Agricultural Water Management Plan

Prepared Pursuant to Water Code Section 10826

Camrosa Water District
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7385 Santa Rosa Road
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Adopted March 10, 2016

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Camrosa Agricultural Water Management Plan
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Section I: Introduction

A. Description of Previous Water Management Activities

Camrosa Water District, a special district formed under Division 13 of the California Water Code, has been providing water service to eastern Camarillo and the Santa Rosa Valley since 1962. Approximately 40 percent of the 14,000–18,000 acre feet Camrosa delivers every year goes to agricultural customers on approximately 3,400 irrigated acres, the rest being delivered to municipal and industrial customers. As such, Camrosa participates in many state-required management activities, including most recently, but not limited to: a 2010 Urban Water Management Plan (Appendix B), which meets the requirements of SBx7-7, adopted June 8, 2011; and a voluntary AB 3030 Santa Rosa Valley Groundwater Management Plan (Appendix C), adopted October 9, 2013. All those documents engage and describe Camrosa's production and delivery of agricultural water. Camrosa also participates in the California Statewide Groundwater Monitoring Program, and as a groundwater sustainability agency (GSA) will be developing a groundwater sustainability plan (GSP) for the Santa Rosa Basin per the 2014 Sustainable Groundwater Management Act (SGMA).

This 2015 AWMP is being prepared as part of Camrosa's water conservation activities associated with State Water Resources Control Board (SWRCB) Resolution 2015-0032, "To Adopt an Emergency Regulation for Statewide Urban Water Conservation" (Appendix D), implementing Governor Brown's April 1, 2015, Executive Order B-29-15 (Appendix E), requiring a statewide 25-percent reduction in urban potable water production. While E.O. B-29-15 stipulated that only areas with more than 10,000 acres of irrigated lands are required to complete an AWMP, excluding agricultural water from the SWRCB's urban-water-conservation-target calculations requires the completion of an AWMP as part of the Agricultural Water Use Exclusion requirements (Appendix F).

B. Coordination Activities

1. Notification of AWMP Preparation: The place and time of the public hearing after which the Camrosa 2015 AWMP was noticed in the *Ventura County Star* on January 27th and February 11th pursuant to California Government Code §6066. A copy of the notices is below:

NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN that a Public Hearing with the Camrosa Water District Board of Directors will be held:

--Thursday, March 10, 2016 at 5:00pm--
CAMROSA WATER DISTRICT
7385 Santa Rosa Rd., Camarillo, CA 93012
(805) 482-4677

The purpose of this public hearing is to consider the adoption of an Agricultural Water Management Plan. The plan is available for public review at the District office and on our website at www.camrosa.com.

Tony Stafford, General Manager
Publish: Feb. 25, March 6, 2016 Ad No.958160

2. Public Participation: The City of Camarillo and the County of Ventura were each notified, via a Notice of Preparation issued December 16, 2015, that Camrosa was preparing a 2015 AWMP. The draft AWMP was sent to those two entities, and made available to the public on January 27, 2016, at the Camrosa Water District headquarters at 7385 Santa Rosa Road, Camarillo, CA 93012, and the Camarillo Public Library, 4101 E. Las Posas Road, Camarillo, CA 93010. Comments were solicited during the review period.

C. AWMP Adoption and Submittal

1. AWMP Adoption: The 2015 AWMP was adopted, as prepared, on March 10, 2016, after a public hearing pursuant to California Water Code §10841. A copy of the adoption resolution is attached as Appendix G.
2. AWMP Submittal: The Camrosa 2015 AWMP was submitted to the Department of Water Resources electronically on March 25, 2016, and a hard copy was postmarked the same day. Hard copies were mailed to the City of Camarillo, the County of Ventura, the Fox Canyon Groundwater Management Agency, the Camarillo Public Library, the California State Library, and Calleguas Municipal Water District postmarked March 25, 2016.
3. AWMP Availability: The Camrosa 2015 AWMP is available at the Camrosa headquarters, 7385 Santa Rosa Road, Camarillo, CA 93012; at the district's website www.camrosa.com; and the Camarillo Public Library, 4101 E. Las Posas Rd., Camarillo, CA 93010.

Worksheet 1. Summary of Coordination, Adoption, and Submittal Activities

Interested Parties	Notified of AWMP Preparation	Notified of Public Meetings	Copy of Adopted AWMP Sent
City of Camarillo	12/16/16		03/28/2016
Ventura County	12/16/16		03/28/2016
Fox Canyon GMA			03/28/2016
Calleguas Municipal Water District			03/28/2016
City of Camarillo Public Library		02/25/16, 03/06/16	03/28/2016
DWR			03/25/2016
Ventura County *Star*		02/25/16, 03/06/16	03/28/2016
CA State Library			03/25/2016
LAFCO			03/25/2016
Website			03/25/2016

D. AWMP Implementation Schedule

As the 2015 AWMP describes the agricultural aspects of the ongoing operations of an urban water supplier, the plan will be effective and implemented immediately. Efficient Water Management Practices will be implemented as described in Sections VII ad VIII of the AWMP.

Section II: Description of the Agricultural Water Supplier and Service Area

A. Physical Characteristics

1. The Camrosa Water District is approximately 31 square miles, or 20,000 acres; irrigated agricultural lands comprise approximately 3,400 acres.

Worksheet 2: Water Supplier History and Size	
Date of formation:	July 24, 1962
Source of Water	
Local Surface Water	Conejo Creek; see Worksheet 40
Local Groundwater	10 wells; see Worksheet 41
Wholesaler	Calleguas Municipal Water District
USBR	N/A
SWP	Approx. 5,500 AFY via Calleguas
Service Area Gross Acreage	19,840
Service Area Agricultural Irrigated Acreage	3,400

2. Figure 2.1 shows the Camrosa Water District boundaries. The Camrosa Water District is located in the southeastern portion of Ventura County, covering the eastern, Mission Oaks portion of the City of Camarillo, the California State University Channel Islands (CSUCI) campus, and the unincorporated Santa Rosa Valley portion of Ventura County.

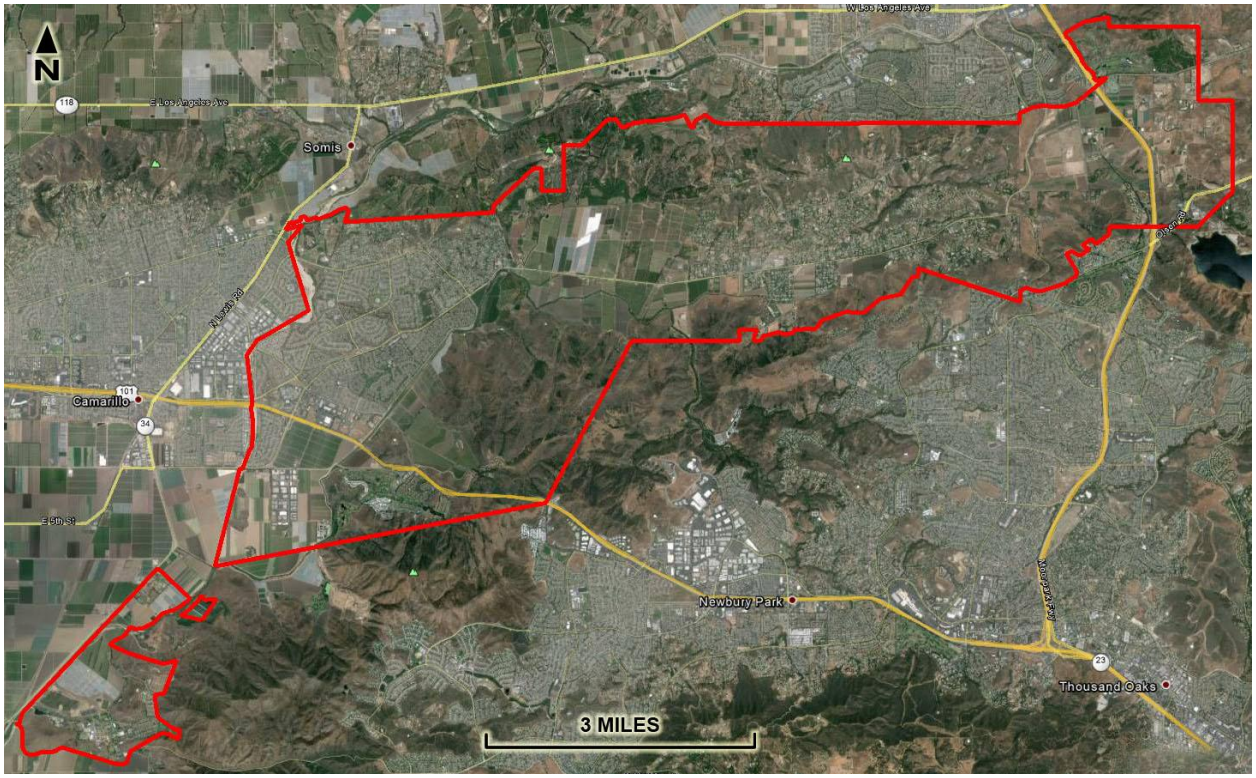

Figure i Camrosa Water District Service Area

Figure 2.2 locates the Conejo Creek Diversion structure and displays the nonpotable surface water distribution area. Camrosa diverts approximately 10,000 AFY of nonpotable surface water off the Conejo Creek, distributing roughly half within the district for agricultural and landscape irrigation, and selling the surplus to the neighboring Pleasant Valley County Water District (PVCWD), whose customers are exclusively agricultural.

The Camrosa Water District boundary is fixed and requires petition of and approval by LAFCO and Camrosa to be adapted. Only in extraordinary cases would the district entertain such proposals, and changes to the service area boundary are not included in planning projections or strategy. Because of the SOAR initiative and other similar legislation restricting land-use practices dominate Ventura County, the areas of Camrosa Water District's service area zoned for M&I are fixed. The zones are near build-out, and apart from a small number of small- to medium-size developments, which are expected to account for approximately six percent of future residential demands. The larger of those developments will not convert agricultural land, and the reduction of farmed acreage due to smaller developments is expected to be negligible. It is not expected that the agricultural service area will reduce significantly after that: certainly not within the five-year planning cycle of the AWMP. Population is expected to continue growing, so M&I zones may become more dense; such projections are included in Camrosa's long-term urban water management planning. As all new development is subject to supply mitigation, which includes installing dual plumbing and the use of nonpotable water where feasible, any offset of or increase in the volume of water used on the land being converted is

mitigated; land conversion and changes in land-use planning are not anticipated to adversely affect the district.

Worksheet 3. Expected Changes to Service Area		
Change to Service Area	**Estimate of Magnitude**	**Effect on Water Supplier**
Reduced Service Area Size	N/A	
Increased Service Area Size	N/A	
Change in Agricultural Area	1-3%	None
Increase in population	1-3% per year	Increased need for supply

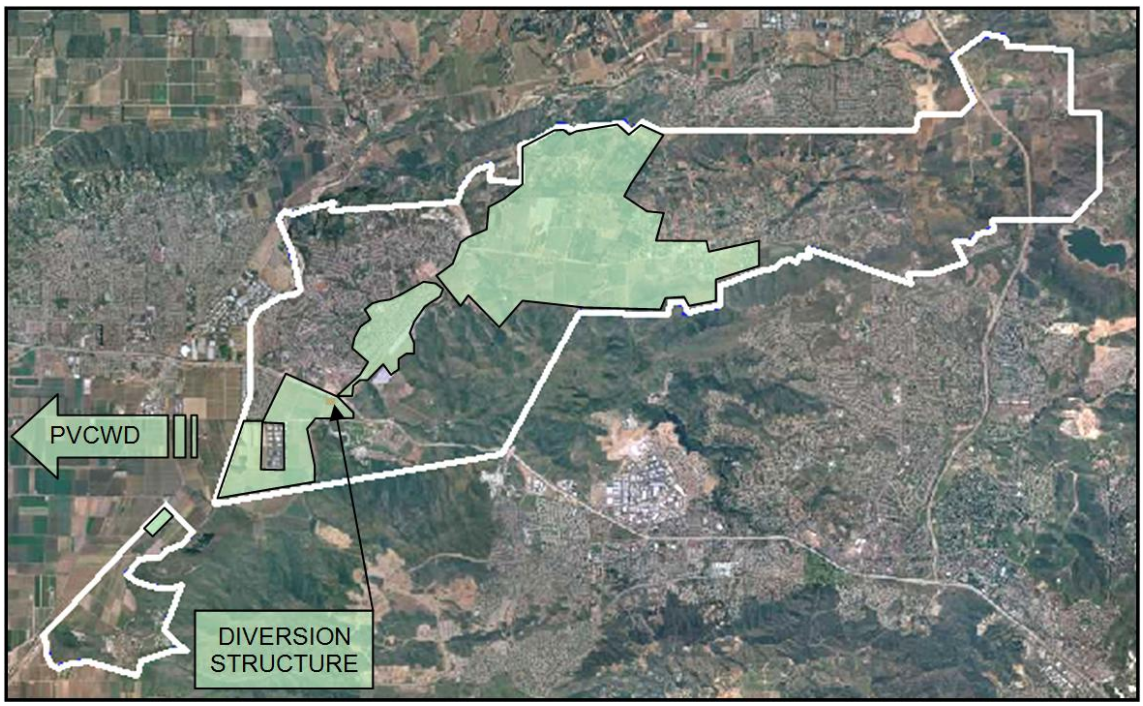

Figure ii Conejo Creek Diversion structure and nonpotable irrigated area

Worksheet 4: Water Delivery and Conveyance System	
Unlined canal	Conejo Creek, 6.9 miles
Pipeline	225 miles (191 potable, 34 nonpotable)

Worksheet 5: Water Supplier Reservoirs	
Potable Reservoirs	10
Potable Capacity	14.3 MG
Nonpotable Tanks	4
Nonpotable Capacity	2.2 MG
Total Capacity	**12.2 MG**

Worksheet 6: Tailwater/Spill Recovery System
Camrosa does not operate a tailwater/spill recovery system.

3. Terrain and soils:
    a. The discontiguous southwesternmost portion of the Camrosa Water District surrounding CSUCI and neighboring agricultural lands is coastal plain that abuts the Conejo Hills, the westernmost reach of the Santa Monica Mountians. The southern portion of the contiguous portion of the district is the same alluvial plain, transitioning northward into Camarillo Hills. Agriculture in the flats is primarily row crops, with avocados grown in the hills. Santa Rosa Valley, which extends eastward from the city limits of Camarillo to Highway 23 and the borders of Moorpark to the north and Simi Valley to the east, is bounded by the Simi Hills to the south-southwest and the Las Posas Hills to the north. The floor of the Santa Rosa Valley is alluvial materials where citrus and row crops are grown; avocados are grown on the hills.
    b. Dry arroyos crisscross both the Camarillo and Santa Rosa Valley portions of the district. Those in the former feed Calleguas Creek, which bounds the district on the west, while those in the latter feed Conejo Creek, which runs down the Santa Rosa Valley and along Santa Rosa Road. The arroyos are ephemeral streams that are primarily runoff channels during storm events. Calleguas Creek is dry the majority of the year in the portion that flows through the district—upstream, it receives treatment plant effluent from the City of Simi Valley and the City of Moorpark, but that has all gone underground by the time the stream reaches Camrosa boundaries. Conejo Creek is perennial, as it receives effluent from the Hill Canyon Wastewater Treatment Plant (HCTP) in Thousand Oaks, just south of the district boundary up the hill from Santa Rosa Valley. During rain events, Camrosa's diversion facility is turned off. A handful of our agricultural customers have irrigation ponds on their property that catch rainwater during rain events, but it is not quantifiable and does not form part of Camrosa's supply. Camrosa is considering a number of stormwater capture projects, but those concepts remain very high-level. Currently, the vast majority of stormwater runoff in the district flows out to sea. The confluence of the Conejo Creek with the Calleguas is located between the main body of the district and the discontiguous portion, near Camrosa's nonpotable storage ponds. From there it flows uninterrupted to the ocean.

4. Climate: Camarillo has a temperate coastal southern California/Mediterranean climate, with approximately 275 sunny days a year. Weather data is taken from the California Irrigation Management Information System (CIMIS) station located at Leisure Village, within the Camrosa service area.

Worksheet 8: Summary Climate Characteristics 2000-2015	
Climate Characteristic	**Value**
Avg. Annual Precipitation (inches)	10.37
Annual Min. Precipitation (inches)	2.82
Annual Max. Precipitation (inches)	18.16
Avg. Annual Min. Temp. (°F)	26.67
Avg. Annual Max. Temp. (°F)	99.61

Worksheet 9: Detailed Climate Characteristics 2000-2015 Averages				
Month/Time	**Avg. Precip. (in)**	**Avg. ET (in)**	**Avg. Min. Temp. (°F)**	**Avg. Max. Temp. (°F)**
Jan	2.26	2.53	68.33	43.80
Feb	2.16	2.54	67.03	43.73
Mar	1.58	3.61	68.64	44.92
Apr	0.69	4.37	69.22	46.27
May	0.22	5.23	71.53	49.66
Jun	0.017	5.17	73.23	53.56
Jul	0.045	5.71	77.20	57.03
Aug	0.004	5.33	77.58	56.39
Sep	0.047	4.31	78.39	54.96
Oct	0.73	3.30	75.67	51.63
Nov	0.7	2.66	72.5	46.85
Dec	1.89	2.11	66.88	43.11
Wet Season	2.79	1.55	69.84	45.67
Dry Season	5.02	0.17	74.53	52.98
* Wet Season is Oct-Mar; Dry Season is Apr-Sep. Values are monthly average over each season.				

B. Operational Characteristics

1. Operating rules and regulations: See Appendix H for Ordinance 40-15, Camrosa Water District Rules and Regulations. Because Camrosa is primarily an urban water supplier, we do not run our system according to agricultural practices described in Worksheets 10, 11, and 12. Scheduling and allocations are not part of our delivery process; water is delivered 100 percent on demand.

2. Water delivery measurements or calculations: All Camrosa customers receive delivery through the pipeline distribution system, and all accounts are metered; Worksheet 13 is therefore omitted. Metering gives the district the ability to analyze water use at the individual, water-class, and macro level, which is useful for the operation of the system at all times, and during the current drought period in particular.

3.

Worksheet 14: Water Rate Basis			
Water Charge Basis	**Check if Used**	**Percent of Water Deliveries**	**Description**
Volume of Water Delivered	✓	100%	See Worksheet 15 for details

4. Water rate schedules and billing: As described in II.B.2, all Camrosa accounts are metered, and Camrosa bills customers monthly on a volumetric rate of HCF units, per the rates in Worksheet 15.

   Camrosa completed a comprehensive rate study in 2012 (see Appendix I), which recommended a five-year rate schedule. As the district operates on a fiscal year of July 1–June 30, rates are raised in July. 2015 was the third increase in the five-year schedule; 2016 and 2017 are included in Worksheet 15 for information.

   The Camrosa Board of Directors determined years ago that the first 12 units of potable water used by residential accounts should be considered the minimum necessary for a typical residential connection; this “lifeline” tier is at a slightly reduced rate from all other potable classes. On the nonpotable side, the “Non-Potable Contractual Agricultural” and the “Recycled Contractual Agricultural” rates are for agricultural customers with riparian rights along Conejo Creek who agreed during the development of the Conejo Creek Diversion project not to exercise those rights once the Diversion was online, in exchange for a significantly reduced rate. The “Blended Non-Potable Agricultural” rate is for avocado growers along the western edge of the Las Posas Hills; nonpotable surface water is typically high in chloride, and is blended at a Camrosa blending station with imported water to control for chlorides. The blend ratio is approximately 2:1 imported to surface, on average, which accounts for the higher cost.

Worksheet 15: Rate Structure			
Potable Water Service	**July 2015**	**July 2016**	**July 2017**
Residential (first 12 units)	2.80	2.94	3.08
Residential (13 unites and up)	3.05	3.19	3.34
Commercial/Industrial/Public	3.05	3.19	3.34
Municipal/Residential Irrigation	3.05	3.19	3.34
Fire Service/Other	3.05	3.19	3.34
Agricultural Irrigation			
MWD Full Service Rate	3.05	3.19	3.34
MWD Tier 2 Rate	3.72	3.89	4.07
Temporary Construction/ Agricultural	3.05	3.19	3.34
Temporary Municipal	3.72	3.90	4.08
Emergency Water Service	4.60	4.82	5.05
Commercial/Industrial/Public Out of Bounds	3.76	3.94	4.13
Residential Out of Bounds (first 12 units)	3.19	3.34	3.50
Residential Out of Bounds (13 units and up)	3.76	3.94	4.13
Non-Potable / Recycled Water	**July 2015**	**July 2016**	
Non-Potable Commercial Agricultural	1.26	1.45	1.64
Non-Potable Landscape Irrigation Water	1.26	1.45	1.64
Non-Potable Residential Landscape	1.26	1.45	1.64
Non-Potable Temporary Construction	1.26	1.45	1.64
Non-Potable Contractual Agricultural	0.59	0.60	0.61
Blended Non-Potable Agricultural			
MWD Full Service Rate	2.46	2.67	2.88
MWD Tier 2 Rate	2.78	3.02	3.25
Recycled Commercial Agricultural	1.26	1.45	1.64
Recycled Landscape Irrigation	1.26	1.45	1.64
Recycled Contractual Agricultural	0.38	0.39	0.40
Recycled Surplus Water Out of Bounds	1.26	1.45	1.64

Worksheet 15a: Monthly Meter Service Charges				
Meter Size	**Fire Service**	**Domestic Ag**	**Potable/Nonpotable**	**Blended Ag**
¾”	-	$18.83	$6.11	-
¾” Master Meter	-	-	$12.72	-
1”	$48.00	$27.31	$21.20	$14.33
1.5”	$48.00	$48.53	$42.42	$22.30
2”	$48.00	$73.97	$67.87	$29.60
3”	$48.00	$154.55	$148.44	$36.63
4”	$48.00	$260.58	$254.48	$62.51
6”	$95.98	$387.82	$381.72	$108.30
8”	$172.77	$642.30	$636.19	N/A
10”	$288.01	-	-	-

Worksheet 15b: Capital Improvement Fees, Potable Water					
Meter Size	**Capacity**	**Meter Fee**	**Area III**	**Area II**	**Area I**
3/4”	15 gpm	$216.61	$2,500	$3,600	$4,800
1”	25 gpm	$301.26	$4,175	$6,000	$8,025
1-1/2” Omni R2	50 gpm	$578.98	$8,325	$12,000	$16,000
2” Omni R2	160 gpm	$812.34	$13,325	$19,200	$25,575
3” Omni T2	350 gpm	$1,467.26	$26,650	$38,375	$51,175
4” Omni T2	1000 gpm	$2,855.87	$40,825	$59,175	$81,675
6” Omni T3	2000 gpm	$4,502.74	$79,675	$118,350	$158,500

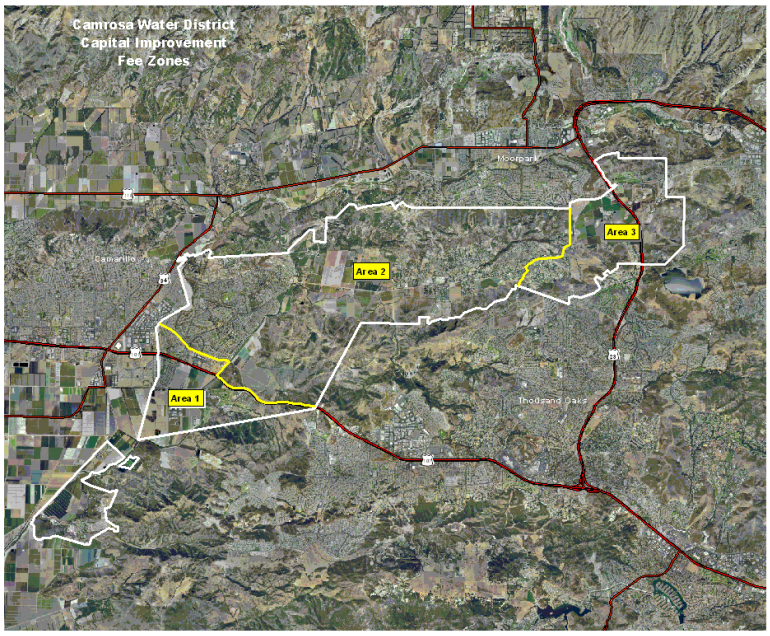

Figure iii Capital Improvement Fee Zones

Worksheet 15c: Capital Improvement Fees, Nonpotable Water		
Meter Size	**Capacity**	**Meter Fee**
1” SRII TRPL Reclaimed	25 gpm	$314.33
1-1/2” Omni R2	120 gpm	$667.86
2” Omni R2 Reclaimed	160 gpm	$901.23
3” Omni T2 Reclaimed	350 gpm	$1,556.14
4” Omni T2 Reclaimed	1000 gpm	$2,944.75
6” Omni T2 Reclaimed	2000 gpm	$4,591.62
1” SRII TRPL Reclaimed	25 gpm	$314.33

Worksheet 15d: Private Fire Service Lines	
Meter Size	**Meter Fee**
6" or smaller	$1,000
8"	$1,500
10"	$2,000
In addition to the Private Fire Line Capital Fees, Plan Check Fee and Inspection Fees will be charged for new developments based on the cost of improvements.	

Worksheet 15e: Sewer Capital Improvement Fees	
Sewer Connection Fee	$4,675 per dwelling unit or equivalent
Sewer Permit Fee	$20 per dwelling unit or equivalent
Inspection Fees	$50 per hour

Worksheet 15f: Miscellaneous Fees		
Service	**Amount**	**Description**
Account Set-Up Fee	$10.00	A one-time charge to set up each account will appear on the first bill.
Large Meter Turn-on/Turn-off	$50.00	A one-time charge to turn on or turn off any service 3 inches in size or larger will appear on the first bill.
Backflow Prevention Device	$1.25/mo	A monthly charge for administering the District's Cross-Connection Control Program for each backflow device.
Door Hanger Fee	$25.00	Service fee to notify a delinquent account customer that their water meter is scheduled to be turned off.
Fire Hydrant Meter	$75.00 fee & $1,000 deposit	A $75.00 account set up and installation fee plus a $1,000 refundable deposit.
Inspection Fee	$50.00/hour	A fee of $50.00 per hour is charged if not included in other services.
Meter Relocation Fee	TBD	Customer is responsible for all costs associated with the relocation of existing facilities plus inspection fees.
Meter Size Change	TBD	Customer is responsible for all costs associated with change in meter size including the new meter, installation costs, inspection fees, overhead and additional capital fees as appropriate.
Potable Pumping Charges	$0.12 per unit	Water services may be subject to surcharges if the areas to be served are above the first hydraulic lift. Zone Surcharges are intended to reflect the actual cost of any additional pumping and shall be reviewed annually to assure that they reflect current costs.
Non-Potable Pumping Charges	$0.07 per unit	Water services may be subject to surcharges if the areas to be served are above the first hydraulic lift. Zone Surcharges are intended to reflect the actual cost of any additional pumping and shall be reviewed annually to assure that they reflect current costs.
Wildwood Estates Facilities Construction Fee	$75.00 per A/F	A fee added to the Nonpotable Residential Irrigation commodity rate to recoup the costs of expansion of the Non-potable distribution system into Wildwood Estates to make low-cost Non-potable irrigation water available to residents.
Reconnection Penalities	$50.00/$75.00	For restoring service due to delinquent accounts a $50.00 fee is charged during regular business hours, $75.00 fee is charged after business hours. Surety deposit may be required for reconnection.
Returned Check Fee	$50.00	Fee is assessed on the customer's account for each check returned for non-sufficient funds or each automatic ACH account debit returned.
Temporary 4" Ag Meter with Backflow Device	$75.00 fee & $2,000 deposit	$75.00 installation and removal fee plus a $2,000 refundable deposit on the device. Customer will be billed $150 per month meter service fee.

Worksheet 16: Frequency of Billing	
Frequency	**Check if Used**
Monthly	✓

5. Water shortage allocation policies: While we make every effort to not treat nonpotable and recycled water like they are interruptible, as sections 4.2.2 and 4.2.3 of Ordinance 40-15 stipulate, nonpotable and recycled water service is interruptible. There are periods of time during the summer, especially the last couple years when drought conditions have been the norm, that there is not enough nonpotable supply to meet demand. In such cases, water is available on a first come, first served basis; a policy of which all nonpotable customers are aware of and agree to by receiving nonpotable service (see Section "Nonpotable Water Service" in Section V.D).

Worksheet 17: Decreased Water Supplies Allocations	
Allocation Method	**Check if Used**
First come, first served	✓

As for potable water, Camrosa treats all its potable customers equally; while coded as interruptible, potable agriculture would only be treated as such in the most dire of circumstances. Twenty years ago, Camrosa depended on the State Water Project, imported via Metropolitan Water District and Calleguas Municipal Water District, to meet upwards of 80 percent of its demand. As a result of a strategy to increase self-reliance, Camrosa has spent over $30 million in that time developing local resources, including both potable and nonpotable groundwater wells, the Conejo Creek Diversion project, upgrading the Camrosa Water Reclamation Facility to produce Title-22 recycled water that was fit for redistribution, and the Round Mountain Water Treatment Plant, a 1 MGD brackish groundwater desalination facility. These facilities have reduced our demand on imported water to approximately one third of our total supply, which significantly buffers the effects of drought on the State Water Project.

Section 5.16 of Ordinance 40-15 enumerates the various stages of a water supply shortage emergency available to the Board to use as tools to reduce demand in the district. The ordinance was written to be flexible enough to adapt to whatever is driving the supply reduction: the implementation of the restrictions can be driven by outside agencies controlling imported deliveries during times of SWP allocations, or they can arise internally, in response to threats to local resources.

For example, during the current drought, which exempted agricultural customers from the statewide 25-percent reduction and attendant conservation regulations, Camrosa declared a stage three water supply shortage emergency, which places severe restrictions on the use of potable water, in order to meet the 32-percent conservation target the SWRCB imposed on Camrosa in order to meet Governor Brown's mandated 25-percent statewide reduction in urban potable water production. We were, however, able to require much less of our agricultural customers, and simply passed on the SWP reductions required by Metropolitan and Calleguas, which amounted to 16.5 percent.

While Ordinance 40-15 does outline the ability for the district, at the General Manager's discretion, to implement fines for violating water-use prohibitions that extend to and include water shut-off, there are currently no penalties in place for agricultural water users who exceed their conservation targets of 16.5 percent. Should any agency impose financial penalties on Camrosa for exceeding agricultural conservation requirements, it is likely that Camrosa would distribute those fines across those customers who exceeded their conservation targets.

Worksheet 18: Enforcement Methods of Allocation Policies	
Enforcement Method	**Check if Used**
Fines	✓
Water shut-off	✓

Section III: Description of Quantity of Water Uses

A. Agriculture Water Use

It is not Camrosa's policy to collect exhaustive agricultural crop data. As part of the permit governing the diversion of Conejo Creek water, however, Camrosa is required to submit, currently on a five-year basis, a "Report on Overall Irrigation Efficiency in the Areas of Camrosa Water District and Pleasant Valley County Water District Receiving Surface Water from the Conejo Creek," included here as Appendix J. Information for the last report, the 2013 report, submitted in October 2014, was based on information gathered by District staff over the course of 2013. The efficiency calculations developed for the 2013 report (appendices B and C of Appendix J) display detailed crop breakdowns for the portions of the district receiving nonpotable Conejo Creek surface water; Worksheet 21, below, is a summary. Camrosa does not collect information on irrigation methods, planting methods, harvest methods, cultural practices, or leaching requirements.

Worksheet 19: Representative Year	
	Description
Representative year	2013
First month of representative year	January
Last month of representative year	December

Worksheet 20: Annual Agricultural Water Use (AF)						
Source	**2013**	**Planning Cycle**				
		2016	**2017**	**2018**	**2019**	**2020**
Surface Water	4,425	4,500	4,500	4,500	4,500	4,500
Groundwater	1,120	1,340	1,340	1,340	1,340	1,340
Recycled Water	1,055	1,161	1,549	1,549	1,549	1,549
Imported	544	600	600	600	600	600
TOTAL	**7,144**	**7,601**	**7,989**	**7,989**	**7,989**	**7,989**

Worksheet 21: Agricultural Crop Data for 2013			
Crop	**Total Acreage**	**ET Crop* (AF/Ac)**	**Total Crop Water Needs (AF)**
Avocados	332.76	3.1	930.39
Lemons	703.99	2.9	1,377.85
Strawberries	807.44	3.4	2,590.36
Nursery	81.03	4.9	259.98
Onions/Celery/Radishes	77.86	1.8	204.24
Other	202.65		435.59
Unknown	1,176.55		2,381.87
TOTAL	**3,382.28**		**8,180.28**
**ET Crop data from Current Irrigation Allowance Index Values, FCGMA 2014 Annual Report 2014, Appendix A, pg. 6.*			

Worksheet 22: Irrigated Acres						
	2013	**Planning Cycle**				
		2016	**2017**	**2018**	**2019**	**2020**
Total Irrigated Acres	3,382.28	3,400	3,400	3,400	3,400	3,400

Camrosa does not collect sufficiently detailed multiple-crop information from its agricultural customers to complete Worksheet 23.

B. Environmental Water Use

As part of the permit governing the diversion of Conejo Creek water, Camrosa is required to bypass 6cfs for downstream beneficial uses and habitat conservation. See Appendix K, "Agreement between T.O. and Camrosa for the beneficial use of water (Contract #10116-2013)."

Worksheet 24: Environmental Water Uses (AF)						
Environmental Resource	2013	Planning Cycle				
		2016	2017	2018	2019	2020
Conejo Creek bypass*	4,344	4,356	4,344	4,344	4,344	4,356
**Continuous 6cfs equates to 4,344 AFY; 4,356 AFY in leap years*						

C. Recreational Water Use

No water delivered by Camrosa is used for recreational purposes within the district boundaries; Worksheet 25 is therefore omitted.

D. Municipal and Industrial Use

Potable Municipal and Industrial (M&I) demands include demand by all non-agricultural sectors including residential, public, landscape, and commercial and industrial users. The potable M&I service area is generally concentrated in the western end of the district, including Mission Oaks in the City of Camarillo, and Camarillo Springs, though residential and commercial accounts are found throughout the district. Commercial usage is primarily community shopping centers with

grocery stores, small restaurants, retail stores, and offices. Industrial uses are light industry, primarily with low water demand. There are three golf courses in the district: Camarillo Springs, Leisure Village, and Tierra Rejada. As discussed in section II.A.2, several portions of the district are served with nonpotable water, both from nonpotable wells and nonpotable surface water diverted from Conejo Creek.

Approximately 85 percent of potable water goes to M&I demands, while only 22 percent of nonpotable and 24 percent of recycled deliveries go to M&I customers. As of December 2015, there are 7,809 potable M&I accounts; 291 nonpotable M&I accounts, and one recycled M&I account; far too many to list independently as Worksheet 26 in the guidebook suggests. Instead, a representative year and the near-term planning cycle are presented, as in similar worksheets.

Worksheet 26: Municipal/Industrial Water Uses (AF)							
	Sector	2014	Planning Cycle				
			2016	2017	2018	2019	2020
Potable	M&I	7,670	7,225	7,225	7,225	7,225	7,225
Nonpotable	M&I	1,506	1,300	1,300	1,300	1,300	1,300
Recycled	M&I	300	264	352	352	352	352

A note about planning cycle years: Because the SOAR initiative and other similar legislation restricting land-use practices dominate Ventura County, Camrosa Water District is very near build-out in the areas of the district zoned for M&I development. 2014 was a high-use year; it was hot and we were in the third year of drought, but the governor had yet to mandate reductions. The amount of growth expected is less than the average annual deviation in year-to-year demand, so projections for planning cycle are left at flat averages of the past several years.

E. Groundwater Recharge Use

Camrosa does not currently recharge groundwater, and does not expect to within the five-year AWMP planning cycle; Worksheet 27 is therefore omitted.

The district's long-term water supply reliability planning, however, does include increasing our groundwater management capability through groundwater recharge. Camrosa has surpluses of nonpotable surface water at various times of the year and is pursuing additional recycled supplies, and is investigating the feasibility of recharging the Santa Rosa Basin with those resources. A pilot recharge program was undertaken in August 2013 with discharge from the Penny Well, a potable water well currently being rehabilitated (see Section IV.A.2). Well product was discharged into the Arroyo Santa Rosa, and Camrosa staff performed a rudimentary study to observe the relationship between streamflow and percolation along the arroyo. Although simple, the study showed favorable results in flow characteristics and percolation rates. Over a 30-day period, flows varied between a low of 280 GPM and a high of 400 GPM and systematically increased in length and width up to a point, but did not progress farther than approximately 1,400 feet from the initial discharge point. Upwards of 4,500 AFY are available for recharge, which would dramatically improve Camrosa's ability o adaptively manage the Santa

Rosa Basin. While initial investigations are promising, a more comprehensive technical and environmental study would be required before pursuing a recharge project further, then a full environmental review and facility design and construction, likely putting a recharge project farther out than the five-year planning cycle required by this AWMP.

F. Transfer and Exchange Use

The "Agreement between T.O. and Camrosa for the beneficial use of water (Contract #10116-2013)" (Appendix K), the permit that allows Camrosa to divert Conejo Creek water, provides for the diversion of significantly more than Camrosa uses on an annual basis, and Camrosa has historically sold nonpotable surplus to our customers' demands to the Pleasant Valley County Water District (PVCWD), an exclusively agricultural water distributor that overlies the Pleasant Valley Groundwater Basin and is within the jurisdiction of the Fox Canyon Groundwater Management Agency (FCGMA). Through the end of 2015, Camrosa had delivered over 60,000 AF of nonpotable water to PVCWD, offsetting demand that would have otherwise met by pumping groundwater.

In 2014, Camrosa renewed its agreement with the city of Thousand Oaks allowing for Conejo Creek diversions for a term of 40 years. At the same time, Camrosa entered into an agreement (FCGMA Resolution 2014-01 [Appendix L]) with FCGMA for the transfer of PVCWD's pumping allocations in the northeast Pleasant Valley Basin to Camrosa in exchange for Conejo Creek surface water, on a one-to-one basis, also for forty years. Worksheet 28 displays the transfers and exchanges made to PVCWD over the past five years, and the near-term planning cycle.

When agreements were initially made for Conejo Creek water, 15 years ago, it was generally assumed that the City of Thousand Oaks would eventually discharge 15,000 AFY of effluent from the HCTP into Conejo Creek. Historically, Camrosa has diverted more than 10,000 AFY from the creek, and sent more than half of that to PVCWD. In the earliest years of the project, nearly all the water diverted from the creek went to PVCWD, as Camrosa's nonpotable distribution system was limited. As more accounts transferred demand to the nonpotable system, in particular some of the larger agricultural users and Leisure Village, a retirement community that uses approximately 500 AFY of nonpotable water for landscape and golf-course irrigation, the amount we sent to PVCWD and the amount we kept began to even out.

All this time, however, the quantity of HCTP effluent discharged into Conejo Creek has steadily decreased, and this has recently shown up in Camrosa's diversions, as can be seen in Worksheet 28. A portion of this is likely due to City of Thousand Oaks conservation directly linked to the drought, but the longevity and continuity of the trend suggests that reduced water use has become a way of life in the City of Thousand Oaks. Thus, Camrosa is planning on diverting only 9,000 AFY from the creek.

While the use of nonpotable Conejo Creek surface water has increased over the past several years, Camrosa does not expect those numbers to increase much beyond their current level, as

the capacity of the nonpotable distribution system is fairly balanced with the quantity of water available for delivery. On an annual basis, it would appear that Camrosa has plenty of water to expand the nonpotable distribution system, but as that water is received steadily over the year, independent of the exaggerated annual landscape-irrigation demand curve, in the hottest, driest and therefore highest-use months of the year, Camrosa uses all the water available in Conejo Creek, sometimes going weeks without transferring so much as a gallon to PVCWD.

As such, for the near-term planning purposes required by this AWMP, Camrosa is forecasting a small rebound from current reduced levels of water use in Thousand Oaks to bring the available water in Conejo Creek back up, but, in keeping with the historical downward trajectory of effluent discharge, not expecting to divert any more than 9,000 AFY. Despite significantly higher use in 2014, Camrosa estimates our landscape and agricultural irrigation customers will use 5,000 AFY of nonpotable Conejo Creek surface water once drought conditions subside and precipitation rates return to normal.

Historical data for the following worksheets is given from the period 2008-2015; while production data exists much further back than that, Camrosa updated its billing system in 2007, allowing much more granular analysis of demand data. Section V, Water Accounting, depends on this level of granularity, and to keep the document internally consistent, we have limited historical production to the previous eight calendar years, except where otherwise noted.

Worksheet 28/30: Transfers and Exchanges of Water (AF)									
Nonpotable surface water diverted from Conejo Creek and transferred to PVCWD									
	Historical								
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Avg.**
Diverted from Conejo Creek	8,244	8,930	8,853	10,314	8,702	9,172	7,670	8,411	**8,787**
Used in Camrosa	3,582	4,717	3,956	3,644	4,343	5,540	5,162	5,625	**4,571**
Sent to PVCWD	4,629	3,998	4,880	6,425	4,323	3,241	2,055	2,355	**3,988**
				Planning Cycle					
				Avg.	2016	2017	2018	2019	2020
Diverted from Conejo Creek				**8,787**	9,000	8,701	8,351	8,397	9,028
Used in Camrosa				**4,571**	5,000	5,000	5,000	5,000	5,000
Sent to PVCWD				**3,988**	4,000	4,000	4,000	4,000	4,000

In addition to the nonpotable water Camrosa delivers to areas within the Fox Canyon Groundwater Management Agency area via PVCWD, we also deliver approximately 5,400 AFY to areas under FCGMA jurisdiction within Camrosa boundaries; see Table V.A.1 in Section V for details about FCMGA imports.

G. Other Water Use

Besides the types of water use mentioned heretofore in Section III, there are no other water uses; Worksheet 29 has therefore been omitted.

Section IV: Description of Quantity and Quality of the Water Resources of the Agricultural Water Supplier

Camrosa Water District has three separate water distribution systems: potable, nonpotable, and recycled. There are not separate systems for agricultural customers, and Camrosa has agricultural customers on all three distribution systems. Camrosa meters deliveries on all three distribution systems, and therefore knows from a demand perspective what percentage of supply ultimately goes to agricultural customers, but for the purposes of this Agricultural Water Management Plan, the sources of supply for all of Camrosa deliveries are considered jointly.

A. Water Supply Quantity

1. Surface Water Supply: Camrosa Water District receives its surface water supply from Conejo Creek. Please see Section III.F for a full description of the Conejo Creek project, and historical and projected water use and availability. As Conejo Creek is Camrosa's sole surface supply, and all relevant information regarding its quantity presented in Worksheet 28, Worksheet 30 has not been included here. Aside from the 6cfs bypass required for downstream habitat conservation, described in Section III.F and Appendix K, there are no restrictions or operational constraints on the Conejo Creek Diversion project.

2. Groundwater Supply: Camrosa overlays four groundwater basins: the northeast Pleasant Valley, Santa Rosa, Tierra Rejada, and the Perched Aquifer. Camrosa has one well in each the Pleasant Valley and Tierra Rejada Basins, and we are in the process of constructing a second well in the PV Basin. Eight wells draw from the Santa Rosa Basin, five potable, one of which is being rehabilitated after more than a decade offline, and three nonpotable. The Perched Aquifer is the supply for the Round Mountain Water Treatment Plant, the 1 MGD desalination facility we constructed in 2014.

   The PV Basin and the western Santa Rosa Basin, a portion approximately 20 percent of the basin's area west of the Bailey Fault, fall under the jurisdiction of the Fox Canyon Groundwater Management Agency (FCGMA). Camrosa has pumping rights in the PV Basin under an FCGMA historical allocation, and no wells in the FCGMA portion of the Santa Rosa Basin. Camrosa's FCGMA allocation in the PV Basin is 806 AFY, and additional pumping allocations are accumulated through the Conejo Creek pumping program, on a one-to-one basis in exchange for nonpotable Conejo Creek surface water delivered to PVCWD (described in detail in Section III.F and Appendix L). The new well being drilled in the PV Basin is being designed at 1,500 gpm; a conservative estimate puts expected capacity at 1,500 AFY, beginning in 2017.

Worksheet 31. Restrictions on Water Sources			
Source	**Restriction**	**Agency Imposing Restrictions**	**Operational Constraints**
Pleasant Valley Basin	Historical Allocation	FCGMA	Pumping limited to 806 AFY
	Conejo Creek Pumping Program	FCGMA	Pumping limited to amount of credits PVCWD retires in exchange for Conejo Creek Water; see Section III.F.

Besides the eight active wells in the Santa Rosa Basin, Camrosa is currently rehabilitating an additional potable water well, the Penny Well. This potable water well was taken offline in the late 1990s. It is expected to be rehabilitated in 2016, and should produce 500 AFY.

Worksheet 32. Groundwater Basins			
Basin Name	**Size (sq. mi.)**	**Usable Capacity (AF)**	**Safe Yield (AFY)**
Pleasant Valley*	21,600	1,886,000	Unknown
Perched Aquifer†	Variable	2,000-6,000	Unknown
Arroyo Santa Rosa*	3,730	94,000-103,600	3,320‡
Tierra Rejada*	4,390	80,000	Unknown

** Size and capacity information from California Department of Water Resources's Groundwater Bulletin 118 (Appendix T)*
† Perched Aquifer information from "Shallow Groundwater of Eastern Pleasant Valley Basin" by Norm Brown, April 2005 (Appendix M); and "Aquifer Pumping Test of Camrosa Water District University Well" by Norm Brown, December 2010 (Appendix N)
‡ Arroyo Santa Rosa safe yield is based on MWH's 2013 Santa Rosa Basin Groundwater Management Plan

The Perched Aquifer is part of a collection of the uppermost water-bearing units overlying the eastern Pleasant Valley Basin in hydraulic connection with the surface and associated stream flow of Calleguas and Conejo Creeks. The aquifer fluctuates according to surface flows and precipitation, and as such, its exact extent is difficult to judge. The usable capacity of the Perched Aquifer is based on the pumping test results carried out on a specific well (the University Well) for a specific project (the RMWTP) and is not meant to apply to the entire shallow aquifer system.

Worksheet 33. Groundwater Management Plan	
Pleasant Valley Basin (Fox Canyon Groundwater Management Plan)	
Written by	FCGMA
Year	2007
Appendix Attached?	Yes, Appendix P
Perched Aquifer (*"Shallow Groundwater of Eastern Pleasant Valley Basin"*)	
Written by	Norman N. Brown, Ph.D., P.G.
Year	2005
Appendix Attached?	Yes, Appendix M
Santa Rosa Groundwater Basin	
Written by	MWH
Year	2014
Appendix Attached?	Yes, Appendix C
Tierra Rejada Basin	
Written by	Norman N. Brown, Ph.D., P.G.
Year	2009
Appendix Attached?	Yes, Appendix O

Worksheet 34a displays annual extractions over the last eight years from the four groundwater basins where Camrosa has wells. The Perched Aquifer, from which the Round Mountain Water Treatment Plant draws its supply, became increasingly salty over the latter half of the 20th century and not been used or monitored regularly for several decades prior to Camrosa's development of the resource in 2014; the average used in Worksheet 34 represents pumping over the last six months of 2015, and projections in the planning cycle reflect estimated production based on design (1 MGD) and recovery (72%) capacity. Pumping in the Santa Rosa Basin varies significantly year to year, from a low of 2,312 to a high of 4,156. Section V.D, which describes groundwater supply and reliability, indicates that "safe yield" from the Santa Rosa Basin is 3,320 AFY. The variations in annual pumping are a result of Camrosa's monitoring and operational understanding of the basin, and reflect Camrosa's adaptive management; when water levels indicate the basin can support sustained pumping, extractions run higher than the estimated safe yield, and as levels recede, in response to sustained below-average precipitation or pumping elsewhere in the basin, Camrosa reduces its extractions. As can be seen in Worksheet 34a, over the course of the last decade, Camrosa has maintained a level of pumping slightly under estimated safe yield. Projected extractions remain at safe yield over the planning cycle despite the increase in Camrosa's Santa Rosa pumping capacity with the addition of the Penny Well, described above; water levels in the vicinity of the the Penny Well are relatively high, and the new well will improve Camrosa's pumping flexibility, rather than increase its capacity. The Tierra Rejada Basin, much like the Santa Rosa Basin, responds predictably to precipitation and the behavior of other pumpers, and Camrosa adjusts its extractions accordingly.

Worksheet 34a. Historical Groundwater Supplies(AF)									
Groundwater Basin	**Historical**								
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Avg.**
Pleasant Valley	820	807	862	775	567	0	735	810	**672**
Perched Aquifer†	-	-	-	-	-	-	[174]	[515]	**-**
Arroyo Santa Rosa	4,075	3,159	2,312	2,725	3,421	4,152	3,714	2,710	**3,284**
Tierra Rejada	504	459	428	487	504	427	398	212	**427**
Total	**5,399**	**4,425**	**3,602**	**3,987**	**4,492**	**4,579**	**4,847**	**3,732**	**4,383**

† The Perched Aquifer feeds the RMWTP, which did not begin production until February 2014; full production began in June 2015. Production is expected to average 850 AFY. While listed in the table above, this is source is not included in historical groundwater calculations.

Worksheet 34. Groundwater Supplies (AF)						
Groundwater Basin	**2008-2015 Average**	**Planning Cycle**				
		2016	**2017**	**2018**	**2019**	**2020**
Pleasant Valley	**672**	800	2,300	2,300	2,300	2,300
Perched Aquifer†	**-**	850	850	850	850	850
Arroyo Santa Rosa	**3,284**	3,320	3,320	3,320	3,320	3,320
Tierra Rejada	**427**	450	450	450	450	450
	4,383	**5,420**	**6,920**	**6,920**	**6,920**	**6,920**

† The Perched Aquifer feeds the RMWTP, which did not begin production until February 2014; full production began in June 2015. While listed in Worksheet 34a, this is source is not included in historical groundwater calculations, but it is included in projections.

3. Other Water Supplies

Approximately one third of the total water Camrosa serves delivers comes from the State Water Project, via Calleguas Municipal Water District, a wholesale member agency of the Metropolitan Water District. Camrosa also delivers Title-22 recycled water, produced at the Camrosa Water Reclamation Facility (CWRF), to California State University Channel Islands for landscape irrigation and to a small number of agricultural customers. Starting in 2017, Camrosa will receive approximately 500 AFY of Title-22 recycled water from the Camarillo Sanitary District (CamSan).

Worksheet 35. Other Supplies (AF)							
Source	**2008-2015 Average**	**Planning Cycle**					**Anticipated Changes**
		2016	**2017**	**2018**	**2019**	**2020**	
Imported	6,637	5,793	4,293	4,293	4,293	4,293	
Groundwater	4,383	5,420	6,920	6,920	6,920	6,920	Additional well in PV Basin, 2016
Surface Water	4,571	4,500	4,500	4,500	4,500	4,500	
CWRF	1,072	1,500	1,500	1,500	1,500	1,500	
CamSan	0		500	5,00	500	5,00	
Private Pumping	N/A	N/A	N/A	N/A	N/A	N/A	SGMA GSP
Transfers/ Exchanges		4,000	4,000	4,000	4,000	4,000	
TOTAL	**3,988**	**17,213**	**17,713**	**17,713**	**17,713**	**17,713**	

Camrosa does not receive any supply from private pumping, and it is not Camrosa's practice to collect pumping information from private wells, of which the Santa Rosa Groundwater Management Plan identified at least 27 currently in-use in the Santa Rosa Basin (see Table 2-6 in Appendix C), and there are a handful in the other groundwater basins in the district. Wells in the FCGMA portion of the Santa Rosa Basin west of the Bailey Fault report extractions to the FCGMA of approximately 1,400 AFY. As the Sustainable Groundwater Management Act groundwater sustainability agency for the Santa Rosa Basin, Camrosa will likely develop a monitoring program for all extractions from the Santa Rosa Basin, but will never receive supply from those wells.

Transfers and exchanges will take place based on the Conejo Creek pumping program described in Section III.F and Appendix L. As these pumping credits do not necessarily translate into increased supply in the year they are accumulated, but are retired as groundwater is produced from the Pleasant Valley Basin, they are not counted as a tangible source of supply in Worksheet 35.

4. Drainage from the Water Supplier's Service Area

Water budgets in the Pleasant Valley Basin have been categorized generally in the Fox Canyon Groundwater Management Plan, and more specifically in the 2008 Northeast Pleasant Valley Basin Surface Water and Groundwater Study (Appendix U). That study describes but does not quantify inflows from upwelling of water from underlying bedrock, agricultural return flows, pore fluid seepage from silt and clay layers, subsurface inflows from the East Los Posas Basin, upstream discharges from shallow groundwater dewatering wells in Simi Valley, wastewater effluent discharges to Arroyo Las Posas/Calleguas Creek from the Simi Valley wastewater treatment plant, and infiltration of surface flows from the Santa Rosa Basin.

As described in the 2009 Tierra Rejada Basin Analysis (Appendix O), the layered groundwater-producing formations in the basin are tilted down to the north and run up against the Simi Fault, which, while it might not be an impermeable barrier, certainly inhibits northward flow out of the basin. To the south, it is estimated that there is approximately 240 AFY of communication with the Santa Rosa Basin. Recharge into the two principal water-producing bedrock units comes primarily from deep percolation of precipitation, agricultural return flows in the Tierra Rejada Valley, and migration through water-bearing geology.

