	4.28	3.61%	208.54
11	arima-meanx w/unemp	-212.91	9.78	8.25%	203.22
12	ncm w/unemp	0.79	19.16	16.16%	182.16

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

Santa Maria - Commercial

FIVE-YEAR AVERAGE: 860.29 Ccf per customer per year

Over the course of ten years the Santa Maria commercial class has undergone large variances in its average annual consumption. The peak of 95 Ccf average monthly consumption was reached twice during this time, once in mid-2004 and then in mid-2006. The lowest point in average monthly consumption came after the economic recession in late 2010 and corresponds to the highest point in unemployment rates (Figure 28). Since this low point, consumption has remained within a relatively small range, with a monthly average between 67-73 Ccf per connection. The five-year average is therefore an appropriate forecast as it accounts for this consistency in the consumption trend. GSWC's five-year average forecast of 860.29 Ccf is an average of 71.69 Ccf per connection on a monthly basis.

Figure 20: 12 Month Rolling Average Commercial Monthly Sales per Customer & 10-Year Average (dashed line)

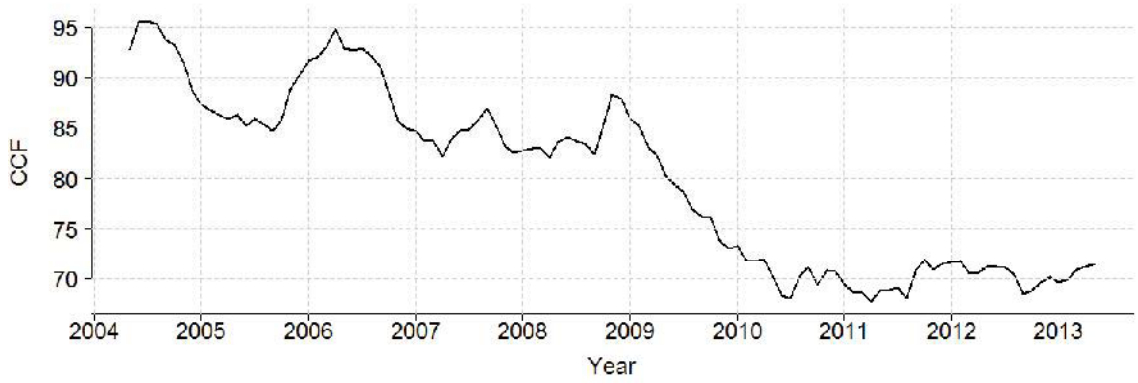


Figure 21: 12-Month Rolling Average Monthly Sales per Customer & Unemployment Rate

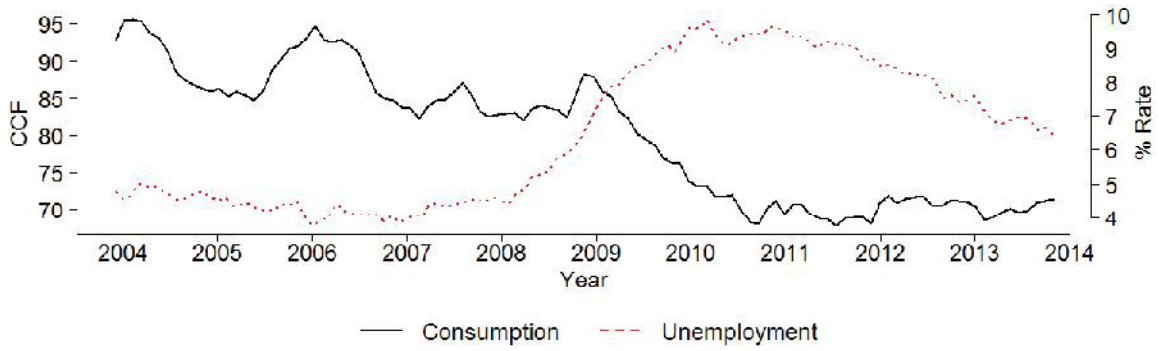


Table 12*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Santa Maria Commercial Customer Class

SM	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-18.08	17.29	3.79%	868.09
2	arima-meanx	-18.08	82.72	18.13%	803.03
3	arima	-51.35	146.33	32.08%	500.63
4	arima-fixed	-26.29	87.71	19.23%	749.30
5	ncm	0.68	112.64	24.69%	661.48
6	5 yr avg	NA	50.70	11.11%	868.47
7	3 yr avg	NA	57.85	12.68%	846.04
8	2 yr avg	NA	49.12	10.77%	856.12
9	current	NA	35.72	7.83%	877.57
10	arima-arimax w/unemp	-24.62	49.99	10.96%	987.93
11	arima-meanx w/unemp	-24.62	7.56	1.66%	888.62
12	ncm w/unemp	0.68	126.15	27.65%	630.83

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"

**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Simi Valley - Residential

ADOPTED: 175.44 Ccf per customer per year

The decline in consumption during the recession years is present in Simi Valley residential customers. Similar to Ojai and Santa Maria, the high seasonal fluctuations indicate high discretionary water use during the summer months. The reduction in discretionary water consumption is evident in Figure 29 as the peaks (discretionary) dropped from around 25 Ccf to less than 20 Ccf, while the valleys (non-discretionary) only dropped from around 12-11 Ccf to slightly less than 10 Ccf. Simi Valley also experienced a dramatic increase in average temperatures since 2009 to present (roughly 6°F, Figure 31). Figure 32 shows corresponding decline in precipitation is also present during this time.

Furthermore, there is a positive effect of unemployment rates on the models predicting consumption (models 1,2, and 5 compared to models 10, 11, and 12 in Table 13). This supports the recent upward trend in consumption beginning in 2011 and the adopted sales forecast is consistent with this trend. The five-year average will overstate the lower values of consumption immediately following the economic recession. The currently adopted annual forecast of 175.44 Ccf per connection is an average of 14.62 Ccf per customer on a monthly basis.

Figure 22: Average Monthly Sales and 12-Month Rolling Average Monthly Sales per Customer (center line)

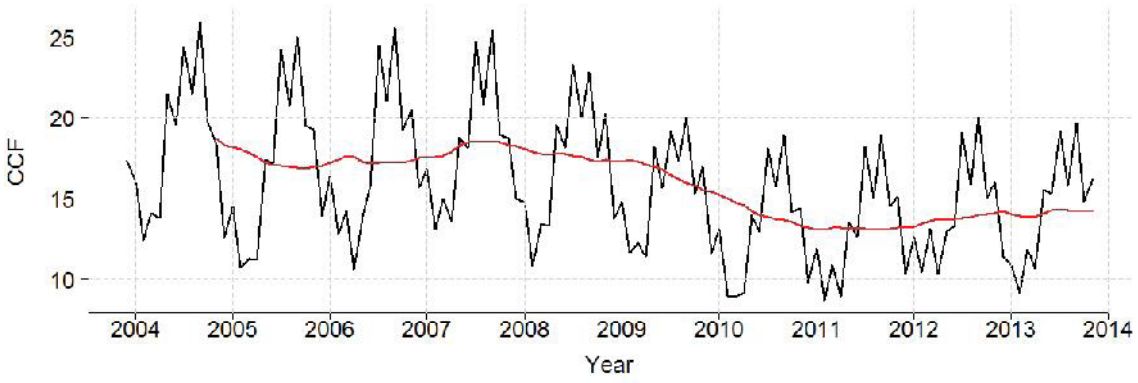


Figure 23: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

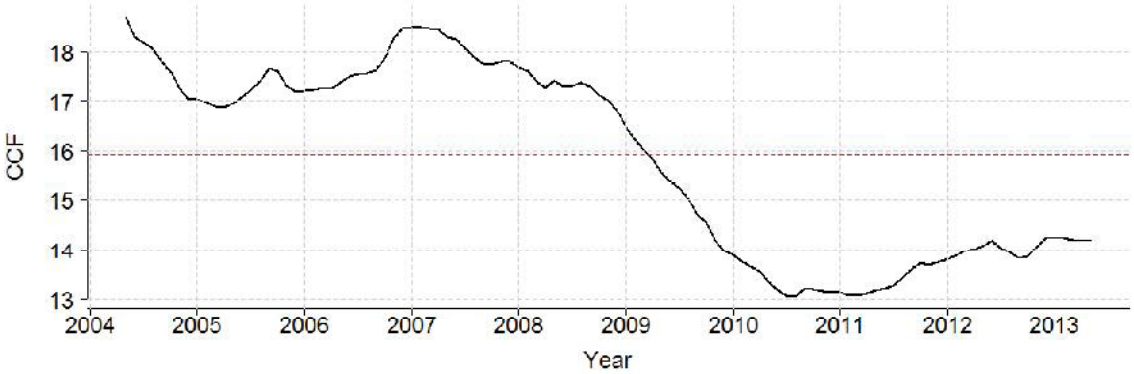


Figure 24: 12-Month Rolling Average Monthly Temperature & 10-Year Average (dashed line)

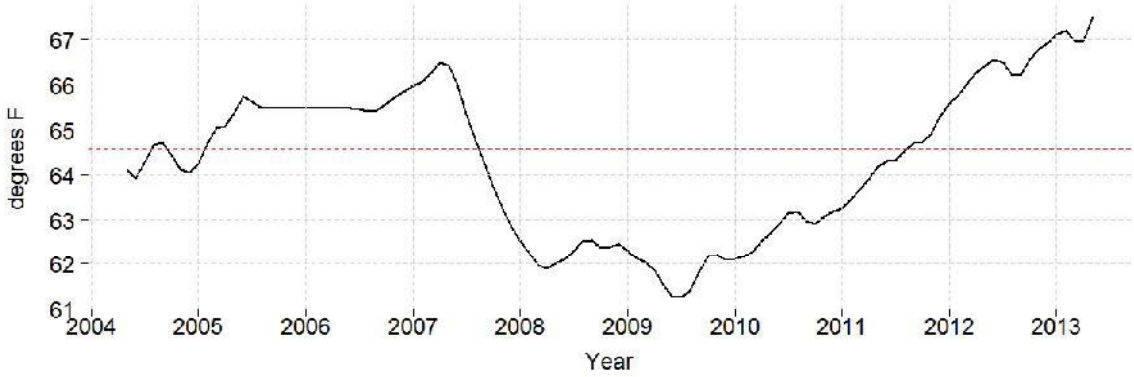


Figure 25: 12-Month Rolling Average Monthly Precipitation & 10-Year Average (dashed line)

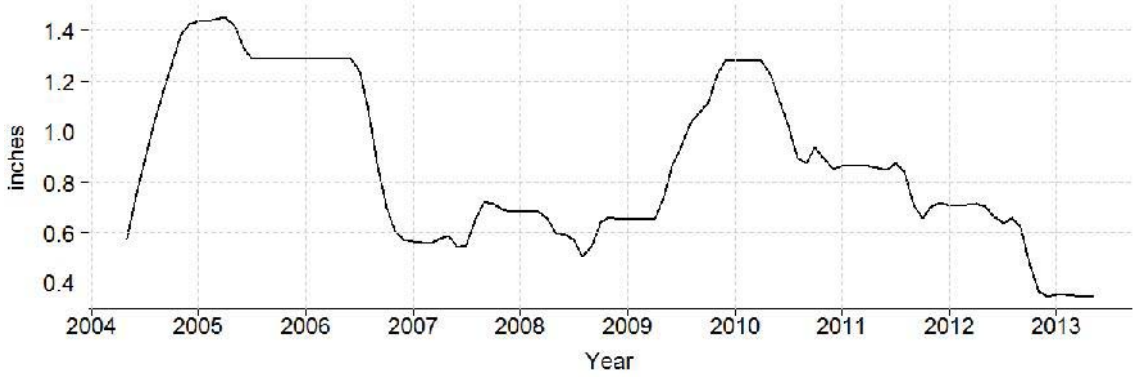


Table 13*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Simi Valley Residential Customer Class

SV	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-218.24	5.52	6.28%	151.56
2	arima-meanx	-218.24	13.25	15.06%	137.10
3	arima	-191.52	7.03	7.99%	149.79
4	arima-fixed	-235.93	5.34	6.07%	155.27
5	ncm	0.75	21.16	24.04%	113.40
6	5 yr avg	NA	3.84	4.36%	168.85
7	3 yr avg	NA	6.58	7.47%	165.91
8	2 yr avg	NA	4.05	4.61%	169.81
9	current	NA	2.69	3.06%	170.98
10	arima-arimax w/unemp	-214.74	0.98	1.11%	167.62
11	arima-meanx w/unemp	-214.74	9.81	11.15%	147.34
12	ncm w/unemp	0.75	18.00	20.46%	120.70

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"

**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Simi Valley - Commercial

CURRENT: 950.72 Ccf per customer per year

Commercial customers in Simi Valley exhibit a relatively strong response to economic conditions as a driving factor of consumption. A comparison of models excluding the unemployment rate (1, 2, and 5), to those including it (10, 11, 12) shows that the variable contributes positively to the forecast. A relatively high correlation coefficient with unemployment,(-0.45, high compared to other CSA's) further confirms the correlation that as unemployment rates drop, water consumption will increase in vice-versa. Figure 34 compares these two trends. Recent upward trends lead to the five-year average overstating the dip in sales during mid-2010 through mid-2011. The current level of consumption is a more appropriate indication of future sales as it is consistent with the recent upward trend. The most recent recorded consumption amount of 950.72 Ccf is an average of 79.23 Ccf per connection on a monthly basis.

Figure 26: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

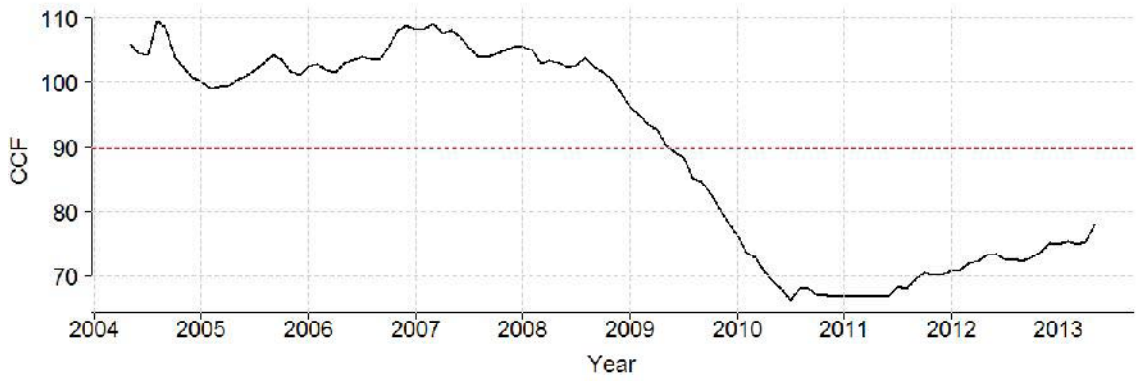


Figure 27: 12-Month Rolling Average Monthly Sales per Customer & Unemployment Rate

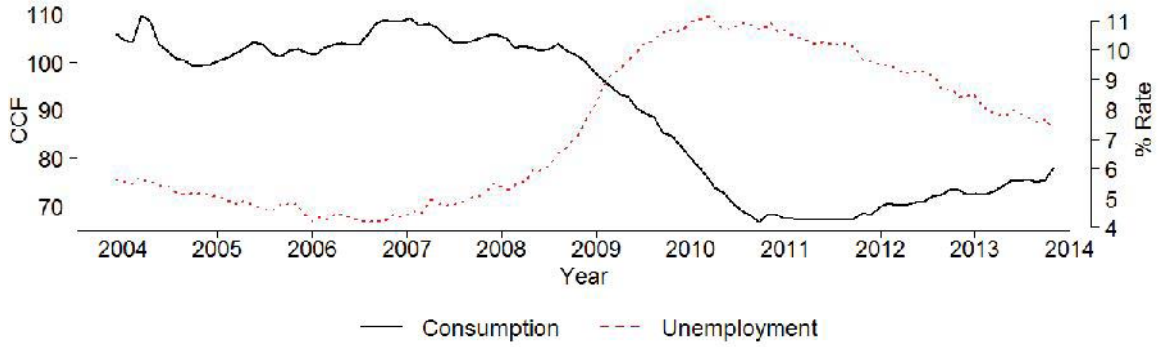


Table 14*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Simi Valley Commercial Customer Class

SV	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	19.19	122.47	20.52%	945.38
2	arima-meanx	19.19	207.11	34.69%	751.12
3	arima	41.46	113.15	18.95%	932.46
4	arima-fixed	36.65	115.24	19.30%	1,010.21
5	ncm	0.74	283.41	47.47%	509.28
6	5 yr avg	NA	135.82	22.75%	906.62
7	3 yr avg	NA	161.81	27.10%	873.52
8	2 yr avg	NA	145.12	24.31%	908.57
9	current	NA	120.34	20.16%	950.13
10	arima-arimax w/unemp	18.58	103.87	17.40%	1,035.08
11	arima-meanx w/unemp	18.58	196.90	32.98%	776.82
12	ncm w/unemp	0.76	229.00	38.36%	635.15

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"

**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

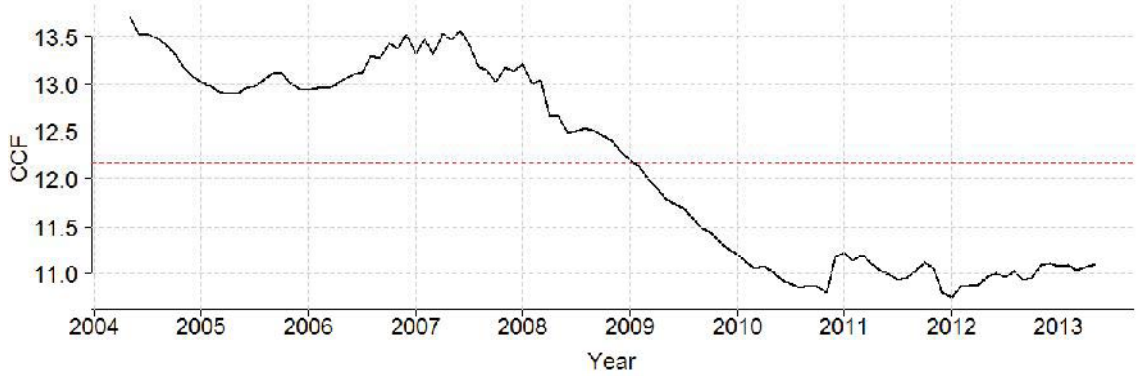
Region II

Residential

FIVE-YEAR AVERAGE: 133.82 Ccf per customer per year

Residential consumption in Region II exhibits low variability in long-run consumption patterns. Over the past ten years, average monthly consumption has varied by 2.5-3 Ccf. This is likely due to the fact that average consumption in Region II is spread over a large base of customers (73,253 customers recorded as of June 2014).[17] Region II's territory is also in a highly urbanized area of Los Angeles which can explain why customers use less discretionary (outdoor) water (peaks in Figure 36). Because of this very low variability in consumption over the course of ten years, and even less over the course of five years (2 Ccf, Figure 35), the five-year average is an appropriate forecast. GSWC's five-year average consumption of 133.82 Ccf results in an average of 11.15 Ccf per month.

Figure 28: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)



[17] Response to Data Request ED3-001

Figure 29: Average Monthly Consumption and 12-Month Rolling Average Monthly Sales per Customer (center line)

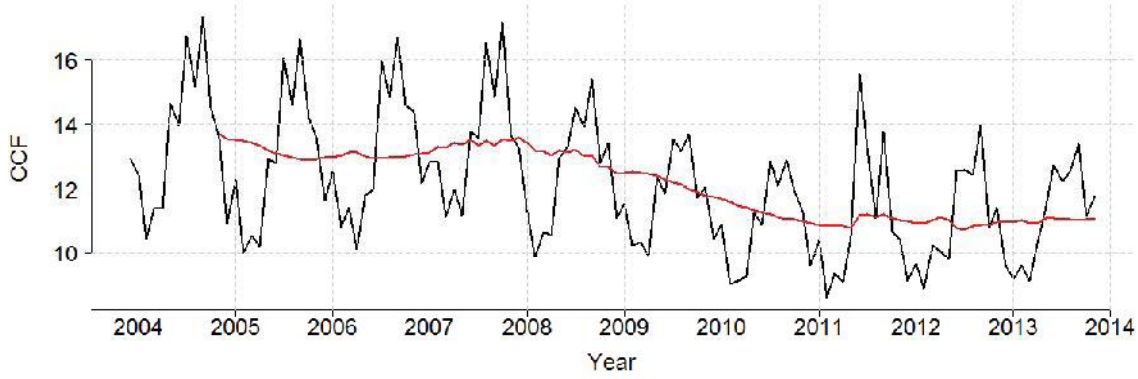


Table 15*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Region 2 Residential Customer Class

ME	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-270.26	0.90	1.25%	123.49
2	arima-meanx	-270.26	2.28	3.17%	123.42
3	arima	-258.87	3.16	4.39%	135.34
4	arima-fixed	-217.39	1.64	2.28%	125.50
5	ncm	0.76	5.11	7.11%	115.20
6	5 yr avg	NA	0.88	1.22%	134.06
7	3 yr avg	NA	0.06	0.08%	132.28
8	2 yr avg	NA	0.72	1.01%	132.26
9	current	NA	0.31	0.43%	133.24
10	arima-arimax w/unemp	-269.42	0.48	0.67%	121.96
11	arima-meanx w/unemp	-269.42	1.40	1.94%	124.73
12	ncm w/unemp	0.76	4.18	5.82%	117.41

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"
**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Commercial

CURRENT: 510.02 Ccf per customer per year

Compared to other commercial customers in other RMA's, Region II's commercial customers experience little variation in average consumption per year making future consumption patterns more predictable (Figure 38). Similar to Region II's residential class, the variation in average consumption is less when more customers are included into the average calculation. Region II

recorded 25,247 commercial customers in 2013. The spread of consumption between more customers makes it less evident when an individual customer changes their consumption, therefore limiting the variability in consumption to changes made by the majority of customers. Therefore, the most recently recorded year provides an appropriate forecast as any changes from this level would have to be made on a large scale. The fact that consumption varies little over the course of ten years (an average of 7 Ccf difference in the average annual consumption) confirms that changes from current levels would be minimal. Therefore ORA recommends the 2013 recorded consumption amount of 510.02 Ccf as the Test Year forecast. This is an average monthly forecast of 42.50 Ccf per customer.

Figure 30: Average Monthly Consumption and 12-Month Rolling Average Monthly Sales per Customer (center line)

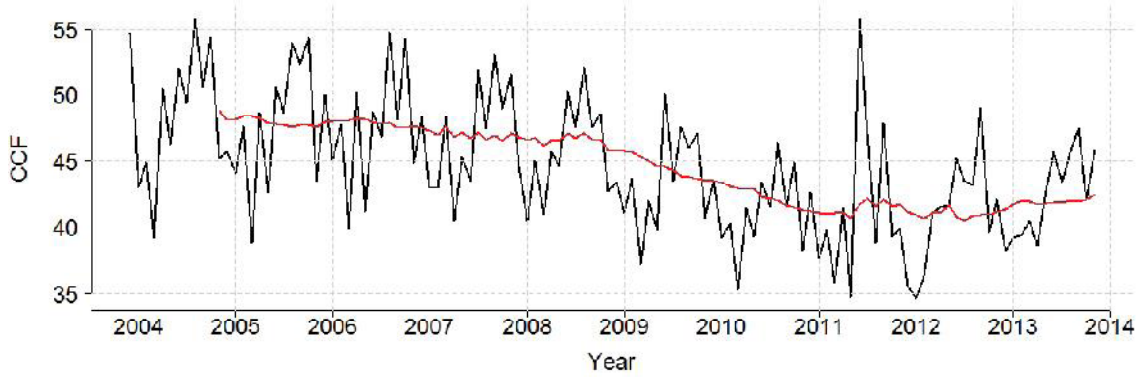


Figure 31: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

Table 16*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Region 2 Commercial Customer Class

ME	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-282.52	0.01	0.00%	468.17
2	arima-meanx	-282.52	4.23	1.50%	467.60
3	arima	-265.04	6.43	2.29%	510.13
4	arima-fixed	-241.40	4.31	1.53%	504.39
5	ncm	0.56	13.51	4.81%	451.98
6	5 yr avg	NA	4.35	1.55%	503.51
7	3 yr avg	NA	1.51	0.54%	500.47
8	2 yr avg	NA	1.02	0.36%	500.60
9	current	NA	4.94	1.76%	509.98
10	arima-arimax w/unemp	-280.48	3.88	1.38%	475.48
11	arima-meanx w/unemp	-280.48	0.83	0.30%	488.30
12	ncm w/unemp	0.57	5.19	1.85%	471.73

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

Region 3

Apple Valley- Residential

FIVE-YEAR AVERAGE: 141.46 Ccf per customer per year

Residential consumption in Apple Valley is highly correlated to temperature (0.8975) indicating that customers' use of discretionary water (outdoor irrigation) is a driving factor of average consumption. This is further confirmed when looking at monthly consumption in Figure 39 below. The peaks, which include discretionary water use, are declining during 2009-2014, while the valleys (non-discretionary water) remain fairly constant. This is an indication that customers in Apple Valley are flexible with their water use (i.e. can make significant reductions from conservation or increase outdoor use). Apple Valley residential consumption has not shown signs of a bounce back effect, but the range in consumption for the most recent four years has remained narrow (an average monthly range of 1.5 Ccf). This makes GSWC's five-year average an appropriate forecast method. The annual average forecast of 141.46 Ccf is a monthly average of 11.79 Ccf per customer.

Figure 32: Average Monthly Consumption and 12-Month Rolling Average Monthly Sales per Customer (center line)

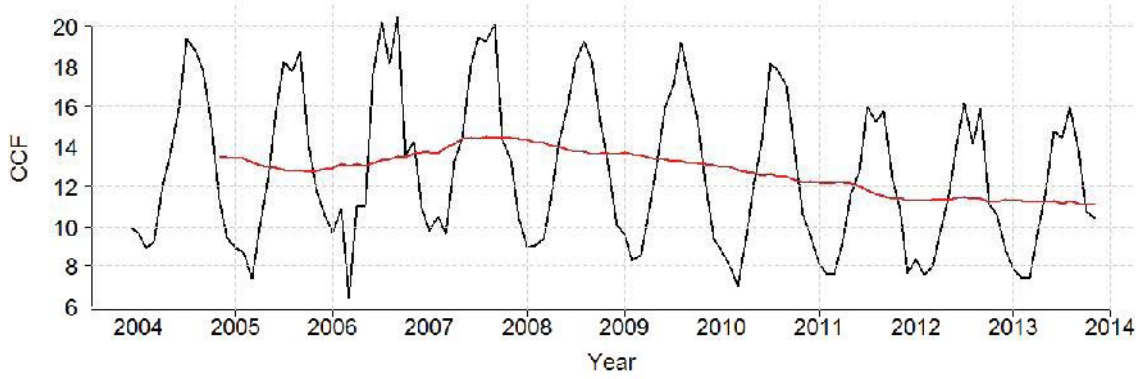


Figure 33: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

Table 17*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Apple Valley Residential Customer Class

AV	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-256.69	0.25	0.39%	122.45
2	arima-meanx	-256.69	1.92	2.96%	113.57
3	arima	-189.82	0.85	1.31%	122.34
4	arima-fixed	-220.45	2.75	4.25%	117.93
5	ncm	0.89	1.29	1.99%	119.60
6	5 yr avg	NA	4.55	7.03%	141.81
7	3 yr avg	NA	2.30	3.56%	134.96
8	2 yr avg	NA	2.49	3.85%	133.84
9	current	NA	2.12	3.28%	132.20
10	arima-arimax w/unemp	-257.26	0.58	0.90%	131.39
11	arima-meanx w/unemp	-257.26	2.40	3.70%	122.39
12	ncm w/unemp	0.90	4.21	6.50%	105.94

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"

**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Apple Valley - Commercial

FIVE-YEAR AVERAGE: 685.80 Ccf per customer per year

Apple Valley commercial customers are also temperature sensitive in their usage. The correlation coefficient between consumption and temperature is 0.91. Over the course of ten years, consumption has varied significantly ranging from much as of 15 Ccf per month on average (Figure 42). Temperature may have been responsible for the peaks in average consumption in late-2006 and mid-2008 (Figures 42 and 43). However the recent upward trend in temperature did not result in a similar upward trend in consumption. Therefore, placing more weight on recent years is useful to determining a forecast as the past four years have remained within a 5 Ccf monthly average range – a relatively small range for commercial customers. The five year average is an appropriate forecast as it includes the variability in consumption from the decline beginning in 2008, the bounce-back effect, and the most recent year. GSWC's five-year average forecast of 685.80 Ccf per commercial customer is appropriate. This is an average of 57.15 Ccf on a monthly basis.