The 2005 Shallow Groundwater of Eastern Pleasant Valley Basin (Appendix M) describes the "relatively close hydraulic connection" (p. 10) of the Perched Aquifer with streamflow in Calleguas Creek, with calculations of stream gains and losses suggesting as much as 6,100 AFY of creek infiltration to into the shallow hydrologic regions. Groundwater levels are modulated by surface flow, with regular seasonal variation. The study also describes the separation of the Perched Aquifer from the Lower Aquifer System of the Pleasant Valley, indicating that drainage from the area under study—the area Camrosa subsequently developed with the University Well to feed the RMWTP—likely passes through to other shallow water-bearing formations.

Although Camrosa does not have detailed drainage information for the other three groundwater basins, the Santa Rosa Groundwater Management Plan (Appendix C) describes recharge and discharge from the Santa Rosa Basin. Section 2.5 of the plan estimates agricultural return at 154 AFY minimum, 407 AFY on average, and 462 AFY maximum. Outflow to the adjacent subbasin—across the Bailey Fault to the western portion of the Santa Rosa Basin and into the jurisdiction of the FCGMA—is estimated at 290 AFY. Where this water travels, and whether it is made available for use by other pumpers, is beyond the scope of the SRGMP.

SRGMP Table 2-11. Estimated Water Budget Components, Santa Rosa Basin	
Component	**AFY**
Inflow into Basin (Recharge)	
Precipitation (Valley Floor)	450
Precipitation (Watershed)	360
Subsurface Inflow (from Tierra Rejada Basin)	240
River Leakage (Conejo Creek)	1,030
River Leakage (Arroyo Santa Rosa)	600
Agricultural Return	200
Residential Wastewater Return (Indoor)	715
Residential Wastewater Return (Outdoor)	765
Residential Wastewater Return (Public and Others)	30
Total Inflows	**4,390**
Outflow from Basin (Discharge)	
Pumping	3,320
Evapotranspiration / Consumptive Use	775
Outflow to Adjacent Subbasin (Bailey Fault)	290
Total Outflows	**4,390**

Outside of the Santa Rosa Basin, all surface drainage ends up in the Conejo Creek or Calleguas Creek, which converge into the Calleguas Creek between the main body and discontiguous portion of the district service area, and flow to the Pacific Ocean. If, in the future, return flows occur upstream of the Conejo Creek Diversion Facility, Camrosa could divert those flows and recirculate them. There are no other diversions of Conejo or Calleguas Creek downstream of Camrosa's Conejo Creek diversion structure.

B. Water Supply Quality

Water supply quality reported in Worksheet 36 represents averages of samples taken during FY2015.

1. Surface Water Supply: Camrosa's surface water supply comes from the Conejo Creek, which is primarily City of Thousand Oaks' HCTP effluent, mixed with the north and south forks of the Conejo Creek, semi-perennial streams comprising city runoff, natural runoff, and storm runoff. Worksheet 36 represents the creek under normal (as opposed to wet-weather) conditions.

   Conejo Creek is subject to the Calleguas Creek Watershed's Salts TMDL, which requires a 70-percent reduction in the mass of stranded salts (TDS, chloride, sulfate) from an estimated baseline. The triannual review of the watershed's demonstration of compliance with the interim milestone (a 40-percent reduction by 2015) is included as Appendix Q.

2. Groundwater Supply: See Section IV.A.2 for a description of groundwater sources.

3. Other Water Supplies: See Section IV.A.3 for a description of other sources.

4. Drainage from the Water Supplier's Service Area: As described in Section IV.A.4, drainage is not considered part of Camrosa's water supply.

Worksheet 36. Camrosa Water Supply Quality

Parameter	Unit	Conejo Creek**	CWRF	Import†	RMWTP	Potable Wells						Nonpotable Wells		
						C2	C3	C4	SR8	TR	WW	SR10	SR9	SR3
TDS	mg/L	846	888	524	500	964.00	864.92	961.14	780.55	646.13	807.63	1002.00	766.00	868.00
Se	µg/L					4	4	5	4	ND	3			
B	mg/L		0.5			0.2	0.3			ND				
Mo	µg/L													
Na	mg/L					89	99.00	85	104.00	48	109.00			
Cl	mg/L	163	224	92.2	47.1	148.33	151.50	144.17	151.08	84.89	132.75	143.20	118.30	147.30
Pesticide	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Herbicide	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate (as NO3)	mg/L	42	17.4	2.5	ND	92.00	72.8	76.73	22.5	4.06	7.46	94.5	78.2	72.5
Other [SO4*]	mg/L	199	163	133.9	84.5	188.00	174.70	170.17	150.10	162.25	155.50	142.70	132.90	150.60

**Required by TMDL*
†During the fall of 2015, due to limited supplies from the State Water Project, Colorado River water from the Jensen Treatment Plant was added to the imported water supply Camrosa receives from Calleguas.
*** Location of Conejo Creek sampling is downstream of HCTP confluence with the North and South Forks.*

Drainage reuse in the district is limited to Conejo Creek surface water, which is described in subsection B.1 and Worksheet 36 above; Worksheet 37 is therefore omitted.

C. Water Quality Monitoring Practices

1. Source Water: Water quality methods and locations are described in Worksheet 38. Conejo Creek, which comprises the drainage water that contributes to Camrosa supply, is described in the penultimate line of that worksheet; Worksheet 39 is therefore omitted.

Worksheet 38. Water Quality Monitoring Practices			
Source	**Monitoring Location**	**Method**	**Frequency**
Calleguas Meter Station 1		Grab	Monthly
Calleguas Meter Station 2		Grab	Monthly
Calleguas Meter Station 3		Grab	Monthly
Calleguas Meter Station 4		Grab	Monthly
Calleguas Meter Station 5		Grab	Monthly
Calleguas Meter Station 6		Grab	Monthly
Calleguas Meter Station 7		Grab	Monthly
Calleguas Meter Station 8		Grab	Monthly
Calleguas Meter Station 9		Grab	Monthly
Calleguas Meter Station 10		Grab	Monthly
Calleguas Meter Station 11		Grab	Monthly
Calleguas Meter Station 12		Grab	Monthly
Calleguas Meter Station 13		Grab	Monthly
Conejo Well 2		Grab	Monthly
Conejo Well 3		Grab	Monthly
Conejo Well 4		Grab	Monthly
Santa Rosa Well 8		Grab	Monthly
Tierra Rejada Well		Grab	Monthly
Woodcreek Well		Grab	Monthly
RMWTP		Grab	Monthly
Santa Rosa Well 10		Grab	Monthly
Santa Rosa Well 9		Grab	Monthly
Santa Rosa Well 3		Grab	Monthly
Conejo Creek	Several, all in-creek	Grab	Monthly
CWRF		Composite	Monthly

Section V: Water Accounting and Water Supply Reliability

A. Quantifying the Water Supplier's Water Supplies

1. Agricultural Water Supplier Water Quantities: As described at the beginning of Section IV, agricultural and M&I customers are served off of the same distribution systems, and while demand is easily quantified by Camrosa's universal metering, it impractical to separate supplies strictly for agriculture from Camrosa's supplies as a whole. Therefore, as the water supplier, all Camrosa's supplies are considered collectively herein.

Worksheet 40/41. Surface, Groundwater, and Other Supplies, 2008-2015 avg.

Source	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Imported	412	315	435	546	679	694	744	765	704	588	437	316	**6,637**
Groundwater*	262	247	314	367	420	418	451	445	424	383	404	247	**4,383**
Conejo Creek	639	576	748	776	868	779	796	789	816	791	722	489	**8,787**
Used in Camrosa	278	215	258	349	440	388	468	563	564	491	328	229	**4,571**
Transfer/Exchange†	385	402	517	390	379	364	304	170	193	246	340	300	**3,988**
CWRF	72	55	79	94	101	88	93	117	107	119	95	53	**1,072**
CamSan	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Private Pumping	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**

** Groundwater includes potable and nonpotable wells, but excludes the RMWTP, which did not come online until 2014. See Worksheet 34 for details.*
† The transfer of pumping allocations in the PV Basin in exchange for Conejo Creek surface water delivered to PVCWD occurs as per the Conejo Creek pumping agreement outlined in Section III.F and Appendix L.

In dry- and multiple-dry-year scenarios, only imported water and Conejo Creek surface supplies are expected to be impacted. Camrosa relies on its groundwater basins for supply reliability under all conditions, including single- and multiple-dry year scenarios, and therefore plans to pump according to safe yields established by our groundwater management plans.

Camrosa has not run wells in the Perched Aquifer, where the RMWTP draws supply from, for a long enough period of time to know how that groundwater formation will react to extended dry periods, but, as described in the Shallow Groundwater of Eastern Pleasant Valley Basin report (Brown, 2005; Appendix M), it is expected to be a dependable and drought-resilient source of supply.

At 21,600 square miles and nearly 2 million AF of storage capacity (Bulletin 118, Appendix T), the Pleasant Valley Basin's volume, as a whole, far exceeds the sphere of Camrosa's management influence. In the vicinity of Camrosa's Pleasant Valley wells—the existing Woodcreek Well, the well currently being built, and any new wells drilled in the area—Camrosa's production is determined by pumping allocations administered by the FCGMA, and subject to any restrictions the agency may impose, such as has occurred under Emergency Ordinance E (Appendix V) in the current drought period.

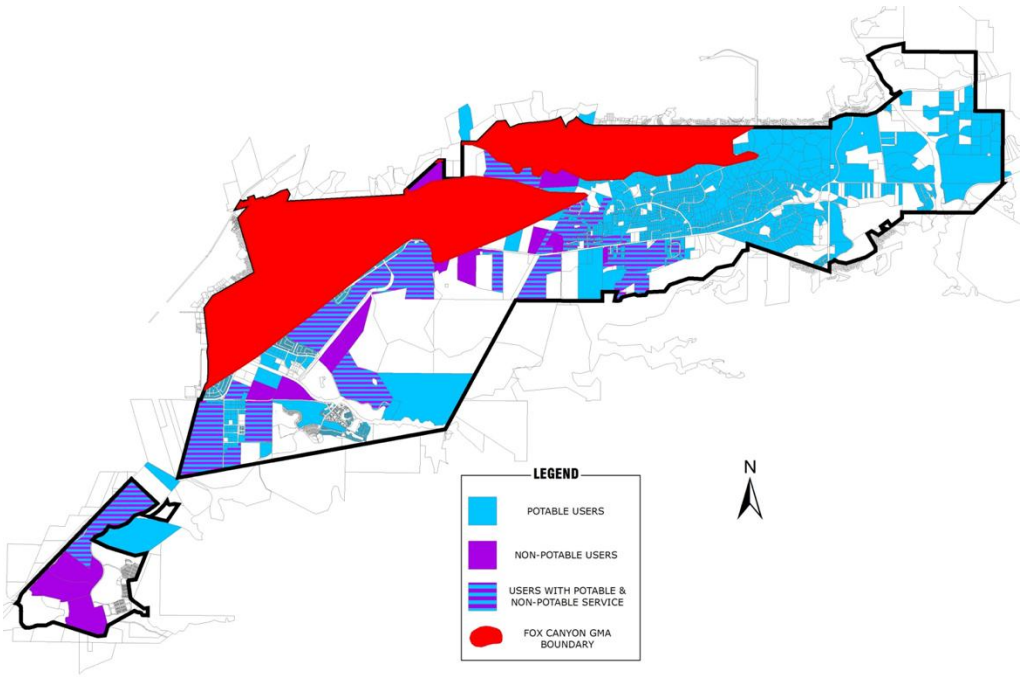

Figure 4 FCGMA area within Camrosa boundaries

Between 2008 and 2015, Camrosa imported 75,170 AF (approximately 9,396 AFY) of water into the FCGMA area, approximately 58 percent of which is delivered within the Camrosa boundaries, while the remainder is delivered to PVCWD (see Section III.F for details of the transfer and exchange program). Most of that, 41,209 AF, is nonpotable, and 33,961 AF potable (5,151 AFY and 4,245 AFY, respectively; see Table V.A.1). On average, 5,332 AFY went to agricultural use, the remainder going to M&I. Over the same period of time, Camrosa has extracted only 5,376 AF (672 AFY on average) from the PV Basin via its one well there, the Woodcreek Well (see Worksheet 34a for historical groundwater pumping details). Although the FCGMA does not account for imports into the basins under its jurisdiction, Camrosa's deliveries to customers within the FCGMA boundaries contribute to the reliability of the Santa Rosa and Pleasant Valley Basins.

Table V.A.1. Camrosa Imports into the FCGMA

	2008	2009	2010	2011	2012	2013	2014	2015	Sum	Avg.
Nonpotable Deliveries within FCGMA	5,513	5,218	6,041	7,280	5,436	4,640	3,395	3,686	**41,209**	**5,151**
Deliveries to FCGMA Area within Camrosa	884	1,220	1,161	855	1,113	1,399	1,340	1,331	9,303	1,163
Deliveries to FCGMA Area within PVCWD	4,629	3,998	4,880	6,425	4,323	3,241	2,055	2,355	31,906	3,988
Potable Deliveries to FCGMA (all within Camrosa)	5,014	4,388	3,718	3,792	4,440	4,629	4,334	3,646	**33,961**	**4,245**
TOTAL	**10,527**	**9,606**	**9,759**	**11,072**	**9,876**	**9,269**	**7,729**	**7,332**	**75,170**	**9,396**
Ag	**5,948**	**5,335**	**6,032**	**7,349**	**5,801**	**4,971**	**3,451**	**3,770**	**42,657**	**5,332**
M&I	**4,579**	**4,270**	**3,727**	**3,723**	**4,075**	**4,298**	**4,278**	**3,563**	**32,513**	**4,064**
Camrosa Extractions from FCGMA	820	807	862	775	567	0	735	810	5,376	**672**

While calls for or legal action requiring conservation do impact demand within the district, such actions do not directly affect the majority of Camrosa's supplies. Executive Order B-29-15, for example, which established a 25-percent reduction in potable urban water production statewide (the implementing SWRCB regulations of which require of Camrosa in particular a 32-percent reduction), limits Camrosa's production but does not have an effect on the district's sources of supply or supply availability.

Metropolitan Water District's limitations on the allocation of State Water Project water is the biggest contributing factor to reduced imported water supplies; Calleguas Municipal Water District, the wholesale agency from which Camrosa purchases its imported water, historically passes through any reductions it receives from Metropolitan. The ability of an outside agency that relies on supply imported from 400 miles away to impose restrictions on Camrosa's ability to serve its customers has the primary driver for Camrosa's long history of increasing its self-reliance. Our efforts have especially benefitted agricultural customers that were able to transfer to the nonpotable system, as neither gubernatorial nor local restrictions have thus far applied to nonpotable sources.

Indirectly, however, drought does have an effect on nonpotable supplies. Conservation in the City of Thousand Oaks in response to the potable-water allocations they face leads to less water at HCTP, which translates into less water in Conejo Creek. Such was the case in 2015, when Conejo Creek diversions that usually average closer to 10,000 AFY reached as low as 8,854. While this is still in excess of Camrosa nonpotable demands on an annual basis, it reduces the district's ability to transfer water to PVCWD in exchange for pumping allocations in the Pleasant Valley Basin.

2. Other Water Sources Quantities: Camrosa does not consider precipitation part of its water supply, and therefore does not include effective precipitation in its supply calculations or forecasts; Worksheet 42 is therefore omitted. See Worksheets 8 and 9 in Section II.A.4 for rainfall data.

B. Quantification of Water Uses

Camrosa Water District is very near full build-out; the Ventura County S.O.A.R. (Save Our Agricultural Resources) initiative regulates land use in much of the district service area, and land-use restrictions in residential areas prevent the subdivision of larger lots. A small number of developers have plans in the works to develop small and medium residential parcels, but the amount of growth expected is less than the average annual deviation in year-to-year demand, so projections for planning cycle are left at flat averages of the past several years.

Water loss has fluctuated between four and ten percent over the last five years. Camrosa recently engaged the services of a leak-detection firm, and, especially in light of the drought

and the incorporation of line loss into water-conservation calculations, Camrosa is dedicated to reaching line loss of five percent or less, which is what is projected over the planning cycle.

Worksheet 43/44. Quantify Water Use (AF)						
	2015	Planning Cycle				
		2016	2017	2018	2019	2020
Potable						
Residential	5,003	5,500	5,500	5,500	5,500	5,500
CII	936	1,100	1,100	1,100	1,100	1,100
Landscape Irrigation	582	600	600	600	600	600
Agriculture*	1,005	1,140	1,140	1,140	1,140	1,140
Other	38	25	25	25	25	25
Total Delivered	7,564	8,365	8,365	8,365	8,365	8,365
Total Produced	8,064	8,783	8,783	8,783	8,783	8,783
Difference	500					
% Line Loss	6%	5%	5%	5%	5%	5%
Nonpotable						
M&I	1,327	1,300	1,300	1,300	1,300	1,300
Agriculture*	4,630	5,300	5,300	5,300	5,300	5,300
Total Delivered	5,957	6,600	6,600	6,600	6,600	6,600
Total Produced	6,347	6,930	6,930	6,930	6,930	6,930
Difference	524					
% Line Loss	8%	5%	5%	5%	5%	5%
Water Leaving District†						
Recycled						
M&I	256	264	352	352	352	352
Agriculture*	1,067	1161	1549	1549	1549	1549
Total Delivered	1,323	1,425	1,900	1,900	1,900	1,900
Total Produced	1,237	1,500	2,000	2,000	2,000	2,000
Difference	-86					
% Line Loss**	-7%	5%	5%	5%	5%	5%

** See Worksheet 21 for details on agricultural water use*
† Nonpotable water leaving district is Conejo Creek water transferred to PVCWD under Conejo Creek pumping program; see Section III.F and Appendix L
***Piping, storage, and reuse at the CWRF of recycled water, and the occasional introduction of potable water into the works can artificially inflate "deliveries" of recycled water*

Camrosa does not recharge groundwater; see Section III.E for a description of future groundwater recharge plans. Besides Conejo Creek surface water deliveries to PVCWD, Camrosa does not quantify water leaving the service area, so Worksheets 45 and 46 do not apply and are not included.

C. Overall Water Budget

The quantification of water supplies and the overall water budget summary are included in Worksheet 43/44, above; see Worksheet 35 for a breakdown of projected supplies by source.

D. Water Supply Reliability

The potential issues that could result in reduction of the amount of water supply from each of Camrosa's water supply sources are discussed below. All water sources are available at consistent levels of use; changes to those levels of use would be brought around by significant and gradual changes in environmental factors, water quality and/or the climate. Where legal agreements are applicable, it is the district's policy to renew or renegotiate current agreements or search out alternative sources far enough in advance to offer ample opportunity to ensure supply prior to the current agreement's expiry. Large-scale conservation and other Demand Management Measures are discussed elsewhere in this Section.

Imported Water from Calleguas

Camrosa depends exclusively upon Calleguas Municipal Water District for its imported potable water supply. While the quantity of imported State Water Project water Camrosa relies on to meet normal-year demands has been significantly reduced from historical levels over the last 20 years due to the development of local resources, SWP deliveries still constitute approximately 60 percent of the district's potable supply, making the reliability of Camrosa's potable distribution system fairly dependent upon the reliability of Calleguas, Metropolitan, and the State Water Project.

Since 1991, Metropolitan has made significant investments in conservation, water recycling, storage and improved supplies. Groundwater storage programs with Semitropic Water Storage District and Arvin-Edison Water Storage District increase Metropolitan's out-of-region storage capacity of state water project water by 600,000 AF. Additional groundwater storage programs have been established with the San Bernardino Valley MWD, and Kern-Delta Water District that will expand that capacity further. The completion of Diamond Valley Reservoir has added 800,000 AF of supply to southern California's mix of resources available to meet dry year needs. The adoption of a "Water Surplus and Drought Management" (WSDM) Plan in 1999 by the Metropolitan Board of Directors has resulted in more effective management of water resources to further improve the reliability of water deliveries by Metropolitan Water District.

In addition, Metropolitan's 2010 Urban Water Management Plan outlines several other projects being pursued by Metropolitan and the State of California to protect and increase imported SWP supplies. These include flexible Central Valley storage and transfer programs, the Delta Action Plan, the Two-Gate System in the Delta, the Bay Delta Conservation Plan and the Water Supply Allocation Plan.

Since 1991, Calleguas Municipal Water District has also implemented a strategy for meeting rising water demands in its service area by implementing both regional and local supply augmentation and demand management programs. The Las Posas Aquifer Storage and Recovery Project has been an ongoing project that, according to the Las Posas Basin Groundwater Management Plan, has the goal of maintaining at least 25,000 AF of water in storage in the Las Posas Basin, with an estimated extraction capacity of approximately 70 cubic feet per second (CFS). Expansion of Lake

Bard Water Treatment Plant to 100 CFS has been completed. Finally, Calleguas has invested in regional recycling projects to reduce demand on imported water.

Despite these investments, recent allocation reductions and the ongoing drought demonstrate that improvements at the regional and local levels of the SWP distribution system only go so far, and reinforce that the primary threat to Camrosa's supply of potable water is the relative health of the Sacramento-San Joaquin Delta and the SWP's vulnerability to legislative rulings, climatic variations, and catastrophic interruptions of service. As such, and as discussed throughout this plan, Camrosa's primary strategy is to conserve imported water and employ alternate sources to SWP water.

Groundwater

Groundwater available to the Camrosa Water District in the four aquifers the District overlays is used to augment imported SWP water, thereby increasing self-reliance and reducing demand on the Sacramento-San Joaquin Delta. Conservation efforts have proven a great benefit to reducing the amount of imported SWP water the District demands. As the District becomes increasingly capable of utilizing more and more groundwater, the need to import SWP water will continue to decline.

The groundwater basins underlying the district service area have proven reliable supplies since Camrosa Water District was established. They are considered stable, predictable, and responsive basins. Camrosa has no reason to expect any significant and/or sudden decrease in quantity or degradation of quality in any of its basins, but for the purposes of the reliability section of this AWMP, such worst-case scenarios are assumed.

Tierra Rejada Basin

Should water table levels fall, the Tierra Rejada Well's contribution to Camrosa's supply would have to be made up for with increased imported SWP water. Should water quality degrade, water from the Tierra Rejada Basin could potentially be blended with SWP water or, if quality is poor, directed into the nonpotable irrigation water distribution system. In either case, more SWP water would have to be imported for the potable system, or the groundwater would have to be treated.

The Tierra Rejada Basin does not currently have a groundwater management plan, but the District plans to complete that in the near future.

Santa Rosa Basin

As described in Section V.A.1, Camrosa manages the Santa Rosa Basin to retain storage capacity for the recharge—currently from rain events and Conejo Creek—that it so readily receives. Unexpected reductions in the water table height in the Santa Rosa Basin could negatively affect the District's dependence on the basin, but its typical predictability and Camrosa's regular monitoring make it operationally feasible to adaptively manage. Should Santa Rosa Basin water quality significantly degrade, potable supply extracted from the basin would have to be replaced

with SWP water, or the groundwater would have to be treated. See Appendix C for the 2013 Santa Rosa Bain Groundwater Management Plan.

Pleasant Valley Basin

The FCGMA allocation for the Woodcreek Well is based on an allowance for the residential development overlying the Fox Canyon Aquifer at a rate of one acre foot per acre of land developed. As of 2010, Camrosa's allocations are approximately 806 AFY. Because this is an annual allocation, water not pumped cannot be carried over from one year to the next. However, because it is based on developed land, the allocation is considered reliable. Should water quality in the northeast Pleasant Valley Basin deteriorate, it could still be used in the potable system provided it were blended with imported water or treated.

As discussed above, the Conejo Creek pumping project allows for the accumulation of pumping allocations in the PV Basin on a one-to-one basis in exchange for nonpotable surface water delivered to PVCWD. Unlike the current allocation based on developed land, these pumping allocations do accrue year over year, up to 4,500 AFY, with no total cap or sunset of availability. Cumulative extractions by Camrosa will never exceed cumulative deliveries to Pleasant Valley.

Perched Aquifer

Due to the fact that the Perched Aquifer has not been used as a source to supply significant volumes of water for over thirty years, it is difficult to know how the aquifer will respond to renewed extraction at the proposed volumes. However, based on the Aquifer Pumping Test of Camrosa Water District's University Well (Brown 2010; Appendix N), the most recent hydrogeologic investigation, extractions are planned at a level that can be sustained indefinitely.

Recycled Water & Nonpotable Irrigation Water

The Title-22 recycled water directly from Camrosa's WRF and CamSan's WWTP, and the nonpotable surface water from HCWWTP that is diverted from Conejo Creek, all come from consistent wastewater flows. They are therefore reliable sources of nonpotable irrigation water supply, even in the driest of years.

It is expected that the Conejo Creek Diversion will consistently produce more water than needed to satisfy demands within the District and the surplus water will continue to be delivered to the PVCWD under the existing agreement.

The only foreseeable interruptions in supply service of the three sources of nonpotable irrigation water are pipeline ruptures on the short-term side and contract/agreement expirations on the long-term. In order to avoid the latter, it is Camrosa's policy to renegotiate contracts well in advance of their expiry, such as was achieved with the 40-year terms negotiated with the water-right agreement with the City of Thousand Oaks and the Conejo Creek pumping program with FCGMA.

Water Supply Shortage Stages & Conditions

On August 27, 2015, Camrosa Water District adopted Ordinance 40-15, "Rules and Regulations Governing the Provision of Water and Sanitary Services." Among other things, the ordinance establishes conditions of service for all classes of water and establishes water-use prohibitions and provisions for staged reductions in water service during water shortage emergencies. The Ordinance, included as Appendix H in its entirety, allows the Board of Directors to progress through three stages of action in the event of a water shortage emergency. Each stage conserves progressively more water from 10 percent in Stage 1 to 50 percent in Stage 3. Since all water delivered by the District is metered both as production supply and as delivered to customers, actual reductions can be measured over time, as has been the case during the current state-mandate drought reporting period. Included below are excerpts from Ordinance 40-15 pertinent to water-use prohibitions designed to curb water waste, and the district's response to water supply shortage and water emergencies.

5.14 Mandatory use of Non-Potable Surface Water or Recycled Water where Available

No person shall cause or permit water under his/her control to be used in violation of the District's water-use prohibitions. Violating water-use prohibitions may result in additional fees, charges and/or termination of service as directed by the Board of Directors. The following prohibitions are in effect at all times, regardless of whether any declared water supply shortage or water emergency condition is in effect:

1. *Gutter Flooding: No person shall cause or permit any water furnished to any property within the District to run or to escape from any hose, pipe, valve, faucet, sprinkler or irrigation device into any gutter or to otherwise escape from the property, if such running or escaping can reasonably be prevented.*
2. *Leaks: No person shall permit leaks of water that he/she has the authority to eliminate. Any detected leak, break or malfunction shall be corrected within 72 hours after a person discovers or receives notice from the District.*
3. *Positive Hose-end Shutoff: All garden and utility hoses shall be equipped with a positive hose-end shutoff nozzle.*
4. *Vehicle Washdown: Vehicles, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer shall be cleaned only by use of a hand-held bucket or a hand-held hose with a shutoff nozzle device.*
5. *Restaurant Equipment: Restaurants are required to use water-conserving dish-washing spray valves in all food preparation and utensil cleaning areas.*
6. *Water Fountains and Decorative Water Features: Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited.*
7. *Single-Pass Cooling Systems: Installation of single pass cooling systems in buildings requesting new water service is prohibited.*

5.15 Mandatory use of Non-Potable Surface Water or Recycled Water where Available

Where non-potable or recycled water is available to a property served by Camrosa, the property shall utilize such water in lieu of potable water wherever practicable. Non-Potable surface water or recycled water must be used for construction purposes when available.

5.16 Water Supply Shortage or Water Emergencies

"Water Supply Shortage" is a condition when Camrosa Water District determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. A "Water Emergency" is a condition resulting from some catastrophic event or events, which cause or threaten to cause an impairment, reduction, or severance of the district's water supply or access to its water supplies in a manner that may result in district's inability to meet ordinary water demands for potable water service. In the event of an imminent inability of the District to meet ordinary water demands for a period beyond what can reasonably be considered routine system repairs the General Manager shall report to the Board of Directors on the extent, estimated duration, cause, and estimated severity of the event or events leading to the water supply shortage or water emergency and by resolution the Board of Directors may declare a Water Supply Shortage or Water Emergency and activate one or more of the following emergency provisions of this ordinance:

5.16.1 Stage One Water Supply Shortage or Water Emergency

The goal of a stage one water supply shortage or water emergency declaration is a 10% potable water demand reduction to preserve water supplies for district and or the region until the emergency has ended. The district shall notify its customers via newspaper, radio, television and direct mail or by any other means determined by the district to be prudent that a Water Supply Shortage or Water Emergency has been declared and that the District is requesting all customers to reduce water use by 10%. In addition to the prohibited uses of water outlined in Section 5.14, the following water conservation requirements apply during a declared Stage One Water Supply Shortage or Water Emergency;

1. *<u>Leaks</u>: No person may permit leaks of water that he/she has the authority to eliminate. Any detected leak, break or malfunction shall be corrected within 48 hours after a person discovers or receives notice from the District.*
2. *<u>Wash-Down of Hard or Paved Surfaces</u>: Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by with a hose equipped with a positive self-closing water shut-off device, a low volume, high-pressure cleaning machine, or a low-volume high-pressure water broom.*
3. *<u>Drinking Water Served Upon Request Only</u>: Eating or drinking establishments, including but not limited to a restaurant, hotel, café, cafeteria, bar, or other public place where food or drinks are sold, served, or offered for sale, are*

prohibited from providing drinking water to any person unless expressly requested.

4. *Limits on Watering Durations: Watering of lawns, landscape or other vegetated area with potable water is limited to non-peak demand times and only when necessary. Use of a hand held hose with positive shut-off nozzle; bucket or micro irrigation systems/equipment may be required.*

5. *Limits on Watering Hours: Watering or irrigating of lawn, landscape or other vegetated area with potable water may be prohibited between the hours of 9:00 a.m. and 5:00 p.m. on any day.*

5.16.2 Stage Two Water Supply Shortage or Water Emergency

The goal of a stage two water supply shortage or water emergency declaration is a 20-30% reduction in potable water demands while preventing the loss of property and protecting the health and safety of the community and region. The district shall notice all of its customers via newspaper, radio, television and direct mail or by any other means determined by the district to be prudent that a Water Supply Shortage or Water Emergency has been declared and that the District is requesting customers to reduce water use. In addition to the prohibitions listed in the Stage One Water Supply Shortage or Water Emergency and the prohibited uses of water in Section 5.14 above, the following water conservation requirements to prudently preserve water supplies shall be observed;

1. *Leaks: No person may permit leaks of water that he/she has the authority to eliminate. Any detected leak, break or malfunction shall be corrected within 24 hours after a person discovers or receives notice from the District.*

2. *Limits on Watering Days: Water or irrigating of landscape or other vegetated area with potable water may be limited to three days per week on a schedule established and posted by the District.*

3. *Limits on Filling Residential Swimming Pools & Spas: Use of water to fill or refill swimming pools and spas may be limited to maintain the level of water only when necessary. Draining of pools and spas or refilling shall be done only for health or safety reasons.*

4. *Substitution of Non-potable water: No person shall permit the outdoor use of potable water for irrigation or dust abatement where non-potable or recycled water is available.*

5.16.3 Stage Three Water Supply Shortage or Water Emergency

The goal of a stage three water supply shortage or water emergency is to reduce potable water demands by 30-50% while protecting the health and safety of the community and the region. The District shall notice all of its customers via newspaper, radio, television, direct mail or any other means determined by the District to be prudent that a Water Supply Shortage or Water Emergency has been declared and that the District is requesting customers to reduce water use. In addition to the actions and requirements of a stage two emergency and the prohibited uses of water in outlined in Section 5.14

above the following water conservation requirements to prudently preserve water supplies must be observed;

1. *Irrigation Restrictions: Watering or irrigation of lawn, landscape or other vegetated area with potable water may be prohibited by the Board.*
2. *New Potable Water Service: No new potable water service will be provided, no new temporary meters or permanent meters will be provided and no statements of immediate ability to serve or provide potable water service will be issued, except as approved on an individual review by the District.*
3. *Other Prohibited Uses: The District may implement other water use requirements as determined by the District to meet water supply shortage or water emergency conditions.*

5.17 Declaration of Emergency State

The Board of Directors may move from stage to stage as necessary to best manage the water supply shortage or water emergency. Once the water supply shortage or water emergency conditions have subsided and water supplies returned to normal the Board shall by resolution declare an end to the emergency and restore service to pre-emergency conditions.

5.18 Violations of Prohibitions

Violation of any water-use prohibition during a Stage Three emergency may result in fines. Repeated violations may result in water capacity restrictions to the property or termination of service.

1. *First Violation: The District will issue a written notice to the customer indicating a violation of one or more of the water-use prohibitions or restrictions.*
2. *Second Violation: If the first violation is not corrected within the time frame specified by the District, or if a second violation occurs within the following twelve (12) months after the first violation notice, a second notice of violation will be issued and a fine of one hundred dollars ($100.00) shall be levied for the second violation.*
3. *Third Violation: A third violation within the following twelve (12) months after the date of issuance of the second notice of violation will result in a third violation and a fine of two hundred fifty dollars ($250.00).*
4. *Fourth and Subsequent Violations: A fourth violation within the following twelve months after the date of issuance of the third notice of violation will result in a fourth violation and a fine of five hundred dollars ($500.00), Each day that a violation occurs beyond the remedy allowance provided for in the fourth notice of violation results in a new violation and a fine of five hundred dollars ($500.00).*

In addition to the fines outlined above, water service may be turned off or installation of a flow restrictor on the service line or lines may be required. Such an order shall be written and subject to appeal pursuant to Section 5.19, Appeals and Exceptions. Any appeal shall be heard as quickly as possible to allow a flow restrictor to be removed promptly should the Board grant the appeal.

1. *<u>Cost of Flow Restrictor and Disconnecting Service:</u> A person or entity that violates this Ordinance is responsible for payment of the District's costs for installing and/or removing any flow restrictors.*

2. *<u>Payment of Fines:</u> The water customer is responsible for the full payment of fines. Each fine shall be applied in the customer's regular water billing. Payment of the fine will be the final responsibility of the individual named on the water account. Non-payment of fines will be subject to the same remedies as non-payment of basic water service, in accordance with this Ordinance.*

5.19 Appeals and Exceptions

Any customer may appeal a fine imposed under this Ordinance to the Board of Directors by filing a written appeal with the District within 30 days.

5.20 Reasonable Attorney Fees Paid by Customer

In the event an action is commenced in a court of law by the District to collect any obligations incurred by the use of water or sewer service, the "Customer" shall be required to pay reasonable attorney's fees if said action is successful.

Emergency stages are declared by resolution of the Board. A draft resolution is attached as Appendix R. The ordinance is specifically written to preserve the Board's discretion to prescribe rates, fees, charges and penalties at the time the emergency is declared. This ensures that the charges will be set appropriately considering the circumstances of the emergency and prevailing factors that would influence the effectiveness of such measures.

Emergency Response Plan

The District maintains an Emergency Response Plan that outlines procedures necessary to respond to emergency disasters. The purpose of that plan is to:

- Minimize damaging effects of natural or man-made disasters on the water production, water distribution, sewage collection and sewage treatment systems of Camrosa Water District;
- Restore those systems to working order as quickly as possible in the event of disasters,
- Provide local, area and state assistance where and when required during and after disasters as directed by the Ventura Operational Area Emergency Operations Center; and,
- Implement training procedures by going through mock exercises to make certain all employees are well versed in their roles.
- Pursuant to the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002, Camrosa Water District conducted a vulnerability assessment and submitted a certified copy of that assessment to the U.S. Environmental Protection Agency in June 2004. The confidential report identified known vulnerabilities and countermeasures and responses to be implemented to safeguard against this potential threat. This report was in response to an isolated request and has not been updated. Camrosa Water District, however, continues to improve the security and surveillance of all its facilities.

The District's emergency procedures are fully integrated with the Standard Emergency Management System (SEMS) to ensure effective multi-agency and multi-jurisdictional responses to emergencies. Internally, Camrosa uses the Incident Command System (ICS) structure to provide a scalable, flexible response to emergencies.

The ICS provides procedures for designation of an Incident Commander who is ultimately responsible for all operations, planning, logistics, finance and public interface associated with any given emergency. Employee recall lists are published and contact lists for emergency assistance from outside contractors, utility companies, and other agencies have been pre-prepared. The plan contemplates full and open cooperation with the public media and individual customers throughout any emergency condition.

In terms of facilities and equipment to meet catastrophic emergencies, nearly 16 million gallons of tank storage is available within the District to provide immediate gravity-powered water service for most of the District in the event of a power outage. The District has two portable diesel backup generators, one in the District Office yard and another semi-permanently positioned at the Conejo Wellfield. A permanent generator is attached to the Tierra Rejada Well, and another permanent generator will be installed at the Woodcreek Well by the end of 2011. The Camrosa Water Reclamation Facility has installed electrical generation equipment to ensure continued operations for extended periods of time and uninterrupted recycled water service. Each District vehicle is equipped with emergency food and water supplies for extended deployment as well as a full set of system plans. An emergency response trailer is also equipped with supplies and equipment to manage emergency field operations. The water system's SCADA system is set up on an independent radio system with solar-powered instrumentation and radio transmission to maintain system monitoring independent of the electrical grid.

The District maintains sufficient reserves to fund most contemplated emergencies. Extensive replacement of infrastructure, in the most catastrophic circumstances, would require additional funding from sources that would need to be determined at the time of the emergency.

Mandatory Prohibitions & Consumption Reduction Methods

Section 5.14 et seq of Camrosa Ordinance 40-15 describes mandatory prohibitions that are part of the existing water shortage contingency plan. Additional measures may be implemented at the discretion of the District Board of Directors.

In the event of a water shortage emergency, Ordinance 40-15 contemplates that special rates, fees, and/or penalty fees may be required to meet demand reductions necessary to preserve water supply. Since the circumstances prevailing at the time of the water shortage emergency will affect the management of the emergency, the existing ordinance does not presume that such fees will be applicable nor does it attempt to establish the basis for such penalties or charges in advance of the circumstances of the emergency.

Nonpotable Water Service

As discussed above, some classes of interruptible water service would be curtailed to meet potable water supply reductions. This section discusses the basis for interruptible water service. All classes of nonpotable service and certain classes of potable water service are interruptible as outlined in the following excerpts from Ordinance 40-15:

4.2.1.2 Agricultural Water Service Classifications

Agricultural Water Service is a class of service intended to serve commercial agriculture. This service, unlike Municipal Water Service is interruptible. Agricultural services may be interrupted for extended periods as a result of general water shortages, drought, maintenance requirements, and operational requirements. Agricultural Water Service may not be promptly restored following emergencies. Therefore, Agricultural service shall not be eligible for conversion to the Municipal Service without satisfying all "Will Serve" requirements as set forth in the "Camrosa Water District Will Serve Water Policy".

4.2.1.2.1. Agricultural Irrigation Water Service

Agricultural Irrigation Water Service is intended for commercial agricultural properties, which raise food crops, floral crops, nursery crops, or commercial livestock. It is not the intent of this ordinance to classify home gardens, home orchards, or pets as agricultural operations. To be eligible for Agricultural Irrigation Water Service the "Property" must include a minimum of one full contiguous, irrigated acre dedicated to commercial agriculture. The "Property" must meet all the general requirements of "Potable Water" service and have a certified backflow prevention device at the meter service.

4.2.1.2.2. Domestic Agricultural Water Service

Domestic Agricultural Water Service is intended for commercial agricultural properties, which raise food crops, floral crops, nursery crops, and commercial livestock where the "Property" includes a dwelling or dwellings in which the residential water requirements are incidental to the agricultural operation. It is not the intent of this ordinance to classify home gardens, home orchards, or pets as agricultural operations. To be eligible for Domestic Agricultural Water Service the "Property" must include a minimum of one full, contiguous, irrigated acre dedicated to commercial agriculture. The "Property" must meet all the general requirements of "Potable Water" service, have a certified backflow prevention device at the meter service, and comply with all "Will Serve" requirements as set forth in the "Camrosa Water District Will Serve Water Policy."

Water Use Monitoring Mechanisms

The District meters all water production sources and customer water services. In the event of a water shortage emergency, metering would be the primary means to monitor whether reductions are being met. Production metering is automated, real-time, and measured to the nearest gallon. Given the volume of supply, the metering is converted to acre-feet under normal operations. Production metering would provide a broad measure of overall quantity of use in generalized zones. Customer service metering provides quantification of water use by customer. Meters are typically read monthly, but could be read on a more frequent basis as necessary. Customer meter reads are read to the nearest HCF.

Section VI: Climate Change

The Department of Water Resources' *Handbook for Regional Water Planning* describes the next 100 years as a period of increased global warming that will have significant impacts on water resources across the state. According to this climate model, Southern California is projected to warm between two and eight degrees Fahrenheit above averages seen around the year 2000. Warmer springs would lead to decreased snow accumulation in the Sierra Nevadas, the principle supply for the SWP, Camrosa's source of imported water, and earlier and faster snowmelt, rendering ineffectual the Northern California precipitation much of the state relies on and to which much of Southern California owes its very existence. Warmer summers mean higher irrigation demand, which will be increasingly difficult to meet as imported demands become more strained—and as the state's population continues to grow. Under this model, local agencies will rely more and more on groundwater resources, which will already be stressed themselves in response to longer, hotter dry periods, as recharge events are fewer and farther between. As groundwater levels fall and stay overdrafted, the quality of the water that remains often degrades, as well. Wildfires are projected to occur more frequently, and be more intense, requiring greater storage and conveyance capacity, putting watershed health could suffer as a result of increased erosion, and threatening agricultural fields themselves.

Although the district has no facilities along the coast, the Conejo Creek structure, CWRF and RMWTP are on the bank of the Conejo and Calleguas Creeks. The former is built to be submersible, and is often inundated during rain events, and the other two facilities were built at elevations above the 100-year flood line. The Conejo Creek is the only perennial stream in the Calleguas Creek Watershed, and the volume of water it carries, originating as it does at the HCTP, is unlikely to be so adversely affected by drought that the health of the stream would suffer from lower, slower levels.

Whether the changes forecast by current models will affect the types of crops agricultural customers within the district grow, or the irrigation techniques they use to grow them, is difficult to anticipate; Camrosa's position is to serve our customers as much water as they need and are willing to pay for, and the alternatives to drought-susceptible resources we have developed over the course of the last 20 years and have planned for the next 20 will go a long way in meeting whatever future grower demands might be.

Section VII: Water Use Efficiency Information

Water code Section 10608.48(a) requires that "an agricultural water supplier shall implement efficient water management practices pursuant to subdivisions (b) and (c):

> (b) Agricultural water suppliers shall implement all of the following critical efficient management practices:
>
> > (1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).
> >
> > (2) Adopt a pricing structure for water customers based at least in part on quantity delivered."

As discussed in Section II.B.2, all Camrosa accounts are metered, and as shown in Worksheet 15, Camrosa's two-tier pricing structure is based at least in part on quantity delivered; a more detailed description of the pricing structure is available in Appendix I, Camrosa Water District's 2013 Water and Wastewater Rate Study. A summary of the additional EWMPs is included in Table VII.A.1.

A. EWMP Implementation and Reporting

Table VII.A.1 Report of EWMPs Implemented/Planned
(Water Code §10608.48(d), §10608.48 (e), and §10826 (e))

EWMP No.*	Description of EWMP Implemented	Description of EWMPs Planned
Critical EWMPs		
1	As discussed in Section II.B.2, all Camrosa accounts are metered	
2	As shown in Worksheet 15, Camrosa's two-tier pricing structure is based at least in part on quantity delivered	
Conditionally Required EWMPs (locally cost-effective and technically feasible EWMPs)		
1	Not feasible	
2	Title 22 recycled water produced at the CWRF is delivered to several customers; Camrosa has built and maintained specialized facilities to move recycled water up-gradient.	
3	Not feasible in current financial model	
4	Camrosa has a contractual agreement that incentivizes the use of reclaimed/surface water over groundwater pumping and/or unregulated riparian harvest	
5		A CIP project is currently being designed to build 3,000' of 16-inch recycled water pipeline to bring at least 500 AFY more recycled water to Camroa's agricultural customers. On the nonpotable side, improvements to existing infrastructure and addressing a storage deficiency will improve operations for nonpotable customers, the biggest users among which are agricultural customers.
6	Camrosa does not operate on a "water ordering" basis. Camrosa is open to and actively encourages water scheduling on our nonpotable and ag-dedicated lines to ease operation.	
7	Supplier spill and tailwater recovery systems are not feasible in the Camrosa service area, or with our distribution system.	
8		Two CIP projects are being investigated to increase the planned conjunctive use of surface water and groundwater within the Camrosa service area: groundwater recharge in the Santa Rosa Valley/Basin, and stormwater capture.
9	Although Camrosa does not have an official "canal" system, the Conejo Creek diversion structure, which produces nonpotable surface water for irrigation use, the majority of which is applied to agricultural fields, is entirely automated and able to divert the maximum allowed at all times.	
10		As part of the groundwater sustainability plan required by the Sustainable Groundwater Management Plan on the medium-priority Arroyo Santa Rosa Basin, Camrosa will facilitate and promote customer pump testing and evaluation. (As of now, it is not built into the rate structure.)
11		Camrosa recently hired a conservation coordinator to implement drought-conservation requirements as described in SWRCB Resolution 2015-0032; the coordinator may be available to implement the ag water management plan and prepare progress reports.
12	a. Camrosa contracts with the Resource Conservation District to do on-site irrigation surveys for agricultural customers b. Although most of our customers are far more expert at real-time irrigation scheduling and evapotransporation information, we consider	

Table VII.A.1 Report of EWMPs Implemented/Planned
(Water Code §10608.48(d), §10608.48 (e), and §10826 (e))

EWMP No.*	Description of EWMP Implemented	Description of EWMPs Planned
	ourselves a resource to help them develop that information and tailor it to their operations c. Our surface water, groundwater, recycled water and imported water quality data is published every year in the Consumer Confidence Report (attached as Appendix S). Recent tests, new tests, and spot tests are available to all our customers upon demand. d. Ag water management educational programs and materials are available on our website (camrosa.com) and at district headquarters for growers, staff, and the public.	
13	Camrosa staff met with Irvine Ranch Water District in 2015 to discuss the recycled water program; we are in constant contact with the Farm Bureau of Ventura County, the RCD, the USDA-NRCS	
14	Camrosa's pumping facilities are maintained and checked for efficiency on a regular basis.	
Other Optional EWMPs (as applicable)		

Notes:
*EWMP numbers correspond to (Water Code §10608.48(c)

As Camrosa has not completed an AWMP or filed an EWMP report, we cannot report on improvements since our last plan. However, as part of its water-right agreement with the City of Thousand Oaks to divert nonpotable surface water off the Conejo Creek (Permit 20952, Condition 25), Camrosa is required to submit an Agricultural Efficiency Report to the SWRCB. Initially this report was required annually, but the 2009 report indicated that overall agricultural efficiencies in the Camrosa service area exceeded 80 percent, allowing Camrosa to reduce its reporting interval to five years. Details can be found in Appendix F, but in summary, irrigators in the Camrosa service area have maintained and in some areas improved their efficiency; irrigation in the Greenbelt planning area is 99.93 percent, and overall efficiency is 95.10 percent.

Section VIII: Supporting Documentation

Agricultural Water Measurement Regulation Documentation (as applicable)

A. Legal Certification and Apportionment Required for Water Measurement

Not applicable.

B. Engineer Certification and Apportionment Required for Water Measurement

Not applicable.

C. Description of Water Measurement Best Professional Practices

Not applicable.

D. Documentation of Water Measurement Conversion to Volume

Not applicable.

E. Device Corrective Action Plan Required for Water Measurement

Not applicable.

APPENDIX A: Checklist: AWMP Component Locations				
AWMP Section	**AWMP Page**	**Guidebook Location**	**Description**	**Water Code Section**
I.A	1	1.4	AWMP Required?	EO B-29-15
	1	1.4	At least 25,000 irrigated acres or	10853
	1	1.4	10,000 - 25,000 acres and funding provided	10853
N/A	N/A	1.4	Initial AWMP prepared and adopted by December 31, 2012?	10820 (a)
N/A	N/A	1.4	December 31, 2015 update	10820 (a)
N/A	N/A	1.4	5-year cycle update	10820 (a)
N/A	N/A	1.4	New agricultural water supplier after December 31, 2012 - AWMP prepared and adopted within 1 year	10820 (b)
N/A	N/A	1.5, 4.2	1999 AWMC MOU: Report on EWMP implemented or scheduled for implementation included	10827
N/A	N/A	1.5, 5	USBR water management/conservation plan:	10828(a)
N/A	N/A	1.5, 5.1	Adopted and submitted to USBR within the previous four years, AND	10828(a)(1)
N/A	N/A	1.5, 5.1	The USBR has accepted the water management/conservation plan as adequate	10828(a)(2)
N/A	N/A	1.4	UWMP or participation in area wide, regional, watershed, or basin wide water management planning: does the plan meet requirements of SB X7-7 2.8 **(use checklist)**	10829
I.A	1	3.1 A	Description of previous water management activities	10826(d)
I.B.1	1-2	3.1 B.1	Was each city or county within which supplier provides water supplies notified that the agricultural water supplier will be preparing or amending a plan?	10821(a)
I.B.2	2	3.2 B.2	Was the proposed plan available for public inspection prior to plan adoption?	10841
I.B.1	1	3.1 B.2	Publically-owned supplier: Prior to the hearing, was the notice of the time and place of hearing published within the jurisdiction of the publicly owned agricultural water supplier in accordance with Government Code 6066?	10841
I.B.1	1	3.1 B.2	14 days notification for public hearing	GC 6066
I.B.1	1	3.1 B.2	Two publications in newspaper within those 14 days	GC 6066
I.B.1	1	3.1 B.2	At least 5 days between publications? (not including publication date)	GC 6066
N/A	N/A	3.1 B.2	Privately-owned supplier: was equivalent notice within its service area and reasonably equivalent opportunity that would otherwise be afforded through a public hearing process provided?	10841
I.C.1	2	3.1 C.1	After hearing/equivalent notice, was the plan adopted as prepared or as modified during or after the hearing?	10841
I.C.1	2	3.1 C.2	Was a copy of the AWMP, amendments, or changes, submitted to the entities below, no later than 30 days after the adoption?	10843(a)

I.C.1	2	3.1 C.2	The department.	10843(b)(1)
I.C.1	2	3.1 C.2	Any city, county, or city and county within which the agricultural water supplier provides water supplies.	10843(b)(2)
I.C.1	2	3.1 C.2	Any groundwater management entity within which jurisdiction the agricultural water supplier extracts or provides water supplies.	10843(b)(3)
I.C.1	2	3.1 C.2	Any urban water supplier within which jurisdiction the agricultural water supplier provides water supplies.	10843(b)(4)
I.C.1	2	3.1 C.2	Any city or county library within which jurisdiction the agricultural water supplier provides water supplies.	10843(b)(5)
I.C.1	2	3.1 C.2	The California State Library.	10843(b)(6)
I.C.1	2	3.1 C.2	Any local agency formation commission serving a county within which the agricultural water supplier provides water supplies.	10843(b)(7)
I.C.1	2	3.1 C.3	Adopted AWMP availability	10844
I.C.1	2	3.1 C.3	Was the AWMP available for public review on the agricultural water supplier's Internet Web site within 30 days of adoption?	10844(a)
I.C.1	2	3.1 C.3	If no Internet Web site, was an electronic copy of the AWMP submitted to DWR within 30 days of adoption?	10844(b)
I.D	3	3.1 D.1	Implement the AWMP in accordance with the schedule set forth in its plan, as determined by the governing body of the agricultural water supplier.	10842
II.A	3	3.2	Description of the agricultural water supplier and service area including:	10826(a)
II.A.1	3	3.2 A.1	Size of the service area.	10826(a)(1)
II.A.2	3	3.2 A.2	Location of the service area and its water management facilities.	10826(a)(2)
II.A.3	6	3.2 A.3	Terrain and soils.	10826(a)(3)
II.A.3	6	3.2 A.4	Climate.	10826(a)(4)
II.B.1	6	3.2 B.1	Operating rules and regulations.	10826(a)(5)
II.B.2	7	3.2 B.2	Water delivery measurements or calculations.	10826(a)(6)
II.B.3	8	3.2 B.3	Water rate schedules and billing.	10826(a)(7)
II.B.4	12	3.2 B.4	Water shortage allocation policies.	10826(a)(8)
III	13	3.3	Water uses within the service area, including all of the following:	10826(b)(5)
III.A	14	3.3 A	Agricultural.	10826(b)(5)(A)
III.B	14	3.3 B	Environmental.	10826(b)(5)(B)
III.C	14	3.3 C	Recreational.	10826(b)(5)(C)
III.D	14	3.3 D	Municipal and industrial.	10826(b)(5)(D)
III.E	15	3.3 E	Groundwater recharge.	10826(b)(5)(E)
III.F	16	3.3 F	Transfers and exchanges.	10826(b)(5)(F)
III.F	17	3.3 G	Other water uses.	10826(b)(5)(G)
IV	18	3.4 A	Description of the quantity of agricultural water supplier's supplies as:	10826(b)

IV.A.1	18	3.4 A.1	Surface water supply.	10826(b)(1)
IV.A.2	18	3.4 A.2	Groundwater supply.	10826(b)(2)
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IV.B.4	25	3.4 C	Source water quality monitoring practices.	10826(b)(4)
IV.C.1	25	3.4 B.4	Drainage from the water supplier's service area.	10826(b)(6)
V	26	3.5	Description of water accounting, including all of the following:	10826(b)(7)
V.A	26	3.5 A	Quantifying the water supplier's water supplies.	10826(b)(7)(A)
V.B	29	3.5 B	Tabulating water uses.	10826(b)(7)(B)
V.C	30	3.5 C	Overall water budget.	10826(b)(7)(C)
V.D	31	3.5 D	Description of water supply reliability.	10826(b)(8)
VI	41	3.6	Analysis of climate change effect on future water supplies analysis	10826(c)
VII	42	3.7	Water use efficiency information required pursuant to Section 10608.48.	10826(e)
VII.A	43	3.7 A	Implement efficient water management practices (EWMPs)	10608.48(a)
Table VII.A.1	43	3.7 A.1	Implement Critical EWMP: Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).	10608.48(b)
Table VII.A.1	43	3.7 A.1	Implement Critical EWMP: Adopt a pricing structure for water customers based at least in part on quantity delivered.	10608.48(b)
Table VII.A.1	43	3.7 A.2	Implement additional locally cost-effective and technically feasible EWMPs	10608.48(c)
N/A	-	3.7 B	If applicable, document (in the report) the determination that EWMPs are not locally cost-effective or technically feasible	10608.48(d)
N/A	-	3.7 A	Include a report on which EWMPs have been implemented and planned to be implemented	10608.48(d)
N/A	-	3.7 A	Include (in the report) an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future.	10608.48(d)
N/A	-	5	USBR water management/conservation plan may meet requirements for EWMPs	10608.48(f)
N/A	45	6 A	Lack of legal access certification (if water measuring not at farm gate or delivery point)	CCR §597.3(b)(2)(A)
N/A	45	6 B	Lack of technical feasibility (if water measuring not at	CCR

			farm gate or delivery point)	§597.3(b)(1)(B), §597.3(b)(2)(B)
N/A	45	6 A, 6 B	Delivery apportioning methodology (if water measuring not at farm gate or delivery point)	CCR §597.3.b(2)(C),
N/A	45	6 C	Description of water measurement BPP	CCR §597.4(e)(2)
N/A	45	6 D	Conversion to measurement to volume	CCR §597.4(e)(3)
N/A	45	6 E	Existing water measurement device corrective action plan? (if applicable, including schedule, budget and finance plan)	CCR §597.4(e)(4))

2010

Urban Water Management Plan

Camrosa Water District

7385 Santa Rosa Road

Camarillo, California 93012

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LIST OF ACRONYMS

AF	Acre-feet
AF/D	Acre-feet per day
AF/Y	Acre-feet per year
ASR	Aquifer Storage and Recovery
BMP	Best Management Practice
CamSan	Camarillo Sanitation District
CDPH	California Department of Public Health
CIS	Customer Information System
CFS	cubic feet per second
CSUCI	California State University Channel Islands
CVP	Central Valley Project
CUWCC	California Urban Water Conservation Coalition
CWRF / WRF	Camrosa Water Reclamation Facility
DHS	Department of Health Services
DMM	Demand Management Measures
DWR	California Department of Water
ETo	Evapotranspiration
FCGMA	Fox Canyon Groundwater Management Agency
GIS	Geographic Information System
GPCD	Gallons Per Capita Per Day
GPM	gallons per minute
HCWWTP	Hill Canyon Wastewater Treatment Plant
HET	High-Efficiency Toilets
ICS	Incident Command System
LAS	Lower Aquifer System
M&I	Municipal & Industrial
MCL	Maximum Containment Level
MGD	Million Gallons per Day
MS	Meter Station
MSA	Metropolitan Statistical Area
MSL	mean sea level
PHG	Public Health Goal
PVB	Pleasant Valley Basin
PVCWD	Pleasant Valley County Water District
RMWTP	Round Mountain Water Treatment Plant
RO	Reverse Osmosis
RWRMP	*Renewable Water Resource Management Plan*
SEMS	Standard Emergency Management System
SOAR	Save Open Space and Agricultural Resources
SRGMP	Santa Rosa Groundwater Management Plan
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids

UAS	Upper Aquifer System
ULFT	Ultra Low Flush Toilet
UWMP	*Urban Water Management Plan*
VCOG	Ventura Council of Governments
VC-Rule	Ventura County Regional Urban Landscape Efficiency Program
WBIC	Weather-Based Irrigation Controllers
WSDM	Water Surplus and Drought Management

Introduction

PURPOSE AND NEED

The Act requires that the Urban Water Management Plan (UWMP) developed by each agency be updated every five years and submitted to the Department of Water Resources for review. Due to newly enacted legislation, the required content of the UWMP has changed significantly for the 2010 UWMP preparation and is quite specific. A major water conservation-related bill passed during the 2009 session and signed into law by the Governor is SBX7-7, which amends the Act effective January 1, 2010. A key component of this new legislation sets a goal of 20 percent reduction in per capita water use and directs urban retail water suppliers to set both interim 2015 and final 2020 urban water use targets. Additionally, AB 1420, effective January 1, 2009, amends the UWMP Act to require that the terms of and eligibility for, any water management grant or loan made to an urban water supplier administered by the DWR, be conditioned on the implementation of water Demand Management Measures described in section 10631(f) of the UWMP Act.

This Urban Water Management Plan was adopted by the Board of Directors on June 8, 2011. The purpose of this plan is to:

- update the data contained in the Urban Water Management Plan 2005
- extend the planning horizon of that plan for an additional 5-year period
- provide comprehensive assessment of Camrosa's water resource needs for a 20-year planning period
- develop a plan to meet the Water Conservation Act of 2009's (SBX7-7) requirements for achieving interim 2015 and final 2020 urban water use targets
- provide the Department of Water Resources with information on present and future water sources and demands.

The UWMP has been coordinated with a number of agencies to ensure that data and issues are presented accurately. It fully complies with the content requirements of the Urban Water Management Planning Act and is integrated with the District's *Integrated Facilities Master Plan*.

Section 1 Plan Preparation

LAW

California Water code, Division 6, Part 2.6 Urban Water Management Planning, Section 10610 et seq.

10620(d) (2). Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

10621(b). Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c). The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

10642 Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643 An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644(a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

10645 Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

A. Coordination within the District

This plan was developed within Camrosa Water District to coincide with the 2011 update of the District's Integrated Facilities Master Plan. It reflects the most recent Water Supply and Water Demand Analyses completed for the Master Plan and relies upon relevant information on the District's groundwater resources contained the 1997 Santa Rosa Groundwater Basin Management Plan; a 2009 study by Norman N. Brown, PH.D., P.G., entitled, *Groundwater Geology and Yield Analysis of the Tierra Rejada Basin;* and J.P. Schaaf's 1998 CSU-Northridge MS thesis, *Hydrogeology of the Tierra Rejada Groundwater Basin* and various other sources of information within Ventura County on groundwater information for the Pleasant Valley, Santa Rosa and Tierra Rejada groundwater basins. This plan has also been coordinated with the Renewable Water Resources Management Plan adopted by the District in October, 2006.

B. Interagency Coordination

Of the approximately 30 square miles within the Camrosa Water District's boundaries, about 7 square miles lie within the City of Camarillo city limits, approximately 1.5 square miles lie within the boundaries of the City of Thousand Oaks and 21.5 square miles lie within the unincorporated area of Ventura County.

In 2010, 19,561 acre-feet (AF) of water was produced or imported by the District and delivered to District customers for both potable and non-potable use. Approximately 45% of the total water supply was recycled water purchased from the City of Thousand Oaks and diverted from Conejo Creek for use as non-potable irrigation supply; 8% recycled water produced from the Camrosa Waste Water Treatment Plant; 29% was imported through the Metropolitan Water District and its wholesale agency, Calleguas Municipal Water District; and the remainder of the water was pumped from local groundwater aquifers. Two aquifers, the Tierra Rejada Groundwater Basin and the Santa Rosa Groundwater Basin, lie wholly within the District's boundaries and jurisdiction, while the Fox Canyon aquifer system, of which the District accesses only a portion for both water storage and recovery, is managed by the Fox Canyon Groundwater Management Agency (FCGMA), which was established December 21, 1982.

In June 2006, the District adopted the *Integrated Regional Watershed Management Plan for the Calleguas Creek Watershed*. The District developed the IRWMP in coordination with the Cities of Thousand Oaks, Camarillo, and Simi Valley; Calleguas Municipal Water District, Ventura County Water Works Districts 1 and 19, Ventura County Resource Conservation District; and Santa Monica Mountains Recreation and Conservation Agency. The broader Watershed Plan seeks to reduce reliance on imported water and over-drafted, confined groundwater aquifers by reclaiming poor quality, unconfined groundwater supplies and otherwise expanding water recycling projects.

The Watershed Plan, developed by a broad cross-section of stake holders, provides an umbrella under which this Urban Water Management Plan has been developed. A *Renewable Water Resources Management Plan* (RWRMP), prepared through consensus of the stakeholders involved in the Watershed planning effort, outlines an integrated set of facilities necessary to achieve the regional goals contained in that plan. The facilities envisioned in the plan reduce reliance on imported water supplies while improving water quality through the managed transport of salts out of the watershed. The goals and objectives of the RWRMP are reflected in the projections and projects incorporated in this UWMP.

Copies of the draft 2010 Urban Water Management Plan were circulated and coordinated with the following agencies with direct interests in District's plan:

- Calleguas Municipal Water District (wholesaler)
- City of Camarillo
- City of Thousand Oaks
- California State University - Channel Islands
- County of Ventura
- Pleasant Valley County Water District

Table 1 below summarizes the efforts Camrosa Water District has taken to include various agencies and citizens in its planning process.

Table 1. Coordination With Appropriate Agencies

Coordinating Agencies	Participated in UWMP Development	Contacted for Assistance	Received Copy of Draft	Commented on the Draft	Sent a Notice of Intention to adopt	Attended public meetings
Wholesaler (Calleguas MWD)		X	X		X	
Retailer (City of Camarillo)		X	X		X	
Retailer (City of Thousand Oaks)			X		X	
County of Ventura			X		X	
Cal State Univ. Channel Islands			X		X	
General Public			X		X	

C. Public Outreach, Plan Adoption, Submittal, and Implementation

In addition to coordination with other agencies, Camrosa Water District has solicited input from District customers and the public at large. Over the course of the last three years, the District has conducted a series of public meetings with groups of constituents to discuss priorities relative to water quality, reliability and cost, and to gauge public opinion on issues related to water conservation, recycling and reuse. Pertinent information from public interface has been used in the preparation of this Plan.

The District prepared this update to its Urban Water Management Plan over a period of several months during the same period that a new District *Integrated Facilities Master Plan* was being developed. Prior to the public hearing to review the plan and accept public input, notices were properly published in a local newspaper of general circulation within the District on May 7 and May 14, 2001, pursuant to Section 6066 of the Government Code. Information regarding the public hearing prior to adoption of this UWMP was also advertized in monthly bills and on the District's Web site.

The updated UWMP was adopted by the Board of Directors on June 8, 2011 and submitted to the California Department of Water Resources, the California State Library, the County of Ventura and cities within the District's service area within 30 days of adoption as required by the Urban Water Management Planning Act. This UWMP will be available for public review at Camrosa Water District headquarters during normal business hours. A copy of the resolution adopting the Urban Water Management Plan is attached as Appendix A. This plan includes all information necessary to meet the requirements of California Water Code Division 6, Part 2.6 (Urban Water Management Planning).

Section 2 System Description

LAW

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631. (a) Describe the service area of the supplier, including climate, current and projected population (population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier [and] shall be in five-year increments to 20 years or as far as data is available.

A. Location and Facilities

Camrosa Water District was formed in 1962 under the California Water Law section 30000 et. seq. as the Camarillo County Water District. Its original purpose was to supply potable water within its established boundaries. Subsequently, the District expanded its boundaries and also its operations to include wastewater treatment services. The District's name has changed twice, first, to the Camrosa County Water District in 1965 and then to its present name in 1987. Camrosa is among the largest water districts in Ventura County in number of connections and population served.

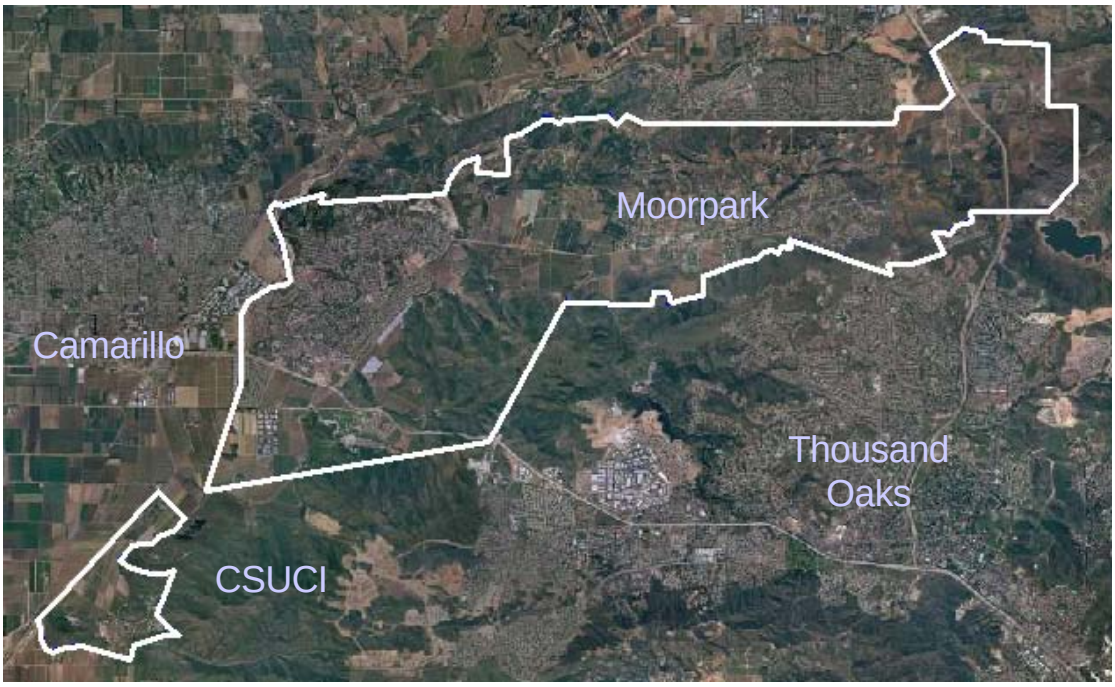

Figure 1 – Camrosa Water District Service Area Boundaries

Camrosa Water District is located, as shown in Figure 1, in the southern portion of Ventura County, surrounded by the Cities of Camarillo, Simi Valley, Moorpark and Thousand Oaks. In terms of geographic features, the District is bounded by Calleguas Creek on the west, the Las Posas Hills on the north, the Simi Hills on the east and the Conejo Hills on the south. Some of these features help define the Terra Rejada, Santa Rosa and Pleasant Valleys. The District serves three classes of water and provides wastewater services to various portions of this area.

B. Potable Water Service

Potable Water Service that meets all primary drinking water standards set forth by the California Department of Public Health is provided throughout the District, as illustrated by the highlighted areas in Figure 2 (different shades represent various pressure zones). Potable water is primarily a blend of State Water Project water imported through Calleguas Municipal Water District and well water obtained from the Tierra Rejada, Santa Rosa and Fox Canyon groundwater basins. The backbone of the potable water system was constructed in the late 1960's and service has been extended into newly developed areas, primarily by developers, in the ensuing years.

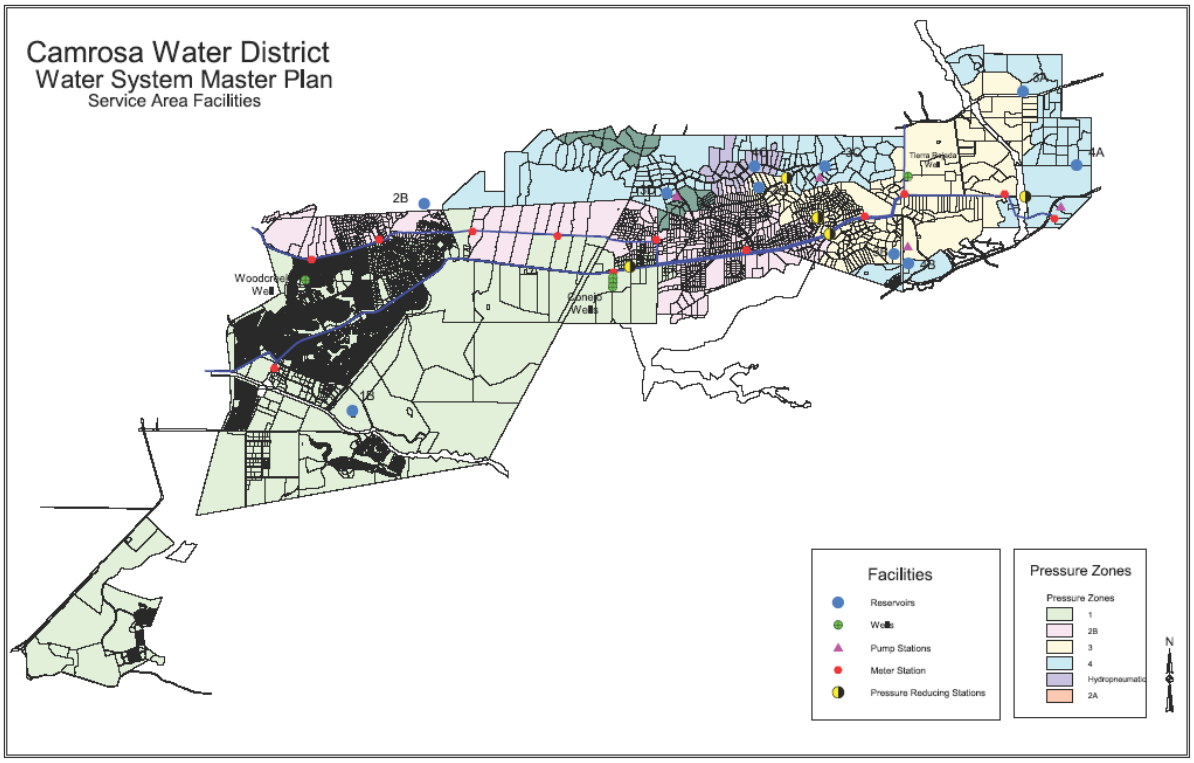

Figure 2 – District Potable Water Service with Facilities

Service was extended by agreement to California State University Channel Islands (CSUCI), located in the discontiguous area southwest of the main District boundaries, in 1981. Water is provided to CSUCI through a master meter located at the CSUCI property line. CSUCI owns and operates its own storage tanks and distribution system for the campus property.

In 2000, Camrosa acquired the distribution system of the Santa Rosa Mutual Water Company and began providing both potable and non-potable service to approximately 240 large parcels in Santa Rosa Valley. With the exception of the CSUCI system, Camrosa owns and operates all potable water distribution facilities within the District boundaries.

Camrosa's potable water distribution system consists of 150 miles of buried pipeline, with diameters up to 24 inches. The District also operates 10 reservoirs with a total storage capacity of 14.3 million gallons (or about 44 AF). The elevation differences within the District's service area necessitate the use of five pumping stations to provide service to customers at higher elevations. Roughly 79% of the potable water served by the District is used for residential, commercial, and industrial uses while the remaining water is used to serve agricultural and other irrigation needs. The District serves approximately 7,990 residential, municipal and industrial water connections and about 90 potable agricultural connections.

C. Recycled Water Collection and Treatment Systems

1. Wastewater Collection System

Wastewater service areas for the Camrosa Water District and the City of Camarillo are the result of an agreement negotiated between the agencies more than 45 years ago. Both City and District boundaries have changed several times in the intervening years resulting in service areas which do not necessarily comport to political boundaries (see Figure 2). Portions of the Camrosa water service area fall within the City boundaries. In the Mission Oaks area in particular, Camrosa is responsible for both potable water delivery and wastewater collection even though these areas are now within the City of Camarillo political boundaries. The City of Camarillo is responsible, through the Camarillo Sanitary District, for wastewater service in most of the unincorporated area of Camrosa south of US Highway 101, with the exception of annexed County and California State University property in the vicinity of the Camrosa Wastewater Reclamation Plant. The graphic below depicts the service areas in more detail.

The recycled water plan for Camrosa Water District is a cooperative effort among the City of Thousand Oaks, Calleguas Municipal Water District, Pleasant Valley County Water District, CSUCI, the City of Camarillo, and the Camarillo Sanitation District and is largely documented in the form of agreements between Camrosa and those agencies. These agreements for the use and distribution of recycled water produced by the various waste treatment plants provide the basis for the plan.

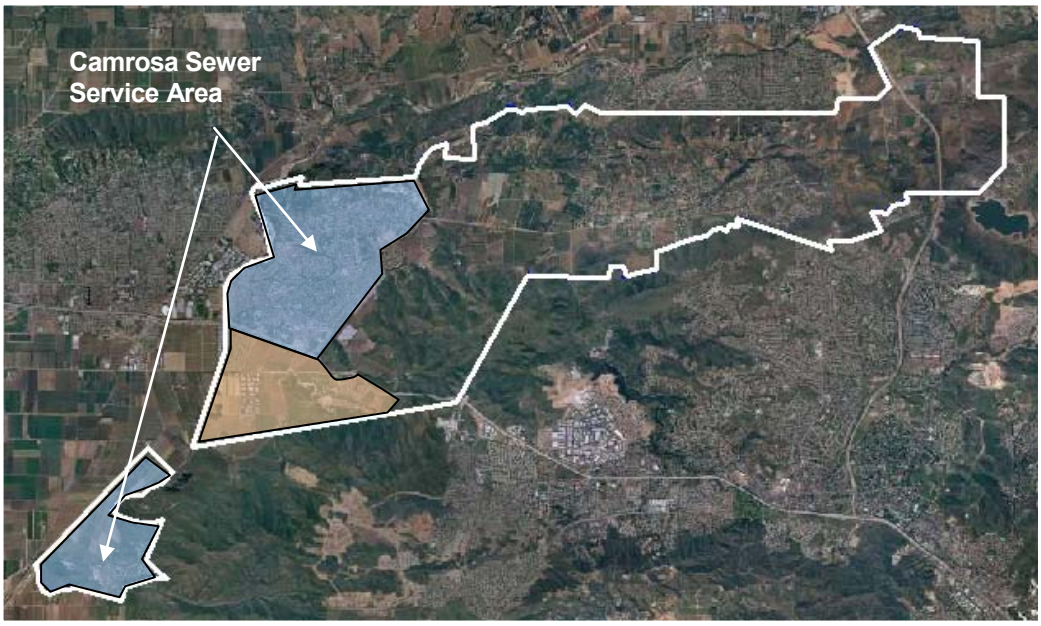

Figure 2 – Camrosa and Camarillo Sanitation District Service Areas

2. Camrosa Water Reclamation Facility (CWRF)

Commissioned in 1997, Camrosa operates a state-of-the-art Water Reclamation Facility. With a capacity of 1.5 Million Gallons per Day (MGD), the facility reclaims wastewater collected from approximately 9,200 connections in the central portion of the District.

The CWRF uses an anaerobic process to breakdown and consume the organic material in the incoming wastewater. A portion of this mixture flows through an anoxic zone where microorganisms denitrify the water biologically by consuming additional organic matter and reducing nitrates to nitrogen gas.

The water moves through both secondary clarifiers and tertiary filters to remove the remaining suspended solids to produce a clean, clear effluent. Disinfection is achieved through the addition of sodium hypochlorite to the filtered water to destroy harmful bacteria. The chlorinated water achieves the required contact time in the chlorine contact basin to ensure maximum bacterial reduction before the final product is pumped off-site to storage ponds for reuse.

Once disinfected, the tertiary treated water is stored in holding ponds and distributed to both agricultural and public landscape users through the recycled water distribution system. The ponds have a storage capacity of nearly 300 AF. During extremely wet periods, when there is no irrigation demand, surplus recycled water is discharged to Calleguas Creek, in which it runs to the ocean. Since 2000, the only discharge of excess effluent to Calleguas Creek has been 90 AF during the heavy storms of January and February, 2005.

The plant is being expanded to 2.25 MGD to accommodate District growth, primarily at CSUCI and is expected to be re-rated by summer, 2012. The CWRF produced approximately 1,522 AF of recycled water in calendar year 2010 and it is expected that plant recycled water production will continue to increase to approximately 2,200 AF/Y by 2035, necessitating the current expansion.

3. Conejo Creek Diversion Project

Backed by a voter-approved bond issue in 1966, the City of Thousand Oaks purchased the Hill Canyon Treatment Plant from the Conejo Valley Sanitary Company and began providing wastewater treatment within the city boundaries. Today, this facility provides treatment for wastewater from about 90 percent of the City. The Hill Canyon Treatment Plant currently treats an average of 11.0 Million gallons of wastewater per day. The water is treated to a tertiary level that complies with a wide variety of operational permits and is eventually discharged to Conejo Creek. Over time, the total volume of wastewater treated at the HCWWTP is expected to increase to 14.5 MGD and produce nearly 16,200 acre-feet of recycled water per year. This non-potable irrigation water serves a number of purposes, including support of a wetlands mitigation project, aquifer replenishment in the Santa Rosa Valley, serving riparian needs along Conejo Creek and serving irrigation needs in the Santa Rosa Valley and on the Oxnard Plain.

In 1997, the State Water Resources Control Board (SWRCB) issued Water Rights Decision 1638 granting a water right of up to 21.7 cubic feet per second (CFS) to the City of Thousand Oaks. Under a series of agreements between the City of Thousand Oaks, Calleguas Municipal Water District, the Pleasant Valley County Water District, and Camrosa; the Camrosa Water District purchases the water granted under the water right. The agreement regarding Camrosa's primary access to HCWWTP recycled water in Conejo Creek was executed in 1994. This 25-year contract will expire in 2019. Camrosa is currently in the process of renegotiating the agreement to retain rights to Conejo Creek water. Camrosa also built and operates the surface water diversion and associated pipelines, the "Conejo Creek Diversion Project," to distribute the water. Under agreements reached with private diverters, all of the private diverters have connected to the Camrosa potable water or non-potable irrigation water distribution systems since the Conejo Creek Diversion Project became operational.

Camrosa purchases all of the effluent discharged into Conejo Creek from HCWWTP and diverts it 6.8 miles downstream at the Conejo Creek Diversion Structure, which is located 300' south of US Highway 101. Water is diverted from the Conejo Creek using a specially designed diversion/pump plant structure located on the western embankment of the creek. The US Department of Fish and Game requires that 6 cubic feet per second (CFS) be returned to the creek from the diversion facility; besides that, the District captures all water that flows down Conejo Creek. During storms and prolonged wet periods, irrigation demand approaches zero and it temporarily goes offline. Approximately 3 miles of 30" pipe carry the diverted water from the structure to Camrosa's storage ponds, located near CSUCI. A pumping station at the ponds moves water as needed into District service areas in Camarillo and the Santa Rosa Valley through its Non-Potable Surface Water Distribution System, which is completely separate from the non-potable Recycled Water Distribution System described above in Section 2.C.2.

Surplus non-potable surface water is delivered west to Pleasant Valley County Water District PVCWD), where it is used as an irrigation source in lieu of groundwater that would otherwise be pumped from the Fox Canyon Basin. Further details concerning the use of non-potable surface water diversions from Conejo Creek are discussed directly below and in Section 4.E.2.

4. Camarillo Sanitary District (CamSan) Wastewater Treatment Plant

The Camarillo Sanitary District (CamSan) was formed in 1955 to provide wastewater treatment for most of what is now the City of Camarillo. The treatment plant occupies a 20-acre site on Howard Road next to Conejo Creek within the Camrosa Water District boundaries. Although the District does not currently receive water from CamSan, plans are in place to begin using tertiary-treated plant output in the District's non-potable recycled water distribution system by 2015 (see Section 4.E.3).

After primary treatment the wastewater undergoes secondary treatment using an "activated sludge treatment" process and is then sent into secondary clarifiers and ultimately disinfected in a contact basin using chlorine. Dechlorination is accomplished with sulfur dioxide before the effluent is delivered for agricultural purposes or discharged to Conejo Creek.

Over the years the treatment plant has undergone several modifications to increase its capacity and to incorporate new technologies. Construction is underway to install tertiary filtration to the treatment train to produce recycled water that meets all DHS Title-22 requirements. The plant currently treats about 4.0 million gallons of wastewater each day, with a maximum capacity of 6.75 million gallons.

D. Non-Potable Irrigation Water Service

Camrosa Water District has two distinct non-potable water distribution systems; one that distributes tertiary-treated, Title-22 product from Camrosa's Water Reclamation Facility and the other that delivers a blend of non-potable surface water diverted from Conejo Creek and local, non-potable groundwater. Due to significant differences in health code regulations and legal definitions between diverted surface water and Title-22 recycled water, the two systems are completely separate within the District; each has its own distribution system and storage facilities. The current service area for Title-22 recycled water from the CWRF is highlighted in purple in Figure 3 below. The service area encompasses all of the parcels adjacent to and surrounding CSUCI, including the campus itself and neighboring farmland, with the exception of the County-owned parcels in the northwest of the Campus Area.

The Conejo Creek Diversion Project was inaugurated in 2000. Non-Potable Surface Water, originally discharged from the City of Thousand Oaks' Hill Canyon Wastewater Treatment Plant 6.8 miles upstream from the diversion structure, is diverted from Conejo Creek and used for both landscape and agricultural irrigation in the areas highlighted in green in Figure 3. In some areas of the District, this water is augmented with groundwater to meet peak irrigation demands.

Areas that receive non-potable surface water include the County-owned property near CSUCI, farmland surrounding the Adolfo Industrial Park, farmland near the diversion structure and adjacent to the non-potable irrigation system pipeline into Santa Rosa Valley and the large agricultural area that lies within the Santa Rosa Valley Greenbelt area. Approximately 240 residential parcels, formerly a part of the Santa Rosa Mutual Water Company, receive both potable water as well as non-potable surface water to meet outdoor irrigation needs. In 2008, Leisure Village, a 415-acre retirement community, transferred over 550 AF/Y of landscape irrigation to the non-potable distribution system. Non-Potable irrigation water surplus to the District's needs is delivered to PVCWD and stored in the PVCWD reservoir located near the Camarillo airport.

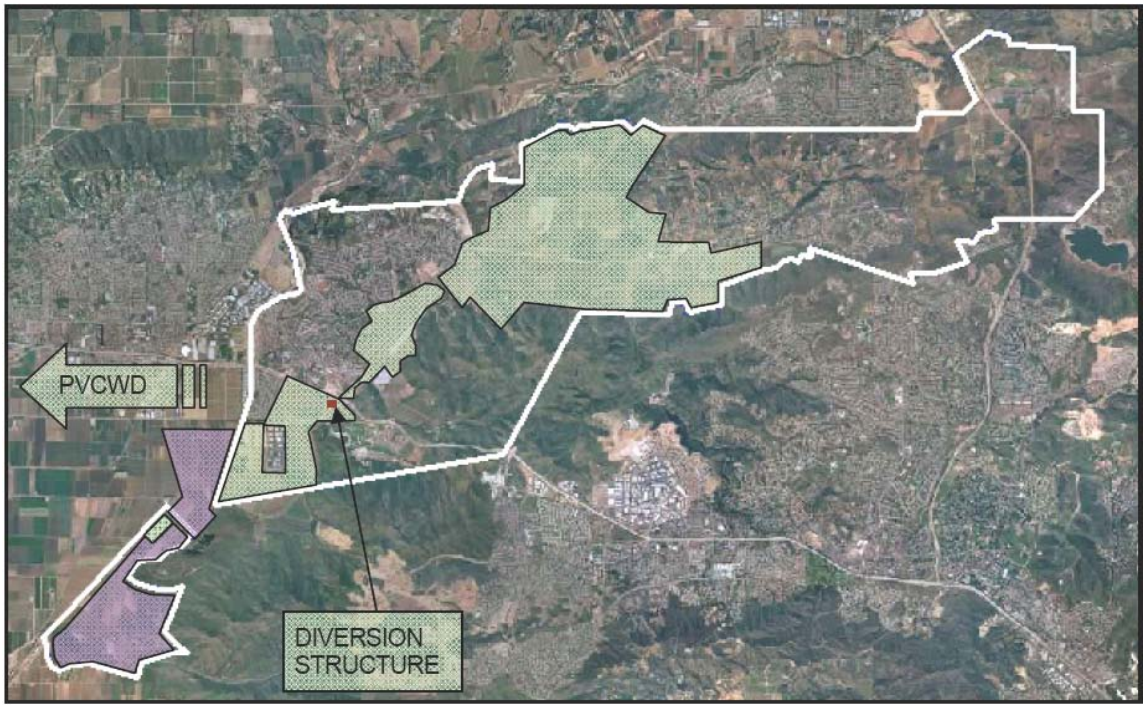

Figure 3 – Non-Potable Irrigation Water Service Areas

Although the two classes of non-potable water Camrosa serves are distinct and are delivered via separate distribution systems, they are both comprised primarily of tertiary-treated product from wastewater treatment plants and are therefore extremely reliable sources of non-potable irrigation water supply, even in the driest of years. For the purposes of this UWMP, in order to streamline calculations and condense explanation, the volume of non-potable water from the CWRF and the volume diverted from Conejo Creek are considered together and referred to collectively as "Non-Potable Irrigation Water" since both are used to meet irrigation demand within the District.

E. Topography and Climate

The majority of the developed area within the District is in three connected valleys. The Tierra Rejada Valley connects to the Santa Rosa Valley through a narrow gap in the hills cut by the Arroyo Santa Rosa. From there, the floor of the Santa Rosa Valley slopes gently down in a westerly direction to meet the broader Pleasant Valley near the western edge of the District. The Conejo Hills, which run along the Southern edge of the District, reach elevations of over 1,000 feet (about 700-800 feet higher than the adjoining valley floor). Owing to their steep nature, much of this hilly area remains undeveloped. To the north, the Las Posas Hills are not quite as steep as the Conejo Hills and have been subject to substantially more development.

The climate within Camrosa's service area is typical of Ventura County, Mediterranean in nature with generally mild temperatures and moderate rainfall. Based on precipitation stations maintained by Ventura County Flood Control District, Camrosa's service area receives an average of almost 15 inches of rainfall per year, varying from less than six inches in the driest years to more than 30 inches in the wettest years. On average, more than 90 percent of the annual rainfall occurs during the six-month period extending from November through April.

The average temperature fluctuates between an average low of about 44 degrees (January) and an average high of about 75 degrees (August). Table 2, based on the period of record May 1998 through January 2010 for the Oxnard California WFSO 045672 station, lists the monthly average climatic data for the Camrosa Water District Service area.

The Evapotranspiration (ETo) averages for the service area are also contained in Table 2. These monthly averages are based on historical data obtained from Station 156 – Camarillo, CA for the period October 2001 through January 2010.

Table 2. Monthly Average Climatic Data

Month	Standard Monthly Average ETo (inches per month)	Monthly Average Maximum Temperature (°F)	Monthly Average Minimum Temperature (°F)	Monthly Average Total Precipitation (inches)
January	1.83	66.8	45.6	2.91
February	2.20	65.9	45.7	3.76
March	3.42	66.9	47.0	1.75
April	4.49	67.6	48.1	1.24
May	5.25	70.0	52.8	0.44
June	5.67	72.5	56.4	0.03
July	5.86	75.8	59.5	0
August	5.61	76.0	59.2	0
September	4.49	74.8	57.7	0.10
October	3.42	73.7	53.7	0.63
November	2.36	70.3	48.8	1.19
December	1.83	66.4	44.8	1.60
Total	**46.43**	**N/A**	**N/A**	**13.64**

F. Demographic Factors

With the exception of the last several years of economic downturn, the number of connections and volume of water served within the District has grown slowly, but steadily since the formation of the District. Ventura County was predominantly an agricultural area when the District was formed and has struggled to maintain a viable agricultural economy in spite of pressures to develop agricultural acreage into more intensive urban uses. Primarily in response to these pressures, the voters of Ventura County and the City of Camarillo approved separate Save Open Space and Agricultural Resources (SOAR) initiatives designed to protect and preserve the community's agricultural and greenbelt resources. In accordance with the initiatives and the resulting adopted ordinances, any lands designated as Agricultural, Open Space or rural within the Ventura County's General Plan or within the City of Camarillo General Plan Map will remain so designated at least until December 31, 2020, unless the re-designation is approved by a vote of the people. Within Camrosa Water District, SOAR will have its greatest impact by preserving the Santa Rosa Valley and Tierra Rejada Greenbelt areas. This plan assumes that existing zoning designations and land uses will continue through the year 2020 and, even if the SOAR initiative lapses the existing land use and zoning designations will not change appreciably in the 15 years between 2020 and 2035

1. Historical Development with the City of Camarillo

a. Development within the City of Camarillo

In 1981, voters in the City of Camarillo approved a ballot measure limiting residential development to 400 units per year. In November 2005, the City Council took action to extend the growth ordinance for a period of 10 years, to expire in 2015. Since there still appears to be broad support for this annual growth restriction within the Camarillo city limits and there is no reason to believe the ordinance will not be extended again when it nears expiration.

During the planning horizon of this Urban Water Management Plan, the City of Camarillo is expected to reach full build-out. While projected growth rate within the City limits is bound by the City's growth ordinance, as a practical matter few parcels remain to be developed in that portion of the City that lies within the District service area and it is assumed that those parcels will be fully developed within the timeline of this UWMP.

b. Population Growth within the City of Camarillo

Overall, the growth rate for the City of Camarillo is projected by the Ventura Council of Governments (VCOG) to average approximately 1.2% per year through 2025 (VCOG projections for 2030 and 2035 – Not Available). On the whole, the City of Camarillo is growing at a slightly faster pace than the County of Ventura in its entirety. The pace is expected to slow considerably as the City approaches build-out. Growth in the unincorporated area of Ventura County is projected to be slightly less at 1.0 % per year while growth in the County as a whole, including all incorporated cities and the unincorporated areas, is projected to be slightly less than 0.9% per year.

c. Population Growth on the CSUCI Campus

The population estimates available from 2010 census tracts provide reasonable population growth-rate estimates for five of the six planning divisions in the District. The sixth planning division, the Campus Area, must be considered separately. CSUCI's projected development of additional housing units in the eastern Campus Area and ultimate build-out of dormitories to 2,000 beds will add approximately 3,300 new residents to the District over the planning period. Nearly two-thirds of that growth is expected to occur in the next 10 years. The daily commuter population will add additional demand for both water and wastewater services.

CSUCI has prepared a comprehensive master plan that estimates the future water and wastewater requirements for the Campus properties. The university has a reserved capacity of 700,000 GPD in the CWRF and has reserved sufficient capacity to provide for future wastewater flows. Further, CSUCI has estimated future water needs and has determined that it can live within existing water service agreements if recycled water is provided to meet irrigation demand. A separate recycled water system is complete and is now serving the campus. CSUCI existing and future potable and recycled water demands have been defined and are considered within this UWMP.

d. Population Growth within the District

The principal residential demand served by Camrosa comes from the eastern portion of the City of Camarillo. The remainder of the population is in Santa Rosa Valley, which does not expect any appreciable growth. It is therefore reasonable to assume that the rate of growth within Camrosa Water District urban areas outside of the CSUCI campus will mirror projected urban growth rates for the City of Camarillo.

Although the official projected growth rate for the unincorporated area of the County as a whole is 1.0%, non-urban growth within the District is not expected to be that high. The large greenbelt areas within Santa Rosa Valley and Tierra Rejada Valley will likely result in rural growth rates substantially less than that projected for the unincorporated areas of the County as a whole. It is expected that the growth rate for unincorporated areas within the District as a whole will likely average 0.75% or less as the Countywide SOAR initiative dampens growth in the Santa Rosa Valley for the foreseeable future. An even lower growth rate of 0.25% for the greenbelt areas will be assumed for the 25-year planning horizon.

2. District Population Projections

Census tract information as shown in Figure 4 below was obtained from the County of Ventura to establish the actual District population as of the 2010 Census. That data provided population counts and average parcel density for those parcels included in each tract.

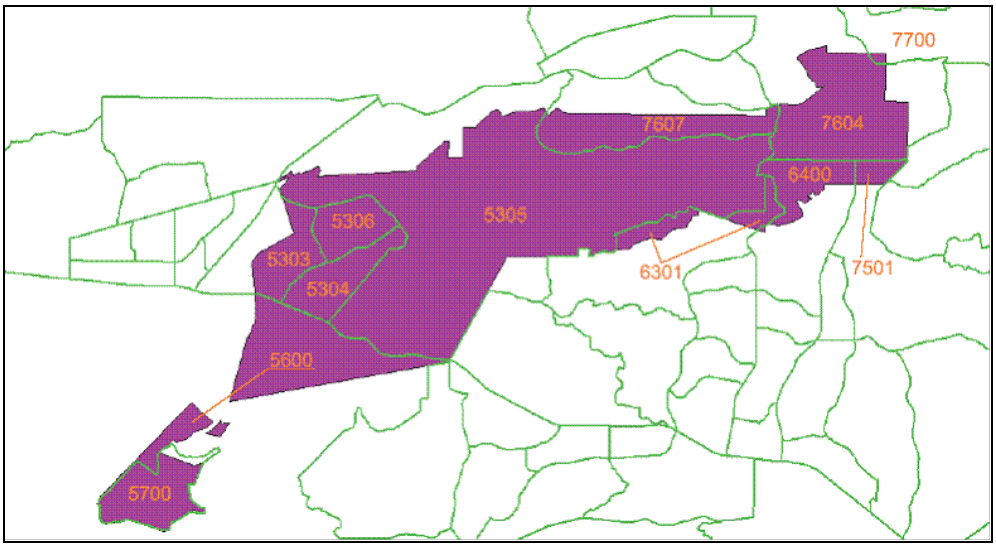

Figure 4 – 2010 Census Tract Number and District Boundaries

Source: Ventura County Resource Management Agency

Because the census tracts do not exactly coincide with District boundaries, the census tract boundaries were overlaid with the service boundaries and, using a count of parcels contained both within the service area and the Census tract multiplied by the average parcel densities for that census tract, to estimate District population in 2010. To project future population, growth projections for the City of Camarillo and the unincorporated County were applied to 2010. Table 3 contains the resulting population determinations.

Table 3. Population - Current and Projected

	2010	2015	2020	2025	2030	2035
Service Area Population	26,931	30,701	32,850	34,164	35,531	36,242
Source	Ventura County RMA derived from California DOF and US Census Bureau Data					

Section 3 System Demands

LAW

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631 (e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and (I) Agricultural.

(2) The water use projections shall be in the same 5-year increments described in subdivision (a).

A. Water Demand Analysis

Camrosa Water District serves potable water to a number of different water uses including residential, commercial & industrial, agricultural, institutional and governmental. Within these different water uses there are various categories ranging from high-density residential condominiums and apartments to low-density, large estate-style homes, master-metered communities, business parks, agricultural growers and other uses. It is a complex matter to determine the distribution of potable water demand over the District's service area.

Projected demands were calculated using current and estimated demands received from large users and in-house estimates based on current use and zoning designations. Future demand was estimated based on expected growth within the District, changes in zoning designations, and the transfer of potable water use to non-potable irrigation water distribution system. All related projects are discussed at length in the District's *Facilities Master Plan* and are summarized in Section 4.F.

1. 2010 Total Demand

The total 2010 demand by customers served by the Camrosa Water District was approximately 15,025 AF, as shown in Table 4, below. This includes all of the demand for water within the District, including potable water (imported and groundwater wells), diverted non-potable surface water and non-potable recycled water. These totals do not include surplus deliveries outside the boundaries of the District.

2010 was an extremely wet and cool year and demand was far below the preceding several years. In order to establish a more accurate approximation of current usage on which to base future demand projections, a normalized current year was established by averaging usage of the previous five years, as explained below in Section 3.B, Water Demand Projections.

Table 4. Total Demand: Accounts and Volume – 2005 & 2010

	2005		2010	
Potable Water Sectors	**# of accounts**	**Volume (AF/Y)**	**# of accounts**	**Volume (AF/Y)**
Residential (all)[1]	7,027	6,478	9,918	5,397
Commercial/Industrial	178	1,036	207	579
Institutional and governmental	16	781	116	422
Landscape	581	624	581	653
Agriculture	249	1,299	89	506
Other (Misc)	130	94	113	12
Other (Potable Line Loss)	N/A	843	N/A	691
Total Potable	**8,181**	**11,155**	**11,024**	**8,261**
Non-Potable Irrigation Water				
Municipal & Industrial (all[1])	248	566	244	1,253
Agriculture	37	3,443	126	5,512
Other (Non-Potable Line Loss)	N/A	N/A	N/A	N/A
Total Non-Potable Irrigation	**285**	**4,009**	**370**	**6,765**
Total District Demand	**8,466**	**15,164**	**11,394**	**15,025**

1) Breakdown between Single- and Multiple-Family Dwellings not available

a. District M&I Demand

Potable Municipal and Industrial (M&I) demands include demand by all non-agricultural sectors including residential, public, landscape, and commercial and industrial users. The Potable M&I service area is generally concentrated in the western end of the District, within the City of Camarillo and includes the Mission Oaks, and Camarillo Springs Divisions. Commercial usage is primarily community shopping centers with grocery stores, small restaurants, retails stores, and offices. Industrial uses are light industry, again with low water demands. The Camarillo Springs area also includes the Camarillo Springs Golf Course. There is also a golf course and driving range within the Tierra Rejada Division at the eastern end of the District that are part of this category.

As the District expands its non-potable water distribution systems, additional neighborhoods will be able to take advantage of non-potable surface water for landscape irrigation. The area formerly served by Santa Rosa Mutual Water Company is already a dual-plumbed neighborhood and the common landscape areas of the master metered community of Leisure Village in Eastern Camarillo were converted to non-potable surface water in 2009.

b. District Agricultural Demand

Amongst agricultural users in the District, there is a demand for potable water and both classes of non-potable irrigation water: Title-22 WRF product and non-potable surface water diverted from Conejo Creek. The three primary areas within the District where agricultural demand exists is in the Eastern end of the District in Tierra Rejada Valley, in the Central Greenbelt area just east of the Camarillo City limits and extending into Santa Rosa Valley, and in the vicinity of the CSUCI campus in the Southwestern portion of the District.

Agricultural lands in the vicinity of the University and Camrosa's Water reclamation facility are the primary users of recycled water produced by the CWRF. Recycled water is the primary source of supply for these customers and is used almost exclusively due to its low cost, abundance and superior quality to local groundwater in the perched aquifer.

Non-potable irrigation water is supplied to agricultural users in the Central Greenbelt area. This surface water is augmented with untreated groundwater to meet demands in the eastern-most extremes of the service area. For some avocado growers in the northern-most portion of the Greenbelt, this water is blended with imported water to reduce the chloride level in the finished water.

Finally, SWP imported water is used to supply agricultural users in the upper pressure zones in Santa Rosa Valley and the Tierra Rejada Valley as well as some agricultural customers in the lower pressure zones who demand the higher quality water and are willing to pay the much higher cost for water. For some of these customers, non-potable surface water is not available at the present time. It is expected that some of the demand for potable agricultural water will decline as the non-potable distribution system is expanded further and the cost of imported water continues to rise.

As can be seen from Table 4, the number of agricultural accounts decreased significantly between 2005 and 2010. This is due primarily to the reassessment of agricultural parcels within the Camrosa Water District in 2008. When Metropolitan Water District ended the Interim Agricultural Water Management Program, which had offered discounted water rates to agricultural customers, Camrosa followed suit and established one cost scale for potable water. Even though classification as agricultural producers no longer affected customers' water rates, Camrosa thought it pertinent at the time to assess how many of its accounts were primarily or exclusively agriculture operations. Approximately 150 customers that had previously been identified as agricultural users were found to not meet the minimum acreage/crop requirements and were reclassified as residences. The reclassification also affected the volume of water considered agricultural irrigation, as shown in the decrease between 2007 and 2008 in Table 5 below, though the exceedingly low agricultural demand in 2010 (506 AF) was the result of abnormally cool and wet weather all year.

c. ***Sale of Surplus Water***

In 2005, 5,503 AF of surplus water was delivered to Pleasant Valley County Water District and out-of-bounds irrigators. The availability of surplus water, however, has declined considerably as demand for non-potable water increases within the District's service area. In 2010, only 4,880 AF of surplus water was available. However, as additional non-potable water becomes available through increases in wastewater plant output, and the quality improves making supplies more marketable, surplus water available for sale is expected to fluctuate between 5,000 and 6,500 AF/Y after 2015 (see Table 9 below).

B. Water Demand Projections

Future demands in the District for 2010 through 2035 were projected based on an evaluation of existing zoning, planning data and land use maps for the various areas within the District, population projections, and discussions with City, County, and various special district staff. Anticipated land use changes from current zoning were incorporated into the analysis. It must be noted that the demand projections depend on the long-term accuracy of the available planning documents. If the Cities, County, or special districts, significantly revise their land use maps or general plans, the population projections and corresponding demands may also change significantly.

It was assumed land designated on current land-use maps for commercial or residential use would be "fully developed" over the next 20 years and would reflect the population projections contained in Table 3 above. It was assumed that parcels currently in agricultural but zoned for M&I use would be developed over the next 20 years.

It was assumed that parcels currently zoned agricultural will remain in agriculture during the planning period, primarily due to the impacts of SOAR and the apparent desire of the community to maintain the greenbelt and agricultural aspect of the undeveloped land within the District. There is little undeveloped land suitable for agricultural use within the District boundaries and there is little likelihood there will be significant increases to the base irrigation demands. Much of this agricultural and otherwise undeveloped land will be transferred from the potable distribution to the non-potable irrigation water distribution system.

The current water use for 2010 is presented in Table 4 above, along with 2005 historical usage. Because 2010 was an abnormally wet and cool year, agriculture and landscape irrigation demand was extremely low. In order to assume a realistic baseline demand off of which to more accurately project growth, the previous five years' demands were averaged. These five years were assumed to be an adequate cross-section of demand extremes, as they included the driest year on record (2006), two other dry years (2007 and 2008), an average year (2009) and a very wet year (2010). Table 5 displays the previous five years and their average, which is used as the projection baseline.

Table 5. Baseline Demand for Projection: Average Demand 2006-2010 (AF/Y)

Potable Water Sectors	2006	2007	2008	2009	2010	AVG
Residential	7,393	7,011	7,285	6,312	5,397	**6,680**
Commercial/Industrial	970	1,023	880	728	579	**836**
Institutional and governmental	527	567	642	476	422	**527**
Landscape	854	748	713	747	653	**743**
Agriculture	2,231	2,359	1,585	1,061	506	**1,548**
Other (Misc)	109	17	36	11	12	**37**
Other (Potable Line Loss)	N/A	N/A	N/A	N/A	691	**519**[1]
Total Potable	**12,084**	**11,725**	**11,141**	**9,335**	**8,261**	**10,890**
Non-Potable Irrigation Water						
Municipal & Industrial1	167	839	1,166	1,436	1,253	**1,285**[2]
Agriculture	6,169	5,050	5,301	5,820	5,512	**5,570**
Other (NP Line Loss)	N/A	N/A	N/A	N/A	N/A	**343**[1]
Total Non-Potable Irrigation Water	**6,336**	**5,889**	**6,467**	**7,256**	**6,764**	**7,198**
Total District Demand	**18,420**	**17,614**	**17,608**	**16,591**	**15,025**	**18,088**

1) Line Loss is estimated 5% of total potable and non-potable, respectively, prior to its inclusion.
2) Because of real transfer of over 500 AF/Y of NP demand to Leisure Village in 2008, Non-Potable Irrigation Water M&I use was averaged from only three previous years, 08-10

Transfers of potable irrigation to the non-potable distribution system make up the bulk of the changes in Tables 4, 6 and 7; while non-potable demand is projected to increase 3,217 AF/Y over the planning horizon, total District demand is only projected to increase 2,495 AF/Y. New development within the District will add an estimated 932 AF/Y of (primarily indoor) potable demand, but the transfer of roughly 2,658 AF/Y from potable to non-potable use resulting from the expansion of the non-potable distribution system (see Section 4.F – Future Water Projects) combine for a net 1,065 AF/Y reduction in Districtwide use of potable water.

Based upon the future growth within the District, the total water demand within the District by 2015, shown in Table 6, is expected to increase to 18,453 AF/Y including imported water, recycled water, groundwater and Conejo Creek surface water. This is an increase of about 22% over total 2005 demand for water within the service area and reflects increased use of non-potable water as the non-potable distribution system is expanded. M&I demands in 2015, which include all residential, public, commercial and industrial and landscape uses of both potable and non-potable water, are projected to be approximately 11,506 AF. 2020 and 2025 projections are also included in Table 6.

Table 6 includes projection estimates for 2030 and 2035. By 2035, the M&I Demand is expected to increase to 15,057 AF/Y. This represents an increase of approximately 23% over current demand and reflects the general population growth expected in the District.

During the same period, agricultural demands placed upon the District will not change very much, and are projected to be 4,664 AF/Y by 2035. Some reduction in agricultural demand is expected as parcels are developed. However, the significant increase in projected non-potable demand is primarily a result of making non-potable water available to Tierra Rejada Valley to displace pumping of high quality groundwater from the Tierra Rejada Basin.