Figure 34: Average Monthly Consumption and 12-Month Rolling Average Monthly Sales per Customer (center line)

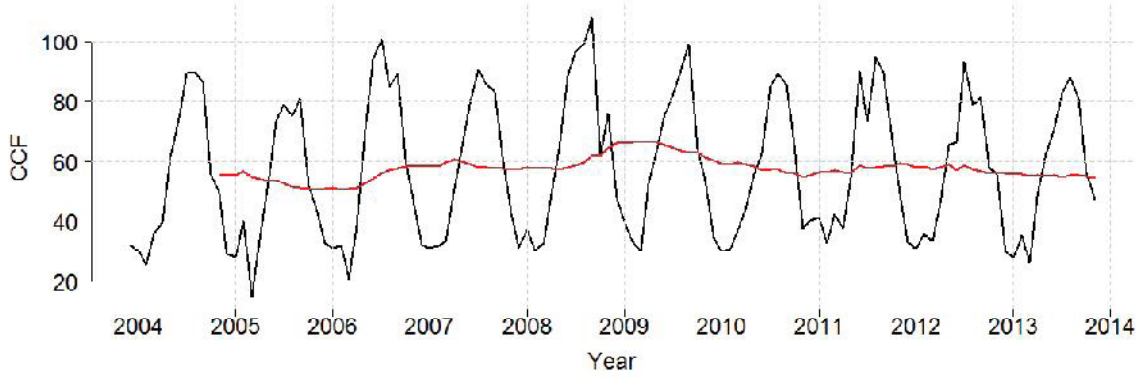


Figure 35: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

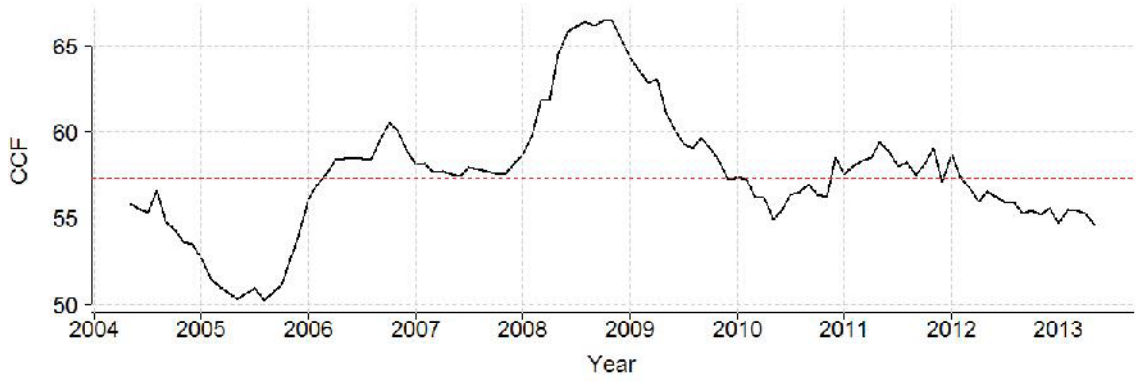


Figure 36: 12-Month Rolling Average Monthly Temperature & 10-Year Average (dashed line)

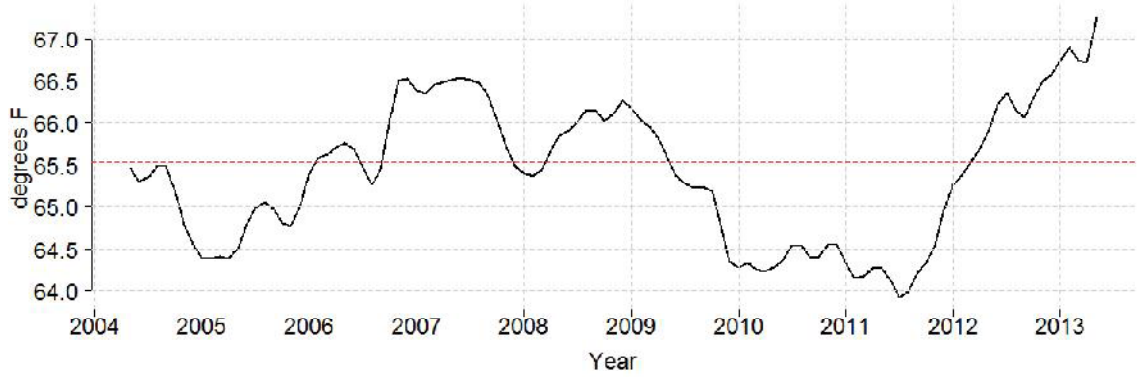


Table 18*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Apple Valley Commercial Customer Class

AV	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-119.39	28.29	8.67%	581.31
2	arima-meanx	-119.39	19.15	5.86%	534.18
3	arima	-104.03	227.80	69.77%	126.47
4	arima-fixed	-69.83	28.47	8.72%	655.26
5	ncm	0.82	12.47	3.82%	679.89
6	5 yr avg	NA	8.47	2.59%	687.69
7	3 yr avg	NA	9.80	3.00%	681.78
8	2 yr avg	NA	21.04	6.44%	666.28
9	current	NA	19.29	5.91%	662.42
10	arima-arimax w/unemp	-117.55	29.54	9.05%	576.41
11	arima-meanx w/unemp	-117.55	19.96	6.11%	533.28
12	ncm w/unemp	0.84	33.54	10.27%	565.57

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"

**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Barstow- Residential

FIVE-YEAR AVERAGE: 148.39 Ccf per customer per year

Consumption in the Barstow residential class is highly correlated to temperature (0.82) and there is a pattern of peaks in consumption declining while the valleys remain relatively constant, an indication that customers have conserved overall water consumption by cutting back on discretionary or outdoor water use. The overall trend has been a steady decline in consumption since 2007. Unlike many of the other CSA's, Barstow has not seen a plateau to the economic recession decline. Considering that the gap between discretionary and non-discretionary water consumption is smaller than in the past ten years it is unlikely for consumption to fall much further (Figure 44). Given the low variability in this trend over the past five years, 2 – 3 Ccf over the long-run average (Figure 45), a five-year average is an appropriate forecast. GSWC's five-year average forecast of 148.39 Ccf is an average of 12.37 Ccf on a monthly basis.

Figure 37: Average Monthly Consumption and 12-Month Rolling Average Monthly Sales per Customer (center line)

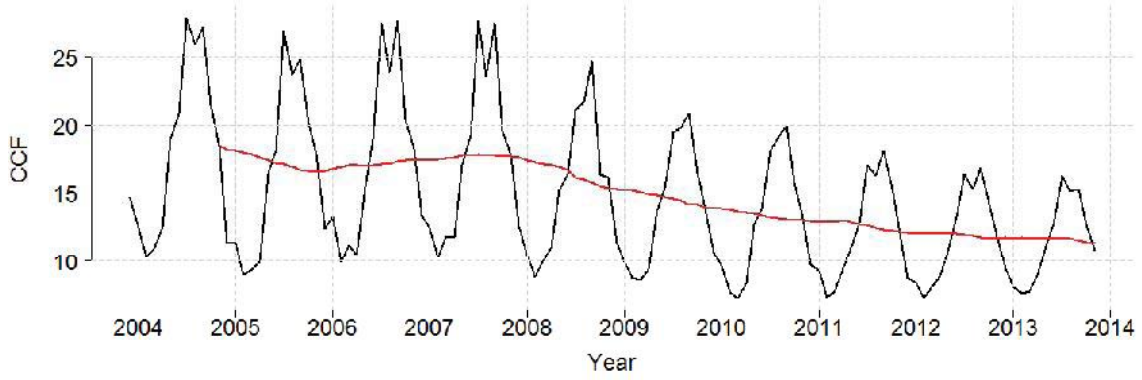


Figure 38: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

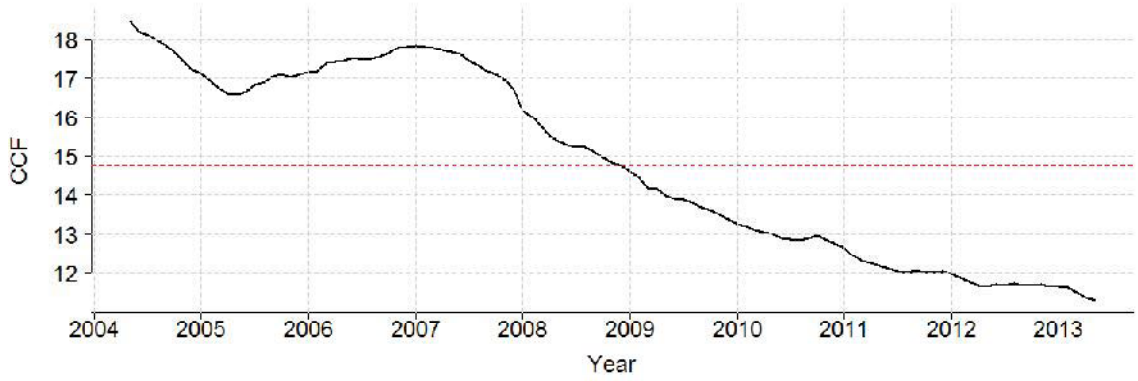


Table 19*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Barstow Residential Customer Class

BA	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-302.58	0.09	0.15%	114.15
2	arima-meanx	-302.58	1.61	2.67%	105.58
3	arima	-257.81	0.83	1.37%	110.89
4	arima-fixed	-272.93	2.21	3.67%	104.96
5	ncm	0.90	3.91	6.48%	94.92
6	5 yr avg	NA	8.56	14.18%	148.98
7	3 yr avg	NA	5.59	9.26%	140.47
8	2 yr avg	NA	5.03	8.33%	137.72
9	current	NA	3.74	6.19%	134.26
10	arima-arimax w/unemp	-341.42	1.24	2.05%	117.94
11	arima-meanx w/unemp	-341.42	2.21	3.66%	109.79
12	ncm w/unemp	0.90	4.29	7.11%	93.97

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"
**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Barstow - Commercial

FIVE YEAR AVERAGE: 891.93 Ccf per customer per year

Compared to other GSWC commercial classes, Barstow's commercial class exhibits little long-run variance, roughly 10 Ccf during 2009 through 2013 and within 5 Ccf the past three years (Figure 47). Consumption has consistently declined since 2009 (Figure 47) mainly as a result of a decline in discretionary or outdoor water consumption (peaks in Figure 46). Temperature has

also been an influential indicator of consumption (Figure 48) with a significant correlation coefficient of 0.77. Given the recent upward trend in temperature, average consumption per connection should see a similar rise. Considering the steady decline, the low long-run variability in consumption, and the correlation with increasing temperatures, a five-year average is an appropriate forecast. The five-year average also captures a slight increase in consumption per connection that will likely occur due to increasing temperatures (Figure 48). GSWC's five-year average forecast of 891.93 Ccf per customer is an average of 74.33 Ccf per customer on a monthly basis.

Figure 39: Average Monthly Consumption and 12-Month Rolling Average Monthly Sales per Customer (center line)

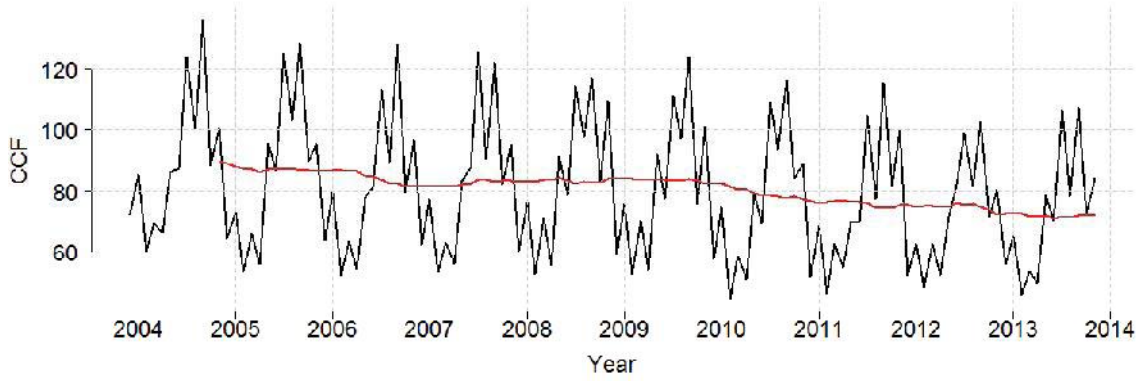


Figure 40: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

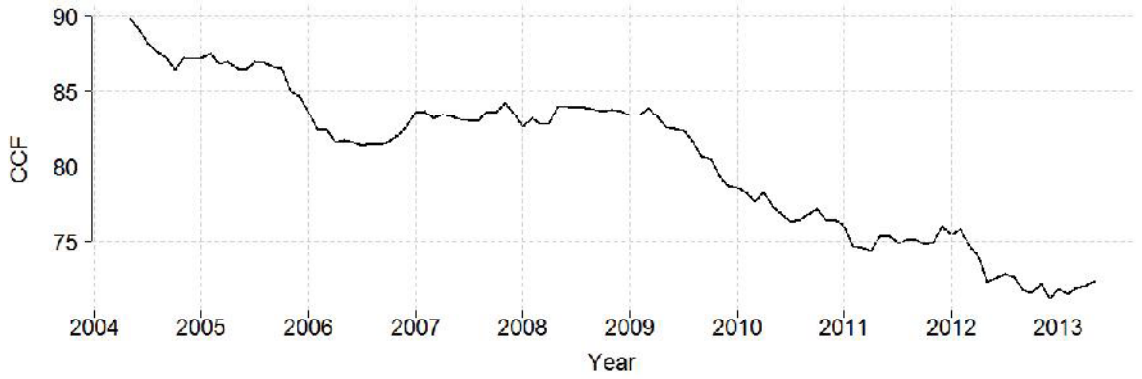


Figure 41: 12-Month Rolling Average Monthly Temperature & 10-Year Average (dashed line)

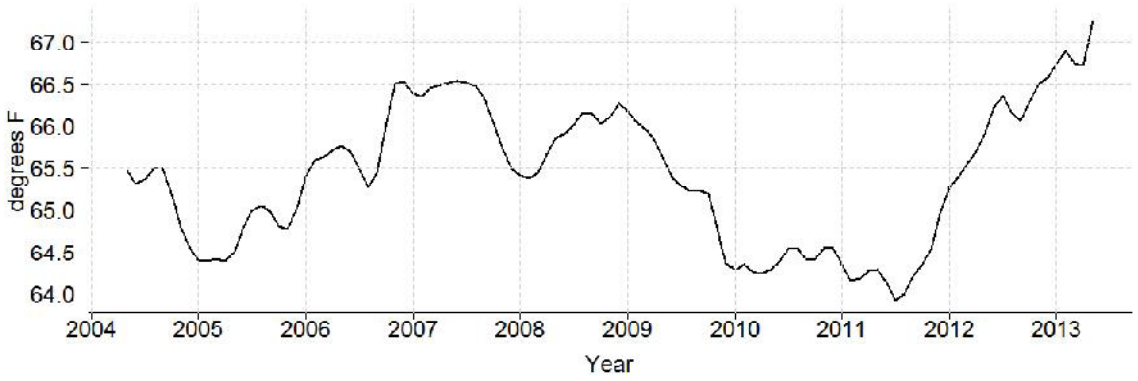


Table 20*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Barstow Commercial Customer Class

BA	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-217.75	4.32	1.06%	817.06
2	arima-meanx	-217.75	5.83	1.43%	806.55
3	arima	-223.47	1.94	0.48%	811.23
4	arima-fixed	-265.12	2.36	0.58%	794.78
5	ncm	0.65	35.73	8.79%	792.26
6	5 yr avg	NA	31.06	7.64%	911.05
7	3 yr avg	NA	17.81	4.38%	879.25
8	2 yr avg	NA	18.21	4.48%	867.00
9	current	NA	4.28	1.05%	860.07
10	arima-arimax w/unemp	-245.26	8.26	2.03%	774.48
11	arima-meanx w/unemp	-245.26	4.61	1.13%	760.62
12	ncm w/unemp	0.66	4.67	1.15%	715.08

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"
**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Calipatria- Residential

FIVE-YEAR AVERAGE: 205.67 Ccf per customer per year

Residential consumption in Calipatria varies dramatically over the past ten years. Consumption is weakly correlated to the unemployment rate, temperature, and precipitation (correlation coefficients of -0.24, 0.18, and -0.15 respectively). Starting in 2009, consumption begins to stabilize to resemble something consistent (Figure 49). Since 2009 average monthly

consumption varied by 6 Ccf, compared to 30 Ccf of variance between mid-2006 through mid-2008. The five year average is therefore an appropriate forecast. GSWC's five-year average consumption of 205.67 Ccf is a monthly average of 17.14 Ccf.

Figure 49: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

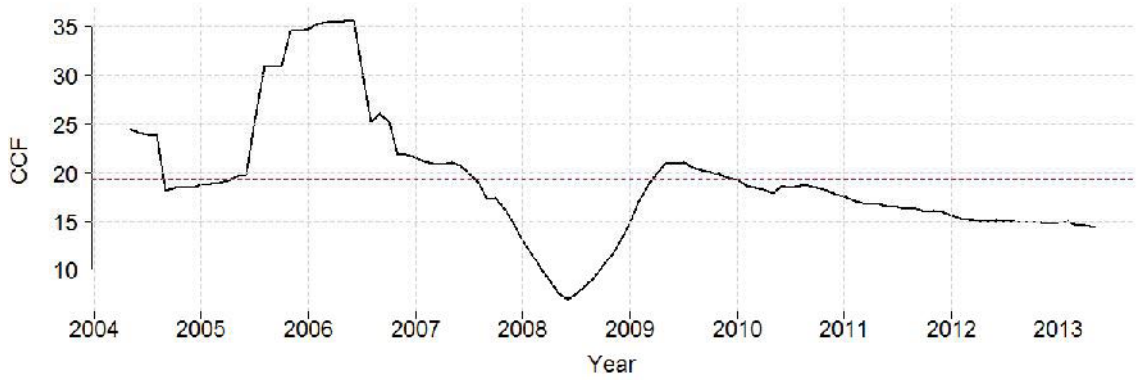


Table 21*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Calipatria Residential Customer Class

CN	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	80.27	28.23	31.74%	114.07
2	arima-meanx	80.27	25.71	28.92%	118.81
3	arima	94.07	2.06	2.32%	159.67
4	arima-fixed	146.36	1.53	1.72%	143.72
5	ncm	0.13	5.31	5.97%	117.41
6	5 yr avg	NA	15.54	17.47%	204.42
7	3 yr avg	NA	8.90	10.01%	185.17
8	2 yr avg	NA	5.42	6.09%	177.08
9	current	NA	3.04	3.41%	172.35
10	arima-arimax w/unemp	134.67	2.10	2.36%	184.32
11	arima-meanx w/unemp	134.67	8.88	9.99%	202.92
12	ncm w/unemp	0.14	16.08	18.08%	168.23

* ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"

**Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data

Calipatria - Commercial

FIVE-YEAR AVERAGE: 890.67 Ccf per customer per year

Commercial consumption varies dramatically similar to the residential class. Consumption does not correlate strongly with any of the key variables (with correlation coefficients of 0.042 with unemployment, 0.50 with temperature, and -0.31 with precipitation). This leads to inefficient regression results. The 2008 increase in consumption may likely be due to the corresponding increase in the number of customers from 85 in 2007 to 157 in 2008 and back down to 86 in 2009. These additional customers, if larger in usage, would have increased the average consumption per connection. However, since 2010 there has been a steady pattern in average monthly consumption (Figure 50). This makes the five-year average forecast appropriate as GSWC has not indicated it anticipates another dramatic increase in the number of customers. If future consumption remains consistent regression models results may become reliable. GSWC's five-year average forecast of 890.67 Ccf per customer is an average of 74.22 Ccf per customer on a monthly basis.

Figure 42: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

Table 22*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Calipatria Commercial Customer Class

CN	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-95.55	23.04	4.87%	929.25
2	arima-meanx	-95.55	33.21	7.02%	942.31
3	arima	-81.86	18.39	3.89%	913.03
4	arima-fixed	-58.38	33.98	7.18%	754.59
5	ncm	0.29	24.98	5.28%	874.68
6	5 yr avg	NA	27.12	5.73%	892.92
7	3 yr avg	NA	41.28	8.72%	908.62
8	2 yr avg	NA	27.40	5.79%	889.43
9	current	NA	4.35	0.92%	838.39
10	arima-arimax w/unemp	-93.81	20.35	4.30%	918.92
11	arima-meanx w/unemp	-93.81	32.78	6.93%	941.77
12	ncm w/unemp	0.29	1.40	0.30%	818.65

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

Claremont- Residential

FIVE-YEAR AVERAGE: 269.18 Ccf per customer per year

Claremont, like most CSA's, experienced a steady decline in residential consumption during the economic recession. Since 2010, residential consumption has remained within a 2 Ccf average monthly range (Figure 51). The lack of a significant bounce-back effect in Claremont indicates the change in consumption, from either the recession or the implementation of tiered pricing, is more structural than a short-term shock. This therefore makes the five-year average an appropriate method to obtaining the test year forecast. The five-year average forecast of 269.18 Ccf per customer is an average monthly consumption of 22.43 Ccf per customer.

Figure 43: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

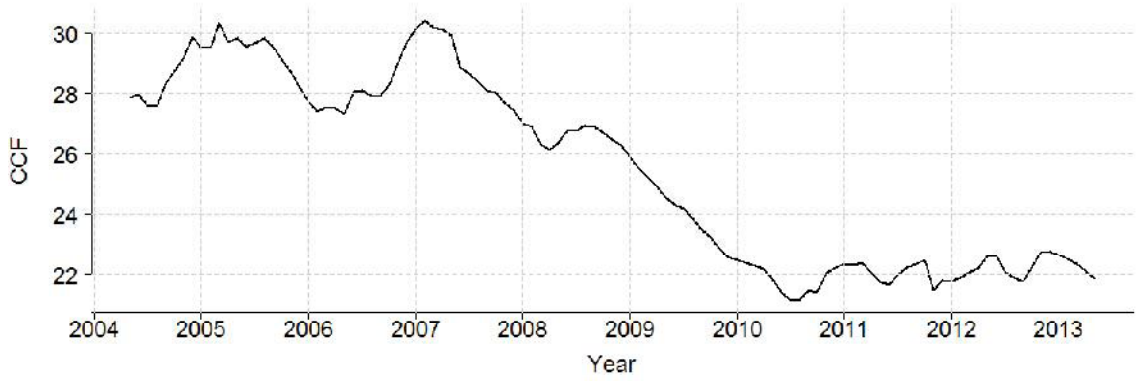


Table 23*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Claremont Residential Customer Class

CM	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-109.36	15.09	11.61%	247.00
2	arima-meanx	-109.36	2.95	2.27%	253.04
3	arima	-58.14	23.14	17.80%	208.29
4	arima-fixed	-92.04	16.53	12.71%	241.99
5	ncm	0.81	15.10	11.61%	222.32
6	5 yr avg	NA	7.22	5.55%	270.44
7	3 yr avg	NA	9.61	7.39%	265.24
8	2 yr avg	NA	9.13	7.02%	267.08
9	current	NA	5.90	4.54%	264.73
10	arima-arimax w/unemp	-119.09	7.61	5.85%	248.47
11	arima-meanx w/unemp	-119.09	9.63	7.41%	283.78
12	ncm w/unemp	0.83	0.95	0.73%	261.59

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

Claremont - Commercial

CURRENT CONSUMPTION: 1620.07 Ccf per customer per year

Commercial consumption in Claremont has followed the typical trend seen in many other CSA's. The decline during the recession years was more abrupt and consumption has remained lower than usual. However, there has been a slow increase in consumption since mid-2010. The five-year average forecast is lower than current consumption, and is not reflective of the increase in

consumption in each subsequent year for the past four years. Therefore the five-year average is not appropriate. The most recent two years of consumption data show a slowing down of the increasing trend and therefore the most recently recorded year is an appropriate forecast. The forecast of 1620.07 Ccf per customer per year results in a monthly average of 135.00 Ccf.

Figure 44: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

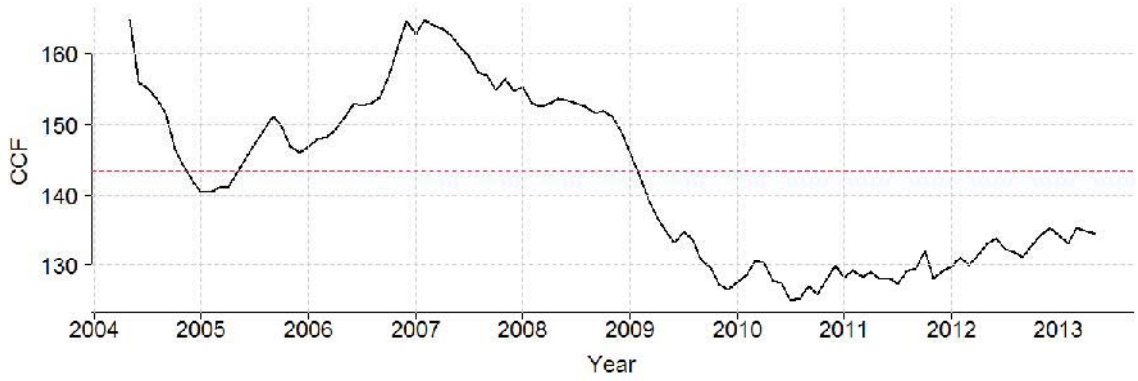


Table 24*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Claremont Commercial Customer Class

CM	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-132.43	92.57	11.31%	1,552.38
2	arima-meanx	-132.43	31.88	3.90%	1,574.01
3	arima	-127.88	121.95	14.90%	1,386.04
4	arima-fixed	-82.51	93.89	11.47%	1,432.37
5	ncm	0.75	88.65	10.83%	1,405.59
6	5 yr avg	NA	86.29	10.54%	1,579.68
7	3 yr avg	NA	89.67	10.96%	1,582.15
8	2 yr avg	NA	81.08	9.91%	1,605.42
9	current	NA	62.48	7.63%	1,619.28
10	arima-arimax w/unemp	-143.46	75.19	9.19%	1,501.39
11	arima-meanx w/unemp	-143.46	5.43	0.66%	1,659.33
12	ncm w/unemp	0.76	23.23	2.84%	1565.66

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

Morongo Valley- Residential

FIVE-YEAR AVERAGE: 120.59 Ccf per customer per year

In the Morongo Valley CSA, aside from the apparent decline during the recession years, there was a sharp increase, plateau, and then decrease during mid-2011 through mid-2013 (Figure 53). However, since the consumption variability is small (2 Ccf over ten years, and 1 Ccf over the past four years), the significance of this event should not be given much weight. Overall low consumption during the past ten years indicates that customers in this CSA are already frugal with their consumption. Future trends should remain in this 2 Ccf range with a slight upward trend as represented by the five-year average. The five-year average is able to spread the variability in consumption so that no one event in this dataset is overstated when the consumption pattern shows no overarching trend. The forecast of 120.59 Ccf annually is an average monthly consumption of 10.05 Ccf.

Figure 45: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

Table 25*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Morongo Valley Residential Customer Class

MV	Model	AIC or R2	CCF Difference	% Difference	TY Sales per Customer (CCF)
1	arima-arimax	-178.72	2.94	5.20%	121.53
2	arima-meanx	-178.72	4.42	7.81%	114.15
3	arima	-160.12	2.52	4.45%	112.39
4	arima-fixed	-41.63	0.42	0.74%	107.85
5	ncm	0.81	2.15	3.79%	107.35
6	5 yr avg	NA	3.32	5.87%	119.98
7	3 yr avg	NA	3.69	6.51%	119.71
8	2 yr avg	NA	5.62	9.92%	121.02
9	current	NA	4.36	7.70%	115.81
10	arima-arimax w/unemp	-84.45	7.60	13.42%	135.24
11	arima-meanx w/unemp	-84.45	9.05	15.99%	124.59
12	ncm w/unemp	0.81	0.39	0.70%	101.04

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

Morongo Valley - Commercial

FIVE YEAR AVERAGE: 278.75 Ccf per customer per year

Commercial customers exhibit large inter-annual variances in their consumption that are sporadic and do not appear to be related to seasonal weather patterns. Combined with the low number of customers (50 in 2013), this suggest that only a few customers are causing the bulk of this variability. The statistical results indicate that the unemployment variable contributes positively to the forecast (models 1-3 compared to models 10-12 in Table 24). The five-year average is an appropriate forecast in this case considering this pattern of fluctuations and accounts for the possibility of increased consumption (from last recorded) in the future due to favorable economic conditions. GSWC's five-year average forecast of 278.75 Ccf is an average monthly forecast of 23.23 Ccf.

Figure 46: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

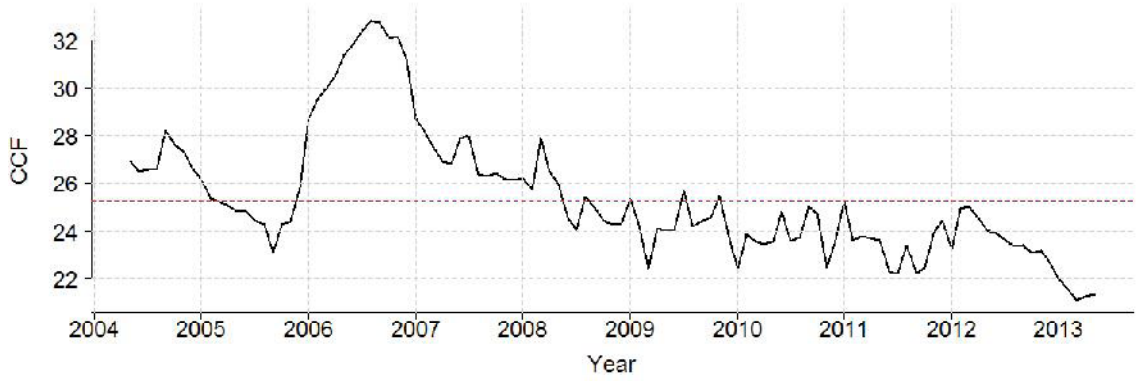


Table 26*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Morongo Valley Commercial Customer Class

MV	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	109.77	5.43	4.10%	270.33
2	arima-meanx	109.77	6.86	5.17%	257.14
3	arima	140.25	20.33	15.34%	266.53
4	arima-fixed	127.50	2.54	1.91%	238.19
5	ncm	0.26	6.92	5.22%	240.30
6	5 yr avg	NA	12.91	9.74%	280.12
7	3 yr avg	NA	13.24	9.99%	276.32
8	2 yr avg	NA	13.66	10.31%	272.56
9	current	NA	3.76	2.84%	254.80
10	arima-arimax w/unemp	109.11	24.60	18.56%	316.42
11	arima-meanx w/unemp	109.11	24.62	18.57%	286.08
12	ncm w/unemp	0.26	8.22	6.20%	243.53

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

Orange County- Residential

FIVE-YEAR AVERAGE: 160.05 Ccf per customer per year

Consumption in the Orange County CSA displays a similar pattern to other residential consumption patterns (Figure 56). The slight upward trend during the mid-2010 through 2014 period should continue going forward as discretionary water consumption was the focus of customer conservation during the recession years (peaks vs. valleys on Figure 55). The trend is

very gradual over recent years and therefore the five-year average forecast is appropriate. The five-year average captures some of the higher consumption of 2009, before reaching its minimum point in mid-2010, therefore spreading this variability into the forecast. An average annual consumption of 160.05 Ccf per customer is an average of 13.34 Ccf per month.

Figure 47: Average Monthly Consumption and 12-Month Rolling Average Monthly Sales per Customer (center line)

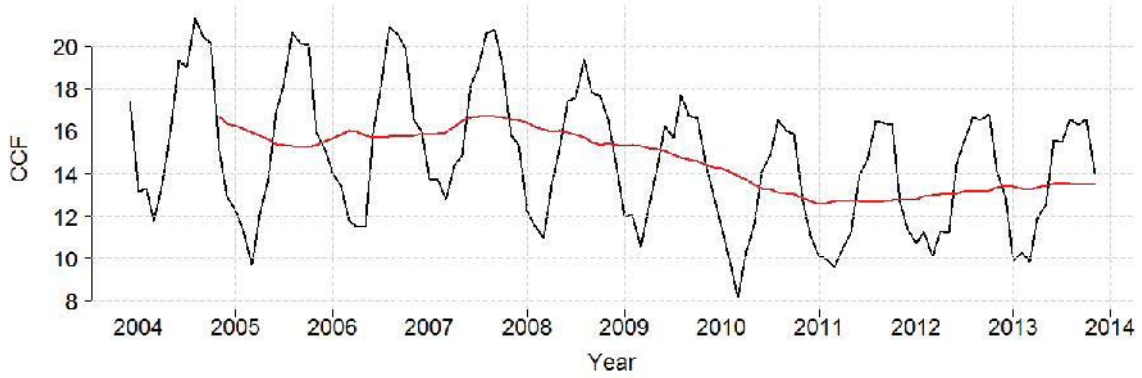


Figure 48: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

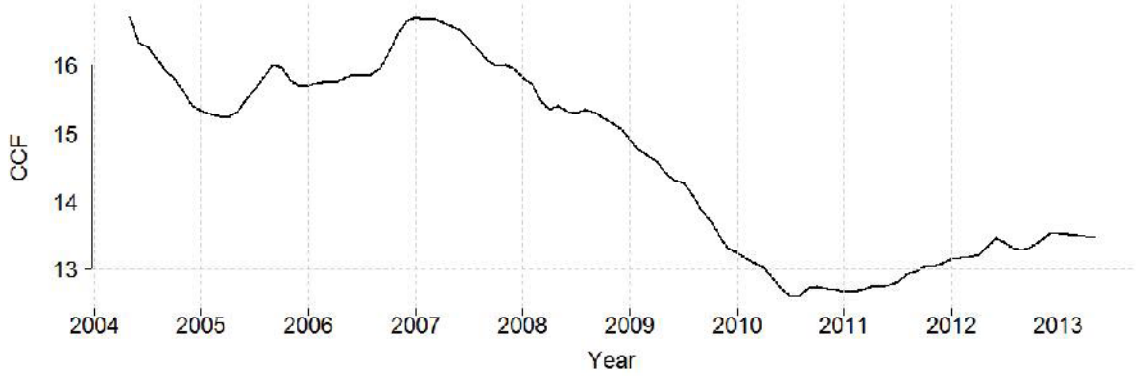


Table 27*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Orange County Residential Customer Class

OC	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-292.12	2.89	3.40%	143.83
2	arima-meanx	-292.12	7.51	8.83%	138.64
3	arima	-250.40	6.93	8.16%	137.97
4	arima-fixed	-284.53	4.11	4.83%	146.41
5	ncm	0.91	10.94	12.87%	131.36
6	5 yr avg	NA	3.13	3.69%	160.32
7	3 yr avg	NA	5.19	6.11%	158.11
8	2 yr avg	NA	3.44	4.05%	160.79
9	current	NA	2.22	2.62%	161.67
10	arima-arimax w/unemp	-284.08	0.69	0.81%	149.63
11	arima-meanx w/unemp	-284.08	6.81	8.02%	141.64
12	ncm w/unemp	0.91	8.15	9.59%	138.10

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

Orange County - Commercial

CURRENT: 868.26 Ccf per customer per year

Commercial consumption in Orange County resembles the trends found in residential customers. This is likely due to the fact that there are many commercial customers in this CSA (3,846 in 2013) that allow for gradual smoothing, so that no one customer has much influence on the average consumption (Morongo Valley is the opposite case). However, although this customer class resembles the Orange County residential class, the five-year average does not reflect well on the recent (two year) bounce-back in consumption (Figure 58). Considering commercial consumption fell mostly in the discretionary category (peaks vs. valleys on Figure 57), there remains more room for an increase in per-connection consumption on average. The five-year average therefore understates the growth in consumption in recent years, and the current level of consumption is a good indicator of 2016 average consumption. The 2013 recorded consumption amount of 868.26 Ccf per customer is an average of 72.36 Ccf per customer per month.

Figure 49: Average Monthly Consumption and 12-Month Rolling Average Monthly Sales per Customer (center line)

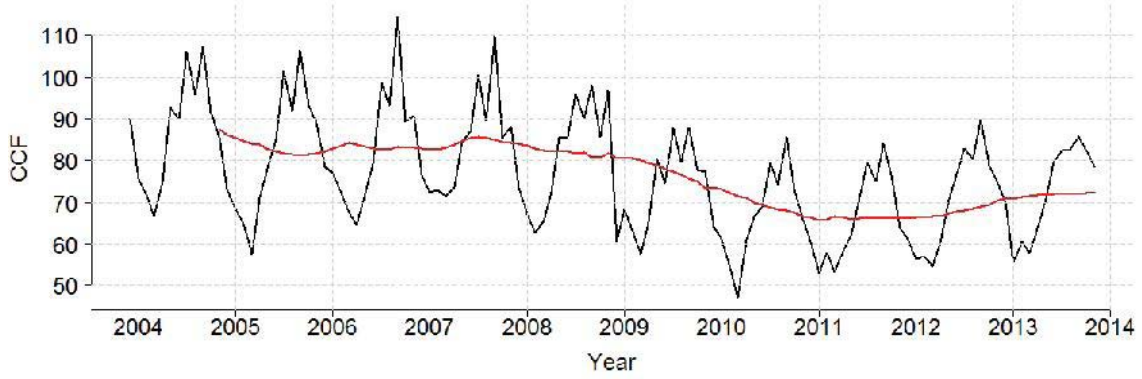


Figure 50: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

Table 28*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Orange County Commercial Customer Class

OC	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-260.22	13.41	2.82%	807.74
2	arima-meanx	-260.22	29.80	6.26%	789.84
3	arima	-316.63	168.65	35.43%	3,759.89
4	arima-fixed	-274.51	21.12	4.44%	826.94
5	ncm	0.85	71.49	15.02%	698.97
6	5 yr avg	NA	35.35	7.43%	837.59
7	3 yr avg	NA	39.12	8.22%	835.50
8	2 yr avg	NA	28.66	6.02%	856.26
9	current	NA	19.24	4.04%	868.14
10	arima-arimax w/unemp	-334.44	3.13	0.66%	829.36
11	arima-meanx w/unemp	-334.44	29.91	6.28%	778.47
12	ncm w/unemp	0.87	45.74	9.61%	761.30

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

San Dimas- Residential

ADOPTED: 197.00 Ccf per customer per year

In San Dimas, the bounce-back growth in consumption began in mid-2011 but has not been as strong of a recovery as in other CSA's (Figure 60). Yet, because the ten year range in average consumption is larger than most other CSA's residential customers (between 16 Ccf and 22 Ccf on Figure 60), the steady growth of the past three years should be considered significant. The wide variances in seasonal consumption between less than 10 Ccf per customer per month to over 30 Ccf per customer per month (Figure 59) indicate that on average customers are using a bulk of their water consumption for outdoor purposes. This implies that customers are likely to consume more water as economic and weather conditions trend toward to pre-recession levels. The five-year average in this case would overstate the low periods of consumption resulting in a low sales forecast. The most recent recorded value ignores the recent upward trend in consumption (from an annual amount of 190.50 Ccf per customer in 2010 to 196.05 Ccf per customer in 2013) while the adopted level of sales accounts for this. The currently adopted forecast is 197.00 Ccf per year which is an average of 16.42 Ccf per month.

Figure 51: Average Monthly Consumption and 12-Month Rolling Average Monthly Sales per Customer (center line)

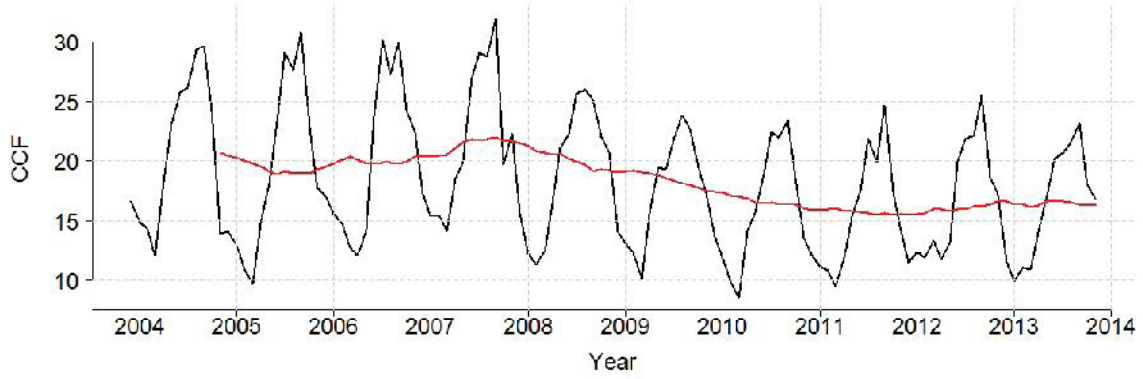


Figure 52: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

Table 29*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the San Dimas Residential Customer Class

SD	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-194.67	8.39	8.31%	190.21
2	arima-meanx	-194.67	2.27	2.25%	191.99
3	arima	-174.42	29.26	29.00%	110.88
4	arima-fixed	-142.42	8.55	8.47%	181.62
5	ncm	0.84	15.40	15.27%	160.46
6	5 yr avg	NA	6.36	6.30%	196.18
7	3 yr avg	NA	8.70	8.63%	193.22
8	2 yr avg	NA	6.73	6.67%	196.73
9	current	NA	4.93	4.89%	196.02
10	arima-arimax w/unemp	-205.29	4.87	4.83%	187.85
11	arima-meanx w/unemp	-205.29	4.38	4.34%	209.65
12	ncm w/unemp	0.85	4.89	4.85%	186.18

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

San Dimas - Commercial

CURRENT: 1647.46 Ccf per customer per year

The commercial class in San Dimas also experienced drops in consumption beginning in mid-2007 through 2011 (Figure 62). When observing the raw at the consumption data (Figure 61), conservation was achieved not by reducing peak usage, but rather by reducing the width of the customers' seasonal use. This is evident by comparing the relatively steady seasonal increases in consumption during 2004-2009 to the steep spikes in use from 2010-2012. 2013 is the exception

to this pattern indicating that the seasonal variation trends may return back to pre-recession levels. The bounce-back effect beginning in late 2011 reached a peak in late 2012 and has tapered down to its current average level of 137.28 Ccf per month. Therefore, recorded consumption in 2013 is an appropriate forecast as this two years of stabilization in consumption is more indicative of future consumption than the three years prior where consumption reached a ten-year low. The five-year average would overstate low consumption in this case. The 2013 recorded amount of 1,647.46 Ccf per customer which is an average of 137.28 Ccf per customer per month.

Figure 53: Average Monthly Consumption and 12-Month Rolling Average Monthly Sales per Customer (center line)

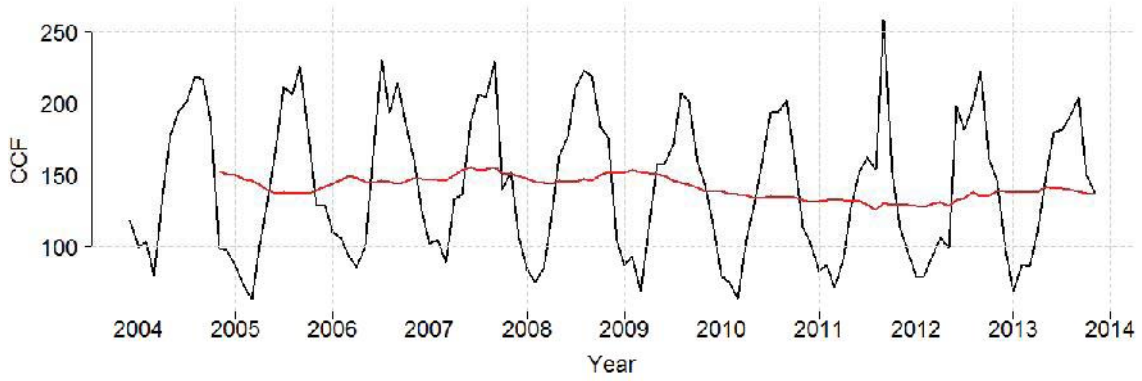


Figure 54: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

Table 30*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the San Dimas Commercial Customer Class

SD	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-144.57	81.97	10.07%	1,573.28
2	arima-meanx	-144.57	13.58	1.67%	1,602.28
3	arima	-70.68	102.01	12.53%	1,470.36
4	arima-fixed	-100.98	83.44	10.25%	1,527.08
5	ncm	0.86	62.46	7.67%	1,520.04
6	5 yr avg	NA	69.29	8.51%	1,617.10
7	3 yr avg	NA	70.44	8.65%	1,614.92
8	2 yr avg	NA	53.33	6.55%	1,648.43
9	current	NA	40.93	5.03%	1,638.12
10	arima-arimax w/unemp	-151.50	78.83	9.68%	1,539.92
11	arima-meanx w/unemp	-151.50	0.19	0.02%	1,635.94
12	ncm w/unemp	0.86	35.62	4.37%	1,585.68

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

San Gabriel- Residential

FIVE-YEAR AVERAGE: 151.33 Ccf per customer per year

Residential customers exhibit very little long-run variation in their consumption patterns (Figure 63). Average monthly consumption has varied little since 2010 and has remained within 12 to 13 Ccf. Therefore, a five-year average is an appropriate forecast as consumption per customer has remained relatively consistent. The five-year average of 151.33 Ccf per customer annually is an average of 12.61 Ccf per customer per month.

Figure 55: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

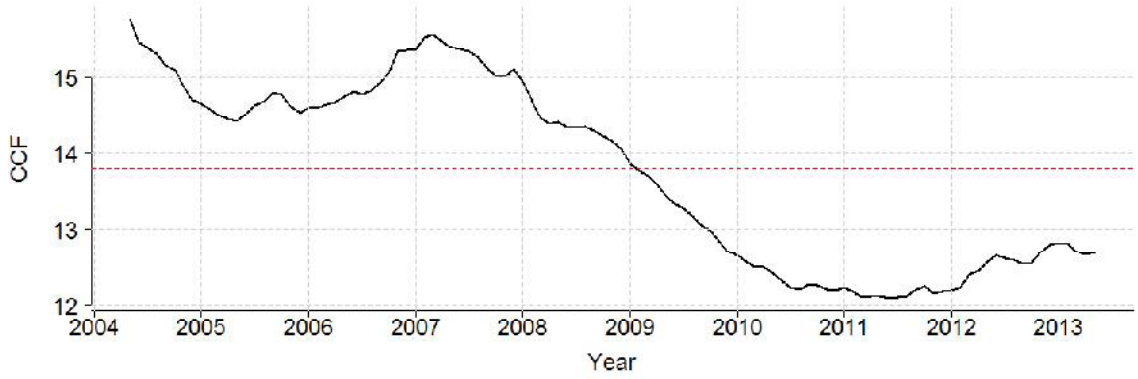


Table 31*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the San Gabriel Residential Customer Class

SG	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-384.38	14.11	17.83%	172.75
2	arima-meanx	-384.38	12.92	16.33%	171.96
3	arima	-301.92	2.69	3.40%	152.10
4	arima-fixed	-293.52	3.03	3.83%	143.35
5	ncm	0.86	9.25	11.69%	124.47
6	5 yr avg	NA	2.22	2.81%	151.57
7	3 yr avg	NA	4.42	5.59%	149.33
8	2 yr avg	NA	3.70	4.67%	151.37
9	current	NA	1.90	2.40%	152.47
10	arima-arimax w/unemp	-361.40	0.85	1.07%	145.77
11	arima-meanx w/unemp	-361.40	0.93	1.18%	152.78
12	ncm w/unemp	0.87	4.20	5.31%	136.98

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

San Gabriel - Commercial

FIVE YEAR AVERAGE: 483.40 Ccf per customer per year

The commercial class also exhibits little variation in long-run consumption patterns (Figure 64). There also is not a significant bounce-back effect during the past three years. Average monthly consumption since 2010 has remained within 1 Ccf indicating a stabilization. Therefore the five-year average is an appropriate forecast. The five-year average forecast of 483.40 Ccf per customer equates to an average monthly consumption of 40.28 Ccf per customer.

Figure 56: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

Table 32*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the San Gabriel Commercial Customer Class

SG	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-289.82	1.78	0.70%	454.68
2	arima-meanx	-289.82	1.43	0.56%	451.29
3	arima	-289.26	1.08	0.43%	456.15
4	arima-fixed	-257.32	5.80	2.28%	441.52
5	ncm	0.70	12.78	5.03%	410.12
6	5 yr avg	NA	6.39	2.51%	483.57
7	3 yr avg	NA	2.11	0.83%	478.24
8	2 yr avg	NA	0.74	0.29%	472.08
9	current	NA	1.85	0.73%	474.64
10	arima-arimax w/unemp	-286.54	1.35	0.53%	444.39
11	arima-meanx w/unemp	-286.54	0.37	0.15%	451.30
12	ncm w/unemp	0.70	6.32	2.48%	426.15

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

Wrightwood- Residential

CURRENT: 83.21 Ccf per customer per year

Consumption in the Wrightwood CSA is characterized by high summer use and low winter use. Figure 65 below shows that in some months average consumption dropped below 2 Ccf per connection, indicating that some homes may have been left vacant during those months. This is an indication of temporary residence of these homes, which is consistent Wrightwood's tourism

industry. Hence, homes may be left vacant during the shoulder seasons lowering average consumption. Long-run consumption variation is small ranging from 8 to 5 Ccf (Figure 66). Similar to other CSA's Wrightwood experiences a small bounce-back after the dip in 2011. Recent consumption begun to decline in early 2013, but should not drop any further as economic recovery provides a positive effect to water consumption as models 10 and 11 show in Table 33 compared to models 1 and 2. Recorded 2013 consumption provides an appropriate forecast for consumption that includes the upward trend during the past two years. The 2013 recorded consumption of 82.21 Ccf per customer per year equates to an average of 6.93 Ccf per customer per month.

Figure 57: Average Monthly Consumption and 12-Month Rolling Average Monthly Sales per Customer (center line)

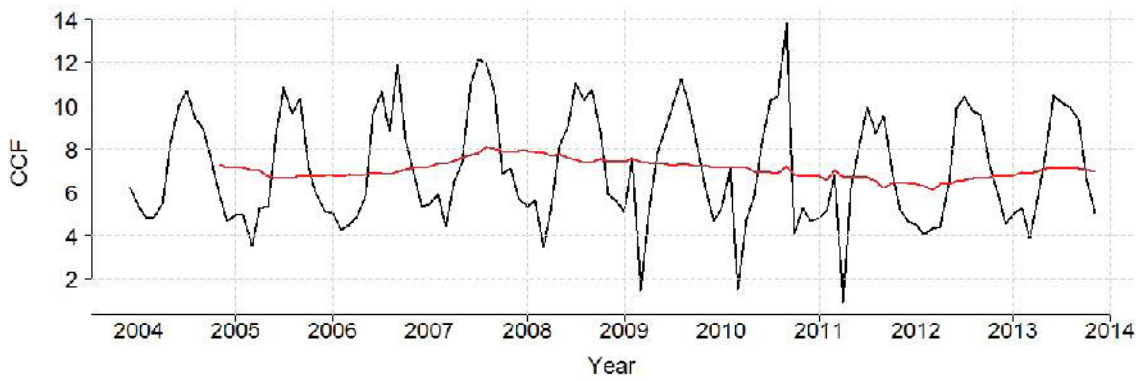


Figure 58: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

Table 33*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Wrightwood Residential Customer Class

WW	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	19.55	3.82	10.51%	77.98
2	arima-meanx	19.55	8.03	22.12%	83.61
3	arima	61.67	6.97	19.21%	80.69
4	arima-fixed	34.51	3.60	9.92%	80.41
5	ncm	0.72	5.06	13.95%	81.15
6	5 yr avg	NA	2.95	8.14%	82.18
7	3 yr avg	NA	2.91	8.01%	80.83
8	2 yr avg	NA	4.13	11.38%	82.66
9	current	NA	5.66	15.59%	83.15
10	arima-arimax w/unemp	14.33	4.44	12.22%	81.02
11	arima-meanx w/unemp	14.33	8.45	23.27%	84.89
12	ncm w/unemp	0.72	3.79	10.44%	78.06

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

Wrightwood- Commercial

FIVE-YEAR AVERAGE: 232.07 Ccf per customer per year

Wrightwood's commercial class also exhibits consumption patterns that can be attributed to the tourism industry. Similar high peaks and valleys are visible in Figure 67. During the years of 2012-2013 a dramatic increase occurred in the average monthly consumption per connection to a point even higher than what it was during the pre-recession years. At this point it is unclear whether this trend is sustainable, or short-term. The five-year average provides an appropriate forecast as the variability in recent years is accounted and no particular event is overstated (Figure 68). GSWC's five-year average of 232.07 Ccf per customer per year is 19.32 Ccf per customer per month.

Figure 59: Average Monthly Consumption and 12-Month Rolling Average Monthly Sales per Customer (center line)

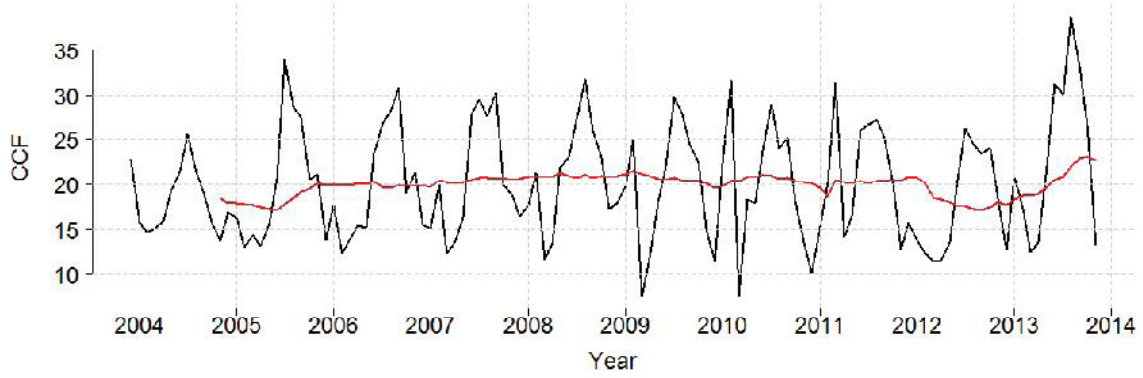


Figure 60: 12-Month Rolling Average Monthly Sales per Customer & 10-Year Average (dashed line)

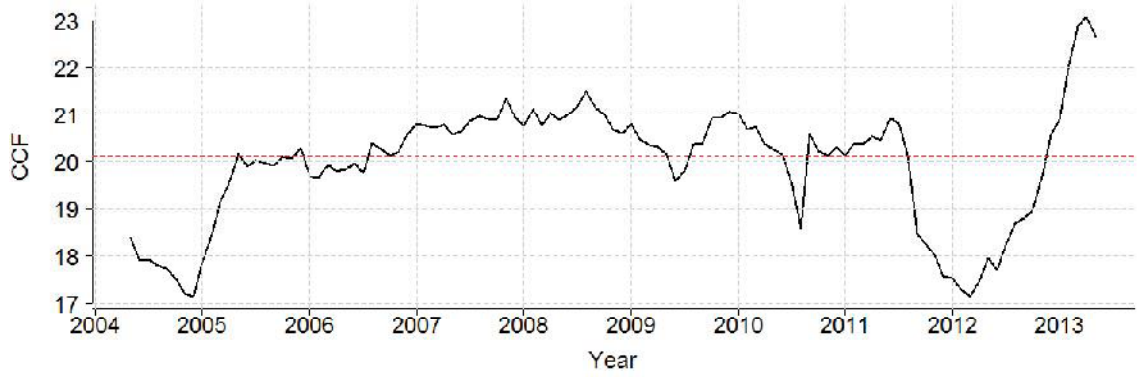


Table 34*: ORA's Model Results Showing Estimated Sales per Customer in Test Year 2016 and Statistical Results for the Wrightwood Commercial Customer Class

WW	Model	AIC or R2	CCF Difference**	% Difference**	TY Sales per Customer (CCF)
1	arima-arimax	-9.23	21.21	22.01%	229.36
2	arima-meanx	-9.23	37.63	39.06%	244.40
3	arima	0.08	29.33	30.45%	243.72
4	arima-fixed	9.78	26.35	27.36%	246.03
5	ncm	0.50	42.64	44.26%	266.74
6	5 yr avg	NA	27.15	28.19%	243.50
7	3 yr avg	NA	24.61	25.54%	244.29
8	2 yr avg	NA	18.25	18.94%	243.68
9	current	NA	32.86	34.12%	270.94
10	arima-arimax w/unemp	-7.25	21.17	21.97%	228.91
11	arima-meanx w/unemp	-7.25	37.62	39.05%	244.42
12	ncm w/unemp	0.50	45.38	47.11%	273.40

** ORA uses GSWC's recorded Jan-Dec recorded consumption. Refer to "Reconciling Differences in GSWC's and ORA's Calculation of Average Sales and Current Sales"*

***Difference between the model's forecasted first 6 months of 2014 data and actual 2014 data*

APPENDIX SALES-B (Special Contracts)

GSWC special sales contracts with three customers in Bay Point, Ojai, and Santa Maria (22 pages total)

Mr. Bailey Well Lease Agreement
(Gorham Well)

STANLEY C. HATCH
GERALD B. PARENT
S. TIMOTHY BUYNAK, JR.
SUSAN F. PETROVICH
PETER N. BROWN
STANLEY M. RODEN
THOMAS O. WISE
SCOTT S. SLATER
STEVEN A. AMERIKANER
GARY M. KVISTAD
CHRISTOPHER A. JACOBS
COLIN L. PEARCE
JEFFREY A. DINKIN†
LORI LEWIS PERRY
KEVIN J. NEESE
ROBERT J. SAPERSTEIN
LINDA K. FORD
PETER K. KONG
TAYLOR L. ANDERSON

†ALSO LICENSED IN NEVADA

LAW OFFICES
HATCH AND PARENT
A PROFESSIONAL CORPORATION
21 EAST CARRILLO STREET
SANTA BARBARA, CALIFORNIA 93101-2782

TELEPHONE
(805) 963-6231
MAILING ADDRESS
POST OFFICE DRAWER 720
SANTA BARBARA, CA 93102-0720
FACSIMILE
(805) 965-4333
(805) 564-6528

RECEIVED
OCT 21 1994
FOOTHILL DIVISION

6774.19

OUR FILE #

October 19, 1994

Chet F. Anderson
SOUTHERN CALIFORNIA WATER COMPANY
Foothill Division
P.O. Box 9016
San Dimas, CA 91773-9016

original
Water Well
Agreement +
Easement

RE: Water Well Agreement

Dear Chet:

The original fully executed Water Well Agreement is enclosed with this letter along with recorded copies of the Memorandum of Water Well Agreement and Subordination Agreement. We have retained copies of all these documents in our files. The original Water Well Agreement should be placed with your permanent records. We will be receiving the original recorded Memorandum of Water Well Agreement in the future and will forward it to you at that time.

The Title Insurance Policy from Lawyers Title Insurance Corporation (Continental) is enclosed with this letter as well. Another copy of the policy will be forwarded by Scott Slater directly to Floyd Wicks. We are pleased, although it has taken some time, that this transaction is finally completed. If you have any questions regarding the above, or otherwise, please call.

Very truly yours,

Gary M. Kvistad
For HATCH AND PARENT

GMK:aar
cc: Floyd E. Wicks
Encl: Water Well Agreement
Memorandum
Subordination Agreement
Title Policy

WATER WELL AGREEMENT

This Water Well Agreement (Agreement) is made and entered into on this 1st day of September, 1994, by and between the Harold L. Bailey and Doralee S. Bailey 1989 Trust and The Shipley Ranch, a California Limited Partnership (collectively Bailey), and Southern California Water Company, a California public utility (SCWC), at Ojai, California, with respect to the following facts and intentions:

A. Bailey is the owner of certain real property located in an unincorporated area of Ventura County, California, Assessor Parcel Number 028-0-111-010, as more particularly described in the attached Exhibit "A," which is incorporated by this reference (Property);

B. SCWC desires to obtain easements to drill, complete and operate a replacement water well (Well) on the Property to produce and transport groundwater to supply to SCWC customers;

C. Bailey agrees to grant such easements to permit SCWC to drill, complete and operate the Well and produce and transport groundwater in exchange for Bailey receiving water from the Well for reasonable beneficial uses on the Property pursuant to the terms and conditions of this Agreement; and,

D. SCWC and Bailey do not intend that anything in this Agreement or that takes place as a result of this Agreement, shall be construed as manifesting an intention to dedicate Bailey's overlying rights to a public use, nor create any prescriptive rights in SCWC or others.

NOW, THEREFORE, it is agreed as follows:

1. Grant of Easements. Bailey grants to SCWC the following easements:

a. Temporary Construction Easement. A temporary nonexclusive easement to construct and install the Well, pipelines and related facilities on, over and through those portions of the Property as described in the attached Exhibit "B," which is incorporated by this reference. SCWC shall restore the surface of the Property to a substantially similar condition as existed prior to installation and construction of the Well, pipelines and related facilities. This construction easement shall terminate upon completion of construction and installation of the Well, pipeline and related facilities.

b. Well and Pipeline Easement. An exclusive Well and pipeline easement (Well and Pipeline Easement) for all purposes customary and incidental to the production of water and maintenance of a water system including, but not limited to constructing, installing, operating, maintaining, repairing, replacing, reconstructing, metering and monitoring the Well, pipeline and related facilities. SCWC shall also have the full and exclusive right, power and authority to pump, extract, store and remove groundwater from the Well, together with such chemicals and materials as may be dissolved or suspended in the water, in such manner, at such times, and in such quantities as SCWC shall, in its sole discretion, determine which is in excess of and subject to the water to be supplied to Bailey under this Agreement. SCWC shall also have the right to exclude Bailey, and any other persons, from a fifty (50) foot by fifty (50) foot area of the Well (Well Area) by installing a fence or other barrier. The location of the Well and pipeline easement is described in the attached Exhibit "B."

c. Access Easement. A nonexclusive easement for ingress and egress on, over and through that portion of the Property described in the attached Exhibit "B" (Access Easement). SCWC's access rights shall be reasonably related to the production of water and operation of the Well, pipelines and related facilities described in section 1.b. above. SCWC shall have the right to use existing road(s) as set out on Exhibit "B". SCWC may construct and maintain a new road(s) located within the Access Easement with the consent of Bailey, which shall not be unreasonably withheld. SCWC shall bear the cost of repair, maintenance or replacement of the existing or new road(s) unless used by both parties; in which event, the parties shall each pay a proportional amount for repair, maintenance and replacement based upon each party's use of the road.