In addition to demand forecasted for the various classes of water delivered within the District, some line-loss is experienced. Line loss is the difference between the total meter readings for water produced or imported, and the aggregated meter readings of water delivered and billed and is usually the result of minor pipe leakage, meter inaccuracy, or pipe ruptures. Historically, line loss has averaged approximately 4.8% of production, but it approached 7.5% in 2005. The District has initiated action to evaluate the existing delivery systems to ensure line losses are minimized, the success of which is evidenced by the decrease to just under 6% line loss in 2010. Line loss for future years has been projected at about 5% and is included in the tables below.

Camrosa plans to meet the Water Conservation Act of 2009's (SBX7-7) requirements for achieving interim 2015 and final 2020 urban water use reduction targets by continuing to shift commercial and residential irrigation and agricultural water demands from potable to non-potable irrigation water supplies. Using this strategy, the District has already demonstrated a reduction in imported, potable State Water Project water and local groundwater supplies between 2005 and 2010, as shown in Table 4 above. With further expansion of the non-potable system and augmentation of non-potable irrigation water supplies, additional reductions in potable water use are anticipated over the planning period.

Table 6. Projected Demand: Accounts and Volume – 2015-2025

	2015		2020		2025	
Potable Water Sectors	**# of accounts**	**Volume (AF/Y)**	**# of accounts**	**Volume (AF/Y)**	**# of accounts**	**Volume (AF/Y)**
Residential (all)[1]	10,186	6,517	11,486	6,176	12,686	6,069
Commercial/Industrial	202	883	202	1,093	202	1,190
Institutional and governmental	116	570	128	634	136	685
Landscape	581	909	479	750	323	506
Agriculture	89	1,376	71	1,187	53	1,030
Other (Misc)	113	41	113	100	113	100
Other (line Loss)	N/A	515	N/A	497	N/A	479
Total Potable	**11,287**	**10,811**	**12,479**	**10,437**	**13,513**	**10,059**
Non-Potable Irrigation Water						
Municipal & Industrial (all[1])	394	1,708	3,330	4,291	4,826	5,102
Agriculture	126	5,570	121	4,090	121	4,090
Other (Non-Potable Line Loss)	N/A	364	N/A	419	N/A	460
Total Non-Potable Irrigation Water	**520**	**7,642**	**3,451**	**8,800**	**4,947**	**9,652**
Total District Demand	**11,807**	**18,453**	**15,930**	**19,237**	**18,460**	**19,711**

1) Breakdown between Single- and Multiple-Family Dwellings not available

Table 7. Projected Demand: Accounts and Volume – 2030-2035

	2030		2035	
Potable Water Sectors	**# of accounts**	**Volume (AF/Y)**	**# of accounts**	**Volume (AF/Y)**
Residential (all)[1]	12,686	6,069	12,686	6,069
Commercial/Industrial	202	1,190	202	1,190
Institutional and governmental	136	695	136	695
Landscape	150	235	150	235
Agriculture	35	574	35	574
Other (Misc)	113	100	113	100
Other (Potable Line Loss)	N/A	443	N/A	443
Total Potable	**13,322**	**9,306**	**13,322**	**9,306**
Non-Potable Irrigation Water				
Municipal & Industrial (all[1])	5,169	5,829	5,169	5,829
Agriculture	121	4,090	121	4,090
Other (Non-Potable Line Loss)	N/A	496	N/A	496
Total Non-Potable Irrigation Water	**5,290**	**10,415**	**5,290**	**10,415**
Total District Demand	**18,612**	**19,721**	**18,612**	**19,721**

1) Breakdown between Single- and Multiple-Family Dwellings not available

a. Projected Low Income Housing Demands

Camrosa Water District boundaries overlap with four jurisdictions: the City of Camarillo, unincorporated areas of Ventura County, the City of Thousand Oaks, and CSUCI. Of the approximately 31 square miles encompassed by the Camrosa Water District's boundaries, about 7 square miles are within the City of Camarillo, 22 square miles lie in unincorporated Ventura County, and 1.5 square miles are attached to the City of Thousand Oaks. Each of these municipalities has a general plan with housing element classifications.

Ventura County, the City of Camarillo, and the City of Thousand Oaks all use the Department of Housing and Urban Development income criteria for the Oxnard–Thousand Oaks–Ventura Metropolitan Statistical Area (MSA) in determining eligibility for affordable housing programs. Senate Bill 1087 requires that water use projections of a UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier. None of the housing elements of the *General Plans* of Ventura County, the City of Camarillo and the City of Thousand Oaks identifies the number or specific location of low income households in the City. Nor do the housing elements in any of these plans project the number or location of low-income households in the future. For this reason, it is not possible to project water use for lower income households separate from overall residential demand. The District will not deny or condition approval of water services applied for by a proposed development that includes low-income affordable housing units, unless one of the following occurs:

- the District specifically finds that it does not have sufficient water supply
- the District is subject to a compliance order issued by the State Department of Health Services that prohibits new water connections

- the applicant has failed to agree to reasonable terms and conditions relating to the provision of services.

Within the Camrosa Water District boundaries, there are currently no single or multi-family residential tracts designated as low-income housing. There are three large-plan developments scheduled for completion by 2025, at which point the District will near full build-out. Of the residential tracts that are planned for development, none are designated as low-income housing. Projections are shown in Table 8 below.

Table 8. Low-Income Projected Water Demands

Low Income Water Demands	2015	2020	2025	2030	2035
Single-family residential	0	0	0	0	0
Multi-family residential	0	0	0	0	0
Total	0	0	0	0	0
Units of Measure (AF/Y)					

2. **Additional Water Uses**

Surplus non-potable water is delivered to users outside the District Boundaries and is accounted for in Table 9 below. These sales include surplus recycled water from the Camrosa CWRF sold to nearby agricultural users and non-potable irrigation water sold to the Pleasant Valley County Water District. Sales of surplus water are considered interruptible to satisfy demands within the District's service area. Table 9 reflects the excess non-potable supplies available for delivery to satisfy demand outside the district after all District non-potable demands have been met. In past years, all surplus non-potable irrigation water has been sold. For the foreseeable future it is expected that all surplus non-potable water will continue to be sold to agricultural use outside the District.

Camrosa anticipates no demand related to saline intrusion barriers or groundwater recharge.

Table 9. Deliveries to Other Agencies (AF/Y)

Name of Agency	2005	2010	2015	2020	2025	2030	2035
Pleasant Valley CWD	5,503	4,880	6,433	5,829	5,541	5,138	6,280
Units of Measure (AF/Y)							

Table 10 sums the total water uses expected within the District over the next 25 years.

Table 10. Total Water Use (AF/Y)

Water Use	2005	2010	2015	2020	2025	2030	2035
Total Water Deliveries within District (from Tables 4, 6, 7)	15,164	15,025	18,453	19,237	19,711	19,721	19,721
Sales to Other Water Agencies (from Table 9)	5,503	4,484	6,433	5,829	5,541	5,138	6,280
Additional Water Use	0	0	0	0	0	0	0
Total	**20,667**	**19,509**	**24,886**	**25,066**	**25,252**	**24,859**	**26,001**
Units of Measure (AF/Y)							

Table 11 below details the demand projections provided to Calleguas Municipal Water District, Camrosa's sole wholesale potable water supplier. Both the existing and projected water volumes reflect a decrease in reliance on State Water Project water over the planning period. This is mainly due to the District's current and continued efforts to expand the non-potable distribution system within the District.

Table 11. Retail Agency Demand Projections Provided to Wholesale Suppliers

Wholesaler	Contracted Volume	2010	2015	2020	2025	2030	2035
Calleguas Municipal Water District	7,900	**5,639**	**5,448**	**5,017**	**4,878**	**4,878**	**4,878**
Units of Measure (AF/Y)							

C. Baselines and Targets

LAW

10608, 12 (b) "Base daily per capita water use" means any of the following:

(1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period, ending no earlier than December 31, 2004, and no later than December 31, 2010.

(2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water us, reported in gallons per capita per day and calculated over a five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.

10608.22 Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

The Water Conservation Act (SBX7-7) of 2009 directs urban retail water suppliers to set both interim 2015 and final 2020 urban water use targets with goals of achieving a 10 percent per capita reduction by 2015 and 20 percent by 2020. Additionally the Act requires urban water suppliers to define a 10 to 15 year base (or baseline) period for water use that will be used to develop their target levels of per capita water use.

Water suppliers must also calculate water use for a 5 year baseline period, and use that value to determine a minimum required reduction in water use by 2020. The longer baseline period applies to a water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water.

There are four overall steps a water supplier must complete to meet the 2010 UWMP requirements identified in the Water Conservation Bill of 2009:

1. Step 1: Determine Base Daily Per Capita Water Use

Base daily per capita water use, measured in GPCD (gallons per capita per day), is established for an initial period of time, which is referred to as the 10-to-15-year base period. Three technical methodologies have been developed to support a water supplier in determining its base daily per capita water use:

- Methodology 1 – Gross Water Use
- Methodology 2 – Service Area Population
- Methodology 3 – Base Daily Per Capita Water Use

The percentage of non-potable water used to satisfy irrigation demands to total water deliveries for 2008 is used to determine the number of continuous years an urban water supplier may use in calculating average GPCD. This provides some flexibility as well as acknowledges the advances of water suppliers that have already begun using recycled water to reduce potable demands. Table 12 below summarizes the 2008 total and non-potable irrigation water deliveries for the District and defines the continuous 10-to-15 and 5 year base periods that will be used.

Table 12. Base Period Ranges			
Base	**Parameter**	**Value**	**Units**
10 to 15 year base period	2008 total water deliveries	18,387	AF
	2008 total volume of delivered non-potable irrigation water	5,341	AF
	2008 non-potable irrigation water as a percent of total deliveries	29	%
	Number of years in base period range	10	years
	Year beginning base period range	1998	
	Year ending base period range	2007	
5 year base period	Number of years in base period	5	years
	Year Beginning base period range	2003	
	Year ending base period range	2007	
Units of Measure:	**AF/Y**		

If an urban retail water supplier's recycled water deliveries for 2008 meet or exceed 10 percent of total deliveries, then the supplier may choose a longer continuous base period of up to 15 years ending no earlier than December 31, 2004 and no later than December 31, 2010. Non-potable irrigation water represents the combined deliveries of two separate non-potable systems. Camrosa has relied upon this resource to offset the use of imported SWP water for the past nine years, will continue to do so and has general plans to further expand the non-potable irrigation water distribution system in order to offset potable SWP water imports. As demonstrated in Table 12, non-potable irrigation water deliveries for the District in 2008 comprised 29 percent of total deliveries, exceeding the DWR requirement for a 10-15 year base period. Camrosa has chosen to use a ten-year period – 1998-2007 – as its base period to determine current GPCD and future GPCD targets.

Gross Water Use

For purposes of determining GPCD in this Plan, the District determined that Gross Water Use constitutes all potable water that entered the potable distribution system, including agricultural deliveries. In order to align with the requirements of other agencies requiring similar information, data was analyzed and calculated on the basis of a fiscal year (July 1 – June 31).

Service Area Population

Section 2.F.2 describes the methodology used and the process followed to arrive at District population for both past and future years. The Service Area boundaries are represented in that section in Figure 2.

Base Daily Per Capita Water Use

The District has determined the optimal baseline period is 10 fiscal years ranging from 1998 through 2007. Table 13 below provides the annual Gallons per Capita per Day (GPCD) calculation as a ratio of Daily Gross Water Use and Service Area Population for each baseline year from 1998 through 2007 with an average baseline GPCD of 454 gallons/person/day. Table 14 below details the 5 year base GPCD use for the years of 2003 through 2007 with an average 5 year baseline of 435 gallons/person/day.

Table 13. Base Daily Per Capita Water Use: 10-15 Year Range				
Base Period Year		Distribution System Population[1]	Daily System Gross Water Use (MGD)	Annual Daily per Capita Water Use (GPCD)
Sequence Year	Calendar Year			
1	1998	22,197	8.472	382
2	1999	22,659	10.513	464
3	2000	22,820	11.417	500
4	2001	22,820	11.194	491
5	2002	23,219	12.151	523
6	2003	23,475	11.607	494
7	2004	23,932	11.17	467
8	2005	25,987	10.049	387
9	2006	26,682	10.195	382
10	2007	26,809	11.921	445
Base Daily Per Capita Water Use				**454**

[1] Source: Ventura County RMA derived from California DOF and US Census Bureau Data overlaid with District parcels as described in Section 2

2. **Step 2: Determine Urban Water Use Target**

Retail water suppliers can choose from four compliance methods as follows:

- Method 1 – Eighty percent of the water supplier's baseline per capita use
- Method 2 – Per capita daily water use estimated using the sum of performance standards applied to indoor residential use; landscaped area water use; and commercial, industrial, and institutional uses
- Method 3 – Ninety-five percent of the applicable state hydrologic region target as stated in the State's April 30, 2009, draft 20x2020 Water Conservation Plan
- Method 4: Requires reduction of Base Daily Per Capita Water Use a specific amount for different water sectors:
    - Indoor residential water use to be reduced by 15 GPCD or an amount determined by use of DWR's "BMP Calculator".
    - A 20 percent savings on all unmetered uses.
    - A 10 percent savings on baseline CII use.
    - A 21.6 percent savings on current landscape and water loss uses.

The District has chosen to use method 1 (80% of average base daily per capita water use) in determining its preliminary urban water use target. From Table 13 above the Base Daily Per Capita Water Use is 454 GPCD. Therefore the District's preliminary Urban Water Use Target is 363 GPCD, as follows:

80% X 454 GPCD = <u>363 GPCD</u>

3. Step 3: Confirm Urban Water Use Target

Step 3 confirms the water supplier's urban water use target determined in Step 2. It compares the urban water use target determined in Step 2 to a 5-year base daily per capita water use value to confirm that the urban water use target has met a minimum reduction established by statute.

In determining the 5 year base period, an urban water supplier may choose a continuous base period ending no earlier than December 31, 2007, and no later than December 31, 2010. Table 14 below details the 5 year base GPCD use for the years of 2003 through 2007 with 5-year average baseline of 435 gallons/person/day.

Table 14. Base Daily Per Capita Water Use: 5-Year Range

Base Period Year		Distribution System Population	Daily System Gross Water Use (MGD)	Annual Daily per Capita Water Use (GPCD)
Sequence Year	Calendar Year			
1	2003	23,475	11.607	494
2	2004	23,932	11.170	467
3	2005	25,987	10.049	387
4	2006	26,682	10.195	382
5	2007	26,809	11.921	445
			Base Daily Per Capita Water Use	**435**

If an urban retail water supplier's base daily per capita water use calculated using the 5-year base period is 100 GPCD or less, then the supplier is exempt from the 5 percent minimum required reduction. However, the District exceeds this amount and must therefore calculate 95 percent of the base daily per capita water use in Table 13 to confirm its urban water use target:

.95 X 435 = <u>413 GPCD</u>

From Step 2 above, the urban water use target is less than 95% of the base daily per capita water use. Therefore the District's Urban Water Use Target is confirmed to be:

<u>363 GPCD</u>

4. Step 4: Determine Interim Urban Water Use Target

As previously mentioned, SBX7-7 also directs urban retail water suppliers to set an interim urban water use target with a goal of achieving a 15 percent per capita reduction by 2015. The interim urban water use target is one-half the sum of the urban water use target (from step 2) and the base daily per capita water use (from step 3). The District's interim target is 399 GPCD, as follows:

(363 + 435) ÷ 2 = <u>399 GPCD</u>

5. Conclusion

Based on the methodology described above, the District has already met its Urban Water Use Target, as GPCD in 2010 was 309. Because 2010 was such an abnormally wet year, GPCD for 2009 was calculated, and found to be 363. The District will continue to monitor GPCD in the years ahead, and will report the District's GPCD to DWR, as required by California Water Code 10608.40, when the standardized forms for doing so become available. While the District has already achieved a decreasing trend in GPCD usage for the last several years due in large part to shifting irrigation demand off of the potable distribution system and through concerted conservation efforts, some of that has also been a result of response to significant regional drought and the general economic downturn. Between continued education and conservation efforts, and the current general strategy of offsetting potable water use with non-potable water through expanding the non-potable distribution system, the District expects GPCD to not only maintain this current level of GPCD, but in addition continue to decline farther below the urban water use target in the future. Section 4F, Future Water Projects, describe several options for expanding the non-potable distribution system to meet the SBX7-7, 2015 and 2020 reduction goals.

Section 4 System Supplies

LAW

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631 (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.; an indication of whether a groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management; a copy of the plan of authorization.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater.

For those basins for which a court or the board has adjudicated the rights to pump groundwater: a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

For basins that have not been adjudicated: information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

1631(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

Water Supply Sources

The current sources of water supply for the customers and properties within the Camrosa Water District service area are a complex mix of public and private sources including imported SWP water; public and private wells in three groundwater basins; surface water diverted from Conejo Creek and recycled water from two wastewater treatment facilities. A single parcel, particularly agricultural parcels, may have more than one source of supply.

Approximately 85% of the water supply for Camrosa Water District residents and property owners is provided by Camrosa Water District. The remaining supply is provided by property owners who own their own wells. During the drought period that peaked in 1990, Camrosa Water District found that agricultural customers moved from public to private water sources to obtain sufficient supplies and to avoid restrictions imposed by public water supply agencies. Since that experience, the District has adopted a more

comprehensive approach to water resource planning with many of the District's water analyses accounting for both public and private sources and demands.

Having multiple water sources gives the District considerable flexibility and improved reliability when compared to other nearby purveyors. Sources available to Camrosa Water District include imported SWP water from Metropolitan Water District of Southern California (imported through Calleguas Municipal Water District), local groundwater and non-potable irrigation water from various sources.

Camrosa has wells in the Tierra Rejada, Santa Rosa, Pleasant Valley and Perched groundwater basins. The Woodcreek well in the Pleasant Valley groundwater basin was completed in 1996. As it is an injection/extraction well, in addition to providing potable ground water can also be operated as a small, internal aquifer storage and recovery facility that can inject discounted imported water in years when the water is available.

Non-potable irrigation water supplies include surface water diverted by the Conejo Creek Project as well as recycled water from the Camrosa Water Reclamation Facility and, in the near future, recycled water from the Camarillo Sanitation District. These sources have been developed to augment the supply for expansion of the District's non-potable distribution system. The agreement regarding Camrosa's primary access to HCWWTP discharge in Conejo Creek was executed in 1994. This 25-year contract will expire in 2019. Camrosa is currently in the process of renegotiating the agreement to retain rights to HCWWTP recycled water product.

Table 15 presents the project water supplies available to the District over the next 25 years.

Table 15. Water Supplies - Current and Projected (AF/Y)

Water Supply Sources	2010	2015	2020	2025	2030	2035
Purchased from wholesaler						
Calleguas MWD	5,639	7,900	7,900	7,900	7,900	7,900
Supplier produced groundwater						
Tierra Rejada Basin	428	928	928	928	928	928
Santa Rosa Basin	2,312	3,530	3,530	3,530	3,530	4,650
Pleasant Valley Basin	807	860	935	935	935	935
Perched Zone	0	1,120	1,620	1,620	1,620	1,620
Transfers In	0	0	0	0	0	0
Exchanges In	0	0	0	0	0	0
Non-Potable Irrigation Water						
Conejo Creek/HCWWTP (Surface)	8,853	10,667	10,667	10,667	10,667	10,667
Camrosa WRF (Recycled)	1,522	1,696	1,870	2,044	2,044	2,044
CamSan WWTP (Recycled)	0	440	680	1,070	1,430	1,825
Desalinated Water						
Other	0	0	0	0	0	0
Total	**19,561**	**27,141**	**28,130**	**28,694**	**29,054**	**30,569**

A. Imported Water

Imported SWP water has been used to supplement the available local water supplies since 1965. Camrosa Water District has 12 active water turnouts that receive water by gravity feed from Calleguas Municipal Water District's Oxnard-Santa Rosa Feeder transmission lines. Blending imported water with local groundwater supplies has improved the water quality significantly and allows the use of groundwater that does not otherwise meat DPH water quality requirements. Camrosa blends imported water with

groundwater to control the level of nitrates and Total Dissolved Solids (TDS) that would otherwise limit the use of groundwater.

Camrosa Water District purchases of imported water peaked in 1990, a drought year when the District purchased 12,900 AF of imported water from Calleguas MWD. Faced with dramatically rising water costs, several large agricultural customers shifted from Camrosa to alternative private sources such as wells or private surface water diversions. Even though the drought continued into early 1992, imported water purchases in 1991 totaled only 7,100 AF. Since 1991, imported water purchases have stayed below 8,900 AF/Y with the exception of FY 1998-99, which was a particularly dry year locally.

During the 1986-1992 droughts, the State Water Project was not able to meet the total water demand of all its contract member agencies. Calleguas Municipal Water District, like all of Metropolitan Water District member wholesalers, instituted a rationing program to reduce purchases by 30 percent. Calleguas chose to charge significant surcharges for water purchases greater than 80 percent of the 1989-90 domestic levels and greater than 50 percent of the 1989-90 agricultural levels. Since the last major drought, Metropolitan Water District and its member wholesale purveyors such as Calleguas MWD have developed local water sources to insulate their customers from such large cutbacks during future droughts. Recent projects completed by Calleguas MWD include a treatment plant to treat water stored in Lake Bard, the Las Posas Aquifer Storage and Recovery well field, an interconnection with the Los Angeles Department of Water and Power, and Camrosa's Conejo Creek Diversion Project.

In the 20 years since the end of the drought, imported water purchases have averaged only 8,110 AF/Y. Development in the late 1990s and early 2000s increased potable consumption, bringing the average of the second half of that 20-year period to 9,025 AF/Y.

At the same time, recent conversions of potable irrigation demand to the non-potable distribution system, such as the 2008 conversion of Leisure Village, have reversed the growth trend. In 2010, Camrosa purchased a total of 6,282 AF of imported water. Figure 6 below summarizes potable water purchases for the period 2000 through 2010. Taking into account that the purchase spike in FY2007-08 was the result of one of the driest years on record, it is apparent there is a decidedly downward trend in the purchases of imported water. It is not expected that future imported water purchases will exceed 7,900 AF/Y in even the driest years.

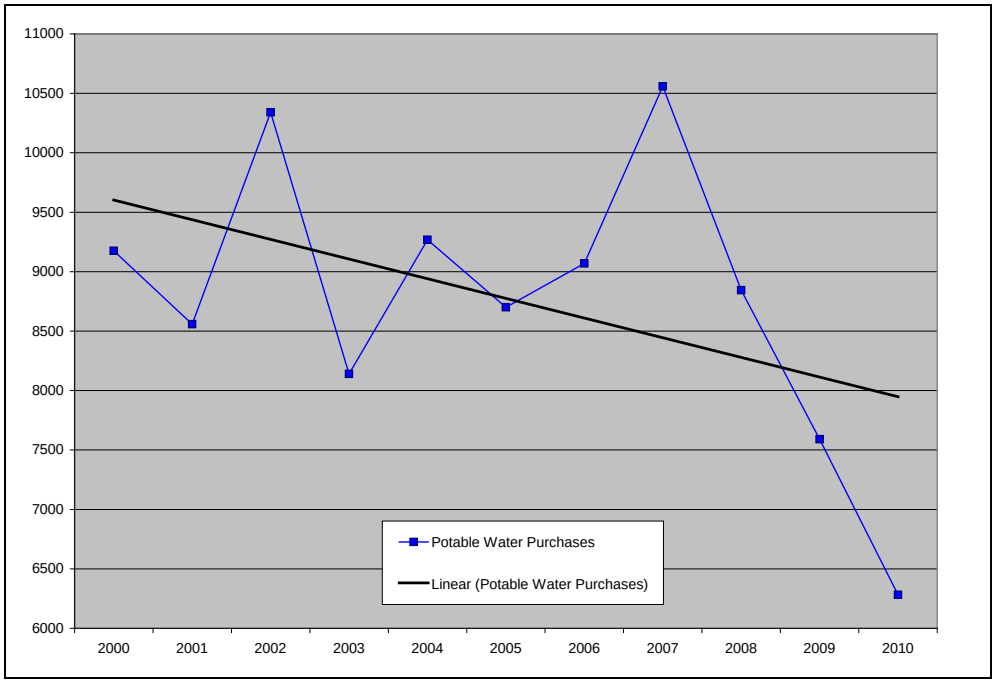

Figure 6 – Imported Water Purchases 2000-2010

Table 16 presents the existing and planned water supplies from Camrosa's wholesaler, Calleguas Municipal Water District, through 2035.

Table 16. Wholesale Supplies: Existing and Planned Sources of Water (AF/Y)

Wholesale Source	Contracted Volume	2015	2020	2025	2030	2035
Calleguas Municipal Water District	7,900	7,900	7,900	7,900	7,900	7,900

B. Groundwater

Camrosa Water District covers three major groundwater basins including Tierra Rejada Basin in the eastern portion of the District, the centrally located Santa Rosa Basin and the Pleasant Valley Basin in the western portions of the District. A fourth groundwater source is the shallow perched groundwater aquifer of poorer quality at the base of the Conejo and Santa Monica Mountains adjacent to the Pleasant Valley Basin. Figure 7 below represents graphically the groundwater basins available to the District. Detailed descriptions of these groundwater basins follow the figure, after which pumping history and projections are provided.

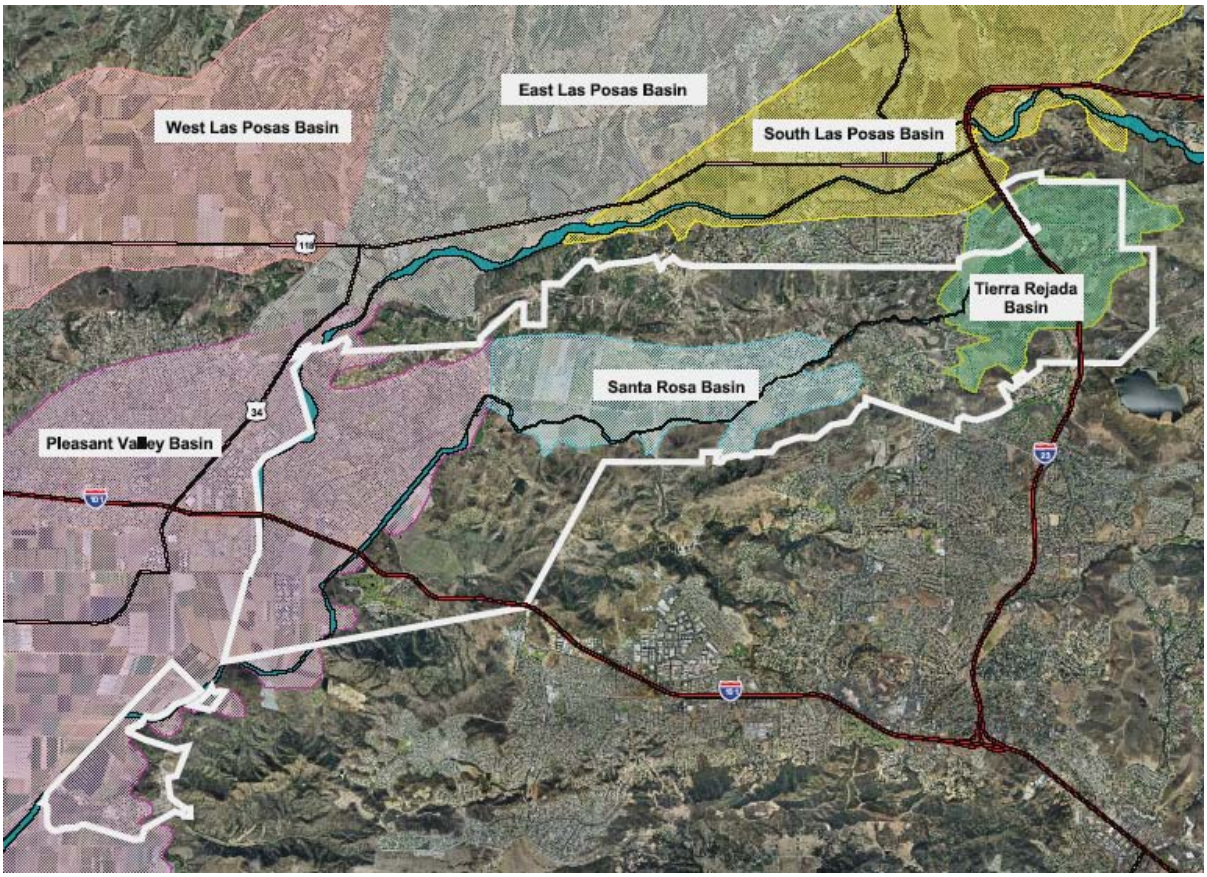

Figure 7 – Groundwater Basins Surrounding the District

1. **Tierra Rejada Basin**

The Tierra Rejada Basin is about 1,900 acres in size. According to J.P. Schaaf's 1998 MA thesis, *Hydrogeology of the Tierra Rejada Groundwater Basin*, the Tierra Rejada Basin is approximately 1,900 acres in size and is recharged by a watershed area of approximately 4,500 acres.

Rainfall provides about 85% of basin water supply. The peripheral drainage area is underlain by non-water bearing rocks or sediments. Groundwater is stored primarily in sandstones and conglomerates with a matrix predominantly composed of volcanic rock of the Topanga Formation, and in fractured basalts and basalt breccias of the Conejo Volcanics. Bedrock formations of marine and non-marine origin present in the basin area include the Saugus Formation, Las Posas Sand, Monterey Shale, Topanga or Calabasas Formation, Conejo Volcanic, and Sespe Formation. Surficial deposits generally overlay the bedrock formations in the basin and include alluvium, and colluvium. The rock sequence in which fresh groundwater is present ranges in age from Oligocene (38 million years ago) to Recent.

Within the basin, the oldest Sespe Formation is water-bearing and known to generally underlie the Conejo Volcanics. The Sespe Formation outcrops on the northern and southern ridges. The compacted formation is mostly sandstone of various colors and contains metavolcanic and quartzitic rocks. This base formation is estimated to be a mile thick. The Conejo Volcanics underlie the entire basin south of the Semi fault and were formed during the Miocene (25 to 5 million years ago) period. Thickness estimates range from 1,000 to 2,000 feet, with deeper wells penetrating fractured upper layers providing ample rates of water extraction. The upper portion has been described as predominantly andesitic-basaltic flows and breccias; gray, maroon-gray and brown aphantic porphyritic rocks, vaguely stratified, flows range from platy to massive,

coherent but much fractured; deposited as flows and breccias; contain some epiclastic volcanic sediments and minor reddish, scoriaceous pyroclastic horizons; probably emplaced sub aerially" (Dibblee, 1992).

Camrosa's well encountered the fractured volcanics at 290 foot depth where brown sandstones of the overlying Topanga formation ends and the gray Conejo Volcanics begins. The concrete well is sealed to 300 feet and produces water from from 300 to 620 feet below the surface.

The Topanga Formation overlying the Conejo Volcanics was deposited during the same era. Rocks of the formation were deposited during a period of marine exposure and consist mainly of medium to course grained sandstone and volcanic pebble conglomerate. Marine influence is also seen in Monterey shale outcrops in the hills south of the basin and along the Semi fault within the northwest area of the basin. Some Los Posas sand of marine origin lies on the south side of the fault. Also in contact with the fault is the Saugus formation which runs toward the northwest. Finally, the main basin is covered by younger sediments of Holocene era (10,000 years ago to the present), with recent alluvium accumulation along stream courses with a maximum thickness of 50 to 80 feet in the central basin.

The water table elevation decreases from approximately 600 feet mean sea level (MSL) in the eastern portion of the basin to 450 feet in the western portion of the basin. The saturated thickness increases from east to west across the basin. In the north central portion of the basin the aquifer reaches a maximum thickness of approximately 700 to 800 feet.

In December 2009, Norman N. Brown, PhD, P.G., conducted a second analysis of the Tierra Rejada Basin, *Groundwater Geology and Yield Analysis of the Tierra Rejada Basin*, on behalf of the District. Brown concluded:

- Groundwater levels observed over a long-term base period including two wet-dry climatic cycles shows that the average groundwater production was within the basin yield over the period 1944-1996
- Current and recent conditions indicate that existing production and possibly new production can be managed within basin yield. It is unknown if production from a proposed new District well would result in total basin production greater than or less than the historic average over the base period 1944-1996
- An increase in basin yield may be possible by active management of basin storage and pumping distribution
- Limited water quality data for the basin show increases in TDS, chloride and sulfate during the last 10 years; concentrations are within drinking water standards. Nitrates concentrations in 2008 exceeded the drinking water standards for four wells in the central portion of the basin

Inflows and outflows for the Tierra Rejada Basin currently total about 6,200 AF in an average rainfall year. Current pumping rates of 1,900 AF/Y for private agricultural wells and an additional 428 AF/Y for Camrosa Water District brings the current groundwater production to approximately 2,330 AF/Y for the Tierra Rejada Basin. The District currently operates one well in the Tierra Rejada basin and has shown a gradual reduction in pumping from 2006 to 2010. Construction of a second well in the basin is being considered as part of the District's Capital Improvement Plan. This second well would augment production in the basin by 500 AF/Y starting in 2015, which would bring total production estimates to 928 AF/Y through 2035. Construction of this second well within the basin has been postponed until the Tierra Rejada Groundwater Management Plan is completed, which is scheduled to be by the end of 2012.

2. Santa Rosa Basin

The Santa Rosa Groundwater Basin underlies about 3,800 acres (5.9 square miles) and is wholly contained within the District boundaries. It is a broad, elliptical, and flat-bottomed valley. The dominant structural element of the basis is the Santa Rosa Syncline, a downward trending fold lying east to west and extending from the east end of Tierra Rejada Valley westward into Pleasant Valley. Several major faults

occur in the Santa Rosa Basin, the largest of the geologic strata of 500 to 5,000 feet along the northern edge of the basin. The other major fault, the Bailey Fault, runs northeast to southwest near the western end of the basin, and separates the northwestern third of the basin from the rest of the basin. The Bailey Fault is geologic and political boundary within the basin.

Groundwater in the Santa Rosa Basin is extracted from sediments of Holocene, Pleistocene, Upper Pleistocene, and Miocene age. There are four major water-bearing zones within the basin; conglomerate beds within the Conejo Volcanics, conglomerate and sandstone within the Santa Margarita Formation, sand and gravel in the Saugus Formation, and alluvium. Structurally, the Conejo Volcanics underlie the basin and form the base on which the formations lie. The Santa Margarita Formation is peculiar to the area of the basin lying east of the Bailey Fault and lies atop the Conejo Volcanics. Over the Santa Margarita Formation lies a confining layer and over that, the alluvium. The area west of the Bailey Fault consists primarily of the Saugus Formation, a combination of Fox Canyon and San Pedro Formations. The Saugus Formation evident within the Santa Rosa Basin is the result of an outcropping of the larger Fox Canyon and San Pedro Formations west of the valley. This outcropping pinches off at the western end of the valley and then fans out into the valley, stopping at the Bailey Fault barrier. Due to the pinching off of the Saugus Formation, the Santa Rosa Groundwater Basin is considered to be a confined basin, separate from the larger western water bearing zones.

In 1975, the California Department of Water Resources (DWR) estimated the total groundwater storage capacity of the Santa Rosa Basin to be 94,000 AF. In 1994, a detailed groundwater basin model was developed in conjunction with the implementation of the Santa Rosa Groundwater Management Plan (see Appendix F). That model estimated the groundwater capacity to be 170,000 AF and recoverable storage to be about 69,000 AF. While the model estimated the basin safe yield at 4,700 AF/Y based on well records for 1989 to 1995, the SRGMP Council adopted a more conservative safe yield estimate of 4,200 AF/Y since it was not readily apparent at the time that inflows would be sustained at the rate assumed in the model. In his 1998 dissertation, however, Schaaf estimated the outflow from the Tierra Rejada Basin into the Santa Rosa Basin was 540 AF/Y, which is significantly higher than the 300 AF/Y assumed in the 1997 model.

Even by the most conservative estimates, Santa Rosa Basin has additional yield not currently utilized and the basin remains full even during the driest of years. The presence of nitrates above acceptable drinking water regulations require that Santa Rosa Basin groundwater be blended with imported water at an average ratio of between 1.5:1 and 2:1 (imported) to improve its quality before being injected into the potable distribution system. The Conejo Wellfield, where Santa Rosa Basin groundwater for potable use is pumped, is supplied through one imported water meter station (MS12), the upper capacity of which is 6,000 GPM. Recent combined pumping capacity of the four wells at the Conejo Wellfield is upwards of 3,300 GPM, meaning that the District is unable to utilize the full capacity of the Conejo Wellfield pumps. With the addition of the desalination facility, such as that discussed in Section 4.D.3, more water will be extracted from the basin. Additional yield may also be achieved by producing water for non-potable purposes in order to offset the significant irrigation demand now being met by potable water.

In the westernmost one-third, the Santa Rosa Basin overlies the Fox Canyon Aquifer. In this area, the Fox Canyon Groundwater Management Agency (FCGMA) has jurisdiction over the Santa Rosa Basin. The Fox Canyon GMA has established a program to bring basin pumping and recharge into balance within the over-drafted Fox Canyon Aquifer. Allocations have been established for each well based upon historical pumping records for 1985 to 1989. The allocations are reduced by 5% every five years until they reach 75 percent of historical extraction levels in the year 2010. An alternative to historical allocations has been adopted for agricultural pumpers. Agricultural wells are allowed to pump more than their historical allocations as long as the water pumped does not exceed the required irrigation water at an 80 percent efficiency rate for the crop under cultivation.

While Camrosa Water District does not have any wells within the lower Santa Rosa Basin, each of the private well owners report their pumped volumes to the GMA semiannually. Because high penalties are applied to extractions above allowed levels, pumpers normally stay within their allocations.

3. Pleasant Valley Basin

The Pleasant Valley basin is one of the seven major basins within FCGMA's jurisdiction and underlies the western portion of the Camrosa Water District. The Pleasant Valley Groundwater Basin underlies Pleasant Valley in southern Ventura County. The basin is bounded on the north by the Camarillo and Las Posas Hills and the south by the Santa Monica Mountains. The eastern boundary is formed by a constriction in Arroyo Santa Rosa. The basin is bounded on the west by the Oxnard subbasin of the Santa Clara River Groundwater Basin. Ground surface elevations range from about 15 feet in the west to about 240 feet above sea level in the east. The upper stratum of the Pleasant Valley Basin is composed of recent and Upper Pleistocene alluvial sands, gravels, silts and clays. The aquifers in this zone are generally unconfined and vary in thickness from a few feet to several hundred feet. The permeable lenses yield little water to wells owing to rapid thinning and predominance of fine-grained materials. The shallow aquifers in the Pleasant Valley Basin are equivalent, but not connected with, the Oxnard aquifer lying to the West. Underlying the Pleasant Valley area at depths from 400 to 1500 feet is a prominent zone of marine sands and gravels known as the Fox Canyon Aquifer. The Fox Canyon Aquifer is the lower most member of the Pleistocene San Pedro formation and forms the major producing zone of the Pleasant Valley Ground water Basin. The aquifer is confined and is 100 to 300 feet thick. Permeable deposits within the upper Santa Barbara Formation underlie the Sand Pedro Formation and contain fresh groundwater of only minor importance.

Camrosa operates one well (Woodcreek) within the basin. In 1975, DWR estimated the total groundwater storage capacity of the Pleasant Valley Basin to be 1,886,000 AF. Between 198,000 and 247,000 AF are recoverable. Although the perennial yield of this basin has not yet been determined, in 1999 it was estimated the applied water recharge of the basin to be approximately 11,400 AF while the average annual extractions was estimated at 18,500 AF.

The Fox Canyon GMA's allocation for the Woodcreek Well is based on an allowance for the residential development overlying the Fox Canyon Aquifer at a rate of 1 acre-foot per acre of land developed. As of 2010, Camrosa's allocations are approximately 807 AF/Y. Due to additional development within the District, this allocation is expected to increase to approximately 916 AF/Y by the end of 2014 and then remain relatively stable through 2035. Because this is an annual allocation, water not pumped cannot be carried over from one year to the next.

The District has also operated the Woodcreek Well as an aquifer storage and recovery facility whenever surplus state water is available during the winter months. It is not likely, however, that any significant additional quantities of water will be injected until such an enterprise becomes economical again.

4. Perched Aquifer

The Perched Aquifer at the base of the Conejo Hills is part of the regional Pleasant Valley Basin, with the specific distinction of being categorized only as an Upper Aquifer System, unlike the Pleasant Valley Basin, which includes a Lower Aquifer System (LAS) and an Upper Aquifer System (UAS) as well as shallow aquifers. The Perched Aquifer is locally semi-confined, with local groundwater levels characteristics that correspond with semi-perched conditions. The aquifer is lenticular and laterally discontinuous in the basin margins. It is designated as the uppermost water-bearing unit in hydraulic connection with surface and associated stream flow of Calleguas and Conejo creeks.

The Bailey Fault is an extension of the Simi-Santa Rosa fault zone which separates the Perched Aquifer from the Pleasant Valley Basin system. Basin sediments, which lie unconformable on bedrock, consist primarily of Tertiary Conejo volcanic rocks. The subsurface geometry of the bedrock surface is associated with truncation of the lower aquifer system along a zone roughly contiguous with the surface location of Calleguas Creek. Lithologic relationships between wells in this vicinity indicate that portions of the basin close to the mountain-front are geologically irregular and likely disrupted by faulting. None of the bedrock units, whether sedimentary or volcanic, are meaningful sources of groundwater production, except for local water supply from fractured volcanics in some mountain-front areas.

From the late 1930s through 1979, Camarillo State Hospital, with a population of nearly 1,000 patients, relied exclusively on the Perched Aquifer to satisfy the irrigation demands of its 634 acres and all potable demands of the hospital and onsite residences. When California State drinking water quality standards changed in 1979 and the aquifer's constituent levels exceeded the newest regulation, the State contracted with Camrosa Water District to supply water to the site. The supply has not been used regularly in the interim.

Water quality tests have shown that the quality of the water in the perched aquifer has not improved in the intervening years. Camrosa has determined, however, that the water could be put to beneficial use if desalinated. Accordingly, the District has entered into an agreement with the California State University – Channel Islands, the new owner of the former state hospital site, to lease a perched zone well owned by the University. Plans are underway to develop a project to rehabilitate the well and begin desalinating the brackish water contained in the perched zone as an alternate supply for the University Campus. It is expected that by 2013, a 1MGD desalination facility, the Round Mountain Water Treatment Plant (RMWTP), will be fully functional and delivering a new supply of potable water within the District.

Another existing well within District boundaries taps the Perched Aquifer. The Adhor Well, which is currently non-operational, is situated on a large agricultural parcel just south of US Highway 101. That parcel is slated to be developed into a mixed commercial/residential subdivision called the Conejo Creek Development Project. When development begins, prior to 2020, the Adhor Well will likely be dedicated to Camrosa Water District. Based off of historical pumping records, the District expects the Adhor Well to make and additional 500 AF/Y available. The well's condition will have to be examined, the water quality analyzed and the aquifer yield/well drawdown tested prior to determining whether this well would be added to the potable or non-potable distribution system.

Due to the fact that the Perched Aquifer has not been used as a source to supply significant volumes of water for over thirty years, it is difficult to know how the aquifer will respond to renewed extraction at the proposed volumes.

5. Groundwater Pumping History and Projections

Table 17 provides a summary of groundwater pumping for the 5-year period ending in 2010.

Table 17. Groundwater Pumped 2006-2010 (AF/Y)

Basin	Metered or Unmetered	2006	2007	2008	2009	2010	Avg.
Tierra Rejada	M	740	510	504	459	428	528
Santa Rosa	M	3,161	3,162	4,105	3,159	2,312	3,180
Fox Canyon	M	544	814	820	807	807	N/A[1]
Perched Aquifer	M	0	0	0	0	0	0

1) The Fox Canyon Allocation is determined every year by the FCGMA. This real number will be used in supply projections, and as an average is not used in to calculate future Fox Canyon supplies, an average was not calculated.

Years 2006-2010 contained both very dry and very wet years, as well as two average rainfall years, and little growth was experienced within the District during that time. Therefore, an average of the last five years (4,466 AF) was used as a base estimate of the volume of groundwater projected to be pumped moving forward through the planning horizon.

Table 18 summarizes projected pumping, in 5-year increments, for the period 2015 to 2035. The 2015 pumping projections incorporate the increased Fox Canyon GMA allocation, the completion of the RMWTP

to put brackish Perched Aquifer water to beneficial use, and the construction of a second well in the Tierra Rejada Basin. By 2020, both the Fox Canyon GMA allocation and the Perched Aquifer yield are projected to increase, the latter as a result of rehabilitating the Adhor Well. The construction of a desalination facility to improve supplies in the Santa Rosa Basin is currently in the conceptual stages and is therefore slated for the end of the planning period, in 2035.

Table 18. Groundwater Projected to be Pumped (AF/Y)

Basin	2015	2020	2025	2030	2035
Tierra Rejada	928	928	928	928	928
Santa Rosa	3,530	3,530	3,530	3,530	4,650
Fox Canyon	860	935	935	935	935
Perched Aquifer	1,120	1,620	1,620	1,620	1,620
Total	**6,438**	**7,013**	**7,013**	**7,013**	**8,133**
% of Total Water Supply	**23.72%**	**24.87%**	**24.05%**	**23.44%**	**25.32%**

Groundwater will remain an important water supply, representing roughly 25 percent of the total supply used within the District.

C. Transfer or Exchange Opportunities

The only transfer currently pursued by Camrosa is a groundwater pumping credit exchange between local agencies within the Fox Canyon Groundwater Management Agency Service Area boundaries. Although this transfer is not on a large scale, it represents a significant volume of water to Camrosa. In keeping with full explanation of Camrosa's water resources and supplies, this small, local transfer is included herein.

1. Pumping Allocation in the Fox Canyon Aquifer

As Camrosa Water District accepts new properties for potable service, existing ordinances require that groundwater wells on the property be abandoned and water rights be dedicated to the District. If the well is located in the Fox Canyon Aquifer, historical allocations in the aquifer can be transferred to the District. The District's pumping entitlement in the Fox Canyon Groundwater Basin could be adjusted upward as development occurs and is projected to increase by approximately 100 AF by the end of the planning period.

Table 19 indicates the transfer and exchange opportunities available the District.

Table 19. Transfer and Exchange Opportunities (AF/Y)

Source Transfer Agency	Transfer or Exchange	Short or Long-Term	Proposed Quantity
Fox Canyon GMA	Transfer	Long-Term	≤100
Total		**935**	≤100

The potential of developing new sources of supply through both short term and long-term potable water exchanges or potable water transfers is recognized. The District remains vigilant to exchange and transfer opportunities and would incorporate feasible strategies into its long range plan should such opportunities present themselves.

2. Groundwater Banking Programs

The only groundwater banking currently available to Camrosa is its own Woodcreek Well in the Pleasant Valley Basin. This well is an injection/extraction and thus has the capability of being operated as an aquifer storage and recovery (ASR) facility whenever surplus SWP water is available, usually during the winter months. Although surplus water is not available every year, Camrosa has injected up to 300 AF of imported water a year. The injected water is later pumped during periods of high demand or left stored for future years. In recent years, very little water has been injected into the basin and for the most part the Woodcreek Well is used only for extraction. In December 2010 and January 2011, the District injected 46 AF. As the cost of imported water continues to rise, operating the Woodcreek Well as an ASR facility has become uneconomical. It is not likely that any significant additional quantities of water will be injected until such an enterprise becomes economical again.

D. Desalinated Water Opportunities

The UWMP Act requires a discussion of potential opportunities for use of desalinated water (Water Code Section 10631[i]). Camrosa has explored such opportunities, and they are described in the following section, including opportunities for desalination of brackish water, groundwater and seawater. Camrosa Water District has several opportunities to develop more local groundwater for potable consumption through the construction of desalination facilities. Three areas have been identified as sources of local groundwater that, if desalinated, would increase locally produced potable supplies.

1. Brackish Water

Two of the groundwater basins that offer opportunities for desalination contain water of sufficiently elevated salinity to be considered “brackish.”

a. Perched Aquifer

As discussed above under Groundwater, the Perched Aquifer at the base of the Conejo Hills provides Camrosa Water District with an opportunity to desalinate local brackish groundwater for potable use. In the past, the Perched Aquifer provided Camarillo State Hospital with 100% of its potable water needs. The proposed Round Mountain Water Treatment Plant (RMWTP) will be designed as a 1.0 MGD capacity reverse osmosis (RO) treatment facility. A pipeline will interconnect the treated water with the existing District infrastructure that serves the CSUCI campus and a second pipeline will transport brine concentrate from the treatment plant through the regional Salinity Management Pipeline (SMP), built by Calleguas Municipal Water District, for ocean disposal. The new treatment plant is expected to remove approximately 85-90% of all constituents, while producing approximately 80% potable water and 20% brine. Construction is expected to commence in early 1012.

b. Northeast Pleasant Valley Basin – Regional Desalination Facility

Another possible measure to develop local sources is to construct an additional desalination facility in the general area surrounding Camrosa Water District. Several agencies in the area are currently pursuing an investigation into the feasibility of constructing the Northeast Pleasant Valley Basin Groundwater Desalter just outside the District boundary in the City of Camarillo. A distinct advantage of this project is that the proposed wellfield would draw from the Northeast Pleasant Valley Basin (PVB), instead of the Fox Canyon Aquifer. This area is considered a sub-basin and is hydrogeologically restricted from the Pleasant Valley Aquifer and is easily recharged by surface flows.

The sub-basin is recharged from the Arroyo Las Posas (aka Arroyo Simi upstream and Calleguas Creek downstream) at a surface water inflow rate estimated between 10,000 and 15,000 AF/Y. The water levels in this sub-basin have risen dramatically (over 250') in the past 20 years from this recharge. As surface water in the Arroyo Las Posas originates as tertiary-treated effluent from wastewater treatment plants upstream, the supply recharging the northeast PVB is expected to remain stable for the foreseeable future.

Water quality in the area is declining, with TDS levels currently in the 1,180 mg/l range. Should the northeast PVB continue to fill at its current rate, it will eventually spill into the Pleasant Valley Forebay, potentially degrading the high-quality water there. The Northeast Pleasant Valley Basin Desalter would therefore accomplish several regional goals, including (but not limited to) reducing dependence on imported water, meeting water quality requirements, transporting salts off of the watershed and protecting higher-quality water within the central Pleasant Valley Basin.

Salty groundwater would be pumped from two exiting City of Camarillo wells and one new well north of Las Posas Road and east of Somis Road. Salinity would be removed from the water by a RO treatment plant, producing approximately 4,500 gallons per minute (GPM) of drinking water, which equates to approximately 7,300 AF/Y. The project is estimated to cost around $50M to construct and $3.7M per year to operate. The cost of product water is expected to be in the vicinity of $950 per AF. The brine stream from the desalter would be discharged into the Calleguas SMP.

2. Groundwater

a. Santa Rosa Basin

As mentioned briefly in Section 4.B.2, Camrosa Water District pumps its wells in the Santa Rosa Basin far short of both the Basin's sustainable yield and Camrosa's own pumping capacity. Sufficient groundwater may be available in the Basin to significantly increase production from local sources for potable consumption; current estimates are that an additional 1MGD could be pumped from the Basin. The District plans to update the Santa Rosa Basin Groundwater Management Plan in the near future to better define available yield. The quality of the water in the Basin, however, requires that the groundwater be blended with higher quality imported water to meet EPA drinking water regulations, but due to the wellfield's location, introducing greater quantities of imported water to the produced groundwater is not feasible.

A possible alternative is to treat a portion of the groundwater to a quality equal to that of blended groundwater served in the potable system and thereby increase the total groundwater produced from the Santa Rosa Basin. The proposed desalination facility would divert up to 1 MGD from the total groundwater pumped prior to it being blended, treat that stream to the appropriate quality, and inject it into the potable water distribution system. It is expected that, as with the Round Mountain Water Treatment Plant, 80% of the water introduced to the desalter would enter the District's distribution system and 20% would be disposed of in the SMP. This is not a near-term project, but is expected to become realized by the end of the planning horizon.

3. Seawater Desalination

Because the Camrosa Water District is not in a coastal area, it is neither practical nor economically feasible for it to implement a seawater desalination program. However, Camrosa could provide financial assistance to other water suppliers in the construction of their seawater desalination facilities in exchange for other supplies, such as SWP water from Calleguas or for groundwater. Such opportunities will be monitored for feasibility.

E. Recycled/Non-Potable Irrigation Water Opportunities

As described above, Camrosa Water District has two separate non-potable distribution systems, one that serves solely Title-22 recycled water directly from the Camrosa Water Reclamation Facility (CWRF) and the other which distributes non-potable surface water and local groundwater sometimes blended with imported

SWP water to control chloride levels. The content of the surface water, diverted from Conejo Creek, is primarily discharge from Hill Canyon Wastewater Treatment Plant in Thousand Oaks. Currently, Camrosa uses only about one half of the non-potable irrigation water available.

1. Recycled Water from Camrosa Water Reclamation Facility (CWRF)

Camrosa Water District owns and operates a 1.5 MGD Water Reclamation Facility (CWRF). The tertiary-treated product is delivered directly to CSUCI and to surrounding growers as recycled irrigation supply before being sent for storage to Camrosa's storage ponds, which have a storage capacity of 300 AF.

The CWRF produced approximately 1,522 AF of tertiary-treated recycled water in calendar year 2010. About half that flow was distributed to several agricultural properties near the plant and to CSUCI. In addition, Camrosa provides surplus recycled water to properties outside the District boundaries. It is Camrosa's goal that all recycled water produced by the CWRF be put to beneficial use and that none be disposed of in any other way. In the rare event that treated CWRF product flows exceed the capacity of Camrosa's storage ponds and PVCWD will not accept the water, remaining or surplus flows are discharged into Calleguas Creek. When the Salinity Management Pipeline (SMP) is complete and accepts surplus CWRF product, discharges into the creek will cease altogether. The only discharge to the creek during the ten-year period since 2000 was approximately 90 AF during the severe storms of January and February, 2005.