2. Construction, Installation and Maintenance.

a. License and Permits. SCWC shall, at its own cost and expense, obtain or cause to be obtained all authorizations, licenses, permits, consents and approvals of, notice to, and registrations or filings with any governmental body, agency or other instrumentality or landowner that are required to be obtained in connection with the construction, installation and operation of the Well, pipelines and related facilities. SCWC shall require the contractor constructing the Well to obtain performance and payment bonds, copies of which will be provided to Bailey before commencement of construction.

b. Construction. SCWC shall construct the Well, pipelines and related facilities in good and workmanlike manner and in accordance with governmental laws, regulations and statutes by a person(s) or entity(ies) qualified, licensed and bonded to perform such work. The construction and installation of the Well, pipeline and related facilities shall be completed as soon as reasonably possible after commencement of such work. Bailey or his authorized representative shall have the right to observe SCWC's construction and installation on [illegible] reasonably necessary to ensure that the Well, pipelines and rel[illegible] constructed in accordance with the terms and conditions of [illegible] Completion of the construction of the Well and connection point [illegible] Bailey shall be no later than one (1) year from the date of this agr[illegible]

20 A.F per month

c. Maintenance. The Well, pipeline and [illegible] including, but not limited to, roads, pipelines, pumps, treatment f[illegible] equipment installed or constructed on the Property by SCWC shall [illegible] SCWC in good working order and condition throughout the term of this Agreement.

3. Consideration. In consideration of granting the easements and other rights to SCWC, Bailey shall be entitled to receive up to (Eighty-Eight) (88) acre feet per year (AFY) of water from the Well free of any charge, cost or expense for reasonable beneficial uses on the Property at a maximum flow rate of (one hundred eighty) (180) gallons per minute and a maximum quantity of (twenty) (20) AFY in any one (1) month. SCWC shall install a regulated connection point and meter at the Well to make water available to Bailey and monitor the quantity of water. Bailey shall be responsible for the cost and expense for construction and maintenance of all facilities from such meter to service Bailey and the Property. Bailey acknowledges and understands that the water which Bailey receives from the Well or any other interim SCWC water source, as provided for in section 4 below, is not a public service provided by SCWC and expressly waives the right to make any claim in the future that such water is being provided as a public service.

4. **Interruption.** In the event water production from the Well is interrupted for any reason, Bailey shall be responsible for obtaining water from other sources including the right to drill wells and produce water as set forth in Section 7 below. SCWC shall endeavor to re-establish water delivery from the Well as soon as reasonably possible under the then existing circumstances. SCWC shall provide Bailey with reasonable advance notice of any planned interruption, i.e., maintenance, and the anticipated length of such interruption.

SCWC shall have the right not to operate the Well for the production of water during certain times as related to SCWC's needs of supplying water to its customers. During such times, SCWC reserves the right to supply Bailey with water from other sources, instead of operating the Well, by back pressuring the regulated connection point. This alternate water supply arrangement shall not exceed a one month time period.

5. **Water Rights.** Bailey expressly retains all water rights for the Property, without limitation, whether characterized as overlying, riparian, or prescriptive, subject to SCWC's right to extract and appropriate groundwater from the Property as provided in this Agreement. It is the express intention of the parties to preserve and document Bailey's water rights subject to the terms and limitations stated in this Agreement. This Agreement and actions or non-action by the parties related to the terms to this Agreement shall not be construed to: (a) constitute a severance of Bailey's overlying rights, (b) the creation of prescriptive rights by SCWC against Bailey, or (c) limit SCWC from obtaining prescriptive rights against or to appropriate water from persons/entities not a party to this Agreement. All water produced by the Well and used by Bailey on the Property is acknowledged by the parties to be pursuant to the exercise of Bailey's water rights. SCWC shall provide Bailey with reasonable production records, including water quality reports and water level reports for the Well on a monthly basis and meter maintenance records on an annual basis.

6. **Non-Interference.** The parties expressly desire SCWC to maximize all opportunities to develop water from the Well. Any action by Bailey which would significantly impair the supply of water from the Well, except as otherwise provided in this Agreement, is expressly prohibited. In the event that SCWC's pumping of water from the Well is significantly impaired, as reasonably determined by SCWC, Bailey agrees to discontinue pumping from any wells within a distance of 300 feet from the Well as further defined in Section 7 below.

7. **Abatement.**

a. Well Production. In the event the reasonably available production of water from the Well diminishes or decreases for any reason, SCWC's use of the water from the Well shall be abated in order to provide Bailey with the quantity of water from the Well, as described in Section 3 above, for reasonable beneficial uses on the Property. Such abatement shall continue until the reasonable available quantity of water produced by the Well increases in sufficient amounts so that use by SCWC does not impair or diminish the quantity of water allocated to Bailey by this Agreement.

b. Ojai Basin. The property is located within the Ojai Water Basin which is subject to the jurisdiction of the Ojai Basin Ground Water Management Agency (Agency). A Groundwater Management Plan (Plan) is being prepared for the Agency by Stahl, Gardner and Dunne. In the event a water shortage occurs within the Ojai Basin which requires water purveyors and/or other water users located within the Ojai Basin to proportionately reduce water use, the then existing use of water from the well shall be proportionately abated as may become necessary under the Plan; otherwise, abatement shall occur as provided in section 7.a., above. Such abatement shall continue until the Agency determines the abatement is no longer necessary.

c. Other Well Production. Nothing in this Agreement, or which occurs as a result of the exercise of rights under this Agreement, shall prohibit or prevent Bailey from producing water from the existing wells set forth in Exhibit "B", except as limited by this Agreement, or constructing, operating and maintaining additional wells for producing water for reasonable and beneficial uses on the Property which are located 300 feet or more from the center point of the Well area.

8. **Water Quality/Quantity.** Neither SCWC nor Bailey makes any representation, warranty or guaranty concerning the quality or quantity of water made available to either party from the Well including, but not limited to, the suitability of the water for domestic or irrigation use.

9. **SCWC's Assets.** Bailey acknowledges by entering into this Agreement, Bailey is not acquiring any right, title or interest in SCWC's assets, including any water or water rights owned by SCWC, or the right to receive continued water service from SCWC after termination of this Agreement.

10. **Bailey Representations and Warranties.** Bailey has not conducted any investigation as to the need for consents or approvals of other persons or entities, including local, state or federal government agencies or whether other easements have been granted over, under, or through the Property, other than as contained in the Continental Lawyers Title Company's Preliminary Title Report, dated April 7, 1994 (Preliminary Title Report), which is attached as Exhibit C and incorporated by this reference. Subject to this disclaimer, Bailey represents and warrants to SCWC that to the best of Bailey's knowledge: (a) Bailey is the sole legal owner of the Property; (b) Bailey has the right, power and authority to grant the above easements and rights to SCWC in the Property without the consent or approval of any other person or entity; (c) there are no other easements over, under or through the Property which would materially interfere with the easements and rights granted to SCWC in this Agreement other than those shown in the Preliminary Title Report; and, (d) no deeds of trust or other encumbrances on the Property exist other than disclosed pursuant to the Preliminary Title Report. Bailey further represents and warrants to SCWC that there has not been, and will not be any, change in the Preliminary Title Report through issuance of a title report (Title Report), as of the date of this Agreement. The Title Report shall be issued at SCWC's expense, insuring the easements granted in this Agreement.

11. **Indemnification.**

a. SCWC. SCWC shall indemnify, defend and hold harmless Bailey, from and against, any and all claims, demands, losses, expenses, litigation, liability, damage, recoveries and deficiencies of any nature whatsoever that Bailey may incur or suffer that arises out of, or results from or relates to the Well, pipeline and related facilities, use of the above-described easements, or distribution of water from the Well.

b. Bailey. Bailey shall indemnify, defend and hold harmless SCWC, its directors, officers, agents and employees, from and against any and all claims, demands, losses, expenses, litigation, liability, damage, recoveries and deficiencies of any nature whatsoever that SCWC may incur or suffer that arises out of, results from or relates to Bailey's use, consumption, or distribution of water from the Well.

12. **Covenant.** This Agreement and the rights, duties and obligations of the parties shall be construed as covenants running with the land.

13. **Assignment.** Subject to the written consent of Bailey, which consent shall not be unreasonably withheld, SCWC shall have the right to: (a) assign all or any part of the Agreement to any other person or entity on either an exclusive or nonexclusive basis; (b) assign any or all of its rights and obligations to any other person or entity; and, (c) permit or designate other persons or entities to exercise any or all of its rights or perform any of the functions or obligations exclusively or in connection with SCWC. Factors affecting Bailey's consent pursuant to this Section shall include, but not be limited to, the financial condition of the assignee, their ability and reputation in the reasonable discretion of Bailey to perform the terms of this Agreement, and the history and reputation of assignee for the quality of operation, maintenance, production methods in the water industry related to the area.

14. **Term and Termination.** The easements granted and the obligation to make water available from the Well as provided in this Agreement shall be perpetual and only terminate if SCWC does not use the Well and easements for the production of water for a period of one (1) year or upon Bailey's purchase of the Well and appurtenant facilities as described below. Upon expiration of such term, SCWC shall execute and deliver to Bailey a recordable quitclaim deed, relinquishing and terminating all the easements and the rights specified in this Agreement. Notwithstanding the above, if Bailey transfers title to the Well Area pursuant to Section 15.a below, the Well and Pipeline Easement and Access Easement shall be appurtenant to the Property and this Agreement and easements described herein shall not terminate.

SCWC shall provide Bailey with at least ninety (90) days prior written notice if SCWC decides to cease production of water from the Well, during which time Bailey shall have the option to purchase the Well and appurtenant facilities as described below. SCWC shall have no obligation to operate the Well for the benefit of Bailey, or otherwise, after expiration of the ninety (90) day period.

Upon termination of this Agreement or SCWC election to cease production of water from the Well, Bailey shall have the right for ninety (90) days thereafter to purchase, any or all, separately or in the aggregate, appurtenant facilities, equipment, machinery or other improvements installed by SCWC on the Property at fair market value, which each party agrees to negotiate in good faith. Bailey shall exercise this right by a notice in writing to SCWC during such period. If the negotiations have not been completed within the 90-day period after written notice by Bailey, any appurtenant facilities, equipment and improvements installed by SCWC upon the Property shall remain the property of SCWC. SCWC shall remove all such machinery, equipment, facilities and improvements constructed or installed within eight (8) months following such termination and, if not removed from the Property within such eight (8) month period shall become the sole property of Bailey. Further, upon termination, SCWC shall cap the Well in such a manner as consented to, in writing, by Bailey in accordance with applicable State law and County ordinances relating to abandoned wells and restore the surface of the Property to good order and condition, including seeding and planting, where appropriate, to the extent reasonably possible. Bailey's consent shall be restricted to conditions which allow Bailey to use the Well for future production of water on the Property for reasonable beneficial uses. Bailey shall pay the cost of implementing any such additional conditions in advance to SCWC as a condition to SCWC implementing such conditions.

15. **Division of Property.** If Bailey subdivides or otherwise divides all or any portion of the Property:

a. Notice of Agreement. Bailey shall provide a copy of this Agreement to the transferee or assignee of all or any portion of the Property.

b. Well Water. SCWC's obligation to make water available from the Well pursuant to this Agreement shall not be reduced and shall be supplied through the connection point to any parcel that was originally a part of the Property provided there is no interference or modification of SCWC's rights under this Agreement.

c. Distribution. Bailey and such assignees or transferees shall be responsible for distribution of any water produced from the Well and appurtenant facilities from the regulated connection point to the points of use on the Property. SCWC shall not be responsible for any such distribution of water or facilities beyond the regulated connection point.

15. **Subordination**. The Property is currently subject to a deed of trust in favor of the Shipley Ranch, recorded on September 18, 1991, as Instrument No. 91-138306 in the Official Records of the Ventura County Recorder's Office, State of California. Bailey shall obtain an agreement to subordinate (Subordination Agreement) the above deed of trust from Shipley which shall be executed concurrently with this Agreement in a form identical to the attached Exhibit D, which is incorporated by this reference, and recorded concurrently with the Memorandum of Water Well Agreement described in section 17.g., below.

17. **General Provisions**.

a. Successors and Assigns. This Agreement shall be binding upon and inure to the benefit of the parties respective heirs, personal representatives, successors and assigns.

b. Authority. The parties to this Agreement each represent and warrant to the other party that they have the authority to enter into this Agreement and perform all acts required by this Agreement, and that the consent, approval or execution or by any third party is not required to legally bind either party to the terms and conditions of this Agreement.

c. Applicable law. This Agreement shall be governed by and interpreted in accordance with the laws of the State of California with venue proper only in the County of Ventura, State of California.

d. Good Faith. The parties agree to exercise their best efforts and good faith to effectuate all the terms and conditions of this Agreement and to execute such further instruments and documents, as necessary or appropriate to effectuate all of the terms and conditions of this Agreement.

e. Notices. All notices, requests, demands and other communications under this Agreement shall be in writing and be deemed to have been duly given on the date of service if served personally on the party to whom notice is to be given or on the second day after mailing if mailed to the party to whom notice is given, by first class mail, registered or certified, return receipt requested, postage prepaid, and properly addressed as follows:

Bailey:	Harold and Doralee Bailey 1887 East Ojai Avenue Ojai, CA 93023
SCWC:	Frank Bennett Southern California Water Company 1002-A East Ojai Avenue Ojai, CA 93023
With Copy to:	Gary M. Kvistad HATCH AND PARENT 21 East Carrillo Street Santa Barbara, CA 93101

Any party may change their address for purposes of this paragraph by giving the other party written notice of the new address in the manner set forth above.

f. Attorneys' fees. If any action, at law or in equity, including any action for declaratory relief, is brought to enforce or interpret the provisions of this Agreement, the prevailing party shall be entitled to recover actual attorneys fees and costs, which shall be determined by the court in the same or separate action brought for that purpose.

g. Memorandum of Water Well Agreement. The parties shall sign and have notarized a memorandum of agreement, a copy of which is attached as Exhibit "E," and incorporated by this reference. The memorandum shall be recorded concurrently with the Subordination Agreement with the county recorder in the county where the Property is located.

h. Counterparts. This Agreement may be executed in any number of counterparts, each of which shall be an original, but all of which shall constitute one and the same instrument.

i. Effective Date. This Agreement shall be effective upon the date of recordation of the Memorandum of Water Well Agreement (Exhibit E) with the Ventura County recorder's office.

j. Entire Agreement. This Agreement constitutes the entire agreement of the parties concerning the subject matter hereof and supercedes any prior representations, agreements and understandings in connection herewith. This Agreement may be amended only in writing by duly authorized representatives of the parties.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first written above.

Southern California Water Company

Floyd E. Wicks

Floyd E. Wicks, President

Harold L. Bailey and Doralee S. Bailey 1989 Trust

By:_____
Harold L. Bailey, Trustee

By:_____
Doralee S. Bailey, Trustee

The Shipley Ranch, a California Limited Partnership

By:_____
Doralee S. Bailey, General partner

h. Counterparts. This Agreement may be executed in any number of counterparts, each of which shall be an original, but all of which shall constitute one and the same instrument.

i. Effective Date. This Agreement shall be effective upon the date of recordation of the Memorandum of Water Well Agreement (Exhibit E) with the Ventura County recorder's office.

j. Entire Agreement. This Agreement constitutes the entire agreement of the parties concerning the subject matter hereof and supercedes any prior representations, agreements and understandings in connection herewith. This Agreement may be amended only in writing by duly authorized representatives of the parties.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first written above.

Southern California Water Company

_____
Floyd Wicks, President

Harold L. Bailey and Doralee S. Bailey 1989 Trust

By: Harold L. Bailey
Harold L. Bailey, Trustee

By: Doralee S. Bailey
Doralee S. Bailey, Trustee

The Shipley Ranch, a California Limited Partnership

By: Doralee S. Bailey
Doralee S. Bailey, General partner

Blockman Union School District Agreement

MEMORANDUM OF UNDERSTANDING

This agreement is made and entered into this First day of June, 1996, by and between the Blochman Union School District, hereinafter referred to as District, and Southern California Water Company (d.b.a. California Cities Water), hereinafter referred to as Company.

WHEREAS, District requests potable and irrigation water service and fire protection to their school located in the Community of Sisquoc, California.

WHEREAS, Company requests an easement for a new water line and reservoir, as well as use the District's existing reservoir.

WHEREAS, Company requests an operation and maintenance agreement for the use of the District's existing elevated reservoir.

NOW THEREFORE, IT IS AGREED by both parties hereto as follows:

1. The Company agrees to provide a main extension from the Company's existing distribution system up to the District's existing elevated tank at no cost to the district.

2. The Company agrees to abandon and replace the existing water line from the reservoir to the District's well house.

3. The Company agrees to install one domestic water service and one irrigation service. The domestic water service shall extend to the school building's plumbing, and the irrigation service line shall extend to the District's well house.

4. The Company agrees to demolish the existing redwood tank and construct a new steel tank adjacent to the existing steel water tank and tie it into the proposed Company water line.

5. The Company agrees to operate and maintain the District's existing steel tank.

6. The Company agrees to provide a fire hydrant in the front of the District school.

Not District property ▷ 7. The District agrees to provide to the Company a 15' wide water line easement and an easement for the new tank. Dist. has 5' easement

8. The Company agrees to install backflow prevention devices for both the domestic and irrigation services as required by the County of Santa Barbara Health Department.

9. The compensation for this agreement shall be calculated as follows:

a. An annual quantity of domestic water shall be furnished equal to .14/CCF/month/student (.14X150X12) or 252CCF, which at the current commodity rate of $.80 calculates to $202/year.

b. An annual quantity of irrigation water shall be furnished equal to 2 acre feet/yr/acre (2X2.5 X 435.6) or 2,178CCF, which at the current commodity rate of $.80 is $1,742/yr.

c. The above Basic compensation of $1,944 shall be increased annually on January 1st of each year by the Consumer Price Index increase for the Los Angeles/Long Beach Statistical Metropolitan Area.

d. In the event that Company's water supply will not provide the irrigation demands of District, a cash payment will be made in lieu of delivered water as compensation.

10. The Company and the District both agree that all facilities installed are owned and maintained by the party paying for the facilities.

11. The Company and the District both agree that all water rights to District's well remain with District, and are in no way restricted, minimized or encumbered by this agreement.

IN WITNESS WHEREOF, each of the parties has caused this "Memorandum of Understanding" to be executed theretofore duly authorized as of the date above their signatures.

Dated July 9, 1996
Blochman Union School District

District Chairman

Dated August 7, 1996
Southern California Water Company

Vice President - Region I

Amendment to Memorandum of Understanding
June 1. 1996
Page 3

This Agreement amends the Memorandum of Understanding between the Blochman Union School District and the Southern California Water Company dated effective June 1. 1996.

The parties agree that the Memorandum of Understanding is amended effective June 1. 1996. to include the following paragraph.

Term of Agreement. This agreement shall have an initial term of forty (40) years. The parties may by subsequent mutual contract agree to extend the term.

All other provisions of the Memorandum of Understanding remain unchanged.

Dated July 9, 1996
Blochman Union School District

District Chairman

Dated August 7, 1996
Southern California Water Company

Vice President - Region I

Westwood Village Condominiums Association Agreement

WATER WELL LEASE RENEWAL AGREEMENT

This **WATER WELL LEASE RENEWAL AGREEMENT** ("**Agreement**") is executed this 17 day of March, 2014 ("**Effective Date**") by and between **GOLDEN STATE WATER COMPANY**, a California Corporation ("**GSWC**"), and the **WESTWOOD VILLAGE CONDOMINIUMS ASSOCIATION**, a California non-profit, mutual benefit corporation ("**Association**") (each a "**Party**" and collectively the "**Parties**"), with reference to the following facts:

A. GSWC is an investor-owned utility, regulated by the California Public Utilities Commission ("**CPUC**"), which provides retail water service to residents and businesses within and surrounding the unincorporated community of Bay Point within Contra Costa County (the "**Bay Point System**").

B. The Association is the owner of a tract of land within a planned unit development, commonly referred to as "**Westwood Village**," which is located within GSWC's Bay Point System. ~~Westlake~~ Westwood Village obtains water from GSWC through two water meters.

C. The Association owns a well site and a groundwater well within the well site (collectively hereafter, the "**Well**") on a parcel located within Westwood Village (Assessor's Parcel Number 097-350-053) ("**Parcel**"). The Well has been operated by GSWC pursuant to a lease entered into on March 10, 1998, expiring on March 10, 2013 ("**Original Lease**").

D. Pursuant to the Original Lease, GSWC was obligated to operate and maintain the Well, and to supply up to 4.5 million gallons of water annually to the Association at no charge except for a monthly service charge for the two water meters operated by GSWC to service the Association. In exchange, the Original Lease authorized GSWC to use additional water available from the Well for its Bay Point System.

E. The Parties desire to renew the Original Lease and substitute it in its entirety with this Agreement.

NOW, THEREFORE, in consideration of the foregoing recitals, the Parties agree as follows:

1. **Renewal Term.** Unless early terminated pursuant to Paragraph 7 of this Agreement, the term of this Agreement shall be five (5) years from the Effective Date with two (2) options to renew at GSWC's option for five (5) years each.

2. **Rights to Pump Well.** During the term of this Agreement GSWC may pump all water available from the Well into GSWC's Bay Point System.

3. **Operation of the Well**. During the term of this Agreement, GSWC shall, at its sole expense: (i) operate, maintain, and repair the Well as is necessary to maintain the Well in a reasonable and safe working condition. GSWC may also make improvements to the Well as it deems appropriate during the term of this Agreement.

4. **Water Service to the Association.** GSWC shall serve water to the Association through two existing meters serving the Association. On a monthly basis GSWC shall bill the Association in accordance with the applicable CPUC Rules and as set forth in GSWC's CPUC tariff schedule. The monthly bill will provide the prior meter read, the current meter read, the total quantity used in hundred cubic feet (CCF), the dollar charge for the quantity used, and the monthly service charge. In addition, the bill will show the amount of credit applied to the prior month's balance for consideration for the lease of the Well by the Association to GSWC. The amount of credit will be for all CCF quantity charge up to a maximum of 4,680 CCF (approximately 3.5 million gallons) per calendar year. Any CCF used above the 4,680 CCF will be billed in accordance with the applicable tariff schedule.

Accounting of the above-stated credit shall commence beginning the first billing period after January 1, 2014. In addition to any sum for volumetric water service owed by the Association for water received in excess of the above-stated credit, the Association shall pay the fixed monthly service charge and additional charges that are not related to the quantity of water used for the two meters serving the Association as set forth in GSWC's CPUC tariff schedule. GSWC shall not be required to provide any further consideration for the lease of the Well other than the above-stated credit and such other obligations expressly set forth in this Agreement.

5. **Access to Well.** The Association shall afford GSWC reasonable rights of ingress and egress to access the Well and Parcel across the roadways, parking areas, and pathways within the Association, as necessary to operate, maintain, repair and improve the Well and ancillary facilities thereto.

6. **Indemnification of Association.** GSWC shall assume all liability for the operation of the Well during the term of this Agreement. Further, during the term of this Agreement, GSWC shall indemnity and save harmless the Association, its individual homeowners, tenants, and assignees, its Directors and Committee members, and its management company, from any loss, claim, expense (including attorneys' fees and court costs), demand or cause of action of any kind or character arising out of the operation, management, maintenance, repair, or improvement of the Well, except for any loss or damage caused by the sole negligence or intentional actions or omissions of the Association, its individual homeowners, tenants and assignees, its Directors and Committee members, or its management company.

7. **Early Termination.** Either party may terminate this Agreement, upon the giving of ninety (90) days written notice to the other party delivered via certified United States Postal Service. In the event GSWC terminates this Agreement pursuant to this Paragraph, and upon written request provided to GSWC from the Association within thirty (30) days from the date of notice of termination by GSWC, GSWC will reimburse the Association for all reasonable costs for the destruction of the Well in a manner consistent with all applicable County regulations, provided that the Association causes the well to be destroyed pursuant to all applicable County regulations within four (4) months from the date of notice of termination by GSWC. In the event this Agreement is terminated pursuant to this Paragraph, GSWC will resume billing, and the Association shall resume paying, for water service at GSWC's then-current CPUC tariff schedule.

8. **General Provisions**

a. Further Assurances. The Parties shall execute such further documents and do any and all such further things as may be necessary to implement and carry out the intent of this Agreement.

b. Construction. The provisions of this Agreement shall be liberally construed to effectuate its purposes. The language of this Agreement shall be construed simply according to its plain meaning and shall not be construed for or against any Party, as each Party has participated in the drafting of this Agreement and had the opportunity to have their counsel review it.

c. Notices and Communication. Any notice or communication hereunder shall be deemed sufficient if given by one Party to another Party or Parties, as appropriate, in writing and either (1) delivered in person, (2) transmitted by electronic mail and acknowledgment of receipt is made by the receiving Party(ies), (3) deposited in the United States mail in a sealed envelope, certified and with postage and postal charges prepaid, or (4) delivered by a nationally-recognized overnight delivery courier service, and addressed as follows:

Association: Westwood Village Condominiums Association
c/o Boardwalk Investment Group, Inc.
317 Lennon Lane, Suite 200
Walnut Creek, CA 94598

GSWC: Northern District Manager
Golden State Water Company
630 E Foothill Blvd
San Dimas, CA 91773

or to such other address or to such other person as each Party shall have last

designated for receipt of notices pursuant to this Agreement. The effective date of any written notice, explanation, or communication shall be the earlier of the date of actual receipt, acknowledgment of receipt in the case of delivery by electronic mail, or three days following deposit in the United States mail.

d. Attorneys' Fees. In the event of any action or proceeding brought by either party against the other under this Agreement the prevailing party shall be entitled to recover its expenses and costs, including its attorneys' fees and expert witness fees in such action or proceeding, including costs of appeal if any, in such amount as the court may adjudge reasonable.

e. Severability. If any term or provision of this Agreement is determined to be illegal, unenforceable, or invalid in whole or in part for any reason, such illegal, unenforceable, or invalid provision or part thereof, shall be stricken from this Agreement, and such provision shall not affect the legality, enforceability, or validity of the remainder of this Agreement. If any provision or part of this Agreement is stricken in accordance with the provisions of this section, then the stricken provision shall be replaced, to the extent possible and as agreed to by the Parties, with a legal, enforceable and valid provision that is as similar in content to the stricken provision as is legally possible.

f. Entire Agreement and Substitution of Original Lease in its Entirety. This Agreement supersedes and substitutes for the Original Lease in its entirety with respect to the matters addressed by this Agreement. The Original Lease is hereby terminated and of no further effect. There are no other terms, conditions, or agreements, express or implied, written or oral, between the Association and GSWC, that extend, limit, or in any way modify the terms of this Agreement.

g. Amendments. This Agreement may be amended, modified or supplemented only by a writing signed by both parties. Any purported oral amendment, modification, or supplement of this Agreement is void.

h. Successors and Assigns. This Agreement shall be binding on and shall inure to the benefit of the Parties and their respective legal representatives, successors, and assigns.

i. No Third Party Rights. Nothing in this Agreement, whether express or implied, is intended to confer any rights or remedies under or by reason of this Agreement on any persons other than the Parties to this Agreement and their respective successors and assigns, nor shall any provision in this Agreement give any third persons any right of subrogation or action over or against any Party to this Agreement.

j. Signatures - Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. The Parties authorize each other to detach and combine original signature pages and consolidate them into a single identical original. Any of such completely executed counterparts shall be sufficient proof of this Agreement.

FOR GOLDEN STATE WATER COMPANY

DATED: 5/2/2014

PATRICK SCANLON
Vice President
Golden State Water Company

DATED: 5/7/2014

EVA TANG
Senior Vice President, CFO
Golden State Water Company

FOR WESTWOOD VILLAGE CONDOMINIUMS ASSOCIATION

DATED: 03-17-2014

Henry P. Giovannetti, Treasurer
Westwood Village Board of Directors

DATED: 3/17/2014

~~Secre~~ Jon Eastlund, Secretary
Westwood Village Board of Directors

DATED: 3/19/2014

John L. Wuhes Jr.
Westwood Village Board of Directors

DATED: 3-17-2014

Westwood Village Board of Directors

DATED: 3/17/2014

Westwood Village Board of Directors

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1 **APPENDIX SALES-C (ORA's Forecasting Program)**

2 ORA's forecasting R (programming language) program. (9 pages total)

```
#### clean script ####
clean<-"yes"

if (clean=="yes") {
  library(lmtest,quietly=T);library(stats,quietly=T);library(forecast,quietly=T);library

(tseries,quietly=T);library(TSA,quietly=T);library(plyr,quietly=T);library(data.table,quietly=T);library

(timeSeries,quietly=T);graphics.off()
  rm(list=ls(all=T));par(mfrow=c(1,1));
  cat("\014")
} else{rm(clean)}
#### user input ####
#plots only?
plot_only<-"yes"
##input test year
ty<-2016
##define start and end dates (year,month)
d_start<-c(2003,12)
d_end<-c(2013,11)

#select dataset (make sure all numbers correspond to the correct subset, otherwise will result in an error)

typ<-1 #customer class 1(commercial), 2(residential)
dis<-16 #district number (see list below)
reg<-1 #golden state region number

#districts
# 1=(ac)arden cordova(R.I)                # 10=(mv)morongo valley(R.III)
# 2=(av)apple valley(R.III)               # 11=(oc)orange county(R.III)
# 3=(ba)barstow(R.III)                    # 12=(oj)ojai(R.I)
# 4=(by)bay point(R.I)                    # 13=(sd)san dimas(R.III)
# 5=(cl)clearlake(R.I)                    # 14=(sg)san gabriel(R.III)
# 6=(cm)claremont(R.III)                  # 15=(sm)santa maria(R.I)
# 7=(cn)calipatria(R.III)                 # 16=(sv)simi valley(R.I)
# 8=(lo)los osos(R.I)                    # 17=(ww)wrightwood(R.III)
# 9=(me)metro csa (R.II)

#plot text size
ptxt<-2
#arima specification (for fixed arima model)
pqd<-c(1,1,1)
spqd<-c(1,1,1)
#### database setup ####

district_name<-c("Arden Cordova","Apple Valley","Barstow","Bay Point",
  "Clearlake","Claremont","Calipatria","Los Osos","Region II",
  "Morongo Valley","Orange County","Ojai","San Dimas","San Gabriel",
  "Santa Maria","Simi Valley","Wrightwood")

type_name<-c("Commercial","Residential")

#load data
dt1<-read.csv("D:/ed3/My Documents/GSWC GRC/forecasting/workpapers/sales_skeleton3.csv")
w1<-read.csv("D:/ed3/My Documents/GSWC GRC/forecasting/workpapers/weathern2.csv")

md1<- dt1
type<-md1[,7]
region<-md1[,8]
district<-md1[,9]
md2<-subset(md1,district==levels(district)[dis] & type==levels(type)[typ] & region==reg)

#remove year and month columns - will be added in next step
md3<-md2[,-c(1,2,7,8,9,10,11,12,13,14,15)]
#define time series dataset - needed for most analysis
mdata<-ts(md3,start=d_start,frequency=12)

sn<-levels(district)
snd<-sn[dis]
wdata<-subset(w1,w1[,14]==snd)

rm(region,sn,snd)

#defining variables
concus<-ts(mdata[,1],start=start(mdata),frequency=frequency(mdata))
temp<-ts(mdata[,2],start=start(mdata),frequency=frequency(mdata))
```

```
precip<-ts(mdata[,3],start=start(mdata),frequency=frequency(mdata))
unrate<-ts(mdata[,4],start=start(mdata),frequency=frequency(mdata))
time<-ts(c(1:length(concus)),start=start(mdata),frequency=frequency(mdata))

d<-ts.union(concus,temp,precip,unrate,time) #create new time series dataset
d2<-d
#### matrix dimensions ####
# ylim dimensions
if(max(na.exclude(concus))>100) {
  ylim1<-c(min(na.exclude(concus)[(length(na.exclude(concus))-35):length(na.exclude(concus))])-40,max

(na.exclude(concus)[(length(na.exclude(concus))-35):length(na.exclude(concus))])+40)
} else {
  ylim1<-c(min(na.exclude(concus)[(length(na.exclude(concus))-35):length(na.exclude(concus))])-5,max

(na.exclude(concus)[(length(na.exclude(concus))-35):length(na.exclude(concus))])+15)
}
#### summary plots ####

#basic consumption plot


#### raw consumption data
png(filename=paste("D:/ed3/My Documents/GSWC GRC/forecasting/plots/",district_name[dis],"/",type_name

[typ],"/","plot1.png", sep=""),width = 1200, height = 430, units = "px")
par(mar=c(5,5,1,1)+1)
plot(concus,col="1",lwd=2,type="l",ylab="",xlab="",axes=F)
axis(at=2000:2014,side = 1,cex.axis=ptxt)
axis(at=NULL,side = 2, las = 1,cex.axis=ptxt)
mtext(1,text="Year",line=3.5,cex=ptxt)
mtext(2,text="CCF",line=4.5,cex=ptxt)
abline(v=c(2000:2017), col="lightgray", lty=2)
abline(h=axTicks(2), col="lightgray", lty=2)
dev.off()


#### rolling average consumption data
png(filename=paste("D:/ed3/My Documents/GSWC GRC/forecasting/plots/",district_name[dis],"/",type_name

[typ],"/","plot2.png", sep=""),width = 1200, height = 430, units = "px")
#12 month moving average - consumption
par(mar=c(5,5,1,1)+1)
plot(rollmean(concus,12),col="1",lwd=2,type="l",xlab="",ylab="",axes=F)
axis(at=2000:2014,side=1,cex.axis=ptxt)
mtext(1,text="Year",line=3.5,cex=ptxt)
axis(at=NULL,side=2,las=1,cex.axis=ptxt)
mtext(2,text="CCF",line=4.5,cex=ptxt)
abline(v=c(2000:2017), col="lightgray", lty=2)
abline(h=axTicks(2), col="lightgray", lty=2)
abline(mean(concus),0,lty=2,col=2)
dev.off()

#### rolling average DIFFERENCED consumption data
png(filename=paste("D:/ed3/My Documents/GSWC GRC/forecasting/plots/",district_name[dis],"/",type_name

[typ],"/","plot2a.png", sep=""),width = 1200, height = 430, units = "px")
#12 month moving average - differenced consumption
par(mar=c(5,5,1,1)+1)
plot(rollmean(diff(concus),12),col="1",lwd=2,type="l",ylab="",xlab="",font.sub=4,axes=F)
axis(at=2000:2014,side = 1,cex.axis=ptxt)
axis(at=NULL,side = 2, las = 1,cex.axis=ptxt)
mtext(1,text="Year",line=3.5,cex=ptxt)
mtext(2,text="CCF",line=4.5,cex=ptxt)
abline(v=c(2000:2017), col="lightgray", lty=2)
abline(h=axTicks(2), col="lightgray", lty=2)
abline(mean(diff(concus)),0,lty=2,col=2)
 dev.off()

#### rolling average TEMP data
png(filename=paste("D:/ed3/My Documents/GSWC GRC/forecasting/plots/",district_name[dis],"/",type_name

[typ],"/","plot3.png", sep=""),width = 1200, height = 430, units = "px")
#12 month moving average - temperature
par(mar=c(5,5,1,1)+1)
plot(rollmean(temp,12),col="1",lwd=2,type="l",xlab="",ylab="",axes=F)
```

```
axis(at=2000:2014,side=1,cex.axis=ptxt)
mtext(1,text="Year",line=3.5,cex=ptxt)
axis(at=NULL,side=2,las=1,cex.axis=ptxt)
mtext(2,text="degrees F",line=4.5,cex=ptxt)
abline(v=c(2000:2017), col="lightgray", lty=2)
abline(h=axTicks(2), col="lightgray", lty=2)
abline(mean(temp),0,lty=2,col=2)
dev.off()

#### rolling average PRECIP data
png(filename=paste("D:/ed3/My Documents/GSWC GRC/forecasting/plots/",district_name[dis],"/",type_name

[typ],"/","plot4.png", sep=""),width = 1200, height = 430, units = "px")
#12 month moving average - precipitation
par(mar=c(5,5,1,1)+1)
plot(rollmean(precip,12),col="1",lwd=2,type="l",xlab="",ylab="",axes=F)
axis(at=2000:2014,side=1,cex.axis=ptxt)
mtext(1,text="Year",line=3.5,cex=ptxt)
axis(at=NULL,side=2,las=1,cex.axis=ptxt)
mtext(2,text="inches",line=4.5,cex=ptxt)
abline(v=c(2000:2017), col="lightgray", lty=2)
abline(h=axTicks(2), col="lightgray", lty=2)
abline(mean(precip),0,lty=2,col=2)
dev.off()

#### rolling average UNEMP data
png(filename=paste("D:/ed3/My Documents/GSWC GRC/forecasting/plots/",district_name[dis],"/",type_name

[typ],"/","plot5.png", sep=""),width = 1200, height = 430, units = "px")
#12 month moving average - unemployment
par(mar=c(5,5,1,1)+1)
plot((unrate-decompose(unrate)$seasonal)*100,col="1",lwd=2,type="l",ylab="",xlab="",font.sub=4,axes=F)
axis(at=2000:2014,side=1,cex.axis=ptxt)
mtext(1,text="Year",line=3.5,cex=ptxt)
axis(at=NULL,side=2,las=1,cex.axis=ptxt)
mtext(2,text="% rate",line=4.5,cex=ptxt)
abline(v=c(2000:2017), col="lightgray", lty=2)
abline(h=axTicks(2), col="lightgray", lty=2)
abline((mean(unrate-decompose(unrate)$seasonal)*100),0,lty=2,col=2)
dev.off()

#### rolling average CONCUS AND UNEMP data
png(filename=paste("D:/ed3/My Documents/GSWC GRC/forecasting/plots/",district_name[dis],"/",type_name

[typ],"/","plot6.png", sep=""),width = 1200, height = 430, units = "px")
#comparison plot
par(mar=c(4, 4, 4, 4) + 1)
layout(rbind(1,2), heights=c(7,1))
  #12-month moving average overlay
  plot(rollmean(concus,12),axes=F,col=1,lwd=2,type="l",ylab="",xlab="")
  axis(at=NULL,2, ylim=c(0,max(rollmean(concus,12))),col="black",lwd=1.5,las=1,cex.axis=ptxt)
  mtext(2,text="CCF",line=3.5,cex=ptxt)

  #unemployment rate overlay
  par(new=T)
  plot((unrate-decompose(unrate)$seasonal)*100,axes=F,xlab="",ylab="",type="l",lty=3,
       main="",lwd=2,col="red")
  axis(at=NULL,4,ylim=c(0,max(unrate*100)),col="black",lwd=1,line=0,las = 1,cex.axis=ptxt)
  mtext(4,text="% Rate",line=3.5,cex=ptxt)

  #time scale
  axis(1,pretty(range(time(concus)),10),lwd=1,cex.axis=ptxt)
  mtext("Year",side=1,col="black",line=3,cex=ptxt)

par(mar=c(0, 0, 0, 0))
# c(bottom, left, top, right)
plot.new()
legend('center','groups',c("Consumption","Unemployment"),lty=c(1,2),
       col=c('black','red'),ncol=2,bty="n",cex=ptxt,lwd=2)

dev.off()

#percentage change plots
png(filename=paste("D:/ed3/My Documents/GSWC GRC/forecasting/plots/",district_name[dis],"/",type_name

[typ],"/","plot7.png", sep=""),width = 1200, height = 430, units = "px")
```

```
mn_pct<-diff(concus,1)/md3[1:(length(concus)-1),1]*100
ylim_mn<-c(-max(abs(mn_pct))-10,max(abs(mn_pct))+10)
an_pct<-diff(concus,12)/md3[1:(length(concus)-12),1]*100
ylim_an<-c(-max(abs(an_pct))-10,max(abs(an_pct))+10)

plot(mn_pct,
     ylab="%",xlab="Year", type="b",pch=20,lwd=1,
     ylim=ylim_mn,
     font.sub=4,axes=F)
    axis(at=2000:2014,side = 1)
    axis(at=NULL,side = 2, las = 1)
abline(v=c(2000:2017), col="lightgray", lty=2)
abline(h=axTicks(2), col="lightgray", lty=2)
    abline(0,0,lty=2,col=2)
dev.off()


png(filename=paste("D:/ed3/My Documents/GSWC GRC/forecasting/plots/",district_name[dis],"/",type_name

[typ],"/","plot8.png", sep=""),width = 1200, height = 430, units = "px")
plot(an_pct,
     ylab="%",xlab="Year", type="b",pch=20,lwd=1,
     ylim=ylim_an,
     font.sub=4,axes=F)
    axis(at=2000:2014,side = 1)
    axis(at=NULL,side = 2, las = 1)
abline(v=c(2000:2017), col="lightgray", lty=2)
abline(h=axTicks(2), col="lightgray", lty=2)
    abline(0,0,lty=2,col=2)
dev.off()


# bar plot
png(filename=paste("D:/ed3/My Documents/GSWC GRC/forecasting/plots/",district_name[dis],"/",type_name

[typ],"/","plot9.png", sep=""),width = 1200, height = 430, units = "px")
at<-cbind(
  sub1<-subset(concus,time(concus)>=start(concus)[1]+1 & time(concus)<start(concus)[1]+2),
  sub2<-subset(concus,time(concus)>=start(concus)[1]+2 & time(concus)<start(concus)[1]+3),
  sub3<-subset(concus,time(concus)>=start(concus)[1]+3 & time(concus)<start(concus)[1]+4),
  sub4<-subset(concus,time(concus)>=start(concus)[1]+4 & time(concus)<start(concus)[1]+5),
  sub5<-subset(concus,time(concus)>=start(concus)[1]+5 & time(concus)<start(concus)[1]+6),
  sub6<-subset(concus,time(concus)>=start(concus)[1]+6 & time(concus)<start(concus)[1]+7),
  sub7<-subset(concus,time(concus)>=start(concus)[1]+7 & time(concus)<start(concus)[1]+8),
  sub8<-subset(concus,time(concus)>=start(concus)[1]+8 & time(concus)<start(concus)[1]+9),
  sub9<-subset(concus,time(concus)>=start(concus)[1]+9 & time(concus)<start(concus)[1]+10)
)

barnames<-c((start(concus)[1]+1):(start(concus)[1]+9))
labs <- round(colSums(at))

barplot(at,names.arg = barnames, space=1,ylab="Ccf",xlab="Year",
        font.sub=4,axes=F)


axis(at=NULL,side = 2, las = 1)

text(cex=.75,x=1.5, y=sum(at[,1])*1.1,labs[1], xpd=TRUE)
text(cex=.75,x=3.5, y=sum(at[,2])*1.1,labs[2], xpd=TRUE)
text(cex=.75,x=5.5, y=sum(at[,3])*1.1,labs[3], xpd=TRUE)
text(cex=.75,x=7.5, y=sum(at[,4])*1.1,labs[4], xpd=TRUE)
text(cex=.75,x=9.5, y=sum(at[,5])*1.1,labs[5], xpd=TRUE)
text(cex=.75,x=11.5, y=sum(at[,6])*1.1,labs[6], xpd=TRUE)
text(cex=.75,x=13.5, y=sum(at[,7])*1.1,labs[7], xpd=TRUE)
text(cex=.75,x=15.5, y=sum(at[,8])*1.1,labs[8], xpd=TRUE)
text(cex=.75,x=17.5, y=sum(at[,9])*1.1,labs[9], xpd=TRUE)
dev.off()


#consumption and weather comparison

png(filename=paste("D:/ed3/My Documents/GSWC GRC/forecasting/plots/",district_name[dis],"/",type_name

[typ],"/","plot10.png", sep=""),width = 1200, height = 430, units = "px")
plot(d[,1:3],col="1",lwd="1",type="l",ylab="Ccf",xlab="Year",ylim=ylim1,main="")
dev.off()
```

```
#decomposition
png(filename=paste("D:/ed3/My Documents/GSWC GRC/forecasting/plots/",district_name[dis],"/",type_name

[typ],"/","plot11.png", sep=""),width = 1200, height = 430, units = "px")
plot(decompose(concus))
dev.off()


#moving average and raw
png(filename=paste("D:/ed3/My Documents/GSWC GRC/forecasting/plots/",district_name[dis],"/",type_name

[typ],"/","plot12.png", sep=""),width = 1200, height = 430, units = "px")
par(mar=c(5,5,1,1)+1)
plot(concus,col="1",lwd=2,type="l",ylab="",xlab="",axes=F)
axis(at=2000:2014,side = 1,cex.axis=ptxt)
axis(at=NULL,side = 2, las = 1,cex.axis=ptxt)
mtext(1,text="Year",line=3.5,cex=ptxt)
mtext(2,text="CCF",line=4.5,cex=ptxt)
abline(v=c(2000:2017), col="lightgray", lty=2)
abline(h=axTicks(2), col="lightgray", lty=2)
lines(filter(concus,rep(1/12,12),sides=1),col=2,lwd=2)
dev.off()


if(plot_only=="yes"){

} else {
#### exogenous forecasts ####
#arima method for exogenous forecasts
#temp
fit_t2<-auto.arima(d2[,2],seasonal=T,stationary=T,stepwise=T,approximation=T,allowdrift=F,lambda=0)
fcast_t2<-forecast(fit_t2,h=61)
new_temp2<-fcast_t2$mean

##precip
fit_p2<-auto.arima(d2[,3],seasonal=T,stationary=T,stepwise=T,approximation=T,allowdrift=F)
fcast_p2<-forecast(fit_p2,h=61)
new_precip2<-fcast_p2$mean

##unrate
fit_u2<-auto.arima(d2[,4],seasonal=T,stationary=T,stepwise=T,approximation=T,allowdrift=F,lambda=0)
fcast_u2<-forecast(fit_u2,h=61)
new_unrate2<-fcast_u2$mean

#exogenous data tables
xreg4<-cbind(new_temp2,new_precip2)
xreg4u<-cbind(new_temp2,new_precip2,new_unrate2)
#### weather averages ####
#defining variables
wdat<-end(d2)[1]-29

#temp
  xval<-"t"

  t1<-mean(subset(wdata[,2],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  t2<-mean(subset(wdata[,3],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  t3<-mean(subset(wdata[,4],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  t4<-mean(subset(wdata[,5],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  t5<-mean(subset(wdata[,6],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  t6<-mean(subset(wdata[,7],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  t7<-mean(subset(wdata[,8],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  t8<-mean(subset(wdata[,9],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  t9<-mean(subset(wdata[,10],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  t10<-mean(subset(wdata[,11],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  t11<-mean(subset(wdata[,12],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  t12<-mean(subset(wdata[,13],wdata[,1]>=wdat-1 & wdata[,15]==xval),na.rm=T)

mean_temp<-rbind(t1,t2,t3,t4,t5,t6,t7,t8,t9,t10,t11,t12)

#weather adjustment

    ta1<-t1*.25+t12*.5+t11*.25
    ta2<-t2*.25+t1*.5+t12*.25
    ta3<-t3*.25+t2*.5+t1*.25
    ta4<-t4*.25+t3*.5+t2*.25
```

```
    ta5<-t5*.25+t4*.5+t3*.25
    ta6<-t6*.25+t5*.5+t4*.25
    ta7<-t7*.25+t6*.5+t5*.25
    ta8<-t8*.25+t7*.5+t6*.25
    ta9<-t9*.25+t8*.5+t7*.25
    ta10<-t10*.25+t9*.5+t8*.25
    ta11<-t11*.25+t10*.5+t9*.25
    ta12<-t12*.25+t11*.5+t10*.25

mean_tempa<-rbind(ta1,ta2,ta3,ta4,ta5,ta6,ta7,ta8,ta9,ta10,ta11,ta12)
rm(xval)


##precip
  xval<-"p"

  p1<-mean(subset(wdata[,2],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  p2<-mean(subset(wdata[,3],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  p3<-mean(subset(wdata[,4],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  p4<-mean(subset(wdata[,5],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  p5<-mean(subset(wdata[,6],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  p6<-mean(subset(wdata[,7],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  p7<-mean(subset(wdata[,8],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  p8<-mean(subset(wdata[,9],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  p9<-mean(subset(wdata[,10],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  p10<-mean(subset(wdata[,11],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  p11<-mean(subset(wdata[,12],wdata[,1]>=wdat & wdata[,15]==xval),na.rm=T)
  p12<-mean(subset(wdata[,13],wdata[,1]>=wdat-1 & wdata[,15]==xval),na.rm=T)

mean_precip<-rbind(p1,p2,p3,p4,p5,p6,p7,p8,p9,p10,p11,p12)

    pa1<-p1*.25+p12*.5+p11*.25
    pa2<-p2*.25+p1*.5+p12*.25
    pa3<-p3*.25+p2*.5+p1*.25
    pa4<-p4*.25+p3*.5+p2*.25
    pa5<-p5*.25+p4*.5+p3*.25
    pa6<-p6*.25+p5*.5+p4*.25
    pa7<-p7*.25+p6*.5+p5*.25
    pa8<-p8*.25+p7*.5+p6*.25
    pa9<-p9*.25+p8*.5+p7*.25
    pa10<-p10*.25+p9*.5+p8*.25
    pa11<-p11*.25+p10*.5+p9*.25
    pa12<-p12*.25+p11*.5+p10*.25

mean_precipa<-rbind(pa1,pa2,pa3,pa4,pa5,pa6,pa7,pa8,pa9,pa10,pa11,pa12)
rm(xval)

#unemployment

  ur1<-mean(subset(d2[,4],cycle(d2)==1))
  ur2<-mean(subset(d2[,4],cycle(d2)==2))
  ur3<-mean(subset(d2[,4],cycle(d2)==3))
  ur4<-mean(subset(d2[,4],cycle(d2)==4))
  ur5<-mean(subset(d2[,4],cycle(d2)==5))
  ur6<-mean(subset(d2[,4],cycle(d2)==6))
  ur7<-mean(subset(d2[,4],cycle(d2)==7))
  ur8<-mean(subset(d2[,4],cycle(d2)==8))
  ur9<-mean(subset(d2[,4],cycle(d2)==9))
  ur10<-mean(subset(d2[,4],cycle(d2)==10))
  ur11<-mean(subset(d2[,4],cycle(d2)==11))
  ur12<-mean(subset(d2[,4],cycle(d2)==12))

mean_unrate<-rbind(ur1,ur2,ur3,ur4,ur5,ur6,ur7,ur8,ur9,ur10,ur11,ur12)

#data table creation
cbin<-cbind(mean_tempa,mean_precipa)
cbin1<-cbind(mean_tempa,mean_precipa,mean_unrate)
xreg5<-ts(cbin,start=c(end(d2)[1],end(d2)[2]+1),end=c(end(d2)[1]+5,12),frequency=12)
xreg5u<-ts(cbin1,start=c(end(d2)[1],end(d2)[2]+1),end=c(end(d2)[1]+5,12),frequency=12)
rm(cbin,cbin1)
#### arima using exogenous forecasts ####

xreg6<-d2[,c("temp","precip")]
xreg6u<-d2[,c("temp","precip","unrate")]

fit4<-auto.arima(d2[,1],xreg=xreg6,lambda=0)
```

```
fit4u<-auto.arima(d2[,1],xreg=xreg6u,lambda=0)

fit.preds2.1<-forecast(fit4,xreg=xreg4) #arima exog
fit.preds2.2<-forecast(fit4,xreg=xreg5) #mean exog

fit.preds2.1u<-forecast(fit4u,xreg=xreg4u) #arima exog
fit.preds2.2u<-forecast(fit4u,xreg=xreg5u) #mean exog
#### arima ####
fit5<-auto.arima(d2[,1],lambda=0)
fit.preds2.3<-forecast(fit5,h=61) #auto arima (no exog)

if(typ==1 & dis==10){
fit6<-Arima(d2[,1],order=pqd,seasonal=spqd,lambda=0)
}else{
fit6<-Arima(d2[,1],order=pqd,seasonal=spqd,method="ML",lambda=0)
}
fit.preds2.4<-forecast(fit6,h=61) #fixed arima
#### ncm ####
ncm2<-lm(concus~temp+precip+time)
ncm2u<-lm(concus~temp+precip+unrate+time)

#using results to forecast future consumption
ncmt2<-ts(c(ta1,ta2,ta3,ta4,ta5,ta6,ta7,ta8,ta9,ta10,ta11,ta12),start=c(end(d2)[1],end(d2)[2]+1),end=c(end(d2)

[1]+5,12),frequency=12)

ncmp2<-ts(c(pa1,pa2,pa3,pa4,pa5,pa6,pa7,pa8,pa9,pa10,pa11,pa12),start=c(end(d2)[1],end(d2)[2]+1),end=c(end(d2)

[1]+5,12),frequency=12)

ncmu2<-ts(c(ur1,ur2,ur3,ur4,ur5,ur6,ur7,ur8,ur9,ur10,ur11,ur12),start=c(end(d2)[1],end(d2)[2]+1),end=c(end(d2)

[1]+5,12),frequency=12)

ncmi2<-ts(c((length(d2[,1])+1):(length(d2[,1])+length(ncmt2))),start=c(end(d2)[1],end(d2)[2]+1),end=c(end(d2)

[1]+5,12),frequency=12)


new_data<-cbind(ncmt2,ncmp2,ncmi2)

cs<-ncm2$coef
csu<-ncm2u$coef

ncm_forecast2<-cs[1]+ncmt2*cs[2]+ncmp2*cs[3]+ncmi2*cs[4]
ncm_forecast2u<-csu[1]+ncmt2*csu[2]+ncmp2*csu[3]+ncmu2*csu[4]+ncmi2*csu[5]
rm(t1,t2,t3,t4,t5,t6,t7,t8,t9,t10,t11,t12,
   p1,p2,p3,p4,p5,p6,p7,p8,p9,p10,p11,p12,
   ta1,ta2,ta3,ta4,ta5,ta6,ta7,ta8,ta9,ta10,ta11,ta12,
   pa1,pa2,pa3,pa4,pa5,pa6,pa7,pa8,pa9,pa10,pa11,pa12,
   ur1,ur2,ur3,ur4,ur5,ur6,ur7,ur8,ur9,ur10,ur11,ur12)
#### mean method ####

xval<-d2[,1]

sy1<-sum(subset(xval,time(xval)>=end(xval)[1]-5 & time(xval)<end(xval)[1]-4))
sy2<-sum(subset(xval,time(xval)>=end(xval)[1]-4 & time(xval)<end(xval)[1]-3))
sy3<-sum(subset(xval,time(xval)>=end(xval)[1]-3 & time(xval)<end(xval)[1]-2))
sy4<-sum(subset(xval,time(xval)>=end(xval)[1]-2 & time(xval)<end(xval)[1]-1))
sy5<-sum(subset(xval,time(xval)>=end(xval)[1]-1 & time(xval)<end(xval)[1]))

u1<-subset(xval,month="January")
u2<-subset(xval,month="February")
u3<-subset(xval,month="March")
u4<-subset(xval,month="April")
u5<-subset(xval,month="May")
u6<-subset(xval,month="June")
u7<-subset(xval,month="July")
u8<-subset(xval,month="August")
u9<-subset(xval,month="September")
u10<-subset(xval,month="October")
u11<-subset(xval,month="November")
u12<-subset(xval,month="December")

#5,3,& 2 year average
```

```
len5<-c((length(u1)-4):length(u1))
len3<-c((length(u1)-2):length(u1))
len2<-c((length(u1)-1):length(u1))

mean1<-cbind(mean(u1[len5],na.rm=T),mean(u1[len3],na.rm=T),mean(u1[len2],na.rm=T))
mean2<-cbind(mean(u2[len5],na.rm=T),mean(u2[len3],na.rm=T),mean(u2[len2],na.rm=T))
mean3<-cbind(mean(u3[len5],na.rm=T),mean(u3[len3],na.rm=T),mean(u3[len2],na.rm=T))
mean4<-cbind(mean(u4[len5],na.rm=T),mean(u4[len3],na.rm=T),mean(u4[len2],na.rm=T))
mean5<-cbind(mean(u5[len5],na.rm=T),mean(u5[len3],na.rm=T),mean(u5[len2],na.rm=T))
mean6<-cbind(mean(u6[len5],na.rm=T),mean(u6[len3],na.rm=T),mean(u6[len2],na.rm=T))
mean7<-cbind(mean(u7[len5],na.rm=T),mean(u7[len3],na.rm=T),mean(u7[len2],na.rm=T))
mean8<-cbind(mean(u8[len5],na.rm=T),mean(u8[len3],na.rm=T),mean(u8[len2],na.rm=T))
mean9<-cbind(mean(u9[len5],na.rm=T),mean(u9[len3],na.rm=T),mean(u9[len2],na.rm=T))
mean10<-cbind(mean(u10[len5],na.rm=T),mean(u10[len3],na.rm=T),mean(u10[len2],na.rm=T))
mean11<-cbind(mean(u11[len5],na.rm=T),mean(u11[len3],na.rm=T),mean(u11[len2],na.rm=T))
mean12<-cbind(mean(u12[len5],na.rm=T),mean(u12[len3],na.rm=T),mean(u12[len2],na.rm=T))

#new data.frame set up as (5 year average, 3 year average, 2 year average)
meanu<-ts(rbind(mean12,mean1,mean2,mean3,mean4,mean5,mean6,mean7,mean8,mean9,mean10,mean11),start=c(end(d2)

[1],12),end=c(end(d2)[1]+5,12),frequency=12)
rm(mean1,mean2,mean3,mean4,mean5,mean6,mean7,mean8,mean9,mean10,mean11,mean12,xval)
#### forecast results ####
#plots

#plotted forecasts in relation to entire dataset
plot(ts(c(d2[,1],fit.preds2.1$mean),start=start(d2),frequency=frequency(d2)),ylim=ylim1
     ,xlab="month",lwd=1,ylab="ccf",main="arimax-arima exog")
plot(ts(c(d2[,1],fit.preds2.2$mean),start=start(d2),frequency=frequency(d2)),ylim=ylim1
     ,xlab="month",lwd=1,ylab="ccf",main="arimax-mean exog")
plot(ts(c(d2[,1],fit.preds2.3$mean),start=start(d2),frequency=frequency(d2)),ylim=ylim1
     ,xlab="month",lwd=1,ylab="ccf",main="arima")
plot(ts(c(d2[,1],fit.preds2.4$mean),start=start(d2),frequency=frequency(d2)),ylim=ylim1
     ,xlab="month",lwd=1,ylab="ccf",main="arima-fixed")
plot(ts(c(d2[,1],ncm_forecast2),start=start(d2),frequency=frequency(d2)),ylim=ylim1
     ,xlab="month",lwd=1,ylab="ccf",main="ncm")
plot(ts(c(d2[,1],meanu[,1]),start=start(d2),frequency=frequency(d2)),ylim=ylim1
     ,xlab="month",lwd=1,ylab="ccf",main="5 year average")
plot(ts(c(d2[,1],meanu[,2]),start=start(d2),frequency=frequency(d2)),ylim=ylim1
     ,xlab="month",lwd=1,ylab="ccf",main="3 year average")
plot(ts(c(d2[,1],meanu[,3]),start=start(d2),frequency=frequency(d2)),ylim=ylim1
     ,xlab="month",lwd=1,ylab="ccf",main="2 year average")
plot(ts(c(d2[,1],fit.preds2.1u$mean),start=start(d2),frequency=frequency(d2)),ylim=ylim1
     ,xlab="month",lwd=1,ylab="ccf",main="arimax-arima exog with unemp")
plot(ts(c(d2[,1],fit.preds2.2u$mean),start=start(d2),frequency=frequency(d2)),ylim=ylim1
     ,xlab="month",lwd=1,ylab="ccf",main="arimax-mean exog with unemp")
plot(ts(c(d2[,1],ncm_forecast2u),start=start(d2),frequency=frequency(d2)),ylim=ylim1
     ,xlab="month",lwd=1,ylab="ccf",main="ncm with unemp")

check<-read.csv("D:/ed3/My Documents/GSWC GRC/forecasting/workpapers/new_cons.csv")
base<-sum(check<-subset(check[,3],
                        check[,6]==levels(district)[dis] & check[,4]==levels(type)[typ]))

cur<-subset(d2[,1],time(d2)>=d_end[1] & time(d2)<d_end[1]+1)
cur[2:12]<-cur
cur[1]<-check[1]

current<-ts(cur,start=c(end(d)[1],end(d)[2]+1),end=c(end(d)[1]+5,end(d)[2]+1),
            frequency=frequency(d))

dbase<-cbind(fit.preds2.1$mean,fit.preds2.2$mean,fit.preds2.3$mean,fit.preds2.4$mean,
             ncm_forecast2,meanu[,1],meanu[,2],meanu[,3],
             current,fit.preds2.1u$mean,fit.preds2.2u$mean,ncm_forecast2u)

fn<-matrix(data=NA,nrow=3,ncol=12)
for (i in 1:ncol(dbase))(
fn[,i]<-rbind(
  sum(subset(dbase[,i],time(dbase[,i])>=ty & time(dbase[,i])<ty+1)),
  sum(subset(dbase[,i],time(dbase[,i])>=ty+1 & time(dbase[,i])<ty+2)),
  sum(subset(dbase[,i],time(dbase[,i])>=ty+2 & time(dbase[,i])<ty+3))
  ))

colnames(fn,do.NULL=F)
colnames(fn)<-c("arimax","arimamx","arima","arimaf","ncm",
                "mean 5","mean 3","mean 2","current","arimaxu","arimamxu","ncmu")
```

```
sum_diff<-matrix(data=NA,nrow=1,ncol=12)
for (i in 1:ncol(dbase))(
  sum_diff[,i]<-abs(sum(dbase[1:7,i])-base)
  )

pct_diff<-matrix(data=NA,nrow=1,ncol=12)
for (i in 1:ncol(dbase))(
  pct_diff[,i]<-abs(sum(dbase[1:7,i])-base)/base
)


colnames(sum_diff,do.NULL=F)
colnames(sum_diff)<-c("arimax","arimamx","arima","arimaf","ncm",
                    "mean 5","mean 3","mean 2","current","arimaxu","arimamxu","ncmu")
print(sum_diff)
print(fn[1,]) #test year estimates

(agmod<-cbind(mean(fn[1,]),mean(fn[2,]),mean(fn[3,])))



table<-matrix(data=NA,nrow=12,ncol=7)
colnames(table,do.NULL=F)
colnames(table)<-c("model","AIC or R2","CCF diff","% diff","TY","80% low","80% high")
table[,1]<-c("arima-arimax","arima-meanx","arima","arima-fixed",
             "ncm","5 yr avg","3 yr avg","2 yr avg","current",
             "arima-arimax w/unemp","arima-meanx w/unemp","ncm w/unemp")
table[,2]<-c(fit4$aic,fit4$aic,fit5$aic,fit6$aic,summary(ncm2)$r.squared,"NA","NA","NA","NA",fit4u$aic,fit4u

$aic,summary(ncm2u)$r.squared)

table[,3]<-sum_diff[1:12]
table[,4]<-pct_diff[1:12]

table[,5]<-fn[1,]

table[,6]<-c(sum(fit.preds2.1$lower[38:49,1]),sum(fit.preds2.2$lower[38:49,1]),sum(fit.preds2.3$lower

[38:49,1]),sum(fit.preds2.4$lower[38:49,1]),"NA","NA","NA","NA","NA",sum(fit.preds2.1u$lower[38:49,1]),sum

(fit.preds2.2u$lower[38:49,1]),"NA")

table[,7]<-c(sum(fit.preds2.1$upper[38:49,1]),sum(fit.preds2.2$upper[38:49,1]),sum(fit.preds2.3$upper

[38:49,1]),sum(fit.preds2.4$upper[38:49,1]),"NA","NA","NA","NA","NA",sum(fit.preds2.1u$upper[38:49,1]),sum

(fit.preds2.2u$upper[38:49,1]),"NA")

write.csv(table, file=paste(district_name[dis]," ",type_name[typ]," Summary.csv", sep=""))


}


# #Models
# arima-arimax - fit4
# arima-meanx - fit4
# arima - fit5
# arima-fixed - fit6
# ncm - ncm2
# 5 yr avg - meanu[,1]
# 3 yr avg - meanu[,2]
# 2 yr avg - meanu[,3]
# current
# arima-arimax w/unemp - fit4u
# arima-meanx w/unemp - fit4u
# ncm w/unemp - ncm2u
```

1 **APPENDIX REVENUES-A (Courtesy Adjustments)**

2 GSWC's external auditors report concerning courtesy adjustments booked as revenues rather
3 than an expense. (1 page total)

In the SEC staff's view, the correct application of GAAP requires strict adherence to the guidance stated in ASC 605-15-45-1:

"... Revenue and cost of sales reported in the income statement shall be reduced to reflect estimated returns."