In 2005, the CWRF produced 1,650 AF of tertiary-treated recycled water. Between 2005 and 2010, the volume of CWRF product decreased 7% from 1,650 AF to 1,522 AF, largely the result of a concerted effort made by CSUCI to upgrade the aging wastewater collection system on campus to minimize infiltration and otherwise reduce wastewater flows and also the success of the district-wide water conservation efforts. With these efforts complete, it is expected that moderate growth in wastewater flows will continue on campus over the next 20 years, until the campus reaches full build-out. Accordingly, forecasts for recycled water contained in this document project a recycled water availability of 2,044 AF/Y by 2035.

To accommodate the anticipated increase in wastewater flows, Camrosa is currently in the process upgrading the capacity of the CWRF to 2.25 MGD. Henceforth, the District intends to distribute all CWRF product, with no discharges to the SMP except in the wettest periods.

2. Non-Potable Surface Water (from HCWWTP)

In 2002, non-potable surface water from the Hill Canyon Wastewater Treatment Plant (HCWWTP) became available to the District for the first time. The plant's product water is discharged into the Conejo Creek, where it joins the North and South Forks of the Arroyo Conejo, which are composed primarily of runoff from irrigation and city streets in and around Thousand Oaks. The combined volume of the two Forks of the Arroyo Conejo and the HCWWTP discharge constitute the total flow in what becomes Conejo Creek by the time water is diverted at Camrosa's Diversion Structure. The Arroyo Conejo Forks make up, on average, 20% of Conejo Creek. Between the origin of Conejo Creek and the Diversion Structure, an estimated 1 CFS is lost absorption, evaporation and limited use, called Creek Loss. As required by the water rights decision, another 6 CFS must be returned to Conejo Creek at the Diversion for environmental benefit downstream. Thus, the volume available to the District is the contents of the creek minus the 6 CFS. Table 20 displays the volumes and constituents of Conejo Creek for the previous six years and the total amount available to Camrosa Water District after creek loss and beneficial use.

Discharge from HCWWTP is measured year-round by the City of Thousand Oaks and is, within 1 MGD (10%), stable throughout the year. Using Parshall flumes, the City also measures the flows in the North and South Forks of Arroyo Conejo and provides Camrosa Water District with these flows in annual Flume Reports. This information was used in the calculations reflected in Table 20, below. The agreement regarding Camrosa's primary access to HCWWTP recycled water in Conejo Creek was executed in 1994.

This 25-year contract will expire in 2019. Camrosa is currently in the process of renegotiating the agreement to retain rights to Conejo Creek water.

Table 20. Conejo Creek/HCWWTP Product Available to Camrosa (AF/Y)

	2005	2006	2007	2008	2009	2010
Discharge from HCWWTP[1]	12,267	11,680	11,550	11,518	11,232	10,363
North Fork[1]	1,822	1,477	986	1,080	765	902
South Fork[1]	5,134	5,448	2,895	2,889	3,129	2,641
Total Conejo Creek[1]	19,223	18,605	15,431	15,486	15,126	13,907
Beneficial Use Return (6 CFS)	4,343	4,343	4,343	4,343	4,343	4,343
Creek Loss (1 CFS)[2]	1,086	1,086	1,086	1,086	1,086	1,086
Available to Camrosa	13,795	13,176	10,002	10,058	9,697	8,478
Diverted from Conejo Creek[3]	**7,862**	**9,152**	**9,053**	**8,224**	**8,895**	**8,853**
Difference/Amount Left in Creek[4]	5,933	4,024	949	1,834	802	-375
Percent of Creek Diverted	56.99%	69.46%	90.51%	81.77%	91.73%	104.43%

1) Data extrapolated from annual HCWWTP Flume Reports
2) Creek Loss estimate determined by Camrosa engineers in mass balance analysis of Conejo Creek
3) Data actual numbers from Camrosa Water District production reports
4) After 7.5 CFS of Beneficial Use and Creek Loss

Creek Loss is a combination of volume reduction due to seepage into the creek bed, water loss along the creek sides, evaporation, water rights and use below HCWWTP but above the Diversion Structure. As can be seen by the difference between the volume Available to Camrosa and Diverted in 2010, the 1.5 CFS Creek Loss estimate is not exact, for it is not possible that Camrosa diverted more water than was available, and as the Creek Loss is only theoretical, it is in that estimate that the error occurred. Depending on the saturation of the underlying creek bed, ambient temperatures and humidity throughout the year, less than 1.5 CFS may be lost. In 2010, the District diverted 8,853 AF of non-potable surface water from Conejo Creek for delivery through the Non-potable Surface Water Distribution System. These quantities are expected to even out at 10,667 AF/Y, mirroring a leveling off of growth in Thousand Oaks and attendant production of tertiary-treated recycled water at HCWWTP. From 2015 through 2035, it is expected that 10,667 AF of non-potable irrigation water will be available to the District from HCWWTP (see Table 23 for projected available volumes).

The District will continue to depend on Conejo Creek to supply non-potable irrigation water demand throughout the District, and much of the new demand that will be created with the expansion of the non-potable distribution system (see Section 4.F) will be met with Conejo Creek flows. Although the table above indicates that Camrosa diverted nearly every available acre-foot of the creek in 2010, this does not mean that the District is at risk of exhausting an integral supply source. The multiagency agreement that allowed for the creation of the Diversion Structure states that Camrosa has first rights to as much water as it can use prior to passing any surplus through to Pleasant Valley County Water District (PVCWD). As can be seen from Table 21, over the previous six years, more and more diverted Conejo Creek water has stayed within District boundaries. As of 2010, nearly 4,900 AF/Y of the Conejo Creek remain available to Camrosa, and it is in part from this remaining portion of Conejo Creek that Camrosa will supply non-potable demand as it continues to grow.

Table 21. Use of Conejo Creek Diversions: District vs. PVCWD (AF/Y)[1]

	2005	2006	2007	2008	2009	2010
Total Diverted	7,862	9,152	9,053	8,224	8,895	8,853
Passed Through to PVCWD	5,656	6,440	6,040	4,612	3,998	4,880
Used in Camrosa Water District	2,206	2,712	3,013	3,612	4,897	3,973

1) All information from Camrosa Water District production reports

3. Recycled Water from Camarillo Sanitation District

The Camarillo Sanitary District (CamSan) was formed in 1955 to provide wastewater treatment for most of what is now the City of Camarillo. The treatment plant occupies a 20-acre site on Howard Road next to Conejo Creek within the Camrosa Water District boundaries. The plant currently treats about 4.0 million gallons of wastewater each day, with a maximum capacity of 6.75 million gallons. Over the years, the treatment plant has undergone several modifications to increase its capacity and to incorporate new technologies. Construction to upgrade treatment from “secondary” to “tertiary” levels, in order to meet all DHS was recently completed. After primary treatment the wastewater undergoes tertiary treatment using an "activated sludge treatment" process and is then sent into secondary clarifiers and tertiary filters ultimately disinfected in a contact basin using chlorine. Dechlorination is accomplished with sulfur dioxide before the effluent is delivered for agricultural purposes or discharged to Conejo Creek.

On December 15, 2005, the District executed an agreement with CamSan to pursue a phased approach to jointly resolving salts accumulation, increasing local water supply and enhancing its quality. One of the projects entailed the future delivery of up to 7,500 AF/Y of tertiary-treated recycled water from CamSan via Camrosa’s Non-Potable Irrigation Water Distribution System. At the time, the City of Camarillo did not anticipate operating its own separate recycled water distribution system. The initial agreement included the construction of additional facilities by CamSan to treat CamSan’s WWTP effluent and deliver it to Camrosa. To date, CamSan has completed upgrading the treatment process at its WWTP with nitrification/denitrification and tertiary filtration equipment necessary to meet Title-22 requirements and has completed the design for 80% of the pipeline to deliver effluent to Camrosa’s distribution system. Camrosa has completed the construction necessary for interconnection to Calleguas’s SMP and completed design for a new discharge point south of Potrero Road, which CamSan partially funded.

In August, 2010, CamSan staff notified Camrosa staff that the original agreement to provide up to 7,500 AF/Y of recycled water required modification due to the City of Camarillo’s intent to construct its own non-potable recycled water distribution system and make non-potable recycled water available to its water customers to meet recent water conservation mandates imposed by Metropolitan Water District and the State of California. CamSan has provided updated estimates of recycled volumes that will be made available to the District. These numbers are reflected in Table 22 below. Camrosa will continue to pursue opportunities for mutually beneficial interagency cooperation and anticipates that deliveries of up to 3,400 AF/Y of non-potable recycled water will eventually be available from CamSan as the City of Camarillo nears build-out. Initial deliveries of 440 AF/Y are expected to begin in 2015. Information received from CamSan indicates specific projections through 2030, and then a more general projection of what will eventually be available when the City of Camarillo reaches full build-out. This CamSan has labeled simply “Future.” In order to arrive at a more precise estimate of the amount of water available from CamSan in 2035, Camrosa averaged the rate of growth over the period 2010-2030 of Total Recycled Water Produced by CamSan (107%) and applied this to the projected Total Recycled Water Produced by CamSan 2030, arriving at 5,925 AF. Being as CamSan projects always delivering 4,100 AF to the City of Camarillo, even at build-out,

Camrosa subtracted that same volume from the Total Recycled Water Produced to arrive at an estimate of 1,825 AF of CamSan water available for delivery to Camrosa in 2035, as displayed in Table 22 below.

Table 22. Discharges from Camarillo Sanitation Department (AF/Y)

	2010	2015	2020	2025	2030	Future[1]	2035[2]
Total Recycled Water Produced by CamSan	4,200	4,340	4,780	5,170	5,530	7,500	5,925
Recycled Water Deliveries to City of Camarillo	1,110	3,900	4,100	4,100	4,100	4,100	4,100
Recycled Water Available to Camrosa	0	440	680	1,070	1,430	3,400	1,825

1) CamSan's estimate of recycled water availability and use at City of Camarillo full build-out
2) Camrosa's estimate based on average growth over 2010-2030

4. **Total Non-Potable Recycled Water Available to Camrosa Water District**

Table 23 indicates the total recycled water projected to be available to Camrosa Water District between now and 2035.

Table 23. Total Combined Recycled Water Available to Camrosa (AF/Y)

	2010	2015	2020	2025	2030	2035
Camrosa WRF	1,522	1,696	1,870	2,044	2,044	2,044
HCWWTP	8,853	10,667	10,667	10,667	10,667	10,667
CamSan	0	440	680	1,070	1,430	1,825
Total	**10,375**	**12,803**	**13,217**	**13,781**	**14,141**	**14,536**

5. **Non-Potable Irrigation Water Use**

As described in Section 3, the use of non-potable irrigation water has been steadily increasing in the District since the completion of the Conejo Creek Diversion Structure in 2002. Prior to that, the District's non-potable irrigation water distribution system supply was limited to the Water Reclamation Facility (WRF) product. When the Diversion came online, deliveries were made initially to agricultural users. As time went on, the use of non-potable irrigation water diverted from Conejo Creek for landscape irrigation increased as areas built with dual-plumbing connected to the system and others began to install new infrastructure to accommodate the transfer. In 2007, Leisure Village, a retirement community located in the District, began converting its common area, open space, landscape and golf course irrigation to the non-potable distribution system. Completed in 2008, this accounts for roughly 500 AF/Y of the increase over the previous five years. Table 24 indicates the previous five years (2006-2010) of non-potable irrigation water use within the District, as well as the 2005 UWMP projection for 2010 use, as a point of reference. Line loss was not accounted for prior to 2010.

Table 24. Non-Potable Irrigation Water: Past Use (AF/Y)						
User Type	**2006**	**2007**	**2008**	**2009**	**2010**	**Projected 2010**[1]
Municipal & Industrial	167	839	1,166	1,436	1,253	N/A
Agriculture	6,169	5,050	5,301	5,820	5,512	N/A
Total	**6,336**	**5,889**	**6,467**	**7,256**	**6,764**	**6,800**

1) Projected in Camrosa's 2005 UWMP

Moving forward, line loss of 5% is assumed and accounted for in non-potable irrigation water use projections. The substantial growth in non-potable demand between 2015 and 2030 is due to the estimated potable landscape/agriculture irrigation offset of the proposed non-potable expansion described in Section 4.F, below, which reflects the current strategy of the District in improving self-reliance and lessening dependence on imported SWP water.

Table 25. Non-Potable Irrigation Water: Current & Potential Future Use (AF/Y)					
User Type	**2015**	**2020**	**2025**	**2030**	**2035**
Municipal & Industrial	1,708	4,291	5,102	5,829	5,829
Agriculture	5,570	4,090	4,090	4,090	4,090
Other (NP Line Loss of 5%)	364	419	460	496	496
Total	**7,642**	**8,800**	**9,652**	**10,415**	**10,415**

6. Rate Incentives

In order to encourage use of non-potable irrigation water within the District, significant price incentives have been established. The current (2010) price per acre-foot of potable water for irrigation is $1,102; non-potable irrigation water served from the Non-potable Irrigation Water Distribution System costs $305 per AF and non-potable water in the Blended-Ag area, which contains on average roughly 60% potable water to control chloride levels, costs $862 per AF. The vast majority of customers who will be offered non-potable irrigation water through the expansion described above would receive unblended non-potable irrigation water at a substantially reduced rate to provide sufficient incentive to use this alternate source of supply.

The Board of Directors has adopted a policy that requires developers to install dual piping systems for all new developments. While the potential increase in non-potable demand resulting from such a policy is difficult to quantify due to the unpredictability of the housing market, such a policy should ensure an increase in demand for non-potable irrigation water to serve M&I irrigation needs.

F. Future Water Projects Under Consideration

Camrosa Water District has developed two strategies to reduce dependency on imported State Water Project water: increasing the production of potable water from local groundwater sources and expanding the non-potable irrigation water distribution system. These two strategies are not contingent upon one

another, nor are they mutually exclusive. The projects presented below represent portions of these two strategies, which Camrosa has included in this plan to demonstrate ways in which the dependency on imported SWP water may be reduced, and are considered a non-exclusive list of alternatives currently under consideration by District staff and its Board. Various projects to pursue each strategy have begun and some have even been completed, others are being planned and still others remain only conceptual. What follows below is a general outline of the two strategies; individual projects will be presented to Camrosa's Board of Directors for approval after in-depth economic analysis and feasibility studies.

1. Potable Water Production Projects Under Consideration

The main components of the District's plan to develop local groundwater sources have been discussed in Section 4.D – Desalinated Water Opportunities. In addition to these three desalination projects, the District also plans to construct an additional well in the Tierra Rejada Valley. As the Round Mountain Water Treatment Plant and the second well in the Tierra Rejada Valley are both expected to come online before the next update of this Urban Water Management Plan in 2015, the volumes they are expected to produce have already been taken into account in supply and demand projections throughout this document. The other two desalination facilities are still conceptual and therefore are not considered in potable water supply projections.

a. Round Mountain Water Treatment Plant

One of the old wells that tap the Perched Aquifer at the base of the Conejo Hills, the University Well, has been rehabilitated for the express purpose of feeding a 1 MGD desalination facility. Preliminary yield and drawdown tests indicate that the well will easily produce the desired 1 MGD and initial water quality assessments indicate that the brackish groundwater within the Perched Aquifer should respond well to basic RO filtration. A contract to design the Round Mountain Water Treatment Plant (RMWTP) has been awarded. Easements necessary for pipelines to connect the University Well to the RMWTP are being acquired. A brine line to the regional SMP has been completed. It is estimated that the RMWTP will be operational and providing up to 1 million gallons per day (1,120 AF/Y) of potable water to the potable distribution system by early 2013.

b. Regional Desalination Facility

On February 23, 2011, Camrosa's Board of Directors approved an agreement with the Calleguas and the cities of Camarillo, Thousand Oaks and Simi Valley to jointly fund a preliminary study to determine the possibility of a regional desalination facility, the Northeast Pleasant Valley Basin Groundwater Desalter, as described in Section 4.D.2. The objectives of this initial study include: determining water quality/level monitoring, Basin Management Objectives, contingency plans, potential sustainable extractions, and the necessary number, depth and location of wells; defining cones of depression; analyzing the project's potential impacts; and preparing necessary CEQA documentation.

c. Desalination of Conejo Wellfield Water

Desalinating Conejo Wellfield water to increase local potable production is contingent upon the SMP, for without that interagency project, disposing of the brine stream from a desalination facility located in this area of the District would be prohibitively expensive. Further investigation and cost-benefit analyses are necessary prior to determining the feasibility of such a project; a schedule for the process is therefore not available.

d. Second Well in Tierra Rejada Valley

The water in the Tierra Rejada Basin is currently of sufficiently high quality to not require blending prior to being injected into the potable water distribution system. The District's single well there produces less than its design capacity due to the tendency for a cone of depression to develop when the well is pumped. Developing a second well in the Tierra Rejada Groundwater Basin would allow the District to increase the volume of high-quality water produced in the District's easternmost service area. In addition, the new well would allow the introduction of groundwater into in the highest elevations in the District, an area now served

exclusively with imported water received through a Calleguas meter station. Service reliability would be improved in that pressure zone as a redundant source of potable water would be available in the event of an interruption of imported water service.

This project is predicated upon the prior completion of a Ground Water Management Plan for the Tierra Rejada Basin, as no GWMP for the basin currently exists.

2. Non-Potable Irrigation Water Distribution System Expansion Projects Under Consideration

Another potential strategy of the District's to decrease dependence on imported water is to expand the non-potable irrigation water distribution system so that as many customers in the District service area as possible can irrigate with non-potable irrigation water. Between the District's three sources of non-potable irrigation water described in Section 2.C, there is far more than enough non-potable irrigation water to meet irrigation demand within the District for the foreseeable future. Therefore, the majority of the projects described herein are concerned with expanding the distribution system infrastructure, rather than developing additional sources of non-potable irrigation water. Only one project, rehabilitating the Penny Well, will develop a brand new non-potable water source. The interconnection to the CamSan non-potable water distribution system has been described several places in this document and will not be elaborated upon here. Descriptions of the infrastructure improvements and expansion will be brief and aimed at providing sufficient explanation of the schedule for the transfer of demand from the potable to the non-potable systems first presented in Tables 6 and 7, detailed here in Table 26 and assumed throughout the remainder of this plan.

The specific potential non-potable demand displayed in Table 26 below was calculated based on estimated outdoor irrigation of the parcels that would be provided non-potable service under the expansion strategy outlined herein, which is only one of several options under consideration. In order to estimate this demand, the actual 2008 potable demand of each parcel to potentially be transferred was obtained through Camrosa's CIS/GIS interface. 2008 demand was then multiplied by 80 percent, which is the estimated average of usage per parcel that goes to outdoor irrigation. Parcels were then grouped into phases according to their general geographical area. Although plans for expansion are still general in nature and the descriptions attendant to Table 26 are non-exclusive, specific volumes of potential non-potable irrigation demand are listed here in order to substantiate the information presented in Tables 6 and 7 above.

Of the significant volume of water available from the Hill Canyon Wastewater Treatment Plant, diverted at the Conejo Creek Diversion Structure, the District retained roughly half for use within the District's service area in 2010. The remainder was sent to PVCWD as per the multiagency agreement described in Section 2.C.3. Considering current use and projected development, the potential exists to offset 2,658 AF/Y of potable water use within the District, which is a significant portion of what will be available to the District over the same time frame.

As currently conceived, the expansion would take place in several distinct segments, each of which contains several phases. The location of new storage reservoirs and the alignment of their attendant pipelines will determine which and how many parcels could be provided non-potable irrigation water and the timeframe the water would become available; Table 26 and the discussion that follows are based on one, non-exclusive set of options for this expansion.

Table 26. Non-Potable Distribution System Expansion (Current/Non-Exclusive Conception of Phases)

Project Segments	Parcels	Scheduled Completion	New Non-Potable Demand	Average AF/parcel
a. Rehabilitate Penny Well	37	2012	75	2.03
b. Santa Rosa Valley	723	2015-2030	1,696	2.35
c. Seminary & Surrounding Area	651	2020	568	0.87
d. Non-Potable Pressure Zone 1	572	2030	319	0.56
TOTAL NEW NP DEMAND	**1,926**	**2030**	**2,658**	**1.38**

a. Rehabilitate Penny Well

The Penny Well was initially used as a potable water supply and the well is still listed as a standby well in the potable distribution system. In an abundance of caution, the well was taken offline in the spring of 1999, when trace concentrations (well below CDPH MCLs) of agricultural pesticides were found in the wellwater. Subsequently, the winter storms of 2005 washed out the pipeline and power lines leading to the well and it has not been used since.

As the contaminants found in the wellwater are not a concern for non-potable water, it is the District plans to return the Penny Well to use as part of the non-potable distribution system. The Penny Well's immediate impact will be to provide additional pressure to feed Wildwood Estates, located just south of Santa Rosa Road. This residential housing tract is dual-plumbed, but is currently not using its non-potable system due to insufficient pressure. Initially, the well will be pumped far short of its 400 GPM capacity and will contribute just enough to meet the limited Wildwood demand. Based on historical pumping and the general condition of the Santa Rosa Basin (in which the Penny Well lies), the District expects an additional 350 AF/Y from the Penny Well. This is the volume that has been added to supply projections throughout this Plan. Rehabilitation and interconnection is expected to be complete by the end of 2012.

Should the contaminant plume that took the Penny Well out of commission in 1999 have moved on and should water quality be sufficiently high, water produced from the Penny Well may be piped into the potable distribution system. Whether it is used in the potable or non-potable system, the Penny Well's output should reduce the volume of SWP water that must be imported.

b. Santa Rosa Valley

Should eastward expansion occur in Santa Rosa Valley, the non-potable irrigation water distribution system would need a significant increase in both storage and pumping capacity in the valley. Currently, two new storage reservoirs – NP 4C Tank and NP 3D Tank – are proposed to provide the needed storage and pressure for the expansion. Parcels near these tanks and their pipelines would begin receiving non-potable irrigation water upon completion of construction.

The main backbone of the Santa Rosa Valley non-potable irrigation water distribution system would extend southeastward in stages, as presented in Table 26, displacing an estimated 1,696 AF/Y of imported potable water use with non-potable irrigation water. Two large residential areas, which would comprise the final two phases of the expansion, may require the introduction of another source of non-potable water and, because of their elevation, more storage and/or new pump stations. Nevertheless, the 456 AF/Y of potential potable

water offset is a goal of the District's and is included in the 2030 supply/demand projections throughout this Plan.

c. St. John's Seminary and Surrounding Service Area

Several housing tracts in the western area of the District, near St. John's Seminary, are either dual-plumbed or will be conditioned to be dual-plumbed upon development. At the present time, this entire area is being irrigated with potable water, both agricultural parcels and housing tracts. Due to the area's elevation, a new pump station and reservoir would have to be built to provide sufficient volume and pressure to the 651 parcels that are estimated to demand 568 AF/Y of non-potable irrigation water.

The area has an existing well located within the Fox Canyon Groundwater Management Agency jurisdiction. As part of the proposed development agreement between Shea Homes and the District, Camrosa will seek to have the well and the 104.9 AF/Y allocation dedicated to the District.

d. Non-Potable Pressure Zone 1

Several areas in the lower elevations of the District's service area are potential candidates for conversion to the non-potable irrigation water distribution system. As can be seen in Table 26, these projects have low estimated acre-foot per parcel demands. No other operational constraints would necessarily be alleviated by providing non-potable water to these areas. Nonetheless, the offset of potable water is significant: transferred non-potable demand represents 2% of the total water used in the District, and roughly 5% of the annual imported potable water.

G. Summary of Current and Projected Water Supplies

The total water supply available to Camrosa Water District was approximately 19,561 AF in 2010. These sources reflect the continued diversion of non-potable surface water from Calleguas Creek, production of recycled water from Camrosa's water reclamation facility, sustained groundwater pumping, and imported State Water Project deliveries through Calleguas Municipal Water District. By 2015, through renewed negotiation, interconnection with the Camarillo Sanitation District is anticipated to bring an additional supply of 440 AF of recycled water to the District. Small pockets of additional urban growth will increase GMA credits by another 100 AF during the planning period. Potential new supplies could be developed by treating water pumped from Santa Rosa Groundwater Basin and desalinating brackish groundwater in the Perched Zone. Water supplies are projected to grow to 32,190 AF by the year 2035.

Section 5 Water Supply Reliability & Water Shortage Contingency Planning

A. Water Supply Reliability

LAW

10620(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10631(c)(2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

10634 The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision 9A0 of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

10631(c) (2) Describe the reliability of the water supply and vulnerability to seasonal or climactic shortage, to the extent practicable, and provide data for each of the following: (A) An average water year, (B) A single dry year, (C) Multiple dry water years.

10635(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water servicer to its customers during normal, dry and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state regional, or local agency population projections within the service are of the urban water supplier.

The potential issues that could result in reduction of the amount of water supply from each of the Water Supply Sources (listed in Table 14) are discussed below. All water sources are available at consistent levels of use; changes to those levels of use would be brought around by significant and gradual changes in environmental factors, water quality and/or the climate. Where legal agreements are applicable, it is the District's policy to renew or renegotiate current agreements or search out alternative sources far enough in advance to offer ample opportunity to ensure supply prior to the current agreement's expiry. Large-scale conservation and other Demand Management Measures are discussed elsewhere in this Section.

1. Imported Water from Calleguas

As Camrosa depends exclusively upon Calleguas Municipal Water District for its imported potable water supply, and because that supply constitutes roughly two-thirds of the District's total potable supply, the reliability of Camrosa's potable distribution system is dependent upon and equal to the reliability of Calleguas. The main and primary threat to Camrosa's supply of potable State Water Project water imported from Metropolitan Water District via Calleguas Municipal Water District is the relative health and ability to convey water from the Sacramento-San Joaquin Delta. As discussed throughout this plan, the District's primary strategy to conserve imported water and employ alternate sources to SWP water is the large-scale conversion of outdoor, landscape and agriculture irrigation to non-potable irrigation water use. Aside from increasing the use of desalination of various water sources (projects which are presented in

Sections 4.D and 4.F), the District does not have a viable alternative to importing some high-quality, potable SWP water from Metropolitan via Calleguas.

2. Groundwater

Groundwater available to the Camrosa Water District in the four aquifers the District overlays is used to augment imported SWP water, thereby increasing self-reliance and reducing demand on the Sacramento-San Joaquin Delta. As discussed in detail in the remainder of this Section, conservation efforts have proven a great benefit to reducing the amount of imported SWP water the District demands. As the District becomes increasingly capable of utilizing more and more groundwater, the need to import SWP water will continue to decline.

a. Tierra Rejada Basin

Unexpected reductions in the water table height and water level quality are the primary threats to the Tierra Rejada Basin's reliability. Should water table levels fall, the Tierra Rejada Well's contribution to Camrosa's supply would have to be made up for with increased imported SWP water. Should water quality degrade, water from the Tierra Rejada Basin could potentially be blended with SWP water or, if quality is poor, directed into the non-potable irrigation water distribution system. In either case, more SWP water would have to be imported for the potable system.

The Tierra Rejada Basin does not currently have a groundwater management plan, but the District plans to complete that in the near future.

b. Santa Rosa Basin

Even by the most conservative estimates, Santa Rosa Basin has additional yield not currently utilized and the basin remains full even during the driest of years. Unexpected reductions in the water table height in the Santa Rosa Basin could negatively affect the District's dependence on the Basin. The project to increase production from the Conejo Wellfield by desalinating a portion of the water extracted there is designed to reduce the District's dependence on imported water under normal conditions and provide additional supply during periods of high demand. Should water levels in the Santa Rosa Basin fall or the water quality significantly degrade, potable supply extracted from the Basin would have to be replaced with imported SWP water; non-potable supply would be substituted with non-potable irrigation water. None of these eventualities is likely to occur, however, and the reliability of the Basin is relatively sure.

The District has plans to update the Santa Rosa Basin Groundwater Management Plan (SRGMP) in the near future.

c. Pleasant Valley Basin

The Fox Canyon GMA's allocation for the Woodcreek Well is based on an allowance for the residential development overlying the Fox Canyon Aquifer at a rate of 1 acre-foot per acre of land developed. As of 2010, Camrosa's allocations are approximately 807 AF/Y. Due to additional development within the District, this allocation is expected to increase to approximately 916 AF/Y by the end of 2014 and then remain relatively stable through 2035. Because this is an annual allocation, water not pumped cannot be carried over from one year to the next. However, because it is based on developed land, the allocation is considered extremely reliable. As the Woodcreek Well, which produces water from the Fox Canyon Basin, currently produces water that is injected directly into the potable distribution system, should its water quality deteriorate mildly, the water could still be used in the potable system, provided it were blended with SWP. If it were to degrade further, it could be used in the non-potable distribution system, and its contribution to potable supply would have to be fulfilled with SWP water.

d. Perched Aquifer

Due to the fact that the Perched Aquifer has not been used as a source to supply significant volumes of water for over thirty years, it is difficult to know how the aquifer will respond to renewed extraction at the

proposed volumes. However, based on the most recent hydrogeologic investigation, extractions are planned at a level that can be sustained indefinitely.

3. Recycled Water & Non-Potable Irrigation Water

The Title-22 recycled water directly from Camrosa's WRF and CamSan's WWTP, and the non-potable surface water from HCWWTP that is diverted from Conejo Creek, all come from consistent wastewater flows. They are therefore extremely reliable sources of non-potable irrigation water supply, even in the driest of years.

During the planning period 2010-2035, it is expected that the Conejo Creek Diversion will consistently produce more water than needed to satisfy demands within the District and the surplus water will continue to be delivered to the Pleasant Valley County Water District under the existing agreement.

Table 27 indicates the disposal breakdown of the three sources of recycled water available to the District for use in the non-potable irrigation water distribution system.

Table 27. Disposal of Treated Wastewater (AF/Y)

Method of Disposal		2010	2015	2020	2025	2030	2035
CWRF	Discharged to Creek	0	0	0	0	0	0
	Recycled	1,522	1,696	1,870	2,044	2,044	2,044
CamSan	Discharged to Creek	0	0	0	0	0	0
	Recycled	4,200	4,340	4,780	5,170	5,530	5,996
	Ag Delivery	840	840	840	840	840	840
HCWWTP	Discharged to Creek	3,167	4,053	4,053	4,053	4,053	4,053
	Recycled	9,939	10,667	10,667	10,667	10,667	10,667
Estimates based upon plant capacity							

The only foreseeable interruptions in supply service of the three sources of non-potable irrigation water are pipeline ruptures on the short-term side and contract/agreement expirations on the long-term. In order to avoid the latter, it is Camrosa's policy to renegotiate contracts well in advance of their expiry. This policy is intended to allow the District sufficient time to develop alternative supplies to ensure that the non-potable irrigation water distribution systems receive adequate supply.

B. Water Shortage Contingency Planning

LAW

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

1. Imported Water

In 2010, approximately 40% of the water used within Camrosa Water District was State Water Project water imported from Metropolitan Water District through Calleguas Municipal Water District. Approximately two-thirds of the District's potable water is imported SWP water and the non-potable irrigation water system contains about 10% imported water to curb chloride content in certain portions of the supply served to agricultural users. As Camrosa relies exclusively on Calleguas Municipal Water District for its SWP water supply, and that supply constitutes the majority of the potable water system, the reliability of Camrosa's potable water system is dependent upon Calleguas. Accordingly, the table below presents Calleguas's own local supply projections.

Over the next 10 years, shortages in local supplies will have little impact upon the District's water supply. The quantities of imported State Water Project water that Camrosa relies on to meet normal year demands are significantly reduced from historical levels. This reduction from historical import levels will continue as the non-potable distribution system expands, as demonstrated by the conversion of Leisure Village to non-potable irrigation. Furthermore, Metropolitan has maintained that they will be 100% reliable for the next 20 years, and Camrosa will rely upon augmentation of its imported supply up to historical levels to meet dry- and multiple dry-year demands.

Camrosa will continue to import SWP water to blend with well water to meet potable demand. However, the quantities may be subject to increases in the future should water quality in the Santa Rosa Basin or the Fox Canyon Aquifer deteriorate. Similarly, should chloride levels in SWP water rise precipitously, greater quantities may be necessary to achieve an acceptable blend for potable water quality purposes.

Since 1991, Metropolitan has made significant investments in conservation, water recycling, storage and improved supplies. Groundwater storage programs with Semitropic Water Storage District and Arvin-Edison Water Storage District increase Metropolitan's out-of-region storage capacity of state water project water by 600,000 AF. Additional groundwater storage programs have been established with the San Bernardino Valley MWD, and Kern-Delta Water District that will expand that capacity further. The completion of Diamond Valley Reservoir has added 800,000 AF of supply to southern California's mix of resources available to meet dry year needs. The adoption of a "Water Surplus and Drought Management" (WSDM) Plan in 1999 by the Metropolitan Board of Directors has resulted in more effective management of water resources to further improve the reliability of water deliveries by Metropolitan Water District.

In addition, Metropolitan's 2010 Urban Water Management Plan outlines several other projects being pursed by Metropolitan and the State of California to protect and increase imported SWP supplies. These include flexible Central Valley storage and transfer programs, the Delta Action Plan, the Two-Gate System in the Delta, the Bay Delta Conservation Plan and the Water Supply Allocation Plan.

Table 28 outlines the projected reserves for Metropolitan Water District for Average, Dry Year and Multiple Dry Year conditions. As can be seen from this table, the conservation efforts undertaken by Metropolitan Water District and its member agencies over the previous several years have reduced demand totals well below available supply totals under Normal Year rainfall conditions.

Table 28. Projected Reserves for Metropolitan Water District (1,000 AF)

Normal Year	2015	2020	2025	2030	2035
Supply Totals	2,395	2,522	2,553	2,580	2,603
Demand totals	1,928	1,763	1,808	1,874	1,931
Reserves (Supply – Demand)	**467**	**759**	**745**	**706**	**672**
Reserves as a % of Demand	**24.22%**	**43.05%**	**41.21%**	**37.67%**	**34.80%**
Single Dry Year	**2015**	**2020**	**2025**	**2030**	**2035**
Supply Totals	2,260	2,322	2,366	2,405	2,419
Demand totals	2,094	1,993	2,025	2,080	2,146
Reserves (Supply – Demand)	**166**	**329**	**341**	**325**	**273**
Reserves as % of Demand	**7.93%**	**16.51%**	**16.84%**	**15.63%**	**12.72%**
Multiple Dry Years	**2015**	**2020**	**2025**	**2030**	**2035**
Supply Totals	2,171	2,305	2,343	2,378	2,402
Demand totals	2,154	2,049	2,106	2,163	2,224
Reserves (Supply – Demand)	**17**	**256**	**237**	**215**	**178**
Reserves as % of Demand	**0.79%**	**12.49%**	**11.25%**	**9.94%**	**8.00%**

1) Information from Calleguas Municipal Water District's 2010 Urban Water Management Plan

Since 1991, Calleguas Municipal Water District, has also implemented a strategy for meeting rising water demands in its service area by implementing both regional and local supply augmentation and demand management programs. The Las Posas Aquifer Storage and Recovery Project has been an ongoing

project that will store up to 300,000 AF of imported water for use during drought. The project is approximately 70% complete and has an extraction capacity of approximately 70 cubic feet per second (CFS). It is anticipated that a maximum extraction rate of 100 CFS will be available upon completion of the project. Expansion of Lake Bard Water Treatment Plant to 100 CFS has been completed. Finally, Calleguas has invested in regional recycling projects to reduce demand on imported water.

Table 29 below outlines the projected reserves for Calleguas Municipal Water District for Average, Dry Year and Multiple Dry Year conditions:

Table 29. Projected Reserves for Calleguas Municipal Water District (1,000 AF)[1]

Normal Year	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Supply Totals	118.5	129	137	140.8	142.4	143.8
Demand totals	116.9	113.4	118.3	121.4	124.8	128.1
Reserves (Supply – Demand)	**1.6**	**15.6**	**18.7**	**19.4**	**17.6**	**15.7**
Reserves as a % of Demand	**1.37%**	**13.76%**	**15.81%**	**15.98%**	**14.10%**	**12.26%**
Single Dry Year	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Supply Totals	121.3	131.9	140	143.8	145.5	147
Demand totals	120.8	118.6	123.2	126.7	132	135.2
Reserves (Supply – Demand)	**0.5**	**13.3**	**16.8**	**17.1**	**13.5**	**11.8**
Reserves as % of Demand	**0.41%**	**11.21%**	**13.64%**	**13.50%**	**10.23%**	**8.73%**
Multiple Dry Years	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Supply Totals	N/A	131.1	140	145.3	148.5	149.5
Demand totals	N/A	125.4	129.9	132.7	138.7	142.6
Reserves (Supply – Demand)	**N/A**	**5.7**	**10.1**	**12.6**	**9.8**	**6.9**
Reserves as % of Demand	**N/A**	**4.55%**	**7.78%**	**9.50%**	**7.07%**	**4.84%**

1) Information from Calleguas Municipal Water District's 2010 Urban Water Management Plan

Calleguas expects to be able to meet all demands for imported water throughout the 25-year planning period, for all three rainfall category years. As a result, the wholesale supply available to the District is considered to be 100% reliable for normal, single dry and multiple dry years. There are no known inconsistencies in the supply that would reduce the amount of water available under non-emergency conditions.

Table 30. Wholesale Supply Reliability (% of Normal Supply)

	Average/Normal Year	**Single Dry Year**	**Multiple Dry Years**		
			Year 1	Year 2	Year 3
Calleguas MWD	7,900	100%	100%	100%	100%

In 1991, the District was importing more than 12,000 AF of State Water Project per year. In developing the inventory of water supplies (Table 14) in 2005, the District expected to import an average of 8,700 AF/Y

between 2010 and 2030. Due to statewide reassessment of the Sacramento-San Joaquin Delta's overall health and sustainability Metropolitan has reduced the amount of water it will allow its constituent agencies to purchase. Thus, quantities expected to be imported for 2015 through 2035 are not expected to exceed 7,900 AF/Y, even in the driest years. Due to the conscious effort on the part of the District to develop alternate water supplies in order to reduce dependence upon imported supplies, and the continued success of conservation efforts on the part of customers, the District will likely stay well below this amount.

2. Water Supply Shortage Stages & Conditions

On June 24, 2009, the Camrosa Water District adopted Ordinance 40-10, "Rules and Regulations Governing the Provision of Water and Sanitary Services." Among other things, the ordinance establishes conditions of service for all classes of water and establishes prohibitions against water waste and provisions for staged reductions in water service during water shortage emergencies. The Ordinance is included as Appendix C in its entirety; applicable portions are quoted below:

5.14. Prohibition of Water Waste

No person shall cause or permit water under his/her control to be wasted. Willful waste of water may result in additional fees, charges and/or termination of service as directed by the Board of Directors. The following prohibitions are in effect at all times, regardless of whether any declared water supply shortage or water emergency condition is in effect:

1. Gutter Flooding - No person shall cause or permit any water furnished to any property within the District to run or to escape from any hose, pipe, valve, faucet, sprinkler or irrigation device into any gutter or to otherwise escape from the property, if such running or escaping can reasonably be prevented.

2. Leaks - No person shall permit leaks of water that he/she has the authority to eliminate. Any detected leak, break or malfunction shall be corrected within 72 hours after a person discovers or receives notice from the District.

3. Positive Hose-end Shutoff - All garden and utility hoses shall be equipped with a positive hose-end shutoff nozzle.

4. Vehicle Washdown - Vehicles, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer shall be cleaned only by use of a hand-held bucket or a hand-held hose with a shutoff nozzle device.

5. Restaurant Equipment - Restaurants are required to use water-conserving dish washing spray valves in all food preparation and utensil cleaning areas.

6. Water Fountains and Decorative Water Features – Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited

7. Single Pass Cooling Systems - Installation of single pass cooling systems in buildings requesting new water service is prohibited.

5.17. Water Supply Shortage or Water Emergencies

"Water Supply Shortage" is a condition when Camrosa Water District determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. A "Water Emergency" is a condition resulting from some catastrophic event or events, which cause or threaten to cause an impairment, reduction, or severance of the district's water supply or access to its water supplies in a manner that may result in district's inability to meet ordinary water demands for potable water service. In the event of an imminent inability of the District to

meet ordinary water demands for a period beyond what can reasonably be considered routine system repairs the General Manager shall report to the Board of Directors on the extent, estimated duration, cause, and estimated severity of the event or events leading to the water supply shortage or water emergency and by resolution the Board of Directors may declare a Water Supply Shortage or Water Emergency and activate one or more of the following emergency provisions of this ordinance:

Stage One Water Supply Shortage or Water Emergency

The goal of a stage one water supply shortage or water emergency declaration is a 10% potable water demand reduction to preserve water supplies for district and or the region until the emergency has ended. The district shall notify its customers via newspaper, radio, television and direct mail or by any other means determined by the district to be prudent that a Water Supply Shortage or Water Emergency has been declared and that the District is requesting all customers to reduce water use by 10%. In addition to the prohibited uses of water outlined in Section 5.14, the following water conservation requirements apply during a declared Stage One Water Supply Shortage or Water Emergency;

1. Leaks - No person may permit leaks of water that he/she has the authority to eliminate. Any detected leak, break or malfunction shall be corrected within 48 hours after a person discovers or receives notice from the District.

2. Wash-Down of Hard or Paved Surfaces – Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by with a hose equipped with a positive self-closing water shut-off device, a low-volume, high-pressure cleaning machine, or a low-volume high-pressure water broom.

3. Drinking Water Served Upon Request Only – Eating or drinking establishments, including but not limited to a restaurant, hotel, café, cafeteria, bar, or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

4. Limits on Watering Durations – Watering of lawns, landscape or other vegetated area with potable water is limited to non-peak demand times and only when necessary. Use of a hand held hose with positive shutoff nozzle; bucket or micro irrigation systems/equipment may be

required.

5. Limits on Watering Hours - Watering or irrigating of lawn, landscape or other vegetated area with potable water may be prohibited between the hours of 9:00 a.m. and 5:00 p.m. on any day.

Stage Two Water Supply Shortage or Water Emergency

The goal of a stage two water supply shortage or water emergency declaration is a 20-30% reduction in potable water demands while preventing the loss of property and protecting the health and safety of the community and region. The district shall notice all of its customers via newspaper, radio, television and direct mail or by any other means determined by the district to be prudent that a Water Supply Shortage or Water Emergency has been declared and that the District is requesting customers to reduce water use. In addition to the prohibitions listed in the Stage One Water Supply Shortage or Water Emergency and the prohibited uses of water in Section 5.14 above, the following water conservation requirements to prudently preserve water supplies shall be observed;

1. Leaks - No person may permit leaks of water that he/she has the authority to eliminate. Any detected leak, break or malfunction shall be corrected within 24 hours after a person discovers or receives notice from the District.

2. Limits on Watering Days – Water or irrigating of landscape or other vegetated area with potable water may be limited to three days per week on a schedule established and posted by the District.

3. Limits on Filling Residential Swimming Pools & Spas – Use of water to fill or refill swimming pools and spas may be limited to maintain the level of water only when necessary. Draining of pools and spas or refilling shall be done only for health or safety reasons.

4. Substitution of Non-potable water - No person shall permit the outdoor use of potable water for irrigation or dust abatement where non-potable or recycled water is available.

Stage Three Water Supply Shortage or Water Emergency

The goal of a stage three water supply shortage or water emergency is to reduce potable water demands by 30-50% while protecting the health and safety of the community and the region. The district shall notice all of its customers via newspaper, radio, television and direct mail or by any other means determined by the district to be prudent that a Water Supply Shortage or Water Emergency has been declared and that the District is requesting customers to reduce water use. In addition to the actions and requirements of a stage two emergency and the prohibited uses of water in outlined in Section 5.14 above the following water conservation requirements to prudently preserve water supplies shall be observed;

1. Irrigation restrictions – Watering or irrigation of lawn, landscape or other vegetated area with potable water may be prohibited by the Board.

2. New Potable Water Service – No new potable water service will be provided, no new temporary meters or permanent meters will be provided and no statements of immediate ability to serve or provide potable water service will be issued, except as approved on an individual review by the District.

3. Other Prohibited Uses – The District may implement other water use requirements as determined by the District to meet water supply shortage or water emergency conditions.

Other Prohibited Uses – The District may implement other water use requirements as determined by the District to meet water supply shortage or water emergency conditions.

Table 31 below summaries the shortage stages and conditions and expected response in each case.

Table 31. Water Supply Shortage Stages & Conditions		
Stage	**Water Supply Condition and Staged Responses**	**% Reduction**
One	Condition: Total net supply potable supply (imported and local sources) at 90% of firm supply (e.g. loss of a local groundwater source). Response: Voluntary reduction to preserve water supplies.	10%
Two	Condition: Total net supply potable supply (imported and local sources) at 70% to 80% of firm supply (e.g. loss of multiple groundwater sources or a limitation in the availability of imported water). Response: Mandatory reduction to prevent property loss & protect health & safety of community.	20-30%
Three	Condition: Total net supply potable supply (imported and local sources) below 70% of firm supply (e.g. loss of all groundwater sources or significant reduction in the availability of imported water). Response: Mandatory reduction to protect health and safety of community.	50%

The ordinance allows the Board of Directors to progress through three stages of action in the event of a water shortage emergency. Each stage conserves progressively more water from 10% in Stage 1 to 50% in Stage 3. Since all water delivered by the District is metered both as production supply and as delivered to customers, actual reductions can be measured over time.

Emergency stages are declared by resolution of the Board. An attached draft resolution is attached as Appendix D. The ordinance is specifically written to preserve the Board's discretion to prescribe rates, fees, charges and penalties at the time the emergency is declared. This ensures that the charges will be set appropriately considering the circumstances of the emergency and prevailing factors that would influence the effectiveness of such measures.

3. Estimated three-year Minimum Water Supply

Groundwater in the District Service Area is pumped at rates that are sustainable even in multiple-dry year scenarios. Sufficient water is available from imported sources, and levels of non-potable irrigation water available remain constant, as displayed in Table 32. For these reasons, the District's ability to provide water in multiple-dry year scenarios is not adversely affected.

Table 32. Three-Year Estimated Minimum Water Supply				
Source	**2011**	**2012**	**2013**	**Normal**
Imported Water	7,900	7,900	7,900	7,900
Groundwater	6,998	6,998	6,998	6,998
Non-Potable Irrigation Water	10,336	10,336	10,336	10,336
Total	**25,234**	**25,234**	**25,234**	**25,234**

4. Emergency Response Plan

The District maintains an Emergency Response Plan, separate from this Urban Water Management Plan that outlines procedures necessary to respond to emergency disasters. The purpose of that plan is to:

- Minimize damaging effects of natural or man-made disasters on the water production, water distribution, sewage collection and sewage treatment systems of Camrosa Water District;
- Restore those systems to working order as quickly as possible in the event of disasters,
- Provide local, area and state assistance where and when required during and after disasters as directed by the Ventura Operational Area Emergency Operations Center; and,
- Implement training procedures by going through mock exercises to make certain all employees are well versed in their roles.
- Pursuant to the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002, Camrosa Water District conducted a vulnerability assessment and submitted a certified copy of that assessment to the U.S. Environmental Protection Agency in June 2004. The confidential report identified known vulnerabilities and countermeasures and responses to be implemented to safeguard against this potential threat. This report was in response to an isolated request and has not been updated. Camrosa Water District, however, continues to improve the security and surveillance of all its facilities.

The District's emergency procedures are fully integrated with the Standard Emergency Management System (SEMS) to ensure effective multi-agency and multi-jurisdictional responses to emergencies. Internally, Camrosa uses the Incident Command System (ICS) structure to provide a scalable, flexible response to emergencies.

The ICS provides procedures for designation of an Incident Commander who is ultimately responsible for all operations, planning, logistics, finance and public interface associated with any given emergency. Employee recall lists are published and contact lists for emergency assistance from outside contractors, utility companies, and other agencies have been pre-prepared. The plan fully contemplates full and open cooperation with the public media and individual customers throughout any emergency condition.

In terms of facilities and equipment to meet catastrophic emergencies, nearly 16 million gallons of tank storage is available within the District to provide immediate gravity-powered water service for most of the District in the event of a power outage. The District has two portable diesel backup generators, one in the District Office yard and another semi-permanently positioned at the Conejo Wellfield. A permanent generator is attached to the Tierra Rejada Well, and another permanent generator will be installed at the Woodcreek Well by the end of 2011. The Camrosa Water Reclamation Facility has installed electrical generation equipment to ensure continued operations for extended periods of time and uninterrupted recycled water service. Each District vehicle is equipped with emergency food and water supplies for extended deployment as well as a full set of system plans. An emergency response trailer is also equipped with supplies and equipment to manage emergency field operations. The water system's SCADA system is set up on an independent radio system with solar-powered instrumentation and radio transmission to maintain system monitoring independent of the electrical grid.

The District maintains sufficient reserves to fund most contemplated emergencies. Extensive replacement of infrastructure, in the most catastrophic circumstances, would require additional funding from sources that would need to be determined at the time of the emergency.

Table 33 below summarizes actions in response to emergency conditions that might reasonably occur in the District.

Table 33. Catastrophe Response Actions	
Possible Catastrophe	**Summary of Actions**
Regional Power Outage	▪ Evaluate need to initiate the Incident Command System ▪ Lock off large interruptible service meters ▪ Shift to fixed electrical generators ▪ Position portable electrical generators ▪ Evaluate need to implement water shortage contingency plan
Earthquake, Flood, or Fire - Caused Catastrophic Damage to Camrosa's Water System	▪ Evaluate need to initiate the Incident Command System ▪ Isolate damaged sections of system ▪ Lock off large interruptible service meters ▪ Fill system storage ▪ Shift to electrical generators as necessary ▪ Evaluate need to implement water shortage contingency plan
Interruption of Supply from Water Wholesaler	▪ Evaluate need to initiate the Incident Command System ▪ Fill system storage ▪ Lock off large interruptible service meters ▪ Evaluate need to implement water shortage contingency plan

5. Mandatory Prohibitions

Pursuant to Camrosa Ordinance 40-10, Table 34 below summarizes existing mandatory prohibitions that are part of the existing water shortage contingency plan. Additional measures may be implemented at the discretion of the District Board of Directors.

Table 34. Mandatory Prohibitions	
Examples of Prohibitions	**Stage when Prohibition is Mandatory**
Potable water for street washing	Stages 2 and above
Outdoor potable water use where non-potable irrigation water is available	Stages 2 and above
Dust abatement, car washing, driveway and sidewalk washing	Stages 2 and above
Outdoor potable water use except to prevent the loss of perennial plants or trees	Stage 3

6. Consumption Reduction Methods

Pursuant to Ordinance 40-10, the following table summarizes consumption reduction methods that would be instituted in the staged water shortage contingency planning by the District. Additional measures may be implemented at the discretion of the District Board of Directors.

Table 35. Consumption Reduction Methods		
Consumption Reduction Method	**Stage When Method takes Effect**	**Projected Reduction (%)**
Voluntary Reductions, Public Information	Stage 1	10%
Prohibit aesthetic outdoor water use	Stage 2	20% to 30%
Prohibit all outdoor use except to maintain perennial plants & trees	Stage 3	50%

7. **Penalties and Charges**

In the event of a water shortage emergency, Ordinance 40-10 contemplates that special rates, fees, and/or penalty fees may be required to meet demand reductions necessary to preserve water supply. Since the circumstances prevailing at the time of the water shortage emergency will affect the management of the emergency, the existing ordinance does not presume that such fees will be applicable nor does it attempt to establish the basis for such penalties or charges in advance of the circumstances of the emergency.

Table 36. Penalties & Charges	
Penalty or Charge	**Stage When Penalty Takes Effect**
Penalty for excess use	TBD at Stages 2 or 3 at the discretion of the District Board of Directors
Charge for excess use	TBD at Stages 2 or 3 at the discretion of the District Board of Directors

8. **Non-Potable Water Service**

As discussed above, some classes of interruptible water service would be curtailed to meet potable water supply reductions. This section discusses the basis for interruptible water service. All Classes of non-potable service and certain classes of potable water service are interruptible as outlined in the following excerpts from Ordinance 40-10:

4.2.1.2 Agricultural Water Service Classifications

Agricultural Water Service is a class of service intended to serve commercial agriculture. This service, unlike Municipal Water Service is interruptible. Agricultural services may be interrupted for extended periods as a result of general water shortages, drought, maintenance requirements, and operational requirements. Agricultural Water Service may not be promptly restored following emergencies. Therefore, Agricultural service shall not be eligible for conversion to the Municipal Service without satisfying all "Will Serve" requirements as set forth in the "Camrosa Water District Will Serve Water Policy".

4.2.1.2.1. Agricultural Irrigation Water Service

Agricultural Irrigation Water Service is intended for commercial agricultural properties, which raise food crops, floral crops, nursery crops, or commercial livestock. It is not the intent of this ordinance to classify home gardens, home orchards, or pets as agricultural operations. To be eligible for Agricultural Irrigation Water Service the "Property" must include a minimum of one full contiguous, irrigated acre dedicated to commercial

agriculture. The "Property" must meet all the general requirements of "Potable Water" service and have a certified backflow prevention device at the meter service.