When applying this guidance, both revenues and costs related to those sales must be eliminated in the current period. For accounting purposes, such products have not been sold. We believe that when a company is able to reliably estimate product returns, a company should generally report estimated products that are deemed unsold as inventory (under a separate caption, inventory on consignment and at cost) and if sales proceeds have been received, record deferred revenue (at sale price). In such situations, companies should consider the need to establish an inventory allowance for products that (1) will be returned and (2) may be obsolete or have a cost greater than market. If the amount of consigned-out inventory is material, a company should, at a minimum, separately disclose in the notes to the financial statements the amount of such inventory and any related inventory allowances or write-downs. Companies should also consider SAB Topic 13.A's requirements for consigned inventory, which mandate separate presentation in the balance sheet. S-X 5-02 provides quantitative thresholds for assigning separate captions to balance sheet items.

In circumstances where a standard warranty provision permits the buyer to return the product at the buyer's sole option, regardless of the performance of the product, the Company should evaluate this provision to determine if there is a right of return that should be subject to ASC 605-15.

Return privileges may take the form of price protection, product obsolescence protection, stock rotation, trade-in agreements or the right to return all products upon termination of the agreement. Some of these rights are articulated in contracts with customers or distributors, while some are implied during the sales process. These rights take many forms and are driven generally by the buyer's desire to mitigate technological risk or the risk that the product will not sell. Caution should be taken in these situations, especially for new products, which may not be similar to previous products (as to price, features, class of customers, etc.), sold by the company.

One area where difficulties may be encountered is where an implicit right to return a product exists. In this circumstance, the sales agreement might be silent as to the return policy or specify a fairly restrictive policy but, in practice, the seller has accepted returns. Implicit rights of return are specifically within the scope of ASC 605-15. In determining whether implicit rights of return exist, companies need a clear understanding of the facts and circumstances surrounding the relationship with the customer as well as the historical trends and past practices relative to accepting/granting returns.

If a reliable estimate cannot be made, a company should delay recognizing revenue until such estimate can be made or the return right expires. It is a common misconception that "sell-in" and "sell-through" are accounting elections. The terms "sell-in" and "sell-through" are merely common industry terms and are not accounting elections. The determination of whether revenue should be recognized upon "sell-in" or "sell-through" is solely dependent on the facts and circumstances of a particular situation and evaluation of the criteria in ASC 605-15-25-1. If a company's facts and circumstances changed such that they were no longer able to meet these criteria, the Company would be required to recognize revenue upon the later of "sell-through" or when the distributor's return rights lapse. There would be no change in policy, just a change in facts and circumstances.

Another area that is not within the scope of ASC 605-15, but is often analogized to that guidance is the accounting for "charge-backs" related to credit card transactions. Charge-backs occur when a company makes sales to customers by credit card and the transaction is found to be fraudulent. A company can recognize revenue at the point of sale if it has the ability to make a reasonable estimate of future charge-backs, as discussed in ASC 605-15-25-3, and it has met the revenue recognition criteria of SAB Topic 13.A and ASC 605-15-25-1. If a company is unable to reasonably estimate the amount of charge-backs, then revenue would be deferred until the expiration of the "chargeback period". The cost of fraudulent transactions should be presented as a reduction of revenue and not as bad debt expense.

APPENDIX AFFORDABILITY-A (Affordability Study)

This appendix provides the affordability study GSWC conducted in 2008-2009. (30 pages total)

2009 WATER RATE COMPARISON AND ANALYSIS

BAY POINT AND CONTRA COSTA COUNTY

GOLDEN STATE WATER COMPANY

Prepared by ROBERT D. NIEHAUS, INC.

GOLDEN STATE WATER COMPANY
BAY POINT AND CONTRA COSTA COUNTY
2009 WATER RATE COMPARISON AND ANALYSIS

Prepared for

Golden State Water Company

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RDN Project No. 203.17

8 July 2009

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EXECUTIVE SUMMARY

This study compares the retail cost of water for residential customers in the Bay Point area, served by Golden State Water Company (GSWC) to that of residents of neighboring areas within Contra Costa County, and identifies differences in structures and operating procedures that influence cost differences from one purveyor to another. Table ES-1 presents the main findings as well as the principal assumptions used in preparing this analysis.

Table ES-1. Water Rate Comparison, Bay Point and Neighboring Contra Costa County

Assumptions/Results

1. Monthly cost estimated for 15 ccf of water to residential customers
2. Total revenues for public entities equal total costs
3. Effective monthly cost per 15 ccf based on revenues consisting solely of water sales

Measure	Amount ($)	Entity
Average nominal monthly cost per 15 ccf	$57.15	All entities surveyed
Minimum nominal monthly cost per 15 ccf	$40.70	Antioch
Maximum nominal monthly cost per 15 ccf	$78.56	Bay Point (GSWC)
Bay Point (GSWC) nominal monthly cost per 15 ccf	$78.56	Bay Point (GSWC)
Average effective monthly cost per 15 ccf	$73.44	All entities surveyed
Minimum effective monthly cost per 15 ccf	$54.61	Diablo WD
Maximum effective monthly cost per 15 ccf	$84.28	East Bay MUD
Bay Point (GSWC) effective monthly cost per 15 ccf	$78.97	Bay Point (GSWC)

Source: Estimates prepared for this study.

Nominal Costs

For the areas compared, the nominal cost of obtaining 15 hundred cubic feet (ccf; one ccf is equal to 748 gallons) of water per month ranges between $40.70 per month in the City of Antioch and $78.56 per month in the Bay Point area served by GSWC. The cost of obtaining 15 ccf of water per month from Bay Point (GSWC) is $37.86 higher than the cost for the lowest-cost purveyor in the area and $21.41 higher than the average cost of $57.15. The monthly cost of obtaining 15 ccf of water from Bay Point (GSWC) is the highest of all the purveyors surveyed for this analysis.

Effective Costs

Most of the purveyors in this analysis are municipal utilities that receive considerable amounts of revenues from sources other than water. For comparative purposes, this analysis estimates what the various purveyors would need to charge their customers if these other sources of revenue were not used. The effective cost of obtaining 15 ccf of water per month ranges between $54.61 in the area served by Diablo Water District (WD) and $84.28 in the area served by East Bay Municipal Utility District (MUD). Water sales represent 99.5 percent of revenues for GSWC's Bay Point operation. The effective cost of obtaining 15 ccf of water from Bay Point (GSWC) is thus $78.97, or $24.36 higher than the cost for the lowest-cost purveyor in the area, $5.31 lower than the cost for the highest-cost purveyor, and $5.53 higher than the average effective cost of $73.44. The effective monthly cost of obtaining 15 ccf of water from Bay Point (GSWC) is the fifth lowest in a lowest-cost to highest-cost ranking of the eight purveyors surveyed for this analysis.

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1. INTRODUCTION AND METHODOLOGY

The purpose of this study is to compare the retail cost of water for residential customers in the Bay Point area to that of residents of neighboring areas within Contra Costa County, California (see Figure 1-1), and to identify differences in structures and operating procedures that influence cost differences from one purveyor to another. Data were collected for eight purveyors, which include the City of Antioch, Bay Point (GSWC), the City of Brentwood, Contra Costa WD, Diablo WD, East Bay MUD, the City of Martinez, and the City of Pittsburg.

Current rate data were obtained for all eight purveyors. Financial information for the eight purveyors was compiled by means of published sources as well as telephone contacts with appropriate agency staff. Financial information for the 2007-2008 fiscal year is used for most agencies. Financial information for the year ended December 2008 is used for Bay Point (GSWC). All water rates are for 2009.

Nominal retail water bills were computed for the use of 15 hundred cubic feet (ccf) of water per month within the area served by each purveyor (one ccf is equal to 748 gallons), assuming a residential water meter size of five-eights inch by thee-fourths inch. Nominal retail water bills are the amounts a single-family residential customer must pay to use 15 ccf per month in each of these jurisdictions and typically include service availability charges and quantity use charges.

According to the American Water Works Association (1999), water rates should be cost based and they should be set at a level such that revenues meet the expenditures (including operations, maintenance, and capital investments) of each entity. For investor-owned enterprises, costs include a competitive profit or rate of return on capital in order to attract and retain investors.

All purveyors included in the analysis are municipal utilities (city water agencies or independent water districts) except for the investor-owned regulated public utility operation of Bay Point (GSWC). This difference in ownership and legal structure presents significant challenges in comparing water rates. Most of the purveyors in this survey obtained significant amounts of revenues from sources other than water sales.

Costs also vary from one purveyor to another. Water production and delivery costs differ by location and sources of water. The City of Martinez, for example, purchases all of the water from Contra Costa WD (Martinez, City of, 2009b). The City of Brentwood, in contrast, utilizes a combination of water from its ground water wells and surface water purchased from East Contra Costa Irrigation District (Brentwood, City of, 2009c). Other factors that vary; and influence debt burdens (and hence current total costs and rates) are the cost of capital facility improvement projects, expenses for routine or programmed maintenance, population densities, and past investments in water infrastructure.

Moreover, the rate structures used by each purveyor are set independently based on the circumstances unique to each agency. These rate structures are similar in that most of the purveyors assess a monthly service or minimum charge, as well as a charge for each ccf used. Quantity use charges (cost per ccf of water used) also vary. Some entities use a uniform block rate structure (each unit of water used costs the same per unit) while others use increasing block rate structures (cost per unit increases with monthly consumption).

These rate structures are chosen by the individual purveyors to accomplish the revenue and other goals of each agency. All entities operate as independent enterprises. They choose the rate structures (service charges, quantity charges, and other charges and fees) most suitable for their operating requirements, considering the need to generate sufficient revenue, discourage water waste, and avoid charging costumers for services they do not use. Capital costs are raised using a combination of connection fees, capacity fees and borrowing using Certificates of Participation, or other similar instruments. Investor-owned companies have the additional option of issuing stock to raise needed capital, mindful of each company's obligation to its shareholders to earn competitive returns on its investments and operations.

Financial data for all eight purveyors surveyed indicate that all purveyors have sources of revenue other than water sales. According to rate setting norms, in the long run revenues must equal costs. This analysis therefore assumes that, in the long run, revenues equal costs, and that the levels of revenues obtained by each entity are the necessary revenues to cover each entity's costs. Effective water bills can then be estimated as the amounts the various purveyors would need to charge their customers in order to achieve the same level of cost-covering revenues if other sources of revenue were not used. Effective retail water bills were computed for all eight purveyors surveyed in this analysis. For the purposes of this analysis, reported water rates and surcharges are rounded to the nearest two decimal points, and sums may therefore not add up to totals.

Revenues as used in this analysis include administration and inspection reimbursement, Brentwood overlap fees, CALFED grant, capital asset contributions, charges for services, connection fees, contributions in aid of construction, county well system labor, Delta Mutual labor, developer fees, impact fees and credits, industrial water sales, interest income, investment income, Local Agency Investment Fund (LAIF) interest income, meter fees, metered commercial, metered public authority, metered irrigation, miscellaneous service charges, other income, other operating revenues, overhead and vehicle reimbursement, private fire protection, property taxes, reimbursement of operating expenses, rent and leases, residential and business water sales, revenue accrued, taxes and subventions, transfers in, treated water sales, and water sales.

Figure 1-1. Principal Cities and Water Purveyors, Contra Costa County, California

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2. COMPARATIVE ANALYSIS

Nominal retail water bills were computed for use of 15 ccf of water per month within the area served by each purveyor, assuming a residential water meter size of five-eights inch by three-fourths inch. These nominal water bills vary measurably from one location to another, from a low of $40.70 per month in the City of Antioch to a high of $78.56 in the Bay Point area served by GSWC. Table 2-1 presents these bills, as well as the approximate population in each service area.

Table 2-1. Residential Water Bill for 15 ccf Per Month in Selected Areas of Contra Costa County, California, 2009

Purveyor	Service Area Population	Cost for 15 ccf Per Month
Antioch	108,200	$40.70
Bay Point (GSWC)	16,715	$78.56
Brentwood	51,908	$47.27
Contra Costa WD	230,000	$60.56
Diablo WD	25,000	$46.15
East Bay MUD	1,300,000	$54.93
Martinez	36,179	$71.85
Pittsburg	62,500	$57.16

Source: Estimates prepared for this study.

These water bills are real and meaningful, because they are the amounts a residential customer must pay to use 15 ccf per month in each of these jurisdictions. There are, in some areas, other costs to the customer, such as connection fees which new customers incur when seeking to connect to the system. Where these connection fees apply, they represent additional revenue (generally earmarked for capital improvements) to the water agency.

Most water purveyors surveyed for this study have significant additional sources of revenue beyond water sales, service charges, and connection fees. Interest is commonly earned on agency fund balances. Some public agencies receive tax revenue support. Developer fees, capital asset contributions, installation charges, and transfers in are typically received by various purveyors included in this study.

It is important for comparative purposes to estimate what the various purveyors would need to charge their customers if these other sources of revenue were not used. This is not to suggest that these other sources will or should disappear. In fact, charges for specific requirements (such as connection fees) permit the purveyor to collect from those who directly benefit from the service provided. But it is a useful benchmark to measure how much each purveyor depends on revenue sources other than water sales. It also is useful to calculate the approximate amount purveyors would need to charge if they pursued a policy of relying solely on water sales for revenue. Moreover, since revenue targets are set to cover costs, this comparison reflects the actual costs purveyors incur.

Table 2-2 presents the share of revenues received from water sales relative to total annual revenues for a recent fiscal year for each purveyor. For purveyors that perform other services (such as sewer and wholesale water services), total revenues are net of revenues from these other services. For purposes of this analysis, water sales include monthly

service and quantity use charges. Published financial reports use various formats and disclosure definitions. Therefore, judgment is required in order to determine what portion of revenues consists of monthly service and quantity charges. For purveyors for which it is not possible to obtain water sales and other service charges separately, the amount reported as water sales and service charges is used to represent water sales.

For the 12 months ending December 2008, Bay Point (GSWC) received 99.5 percent of their total revenues from water sales. All other purveyors received between 65.2 percent (East Bay MUD) and 92.4 percent (Martinez) of their revenues from water sales.

Table 2-2. Share of Revenues from Water Sales Relative to Total Annual Revenues, Selected Water Purveyors in Contra Costa County, 2007-2008

Purveyor	Water Sales as Percent of Total Revenues
Antioch	73.9%
Bay Point (GSWC)	99.5% [1]
Brentwood	65.5%
Contra Costa WD	72.9%
Diablo WD	84.5%
East Bay MUD	65.2%
Martinez	92.4%
Pittsburg	70.1%

Note: [1] Calendar year 2008 data used.
Source: Estimates prepared for this study.

Table 2-3 presents the effective cost for 15 ccf per month assuming all purveyors relied on water sales for 100 percent of their revenues. These were computed by dividing the water bills in Table 2-1 by the share of total revenues from water sales as shown in Table 2-2.

Table 2-3. Effective Retail Cost of 15 ccf of Water Per Month for Residential Customers of Selected Water Purveyors, Contra Costa County, 2009

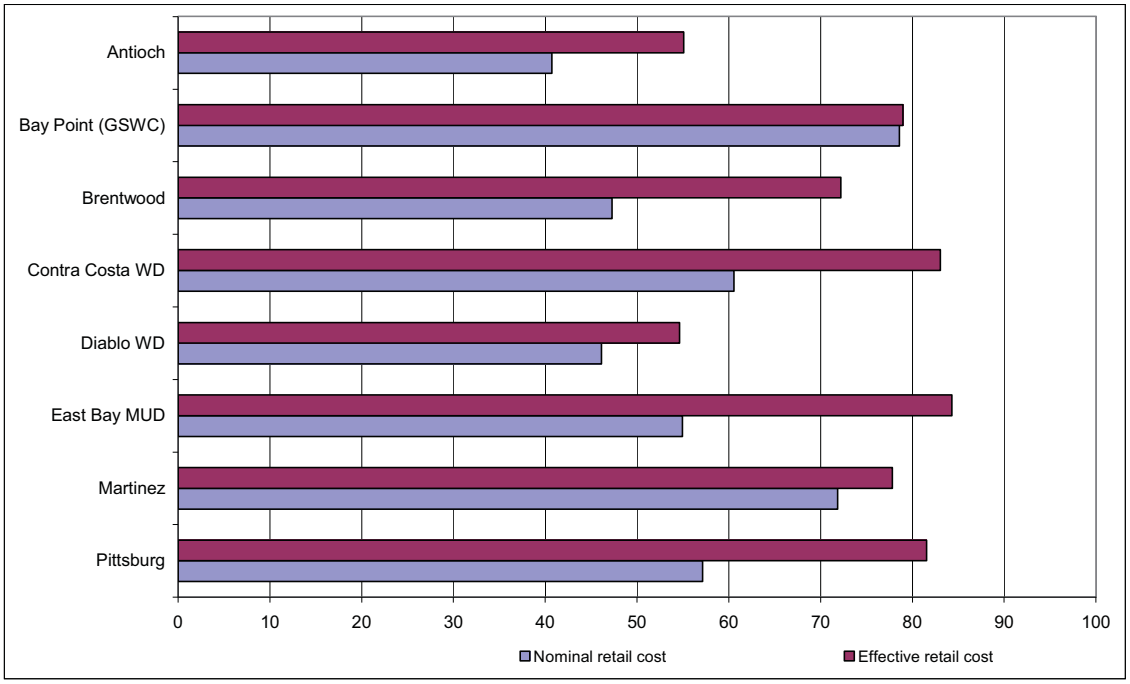
Purveyor	Cost for 15 ccf Per Month
Antioch	$55.09
Bay Point (GSWC)	$78.97
Brentwood	$72.20
Contra Costa WD	$83.02
Diablo WD	$54.61
East Bay MUD	$84.28
Martinez	$77.79
Pittsburg	$81.53

Source: Estimates prepared for this study.

Effective water bills vary measurably from one location to another, from a low of $54.61 per month in the area served by Diablo WD to a high of $84.28 in the area served by East Bay MUD. The effective water bill for Bay Point (GSWC) is $78.97, lower than East Bay

MUD, Contra Costa WD, and the City of Pittsburg. Both the nominal water bills and the effective costs are displayed graphically in Figure 2-1.

Figure 2-1. Comparative Rate Analysis for Selected Water Purveyors in Contra Costa County, 2009



Source: Estimates prepared for this study.

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3. PURVEYOR INFORMATION

Table 3-1 presents a summary of information for purveyors contacted for this study.

Table 3-1. Summary of Purveyor Information, Selected Water Purveyors, Contra Costa County, 2009

Purveyor	Service Area Population	Nominal Cost for 15 ccf	Low-to-High Rank (1-8)	Water Sales as Percent of Revenues	Effective Cost for 15 ccf	Low-to-High Rank (1-8)	Operating & Capital Expenses [1]	Expenses by Category	
Antioch	108,200	$40.70	1	73.9%	$55.09	2	$23,291,546	Operations:	**96.9%**
								Maintenance:	**0.0%** [3]
								Capital [2]:	**3.1%**
Bay Point (GSWC)	16,715	$78.56	8	99.5%	$78.97	5	$9,737,817	Operations:	**41.1%**
								Maintenance:	**1.0%**
								Capital [2]:	**57.9%**
Brentwood	51,908	$47.27	3	65.5%	$72.20	3	$19,044,495	Operations:	**58.1%**
								Maintenance:	**1.0%**
								Capital [2]:	**40.9%**
Contra Costa WD	230,000	$60.56	6	72.9%	$83.02	7	$111,282,093	Operations:	**35.0%**
								Maintenance:	**1.6%**
								Capital [2]:	**63.4%**
Diablo WD	25,000	$46.15	2	84.5%	$54.61	1	$12,300,455	Operations:	**57.0%**
								Maintenance:	**3.2%**
								Capital [2]:	**39.7%**
East Bay MUD	1,300,000	$54.93	4	65.2%	$84.28	8	$532,657,000	Operations:	**38.0%**
								Maintenance:	**23.2%**
								Capital [2]:	**38.8%**
Martinez	36,179	$71.85	7	92.4%	$77.79	4	$10,347,553	Operations:	**82.3%**
								Maintenance:	**0.0%** [3]
								Capital [2]:	**17.7%**
Pittsburg	62,500	$57.16	5	70.1%	$81.53	6	$17,045,104	Operations:	**71.4%**
								Maintenance:	**2.9%**
								Capital [2]:	**25.8%**

Notes: [1] Operating and capital expenses from most recent budget documents for all purveyors providing budget information. When budget documents were not available, most recent audited financial reports were used.
[2] Capital expenses include capital improvement, capital replacement, depreciation, interest expenses, amortization expenses, and debt services.
[3] Budget documents did not itemize maintenance expenses in a separate category.
Source: Estimates prepared for this study.

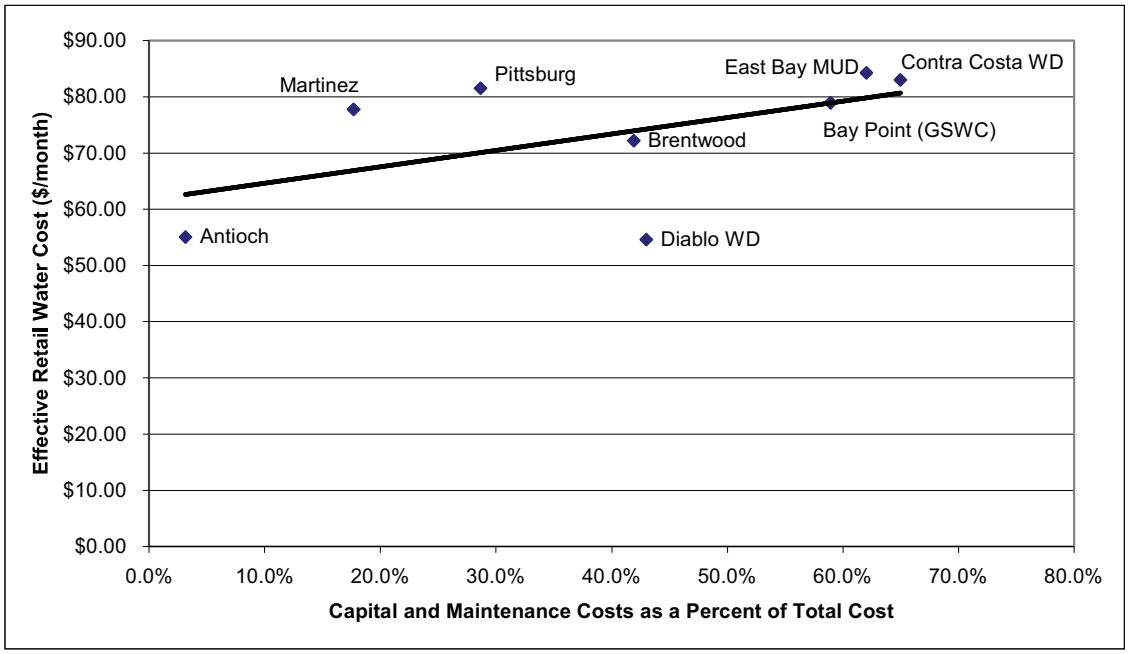
Table 3-1 presents the nominal and effective cost estimates for each purveyor as shown in Section 2 of this report, as well as data on total expenditures and the composition of those expenditures among operating, maintenance, and capital functions. These classifications by function were accomplished using published financial documents for each entity. Rate information and recent financial data are available from individual purveyors in the form of rate sheets, audited and unaudited financial statements, and budgetary documents. This analysis used each of these sources.

Published financial reports use various formats and disclosure definitions, so judgment was required in order to classify outlays as operating, maintenance, or capital spending. Specifically, salaries and benefits are classified as operating expenses; interest expenses, amortization, other debt service expenses, depreciation, and contingencies are categorized as capital expenses.

As discussed previously (see Section 1), numerous factors influence water costs in any given jurisdiction. The extent of capital and facility maintenance spending to improve and enhance water treatment and delivery systems is one of the factors that influences the effective retail cost of water. Generally, a greater share of outlays going to capital and

maintenance functions implies a higher effective water cost as entities spending a large share of their revenues on capital and/or maintenance expenses may need to increase their nominal costs or rely more on other sources of revenue, both of which lead to higher effective cost. In order to determine the extent to which capital and maintenance spending influences effective water costs, a regression analysis was performed using the share of total expenditures going to capital and maintenance functions and effective water costs (Figure 3-1). The upward slope of the regression shows the expected positive relationship between capital and maintenance costs as a percent of total cost and effective water costs – the larger the share of expenditures devoted to capital and maintenance functions, the higher the effective water cost is on average. However, the results of the regression indicate that the share of spending devoted to capital and maintenance only accounts for a small portion of the variation in effective water costs. Hence, there are other important factors – such as acquisition cost of water or source of water – that are also important in determining effective and nominal water costs.

Figure 3-1. Relationship between Capital Maintenance Costs as a Percent of Total Cost and Effective Retail Water Cost



City of Antioch

The City of Antioch provides water through 27,606 connections to a population of 108,200 people (Antioch, City of, 2009b). The City charges a monthly service fee of $8.65 for a residential meter (Antioch, City of, 2009a). In addition, residential customers pay a quantity use charge and a pumping charge (applies to customers residing in zones 2, 3 and 4) that vary by location according to the City's water zones. Specifically:

- Zone 1: $1.87 per ccf of water consumed,
- Zone 2: $1.95 per ccf of water consumed plus a $0.07 per ccf pumping charge,
- Zone 3: $2.04 per ccf of water consumed plus a $0.15 per ccf pumping charge, and

- Zone 4: $2.24 per ccf of water consumed plus a $0.34 per ccf pumping charge.

Representatives from the City indicated that customers are distributed among the different zones approximately as follows (Antioch, City of, 2009b):

- Zone 1: 13.0 percent of customers,
- Zone 2: 32.0 percent of customers,
- Zone 3: 44.0 percent of customers, and
- Zone 4: 11.0 percent of customers.

Based on this distribution of customers, a weighted average quantity charge of $2.01 per ccf regardless of the amount of water used and a weighted average pumping charge of $0.13 per ccf are calculated for this study. Thus the monthly cost for 15 ccf purchased from the City is $40.70 ($8.65 service charge and $32.05 quantity use charge). Based on the nominal cost of 15 ccf, Antioch has the lowest cost of all the purveyors surveyed in this study.

The City's water utility fund received $24,245,208 in total revenues during the 2007-2008 fiscal year (Antioch, City of, 2008b). Receipts from water sales amounted to $17,914,550. Other revenues ($6,330,658) consisted of other operating revenues, investment income, developer fees, and connection fees. Water sales thus represented 73.9 percent of total revenues.

The effective monthly cost for 15 ccf purchased from the City is $55.09. Based on the effective cost of 15 ccf, Antioch is ranked second lowest out of eight in a lowest-cost to highest-cost ranking of purveyors. Proposed expenses for the City's water fund total $23,291,546 for the 2009-2010 period. Of this amount, 71.3 percent are for operating expenses including services and supplies; 25.6 percent are for other operating expenses including personnel expenses and interfund charges; and 3.1 percent are for capital expenses including water main replacement, raw water supply improvement, and water treatment plant renovation (Antioch, City of, 2008a).

Representatives for the City were unable to provide information about the amount budgeted exclusively for maintenance expenses.

Bay Point (Golden State Water Company)

Bay Point (GSWC) provides water to a population of 16,715 people (Environmental Protection Agency, 2009) through 4,765 connections in parts of the City of Pittsburg and the immediate vicinity (Golden State Water Company, 2009). Residential customers pay a $27.60 monthly service charge (Golden State Water Company, 2009). In addition, customers pay $3.28 per ccf regardless of the amount of water consumed. Surcharges of $0.05 per ccf and a reimbursement fee of 1.5 percent are also added to all customer bills. Thus 15 ccf of water per month cost $78.56 ($28.01 service charge and $50.55 quantity use charge). Based on the nominal cost of 15 ccf, Bay Point (GSWC) has the highest cost of all the purveyors surveyed in this study.

The Company's Bay Point operation received $5,562,397 in revenues for the 12 months ending December 2008 (Golden State Water Company, 2009). Of this amount, water sales receipts amounted to $5,533,850. Other revenues ($28,547) consisted of private fire

protection, miscellaneous service, and other water revenue. Thus 99.5 percent of total revenues during this period were from water sales.

The effective monthly cost for 15 ccf purchased from the Company is $78.97. Based on the effective cost of 15 ccf, Bay Point (GSWC) is ranked fifth lowest out of eight in a lowest-cost to highest-cost ranking of purveyors. The Company's Bay Point operation budgeted $9,737,817 for the year 2009. Of this amount, 27.0 percent are for operating expenses such as purchased water, power for pumping, outside services, chemicals, rent, and allocated customer expenses; and 14.1 percent are for other operating expenses such as operation labor, administrative and general labor, injuries and damages, pensions and benefits, allocated administrative and general expense. An additional 1.0 percent is for maintenance expenses. Budgeted capital expenses such as depreciation and amortization, water supply, street improvements, contingency, and new business funded by GSWC amount to $5,638,292 for this period, which account for 57.9 percent of total expenses (Golden State Water Company, 2009).

City of Brentwood

The City of Brentwood provides water through 16,307 connections to a population of 51,908 people (Brentwood, City of, 2009b). The City charges $16.95 as a monthly service charge for a residential meter (Brentwood, City of, 2009a). In addition, each residential customer pays $2.65 per 1,000 gallons of water for the first 10,000 gallons used, which is the equivalent of $1.98 per ccf for the first 13.37 ccf of water used. The next 10,000 gallons (13.37 ccf) cost the residential customer $3.16 per 1,000 gallons, or $2.36 per ccf. The next 10,000 gallons (13.37 ccf) cost $3.79 per 1,000 gallons, or $2.83 per ccf. Any subsequent use over 30,000 gallons (40.11 ccf) is billed at $4.16 per 1,000 gallons or $3.30 per ccf regardless of the amount of water used. Thus 15 ccf of water per month cost $47.27 ($16.95 service charge and $30.32 quantity use charge). Based on the nominal cost of 15 ccf, Brentwood is ranked third lowest out of eight in a lowest-cost to highest-cost ranking of purveyors.

Brentwood received $23,602,587 in total revenues for the 2007-2008 fiscal year (Brentwood, City of, 2008). Of this amount, Receipts from water sales amounted to $15,453,126. Other revenues ($8,149,461) included application fees, hydrant usage, late charges, other operating revenues, stand by charge, miscellaneous items, water developer impact fees and credits, interest income, capital asset contributions, and transfers in. Water sales thus represented 65.5 percent of total revenues.

The effective monthly cost for 15 ccf purchased from the City is $72.20. Based on the effective cost of 15 ccf, Brentwood is ranked third lowest out of eight in a lowest-cost to highest-cost ranking of purveyors. Budgeted expenses for the City's water fund total $19,044,495 for the 2008-2009 period. Operating expenses such as utilities, production and distribution expenses, special services, purchased water, and contractual services account for 36.9 percent; other operating expenses such as salaries, insurance, retirement benefits, interfund services, and taxes account for 21.2 percent; maintenance expenses including fleet maintenance service, facilities maintenance services, equipment/vehicle maintenance, and building/facility maintenance account for 1.0 percent; and capital expenses such as interest, depreciation, amortization, loan principal, equipment replacement, and capital improvement projects account for 40.9 percent. Budgeted capital

improvement projects for this period include major transmission mains, new water sources, booster stations, water wells, reservoirs, and treatment facilities, among others (Brentwood, City of, 2007).

Contra Costa Water District

Contra Costa WD serves approximately 230,000 residents through 60,983 connections (Contra Costa Water District, 2009b) in the Cities of Brentwood, Clayton, and Concord; the communities of Clyde, Pacheco, and Port Costa; and portions of Pleasant Hill, Martinez and Walnut Creek. The District charges a daily service and demand fee of $0.54, a daily public fire protection fee of $0.032, a daily life line fee of $0.0032, and a daily backflow prevention surcharge of $0.046 (Contra Costa Water District, 2009a). Based on an average 30-day month, these fees combined amount to a monthly service fee of $18.71 for a residential meter. In addition, each residential single-family customer pays a quantity use charge of $2.63 per ccf regardless of the amount of water consumed, and an energy surcharge per ccf that varies by location according to the District's water zones. Specifically:

- Zone 1: $0.0767 per ccf of water consumed,
- Zone 2: $0.1514 per ccf of water consumed,
- Zone 3: $0.2120 per ccf of water consumed,
- Zone 4: $0.2763 per ccf of water consumed,
- Zone 5: $0.3889 per ccf of water consumed,
- Zone 6: $0.4497 per ccf of water consumed,
- Zone 5E: $0.5614 per ccf of water consumed,
- Zone 6E: $0.5614 per ccf of water consumed,
- Zone 7: $0.5614 per ccf of water consumed, and
- Zone 8: $0.7545 per ccf of water consumed.

Representatives from the District indicated that customers are distributed among the different zones approximately as follows (Contra Costa Water District, 2009b):

- Zone 1: 45.4 percent of customers,
- Zone 2: 28.9 percent of customers,
- Zone 3: 11.2 percent of customers,
- Zone 4: 7.2 percent of customers,
- Zone 5: 2.7 percent of customers,
- Zone 6: 2.7 percent of customers,
- Zone 5E: 0.4 percent of customers,
- Zone 6E: 0.4 percent of customers,
- Zone 7: 0.9 percent of customers, and
- Zone 8: 0.3 percent of customers.

Based on this distribution of customers, a weighted average energy surcharge is estimated at $0.16 per ccf. The average cost per ccf is therefore estimated to be $2.79 ($2.63

quantity use charge and $0.16 energy surcharge). Thus the monthly cost for 15 ccf purchased from the District is $60.56 ($18.71 service charge and $41.85 quantity use charge). Based on the nominal cost of 15 ccf, Contra Costa WD is ranked sixth lowest out of eight in a lowest-cost to highest-cost ranking of purveyors.

Contra Costa WD provides wholesale water services in addition to retail water services. Revenues in financial documents from Contra Costa WD analyzed for this study have subtracted revenues from all the District's untreated water sales and the portion of treated water sales from wholesale services. The District's revenues from untreated water sales (assumed to be all wholesale) totaled $37,663.975 in fiscal year 2007-2008 (Contra Costa Water District, 2008b).

Additionally, the revenues from treated water sales amounted to $64,046,744 during this period. District representatives indicated that $3,868,000 of the total treated water sales is from wholesale services (Contra Costa Water District, 2009c). Based on total revenues from water sales (treated and untreated) of $101,710,719, revenues from retail treated water sales account for 59.2 percent of all water sales revenues. Revenues from other operating revenues and non-operating revenues reported have been adjusted accordingly, apportioning 59.2 percent to retail water activities.

The District received an estimated $82,499,204 in total revenues (net of wholesale activities) in the 2007-08 fiscal year (Contra Costa Water District, 2008b). Receipts from water sales amounted to $60,178,744 during this period. Other revenues ($22,320,460) included reimbursement of operating expenses, miscellaneous service charges, property taxes, investment earnings, contributions, grants, and others. Water sales thus represented 72.9 percent of total revenues during this period.

The effective monthly cost for 15 ccf purchased from the District is $72.20. Based on the effective cost of 15 ccf, Contra Costa WD is ranked seventh lowest out of eight in a lowest-cost to highest-cost ranking of purveyors. Estimated treated retail water expenses budgeted for the District total $111,282,093 for the 2010-2011 period. Total budgeted expenses were adjusted apportioning 59.2 percent to treated retail water expenses. Operating expenses such as supplies and materials, utilities, purchased water, treatment chemicals, professional services, and construction services represent 14.4 percent; other operating expenses such as salaries and benefits, legal services, insurance premiums, financial activity, business activities, and taxes represent 20.6 percent; maintenance services represent 1.6 percent; and capital expenses including debt service, contingency, purchased real property, and capital improvement projects represent 63.4 percent. Total expenses for capital improvement projects were also adjusted apportioning 59.2 percent to treated retail water activities, which amount to $41,372,224. Capital improvement projects budgeted for this period include alternative intake project, CCWD/Brentwood Water Treatment Plant improvements, canal replacement project, Los Vaqueros Reservoir expansion and energy recovery, pipeline renewal and replacement, water conservation incentives, and Randall-Bold Water Treatment Plant improvements, among others. Of the total budgeted capital improvement project expenses, 22.0 percent are funded from outside sources including grants for the Los Vaqueros expansion, alternative intake and canal replacement projects, and the conservation incentives program and applicants for development related projects. The City of Brentwood pays all capital costs for the CCWD/Brentwood Water Treatment Plant, and the District's partners (the Diablo

Water District and the Cities of Brentwood and Antioch) fund proportional shares of improvements at the Randall-Bold Water Treatment Plant (Contra Costa Water District, 2008a).

Diablo Water District

Diablo WD provides water to approximately 25,000 people through 10,093 connections (Diablo Water District, 2009b) in an area consisting of Oakley, Cypress Corridor, Hotchkis Tract, and Summer Lakes; and portions of Bethel Island and Knightsen. The District charges $8.95 as a monthly service charge for a residential meter (Diablo Water District, 2009a). In addition, each residential customer pays $2.48 per ccf regardless of the amount of water consumed. Thus 15 ccf of water per month cost $46.15 ($8.95 service charge and $37.20 quantity use charge). Based on the nominal cost of 15 ccf, Diablo WD is ranked second lowest out of eight in a lowest-cost to highest-cost ranking of purveyors.

The District's water fund received $8,891,101 in total revenues in the 2007-2008 fiscal year (Diablo Water District, 2009b). Receipts from water sales amounted to $7,513,903 during this period. Other revenues ($1,377,198) included interest income, LAIF interest income, administration and inspection reimbursement, Brentwood overlap fees, county well system labor overhead and vehicle reimbursement, rental income, and other miscellaneous. Water sales thus represented 84.5 percent of total revenues during this period.

The effective monthly cost for 15 ccf purchased water from the District is $54.61. Based on the effective cost of 15 ccf, Diablo WD has the lowest cost of all the purveyors surveyed in this study. Budgeted expenses for the District's water operation total $12,300,455 for the 2008-2009 period. Operating expenses such as engineering/consulting, water purchases, and water samples represent 40.5 percent; other operating expenses such as salaries, benefits, workers' compensation, legal service, accounting service, and payroll taxes represent 16.6 percent; maintenance expenses such as backflow, reservoir, and well maintenance represent 3.2 percent; and capital expenses such as debt services, reservoir construction, Stone Creek Well final design, facilities replacement study, and public right of way relocations represent 39.7 percent. Of the total budgeted expenses, approximately $3,152,000 is funded from the District's facilities reserve (Diablo Water District, 2009b).

East Bay Municipal Utility District

East Bay MUD provides water through 381,903 connections (East Bay Municipal Utility District, 2009c) to approximately 1,300,000 people in an area extending from Crockett on the north, southward to San Lorenzo, eastward from San Francisco Bay to Walnut Creek, and south through the San Ramon Valley (East Bay Municipal Utility District, 2009b). The District charges a monthly service fee of $9.53 and monthly seismic improvement surcharges of $0.88 (East Bay Municipal Utility District, 2009b). In addition, each residential customer must pay $2.00 per ccf for the first 172 gallons per day (gpd) of water consumed. Based on an average 30-day month, 172 gpd is equivalent to 5,160 gallons, or 6.9 ccf per month. The next 221 gpd (or 8.9 ccf monthly) cost the residential customer $2.49 per ccf. Any additional water over 15.7 ccf costs the residential customer $3.05 per ccf. Other surcharges consist of a $2.00 per ccf drought

surcharge, which is added to customer bills when water consumption exceeds account's water use allocation (the average allocation amount is 11.0 ccf for a single family residential customer - East Bay Municipal Utility District, 2009d), and an elevation surcharge, which varies by location according to the District's water zones. Specifically:

- Zone 1: no charge
- Zone 2: $0.35 per ccf, and
- Zone 3: $0.72 per ccf.

Representatives from the District indicated that customers are distributed among the different zones approximately as follows (East Bay Municipal Utility District, 2009d):

- Zone 1: 60.0 percent of customers,
- Zone 2: 32.0 percent of customers, and
- Zone 3: 8.0 percent of customers.

Accordingly, weighted averages of $2.17 per ccf for the first 6.9 ccf, $2.66 per ccf for water consumption up to 11.0 ccf (the average water use allocation before the drought surcharge is applied), $4.66 per ccf ($2.66 per ccf quantity charge plus $2.00 per ccf drought charge) for water consumption between 12.0 ccf and 15.8 ccf, and $5.22 per ccf ($3.22 per ccf quantity charge plus $2.00 per ccf drought charge) for any additional water used over 15.8 ccf were computed for this study. Thus the monthly cost for 15 ccf purchased from East Bay MUD is $54.93 ($10.41 service charge and $44.52 quantity use charge). Based on the nominal cost of 15 ccf, East Bay MUD is ranked fourth lowest out of eight in a lowest-cost to highest-cost ranking of purveyors.

East Bay MUD provides wastewater services in addition to water services. Revenues in financial documents from East Bay MUD analyzed for this study include only revenues from the District's water activities. The District received $415,155,000 in total revenues (net of wastewater services revenues) in the 2007-2008 fiscal year (East Bay Municipal Utility District, 2009a). Receipts from water sales amounted to $270,564,000 during this period. Other revenues ($144,591,000) included investment income, taxes and subvention, other income, and capital contributions. Water sales thus represented 65.2 percent of total revenues during this period.

The effective monthly cost for 15 ccf purchased from the District is $84.28. Based on the effective cost of 15 ccf, East Bay MUD has the highest cost of all the purveyors surveyed for this study. Budgeted expenses for the District's water fund totaled $532,657,000 for the 2009-2010 period. Operating expenses such as water operations, customer and community services, engineering and construction, water resources, and natural resources account for 20.7 percent; other operating expenses such as administrative and general expenses, finance expenses, and human resources account for 17.3 percent; maintenance expenses such as infrastructure, facilities, and distribution maintenance account for 23.2 percent; and capital expenses such as debt service, contingency, and capital improvement projects account for 38.8 percent. Budgeted capital improvement projects for this period include pressure zone improvements program, pipeline infrastructure renewals, pipeline system extensions and improvements, reservoir rehabilitation, dam seismic upgrades,

aqueduct relining and recoating, and distribution system corrosion protection, among others (East Bay Municipal Utility District, 2007a,b).

City of Martinez

The City of Martinez serves approximately 36,179 residents through 9,855 connections (Martinez, City of, 2009b). The City charges a $45.00 bi-monthly (or the equivalent of $22.50 monthly) service charge for a residential meter (Martinez, City of, 2009a). In addition, residential single-family customers pay a quantity use charge, which varies by location according to the City's water zones. Specifically;

- Zone 1: $3.17 per ccf regardless of the amount of water used,
- Zone 2: $3.35 per ccf regardless of the amount of water used,
- Zone 3: $3.49 per ccf regardless of the amount of water used, and
- Zone 4: $3.68 per ccf regardless of the amount of water used.

Representatives from the City indicated that customers are distributed among the different zones approximately as follows (Martinez, City of, 2009b):

- Zone 1: 40.0 percent of customers,
- Zone 2: 54.0 percent of customers,
- Zone 3: 4.0 percent of customers, and
- Zone 4: 2.0 percent of customers.

Based on this distribution of customers, a weighted average quantity charge is estimated at $3.29 per ccf. Thus the monthly cost for 15 ccf purchased from the City is $71.85 ($22.50 service charge and $49.35 quantity use charge). Based on the nominal cost of 15 ccf, Martinez is ranked seventh lowest out of eight in a lowest-cost to highest-cost ranking of purveyors.

The City's water fund received $10,311,018 in total revenues for the 2007-2008 fiscal year (Martinez, City of, 2008). Of this amount, water sales amounted to $9,523,618. Other revenues ($787,400) consisted of charges for services, other fees, rents and leases, interest income, and transfers in. Water sales thus represented 92.4 percent of total revenues.

The effective monthly cost for 15 ccf purchased from the City is $77.79. Based on the effective cost of 15 ccf, Martinez is ranked fourth lowest out of eight in a lowest-cost to highest-cost ranking of purveyors. Budgeted expenses for the City's water fund total $10,347,553 for the 2008-2009 period. Of this amount, 47.4 percent are for operating expenses including water treatment and distribution; 34.9 percent are for other operating expenses including administration and labor; and the remaining 17.7 percent are for capital expenses such as debt service, water main replacement, Saint Mary's Pump Station upgrade, and raw water line replacement (Martinez, City of, 2007).

Representatives for the City were unable to provide information about the amount budgeted exclusively for maintenance expenses.

City of Pittsburg

The City of Pittsburg serves approximately 62,500 people through 16,500 connections (Pittsburg, City of, 2009c). The City charges a $18.10 monthly service charge (Pittsburg, City of, 2009b). In addition, each residential customer must pay $2.49 per ccf for the first 14 ccf of water consumed, and any additional water consumed costs $4.20 per ccf regardless of the amount of water used. Thus the retail cost for 15 ccf purchased from the City is $57.16 ($18.10 service charge and $39.06 quantity use charge). Based on the nominal cost of 15 ccf, Pittsburg is ranked fifth lowest out of eight in a lowest-cost to highest-cost ranking of purveyors.

The City's water utility fund received $20,605,331 in total revenues in fiscal year 2007-2008 (Pittsburg, City of, 2008). Receipts from water sales amounted to $14,445,798 during this period. Other revenues ($6,159,533) consisted of meter fees, other fees, other operating revenues, capital contributions, investment earnings, and transfers in. Water sales thus represented 70.1 percent of total revenues.

The effective monthly cost for 15 ccf purchased from the City is $81.53. Based on the effective cost of 15 ccf, Pittsburg is ranked sixth lowest out of eight in a lowest-cost to highest-cost ranking of purveyors. For the 2008-2009 period, the District has budgeted $17,045,104 in expenses for its water fund. Operating expenses such as raw water supplies, recycled water supplies, chemical supplies, contractual and professional services, and utilities represent 42.5 percent; other operating expenses such as salaries, retirement benefits, insurance, administrative overhead, and taxes represent 28.8 percent; maintenance expenses including maintenance agreements, maintenance and repairs, and allocated costs for fleet and building maintenance represent 2.9 percent; and capital expenses including debt service and capital outlay represent 25.8 percent (Pittsburg, City of, 2009a).

Representatives for the City were unable to provide budgetary information for capital improvement projects.

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APPENDIX AFFORDABILITY-B (Affordability Data)

Affordability spreadsheets provided by GSWC to ORA on January 9, 2014. (11 pages total)

CARW BILL AFFORDABILIY

	Customer Service Area	Annual Average (CARW)						
7 CSAs	**Region 1**	Ccf	Svc Chg	Qty Chg	Surcharge/Surcredit	CARW Discount	Mo bill	Annual
	Arden Cordova	20	$7.90	$ 25.42	$2.64	($3.00)	$ 32.96	$396
	Bay Point	8	$19.90	$ 36.04	$11.82	($11.00)	$ 56.76	$681
	Clearlake	5	$45.35	$ 28.74	($18.00)	($17.00)	$ 39.09	$469
	Los osos	9	$20.40	$ 54.59	$8.66	($14.00)	$ 69.65	$836
	Ojai	17	$25.30	$ 66.18	$3.54	($11.00)	$ 84.02	$1,008
	Santa Maria	19	$14.65	$ 34.48	$3.15	($5.00)	$ 47.28	$567
	Simi Valley	12	$20.85	$ 38.93	$1.24	($9.00)	$ 52.01	$624
4 CSAs	**Region 2**							
	Central Basin East	11	$17.70	$ 40.82	$2.71	($9.00)	$ 52.23	$627
	Central Basin West	12	$17.70	$ 45.09	$2.97	($9.00)	$ 56.76	$681
	Culver City	10	$17.70	$ 37.11	$2.45	($9.00)	$ 48.26	$579
	Southwest*	11	$17.70	$ 40.82	$2.71	($9.00)	$ 52.23	$627
10 CSAs	**Region 3**							
	Los Alamitos	11	$16.15	$ 34.27	$5.09	($8.00)	$ 47.51	$570
	Placentia	16	$16.15	$ 51.24	$7.50	($8.00)	$ 66.89	$803
	Claremont	22	$16.15	$ 72.73	$10.38	($8.00)	$ 91.27	$1,095
	San Dimas	15	$16.15	$ 47.66	$7.02	($8.00)	$ 62.82	$754
	San Gabriel	12	$16.15	$ 37.38	$5.57	($8.00)	$ 51.10	$613
	Barstow	12	$16.15	$ 37.38	$5.57	($8.00)	$ 51.10	$613
	Calipatria	17	$16.15	$ 54.82	$7.98	($8.00)	$ 70.95	$851
	Apple Valley	10	$16.15	$ 31.15	$4.61	($8.00)	$ 43.91	$527
	Morongo Valley	11	$16.15	$ 34.27	$5.09	($8.00)	$ 47.51	$570
	Wrightwood	6	$16.15	$ 18.69	$2.69	($8.00)	$ 29.53	$354

- Data used - 2011 Residential
- Winter Average = average usage of the lowest 4 consecutive months (proxy for indoor usage)

CARW BILL AFFORDABILIY

Customer Service Area		Winter Average (CARW)					
Region 1	Ccf	Svc Chg	Qty Chg	Surcharge	CARW Discount	Mo bill	
Arden Cordova	9	$7.90	$ 11.44	($0.24)	($3.00)	$16.10	$193
Bay Point	7	$19.90	$ 30.13	$8.90	($11.00)	$47.92	$575
Clearlake	4	$45.35	$ 22.99	($18.00)	($17.00)	$33.34	$400
Los osos	7	$20.40	$ 39.97	$6.28	($14.00)	$52.64	$632
Ojai	10	$25.30	$ 37.60	($0.14)	($11.00)	$51.76	$621
Santa Maria	10	$14.65	$ 17.59	$1.21	($5.00)	$28.45	$341
Simi Valley	10	$20.85	$ 32.44	$0.63	($9.00)	$44.92	$539
Region 2							
Central Basin East	9	$17.70	$ 34.84	$2.44	($9.00)	$45.83	$550
Central Basin West	10	$17.70	$ 37.11	$2.60	($9.00)	$48.26	$579
Culver City	8	$17.70	$ 28.75	$2.01	($9.00)	$39.31	$472
Southwest*	9	$17.70	$ 33.83	$2.37	($9.00)	$44.75	$537
Region 3							
Los Alamitos	9	$16.15	$ 27.34	$4.02	($8.00)	$39.51	$474
Placentia	10	$16.15	$ 31.15	$4.61	($8.00)	$43.91	$527
Claremont	10	$16.15	$ 31.15	$4.61	($8.00)	$43.91	$527
San Dimas	10	$16.15	$ 31.15	$4.61	($8.00)	$43.91	$527
San Gabriel	10	$16.15	$ 31.15	$4.61	($8.00)	$43.91	$527
Barstow	8	$16.15	$ 25.60	$3.75	($8.00)	$37.50	$450
Calipatria	10	$16.15	$ 31.15	$4.61	($8.00)	$43.91	$527
Apple Valley	7	$16.15	$ 21.80	$3.17	($8.00)	$33.12	$397
Morongo Valley	8	$16.15	$ 24.09	$3.52	($8.00)	$35.76	$429
Wrightwood	5	$16.15	$ 15.44	$2.18	($8.00)	$25.78	$309

CARW BILL AFFORDABILIY

Customer Service Area	2.5% of	2.50%		1.5% of	1.50%	
Region 1	Median Income	Primary Screening	Secondary Screening	Median Income	Primary Screening	Secondary Screening
Arden Cordova	$1,256	No	No	$753.75	No	No
Bay Point	$1,255	No	No	$752.76	No	No
Clearlake	$626	No	No	$375.41	Yes	Yes
Los osos	$1,083	No	No	$649.77	No	Yes
Ojai	$1,405	No	No	$842.81	No	Yes
Santa Maria	$1,151	No	No	$690.63	No	No
Simi Valley	$2,217	No	No	$1,329.99	No	No
Region 2						
Central Basin East	$1,058	No	No	$634.73	No	No
Central Basin West	$1,335	No	No	$801.30	No	No
Culver City	$1,631	No	No	$978.87	No	No
Southwest*	$1,197	No	No	$718.00	No	No
Region 3						
Los Alamitos	$1,742	No	No	$1,044.90	No	No
Placentia	$1,978	No	No	$1,186.98	No	No
Claremont	$2,076	No	No	$1,245.71	No	No
San Dimas	$1,981	No	No	$1,188.53	No	No
San Gabriel	$1,316	No	No	$789.86	No	No
Barstow	$1,105	No	No	$662.81	No	No
Calipatria	$968	No	No	$581.02	No	Yes
Apple Valley	$1,273	No	No	$763.95	No	No
Morongo Valley	$1,145	No	No	$687.15	No	No
Wrightwood	$1,586	No	No	$951.39	No	No
		0	0		1	4

CARW BILL AFFORDABILIY

	AC	BY	CL	LO	Oj	SM	SV	R2	R3
Svc	$7.90	$19.90	$45.35	$20.40	$25.30	$14.65	$20.85	$17.70	$16.15
Tier 1	$ 1.271	$ 4.505	$ 5.748	$ 5.966	$ 3.760	$ 1.759	$ 3.244	$ 3.711	$ 3.115
Tier 2		$ 5.181		$ 6.861	$ 4.325	$ 2.023	$ 3.731	$ 4.268	$ 3.582
Tier 3		$ 5.958		$ 7.890	$ 4.973	$ 2.326	$ 4.291	$ 4.908	$ 4.119
Surcharges (excluce CAR\	$ 0.26	$ 2.23		$ 1.03	$ 0.53	$ 0.22	$ 0.30	$ 0.26	$ 0.48
Surcredit	$ (2.60)	$ (6.00)	$ (18.00)	$ (0.65)	$ (5.40)	$ (0.95)	$ (2.40)	$ (0.15)	$ (0.20)
CARW Discount	$ (3.00)	$ (11.00)	$ (17.00)	$ (14.00)	$ (11.00)	$ (5.00)	$ (9.00)	$ (9.00)	$ (8.00)

AVERAGE BILL AFFORDABILITY

Customer Service Area	Annual Average					
Region 1	Ccf	Svc Chg	Qty Chg	Surcharge/ Surcredit	Mo bill	Annual
Arden Cordova	20	$7.90	$25.42	$3.74	$ 37.06	$445
Bay Point	8	$19.90	$ 36.04	$12.26	$ 68.20	$818
Clearlake	5	$45.35	$ 28.74	($17.73)	$ 56.37	$676
Los osos	9	$20.40	$ 54.59	$9.15	$ 84.14	$1,010
Ojai	17	$25.30	$ 66.18	$4.48	$ 95.96	$1,151
Santa Maria	19	$14.65	$ 34.48	$4.20	$ 53.33	$640
Simi Valley	12	$20.85	$ 38.93	$1.90	$ 61.67	$740
Region 2						
Central Basin East	11	$17.70	$ 40.82	$4.43	$ 62.95	$755
Central Basin West	12	$17.70	$ 45.09	$4.84	$ 67.63	$812
Culver City	10	$17.70	$ 37.11	$4.01	$ 58.82	$706
Southwest*	11	$17.70	$ 40.82	$4.43	$ 62.95	$755
Region 3						
Los Alamitos	11	$16.15	$ 34.27	$5.99	$ 56.41	$677
Placentia	16	$16.15	$ 51.24	$8.81	$ 76.20	$914
Claremont	22	$16.15	$ 72.73	$12.19	$ 101.07	$1,213
San Dimas	15	$16.15	$ 47.66	$8.25	$ 72.05	$865
San Gabriel	12	$16.15	$ 37.38	$6.56	$ 60.09	$721
Barstow	12	$16.15	$ 37.38	$6.56	$ 60.09	$721
Calipatria	17	$16.15	$ 54.82	$9.37	$ 80.34	$964
Apple Valley	10	$16.15	$ 31.15	$5.43	$ 52.73	$633
Morongo Valley	11	$16.15	$ 34.27	$5.99	$ 56.41	$677
Wrightwood	6	$16.15	$ 18.69	$3.18	$ 38.02	$456

- Data used - 2011 Residential
- Winter Average = average usage of the lowest 4 consecutive months (proxy for indoor usage)

AVERAGE BILL AFFORDABILITY

Customer Service Area	Winter Average					
Region 1	Ccf	Svc Chg	Qty Chg	Surcharge/ Surcredit	Mo bill	Annual
Arden Cordova	9	$7.90	$11.44	$0.25	$19.59	$235
Bay Point	7	$19.90	$ 30.13	$9.27	$59.29	$712
Clearlake	4	$45.35	$ 22.99	($17.78)	$50.56	$607
Los osos	7	$20.40	$ 39.97	$6.65	$67.01	$804
Ojai	10	$25.30	$ 37.60	$0.41	$63.31	$760
Santa Maria	10	$14.65	$ 17.59	$1.76	$34.00	$408
Simi Valley	10	$20.85	$ 32.44	$1.18	$54.47	$654
Region 2						
Central Basin East	9	$17.70	$ 34.84	$3.76	$56.29	$676
Central Basin West	10	$17.70	$ 37.11	$4.01	$58.82	$706
Culver City	8	$17.70	$ 28.75	$3.07	$49.52	$594
Southwest*	9	$17.70	$ 33.83	$3.64	$55.17	$662
Region 3						
Los Alamitos	9	$16.15	$ 27.34	$4.74	$48.23	$579
Placentia	10	$16.15	$ 31.15	$5.43	$52.73	$633
Claremont	10	$16.15	$ 31.15	$5.43	$52.73	$633
San Dimas	10	$16.15	$ 31.15	$5.43	$52.73	$633
San Gabriel	10	$16.15	$ 31.15	$5.43	$52.73	$633
Barstow	8	$16.15	$ 25.60	$4.43	$46.18	$554
Calipatria	10	$16.15	$ 31.15	$5.43	$52.73	$633
Apple Valley	7	$16.15	$ 21.80	$3.74	$41.69	$500
Morongo Valley	8	$16.15	$ 24.09	$4.15	$44.40	$533
Wrightwood	5	$16.15	$ 15.44	$2.59	$34.19	$410