4.2.1.2.2. Domestic Agricultural Water Service

Domestic Agricultural Water Service is intended for commercial agricultural properties, which raise food crops, floral crops, nursery crops, and commercial livestock where the "Property" includes a dwelling or dwellings in which the residential water requirements are incidental to the agricultural operation. It is not the intent of this ordinance to classify home gardens, home orchards, or pets as agricultural operations. To be eligible for Domestic Agricultural Water Service the "Property" must include a minimum of one full, contiguous, irrigated acre dedicated to commercial agriculture. The "Property" must meet all the general requirements of "Potable Water" service, have a certified backflow prevention device at the meter service, and comply with all "Will Serve" requirements as set forth in the "Camrosa Water District Will Serve Water Policy."

9. Economic Considerations

Any reductions in water use will certainly reduce revenues projected by the District to meet planned expenses. Production costs may increase as a result of higher rates and/or penalties placed on pumped or imported water.

The impact of Stage 1, 2 and 3 emergencies upon revenues was examined in detail and is outlined in Table 37 below.

Table 37. Revenue Impact from Reduced Potable Sales[1]

			Stages of Emergency	
	Average/ Normal Water Year	**Stage 1 10% Cutback**	**Stage 2 30% Cutback**	**Stage 3 50% Cutback**
Water Production Costs				
Import Purchases	$5,908,566	$5,317,709	$4,135,996	$2,954,283
Non-Potable Irrigation Purchases	$550,051	$550,051	$550,051	$550,051
Energy Costs	$974,421	$898,689	$760,824	$653,046
Total Water Costs	**$7,433,038**	**$6,766,449**	**$5,446,871**	**$4,157,380**
Water Revenues				
Potable Water Sales	$8,031,803	$7,228,623	$5,622,262	$4,015,902
Potable Meter Service Charge	$1,518,565	$1,518,565	$1,518,565	$1,518,565
Non-Potable Sales	$1,880,878	$1,880,878	$1,880,878	$1,880,878
Non-Potable Meter Service Charge	$87,921	$87,921	$87,921	$87,921
NP Irrigation Sales	$118,703	$118,703	$118,703	$118,703
NP Irrigation Meter Service Charge	$906	$906	$906	$906
Total Water Revenues	**$11,638,776**	**$10,835,596**	**$9,229,235**	**$7,622,875**
Net from Water Operations	**$4,205,738**	**$4,069,146**	**$3,782,364**	**$3,465,494**

1) Information garnered from CY 2009 Revenues/Expenses

Substantial reductions in revenues resulting from reduced water sales are dampened to a large extent by reductions in imported water purchases. While revenues may be reduced during a Stage 3 Water

Emergency by more than $4 Million compared to a Normal Water Year, water purchase costs are reduced by more than $3 Million, as well. The estimated net revenue reduction would be $740,244. In a single year of water delivery cutbacks, the revenue reductions could be accommodated through the Rate Stabilization Fund and the suspension of Capital Contribution.

The Board of Directors has several options available to maintain financial stability in the event an emergency lasted more than one accounting period.

- Non-capital expenses may be reduced in an attempt to balance reduced revenues.
- The Variation in Water Sales reserve, established to dampen price fluctuations driven by changes in delivered volumes of water and increased production costs, may be used to offset added expenses attributable to a stage 2 or stage 3 water shortage emergency.
- Additional reserves, beyond the Variation in Water Sales reserve may be used to meet costs.
- In the longer term, rates may be restructured to reflect increased costs and/or reduced deliveries.
- Added capital investment may allow accelerated expansion of non-potable supplies or may allow development of lower quality supplies to dampen the need to enter more severe emergency stages.

In all cases, the Board will assess the financial impacts at the point an emergency is declared and will apply the appropriate measures to overcome those impacts.

10. Draft Water Shortage Contingency Resolution

Consistent with Ordinance 40-05, a draft resolution to serve as a model of the Board of Directors declaration of a water shortage emergency and establishing an appropriate emergency stage is attached as Appendix D.

11. Water Use Monitoring Mechanisms

The District meters all water production sources and customer water services. In the event of a water shortage emergency, metering would be the primary means to monitor whether reductions are being met. Production metering is automated, real-time, and measured to the nearest gallon. Given the volume of supply, the metering is converted to acre-feet under normal operations. Production metering would provide a broad measure of overall quantity of use in generalized zones. Customer service metering provides quantification of water use by customer. Meters are typically read monthly, but could be read on a more frequent basis as necessary. Customer meter reads are read to the nearest HCF.

Table 38. Water Use Monitoring Mechanisms	
Mechanisms for Monitoring Actual Reductions	**Type and Quality of Data Expected**
Production Metering	Production Metering: Real time production metering for all sources of supply, computer compiled and generated trend graphs with quantities measured to the gallon and reported in acre-feet
Service Metering	Customer service meters: All water use is metered and in normal operations read monthly. More frequent reading could be implemented to evaluate response to staged reduction plan. Metered services calibrated in HCF.
Interruptible Service	Visual confirmation as needed that locked off meters remain locked off and not providing service
Prohibited Uses	Community monitoring

C. Water Quality

1. Known and Potential Water Quality Issues

The quality of the District's water supply is relatively stable and is not currently threatened by contaminants. The quality of imported water is excellent and relatively constant although a trend of increasing chlorides in the water has been noted in recent years. Increasing chlorides in non-potable irrigation water, as a result, may cause some concern for growers who may irrigate salt sensitive crops. It is difficult, however, to determine if the trend will continue and, because cropping patterns can change, it is equally difficult to determine if there will be any impact as a result.

2. Water Quality Effects on Reliability

Increasing nitrate levels in groundwater may require short-term increases in imported water to blend the nitrates levels down to acceptable DHS levels. However, in the long-term, desalination of supplies pumped form the Santa Rosa Aquifer will ensure that supply remains viable. There are no other contaminant issues involving District groundwater supplies. Therefore, the projected volumes of water available to the District, as described in Table 14 are not expected to be affected by water quality issues.

D. Drought Planning

1. Supply and Demand – All Water Combined

The total water supply, from both potable and non-potable sources in 2015 is expected to be 26,791 AF. That quantity is expected to grow to 30,569 AF by 2035. In terms of the 19,561 AF of supplies available to the District in 2010, supplies will increase by 37% by 2015 and will be approximately 56% above 2010 supply by 2035. Projected normal water year supply for all water combined is presented in Table 39.

Table 39. Projected Normal Water Year Supply: All Water Combined (AF/Y)					
	2015	2020	2025	2030	2035
Projected Supply	27,141	28,130	28,694	29,054	30,569
% of Year 2010 Supply	**139%**	**144%**	**147%**	**149%**	**156%**

Demand within the District will grow at a slower rate, allowing surplus water to be made available for delivery outside the District boundaries. Agreements are already in place to provide surplus non-potable irrigation surface water to PVCWD and out-of-bounds deliveries are expected to expand as additional non-potable demands are brought online. In terms of the demand for 2010, demand is expected to be about 21% higher in 2015 and grow to about 30% above 2010 demand as the University grows and the non-potable system is expanded to Tierra Rejada Valley. As 2010 was a relatively wet year, the District thought it pertinent to develop a normalized year to approximate realistic growth over the planning horizon. Due to the economic situation over the last several years, there has been little growth in the District's Service Area. Therefore, an average of the previous four years, which included one dry, one very dry and one normal year, was assumed to represent an adequate approximation of current normalized annual use. As can be seen in Table 40 below, District demand is expected to increase less dramatically over normalized current use than over actual 2010 use: 6% by 2015 and 14% by full build-out.

Table 40. Projected Normal Water Year Total Demand: All Water Combined (AF/Y)					
	2015	2020	2025	2030	2035
Demand	18,203	18,990	19,464	19,475	19,475
% of 2010 Demand	**121%**	**126%**	**130%**	**130%**	**130%**
% of 2010 Normalized Demand	**106%**	**111%**	**114%**	**114%**	**114%**

Tables 41 through 43 summarize and compare the supply and demand data previously presented in Tables 4-6 and 15 for normal, single-dry and multiple-dry year scenarios. The Supply totals reflect the sum of all sources from Tables 4, 6 and 7, and include both recycled water from both Camrosa's WRF and CamSan's WWTP as well as and non-potable surface water from the Hill Canyon WWTP. Demand totals reflect all normal demands including line loss. The resulting difference represents projected water surplus for each 5-year increment of the planning period.

Using demand factors previous established, single-dry year demand is expected to increase by 6% over normal-year demand and multiple-dry year demand is expected to increase by 14% over normal-year demand. All water supply is expected to remain the same in all scenarios. In all scenarios, the availability of non-potable irrigation water is flat and represents no change in expected indoor demand.

Table 41. Projected Normal Water Year Total Supply/Demand: All Water Combined (AF/Y)					
	2015	**2020**	**2025**	**2030**	**2035**
Supply Totals	27,141	28,130	28,694	29,054	30,569
Demand totals	18,203	18,990	19,464	19,475	19,475
Difference (Supply – Demand)	8,938	9,140	9,230	9,579	11,094
Difference as % of Supply	**33%**	**32%**	**32%**	**33%**	**36%**
Difference as % of Demand	**49%**	**48%**	**47%**	**49%**	**57%**

Table 42. Projected Single Dry Year Total Supply/Demand: All Water Combined (AF/Y)					
	2010	**2015**	**2020**	**2025**	**2030**
Supply Totals	27,141	28,130	28,694	29,054	30,569
Demand totals	19,296	20,129	20,632	20,643	20,643
Difference (Supply – Demand)	7,845	8,001	8,062	8,411	9,926
Difference as % of Supply	**29%**	**28%**	**28%**	**29%**	**32%**
Difference as % of Demand	**41%**	**40%**	**39%**	**41%**	**48%**

Table 43. Projected Multiple Dry Year Total Supply/Demand: All Water Combined (AF/Y)					
	2015	**2020**	**2025**	**2030**	**2035**
Supply Totals	27,141	28,130	28,694	29,054	30,569
Demand totals	20,752	21,648	22,189	22,201	22,201
Difference (Supply – Demand)	6,389	6,482	6,505	6,853	8,368
Difference as % of Supply	**24%**	**23%**	**23%**	**24%**	**27%**
Difference as % of Demand	**31%**	**30%**	**29%**	**31%**	**38%**

2. Supply and Demand – Potable Water

Because the supply of non-potable water available to the District cannot be readily substituted for potable supplies to serve potable demand in case of emergencies or other disruptions of imported potable water service, the projected supply and demand for potable water under various weather scenarios is provided separately from the projected supply and demand for non-potable water. Table 44 displays projected normal water year supplies of potable water, both locally produced and imported.

Table 44. Projected Normal Water Year Supply: Potable Water (AF/Y)

	2015	2020	2025	2030	2035
Supply	12,926	13,501	13,501	13,501	14,173
% of 2010 Supply	**156%**	**162%**	**162%**	**162%**	**171%**

Although the total supply of imported water available to the District is determined by renewable ten-year agreement, the volume that is actually brought into the District is not fixed. Rather, the District imports sufficient water to blend with local supplies to meet expected demand. During the drought that peaked in 1990, that demand was nearly 12,900 AF, but it has not exceeded 8,900 AF in the intervening years. As discussed in Section 4.A, the District does not expect to import more than 7,900 AF/Y even the very driest years. In developing all of the scenarios, therefore, the District has limited imported water to 7,900 AF/Y. See Appendix E for full justification and supporting documentation from Metropolitan.

With increasing amounts of non-potable supply available to satisfy irrigation demand and an aggressive program to expand the non-potable distribution system, demand for potable water is expected to decline from historical levels and remain relatively level, even thought growth will add to the demand. This demand trend reflects continued expansion of non-potable irrigation water use within the District. Table 45 represents projected normal potable demand over the course of the planning horizon.

Table 45. Projected Normal Water Year Total Demand: Potable Water (AF/Y)

	2015	2020	2025	2030	2035
Demand	11,238	10,921	10,585	9,868	9,781
% of 2010 Demand	**136%**	**132%**	**128%**	**119%**	**118%**
% of Normalized Current Year Demand	**108%**	**105%**	**102%**	**95%**	**94%**

Tables 46-48 indicate projected potable supply and demand volumes in normal, single-dry and multiple-dry year scenarios. All three scenarios have a goal of limiting imported water to 7,900 AF, an artificial constraint that can be exceeded if necessary.

Table 46. Projected Normal Water Year Total Supply/Demand: Potable Water (AF/Y)					
	2015	2020	2025	2030	2035
Supply Totals	12,926	13,501	13,501	13,501	14,173
Demand totals	11,238	10,921	10,585	9,868	9,781
Difference (Supply – Demand)	1,688	2,580	2,916	3,633	4,392
Difference as % of Supply	**13%**	**19%**	**22%**	**27%**	**31%**
Difference as % of Demand	**15%**	**24%**	**28%**	**37%**	**45%**

Table 47. Projected Single Dry Year Total Supply/Demand: Potable Water (AF/Y)					
	2015	2020	2025	2030	2035
Supply Totals	12,926	13,501	13,501	13,501	14,173
Demand totals	11,912	11,576	11,220	10,461	10,368
Difference (Supply – Demand)	1,014	1,925	2,281	3,040	3,805
Difference as % of Supply	**8%**	**14%**	**17%**	**23%**	**27%**
Difference as % of Demand	**9%**	**17%**	**20%**	**29%**	**37%**

Table 48. Projected Multiple Dry Year Total Supply/Demand: Potable Water (AF/Y)					
	2015	2020	2025	2030	2035
Supply Totals	12,926	13,501	13,501	13,501	14,173
Demand totals	11,912	11,576	11,220	10,461	10,368
Difference (Supply – Demand)	1,014	1,925	2,281	3,040	3,805
Difference as % of Supply	**8%**	**14%**	**17%**	**23%**	**27%**
Difference as % of Demand	**9%**	**17%**	**20%**	**29%**	**37%**

Sufficient supply is available to meet expected potable demand in normal, single-dry years and multiple-dry years. Because contracts have not been renegotiated for the planning horizon, the District is unsure what Metropolitan and, therefore, Calleguas will do should suppliers exceed their allocations in extended drought conditions

3. Supply and Demand – Non-potable Irrigation water

Ample supplies of non-potable irrigation water are available to meet expected irrigation demands within the District. As new supplies are brought on line, the District will greatly increase the volume of non-potable water available for distribution.

Table 49. Projected Normal Water Year Supply: Non-Potable Irrigation Water (AF/Y)

	2015	2020	2025	2030	2035
Supply	14,215	14,629	15,193	15,553	16,396
% of 2010 Supply	124%	128%	133%	136%	143%

Demand for non-potable supplies are expected to grow as well as this economical supply is made available to ever-widening areas within the District. Table 50 displays projected normal water year total non-potable demand over the course of the planning horizon.

Table 50. Projected Normal Water Year Total Demand: Non-Potable Irrigation Water (AF/Y)

	2015	2020	2025	2030	2035
Demand	7,642	8,800	9,652	10,415	10,415
% of 2010 Demand	113%	130%	143%	154%	154%
% of Normalized Current Year Demand	111%	128%	141%	152%	152%

It was assumed that demand for non-potable irrigation water would increase by 6% in single dry year scenarios. Sufficient non-potable irrigation water is available to serve expected demands in even the driest scenarios and in multiple-dry years, which are projected to see an 18% increase in demand. It is expected that surplus water will continue to be available for delivery outside the district boundaries in even the driest years and multiple-dry year scenarios, as displayed in Tables 51-53.

Table 51. Projected Normal Water Year Total Supply: Non-Potable Irrigation Water (AF/Y)					
	2015	2020	2025	2030	2035
Supply Totals	14,215	14,629	15,193	15,553	16,396
Demand totals	7,642	8,800	9,652	10,415	10,415
Difference (Supply – Demand)	6,114	5,829	5,541	5,138	5,981
Difference as % of Supply	**46%**	**40%**	**36%**	**33%**	**36%**
Difference as % of Demand	**86%**	**66%**	**57%**	**49%**	**57%**

Table 52. Projected Single Dry Year Total Supply/Demand: Non-Potable Irrigation (AF/Y)					
	2015	2020	2025	2030	2035
Supply Totals	14,215	14,629	15,193	15,553	16,396
Demand totals	8,101	9,328	10,231	11,040	11,040
Difference (Supply – Demand)	6,114	5,301	4,962	4,513	5,356
Difference as % of Supply	**43%**	**36%**	**33%**	**29%**	**33%**
Difference as % of Demand	**75%**	**57%**	**49%**	**41%**	**49%**

Table 53. Projected Multiple Dry Year Total Supply/Demand: Non-Potable Irrigation (AF/Y)					
	2015	2020	2025	2030	2035
Supply Totals	14,215	14,629	15,193	15,553	16,396
Demand totals	9,018	10,384	11,389	12,290	12,290
Difference (Supply – Demand)	5,197	4,245	3,804	3,263	4,106
Difference as % of Supply	**37%**	**29%**	**25%**	**21%**	**25%**
Difference as % of Demand	**58%**	**41%**	**33%**	**27%**	**33%**

Section 6 Demand Management Measures

LAW

10608.36. Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

16031 (f) (1) and (2) Describe and provide a schedule of implementation for each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following: (A) water survey programs for single-family residential and multifamily residential customers; (B) residential plumbing retrofit; (C) system water audits, leak detection and repair; (D) metering with commodity rates for all new connections and retrofit of existing connections; (E) large landscape conservation programs and incentives; (F) high-efficiency washing machine rebate programs; (G) public information programs; (H) school education programs; (I) conservation programs for commercial, industrial and institutional accounts; (J) wholesale agency programs; (K) conservation pricing; (L) water conservation coordinator; (M) water waste prohibition; (N) residential ultra-low-flush toilet replacement programs.

10631 (f) (3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

10631 (f) (4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

10631 (g) An evaluation of each water demand management measure listed in paragraph (1) subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following: (!) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors; (2) Include a cost-benefit analysis, identifying total benefits and total costs; (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost; (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

Improving water supply reliability and maintaining its affordability have been ongoing priorities of the District. During the most recent drought, the District was subjected to 30% cutbacks in imported water deliveries and immediately began developing alternative water sources. Camrosa has been a leader among local water Districts in promoting non-potable irrigation water use and has placed 12,000 AF of non-potable water on-line to reduce demand on imported water. In addition to developing new supplies, the District has found it prudent to implement demand management measures as well to ensure long-term reliability.

A. Conservation Programs

Camrosa Water District is committed to implementing water conservation and water recycling programs. As a signatory to the California Urban Water Conservation Council's (CUWCC) Memorandum of Understanding, the District is actively involved in implementing a prescribed set of urban water conservation best management practices (BMPs).

Camrosa Water District has implemented or plans to implement all of the required Demand Management Measures outlined in the CUWCC's BMPs. Annual reports are filed with the CUWCC on activities conducted by the District to effect implementation. Coverage Reports are provided in Appendix B.

On December 24, 2010, DWR approved of Camrosa's Self-Certification Statement regarding the implementation of its Urban BMPs, declaring that Camrosa's implementation is consistent with AB 1420 and, therefore, is eligible to receive water management grant or loan funds (see Appendix F for DWR Certification).

The CUWCC has indicated that should it receive FY2010 BMP Reports from water agencies by May 31, 2011, it would gauge compliance in time to include approval in this 2010 UWMP. When CUWCC certification is received, it will be added as an appendix and will be described in place of this text.

B. BMP Summary

The following is a brief summary some of the implementation actions initiated by the District. In order to satisfy the UWMP Act, specific activity numbers (for such programs as ULFTs and HECW, etc.) will be added. While these are unnecessary should the CUWCC certification be obtained, the fact that as of now that certification has not been submitted (due 5/31/11 as note above), it is in the District's best interest to provide adequate reporting herein as a precautionary measure.

1. Utility Operations Programs

BMP 1.11: Water Conservation Coordinator

While several people contribute to the conservation efforts at the District, Camrosa has a Water Conservation Technician who is responsible for all conservation related programs and implementing the BMPs formulated by the CUWCC. The water conservation program is a line item in the District's budget.

BMP 1.12: Water Waste Prohibition

In December 2008, at the time BMPs were last reported, the District was not in full compliance with this BMP. Since that time, the District has amended its ordinance to upgrade its Water Waste Prohibitions to prohibit use of facilities such as single pass cooling systems and non-circulated water fountains (among other prohibitions) and included the requirement to use dish washing spray valves, and positive hose-end shutoff nozzles. In addition, the District included consumer demand reductions through a staged Water Supply Shortage Plan to accommodate drought or other water supply conditions. The District is now 100% in compliance as a result of the above additions to the water waste prohibitions and Staged Water Supply Shortage Plan.

BMP 1.13: Wholesale Agency Programs

This BMP does not apply to Camrosa.

BMP 1.20: System Water Audits, Lead Detection and Repair

The historical average for unaccounted water for Camrosa Water District is 4.8%, substantially under the observed range of 10-15% as stated in AWWA Manual M32. The District is conscientious about locating and repairing main and service connection leaks when they occur. While the 2005 observed water-loss was 7.5%, this was partially due to pipe ruptures which occurred as a result of severe winter storms, and line loss was only 4.8% in 2010. The District has initiated a process to reduce unaccounted-for water-loss to less than 5% for the planning period covered by this plan. For the annual 2009 CUWCC BMP reporting period, the District will implement and report the AWWA's 3rd Edition M36, *"Water Audits and Loss Control Program"* using AWWA's Water Audit Software.

BMP 1.30: Metering with Commodity Rates

Camrosa has a two-tier rate structure for the water system and all water connections are metered. Camrosa does not intend to implement a volumetric pricing structure for the wastewater system.

BMP 1.40: Conservation Pricing

The District has implemented a rate structure that includes a meter service fee that is fixed by meter size and a tiered commodity rate which increases in proportion to the amount of water used.

2. Educational Programs

BMP 2.10: Public Information Programs

The District actively participates in associations such as the Association of Water Agencies of Ventura County, and the California Urban Water Conservation Council. Literature from these two associations and from Metropolitan Water District and Calleguas Municipal Water District is used in educating the public.

The District participates in the Watershed Coalition of Ventura County Water Use Efficiency Group, which is made up of local water conservation coordinators throughout Ventura County. The Group was just recently organized and is currently investigating the most efficient ways to develop a unified regional message that water conservation and specifically landscape water use efficiency, is an important and necessary component of the region's effort to improve water supply reliability.

The District has developed an effective public outreach program to educate the District's customers about water resources and conservation. Included in the public outreach and education program is an interactive website to provide a resource tool for the customers. In 2008, the District inaugurated its newsletter, "The Independent," as another public outreach/education resource to inform customers of water supply resource challenges and conservation practices. The District also hosts speaker bureaus to inform local community organizations about the challenges facing California and the District regarding water reliability, water quality and the future of water availability and cost. In addition, the District includes water conservation messages in its monthly bills, to remind customers of easy day-to-day water conservation practices and techniques.

Residential Landscape Classes are another public outreach and education forum the District utilizes to educate customers on good water stewardship, in such areas as California-Friendly gardens, landscape design, and irrigation maintenance.

BMP 2.20: School Education Programs

The District has conducted teacher in-service workshops to promote water awareness as part of the school curriculum. Coordinated with Metropolitan, Calleguas Municipal Water District and the City of Camarillo, a teacher resources workshop is hosted annually with the school district to promote Metropolitan's educational materials that meet local elementary and junior high school curriculum. In addition, the District holds an annual art contest with elementary and junior high school students to promote and educate water conservation. The winners are submitted to Metropolitan to be considered as part of the annual "Water Is Life" calendar contest. The District also hosts an annual school assembly called "H_20, Where Did You Go?" to local schools to promote water resource and conservation education.

3. Residential Programs

BMP 3.11: Indoor Water Surveys

Camrosa currently does not offer indoor water surveys to its customers. Based upon past offers of indoor Water Surveys, we have found that Camrosa customers are hesitant to invite District personnel into their homes and the number of surveys requested was extremely low. Instead, the District distributes the California Urban Water Conservation Council's *Practical Plumbing Handbook*, which residents can use to perform self surveys. Camrosa also distributes indoor water saving devices such as low-flow showerheads, faucet aerators, and toilet flappers free of charge at the main office. In addition to the distribution of indoor water saving devices, the District fully participates in Metropolitan Water District's SoCal Water$mart rebate program and advertises the financial rebates for High Efficiency Toilets and High Efficiency Clothes Washers and other water saving rebates for residential water users.

Effective with the next report, the District intends to begin reporting by the Gallons Per Capita Per Day (GPCD) Alternative Conservation Approach. Using this approach, the District will demonstrate full compliance with the following BMP's through the GPCD Alternative Conservation Approach.

BMP 3.12 Outdoor Water Surveys

Camrosa offers outdoor water surveys through a third party vendor to customers who request water surveys. The District has partnered with local water purveyors in a regional landscape survey program, Ventura County Regional Urban Landscape Efficiency Program (VC-Rule). The program is designed to improve irrigation efficiency, conserve water and improve the reliability of Ventura County's water supply. Customers will be offered a landscape survey, direct installation low-precipitation rate nozzles, and either rain gage or weather-based irrigation controller to achieve significant landscape water savings. In addition, the District has partnered with the Ventura County Resource Conservation District to provide large landscape water evaluations with the use of grant funding.

BMP 3.20: Residential Plumbing Retrofit

Low-flow showerheads, faucet aerators, and toilet flappers are available upon request at the District office at no cost. Camrosa distributes Welcome Packets to new residents when new water services are activated Included in the Welcome Packets is information regarding the indoor water saving devices offered to our customers, and Metropolitan's residential rebates for water efficient appliances. These water saving devices are also presented at Residential Landscape Classes.

BMP 3.30: High-Efficiency Washing Machine Rebate Programs

The District participates with Metropolitan in their SoCal Water$mart rebate program which offers High-Efficiency Clothes Washer rebates. In 2008, Metropolitan assumed responsibility of administering the rebate program, and customers now submit applications to, and receive rebates directly from Metropolitan.

BMP 3.40: Residential Ultra Low Flush Toilet (ULFT) Replacement Program

Included in Metropolitan's SoCal Water$mart program are rebates for High-Efficiency Toilets. In 2009, Metropolitan replaced the ULFT rebate program with High-Efficiency Toilets (HETs) as to achieve greater long-term water savings from the HETs.

4. **Commercial, Industrial, Institutional**

BMP 4.00: Commercial, Industrial & Institutional Water Conservation Program

The District has conducted large landscape water surveys, through the use of outside contractors, for Multi-Family Home Owners Associations. The District promotes Metropolitan's Save-A-Buck rebate program which targets Commercial, Industrial and Institutional customers. Water-efficient devices eligible for rebates include Commercial HETs, Ultra Low Water Urinals, and Zero Water Urinals, Cooling Tower Controllers, Water Brooms, Weather-based Irrigation Controllers, and Rotating Nozzles.

5. **Landscape**

BMP 5.00: Large Landscape Conservation Programs and Incentives

The District implemented Residential Landscape Class and professional training programs, sponsored by Metropolitan Water District of Southern California, in 1998. The District has a water-efficient California Friendly Demonstration Garden, which was partially funded by Metropolitan's City Makeover grant program. The garden is used during Residential Landscape Classes as a demonstration and has resulted in a number of customers using water efficient plants in their own gardens.

Working with the Resource Conservation District of Ventura County, Camrosa has provided large landscape water surveys to customers who have avocado irrigation systems. These surveys evaluate irrigation systems for ways to improve distribution uniformity.

Metropolitan Water District of Southern California selected Camrosa to participate in a pilot program for weather-based irrigation controllers (WBIC). Customers were offered a free WBIC for the removal and exchange of their existing irrigation controller. The District continues to promote WBICs to customers with large landscapes through the Residential Landscape Class and outreach material.

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APPENDIX A. Announcements and Resolutions

- Resolution 11-04: A resolution of the Board of Directors of Camrosa Water District Adopting the Urban Water Management Plan 2010
- Announcement of Public Hearing
- Proof of Public Hearing

APPENDIX B. CUWCC Reporting

- *FY2009-10 Coverage Report*

APPENDIX C. Camrosa Water District Ordinance 40-10

- CWD Ordinance 40-10 – Rules and Regulations Governing the Provision of Water and Sanitary Services (Adopted April 7, 2010)
    - Also submitted electronically

APPENDIX D. Draft Resolution Declaring a Water Shortage Emergency

- A Resolution of the Board of Directors of Camrosa Water District Declaring a Water Shortage Emergency & Implementing a Water Shortage Contingency Plan (DRAFT)

APPENDIX E. Metropolitan Allocation Information

- Information from Metropolitan Water District delineating allocations to its member agencies, and from Calleguas Municipal Water District to Camrosa.

APPENDIX F. Santa Rosa Groundwater Management Plan

- Due to the length of the *Santa Rosa Groundwater Management Plan*, Camrosa has not included it in this hardcopy. It is available electronically and in hard form upon request.
    - Please contact the Camrosa Water District at 7385 Santa Rosa Road, Camarillo, CA 93012 for copies of the management plan.

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2015-0032

TO ADOPT AN EMERGENCY REGULATION FOR
STATEWIDE URBAN WATER CONSERVATION

WHEREAS:

1. On April 25, 2014, Governor Edmund G. Brown Jr. issued an executive order (April 2014 Proclamation) to strengthen the State's ability to manage water and habitat effectively in drought conditions, and called on all Californians to redouble their efforts to conserve water. The April 2014 Proclamation finds that the continuous severe drought conditions present urgent challenges across the State, including water shortages in communities and for agricultural production, increased wildfires, degraded habitat for fish and wildlife, threat of saltwater contamination, and additional water scarcity, if drought conditions continue into 2015. The April 2014 Proclamation also suspends the environmental review required by the California Environmental Quality Act to allow the emergency regulation and other actions to take place as quickly as possible;

2. The April 2014 Proclamation refers to the Governor's Proclamation No. 1-17-2014, issued on January 17, 2014, declaring a drought State of Emergency to exist in California due to severe drought conditions (January 2014 Proclamation). The January 2014 Proclamation finds that dry conditions and lack of precipitation present urgent problems to drinking water supplies and cultivation of crops, which put farmers' long-term investments at risk. The conditions also threaten the survival of animals and plants that rely on California's rivers, including many species in danger of extinction. The January 2014 Proclamation also calls on all Californians to reduce their water usage by 20 percent;

3. On December 22, 2014, in light of the continued lack of rain, Governor Brown issued Executive Order B-28-14, which extends the California Environmental Quality Act suspension through May 31, 2016 for Water Code section 13247 and certain activities identified in the January 2014 and April 2014 proclamations;

4. On April 1, 2015, Governor Brown issued a new Executive Order that directs the State Water Board to impose restrictions on urban water suppliers to achieve a statewide 25 percent reduction in potable urban usage through February 2016; require commercial, industrial, and institutional users to implement water efficiency measures; prohibit irrigation with potable water of ornamental turf in public street medians; and prohibit irrigation with potable water outside newly constructed homes and buildings that is not delivered by drip or microspray systems; along with other directives;

5. Water Code section 1058.5 grants the State Water Board the authority to adopt emergency regulations in certain drought years in order to: "prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion, of water, to promote water recycling or water conservation, to require curtailment of diversions when water is not available under the diverter's priority of right, or in furtherance of any of the foregoing, to require reporting of diversion or use or the preparation of monitoring reports";

6. On July 15, 2014, the State Water Board adopted an emergency regulation to support water conservation (Resolution No. 2014-0038), and that regulation became effective July 28, 2014 upon approval by the Office of Administrative Law (OAL);

7. On March 17, 2015, the State Water Board amended and readopted the emergency regulation to support water conservation (Resolution No. 2015-0013), which became effective March 27, 2015 upon approval by OAL;

8. The current emergency regulation has supported Californians' water conservation efforts, with over 125 billion gallons saved from August 2014 through March 2015; however, statewide water use is only nine percent less than the same months in 2013. Achieving a 25 percent reduction in use will require even greater conservation efforts across the state. In particular, many communities must dramatically reduce their outdoor water use;

9. In many areas, 50 percent or more of daily water use is for lawns and outdoor landscaping. Outdoor water use is generally discretionary, and many irrigated landscapes will survive while receiving a decreased amount of water;

10. Although urban water suppliers have placed restrictions on outdoor watering, the State Water Board continues to receive reports of excessive outdoor water use;

11. Water conservation is the easiest, most efficient and most cost-effective way to quickly reduce water demand and extend supplies into the next year, providing flexibility for all California communities. Water saved this summer is water available later in the season or next year, reducing the likelihood of even more severe water shortages should the drought continue;

12. Education and enforcement against water waste is a key tool in conservation programs. When conservation becomes a social norm in a community, the need for enforcement is reduced or eliminated;

13. Public information and awareness is critical to achieving conservation goals, and the Save Our Water campaign, run jointly by the Department of Water Resources (DWR) and the Association of California Water Agencies, is an excellent resource for conservation information and messaging that is integral to effective drought response (http://saveourwater.com);

14. Many California communities are facing social and economic hardship due to this drought. The rest of us can make adjustments to our water use, including landscape choices that conserve even more water;

15. The California Constitution declares, at article X, section 2, that the water resources of the state must be put to beneficial use in a manner that is reasonable and not wasteful. Relevant to the current drought conditions, the California Supreme Court has clarified that "what may be a reasonable beneficial use, where water is present in excess of all needs, would not be a reasonable beneficial use in an area of great scarcity and great need. What is a beneficial use at one time may, because of changed conditions, become a waste of water at a later time." (*Tulare Dist. v. Lindsay Strathmore Dist*. (1935) 3 Cal.2d 489, 567.) In support of water conservation, the legislature has, through Water Code section 1011, deemed reductions in water use due to conservation as equivalent

to reasonable beneficial use of that water. Accordingly, this regulation is in furtherance of article X, section 2 during this drought emergency. This temporary emergency regulation is not to be used in any future administrative or judicial proceedings as evidence or finding of waste and unreasonable use of any individual water user or water supplier subject to this regulation, and are not to affect or otherwise limit any rights to water conserved under applicable law, including without limitation, water conserved consistent with Water Code section 1011;

16. Directive two of the Governor's April 1, 2015 Executive Order directs the State Water Board to consider the relative per capita usage of each urban water supplier's service area and require that areas with high per capita use achieve proportionally greater reductions than areas with low per capita use;

17. On April 7, 2015, the State Water Board issued a draft framework proposing increasing levels of required water reduction based upon residential per capita per day use (R-GPCD) for the proposed regulation, and solicited public comments. The Board received over 300 comments on the framework, primarily relating to the levels of required water reduction;

18. On April 18, the State Water Board issued draft regulatory language for public comment based on the April 7 framework and the comments received. The draft regulatory language reflected careful consideration of all comments including those directed at the levels of required reduction. Again, the Board received close to 300 comments;

19. On April 28, 2015, the State Water Board issued a final version of draft regulatory language for comment, followed on April 29 by a formal public notice that it would consider the adoption of the emergency regulation at the Board's regularly-scheduled May 5 and 6, 2015 public meeting, in accordance with applicable State laws and regulations. The State Water Board also distributed for public review and comment a Finding of Emergency that complies with State laws and regulations;

20. As discussed above, the State Water Board is adopting the emergency regulation because of the continuing emergency drought conditions, the need for prompt action to prevent the waste and unreasonable use of water and to promote conservation, and the specific actions called for in the Governor's April 1, 2015 Executive Order; and

21. Nothing in the regulation or in the enforcement provisions of the regulation precludes a local agency from exercising its authority to adopt more stringent conservation measures. Moreover, the Water Code does not impose a mandatory penalty for violations of the regulation adopted by this resolution, and local agencies retain the enforcement discretion in enforcing the regulation to the extent authorized. Local agencies are encouraged to develop their own progressive enforcement practices to promote conservation.

THEREFORE BE IT RESOLVED THAT:

1. The State Water Board adopts California Code of Regulations, title 23, section 866 and re-adopts sections 863, 864,and 865, as appended to this resolution as an emergency regulation;

2. State Water Board staff will submit the regulation to OAL for final approval;

3. If, during the approval process, State Water Board staff, the State Water Board, or OAL determines that minor corrections to the language of the regulation or supporting documentation are needed for clarity or consistency, the State Water Board Executive Director or the Executive Director's designee may make such changes;

4. This regulation shall remain in effect for 270 days after filing with the Secretary of State unless the State Water Board determines that it is no longer necessary due to changed conditions, or unless the State Water Board renews the regulation due to continued drought conditions as described in Water Code section 1058.5;

5. The State Water Board directs staff to provide the Board with monthly updates on the implementation of the emergency regulation and its effect. These updates shall include information regarding the progress of the Building Standards Commission, Department of Housing and Community Development, and other state agencies in the adoption and implementation of emergency regulations or other requirements that implement increased outdoor irrigation efficiency for new construction. These regulations and other requirements will extend existing efficiency standards for new construction to the outdoor environment and ensure that California's new homes are constructed to meet the growing demand with the most efficient standards;

6. The State Water Board directs staff to condition funding upon compliance with the emergency regulation, to the extent feasible;

7. The State Water Board directs staff to work with DWR and the Save Our Water campaign to disseminate information regarding the emergency regulation; and

8. The State Water Board directs staff to update the electronic reporting portal to include data fields for the new reporting required by the emergency regulation.

THEREFORE BE IT FURTHER RESOLVED THAT:

9. The State Water Board shall work with DWR, the Public Utilities Commission, and other agencies to support urban water suppliers' actions to implement rates and pricing structures to incent additional conservation, as required by directive eight in the Governor's April 1, 2015 Executive Order. The Fourth District Court of Appeal's recent Decision in *Capistrano Taxpayer Association Inc. v. City of San Juan Capistrano* (G048969) does not foreclose the use of conservation-oriented rate structures;

10. The State Water Board calls upon water suppliers to:

    a. ensure that adequate personnel and financial resources exist to implement conservation requirements not only for 2015, but also for another year of drought should it occur. Water suppliers that face budget shortfalls due to reduced sales should take immediate steps to raise necessary revenues in a way that actively promotes continued conservation;

    b. expedite implementation of new conservation programs by minimizing internal review periods and utilizing emergency authorities, as appropriate;

c. consider the relative water use and conservation practices of their customers and target those with higher water use to achieve proportionally greater reductions than those with low use;

d. minimize financial impacts to low-income customers;

e. preserve safe indoor water supplies in areas with very low R-GPCD and where necessary to protect public health and safety;

f. promote low-water use methods of preserving appropriate defensible space in fire-prone areas, consistent with local fire district requirements;

g. educate customers on the preservation of trees;

h. promote on-site reuse of water; and

i. promptly notify staff of the supplier's need for an alternate method of compliance pursuant to resolved paragraph 16.

11. The State Water Board calls upon all businesses within California's travel and tourism sectors to inform visitors of California's dire drought situation and actions visitors should take to conserve water;

12. The State Water Board commends wholesale water agencies that have set aggressive conservation targets for their retail water suppliers;

13. The State Water Board commends water suppliers that have made investments to boost drought-resistant supplies, such as advanced treated recycled water and desalination. Those investments help to make communities more resilient in the face of drought;

14. The State Water Board commends the many water suppliers that have already surpassed their 20x2020 conservation targets. Long-term conservation efforts are critical to maintaining economic and social well-being, especially in light of the impacts of climate change on California's hydrology;

15. During this drought emergency, heightened conservation that extends urban resilience is necessary. The State Water Board's focus is primarily on immediate reductions in outdoor water use. Some short-term conservation efforts, such as landscape conversions and installation of efficient appliances, will also support long-term conservation objectives, and are encouraged wherever possible;

16. The State Water Board recognizes that some commercial and industrial customers, while accounting for a significant portion of total use in a service area, have already taken steps to significantly reduce their water consumption and cannot further reduce their use without substantial impacts. However, the Board also recognizes that in many areas there are significant opportunities for reductions in water use by industries and commercial enterprises that have yet to take action, especially those with large areas of non-functional turf. The Board directs staff to respond promptly upon receipt of any request for alternate enforceable methods of compliance. If the supplier believes the conservation standard is unachievable due to firm commercial and industrial water use

and residential use reductions that would affect public health and safety, it should provide any supporting information or documentation for an alternate method of compliance; and

17. Some water suppliers have called for further refinement of the tiers to reflect a range of factors that contribute to water use, including but not limited to temperature, lot size, and income. Others have called for an approach that provides greater recognition for early investments in conservation, the development of local, drought resistant water supplies, and health and safety needs. These suggestions and many others are important considerations in the development of a more comprehensive, and long term, conservation framework. The State Water Board directs staff to work with stakeholders on a thoughtful process to devise options for extended and expanded emergency regulations should the drought continue into 2016.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on May 5, 2015.

AYE:	Chair Felicia Marcus Vice Chair Frances Spivy-Weber Board Member Tam M. Doduc Board Member Steven Moore Board Member Dorene D'Adamo
NAY:	None
ABSENT:	None
ABSTAIN:	None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

ADOPTED TEXT OF EMERGENCY REGULATION

Article 22.5. Drought Emergency Water Conservation.

Sec. 863. Findings of Drought Emergency.

(a) The State Water Resources Control Board finds as follows:

(1) On January 17, 2014, the Governor issued a proclamation of a state of emergency under the California Emergency Services Act based on drought conditions;

(2) On April 25, 2014, the Governor issued a proclamation of a continued state of emergency under the California Emergency Services Act based on continued drought conditions;

(3) On April 1, 2015, the Governor issued an Executive Order that, in part, directs the State Board to impose restrictions on water suppliers to achieve a statewide 25 percent reduction in potable urban usage through February, 2016; require commercial, industrial, and institutional users to implement water efficiency measures; prohibit irrigation with potable water of ornamental turf in public street medians; and prohibit irrigation with potable water outside newly constructed homes and buildings that is not delivered by drip or microspray systems;

(4) The drought conditions that formed the basis of the Governor's emergency proclamations continue to exist;

(5) The present year is critically dry and has been immediately preceded by two or more consecutive below normal, dry, or critically dry years; and

(6) The drought conditions will likely continue for the foreseeable future and additional action by both the State Water Resources Control Board and local water suppliers will likely be necessary to prevent waste and unreasonable use of water and to further promote conservation.

Authority: Section 1058.5, Water Code.
References: Cal. Const., Art., X § 2; Sections 102, 104, 105, and 275, Water Code; *Light v. State Water Resources Control Board* (2014) 226 Cal.App.4th 1463.

Sec. 864. End-User Requirements in Promotion of Water Conservation.

(a) To prevent the waste and unreasonable use of water and to promote water conservation, each of the following actions is prohibited, except where necessary to address an immediate health and safety need or to comply with a term or condition in a permit issued by a state or federal agency:

(1) The application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;

(2) The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use;

(3) The application of potable water to driveways and sidewalks; and

(4) The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system;

(5) The application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall;

(6) The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;

(7) The irrigation with potable water of ornamental turf on public street medians; and

(8) The irrigation with potable water of landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

(b) To promote water conservation, operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guestroom using clear and easily understood language.

(c) Immediately upon this subdivision taking effect, all commercial, industrial and institutional properties that use a water supply, any portion of which is from a source other than a water supplier subject to section 865, shall either:

(1) Limit outdoor irrigation of ornamental landscapes or turf with potable water to no more than two days per week; or

(2) Reduce potable water usage supplied by sources other than a water supplier by 25 percent for the months of June 2015 through February 2016 as compared to the amount used from those sources for the same months in 2013.

(d) The taking of any action prohibited in subdivision (a) or the failure to take any action required in subdivisions (b) or (c), is an infraction, punishable by a fine of up to five hundred dollars ($500) for each day in which the violation occurs. The fine for the infraction is in addition to, and does not supersede or limit, any other remedies, civil or criminal.

Authority: Section 1058.5, Water Code.
References: Cal. Const., Art., X § 2; Sections 102, 104, 105, 275, 350, and 10617, Water Code; *Light v. State Water Resources Control Board* (2014) 226 Cal.App.4th 1463.

Sec. 865. Mandatory Actions by Water Suppliers.

(a) As used in this section:

(1) "Distributor of a public water supply" has the same meaning as under section 350 of the Water Code, except it does not refer to such distributors when they are functioning solely in a wholesale capacity, but does apply to distributors when they are functioning in a retail capacity.

(2) "R-GPCD" means residential gallons per capita per day.

(3) "Total potable water production" means all potable water that enters into a water supplier's distribution system, excluding water placed into storage and not withdrawn for use during the reporting period, or water exported outsider the supplier's service area.

(4) "Urban water supplier" means a supplier that meets the definition set forth in Water Code section 10617, except it does not refer to suppliers when they are functioning solely in a wholesale capacity, but does apply to suppliers when they are functioning in a retail capacity.

(b) In furtherance of the promotion of water conservation each urban water supplier shall:

(1) Provide prompt notice to a customer whenever the supplier obtains information that indicates that a leak may exist within the end-user's exclusive control.

(2) Prepare and submit to the State Water Resources Control Board by the 15th of each month a monitoring report on forms provided by the Board. The monitoring report shall include the amount of potable water the urban water supplier produced, including water provided by a wholesaler, in the preceding calendar month and shall compare that amount to the amount produced in the same calendar month in 2013. The monitoring report shall specify the population served by the urban water supplier, the percentage of water produced that is used for the residential sector, descriptive statistics on water conservation compliance and enforcement efforts, and the number of days that outdoor irrigation is allowed, and monthly commercial, industrial and institutional sector use. The monitoring report shall also estimate the gallons of water per person per day used by the residential customers it serves.

(c)(1) To prevent the waste and unreasonable use of water and to meet the requirements of the Governor's April 1, 2015 Executive Order, each urban water supplier shall reduce its total potable water production by the percentage identified as its conservation standard in this subdivision. Each urban water supplier's conservation standard considers its service area's relative per capita water usage.

(2) Each urban water supplier whose source of supply does not include groundwater or water imported from outside the hydrologic region in which the water supplier is located, and that has a minimum of four years' reserved supply available may, submit to the Executive Director for approval a request that, in lieu of the reduction that would otherwise be required under paragraphs (3) through (10), the urban water supplier shall reduce its total potable water production by 4 percent for each month as compared to the amount used in the same month in 2013. Any such request shall be accompanied by information showing that the supplier's sources of supply do not include groundwater or water imported from outside the hydrologic region and that the supplier has a minimum of four years' reserved supply available.

(3) Each urban water supplier whose average July-September 2014 R-GPCD was less than 65 shall reduce its total potable water production by 8 percent for each month as compared to the amount used in the same month in 2013.

(4) Each urban water supplier whose average July-September 2014 R-GPCD was 65 or more but less than 80 shall reduce its total potable water production by 12 percent for each month as compared to the amount used in the same month in 2013.

(5) Each urban water supplier whose average July-September 2014 R-GPCD was 80 or more but less than 95 shall reduce its total potable water production by 16 percent for each month as compared to the amount used in the same month in 2013.

(6) Each urban water supplier whose average July-September 2014 R-GPCD was 95 or more but less than 110 shall reduce its total potable water production by 20 percent for each month as compared to the amount used in the same month in 2013.

(7) Each urban water supplier whose average July-September 2014 R-GPCD was 110 or more but less than 130 shall reduce its total potable water production by 24 percent for each month as compared to the amount used in the same month in 2013.

(8) Each urban water supplier whose average July-September 2014 R-GPCD was 130 or more but less than 170 shall reduce its total potable water production by 28 percent for each month as compared to the amount used in the same month in 2013.

(9) Each urban water supplier whose average July-September 2014 R-GPCD was 170 or more but less than 215 shall reduce its total potable water production by 32 percent for each month as compared to the amount used in the same month in 2013.

(10) Each urban water supplier whose average July-September 2014 R-GPCD was 215 or more shall reduce its total potable water production by 36 percent for each month as compared to the amount used in the same month in 2013.

(d)(1) Beginning June 1, 2015, each urban water supplier shall comply with the conservation standard specified in subdivision (c).

(2) Compliance with the requirements of this subdivision shall be measured monthly and assessed on a cumulative basis.

(e)(1) Each urban water supplier that provides potable water for commercial agricultural use meeting the definition of Government Code section 51201, subdivision (b), may subtract the amount of water provided for commercial agricultural use from its potable water production total, provided that any urban water supplier that subtracts any water provided for commercial agricultural use from its total potable water production shall:

(A) Impose reductions determined locally appropriate by the urban water supplier, after considering the applicable urban water supplier conservation standard specified in subdivision (c), for commercial agricultural users meeting the definition of Government Code section 51201, subdivision (b) served by the supplier;

(B) Report its total potable water production pursuant to subdivision (b)(2) of this section, the total amount of water supplied for commercial agricultural use, and shall identify the reduction imposed on its commercial agricultural users and each recipient of potable water for commercial agricultural use;

(C) Certify that the agricultural uses it serves meet the definition of Government Code section 51201, subdivision (b); and

(D) Comply with the Agricultural Water Management Plan requirement of paragraph 12 of the April 1, 2015 Executive Order for all commercial agricultural water served by the supplier that is subtracted from its total potable water production.

(2) Submitting any information pursuant to subdivision (e)(1)(B) or (C) of this section that is found to be materially false by the board is a violation of this regulation, punishable by civil liability of up to five hundred dollars ($500) for each day in which the violation occurs. Every day that the error goes uncorrected constitutes a separate violation. Civil liability for the violation is in addition to, and does not supersede or limit, any other remedies, civil or criminal.

(f)(1) To prevent waste and unreasonable use of water and to promote water conservation, each distributor of a public water supply that is not an urban water supplier shall take one or more of the following actions:

(A) Limit outdoor irrigation of ornamental landscapes or turf with potable water by the persons it serves to no more than two days per week; or

(B) Reduce by 25 percent reduction its total potable water production relative to the amount produced in 2013.

(2) Each distributor of a public water supply that is not an urban water supplier shall submit a report by December 15, 2015, on a form provided by the Board, that either confirms compliance with subdivision (f)(1)(A) or identifies total potable water production, by month, from June through November, 2015, and total potable water production, by month, for June through November 2013.

Authority: Section 1058.5, Water Code.
References: Cal. Const., Art., X § 2; Sections 102, 104, 105, 275, 350, 1846, 10617 and 10632, Water Code; *Light v. State Water Resources Control Board* (2014) 226 Cal.App.4th 1463.

Sec. 866. Additional Conservation Tools.

(a)(1) To prevent the waste and unreasonable use of water and to promote conservation, when a water supplier does not meet its conservation standard required by section 865 the Executive Director, or the Executive Director's designee, may issue conservation orders requiring additional actions by the supplier to come into compliance with its conservation standard.

(2) A decision or order issued under this article by the board or an officer or employee of the board is subject to reconsideration under article 2 (commencing with section 1122) of chapter 4 of part 1 of division 2 of the California Water Code.

(b) The Executive Director, or his designee, may issue an informational order requiring water suppliers, or commercial, industrial or institutional properties that receive any portion of their supply from a source other than a water supplier subject to section 865, to submit additional information relating to water production, water use or water conservation. The failure to provide the information requested within 30 days or any additional time extension granted is a violation subject to civil liability of up to $500 per day for each day the violation continues pursuant to Water Code section 1846.

Authority: Section 1058.5, Water Code.
References: Cal. Const., Art., X § 2; Sections 100, 102, 104, 105, 174, 186, 187, 275, 350, 1051, 1122, 1123, 1825, 1846, 10617 and 10632, Water Code; *Light v. State Water Resources Control Board* (2014) 226 Cal.App.4th 1463.

Executive Department
State of California

EXECUTIVE ORDER B-29-15

WHEREAS on January 17, 2014, I proclaimed a State of Emergency to exist throughout the State of California due to severe drought conditions; and

WHEREAS on April 25, 2014, I proclaimed a Continued State of Emergency to exist throughout the State of California due to the ongoing drought; and

WHEREAS California's water supplies continue to be severely depleted despite a limited amount of rain and snowfall this winter, with record low snowpack in the Sierra Nevada mountains, decreased water levels in most of California's reservoirs, reduced flows in the state's rivers and shrinking supplies in underground water basins; and

WHEREAS the severe drought conditions continue to present urgent challenges including: drinking water shortages in communities across the state, diminished water for agricultural production, degraded habitat for many fish and wildlife species, increased wildfire risk, and the threat of saltwater contamination to fresh water supplies in the Sacramento-San Joaquin Bay Delta; and

WHEREAS a distinct possibility exists that the current drought will stretch into a fifth straight year in 2016 and beyond; and

WHEREAS new expedited actions are needed to reduce the harmful impacts from water shortages and other impacts of the drought; and

WHEREAS the magnitude of the severe drought conditions continues to present threats beyond the control of the services, personnel, equipment, and facilities of any single local government and require the combined forces of a mutual aid region or regions to combat; and

WHEREAS under the provisions of section 8558(b) of the Government Code, I find that conditions of extreme peril to the safety of persons and property continue to exist in California due to water shortage and drought conditions with which local authority is unable to cope; and

WHEREAS under the provisions of section 8571 of the California Government Code, I find that strict compliance with various statutes and regulations specified in this order would prevent, hinder, or delay the mitigation of the effects of the drought.

NOW, THEREFORE, I, EDMUND G. BROWN JR., Governor of the State of California, in accordance with the authority vested in me by the Constitution and statutes of the State of California, in particular Government Code sections 8567 and 8571 of the California Government Code, do hereby issue this Executive Order, effective immediately.

IT IS HEREBY ORDERED THAT:

1. The orders and provisions contained in my January 17, 2014 Proclamation, my April 25, 2014 Proclamation, and Executive Orders B-26-14 and B-28-14 remain in full force and effect except as modified herein.

SAVE WATER

2. The State Water Resources Control Board (Water Board) shall impose restrictions to achieve a statewide 25% reduction in potable urban water usage through February 28, 2016. These restrictions will require water suppliers to California's cities and towns to reduce usage as compared to the amount used in 2013. These restrictions should consider the relative per capita water usage of each water suppliers' service area, and require that those areas with high per capita use achieve proportionally greater reductions than those with low use. The California Public Utilities Commission is requested to take similar action with respect to investor-owned utilities providing water services.