AVERAGE BILL AFFORDABILITY

Customer Service Area	2.5% of	2.50%		1.5% of	1.50%	
Region 1	Median Income	Primary Screening	Secondary Screening	Median Income	Primary Screening	Secondary Screening
Arden Cordova	$1,256	No	No	$753.75	No	No
Bay Point	$1,255	No	No	$752.76	No	Yes
Clearlake	$626	No	Yes	$375.41	Yes	Yes
Los osos	$1,083	No	No	$649.77	Yes	Yes
Ojai	$1,405	No	No	$842.81	No	Yes
Santa Maria	$1,151	No	No	$690.63	No	No
Simi Valley	$2,217	No	No	$1,329.99	No	No
Region 2						
Central Basin East	$1,058	No	No	$634.73	Yes	Yes
Central Basin West	$1,335	No	No	$801.30	No	Yes
Culver City	$1,631	No	No	$978.87	No	No
Southwest*	$1,197	No	No	$718.00	No	Yes
Region 3						
Los Alamitos	$1,742	No	No	$1,044.90	No	No
Placentia	$1,978	No	No	$1,186.98	No	No
Claremont	$2,076	No	No	$1,245.71	No	No
San Dimas	$1,981	No	No	$1,188.53	No	No
San Gabriel	$1,316	No	No	$789.86	No	No
Barstow	$1,105	No	No	$662.81	No	Yes
Calipatria	$968	No	No	$581.02	Yes	Yes
Apple Valley	$1,273	No	No	$763.95	No	No
Morongo Valley	$1,145	No	No	$687.15	No	No
Wrightwood	$1,586	No	No	$951.39	No	No
		0	1		4	9

**Bay Point and Calipatria Median income is based on Zip Codes

AVERAGE BILL AFFORDABILITY

	AC	BY	CL	LO	Oj	SM	SV	R2	R3
Svc	$7.90	$19.90	$45.35	$20.40	$25.30	$14.65	$20.85	$17.70	$16.15
Tier 1	$ 1.271	$ 4.505	$ 5.748	$ 5.966	$ 3.760	$ 1.759	$ 3.244	$ 3.711	$ 3.115
Tier 2		$ 5.181		$ 6.861	$ 4.325	$ 2.023	$ 3.731	$ 4.268	$ 3.582
Tier 3		$ 5.958		$ 7.890	$ 4.973	$ 2.326	$ 4.291	$ 4.908	$ 4.119
Surcharges	$ 0.32	$ 2.28	$ 0.06	$ 1.09	$ 0.58	$ 0.27	$ 0.36	$ 0.42	$ 0.56
Surcredit	($2.60)	($6.00)	($18.00)	($0.65)	($5.40)	($0.95)	($2.40)	($0.15)	($0.20)

GSWC RATEMAKING AREA AFFORDABILITY STATS

GOLDEN STATE WATER COMPANY

Customer Service Area	No. of Customer (12-month ended Sept 2012)	Revenue (Adopted)	Ratebase (Recorded as of Aug 2012)	Median Income*	Avg. Residential Water Use (Ccf/Yr)	Description of 1st tier rate design	Rate Base Per Customer
Region 1							
Arden Cordova	16,212	$11,379,725	$16,939,100	$50,250	237.3	Single Quantity Rate	1,045
Bay Point	4,938	$5,770,447	$9,844,300	$56,638	102.2	3-tier increasing block rate structure base on seasonal averages with 15% rate differential; 1st tier is 0 to average winter usage(4 consecutive low-use months); proxy for indoor water use; **Tier 1: 0 - 8 Ccf**	1,993
Clearlake	2,143	$2,090,782	$4,992,700	$25,027	67.2	Single Quantity Rate	2,330
Los osos	3,268	$3,740,720	$8,298,700	$43,318	107.8	3-tier increasing block rate structure base on seasonal averages with 15% rate differential; 1st tier is 0 to average winter usage(4 consecutive low-use months); proxy for indoor water use; **Tier 1: 0 - 8 Ccf**	2,540
Ojai	2,888	$5,405,651	$14,713,300	$56,187	230.7	Historical tier structure (0-5 Ccf); In 2013, Ojai residential customer will have a similar tier rate design as the rest of the Region 1; with 1st tier set at 0 to average winger usage; **Tier 1: 0 - 13 Ccf**	5,094
Santa Maria	13,396	$10,226,573	$25,362,400	$46,042	234.6	3-tier increasing block rate structure base on seasonal averages with 15% rate differential; 1st tier is 0 to average winter usage(4 consecutive low-use months); proxy for indoor water use; **Tier 1: 0 - 15 Ccf**	1,893
Simi Valley	13,287	$12,417,609	$8,768,800	$88,666	167.7	3-tier increasing block rate structure base on seasonal averages with 15% rate differential; 1st tier is 0 to average winter usage(4 consecutive low-use months); proxy for indoor water use; **Tier 1: 0 - 13 Ccf**	660

GSWC RATEMAKING AREA AFFORDABILITY STATS

GOLDEN STATE WATER COMPANY

Customer Service Area	No. of Customer (12-month ended Sept 2012)	Revenue (Adopted)	Ratebase (Recorded as of Aug 2012)	Median Income*	Avg. Residential Water Use (Ccf/Yr)	Description of 1st tier rate design	Rate Base Per Customer
Region 1							
Customer Service Area	No. of Customer (12-month ended Sept 2012)	Revenue (Adopted)	Ratebase (Recorded as of Aug 2012)	Median Income*	Avg. Residential Water Use (Ccf/Yr)	Description of 1st tier rate design	Rate Base Per Customer
Region 2		$127,461,403	$275,913,600				
Central Basin East	19,956		$116,706,385	$42,315	132.9	3-tier increasing block rate structure base on seasonal averages with 15% rate differential; 1st tier is 0 to average winter usage(4 consecutive low-use months); proxy for indoor water use; Tier 1: 0 - 11 Ccf	5,848
Central Basin West	20,015		$81,677,367	$53,420	145.5		4,081
Culver City	9,567		$40,783,415	$65,258	118.1		4,263
Southwest*	51,301		$36,746,417	$47,867	126.2		716
Region 3		$124,063,966	$230,746,700				
Los Alamitos	27,240		$20,406,055	$69,660	131.9	3-tier increasing block rate structure base on seasonal averages with 15% rate differential; 1st tier is 0 to average winter usage(4 consecutive low-use months); proxy for indoor water use; **Tier 1: 0 - 13 Ccf**	749
Placentia	15,461		$41,098,550	$79,132	201.4		2,658
Claremont	11,044		$32,762,483	$83,047	264.8		2,966
San Dimas	15,966		$32,882,226	$79,235	194.6		2,060
San Gabriel	12,328		$25,884,771	$52,657	148.6		2,100
Barstow	8,822		$28,349,244	$44,187	141.3		3,213
Calipatria	1,155		$17,108,871	$39,012	183.3		14,816
Apple Valley	2,888		$14,367,522	$50,930	136.5		4,976
Morongo Valley	953		$5,619,961	$45,810	124.7	Single Quantity Rate (Frozen); will become unfrozen in 2013 and join the Region 3 tier rate structure	5,895
Wrightwood	2,703		$12,266,976	$63,426	80.3	Single Quantity Rate (Frozen); will become unfrozen in 2013 and join the Region 3 tier rate structure	4,538

*http://www.areavibes.com

- Los Osos - Morro Bay
- Central Basin (West)
  - -Bell Garden ($38,222)
  - - South Gate ($44,976)
  - - Bell Flower ($49,596)
  - - Hungtingon Park ($36,466)
- Centra Basin (East)
  - - Norwalk ($58,019)
  - - Artesia ($56,070)
  - - Hawaiian Garden ($43,470)
  - - Santa Fe Springs (56,120)
- Southwest
  - - Gardena ($49,125)
  - - Lawndale ($49,155)
  - - Los Angeles ($46,226)
  - - Santa Fe Springs ($46,960)

HIGH COST CALCULATION

GOLDEN STATE WATER COMPANY (2013 Proposed)

Customer Service Area	Total Sales (ccf)	Revenue	$/Ccf	Ratebase	Customer	RB/Cust/Yr
Region 1						
Arden Cordova	6,420,629	$11,729,525	$1.83	$15,966,222	16,421	$972
Bay Point	880,837	$5,878,455	$6.67	$10,816,808	4,819	$2,245
Clearlake	154,281	$2,098,792	$13.60	$4,997,988	2,173	$2,300
Los osos	395,126	$4,240,067	$10.73	$11,337,374	3,270	$3,467
Ojai	969,635	$5,525,695	$5.70	$17,143,013	2,922	$5,868
Santa Maria	3,765,011	$10,218,673	$2.71	$24,487,842	13,513	$1,812
Simi Valley	3,027,715	$14,618,604	$4.83	$11,018,785	13,277	$830
Region 2	24,799,387	$134,241,149	$5.41	$312,123,950	101,008	$3,090
Region 3	27,095,236	$124,925,439	$4.61	$281,381,833	99,275	$2,834

RANKING Per MEDIAN

Customer Service Area	Total Sales (ccf)	Revenue	$/Ccf	% of Median	Ratebase	Customer	RB/Cust/Yr
Arden Cordova	6,420,629	$11,729,525	$1.83	**34%**	$15,966,222	16,421	$972
Santa Maria	3,765,011	$10,218,673	$2.71	**50%**	$24,487,842	13,513	$1,812
Region 3	27,095,236	$124,925,439	$4.61	**85%**	$281,381,833	99,275	$2,834
Simi Valley	3,027,715	$14,618,604	$4.83	**89%**	$11,018,785	13,277	$830
Region 2	**24,799,387**	**$134,241,149**	**$5.41**	**100%**	**$312,123,950**	**101,008**	**$3,090**
Ojai	969,635	$5,525,695	$5.70	**105%**	$17,143,013	2,922	$5,868
Bay Point	880,837	$5,878,455	$6.67	**123%**	$10,816,808	4,819	$2,245
Los osos	395,126	$4,240,067	$10.73	**198%**	$11,337,374	3,270	$3,467
Clearlake	154,281	$2,098,792	$13.60	**251%**	$4,997,988	2,173	$2,300

APPENDIX SR#7-A (Special Facilities)

GSWC – proposed and ORA – revised Rule 15 tariff sheets regarding special facilities fees in Santa Maria. (4 pages total)

GSWC PROPOSED

Rule No. 15

MAIN EXTENSIONS
(Continued)

C. Extensions to Serve Subdivisions, Tracts, Housing Projects, Industrial Developments, Commercial Buildings, or Shopping Centers

1. c. In lieu of providing the advances in accordance with Sections C.1.a. and C.1.b., the applicant for the main extension shall be permitted, if qualified in the judgment of the utility, to construct and install the facilities himself, or arrange for their installation pursuant to competitive bidding procedures initiated by him and limited to the qualified bidders. The cost, including the cost of inspection and supervision by the utility, shall be paid directly by applicant. The applicant shall provide the utility with a statement of actual construction cost in reasonable detail. The amount to be treated as an advance subject to refund shall be the lesser of (1) the actual cost or (2) the price quoted in the utility's detailed cost estimate. The installation shall be in accordance with the plans and specifications submitted by the utility pursuant to Section A.5.b.

d. If, in the opinion of the utility, it appears that proposed main extension will not, within a reasonable period, develop sufficient revenue to make the extension self-supporting, or if for some other reason it appears to the utility that a main extension contract would place an excessive burden on customers, the utility may require non-refundable contributions of plant facilities from developers in lieu of a main extension contract.

If an applicant for a main extension contract who is asked to contribute the facilities believes such a request to be unreasonable, such applicant may refer the matter to the Commission for determination, as provided for in Section A.8. of this rule.

e. A special facilities fee for water supply will be included in the advance in lieu of any domestic water supply requirement covered under Section C1.b. in some areas. The districts and fees applicable are shown below. This fee is per service and is applicable to all subdivisions requiring a main extension except those extensions serving four or fewer residential lots or equivalent single-family dwelling units.

	$ Santa Maria	ratio
5/8 x 3/4	1,300.00	1.00
3/4	1,950.00	1.50
1	4,875.00	2.50
1-1/2	9,750.00	5.00
2	15,600.00	8.00
3	29,250.00	15.00
4	48,750.00	25.00
6	97,500.00	50.00
8	156,000.00	80.00
10	224,250.00	115.00
Sprinkler 1" to 5/8"	1,989.00	1.02
Sprinkler 1" to 3/4"	2,925.00	1.50
Sprinkler 1 1/2" to 3/4"	3,100.50	1.59
Sprinkler 2 " to 3/4"	3,159.00	1.62
Sprinkler 1 1/2 " to 1"	5,021.25	2.58
Sprinkler 2" to 1"	5,118.75	2.63

GSWC PROPOSED

Sprinkler 3" to 5/8"	3,863.41	1.98
Sprinkler 3" to 3/4"	4,825.96	2.47
Sprinkler 3" to 1"	6,759.68	3.47
Sprinkler 3" to 1 1/2"	11,444.10	5.87
Sprinkler 3" to 2"	17,213.66	8.83
Sprinkler 4" to 5/8"	4,431.78	2.27
Sprinkler 4" to 3/4"	5,393.85	2.77
Sprinkler 4" to 1"	7,327.57	3.76
Sprinkler 4" to 1 1/2"	12,012.47	6.16
Sprinkler 4" to 2"	17,782.03	9.12
Sprinkler 4" to 3"	29,817.89	15.29
Sprinkler 6" to 5/8"	5,772.98	2.96
Sprinkler 6" to 3/4"	6,735.53	3.45
Sprinkler 6" to 1"	8,669.25	4.45
Sprinkler 6" to 1 1/2"	13,354.15	6.85
Sprinkler 6" to 2"	19,123.71	9.81
Sprinkler 6" to 3"	31,159.57	15.98
Sprinkler 6" to 4"	50,091.68	25.69
Sprinkler 8" to 5/8"	6,505.59	3.34
Sprinkler 8" to 3/4"	7,468.14	3.83
Sprinkler 8" to 1"	9,401.86	4.82
Sprinkler 8" to 1 1/2"	14,086.76	7.22
Sprinkler 8" to 2"	19,856.32	10.18
Sprinkler 8" to 3"	31,892.18	16.35
Sprinkler 8" to 4"	50,824.29	26.06
Sprinkler 8" to 6"	98,232.61	50.38
Sprinkler 10" to 5/8"	9,863.62	5.06
Sprinkler 10" to 3/4"	10,825.70	5.55
Sprinkler 10" to 1"	12,759.90	6.54
Sprinkler 10" to 1 1/2"	17,444.32	8.95
Sprinkler 10" to 2"	23,213.88	11.90
Sprinkler 10" to 3"	35,250.22	18.08
Sprinkler 10" to 4"	54,181.85	27.79
Sprinkler 10" to 6"	101,590.17	52.10
Sprinkler 10" to 8"	159,357.56	81.72

ORA REVISED

Rule No. 15

MAIN EXTENSIONS
(Continued)

C. Extensions to Serve Subdivisions, Tracts, Housing Projects, Industrial Developments, Commercial Buildings, or Shopping Centers

1. c. In lieu of providing the advances in accordance with Sections C.1.a. and C.1.b., the applicant for the main extension shall be permitted, if qualified in the judgment of the utility, to construct and install the facilities himself, or arrange for their installation pursuant to competitive bidding procedures initiated by him and limited to the qualified bidders. The cost, including the cost of inspection and supervision by the utility, shall be paid directly by applicant. The applicant shall provide the utility with a statement of actual construction cost in reasonable detail. The amount to be treated as an advance subject to refund shall be the lesser of (1) the actual cost or (2) the price quoted in the utility's detailed cost estimate. The installation shall be in accordance with the plans and specifications submitted by the utility pursuant to Section A.5.b.

d. If, in the opinion of the utility, it appears that proposed main extension will not, within a reasonable period, develop sufficient revenue to make the extension self-supporting, or if for some other reason it appears to the utility that a main extension contract would place an excessive burden on customers, the utility may require non-refundable contributions of plant facilities from developers in lieu of a main extension contract.

If an applicant for a main extension contract who is asked to contribute the facilities believes such a request to be unreasonable, such applicant may refer the matter to the Commission for determination, as provided for in Section A.8. of this rule.

e. A special facilities fee for water supply will be included in the advance in lieu of any domestic water supply requirement covered under Section C1.b. in some areas. The districts and fees applicable are shown below. This fee is per service and is applicable to all subdivisions requiring a main extension except those extensions serving four or fewer residential lots or equivalent single-family dwelling units.

	$	ratio
	Santa Maria	
5/8 x 3/4	3,350.00	1.00
3/4	5,025.00	1.50
1	8,375.00	2.50
1-1/2	16,750.00	5.00
2	26,800.00	8.00
3	50,250.00	15.00
4	83,750.00	25.00
6	167,500.00	50.00
8	268,000.00	80.00
10	385,250.00	115.00
Sprinkler 1" to 5/8"	3,417.00	1.02
Sprinkler 1" to 3/4"	5,025.00	1.50
Sprinkler 1 1/2" to 3/4"	5,326.50	1.59
Sprinkler 2 " to 3/4"	5,427.00	1.62
Sprinkler 1 1/2 " to 1"	8,626.25	2.58

ORA REVISED

Sprinkler 2" to 1"	8,793.75	2.63
Sprinkler 3" to 5/8"	6,637.13	1.98
Sprinkler 3" to 3/4"	8,290.74	2.47
Sprinkler 3" to 1"	11,612.78	3.47
Sprinkler 3" to 1 1/2"	19,660.38	5.87
Sprinkler 3" to 2"	29,572.18	8.83
Sprinkler 4" to 5/8"	7,613.56	2.27
Sprinkler 4" to 3/4"	9,266.35	2.77
Sprinkler 4" to 1"	12,588.39	3.76
Sprinkler 4" to 1 1/2"	20,636.81	6.16
Sprinkler 4" to 2"	30,548.61	9.12
Sprinkler 4" to 3"	51,225.61	15.29
Sprinkler 6" to 5/8"	9,917.68	2.96
Sprinkler 6" to 3/4"	11,571.29	3.45
Sprinkler 6" to 1"	14,893.33	4.45
Sprinkler 6" to 1 1/2"	22,941.75	6.85
Sprinkler 6" to 2"	32,853.55	9.81
Sprinkler 6" to 3"	53,530.55	15.98
Sprinkler 6" to 4"	86,054.94	25.69
Sprinkler 8" to 5/8"	11,176.27	3.34
Sprinkler 8" to 3/4"	12,829.88	3.83
Sprinkler 8" to 1"	16,151.91	4.82
Sprinkler 8" to 1 1/2"	24,200.34	7.22
Sprinkler 8" to 2"	34,112.14	10.18
Sprinkler 8" to 3"	54,789.14	16.35
Sprinkler 8" to 4"	87,313.53	26.06
Sprinkler 8" to 6"	168,758.59	50.38
Sprinkler 10" to 5/8"	16,945.20	5.06
Sprinkler 10" to 3/4"	18,597.99	5.55
Sprinkler 10" to 1"	21,920.85	6.54
Sprinkler 10" to 1 1/2"	29,968.45	8.95
Sprinkler 10" to 2"	39,880.25	11.90
Sprinkler 10" to 3"	60,558.07	18.08
Sprinkler 10" to 4"	93,081.64	27.79
Sprinkler 10" to 6"	174,526.70	52.10
Sprinkler 10" to 8"	273,768.11	81.72

APPENDIX SR#7-B (Connection Fees)

GSWC – proposed and ORA – revised Rule 15 tariff sheets regarding connection fees in Bay Point and Clearlake. (6 pages total)

Rule No. 15

MAIN EXTENSIONS
(Continued)

A. General Provisions and Definitions

6. e. Any difference between the adjusted construction costs and the amount advanced shall be shown as a revision of the amount of advance and shall be payable within thirty days of date of submission of statement.

7. Assignment of Main Extension Contracts

Any contract entered into under Sections B and C of this rule, or under similar provisions of former rules, may be assigned, after settlement of adjusted construction costs, after written notice to the utility by the holder of said contract as shown by the utility's records. Such assignment shall apply only to those refunds which become due more than thirty days after the date of receipt by the utility of the notice of assignment. The utility shall not be required to make any one refund payment under such contract to more than a single assignee.

8. Interpretation and Deviations

In case of disagreement or dispute regarding the application of any provision of this rule, or in circumstances where the application of this rule appears unreasonable to either party, the utility, applicant or applicants may refer the matter to the Commission for determination.

B. Extensions to Serve Individuals

1. Payment

Extensions of water mains to serve new individual customers shall be paid for and contributed to the utility by the individual customer requesting the main extension. Calculation of payment shall be on the basis of a main not in excess of 6" in diameter, except where a larger main is required by the special needs of the new customer. The utility shall be responsible for installing and paying for service pipes, meter boxes and meters to serve the new individual customer; provided, however, for those areas noted below and for a Class C or Class D utility, or a Class A or Class B utility district or subsidiary serving 2000 or fewer connections, may accept from individual customers amounts in contribution as a connection fee calculated pursuant to the Commission's Connection Fee Data Form contained in the utility's tariffs. (N)

(Continued)

SOUTHERN CALIFORNIA WATER COMPANY
630 E. FOOTHILL BLVD. - P. O. BOX 9016
SAN DIMAS, CALIFORNIA 91773-9016

Revised Cal. P.U.C. Sheet No. ~~3442~~-W
Canceling Revised Cal. P.U.C. Sheet No. ~~2461~~-W

B. Extensions to Serve Individuals
1. Payment (cont.)
Individual Connection Fees will be collected as Contributions in some areas. The districts and fees applicable are shown below.

Connection Fees			
	$	$	ratio
	Clearlake	Bay Point	
5/8 x 3/4	**2,500.00**	$2,050.00	1.00
3/4	3,750.00	3,075.00	1.50
1	9,375.00	7,687.50	2.50
1-1/2	18,750.00	15,375.00	5.00
2	30,000.00	24,600.00	8.00
3	56,250.00	46,125.00	15.00
4	93,750.00	76,875.00	25.00
6	187,500.00	153,750.00	50.00
8	300,000.00	246,000.00	80.00
Sprinkler 1" to 5/8"	3,825.00	3,136.50	1.02
Sprinkler 1" to 3/4"	5,625.00	4,612.50	1.50
Sprinkler 1 1/2" to 3/4"	5,962.50	4,889.25	1.59
Sprinkler 2 " to 3/4"	6,075.00	4,981.50	1.62
Sprinkler 1 1/2 " to 1"	9,656.25	7,918.13	2.58
Sprinkler 2" to 1"	9,843.75	8,071.88	2.63
Sprinkler 3" to 5/8"	7,429.63	6,092.29	1.98
Sprinkler 3" to 3/4"	9,280.68	7,610.16	2.47
Sprinkler 3" to 1"	12,999.38	10,659.49	3.47
Sprinkler 3" to 1 1/2"	22,007.89	18,046.47	5.87
Sprinkler 3" to 2"	33,103.19	27,144.61	8.83
Sprinkler 4" to 5/8"	8,522.65	6,988.57	2.27
Sprinkler 4" to 3/4"	10,372.78	8,505.68	2.77
Sprinkler 4" to 1"	14,091.48	11,555.01	3.76
Sprinkler 4" to 1 1/2"	23,100.91	18,942.74	6.16
Sprinkler 4" to 2"	34,196.21	28,040.89	9.12
Sprinkler 4" to 3"	57,342.10	47,020.52	15.29
Sprinkler 6" to 5/8"	11,101.88	9,103.54	2.96
Sprinkler 6" to 3/4"	12,952.94	10,621.41	3.45
Sprinkler 6" to 1"	16,671.63	13,670.74	4.45
Sprinkler 6" to 1 1/2"	25,681.07	21,058.47	6.85
Sprinkler 6" to 2"	36,776.37	30,156.62	9.81
Sprinkler 6" to 3"	59,922.26	49,136.25	15.98

ISSUED BY
F. E. WICKS
President

Date Filed October 7, 1991
Advice Letter No. 846-W
Effective Date November 15, 1991
Decision No. _____
Resolution No._____

SOUTHERN CALIFORNIA WATER COMPANY
630 E. FOOTHILL BLVD. - P. O. BOX 9016
SAN DIMAS, CALIFORNIA 91773-9016

Revised Cal. P.U.C. Sheet No. ~~3442~~-W

Canceling Revised Cal. P.U.C. Sheet No. ~~2461~~-W

Sprinkler 6" to 4"	96,330.16	78,990.73	25.69
Sprinkler 8" to 5/8"	12,510.75	10,258.81	3.34
Sprinkler 8" to 3/4"	14,361.81	11,776.68	3.83
Sprinkler 8" to 1"	18,080.50	14,826.01	4.82
Sprinkler 8" to 1 1/2"	27,089.93	22,213.74	7.22
Sprinkler 8" to 2"	38,185.23	31,311.89	10.18
Sprinkler 8" to 3"	61,331.12	50,291.52	16.35
Sprinkler 8" to 4"	97,739.02	80,146.00	26.06
Sprinkler 8" to 6"	188,908.87	154,905.27	50.38

ISSUED BY

F. E. WICKS

President

Date Filed October 7, 1991

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Effective Date November 15, 1991

Decision No. _____

Resolution No._____

Rule No. 15

MAIN EXTENSIONS
(Continued)

A. General Provisions and Definitions

6. e. Any difference between the adjusted construction costs and the amount advanced shall be shown as a revision of the amount of advance and shall be payable within thirty days of date of submission of statement.

7. Assignment of Main Extension Contracts

Any contract entered into under Sections B and C of this rule, or under similar provisions of former rules, may be assigned, after settlement of adjusted construction costs, after written notice to the utility by the holder of said contract as shown by the utility's records. Such assignment shall apply only to those refunds which become due more than thirty days after the date of receipt by the utility of the notice of assignment. The utility shall not be required to make any one refund payment under such contract to more than a single assignee.

8. Interpretation and Deviations

In case of disagreement or dispute regarding the application of any provision of this rule, or in circumstances where the application of this rule appears unreasonable to either party, the utility, applicant or applicants may refer the matter to the Commission for determination.

B. Extensions to Serve Individuals

1. Payment

Extensions of water mains to serve new individual customers shall be paid for and contributed to the utility by the individual customer requesting the main extension. Calculation of payment shall be on the basis of a main not in excess of 6" in diameter, except where a larger main is required by the special needs of the new customer. The utility shall be responsible for installing and paying for service pipes, meter boxes and meters to serve the new individual customer; provided, however, for those areas noted below and for a Class C or Class D utility, or a Class A or Class B utility district or subsidiary serving 2000 or fewer connections, may accept from individual customers amounts in contribution as a connection fee calculated pursuant to the Commission's Connection Fee Data Form contained in the utility's tariffs. (N)

(Continued)

ORA REVISED

B. Extensions to Serve Individuals
1. Payment (cont.)
Individual Connection Fees will be collected as Contributions in some areas. The districts and fees applicable are shown below.

Connection Fees			
	$	$	ratio
	Clearlake	Bay Point	
5/8 x 3/4	3,750.00	3,075.00	1.00
3/4	6,250.00	5,125.00	1.50
1	12,500.00	10,250.00	2.50
1-1/2	20,000.00	16,400.00	5.00
2	37,500.00	30,750.00	8.00
3	62,500.00	51,250.00	15.00
4	125,000.00	102,500.00	25.00
6	200,000.00	164,000.00	50.00
8	3,750.00	3,075.00	80.00
Sprinkler 1" to 5/8"	2,550.00	2,091.00	1.02
Sprinkler 1" to 3/4"	3,750.00	3,075.00	1.50
Sprinkler 1 1/2" to 3/4"	3,975.00	3,259.50	1.59
Sprinkler 2 " to 3/4"	4,050.00	3,321.00	1.62
Sprinkler 1 1/2 " to 1"	6,437.50	5,278.75	2.58
Sprinkler 2" to 1"	6,562.50	5,381.25	2.63
Sprinkler 3" to 5/8"	4,953.08	4,061.53	1.98
Sprinkler 3" to 3/4"	6,187.12	5,073.44	2.47
Sprinkler 3" to 1"	8,666.25	7,106.33	3.47
Sprinkler 3" to 1 1/2"	14,671.92	12,030.98	5.87
Sprinkler 3" to 2"	22,068.79	18,096.41	8.83
Sprinkler 4" to 5/8"	5,681.76	4,659.05	2.27
Sprinkler 4" to 3/4"	6,915.19	5,670.46	2.77
Sprinkler 4" to 1"	9,394.32	7,703.34	3.76
Sprinkler 4" to 1 1/2"	15,400.61	12,628.50	6.16
Sprinkler 4" to 2"	22,797.47	18,693.93	9.12
Sprinkler 4" to 3"	38,228.07	31,347.02	15.29
Sprinkler 6" to 5/8"	7,401.26	6,069.03	2.96
Sprinkler 6" to 3/4"	8,635.29	7,080.94	3.45
Sprinkler 6" to 1"	11,114.42	9,113.83	4.45
Sprinkler 6" to 1 1/2"	17,120.71	14,038.98	6.85
Sprinkler 6" to 2"	24,517.58	20,104.41	9.81
Sprinkler 6" to 3"	39,948.17	32,757.50	15.98

ORA REVISED

SOUTHERN CALIFORNIA WATER COMPANY
630 E. FOOTHILL BLVD. - P. O. BOX 9016
SAN DIMAS, CALIFORNIA 91773-9016

Revised Cal. P.U.C. Sheet No. ~~3442~~-W

Canceling Revised Cal. P.U.C. Sheet No. ~~2461~~-W

Sprinkler 6" to 4"	64,220.11	52,660.49	25.69
Sprinkler 8" to 5/8"	8,340.50	6,839.21	3.34
Sprinkler 8" to 3/4"	9,574.54	7,851.12	3.83
Sprinkler 8" to 1"	12,053.67	9,884.01	4.82
Sprinkler 8" to 1 1/2"	18,059.95	14,809.16	7.22
Sprinkler 8" to 2"	25,456.82	20,874.59	10.18
Sprinkler 8" to 3"	40,887.42	33,527.68	16.35
Sprinkler 8" to 4"	65,159.35	53,430.67	26.06
Sprinkler 8" to 6"	125,939.24	103,270.18	50.38

ISSUED BY

F. E. WICKS

President

Date Filed October 7, 1991

Advice Letter No. 846-W

Effective Date November 15, 1991

Decision No. _____

Resolution No._____

APPENDIX CONSERVATION-A (Enhanced Annual Report Schedule E3 Reporting Requirement)

Enhanced Annual Report Schedule E3 Reporting Requirement											
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**
Name of Measure, as listed in Decision or Settlement*	Description of measure	*Class (Single family, Multi Family, CII, etc.*	Authorized $	# of units / activities purchased and provided	*# of units purchased but not provided*	$ per unit, activity, etc.	Total $ spent	Designated water savings per unit per year**	Unit lifespan **	Estimated Annual measure savings** (AFY)	Estimated Lifetime measure savings** (AF)
							(E+F) x G			E x I	J x K
Measure A											
Measure B											
Credit from third party / co-funding partner											
**If not specifically listed, state the category in which the activity falls and rationale for including this particular activity*											
***This may not apply to all measures, e.g., public information / education*											
Enhancements to the table adopted in D.11-05-004, Attachment 1 are shown in italics.											