3. The Department of Water Resources (the Department) shall lead a statewide initiative, in partnership with local agencies, to collectively replace 50 million square feet of lawns and ornamental turf with drought tolerant landscapes. The Department shall provide funding to allow for lawn replacement programs in underserved communities, which will complement local programs already underway across the state.

4. The California Energy Commission, jointly with the Department and the Water Board, shall implement a time-limited statewide appliance rebate program to provide monetary incentives for the replacement of inefficient household devices.

5. The Water Board shall impose restrictions to require that commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, immediately implement water efficiency measures to reduce potable water usage in an amount consistent with the reduction targets mandated by Directive 2 of this Executive Order.

6. The Water Board shall prohibit irrigation with potable water of ornamental turf on public street medians.

7. The Water Board shall prohibit irrigation with potable water outside of newly constructed homes and buildings that is not delivered by drip or microspray systems.

8. The Water Board shall direct urban water suppliers to develop rate structures and other pricing mechanisms, including but not limited to surcharges, fees, and penalties, to maximize water conservation consistent with statewide water restrictions. The Water Board is directed to adopt emergency regulations, as it deems necessary, pursuant to Water Code section 1058.5 to implement this directive. The Water Board is further directed to work with state agencies and water suppliers to identify mechanisms that would encourage and facilitate the adoption of rate structures and other pricing mechanisms that promote water conservation. The California Public Utilities Commission is requested to take similar action with respect to investor-owned utilities providing water services.

INCREASE ENFORCEMENT AGAINST WATER WASTE

9. The Water Board shall require urban water suppliers to provide monthly information on water usage, conservation, and enforcement on a permanent basis.

10. The Water Board shall require frequent reporting of water diversion and use by water right holders, conduct inspections to determine whether illegal diversions or wasteful and unreasonable use of water are occurring, and bring enforcement actions against illegal diverters and those engaging in the wasteful and unreasonable use of water. Pursuant to Government Code sections 8570 and 8627, the Water Board is granted authority to inspect property or diversion facilities to ascertain compliance with water rights laws and regulations where there is cause to believe such laws and regulations have been violated. When access is not granted by a property owner, the Water Board may obtain an inspection warrant pursuant to the procedures set forth in Title 13 (commencing with section 1822.50) of Part 3 of the Code of Civil Procedure for the purposes of conducting an inspection pursuant to this directive.

11. The Department shall update the State Model Water Efficient Landscape Ordinance through expedited regulation. This updated Ordinance shall increase water efficiency standards for new and existing landscapes through more efficient irrigation systems, greywater usage, onsite storm water capture, and by limiting the portion of landscapes that can be covered in turf. It will also require reporting on the implementation and enforcement of local ordinances, with required reports due by December 31, 2015. The Department shall provide information on local compliance to the Water Board, which shall consider adopting regulations or taking appropriate enforcement actions to promote compliance. The Department shall provide technical assistance and give priority in grant funding to public agencies for actions necessary to comply with local ordinances.

12. Agricultural water suppliers that supply water to more than 25,000 acres shall include in their required 2015 Agricultural Water Management Plans a detailed drought management plan that describes the actions and measures the supplier will take to manage water demand during drought. The Department shall require those plans to include quantification of water supplies and demands for 2013, 2014, and 2015 to the extent data is available. The Department will provide technical assistance to water suppliers in preparing the plans.

13. Agricultural water suppliers that supply water to 10,000 to 25,000 acres of irrigated lands shall develop Agricultural Water Management Plans and submit the plans to the Department by July 1, 2016. These plans shall include a detailed drought management plan and quantification of water supplies and demands in 2013, 2014, and 2015, to the extent that data is available. The Department shall give priority in grant funding to agricultural water suppliers that supply water to 10,000 to 25,000 acres of land for development and implementation of Agricultural Water Management Plans.

14. The Department shall report to Water Board on the status of the Agricultural Water Management Plan submittals within one month of receipt of those reports.

15. Local water agencies in high and medium priority groundwater basins shall immediately implement all requirements of the California Statewide Groundwater Elevation Monitoring Program pursuant to Water Code section 10933. The Department shall refer noncompliant local water agencies within high and medium priority groundwater basins to the Water Board by December 31, 2015, which shall consider adopting regulations or taking appropriate enforcement to promote compliance.

16. The California Energy Commission shall adopt emergency regulations establishing standards that improve the efficiency of water appliances, including toilets, urinals, and faucets available for sale and installation in new and existing buildings.

INVEST IN NEW TECHNOLOGIES

17. The California Energy Commission, jointly with the Department and the Water Board, shall implement a Water Energy Technology (WET) program to deploy innovative water management technologies for businesses, residents, industries, and agriculture. This program will achieve water and energy savings and greenhouse gas reductions by accelerating use of cutting-edge technologies such as renewable energy-powered desalination, integrated on-site reuse systems, water-use monitoring software, irrigation system timing and precision technology, and on-farm precision technology.

STREAMLINE GOVERNMENT RESPONSE

18. The Office of Emergency Services and the Department of Housing and Community Development shall work jointly with counties to provide temporary assistance for persons moving from housing units due to a lack of potable water who are served by a private well or water utility with less than 15 connections, and where all reasonable attempts to find a potable water source have been exhausted.

19. State permitting agencies shall prioritize review and approval of water infrastructure projects and programs that increase local water supplies, including water recycling facilities, reservoir improvement projects, surface water treatment plants, desalination plants, stormwater capture, and greywater systems. Agencies shall report to the Governor's Office on applications that have been pending for longer than 90 days.

20. The Department shall take actions required to plan and, if necessary, implement Emergency Drought Salinity Barriers in coordination and consultation with the Water Board and the Department of Fish and Wildlife at locations within the Sacramento - San Joaquin delta estuary. These barriers will be designed to conserve water for use later in the year to meet state and federal Endangered Species Act requirements, preserve to the extent possible water quality in the Delta, and retain water supply for essential human health and safety uses in 2015 and in the future.

21. The Water Board and the Department of Fish and Wildlife shall immediately consider any necessary regulatory approvals for the purpose of installation of the Emergency Drought Salinity Barriers.

22. The Department shall immediately consider voluntary crop idling water transfer and water exchange proposals of one year or less in duration that are initiated by local public agencies and approved in 2015 by the Department subject to the criteria set forth in Water Code section 1810.

23. The Water Board will prioritize new and amended safe drinking water permits that enhance water supply and reliability for community water systems facing water shortages or that expand service connections to include existing residences facing water shortages. As the Department of Public Health's drinking water program was transferred to the Water Board, any reference to the Department of Public Health in any prior Proclamation or Executive Order listed in Paragraph 1 is deemed to refer to the Water Board.

24. The California Department of Forestry and Fire Protection shall launch a public information campaign to educate the public on actions they can take to help to prevent wildfires including the proper treatment of dead and dying trees. Pursuant to Government Code section 8645, $1.2 million from the State Responsibility Area Fire Prevention Fund (Fund 3063) shall be allocated to the California Department of Forestry and Fire Protection to carry out this directive.

25. The Energy Commission shall expedite the processing of all applications or petitions for amendments to power plant certifications issued by the Energy Commission for the purpose of securing alternate water supply necessary for continued power plant operation. Title 20, section 1769 of the California Code of Regulations is hereby waived for any such petition, and the Energy Commission is authorized to create and implement an alternative process to consider such petitions. This process may delegate amendment approval authority, as appropriate, to the Energy Commission Executive Director. The Energy Commission shall give timely notice to all relevant local, regional, and state agencies of any petition subject to this directive, and shall post on its website any such petition.

26. For purposes of carrying out directives 2–9, 11, 16–17, 20–23, and 25, Division 13 (commencing with section 21000) of the Public Resources Code and regulations adopted pursuant to that Division are hereby suspended. This suspension applies to any actions taken by state agencies, and for actions taken by local agencies where the state agency with primary responsibility for implementing the directive concurs that local action is required, as well as for any necessary permits or approvals required to complete these actions. This suspension, and those specified in paragraph 9 of the January 17, 2014 Proclamation, paragraph 19 of the April 25, 2014 proclamation, and paragraph 4 of Executive Order B-26-14, shall remain in effect until May 31, 2016. Drought relief actions taken pursuant to these paragraphs that are started prior to May 31, 2016, but not completed, shall not be subject to Division 13 (commencing with section 21000) of the Public Resources Code for the time required to complete them.

27. For purposes of carrying out directives 20 and 21, section 13247 and Chapter 3 of Part 3 (commencing with section 85225) of the Water Code are suspended.

28. For actions called for in this proclamation in directive 20, the Department shall exercise any authority vested in the Central Valley Flood Protection Board, as codified in Water Code section 8521, et seq., that is necessary to enable these urgent actions to be taken more quickly than otherwise possible. The Director of the Department of Water Resources is specifically authorized, on behalf of the State of California, to request that the Secretary of the Army, on the recommendation of the Chief of Engineers of the Army Corps of Engineers, grant any permission required pursuant to section 14 of the Rivers and Harbors Act of 1899 and codified in section 48 of title 33 of the United States Code.

29. The Department is directed to enter into agreements with landowners for the purposes of planning and installation of the Emergency Drought Barriers in 2015 to the extent necessary to accommodate access to barrier locations, land-side and water-side construction, and materials staging in proximity to barrier locations. Where the Department is unable to reach an agreement with landowners, the Department may exercise the full authority of Government Code section 8572.

30. For purposes of this Executive Order, chapter 3.5 (commencing with section 11340) of part 1 of division 3 of the Government Code and chapter 5 (commencing with section 25400) of division 15 of the Public Resources Code are suspended for the development and adoption of regulations or guidelines needed to carry out the provisions in this Order. Any entity issuing regulations or guidelines pursuant to this directive shall conduct a public meeting on the regulations and guidelines prior to adopting them.

31. In order to ensure that equipment and services necessary for drought response can be procured quickly, the provisions of the Government Code and the Public Contract Code applicable to state contracts, including, but not limited to, advertising and competitive bidding requirements, are hereby suspended for directives 17, 20, and 24. Approval by the Department of Finance is required prior to the execution of any contract entered into pursuant to these directives.

This Executive Order is not intended to, and does not, create any rights or benefits, substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, or any other person.

I FURTHER DIRECT that as soon as hereafter possible, this Order be filed in the Office of the Secretary of State and that widespread publicity and notice be given to this Order.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 1st day of April 2015.

EDMUND G. BROWN JR.
Governor of California

ATTEST:

ALEX PADILLA
Secretary of State

Agricultural Water Use Exclusion - REQUIREMENTS

The emergency regulation for urban water conservation adopted by the State Water Board on May 5th 2015 provides urban water suppliers with the option of subtracting water delivered for commercial agriculture from total potable water production if certain conditions are met. Excluding water delivered for commercial agriculture (irrigation of land, including but not limited to greenhouses, for the purpose of producing an agricultural commodity for commercial purposes) has the effect of reducing the volume of water that must be conserved to meet a supplier's conservation standard; however the supplier still must meet the percentage conservation requirement for all other potable water produced. Urban Water suppliers choosing to exclude commercial agriculture deliveries from total potable water production must comply with the following requirements:

1. Report the total quantity of potable water supplied for commercial agricultural use as part of its monthly conservation reporting to the State Water Board;

2. The General Manager or equivalent executive level staff person must sign and submit to the State Water Board a certified statement indicating that all water subtracted from total potable water production is being served for commercial agricultural use that meets the definition of Government Code section 51201, subdivision (b). Certification forms must be submitted to Jessica Bean, State Water Resources Control Board, P.O. Box 100, Sacramento, CA 95812-0100.

3. A list of each customer that receives potable water deliveries for commercial agriculture use must be submitted with the certification form.

4. Prepare and submit to the Department of Water Resources no later than February 13, 2016, an Agricultural Water Management Plan that includes a detailed drought management plan describing the actions and measures the supplier will take to manage water demand during the drought.

5. Impose water use reductions on water delivered to its commercial agricultural users, as determined locally appropriate by the supplier, taking into consideration the supplier's conservation standard (tier).

The Agricultural Water Use Exclusion Certification Form is on page two of this document

Select Supplier Name

I hereby certify that **Select Supplier Name** provides potable water to the attached list of customers, and that this water is used exclusively for irrigation of land, including but not limited to greenhouses, for the purpose of producing an agricultural commodity for commercial purposes. I further certify that:

1. I will oversee, review, and take full responsibility for the completeness and accuracy of all data submitted to the State Water Resources Control Board as part of the reporting required pursuant to California Code of Regulations, title 23, section 865, subdivisions (b)(2) and (e);
2. **Select Supplier Name** will prepare and submit to the Department of Water Resources, no later than February 13, 2016, an Agricultural Water Management Plan that includes a detailed drought management plan describing the actions and measures the supplier will take to manage water demand during drought; and
3. **Select Supplier Name** will impose reductions on water it delivers to its commercial agricultural users, as determined locally appropriate by the supplier taking into consideration its applicable urban water supplier conservation standard (tier) under California Code of Regulations, title 23, section 865; and
4. I have the authority to make the aforesaid certifications on behalf of **Select Supplier Name** .

I acknowledge that submitting any information pursuant to California Code of Regulations, title 23, section 865, subdivision (e)(1)(B) or (C), including this certification, that is found to be materially false by the State Water Resources Control Board is a violation of that section, punishable by civil liability of up to five hundred dollars ($500) for each day in which the violation occurs. Every day that the error goes uncorrected constitutes a separate violation. Civil liability for the violation is in addition to, and does not supersede or limit, any other remedies, civil or criminal.

Printed Name	
Title *(General Manager or equivalent)*	
Signature	
Date	

Please print, sign and submit completed form along with a list of each customer that receives potable water deliveries for commercial agriculture use to:

Jessica Bean
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

CAMROSA WATER DISTRICT
BUILDING WATER SELF-RELIANCE

Board of Directors
Al E. Fox
Division 1
Jeffrey C. Brown
Division 2
Timothy H. Hoag
Division 3
Eugene F. West
Division 4
Terry L. Foreman
Division 5

General Manager
Frank E. Royer

Resolution No: 16-XX

A Resolution of the Board of Directors
of
Camrosa Water District

Adopting the 2015 Agricultural Water Management Plan

Whereas, California is entering its fifth year of drought, and the Capitol, State Water Resources Control Board (SWRCB), local agencies, and individual customers are concerned about water supply reliability and looking for ways to conserve water to survive the drought; and,

Whereas, on April 1, 2015, Governor Brown issued Executive Order B-29-15, calling for a 25-percent statewide cutback in urban potable water production from the 2013 baseline; and,

Whereas, on May 5, 2015, the SWRCB passed Resolution 2015-0032 promulgating emergency regulations implementing Executive Order B-29-15, which require of Camrosa a 32-percent reduction; and,

Whereas, because Executive Order B-29-15 does not apply to agricultural water users, SWRCB regulations stipulate that commercial agricultural water can be excluded from the conservation-target calculation, provided certain conditions are met, including the preparation and submission, by February 13, 2016, of an Agricultural Water Management Plan (AWMP); and,

Whereas, because the District desires to exclude the approximately 14 percent of potable water production that goes to agricultural customers from the SWRCB conservation-target calculation, Staff has prepared a 2015 AWMP; and,

Whereas, a properly noticed public hearing regarding the AWMP was held by the Board of Directors on February 11, 2016; and,

Whereas, Camrosa Water District shall file the AWMP with the California Department of Water Resources by February 13, 2016;

Now, Therefore, Be It Resolved ***by the Camrosa Water District Board of Directors that the attached Agricultural Water Management Plan is hereby adopted.***

Adopted, Signed and Approved **this** ***11h day of February, 2016.***

_____

Eugene F. West, President
Board of Directors
Camrosa Water District

ATTEST:

_____

Tony L. Stafford, Secretary
Board of Directors
Camrosa Water District

CAMROSA WATER DISTRICT

BUILDING WATER SELF-RELIANCE

Ordinance 40-15

Rules and Regulations

Governing
The Provision of

Water and Sanitary Services

Adopted:

August 27, 2015

ORDINANCE 40-15

An Ordinance of the Camrosa Water District

Repealing Ordinance 40-10

And Establishing Rules and Regulations

Governing the Provision of

Water and Sanitary Services

The Board of Directors of the Camrosa Water District do ordain as follows on pages 2 through 25, attached:

By Motion of Director _____, Second by Director_____, this ordinance is

ADOPTED, SIGNED, AND APPROVED this August 27, 2015

_____

Eugene F. West, President
Board of Directors
CAMROSA WATER DISTRICT

ATTEST:

_____

Tony L. Stafford, Secretary
Board of Directors
CAMROSA WATER DISTRICT

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Camrosa Water District Rules and Regulations Governing Water and Sanitary Services

1. PURPOSE

The purpose of this ordinance is to establish the terms and conditions of Camrosa's Water and Sanitary Services. These terms and conditions are intended to both assure the individual "Customer" of fair and equitable service and protect the community Camrosa serves from the undue exposure to liability. Water, Sewer, Non-Potable Surface Water and Recycled Water service shall be available only in accordance with the Rules and Regulations contained herein and in conformance with applicable federal, state and local statues, ordinances, regulations and contracts.

2. GENERAL

Water and sanitary service by Camrosa Water District is subject to the availability of facilities, adequate capacity of facilities and compliance with the terms and conditions herein set forth or as may be augmented and set forth in any agreement or permit issued by the District.

3. DEFINITIONS

"Acre Foot of Water" shall mean for the purposes of this Ordinance 43,560 cubic feet of water, which is equal to 435.6 Units or 325,851 gallons of water.

"Customer" shall mean the applicant of record for water services rendered by District.

"Certified Backflow Device" shall mean for the purposes of this Ordinance equipment, with proper and current certification, designed to prevent the reverse flow of customer's system into district system.

"Cross-connection" shall mean any unprotected connection between any part of a water system used or intended to supply water for drinking purposes and any source or system containing water or substance that is not or cannot be approved as safe, wholesome, and potable for human consumption.

"Non-Potable Water" shall mean for the purposes of this Ordinance ground water or surface water which is intended for use as irrigation water and other accepted uses for which "Potable Water" is not required.

"Non-Potable Irrigation System" shall mean for the purposes of this Ordinance the transmission and distribution piping and appurtenances, which transport Non-Potable Irrigation Water.

"Potable Water" shall mean for the purposes of this Ordinance water, which is intended for all general uses including human consumption, and therefore, water that meets all primary drinking water standards set forth by the California Department of Public Health.

"Potable Water System" shall mean for the purposes of this Ordinance the transmission and distribution piping and appurtenances, which transport "Potable Water" from the various "Potable Water" sources to the "Customer".

“Pressure Zones” shall mean for the purposes of this Ordinance subdivisions within the “Potable Water” System, the “Non-Potable Irrigation System”, and the “Recycled Irrigation Water System”, which are hydraulically isolated from the main distribution system and have their own unique hydraulic characteristics and associated energy requirements for delivery.

"Property" shall mean a parcel of land assigned a separate assessors parcel number by the County of Ventura.

“Recycled Water” shall mean for the purposes of this Ordinance, water that is a direct product of a wastewater treatment plant and, therefore, water which is regulated by the State of California as recycled water.

"Recycled Secondary Treated Water" shall mean recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a Most Probable Number (MPN) 23 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 240 per 100 milliliters in more than one sample in any 30 day period.

"Recycled Tertiary Treated Water” shall mean filtered and subsequently disinfected wastewater using a chlorine disinfection process following filtration that provides a contact time (CT) value of not less than 450 milligram-minutes per liter at all times with modal contact time of at least 90 minutes, based on peak dry weather design flow and a median concentration of total coliform bacteria measured in the disinfected effluent that does not exceed an MPN of 2.2. per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacterial does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacterial per 100 milliliters.

“Recycled Irrigation Water System” shall mean for the purposes of this Ordinance the transmission and distribution piping and appurtenances, which transport effluent water from the Camrosa Water Reclamation Facility.

“Surplus Water” shall mean for the purposes of this Ordinance water in excess of the current water demands within the boundaries of the district as determined by Camrosa Water District.

“Unit of Water” shall mean for the purposes of this Ordinance one hundred cubic feet of water, which is equal to 748 gallons.

SECTION 1 - WATER SERVICE

4. ELIGIBILITY FOR WATER SERVICE

Camrosa provides both Potable and Non-Potable Water Service for all indoor and outdoor uses to “Properties” within the District. To be eligible for Water Service the “Customer” shall satisfy both the General Requirements of Water Service and the requirements of the Type and Classification of Water Service listed below.

The District shall devote its best efforts to plan for and, on a case by case basis if necessary, prioritize provision of water services to proposed lower income housing developments pursuant to Government Code Section 65589.7.

Development projects that include lower income housing units shall not be denied approval of an application for service, nor shall conditions be imposed thereon or services reduced which are applied for, unless the District makes specific written findings that the denial, condition or reduction is necessary due to the existence of one or more of the following:

a. Insufficient water supply or insufficient water treatment or distribution capacity

b. A State Department of Public Health order prohibiting new water connections;

c. The proposed development applicant has failed to agree to reasonable terms and conditions.

The District shall not discriminate in any manner when processing and considering requests for services by proposed developments that include lower income housing units.

4.1. General Requirements of Water Service

The “Property” to be served shall be within the Camrosa Water District boundaries. The “Property” shall have an established water connection with a Camrosa water meter of adequate size and capacity, as determined by Camrosa, to serve the “Property’s” water needs without causing undue wear to the Camrosa metering facilities or interfere with Camrosa’s ability to provide reliable service to other “Properties". The “Customer” shall have completed and submitted an application for water service, paid any deposit that may be required as defined in the "Schedule of Rates, Fees and Charges for Water and Sanitary Services". The “Property” shall be free of any delinquent fees and charges from prior accounts established to serve the “Property” and the current “Customer” must establish and maintain an active water service account with Camrosa that is current, free of any delinquent fees and charges.

4.2. Types and Classifications of Water Service

Camrosa provides three types of water service: “Potable” water service, “Non-Potable” water service, and “Recycled” water service. For each type of water service, Camrosa provides water based upon service classification. Specific terms and requirements for water service are based upon the type and classification of the “Customer’s” intended water use. Failure to continuously comply with any requirement for water service may result in re-classification of the service and/or termination of service.

4.2.1. "Potable" Water Service

Camrosa provides "Potable Water" Service for all indoor and outdoor uses. To be eligible for "Potable Water" Service the "Customer" shall satisfy both the *General Requirements of Water Service* contained in Section 4.1 and the requirements of the classification of water use.

4.2.1.1. Municipal Water Service Classifications

Municipal Water Service is water service, which is intended to meet long-term "potable" water needs. It is considered uninterruptible service and, accordingly, must meet "Camrosa Water District Will Serve Policy" requirements.

4.2.1.1.1. Residential Water Service Class I

Residential Water Service - Class I is intended for all general uses both indoor and outdoor. To be eligible for Residential Water Service - Class I the "Property" served must include a dwelling or other structure suitable for occupancy, meet all the general requirements of "Potable Water" service, and have an approved application for "Potable Water" service on record.

4.2.1.1.2. Master Metered Residential Service Class II

Master Metered Residential Service – Class II is intended for all general uses both indoor and outdoor. To be eligible for Master Metered Residential Service the "Property" served must include multiple dwelling units, have a common plumbing system, managed by a formal homeowners association and have water service provided through one or more meters serving the common water system. The "Property" served must meet all the general requirements of "Potable Water" service, and have an approved application for "Potable Water" service on record. In addition, because it is the policy of the Camrosa Water District to encourage wherever practicable the metering of individual residential units, the property must secure the approval of the General Manager in the "Will Serve" process to qualify for Master Metered Service. Camrosa may require a backflow device be installed in order to qualify for this classification.

4.2.1.1.3. Commercial and Industrial Water Service Class III

Commercial and Industrial Water Service – Class III is intended for all general uses both indoor and outdoor for the purpose of providing service to privately operated services, manufacturing, or other business activities. To be eligible for Commercial and Industrial Water Service the "Property" served must possess an active conditional use permit, business license, or other evidence that the local land use jurisdiction recognizes the operation as a commercial or industrial enterprise. The primary water use must be a use other than irrigation. The "Property" must also meet all the general requirements of "Potable Water" service, have a certified backflow prevention device at the meter service, and have an approved application for Commercial and Industrial Water Service on record.

4.2.1.1.4. Public Water Service Class IV

Public Water Service – Class IV is intended for all general uses both indoor and outdoor for public services, such as public schools, recreation facilities, hospitals, government administrative services, and public safety services. To be eligible for Public Water Service the "Property" served must be publicly operated, exempt from property tax, and the primary water use must be a use other than landscape irrigation. The "Property" must also meet all the general requirements of "Potable Water" service, have a certified backflow prevention device at the meter service, and have an approved application for "Potable Water" service on record.

4.2.1.1.5. Municipal Irrigation Water Service Class V

Municipal Irrigation Water Service – Class V is intended for all general landscape irrigation needs where the primary use of water is to maintain large turf areas and other landscape for parks, golf courses, common areas, medians, open spaces and similar uses. To be eligible for Municipal Irrigation Water Service the "Property" served must meet all the general requirements of "Potable Water" service, have a certified backflow prevention device at the meter service, and have an approved application for "Potable Water" service on record.

4.2.1.1.6. Fire Service Class VI

Fire Service – Class VI is intended to provide water for private fire flow needs either within a private complex to which Camrosa does not provide public fire hydrants or for supplementary indoor fire flows. To be eligible for Fire Service the "Property" serviced must maintain a separate and isolated fire service water system and, rather than a conventional water meter, the service must include a fire flow detector meter that will detect the use of water on the fire flow system. Use of water through the fire flow system for other than fire protection shall disqualify the service from fire service classification and require compliance with a conventionally metered municipal service classification. The "Property" must also meet the general requirements of "Potable Water" service, have a certified backflow prevention device at the meter service, and have an approved application for "Potable Water" service on record.

4.2.1.2. <u>Agricultural Water Service Classifications</u>

Agricultural Water Service is a class of service intended to serve commercial agriculture. This service, unlike Municipal Water Service is interruptible. Agricultural services may be interrupted for extended periods as a result of general water shortages, drought, maintenance requirements, and operational requirements. Agricultural Water Service may not be promptly restored following emergencies. Therefore, Agricultural service shall not be eligible for conversion to the Municipal Service without satisfying all "Will Serve" requirements as set forth in the "Camrosa Water District Will Serve Water Policy".

4.2.1.2.1. Agricultural Irrigation Water Service

Agricultural Irrigation Water Service is intended for commercial agricultural properties, which raise food crops, floral crops, nursery crops, or commercial livestock. It is not the intent of this ordinance to classify home gardens, home orchards, or pets as agricultural operations. To be eligible for Agricultural Irrigation Water Service the

"Property" must include a minimum of one full contiguous, irrigated acre dedicated to commercial agriculture. The "Property" must meet all the general requirements of "Potable Water" service and have a certified backflow prevention device at the meter service.

4.2.1.2.2. Domestic Agricultural Water Service

Domestic Agricultural Water Service is intended for commercial agricultural properties, which raise food crops, floral crops, nursery crops, and commercial livestock where the "Property" includes a dwelling or dwellings in which the residential water requirements are incidental to the agricultural operation. It is not the intent of this ordinance to classify home gardens, home orchards, or pets as agricultural operations. To be eligible for Domestic Agricultural Water Service the "Property" must include a minimum of one full, contiguous, irrigated acre dedicated to commercial agriculture. The "Property" must meet all the general requirements of "Potable Water" service, have a certified backflow prevention device at the meter service, and comply with all "Will Serve" requirements as set forth in the "Camrosa Water District Will Serve Water Policy".

4.2.1.3. <u>Temporary Service</u>

Temporary Water Service is service intended for "Customers" having short-term water use needs.

4.2.1.3.1. Temporary Construction Water

Construction water is intended for "Customers" that may need water for dust abatement, general construction site use, and other construction related needs. The "Property" shall meet all the general requirements of "Potable Water" service; a site, approved by Camrosa, shall be specified for installation of a Temporary Meter Service; the temporary meter installed; suitable backflow prevention techniques, approved by Camrosa, are employed and the "Customer" shall have completed and submitted an application for Construction Water Service. Construction Water Service shall be for a term no longer than six (6) consecutive months. The General Manager may authorize longer terms on a case-by-case basis.

4.2.1.3.2. Temporary Municipal Water

Temporary Municipal Water is intended for "Customer's" having a short term need for "Potable Water" service. Examples of such short-term needs are special events, community sponsored functions, which may require water service for a period not to exceed 30 days. The General Manager, on a case-by-case basis, shall determine the requirements and conditions of such service and may authorize longer terms on a case-by-case basis.

4.2.1.3.3. Temporary Agricultural Water

Temporary Agricultural Water Service is intended to provide short-term water service to agriculture operations, which do not have service to the "Property" and require water to supplement the primary water source for a term not to exceed one (1) year.

4.2.1.3.4. Temporary Contractual Water

The Board of Directors may, from time to time, authorize water service on a temporary basis for a term and under conditions set forth by special contract.

4.2.1.4. Emergency Water Service

Emergency Water Service is intended to provide water for the protection of the health, safety and/or property for a "Property" or "Customer" unable to satisfy the requirements and conditions of "Potable Water" service. Emergency service may be provided only after Camrosa has received a complete application for Emergency Water Service from a "Customer" for a specific "Property", has determined that the situation warrants an emergency determination and all fees and charges have been paid. Camrosa shall determine any additional terms and conditions as established in the Camrosa "Schedule of Rates, Fees and Charges for Water and Sanitary Services".

4.2.1.5. Surplus Water - Out of boundary service

Surplus water may be served for any useful purpose outside the boundaries of the District by special agreement as authorized by the Board of Directors.

4.2.2. "Non-Potable Water" Service

Camrosa provides "Non-Potable Water" for a variety of irrigation, industrial, and commercial purposes. All non-potable service is interruptible due to non-availability of water, system maintenance requirements or operational requirements. To be eligible for "Non-Potable Water" Service the "Customer" shall satisfy the *General Requirements of Water Service* contained in Section 4.1, the "Property" to be served must either have no potable service or have a certified backflow prevention device on the potable service and a separate non-potable plumbing system with no existing or potential cross-connections. "Customers" must have a beneficial use for "Non-potable Water" approved by Camrosa and meet the requirements of the specific "Non-potable Water" classification of water use.

4.2.2.1. "Non-Potable Water" Classifications

The following outlines the classifications of non-potable service available from Camrosa Water District. Qualifications and requirements for use of "Non-potable Water" by individual residents may require State or County Department of Public Health prior approval before Camrosa may provide service. In addition, State or County Departments of Public Health or Camrosa may require periodic inspections of privately operated Non-Potable Irrigation Systems to assure that no cross-connections exist.

4.2.2.1.1. Commercial Agricultural - Class I

Commercial Agricultural - Class I is intended for general irrigation purposes on lands requiring water to irrigate commercial crops. To receive water under this classification, the lands must be primarily used for production of commercial crops.

4.2.2.1.2. Landscape Irrigation - Class II

Landscape Irrigation - Class II is intended for commercial operations, public landscaping such as public parks, medians, playing fields and schools, and common-area landscaping needs of homeowners associations where large amounts of irrigation water are needed to maintain turf areas or other landscaping. To qualify for this class, the property must have access to the non-potable water system, have an approved backflow prevention device, must be free of any cross-connections between the potable and non-potable systems and must be primarily in turf or other high-water-demand landscaping.

4.2.2.1.3. Residential Landscaping - Class III

Residential Landscaping – Class III is intended for irrigation of landscape, gardens, orchards and other appropriate outdoor water uses. To be eligible for Non-potable Residential Water service the property served must have access to the non-potable water system, have an approved backflow prevention device owned and maintained by the district on the potable water service to the property, the property must be free of any cross-connections between the potable and non-potable systems, meet all the general requirements of non-potable water service, have an approved application for non-potable water service on record and have paid all applicable fees and charges for non-potable water service.

4.2.2.1.4. Temporary Construction Water – Class IV

Temporary Construction Water - Class IV is intended for uses related to general construction such as dust abatement, compaction, and roadway cleaning. To be eligible for Class IV Non-Potable service a construction site must (1) have access to a non-potable water supply; (2) be permitted by Camrosa for use of “Non-potable Water”; (3) the “Customer” shall make deposits and pay any special fees and charges as established by the Board of Directors; and (4) “Customer” shall agree to comply with all State and County Department of Public Health requirements for uses of “Non-potable Water”.

4.2.2.1.5. Commercial Agricultural – Class VI

The District has entered into separate agreements for delivery of non-potable water and may again enter into such agreements. This class is intended for lands requiring large amounts of water to irrigate commercial crops and have contractual commitments with Camrosa for long-term Non-Potable Irrigation Water Service. Minimum requirements for Class I service are: (1a) the parcel served is a minimum of 20 acres; or (1b) the parcel is joined with a larger parcel totaling 20 acres and is considered part of the larger parcel's operation as determined by Camrosa; (2) the lands are primarily used for production of commercial crops; (3) the owner of the land has endorsed, submitted, and secured approval of a Non-Potable Irrigation Service Agreement with Camrosa Water District on or before December 31, 1994.

4.2.3. "Recycled Water" Service

Camrosa provides "Recycled Water" for a variety of irrigation, industrial, and commercial purposes. The "Customer" must have a beneficial use for "Recycled Water" and meet the requirements of the specific "Recycled Water" use classification of water. To be eligible for "Recycled Water" Service the "Customer" shall satisfy the following; (1) the *General Requirements of Water Service* contained in Section 4.1 above; (2) have available and agree to operate an approved Recycled Water Facility in accordance Ordinance with 40-10 – "Standards for Maintenance and Operation of Recycled Water Facilities"; and (3) execute (or receive an executed copy from the landowner) an approved "Recycled Water Use Agreement" with Camrosa Water District.

4.2.3.1. "Recycled Water" Service Classifications

The following outlines the classifications of non-potable service available from Camrosa Water District. Qualifications and requirements for use of "Non-potable Water" by individual residents may require State or County Department of Public Health prior approval before Camrosa may provide service. In addition, State or County Departments of Public Health or Camrosa may require periodic inspections of privately operated Non-Potable Irrigation Systems to assure that no cross connections exist.

4.2.3.1.1. Commercial Agricultural - Class I

Commercial Agricultural – Class I is intended for lands requiring large amounts of water for irrigation of commercial crops. The water served under this class is "Recycled Tertiary Treated Water", therefore, qualifying for use under minimum restrictions. To receive water under this classification, the lands must be primarily used for production of commercial crops

4.2.3.1.2. Landscape Irrigation Water – Class II

Landscape Irrigation Water - Class II is intended for parks, golf courses, and other large irrigated turf areas. The water provided under this class is "Recycled Tertiary Treated Water", therefore, qualifying for use under minimum restrictions. Minimum requirements are: (1) the land to be served is primarily used for recreational, decorative, or other purposes where large amounts of irrigated turf are required; (2) the land to be served is posted in accordance with Department of Public Health regulations for use of "Recycled Water" in areas open to the general public.

4.2.3.1.3. Limited-use Commercial Agricultural Water - Class III

Limited-use Commercial Agricultural Water - Class III is intended for the irrigation of commercial crops with restrictions on the method of irrigation or crop type as imposed by the Department of Public Health. The water provided is "Recycled Secondary Treated Water" therefore, its uses are restricted.

To receive water under this classification, the lands must be primarily used for production of commercial crops and must meet the requirements set forth in the most current "Camrosa Water District Commercial Agricultural Policy".

4.2.3.1.4. Commercial Agriculture Class IV

Commercial Agriculture - Class IV is intended for lands requiring large amounts of water for commercial crops and contractual commitments with Camrosa for long-term “Recycled Water” Service. The water provided under this class is "Recycled Tertiary Treated Water", therefore, qualifying for use under minimum restrictions. To be eligible for Class IV service, the land to be served must be used primarily for the production of commercial crops and the owner of the land has endorsed, submitted, and secured approval of a “Recycled Water” Service Agreement with Camrosa Water District on or before December 31, 1994.

5. CONDITIONS OF WATER SERVICE

In addition to the general requirements for water service contained in this ordinance, properties with water service agree, upon receiving service, to the conditions contained in this ordinance as it may be amended from time to time by the Camrosa Water District Board of Directors. Failure to meet the conditions contained herein may result in termination of service.

5.1. Cross-Connection Control

The “Customer” shall be responsible for the prevention of cross-connections of the “Customer’s” system with sources of potential contamination. Any “Customer” that has an alternate source of water to the “Property” served by Camrosa regardless of classification shall maintain the water systems separately and shall maintain a certified backflow prevention device at the “Property’s” potable water service meter. At the discretion of the District, Camrosa may require the installation of a backflow device on any service provided by the District. “Customer” required to maintain backflow prevention equipment shall certify the equipment annually except in those instances where the backflow prevention devices are maintained by Camrosa as part of the monthly service fee. In those instances, Camrosa shall test and certify the equipment annually.

5.2. Water Pressure and Surges

Camrosa is not responsible for damages resulting from pressure variations or surges. It is the responsibility of the “Customer” to protect the “Property” from variations in water system pressure and water system surges. The “Customer” shall not operate the "Property’s” system in a manner, which may cause surges to the Camrosa water system.

5.3. Water Leaks

Camrosa is not responsible for water losses due to leaks in the “Property’s” water system. The “Customer” shall maintain the “Property’s” water system to avoid leaks and shall repair leaks promptly.

5.4. Meters, Metering Facilities and Hydrants

The meter and the metering facility are the property of the Camrosa Water District. The outlet, outlet valve and any piping and equipment on the outlet side of the meter are the full responsibility of the “Customer”. All water that passes through the meter is the responsibility of the “Customer”.

5.4.1. Meter Testing

Any customer may demand that the meter through which potable, Non-Potable surface water or recycled water is being furnished be examined and tested by the District for the purpose of ascertaining whether or not it is correctly registering the amount of water being delivered through it. Such demand shall be in writing and shall be accompanied by a deposit equal to the charge for testing as determined by the District. Upon receipt of such demand and deposit, the District will have the meter examined and tested and, if upon such test the meter shall be found to register over two percent (2%) more water than actually passes through it, the meter shall be properly adjusted or another meter substituted therefore, the deposit shall be returned, and the water bill for the current month will be adjusted proportionately. If the meter should be found to register no more than two percent (2%) more water than actually passes through it, the deposit shall be retained by the District to offset the expense of making the test.

5.4.2. Obstruction of or deposit of material in and around Meter Boxes or Hydrants

No person shall place, dispose or deposit or permit the placement, disposal or deposit of oil, toxic hazardous or contaminated liquid or waste, trash, dirt building materials or other substances, objects or obstructions in on or around meter boxes or hydrants. It shall be the responsibility of each customer to prevent meter boxes, District hydrants or other District facilities from becoming obstructed or obscured by the customer's trees, shrubs plants or in any other manner so as to impede their use or access to them or make their location difficult to determine. If such substances, objects or obstructions are not cleaned or removed, or obscure or impede such facilities, the District may, after providing reasonable notice to the customer, accomplish the cleaning and removal and charge the customer for the cost of doing so.

5.4.3. Change of Meter Location

When the location of a meter and service is changed at the "Customer's" request, the cost of making such change will be paid for by the "Customer" in accordance with charges established in the "Schedule of Rates, Fees and Charges for Water and Sanitary Service".

5.5. Resale of Water

In the case where a “Customer” has established a Master Metered account for a property, or where a “Customer” is leasing their property to another and still maintains the water account for the property in the “Customer’s” own name, the “Customer” shall not resell water to others at a volumetric rate higher than the District charges the “Customer”. This section shall apply to all “Customers” within the District except the California State University – Channel Islands.

5.6. Exporting Water

The “Customer” shall not export water from the “Property” assigned service by Camrosa to any other “Property” without the written permission of Camrosa. This prohibition includes other “Property” under the same ownership.

5.7. Water Quality

5.7.1. Potable Water

"Potable Water" provided by Camrosa meets or exceeds all primary drinking water requirements set forth by the California Department of Public Health. Camrosa water does contain minerals that contribute to "hardness". Hardness may result in the accumulation of mineral deposits of water appliances. Camrosa is not liable for any discoloration, spotting or any other damages resulting from the mineral content of the water.

5.7.2. Non-Potable and Recycled Water

Non-Potable and Recycled water are not intended for human consumption. These waters may contain high levels of minerals and salts to which some plants are not tolerant. Camrosa is not responsible for any damages to crops or plants resulting from the use of water delivered by Camrosa.

5.8. Interruptions in Service for System Maintenance

Camrosa may interrupt service from time to time for routine maintenance, repairs, and meter testing. Camrosa is not responsible for any damages to the "Customer's" property or other losses as a result of such interruptions.

5.9. Automatic Fire Sprinkler Service Connections

When an automatic fire sprinkler service connection is installed, the control valve for the sprinkler system will be left closed and sealed until a written order to turn on the water is received from the "Customer". After the water is turned on, the District shall not be liable for damages of any kind that may occur on or to the premises or "Property" therein served due to the installation, maintenance or use of such service connection, or because of fluctuation of pressure or interruption of water supply. Water shall not be used through an automatic fire sprinkler service connection for any purpose other than the extinguishing of fires, or a purpose related thereto.

5.10. Access to District-owned Facilities

Camrosa shall have access to all District-owned meters, pipelines and appurtenant facilities at all times. No person shall willingly obstruct or prevent access to District-owned facilities.

5.11. Right of Inspection of and Access to Customers Premises

By accepting service from the District, the "Customer" agrees that authorized representatives of the District may, at reasonable times, enter upon the "Customer's" premises for the purpose of determining the existence, operation, maintenance, and/or use of:

1. Any plumbing or water piping that may cause, create or permit backflow, back-siphonage or any other condition affecting or likely to affect the purity and/or potability of the water supply furnished by the District;
2. Any private source of water supply which may be connected to the water supply system of the District; or,
3. Any source of pressure, vacuum, contamination, or pollution affecting or likely to affect the purity and/or potability of the water supply furnished by the District.

5.12. Tampering with Metering Facilities

Tampering with any Camrosa facility, which results in damages to the facilities or the loss of water by leakage or meter malfunction, may result in immediate termination of service and both civil and criminal prosecution.

5.13. Beneficial Use of Water

The "Customer" shall use water provided by Camrosa in any manner, which results in reasonable benefit to the "Property" or the "Customer".

5.14. Water-Use Prohibitions

No person shall cause or permit water under his/her control to be used in violation of the District's water-use prohibitions. Violating water-use prohibitions may result in additional fees, charges and/or termination of service as directed by the Board of Directors. The following prohibitions are in effect at all times, regardless of whether any declared water supply shortage or water emergency condition is in effect:

1. Gutter Flooding - No person shall cause or permit any water furnished to any property within the District to run or to escape from any hose, pipe, valve, faucet, sprinkler or irrigation device into any gutter or to otherwise escape from the property, if such running or escaping can reasonably be prevented.
2. Leaks - No person shall permit leaks of water that he/she has the authority to eliminate. Any detected leak, break or malfunction shall be corrected within 72 hours after a person discovers or receives notice from the District.
3. Positive Hose-end Shutoff - All garden and utility hoses shall be equipped with a positive hose-end shutoff nozzle.
4. Vehicle Washdown - Vehicles, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer shall be cleaned only by use of a hand-held bucket or a hand-held hose with a shutoff nozzle device.
5. Restaurant Equipment - Restaurants are required to use water-conserving dish-washing spray valves in all food preparation and utensil cleaning areas.
6. Water Fountains and Decorative Water Features - Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited.
7. Single-Pass Cooling Systems - Installation of single pass cooling systems in buildings requesting new water service is prohibited.

5.15. Mandatory use of Non-Potable Surface Water or Recycled Water where Available

Where non-potable or recycled water is available to a property served by Camrosa, the property shall utilize such water in lieu of potable water wherever practicable. Non-Potable surface water or recycled water must be used for construction purposes when available.

5.16. Water Supply Shortage or Water Emergencies

"Water Supply Shortage" is a condition when Camrosa Water District determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. A "Water Emergency" is a condition resulting from some catastrophic event or events, which cause or threaten to cause an impairment, reduction, or severance of the district's water supply or access to its water supplies in a manner that may result in district's inability to meet ordinary water demands for potable water service. In the event of an imminent inability of the District to meet ordinary water demands for a period beyond what can reasonably be considered routine system repairs the General Manager shall report to the Board of Directors on the extent, estimated duration, cause, and estimated severity of the event or events leading to the water supply shortage or water emergency and by resolution the Board of Directors may declare a Water Supply Shortage or Water Emergency and activate one or more of the following emergency provisions of this ordinance:

5.16.1. Stage One Water Supply Shortage or Water Emergency

The goal of a stage one water supply shortage or water emergency declaration is a 10% potable water demand reduction to preserve water supplies for district and or the region until the emergency has ended. The district shall notify its customers via newspaper, radio, television and direct mail or by any other means determined by the district to be prudent that a Water Supply Shortage or Water Emergency has been declared and that the District is requesting all customers to reduce water use by 10%. In addition to the prohibited uses of water outlined in Section 5.14, the following water conservation requirements apply during a declared Stage One Water Supply Shortage or Water Emergency;

1. Leaks - No person may permit leaks of water that he/she has the authority to eliminate. Any detected leak, break or malfunction shall be corrected within 48 hours after a person discovers or receives notice from the District.

2. Wash-Down of Hard or Paved Surfaces - Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by with a hose equipped with a positive self-closing water shut-off device, a low volume, high-pressure cleaning machine, or a low-volume high-pressure water broom.

3. Drinking Water Served Upon Request Only - Eating or drinking establishments, including but not limited to a restaurant, hotel, café, cafeteria, bar, or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

4. Limits on Watering Durations - Watering of lawns, landscape or other vegetated area with potable water is limited to non-peak demand times and only when necessary. Use of a hand held hose with positive shut-off nozzle; bucket or micro irrigation systems/equipment may be required.

5. Limits on Watering Hours - Watering or irrigating of lawn, landscape or other vegetated area with potable water may be prohibited between the hours of 9:00 a.m. and 5:00 p.m. on any day.

5.16.2. Stage Two Water Supply Shortage or Water Emergency

The goal of a stage two water supply shortage or water emergency declaration is a 20-30% reduction in potable water demands while preventing the loss of property and protecting the health and safety of the community and region. The district shall notice all of its customers via newspaper, radio, television and direct mail or by any other means determined by the district to be prudent that a Water Supply Shortage or Water Emergency has been declared and that the District is requesting customers to reduce water use. In addition to the prohibitions listed in the Stage One Water Supply Shortage or Water Emergency and the prohibited uses of water in Section 5.14 above, the following water conservation requirements to prudently preserve water supplies shall be observed;

1. Leaks - No person may permit leaks of water that he/she has the authority to eliminate. Any detected leak, break or malfunction shall be corrected within 24 hours after a person discovers or receives notice from the District.

2. Limits on Watering Days – Water or irrigating of landscape or other vegetated area with potable water may be limited to three days per week on a schedule established and posted by the District.

3. Limits on Filling Residential Swimming Pools & Spas – Use of water to fill or refill swimming pools and spas may be limited to maintain the level of water only when necessary. Draining of pools and spas or refilling shall be done only for health or safety reasons.

4. Substitution of Non-potable water - No person shall permit the outdoor use of potable water for irrigation or dust abatement where non-potable or recycled water is available.

5.16.3. Stage Three Water Supply Shortage or Water Emergency

The goal of a stage three water supply shortage or water emergency is to reduce potable water demands by 30-50% while protecting the health and safety of the community and the region. The District shall notice all of its customers via newspaper, radio, television, direct mail or any other means determined by the District to be prudent that a Water Supply Shortage or Water Emergency has been declared and that the District is requesting customers to reduce water use. In addition to the actions and requirements of a stage two emergency and the prohibited uses of water in outlined in Section 5.14 above the following water conservation requirements to prudently preserve water supplies must be observed;

1. Irrigation Restrictions - Watering or irrigation of lawn, landscape or other vegetated area with potable water may be prohibited by the Board.

2. New Potable Water Service - No new potable water service will be provided, no new temporary meters or permanent meters will be provided and no statements of immediate ability to serve or provide

potable water service will be issued, except as approved on an individual review by the District.

3. Other Prohibited Uses - The District may implement other water use requirements as determined by the District to meet water supply shortage or water emergency conditions.

5.17. Declaration of Emergency State

The Board of Directors may move from stage to stage as necessary to best manage the water supply shortage or water emergency. Once the water supply shortage or water emergency conditions have subsided and water supplies returned to normal the Board shall by resolution declare an end to the emergency and restore service to pre-emergency conditions.

5.18. Violations of Prohibitions

Violation of any water-use prohibition during a Stage Three emergency may result in fines. Repeated violations may result in water capacity restrictions to the property or termination of service.

1. **First Violation** - The District will issue a written notice to the customer indicating a violation of one or more of the water-use prohibitions or restrictions.

2. **Second Violation** - If the first violation is not corrected within the time frame specified by the District, or if a second violation occurs within the following twelve (12) months after the first violation notice, a second notice of violation will be issued and a fine of one hundred dollars ($100.00) shall be levied for the second violation.

3. **Third Violation** - A third violation within the following twelve (12) months after the date of issuance of the second notice of violation will result in a third violation and a fine of two hundred fifty dollars ($250.00).

4. **Fourth and Subsequent Violations** – A fourth violation within the following twelve months after the date of issuance of the third notice of violation will result in a fourth violation and a fine of five hundred dollars ($500.00), Each day that a violation occurs beyond the remedy allowance provided for in the fourth notice of violation results in a new violation and a fine of five hundred dollars ($500.00).

In addition to the fines outlined above, water service may be turned off or installation of a flow restrictor on the service line or lines may be required. Such an order shall be written and subject to appeal pursuant to Section 5.19, Appeals and Exceptions. Any appeal shall be heard as quickly as possible to allow a flow restrictor to be removed promptly should the Board grant the appeal.

1. **Cost of Flow Restrictor and Disconnecting Service** – A person or entity that violates this Ordinance is responsible for payment of the District's costs for installing and/or removing any flow restrictors.

2. **Payment of Fines** - The water customer is responsible for the full payment of fines. Each fine shall be applied in the customer's regular

water billing. Payment of the fine will be the final responsibility of the individual named on the water account. Non-payment of fines will be subject to the same remedies as non-payment of basic water service, in accordance with this Ordinance.

5.19. Appeals and Exceptions

Any customer may appeal a fine imposed under this Ordinance to the Board of Directors by filing a written appeal with the District within 30 days.

5.20. Reasonable Attorney Fees Paid by Customer

In the event an action is commenced in a court of law by the District to collect any obligations incurred by the use of water or sewer service, the "Customer" shall be required to pay reasonable attorney's fees if said action is successful.

SECTION 2 - FEES AND CHARGES

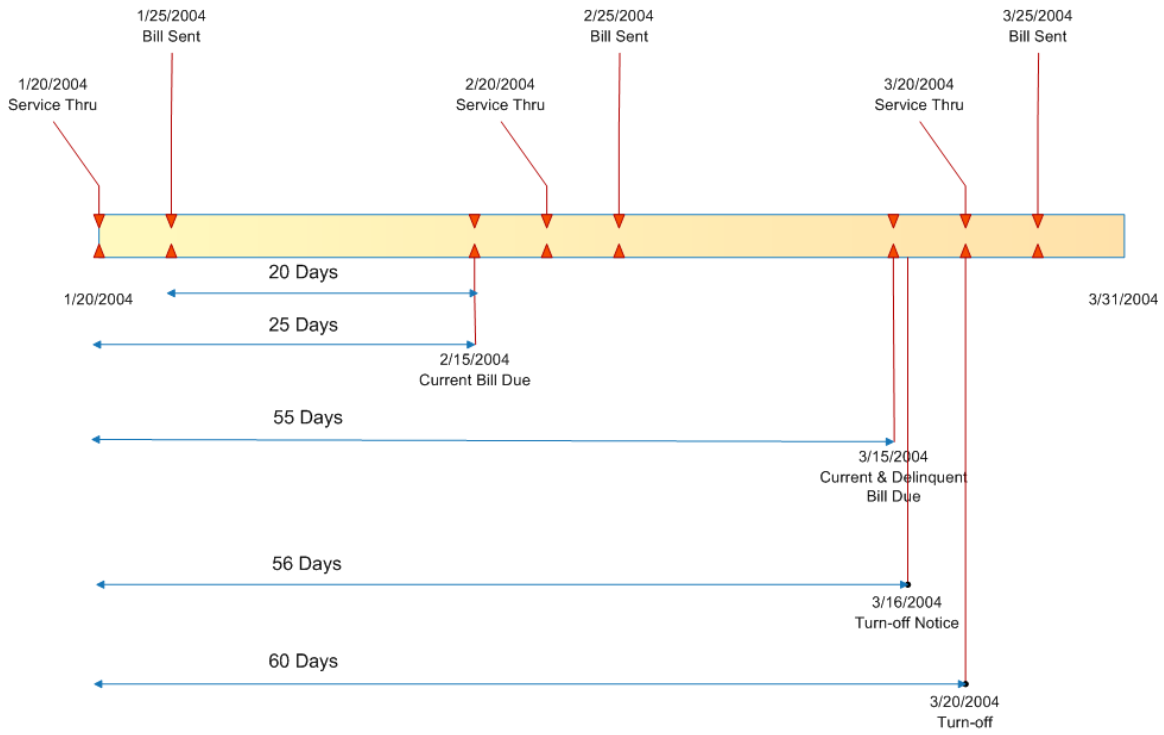
6. WATER SERVICES RATES, FEES, AND CHARGES

Camrosa shall establish, by Board Resolution, a “Schedule of Rates, Fees and Charges for Water and Sanitary Service” after holding a properly noticed public hearing in accordance with Government Code 53756. The schedule for services may cover a period not to exceed five years. The “Schedule of Rates, Fees and Charges for Water and Sanitary Services” may provide for automatic adjustments that pass through to the customer the adopted increases or decreases in the wholesale charge for water established by another public agency. Notice of any automatic adjustments pursuant to the schedule shall be given not less than 30 days before the effective date of the adjustment.

The “Customer” shall pay all assigned rates, fees, and charges for the type and class of service provided in the manner and within the times set forth in this Ordinance and the Camrosa Water District “Schedule of Rates, Fees and Charges for Water and Sanitary Services” as established and amended from time to time by the Camrosa Board of Directors. Failure to make timely payment may result in termination of service upon notice as may be required by law.

a. Time and Manner of Payment

All bills and charges for water, sewer, Non-Potable surface water and recycled water service shall be due and payable upon presentation and shall become delinquent if not paid by the date specified on the face thereof. Such bills and charges shall be deemed to be presented upon having been deposited in the United States Mail, postage paid, and addressed to the customer or owner reflected in the records of the District. Payments may be made in person, by mail or by electronic transfer of funds to the District.



The timeline presented above is the normal billing cycle for the District. If an amount billed is not paid within 25 days of date it is presented for payment, the amount shall be considered delinquent. If a delinquent amount is not paid within 55 days from its original date of presentment, the account shall become a candidate for termination and, following such notice and proceedings as may be required by law, the water, Non-Potable surface water and/or recycled water service to the property may be discontinued.

b. Delinquent Fees and Charges

Fees may be applied to accounts deemed delinquent. Charges may be applied for noticing the customer with a door hanger and for reconnection of service terminated as a result of delinquency, as provided for in the "Schedule of Rates, Fees and Charges for Water and Sanitary Services." The General Manager is authorized to waive the door hanger fee if, in the judgment of the General Manager, such waiver is in the best interests of the District.

c. Property Liens

If, in the judgment of the General Manager, a delinquent account has proven to be uncollectible, a lien against the property served may be established in the amount owing to the District. Reestablishment of service to the property may be withheld until the General Requirements of Water Service are met.

d. Pressure Zone Surcharges

Water Services may be subject to surcharges if the areas to be served are above the first hydraulic lift. Zone Surcharges are intended to reflect the actual cost of any additional pumping and shall be reviewed annually to assure that they reflect current costs.

SECTION 3 - SEWER SERVICE

7. SEWER SERVICE GENERAL

The District protects the health, welfare and safety of the local residents by constructing, operating and maintaining a system of local sewers and laterals, trunk sewers and interceptors, and liquid waste treatment and disposal facilities to serve the homes, industries and commercial establishments throughout the District and surrounding environs as required by State and Federal law.

The District shall devote its best efforts to plan for and, on a case by case basis if necessary, prioritize provision of sewer services to proposed lower income housing developments pursuant to Government Code Section 65589.7.

Development projects that include lower income housing units shall not be denied approval of an application for service, nor shall conditions be imposed thereon or services reduced which are applied for, unless the District makes specific written findings that the denial, condition or reduction is necessary due to the existence of one or more of the following:

a. Insufficient sewer treatment or sewer collection capacity;

b. A Regional Water Quality Control Board order prohibiting new sewer connections;

c. The proposed development applicant has failed to agree to reasonable terms and conditions.

The District shall not discriminate in any manner when processing and considering requests for services by proposed developments that include lower income housing units.

a. Sewer Service Area

Camrosa Water District has facilities capable of providing Sanitary Service to approximately 50% of its customers. The boundaries of the existing service area are:

1. North of the 101 Freeway to Worth Way and;
2. Calleguas Creek on the West to Morongo Drive on the East.
3. California State University, Channel Islands
4. Casa Pacifica, Las Posadas, Villa Calleguas

Sanitary Service south of the 101 Freeway, and within the Camrosa Water District boundary, is provided by the City of Camarillo while Camrosa provides the Water Service. The only exceptions are listed as #3 and #4 above.

b. Demarcation of Sewer Service Responsibilities

i. Demarcation of District Facilities

For the purpose of defining the location at which District facilities end and private facilities begin, the cleanout on sewer lateral connections to private property, located either just behind the curb and gutter, or just behind the sidewalk, shall serve as the point of demarcation.

ii. Customer Responsibility

The point of demarcation of district facilities shall not serve as the point where obstructions, causing a backup of wastewater within the lateral, cease to be the responsibility of the sewer customer. It is the responsibility of the Customer to maintain clear and free flow in the lateral from their property all the way to the District sewer main. This includes clearing obstructions caused by something flushed or dropped into the lateral or caused by root intrusion from nearby landscaping. Simply causing the obstruction to pass the demarcation point does not then place the responsibility for correction of the problem onto the District. Root intrusion caused by City or County placed trees or shrubs is, likewise, the customers responsibility to correct and then, if so inclined, to file a claim with the appropriate agency.

iii. Liability for Property Damage

The District shall not be liable for damage to private property caused by blockage in a sewer lateral. The District may assume liability only in instances when a backup in the District sewer main causes damage to private property.

c. Water Reclamation Policy

The District is committed to a policy of wastewater reclamation and reuse in order to provide an alternate source of water supply and to reduce overall costs of wastewater treatment and disposal. The reclamation of wastewater through wastewater treatment processes may necessitate more stringent quality requirements on industrial waste discharges as the demand for Non-Potable surface water increases. Accordingly, industry is urged to seek recovery and reuse procedures to meet the limitations set in industrial waste discharges rather than those procedures designed solely to meet discharge limitations.

d. Eligibility for Sewer Service

The highest and best use of the sewerage system is the collection, treatment and reclamation or disposal of domestic sewage. Connection to the District's facilities by customers within the sewer service area is unrestricted provided the prospective customer has completed the application process, all fees have been paid, the connection meets district construction specifications and the type of discharge is not detrimental to either the collection system or the treatment process.

The use of the sewerage system for industrial waste discharges is subject to regulation by the District. The District shall retain responsibility for final regulation and control of industrial waste discharges into District facilities.

Sewage, liquid waste and industrial waste will be accepted into the sewerage system provided such wastes will not: 1) menace public health, 2) detrimentally affect the local environments, 3) create nuisances such as odors, insects, etc., 4) damage structures, 5) impose excessive collection, treatment or disposal costs on the District, 6) significantly interfere with wastewater treatment processes, 7) interfere with wastewater reclamation processes, 8) exceed quality limits and quantity requirements established by the District.

e. Regulation of Sewer Service

The District has adopted *Camrosa Water District Industrial Waste and Sanitary Service Ordinance Regulating and Controlling Sewage Liquid Waste and Industrial Waste Discharges* (as amended from time to time) for the purpose of controlling and regulating sewage, liquid waste and industrial waste discharges directly or indirectly into the sewerage system and disposal works of the Camrosa Water District,

The Ordinance establishes the quality and quantity of discharged wastes; the degree of waste pretreatment required; the issuance of industrial wastewater discharge permits; the establishment of fees and charges; and the establishment of fees, charges, and penalties for violation.

Provisions are made within the Ordinance to regulate industrial waste discharges, to comply with State and Federal government requirements and policies, and to meet increasingly higher standards of treatment plant effluent quality and environmental considerations. The ordinance establishes quantity and quality limitations on sewage, liquid waste and industrial waste discharges where such discharges may adversely affect the sewerage system or the effluent quality. Methods of cost recovery are also established where the industrial waste discharge would impose unreasonable collection, treatment or disposal costs on the District.

*The provisions of "*Camrosa Water District Industrial Waste and Sanitary Service Ordinance Regulating and Controlling Sewage Liquid Waste and Industrial Waste Discharges"*, as amended from time to time, are fully incorporated by reference into these rules and regulations and shall apply to the discharge of all wastes, directly or indirectly, to a public sewer of the District*.

SECTION 4 - CONSTRUCTION SPECIFICATIONS

8. INCLUSION OF SPECIFICATIONS BY REFERENCE

The design and construction of water, Non-Potable surface water, recycled water and sewer lines and other appurtenances within the District's service area shall comply with the published "*Requirements and Specifications for Making Application - Developing Designs and Constructing Water Facilities by Public and Private Contract for Camrosa County Water District*" and "*Rules and Regulations of Camrosa County Water District Establishing General Provisions and Specifications for Design and Construction of Sanitary Sewers and Appurtenances*".

SECTION 5 - IMPLEMENTATION

9. IMPLEMENTATION AND PRIOR RULES AND REGULATIONS

This Ordinance supersedes all prior Ordinances and Resolutions relating to rules and regulations for Potable, Non-Potable and/or “Recycled Water” Services.

SECTION 6 – AUTHORITY FOR IMPLEMENTATION

10. DISCRETIONARY AUTHORITY PROVIDED TO THE GENERAL MANAGER

The General Manager is provided, herein, discretionary authority to interpret this ordinance and implement its provisions. This authority includes establishment of eligibility for service, determination of the availability of facilities and capacity, determination of compliance with this ordinance, application of fees, resolution of billing disputes, and negotiation of agreements. The Camrosa Board of Directors may address unresolved disputes. The decision of the Board of Directors regarding such disputes is final.

WATER AND WASTEWATER RATE STUDY

B&V PROJECT NO. 176244.0100

PREPARED FOR

Camrosa Water District

MARCH 20, 2013

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1 Introduction

This report was prepared for Camrosa Water District (District) to document the development of a multi-year financial plan, the cost of service analysis and the design of a rate structure for the District's Water and Wastewater Funds. The Water Fund is composed of potable and non-potable operations. The specific goals of the study were to:

- Review and evaluate existing policies and procedures affecting potable, non-potable and wastewater rates;
- Develop a sound financial plan for potable, non-potable, and wastewater covering a five-year study period for ongoing operations, planned capital improvements and capital replacement;
- Allocate the potable, non-potable and wastewater projected Fiscal Year 2013-2014 (FY 13/14) revenue requirements to the various customer class in accordance with the respective service requirements;
- Develop a suitable rate schedule that produces revenues adequate to meet financial needs while recognizing customer costs of service and local and state policy considerations such as Proposition 218 and Senate Bill x7-7 (SBx7-7).

1.1 BACKGROUND

Located in Ventura County, Camrosa Water District provides water and wastewater services to over 8,000 residential, commercial, industrial, municipal, and agricultural connections. The District provides four types of water: groundwater, import water, non-potable water, and recycled water. Groundwater is pumped from three basins through active wells located throughout the District. Import water is purchased from Metropolitan Water District (MWD) via Calleguas Municipal Water District (CMWD). Non-potable water is surface water obtained from the Conejo Creek through an agreement with CMWD and the City of Thousand Oaks. Recycled water is generated via the District's Water Reclamation Facility (WRF). The four sources currently meet the District's annual 14,750 acre-feet (AF) demand. The District treats its wastewater at the 1.5 million gallons per day (MGD) Water Reclamation Facility. Wastewater is collected through the District's 70 miles of mains and pumped through the 5 lift stations to the WRF. Also, the District maintains 0.45 MGD capacity in the CamSan treatment plant up to 2015.

The District operates and maintains the Water and Wastewater Funds as a combined, self-supporting enterprise. As such, the water and wastewater rates are developed to provide sufficient levels of revenue to meet all operation and maintenance expenses, debt service requirements, routine annual replacements of capital improvements to be funded from current revenues, and other revenue requirements.

1.2 PURPOSE

The purpose of this report is to present the findings obtained from Black & Veatch Corporation's (Black & Veatch's) study of the Water and Wastewater Fund's rate structure and alternatives, financing, and capital needs. The study develops a financial plan that projects operating revenue, expenses and capital financing costs for the Water and Wastewater Fund over a five-year planning period ending June 30, 2018. As part of the plan, future revenues under existing rates, operation and maintenance expense, principal and interest expense on bonded debt, and capital improvement requirements are considered. Annual projections of customers, water use,

revenues, and expenditures have been made using historical data and estimates based on SBx7-7 requirements for the next five years.

1.3 SCOPE OF WORK

The results of a study of the projected revenues, revenue requirements, costs of service, and rates for potable, non-potable and wastewater services are presented herein. For this report, the study period (Study Period) is the five fiscal years beginning July 1, 2013 and ending June 30, 2018. Unless otherwise noted, references in this report to a specific year are for the District's year ending June 30. To avoid confusion between calendar and fiscal years (FY), the abbreviation FY refers to the year beginning July 1 and ending June 30. Revenues and revenue requirements for the study period were projected based on a review of historical factors and the Water Fund's operating and capital budgets and financial policies. The study of revenue requirements recognizes projected operation and maintenance (O&M) expense, establishment and/or maintenance of reserve funds, and capital financing requirements. Capital financing requirements include payments on outstanding bond issues as well as capital improvement expenditures met from annual revenues and available reserve funds.

The Water and Wastewater Fund's costs of service were allocated to customer classes utilizing a cost causative approach endorsed by the American Water Works Association (AWWA) M1 manual and Water Environment Federation (WEF) Manual of Practice (MoP) No. 27. These allocation methodologies produce cost of service allocations recognizing the projected customer service requirements for the District. Proposed rates are designed in accordance with allocated cost of service and local policy considerations. The extent to which the existing rate structure recovers revenues from customer classes in accordance with cost of service allocations is also evaluated.

1.4 DISCLAIMER

In conducting our study, we reviewed the books, records, agreements, capital improvement programs, and customer sales and financial projections of the Water and Wastewater Funds as we deemed necessary to express our opinion of the operating results and projections. While we consider such books, records, documents, and projections to be reliable, Black & Veatch has not verified the accuracy of these documents.

The projections set forth in this report below are intended as "forward-looking statements". In formulating these projections, Black & Veatch has made certain assumptions with respect to conditions, events, and circumstances that may occur in the future. The methodology utilized in performing the analyses follows generally accepted practices for such projections. Such assumptions and methodologies are reasonable and appropriate for the purpose for which they are used. While we believe the assumptions are reasonable and the projection methodology valid, actual results may differ materially from those projected, as influenced by the conditions, events, and circumstances that actually occur. Such factors may include the Water and Wastewater Fund's ability to execute the capital improvement program as scheduled and within budget, regional climate and weather conditions affecting the demand for water and production of wastewater and adverse legislative, regulatory or legal decisions (including environmental laws and regulations) affecting the Water and Wastewater Fund's ability to manage the system and meet water quality requirements.

2 Water Rate Study

2.2 REVENUE AND REVENUE REQUIREMENTS

The Water Fund is composed of potable and non-potable operations. Potable serves the primary demands such as household use while non-potable serves secondary uses such as irrigation and landscape. Together, potable and non-potable provide for the need of the District's customers. To meet the costs associated with providing potable and non-potable water services to its customers, the Water Fund derives revenue from a variety of sources including water user charges, special services, property taxes, pumping charges, and interest earned from the investment of available funds. The level of future revenue generated in the study is projected through a combination of an analysis of historical and future system growth in terms of number of accounts and consumption.

With revenue derived from the various sources, the Water Fund meets the cash requirements of operation and maintenance (O&M); water supply costs; debt service and reserve payments on bond indebtedness; and recurring annual capital expenditures for replacements, system betterments, and extensions not debt financed. Operation and maintenance expenses are those expenditures necessary to maintain the system in good working order. Water supply costs are those associated with purchasing import water from CMWD. Routine annual capital expenditures, which include equipment replacements, consist of recurring annual replacements, minor extensions, and betterments which are normally revenue financed. Other capital costs include principal and interest payments, bond covenant-required payments, and the costs of infrequent major capital improvements paid directly from annual operating revenues.

2.3 CUSTOMER AND WATER USAGE PROJECTIONS

The Water Fund provides potable and non-potable water services to the various customer classes within the District boundaries. The following provides a brief description of the major types of customers:

- Potable serves the potable needs of residential, commercial, industrial, municipal, construction, and fire service. These include drinking water, household activities, business activities, etc. Potable water is also used for irrigation where no separate non-potable meter exists.
- Non-potable serves the non-potable needs associated with irrigation, landscape and agriculture. The water meets regulatory standards for its intended use. Within the non-potable resides recycled water. Recycled water is obtained from the District's WRF. Water is treated at the plant to meet Title 22 standards.

Based on a detailed review of historical growth patterns and planning estimates in the District's Draft *2011 Integrated Facilities Master Plan* and *2010 Urban Water Management Plan*, the number of customer accounts is projected to increase by an average of 0.3 percent for the Study Period. In the past couple of years, the District has experienced slowed growth in the area as a result of economic conditions. Projected customer accounts are shown in Table 2-1.

Table 2-1. Number of Customer Accounts

Line No.	Description	FY 13/14 (Accts)	FY 14/15 (Accts)	FY 15/16 (Accts)	FY 16/17 (Accts)	FY 17/18 (Accts)
	Potable Customer Classes					
1	C02 District Owned - Municipal Irrigation	4	4	4	4	4
2	C03 District Owned - Temp Construction	1	1	1	1	1
3	C04 District Owned - Comm/Ind Water	2	2	2	2	2
4	PI0 Municipal Irrigation (Class V)	213	213	213	213	213
5	PI1 Agriculture Irrigation	86	86	86	86	86
6	PI2 Residential Irrigation (Class V)	145	145	145	145	145
7	PP0 Temp Construction	7	7	7	7	7
8	PP1 Temp Municipal	0	0	0	0	0
9	PP5 Fire Service (Class VI)	91	91	91	91	91
10	PW0 Residential Water Class (Class I)	7,091	7,108	7,108	7,126	7,144
11	PW2 Residential Water Master Meter	3	3	3	3	3
12	PW1 Residential Water (Out of Bounds)	3	3	3	3	3
13	PW3 Commerical / Industrial Water (Class II)	203	203	203	203	203
14	PW4 Commercial Water (Out of Bounds)	1	1	1	1	1
15	PW5 Public Water	16	16	16	16	16
16	PW6 Domestic Agriculture	129	129	129	129	129
17	Total P Accounts	7,995	8,012	8,012	8,030	8,048
	Non-Potable Customer Classes					
18	C01 District Owned - Residential Landscape	1	1	1	1	1
19	NP0 Commercial Agriculture (Class I)	19	19	19	19	19
20	NP1 Commercial Agriculture (Class VI)	22	22	22	22	22
21	NP2 Landscape Irrigation (Class II)	9	9	9	9	9
22	NP4 Temp Construction	1	1	1	1	1
23	NP3 Residential Landscape (Class III)	278	283	283	287	292
24	NP5 Blended Agriculture (Class V)	29	29	29	29	29
25	RC1 Commercial Agriculture (Class IV)	5	5	5	5	5
26	RC2 Landscape Irrigation (Class II)	1	1	1	1	1
27	RC4 Recycled Out of Bounds Surplus (Class V)	2	2	2	2	2
28	Total NP Accounts	367	372	372	376	381
29	**Total Water Accounts**	**8,362**	**8,384**	**8,384**	**8,406**	**8,429**

Projected water sales volumes for the Study Period are shown in Table 2-2. In determining the projected water sales volume, historical patterns of water usage were analyzed. In addition, Black & Veatch incorporated water conservation requirements set forth in SBx7-7, which mandates water utilities to reduce their customer's per day per capita use by 15 percent by 2015 and 20 percent by 2020. Since the Water Fund, specifically potable water, is currently at a level that satisfies the SBx7-7 requirement, it was projected that the water sales volumes would increase in direct relation to the increases in accounts. The water sales volumes increase at an overall average of 0.4 percent for the Study Period.

Table 2-2. Billed Water Usage

Line No.	Description	Fiscal Year Ending June 30, FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
		(HCF)	(HCF)	(HCF)	(HCF)	(HCF)
	Potable Customer Classes					
1	C02 District Owned - Municipal Irrigation	500	500	500	500	500
2	C03 District Owned - Temp Construction	0	0	0	0	0
3	C04 District Owned - Comm/Ind Water	200	200	200	200	200
4	PI0 Municipal Irrigation (Class V)	242,200	242,600	243,100	243,500	243,900
5	PI1 Agriculture Irrigation	256,600	257,900	259,200	260,500	261,800
6	PI2 Residential Irrigation (Class V)	71,900	71,900	71,900	71,900	71,900
7	PP0 Temp Construction	5,700	5,700	5,700	5,700	5,700
8	PP1 Temp Municipal	0	0	0	0	0
9	PW0 Residential Water Class (Class I)	2,073,000	2,076,100	2,079,100	2,082,200	2,085,200
10	PW1 Residential Water (Out of Bounds)	1,300	1,300	1,300	1,300	1,300
11	PW2 Residential Water Master Meter Class II	174,700	175,100	175,500	176,000	176,400
12	PW3 Commerical / Industrial Water (Class II)	261,400	261,800	262,200	262,700	263,100
13	PW4 Commercial Water (Out of Bounds)	0	0	0	0	0
14	PW5 Public Water	174,700	175,100	175,500	176,000	176,400
15	PW6 Domestic Agriculture	304,500	304,500	304,500	304,500	304,500
16	Total NP Water Usage (HCF)	3,566,700	3,572,700	3,578,700	3,585,000	3,590,900
	Non-Potable Customer Classes					
16	C01 District Owned - Residential Landscape	0	0	0	0	0
17	NP0 Commercial Agriculture (Class I)	815,400	823,700	832,000	840,300	848,500
18	NP1 Commercial Agriculture (Class VI)	651,700	658,200	664,700	671,300	677,800
19	NP2 Landscape Irrigation (Class II)	10,500	10,500	10,500	10,500	10,500
20	NP3 Residential Landscape (Class III)	287,900	291,000	294,000	297,100	300,100
21	NP5 Blended Agriculture (Class V)	431,200	431,200	431,200	431,200	431,200
22	RC1 Commercial Agriculture (Class IV)	347,200	348,000	348,900	349,800	350,700
23	RC2 Landscape Irrigation (Class II)	87,600	88,000	88,400	88,900	89,300
24	RC4 Recycled Out of Bounds Surplus (Class V)	17,900	17,900	17,900	17,900	17,900
25	Total P Water Usage (HCF)	2,649,400	2,668,500	2,687,600	2,707,000	2,726,000
26	**Total Water Usage (HCF)**	**6,216,100**	**6,241,200**	**6,266,300**	**6,292,000**	**6,316,900**
27	Total Water Usage (AF)	14,270	14,328	14,385	14,444	14,502

2.4 REVENUE UNDER EXISTING RATES

The primary source of revenue for the Water Fund is derived from water user rates. Other revenue sources include; special services, pumping charges, property taxes, interest earned from the investment of available funds and other miscellaneous revenues. The level of future revenue is projected based on an analysis of historical system growth in terms of number of accounts and water consumption.

Projections of future water sales revenue are based on an analysis of historical and forward looking trends for customer growth and average water use per customer. The number of customers and volume of water sold are applied to the applicable rates to determine water sales revenue. Charges are applied monthly and a schedule of the Water Fund's existing rate structure is shown in Table 2-3. The existing rate structure incorporates the anticipated pass-through on March 1, 2013. The District is separated into 6 distinct pressure zones. The zones cover an elevation range of 100 to 1,050 feet above sea level. Due to the increased operational energy and facilities associated with

serving customers above 700 feet, the District imposes a pumping surcharge to these customers. The pressure zone charge was not adjusted as part of this study.

Table 2-3. Existing Water Rates

Description	Existing FY 12/13
Monthly Meter Service Charge	
Potable/Non-Potable Irrigation/Ble	($/monthly)
3/4" (MM)	8.43
3/4"	8.60
1"	14.33
1.5"	28.67
2"	45.87
3"	100.33
4"	172.00
6"	258.00
Domestic Agricultural	
3/4"	17.03
1"	22.76
1.5"	37.10
2"	54.30
3"	108.76
4"	180.43
Blended Agricultural	
1"	14.33
1.5"	22.30
2"	29.06
3"	36.63
4"	62.51
6"	108.30
Fire Service (all meter sizes)	40.00

Description	Existing FY 12/13
Commodity Charge - Potable Water Service Classifications	
	($/HCF)
Residential, Master Meter, Domestic Ag First 12 Units	2.37
Residential, Master Meter, Domestic Ag 13 Units & Higher	2.69
Commercial/Industrial/Public	2.69
Municipal Irrigation/Residential Irrigation	2.69
Fire Service/Other	2.69
Agricultural Irrigation	
MWD Full Service Rate	2.69
MWD Tier 2 Rate	3.29
Temporary Construction and Temporary Agricultural	2.69
Temporary Municipal	3.28
Emergency Water Service	4.06
Commercial/Industrial and Public Out of Bounds	2.81
Residential Out of Bounds First 12 Units	2.81
Residential Out of Bounds 13 Units and Higher	3.32
Commodity Charge - Non-Potable/Recycled Water Service Classifications	
Non-Potable Commercial Agricultural	0.70
Non-Potable Landscape Irrigation Water	0.70
Non-Potable Residential Landscape	0.70
Non-Potable Temporary Construction	0.70
Non-Potable Commercial Agricultural (contractual)	0.46
Blended Non-Potable Agricultural	
MWD Full Service Rate	1.92
MWD Tier 2 Rate	2.17
Recycled Commercial Agricultural	0.37
Recycled Landscape Irrigation	0.55
Recycled Commercial Agricultural (contractual)	0.37
Recycled Surplus Water (Served Outside District)	0.49

Table 2-4 represents a summary of projected water sales revenue under existing rates and charges. As shown, the revenue generated is anticipated to slowly increase over the Study Period in conjunction with the increase in number of accounts and water usage. The projected water revenue increases from $12,783,400 in FY 13/14 to $12,906,900 in FY 17/18. This represents an overall increase of roughly 1.0 percent for the Study Period. Within the revenue projections are two non-potable customer classes that are under contract with the District to provide water under a specified rate. These customers are both commercial and agricultural.

Table 2-4. Revenue under Existing Water Rates

Line No.	Description	Fiscal Year Ending June 30, FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
		($)	($)	($)	($)	($)
	Potable Customer Classes					
1	C02 District Owned - Municipal Irrigation	3,700	3,700	3,700	3,700	3,700
2	C03 District Owned - Temp Construction	0	0	0	0	0
3	C04 District Owned - Comm/Ind Water	3,900	3,900	3,900	3,900	3,900
4	PI0 Municipal Irrigation (Class V)	718,600	719,600	721,000	722,000	723,100
5	PI1 Agriculture Irrigation	716,800	720,300	723,700	727,200	730,600
6	PI2 Residential Irrigation (Class V)	214,600	214,600	214,600	214,600	214,600
7	PP0 Temp Construction	31,700	31,700	31,700	31,700	31,700
8	PP1 Temp Municipal	0	0	0	0	0
9	PP5 Fire Service (Class VI)	5,300	5,300	5,300	5,300	5,300
10	PW0 Residential Water Class (Class I)	6,156,300	6,166,500	6,176,600	6,186,700	6,196,800
11	PW1 Residential Water (Out of Bounds)	4,900	4,900	4,900	4,900	4,900
12	PW2 Residential Water Master Meter Class II	673,200	674,800	676,500	678,300	679,900
13	PW3 Commerical / Industrial Water (Class II)	758,600	759,700	760,800	762,100	763,200
14	PW4 Commercial Water (Out of Bounds)	0	0	0	0	0
15	PW5 Public Water	478,600	479,600	480,700	482,000	483,100
16	PW6 Domestic Agriculture	866,500	866,500	866,500	866,500	866,500
17	Total P Revenue	$ 10,632,700	$ 10,651,100	$ 10,669,900	$ 10,688,900	$ 10,707,300
	Non-Potable Customer Classes					
18	C01 District Owned - Residential Landscape	200	200	200	200	200
19	NP0 Commercial Agriculture (Class I)	577,600	583,400	589,200	595,000	600,700
20	NP1 Commercial Agriculture (Class VI)	303,500	306,500	309,500	312,500	315,500
21	NP2 Landscape Irrigation (Class II)	7,600	7,600	7,600	7,600	7,600
22	NP3 Residential Landscape (Class III)	261,900	264,700	267,500	270,500	273,500
23	NP5 Blended Agriculture (Class V)	814,400	814,400	814,400	814,400	814,400
24	RC1 Commercial Agriculture (Class IV)	128,500	128,800	129,100	129,400	129,800
25	RC2 Landscape Irrigation (Class II)	48,200	48,400	48,600	48,900	49,100
26	RC4 Recycled Out of Bounds Surplus (Class V)	8,800	8,800	8,800	8,800	8,800
27	Total NP Revenue	$ 2,150,700	$ 2,162,800	$ 2,174,900	$ 2,187,300	$ 2,199,600
28	**Total Water Revenue**	**$ 12,783,400**	**$ 12,813,900**	**$ 12,844,800**	**$ 12,876,200**	**$ 12,906,900**

2.5 OTHER REVENUE

In addition to revenue from rates, the Water Fund obtains revenue from other operating sources. These revenues include special services, pumping charges, property taxes, interest earned from the investment of available funds and other miscellaneous revenues. These revenues represent roughly 3.3 percent of the Water Fund's total revenue. It is anticipated that these revenues will remain relatively constant for the duration of the Study Period. Property taxes represent the largest contributor but with depressed property values and uncertainty with the State budget, the forecast keeps the revenue at a constant level for the Study Period.

2.6 OPERATING AND MAINTENANCE EXPENSES

Table 2-5 summarizes the Water Fund's projected operating and maintenance expense (O&M) for the Study Period. These expenses include costs related to production, salaries and benefits, contracts and professional services, and services and supplies. All O&M expenditures are projected to increase between 2 to 3 percent annually from the Water Fund's budget for FY 11/12. The FY 12/13 budget reflects decrease in operating costs as the District sought to minimize expenditures. With Round Mountain Water Treatment Plant and the Salinity Pipeline, the District

anticipates increased costs. These new system additions will begin operation in January of 2014. Therefore, the costs increase to accurately reflect these additional costs. In general, salaries escalate at 2 percent annually, benefits escalate at 3 percent annually, and contract services and supplies escalate at 2 to 3 percent annually.

The largest O&M expenditure that Water Fund incurs is associated with water supply costs. The District imports water from MWD via CMWD. Import water is blended with local groundwater at roughly a 70/30 import to groundwater ratio and is used for potable uses. In addition, import water is blended with surface water for a specific set of non-potable users. Other water supply costs include purchase water from the Conejo Creek for non-potable uses and production costs for local potable and non-potable supplies. Import water represents about 42 percent of the total water supply for the District. Groundwater represents about 17 percent of the total water supply. Surface water and recycled water represent the remaining 41 percent of the total water supply. Included in the water supply costs are fixed fees that are incurred by the Water Fund regardless of the amount of water that is supplied.

Table 2-5. O&M Expenses

Line No.	Description	Fiscal Year Ending June 30, FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
		($)	($)	($)	($)	($)
	Potable					
1	Production	676,450	1,058,700	1,084,700	1,114,000	1,143,800
2	Water Purchases (CMWD)	7,773,000	8,261,400	8,770,800	9,313,000	9,891,800
3	Salaries & Benefits	1,235,100	1,263,600	1,292,600	1,322,300	1,352,800
4	Contracts & Professional Services	499,900	509,900	520,100	530,500	541,100
5	Services & Supplies	445,200	456,200	469,900	484,100	498,800
6	Total P O&M Expenses	$ 10,629,650	$ 11,549,800	$ 12,138,100	$ 12,763,900	$ 13,428,300
	Non-Potable					
7	Production	1,376,000	1,426,000	1,477,800	1,534,100	1,587,600
8	Water Purchases (CMWD)	700,000	741,600	785,400	831,800	881,300
9	Salaries & Benefits	665,000	680,200	695,700	711,600	727,900
10	Contracts & Professional Services	336,000	342,700	349,500	356,500	363,600
11	Services & Supplies	254,700	261,000	268,700	276,700	284,900
12	Total NP O&M Expenses	$ 3,331,700	$ 3,451,500	$ 3,577,100	$ 3,710,700	$ 3,845,300
13	**Total Water O&M Expenses**	**$ 13,961,350**	**$ 15,001,300**	**$ 15,715,200**	**$ 16,474,600**	**$ 17,273,600**

As shown in Table 2-5, the water production expenditures in FY 13/14 are anticipated to increase as water demand returns from historical lows. Thereafter, the costs increase to incorporate additional operational expenses. In addition, water supply costs reflect the anticipated fixed and variable increases from CMWD.

2.7 DEBT SERVICE REQUIREMENTS

Table 2-6 represents the Water Fund's existing debt service obligations. This table shows both principal and interest requirements on the existing debt over the Study Period. It is common practice for utilities to utilize debt to finance large capital improvement projects. By financing the cost of the projects, the Water Fund is able to fund large projects immediately and spread the payment over a specified time frame, thereby helping to offset the impact on rate-payers. Debt service represents about 6.9 percent of total Water Fund's expenditures. Based on the revenue bond requirements, the debt service coverage ratio is set at 1.15x net revenues for the Water Fund.

Table 2-6. Debt Service

Line No.	Description	Fiscal Year Ending June 30, FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
		($)	($)	($)	($)	($)
	Potable					
1	Revenue Bond, Series 2011A	513,334	510,491	512,136	512,136	510,444
2	Refunding Revenue Bond, Series 2012	0	0	0	0	0
3	Total P Long Term Debt	$ 513,334	$ 510,491	$ 512,136	$ 512,136	$ 510,444
	Non-Potable					
4	Revenue Bond, Series 2011A	32,766	32,585	32,690	32,690	32,582
5	Refunding Revenue Bond, Series 2012	662,500	671,900	665,500	668,000	669,500
6	Total NP Long Term Debt	$ 695,266	$ 704,485	$ 698,190	$ 700,690	$ 702,082
7	**Total Water Long-Term Debt**	**$ 1,208,600**	**$ 1,214,975**	**$ 1,210,325**	**$ 1,212,825**	**$ 1,212,525**

2.8 CAPITAL IMPROVEMENT PROGRAM

Traditionally the District develops a multi-year Capital Improvement Program (CIP) covering its capital commitments for a specified time frame of 5 to 10 years. In the process of conducting this study, the District decided to defer major capital projects for the Study Period. Therefore, there is only minor CIP planned between FY 13/14 and FY 17/18.

2.8.1 Capital Financing

Typically expenditures for the CIP are met from a combination of available funds on hand, revenue bonds, SRF loans, grants, revenues derived from user rates, and interest earnings. In FY 11/12, the District issued a Revenue Bond to construct Round Mountain Water Treatment Plant. Part of the plant costs will be offset by grant funding. Shown in Tables 2-7 are the cash fund balance in the capital improvement fund and capital replacement fund that are left in these funds after minor CIP is expensed.

Table 2-7. Capital Fund Balances

Line No.	Description	Fiscal Year Ending June 30, FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
		($)	($)	($)	($)	($)
	Potable					
1	Capital Improvement	0	0	0	0	0
2	Capital Replacement	1,721,900	1,517,700	1,461,900	1,387,100	1,283,900
3	Total P Cash Balance	$ 1,721,900	$ 1,517,700	$ 1,461,900	$ 1,387,100	$ 1,283,900
	Non-Potable					
4	Capital Improvement	63,100	129,700	200,100	274,500	353,100
5	Capital Replacement	185,500	244,200	290,600	311,400	309,300
6	Total NP Cash Balance	$ 248,600	$ 373,900	$ 490,700	$ 585,900	$ 662,400
7	**Total Water Capital Cash Balance**	**$ 1,970,500**	**$ 1,891,600**	**$ 1,952,600**	**$ 1,973,000**	**$ 1,946,300**

2.9 OTHER OPERATING REQUIREMENTS

In addition to O&M and CIP commitments, the Water Fund incurs some additional costs which make up the revenue requirements.

2.9.1 Capital Contributions

In addition to the CIP, the Water Fund recognizes the need to perform recurring/annual maintenance to maintain the functionality and reliability of the potable and non-potable water system. This maintenance, routine capital outlay usually covers the replacement of small portions of mains; additions and replacements of operating equipment, pump station and superstructure maintenance, fire hydrants, meters and meter boxes, and other miscellaneous items. These capital outlays are such that they occur in a system regardless of system growth. As standard practice, the District sets a minimum target of $700,000 to be contributed to the capital replacement. Of the total, $600,000 is set for potable and $100,000 for non-potable. Also, any excess cash in the operating fund is directly contributed to the capital replacement fund.

2.9.2 Transfers

The Water Fund occasionally transfers funds to the rate stabilization fund when excess fund in the operating fund occur. The rate stabilization fund helps stabilize rate increases during economic downturns, unexpected costs, or drought conditions. Since such transfers do not represent direct operating expenses for the Water Fund, they are included herein as below-the-line cash flow items and not included as O&M expenses in the calculation of projected debt service coverage. Table 2-10 (Line 27) represents these transfers on an annual basis throughout the Study Period.

2.9.3 Reserves

Currently, the Water Fund has no stated fiscal policy with respect to operating reserves. The Water Fund transfers excess operating funds to the capital replacement fund. While this allows the District to maintain the water system, it requires that rates on any given year be set to cover the complete O&M, debt service and pay as you go (PAYGO) expenditures. It is a standard industry practice to maintain an operating reserve of 90-days of operating expenses, which would require an average target level of $935,000 to $1.12 million during the Study Period.

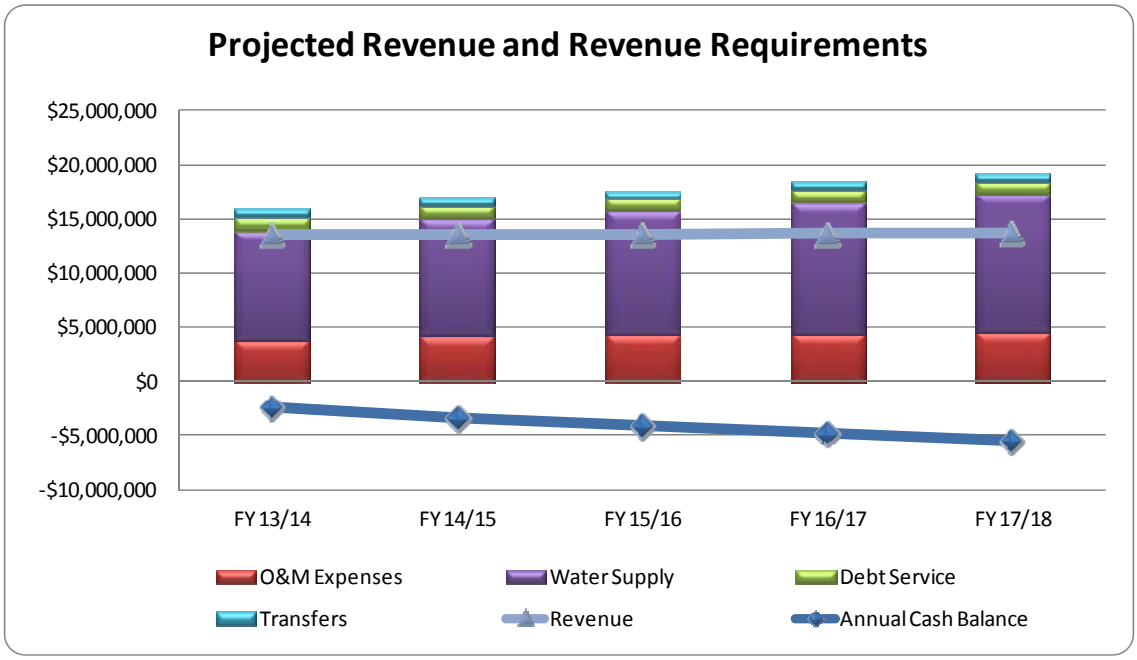
The Water Fund has a stated policy with respect to the capital reserves. The policy states that the Water Fund will strive to maintain a minimum reserve balance of at least next year's CIP costs and a maximum of ½ of total CIP costs for the next 5-years costs. Therefore, the reserve balance varies from year to year.

2.10 PROJECTED OPERATING RESULTS

The revenue requirements of the Water Fund consist of system O&M expense, water supply costs, debt service requirements, transfers, and capital contributions.

In the analysis, it was important to identify the state of the Water Fund if no revenue increases were to occur. Under the status quo scenario, the Water Fund would not impose any revenue increases over the Study Period. As shown in Figure 2-1, the status quo conditions means that the Water Fund will operate at an annual deficit position thus tapping into its rates stabilization reserves. In addition, since the Water Fund has debt service commitments, the District would need to extract from the capital funds or implement some type of rate increase.

Figure 2-1. Status Quo



In order to avoid deficit positions, the Water Fund examined various options for revenue increases that would meet the revenue requirements. Based on the goals and objectives, the District arrived at the revenue increases shown in Table 2-9. The revenue increases represents the total revenue adjustment needed to meet revenue requirements contingent on the incorporation of the pass-through. The revenue adjustment does not represent adjustments to the individual rates.

Table 2-9. Revenue Increases

Fiscal Year	Combined Revenue Adjustment	Potable Revenue Adjustment	Non-Potable Revenue Adjustment	Effective Month
FY 13/14	18.9%	7.5%	71.5%	July
FY 14/15	6.3%	7.5%	3.0%	July
FY 15/16	4.2%	5.0%	2.0%	July
FY 16/17	3.9%	4.5%	2.0%	July
FY 17/18	3.9%	4.5%	2.0%	July

Table 2-10 reflects the combined operating cash flow. The District selected this option as it incorporates the capital contribution and keeps the Water Fund at positive cash flow over the Study Period. Table 2-11 and 2-12 reflect the potable and non-potable operating cash flow, respectively.

The operating fund is subdivided into revenue and revenue requirements. In lines 3 to 7, the required annual revenue increases arrived in Table 2-9 are presented. Line 12 and 15 represents other revenues, which include special services, pumping charges, property taxes and other miscellaneous revenue. In line 18, the total revenues generated from existing rates, revenue from increases and other operating revenue are shown.

In the revenue requirement section of Tables 2-10 to 2-12, O&M, water supply, debt service, and transfers are shown and discussed earlier. Line 28 represents that total revenue requirement that will need to be met through revenue. The net cumulative balance is indicated in line 31. The

District strives to be revenue neutral with respect to the net cumulative balance. Other water utilities desired minimum operating reserve balance. The industry standard is 90 days of O&M expenditures. As shown in line 31, the annual net cumulative balance is slightly positive which allows the Water Fund to supplement the capital replacement and rate stabilization funds. Under this scenario the debt service coverage based on the 1.15x requirement is met in all years as shown on line 32 in Table 2-10. The requirement is set forth by the lending institution and is based on mandatory expenses only. Items such as transfers are excluded. Figure 2-2 presents the major components of the operating fund.

Figure 2-2. Operating Cash Flow

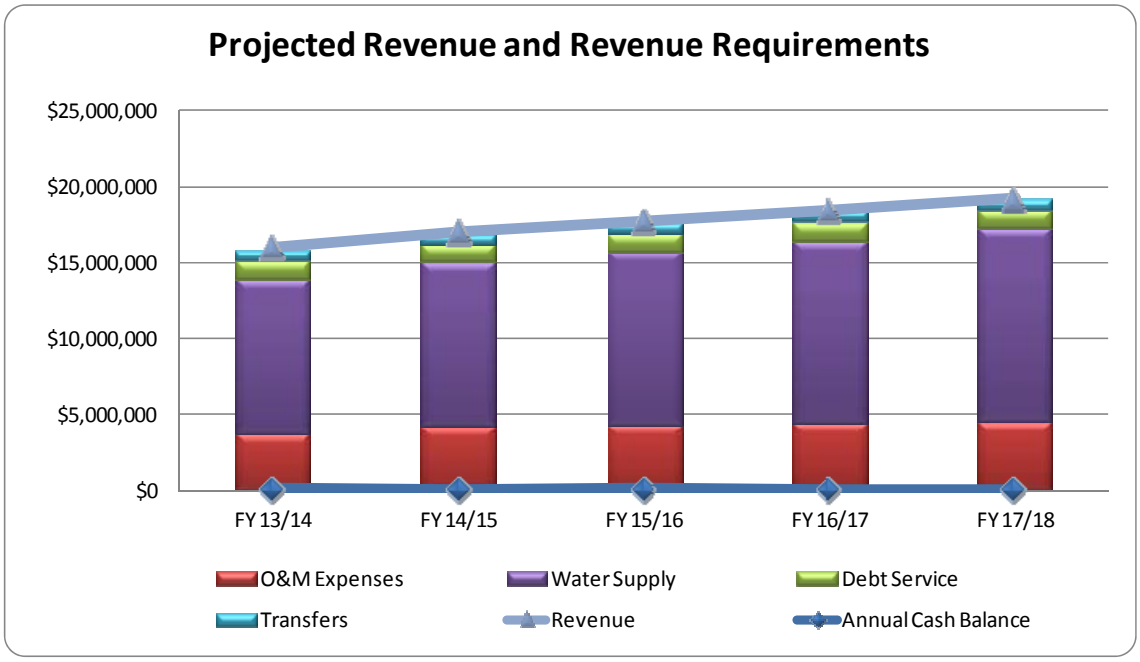


Table 2-10. Combined Operating Cash Flow

Line No.	Description		Fiscal Year Ending June 30, FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
			($)	($)	($)	($)	($)
	Revenue						
	Rate Revenue						
1	Revenue from Existing Rates		12,949,000	12,981,000	13,013,500	13,046,700	13,079,200
2	Year	Rate Adj					
3	FY 13/14	18.9%	2,453,700	2,464,700	2,475,900	2,487,500	2,498,900
4	FY 14/15	6.3%		978,600	980,900	983,100	985,300
5	FY 15/16	4.2%			699,300	700,900	702,500
6	FY 16/17	3.9%				668,700	670,200
7	FY 17/18	3.9%					698,200
8	Increased Revenue Due to Adjustments		2,453,700	3,443,300	4,156,100	4,840,200	5,555,100
9	Subtotal Rate Revenue		15,402,700	16,424,300	17,169,600	17,886,900	18,634,300
	Other Operating Revenue						
10	Special Services		35,800	35,800	35,800	35,800	35,800
11	Miscellaneous		43,700	43,700	43,700	43,700	43,700
12	Subtotal Other Operating Revenue		79,500	79,500	79,500	79,500	79,500
	Non-Operating Revenue						
13	Taxes		463,300	463,300	463,300	463,300	463,300
14	Interest		38,800	38,800	38,800	38,800	38,800
15	Subtotal Non-Operating Revenue		502,100	502,100	502,100	502,100	502,100
	Transfers						
16	Transfer from Rate Stabilization		0	0	0	0	0
17	Subtotal Non-Operating Revenue		0	0	0	0	0
18	**Total Revenue**		**$ 15,984,300**	**$ 17,005,900**	**$ 17,751,200**	**$ 18,468,500**	**$ 19,215,900**
	Revenue Requirements						
	Operating & Maintenance						
19	O&M Expenses		3,791,200	4,239,800	4,340,100	4,443,200	4,549,000
20	Water Supply		10,170,200	10,761,500	11,375,100	12,031,400	12,724,600
21	Subtotal O&M		13,961,400	15,001,300	15,715,200	16,474,600	17,273,600
	Debt Service						
22	Existing Revenue Bonds		1,208,600	1,215,000	1,210,300	1,212,800	1,212,500
23	Proposed Revenue Bonds		0	0	0	0	0
24	Total Debt Service		1,208,600	1,215,000	1,210,300	1,212,800	1,212,500
	Transfers						
25	Transfer to Water Capital Replacement		0	0	0	0	0
26	Transfer to Water Rate Stabilization		700,000	700,000	700,000	700,000	700,000
27	Total Transfers		700,000	700,000	700,000	700,000	700,000
28	**Total Revenue Requirements**		**$ 15,870,000**	**$ 16,916,300**	**$ 17,625,500**	**$ 18,387,400**	**$ 19,186,100**
29	Net Annual Cash Balance		114,300	89,600	125,700	81,100	29,800
30	Beginning Fund Balance		0	0	0	0	0
31	Net Cumulative Fund Balance		$ 114,300	$ 89,600	$ 125,700	$ 81,100	$ 29,800
32	Debt Service Coverage (1.15x)		1.67	1.65	1.68	1.64	1.60

Table 2-11. Potable Operating Cash Flow

Line No.	Description			Fiscal Year Ending June 30, FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
				($)	($)	($)	($)	($)
	Revenue							
	Rate Revenue							
1	Revenue from Existing Rates			10,632,700	10,651,100	10,669,900	10,688,900	10,707,300
2	Year	Months Effective	Rate Adj					
3	FY 13/14	12	7.5%	797,500	798,800	800,200	801,700	803,000
4	FY 14/15	12	7.5%		858,700	860,300	861,800	863,300
5	FY 15/16	12	5.0%			616,500	617,600	618,700
6	FY 16/17	12	4.5%				583,700	584,700
7	FY 17/18	12	4.5%					611,000
8	Increased Revenue Due to Adjustments			797,500	1,657,500	2,277,000	2,864,800	3,480,700
9	Subtotal Rate Revenue			11,430,200	12,308,600	12,946,900	13,553,700	14,188,000
	Other Operating Revenue							
10	Special Services			34,700	34,700	34,700	34,700	34,700
11	Miscellaneous			26,800	26,800	26,800	26,800	26,800
12	Subtotal Other Operating Revenue			61,500	61,500	61,500	61,500	61,500
	Non-Operating Revenue							
13	Taxes			278,000	278,000	278,000	278,000	278,000
14	Interest			31,800	31,800	31,800	31,800	31,800
15	Subtotal Non-Operating Revenue			309,800	309,800	309,800	309,800	309,800
	Transfers							
16	Transfer from Rate Stabilization			0	0	0	0	0
17	Subtotal Non-Operating Revenue			0	0	0	0	0
18	**Total Revenue**			**$ 11,801,500**	**$ 12,679,900**	**$ 13,318,200**	**$ 13,925,000**	**$ 14,559,300**
	Revenue Requirements							
	Operating & Maintenance							
19	O&M Expenses			2,535,500	2,955,900	3,026,200	3,098,400	3,172,600
20	Water Supply			8,094,200	8,593,900	9,111,900	9,665,500	10,255,700
21	Subtotal O&M			10,629,700	11,549,800	12,138,100	12,763,900	13,428,300
	Debt Service							
22	Existing Revenue Bonds			513,300	510,500	512,100	512,100	510,400
23	Proposed Revenue Bonds			0	0	0	0	0
24	Total Debt Service			513,300	510,500	512,100	512,100	510,400
	Transfers							
25	Transfer to Water Capital Replacement			0	0	0	0	0
26	Transfer to Water Rate Stabilization			600,000	600,000	600,000	600,000	600,000
27	Total Transfers			600,000	600,000	600,000	600,000	600,000
28	**Total Revenue Requirements**			**$ 11,743,000**	**$ 12,660,300**	**$ 13,250,200**	**$ 13,876,000**	**$ 14,538,700**
29	Net Annual Cash Balance			58,500	19,600	68,000	49,000	20,600
30	Beginning Fund Balance			0	0	0	0	0
31	Net Cumulative Fund Balance			$ 58,500	$ 19,600	$ 68,000	$ 49,000	$ 20,600
32	Debt Service Coverage (1.15x)			2.28	2.21	2.30	2.27	2.22

Table 2-12. Non-Potable Operating Cash Flow

Line No.	Description			Fiscal Year Ending June 30, FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
				($)	($)	($)	($)	($)
	Revenue							
	Rate Revenue							
1	Revenue from Existing Rates			2,316,300	2,329,900	2,343,600	2,357,800	2,371,900
2	Year	Months Effective	Rate Adj					
3	FY 13/14	12	71.5%	1,656,200	1,665,900	1,675,700	1,685,800	1,695,900
4	FY 14/15	12	3.0%		119,900	120,600	121,300	122,000
5	FY 15/16	12	2.0%			82,800	83,300	83,800
6	FY 16/17	12	2.0%				85,000	85,500
7	FY 17/18	12	2.0%					87,200
8	Increased Revenue Due to Adjustments			1,656,200	1,785,800	1,879,100	1,975,400	2,074,400
9	Subtotal Rate Revenue			3,972,500	4,115,700	4,222,700	4,333,200	4,446,300
	Other Operating Revenue							
10	Special Services			1,100	1,100	1,100	1,100	1,100
11	Miscellaneous			16,900	16,900	16,900	16,900	16,900
12	Subtotal Other Operating Revenue			18,000	18,000	18,000	18,000	18,000
	Non-Operating Revenue							
13	Taxes			185,300	185,300	185,300	185,300	185,300
14	Interest			7,000	7,000	7,000	7,000	7,000
15	Subtotal Non-Operating Revenue			192,300	192,300	192,300	192,300	192,300
	Transfers							
16	Transfer from Rate Stabilization			0	0	0	0	0
17	Subtotal Non-Operating Revenue			0	0	0	0	0
18	**Total Revenue**			**$ 4,182,800**	**$ 4,326,000**	**$ 4,433,000**	**$ 4,543,500**	**$ 4,656,600**
	Revenue Requirements							
	Operating & Maintenance							
19	O&M Expenses			1,255,700	1,283,900	1,313,900	1,344,800	1,376,400
20	Water Supply			2,076,000	2,167,600	2,263,200	2,365,900	2,468,900
21	Subtotal O&M			3,331,700	3,451,500	3,577,100	3,710,700	3,845,300
	Debt Service							
22	Existing Revenue Bonds			695,300	704,500	698,200	700,700	702,100
23	Proposed Revenue Bonds			0	0	0	0	0
24	Total Debt Service			695,300	704,500	698,200	700,700	702,100
	Transfers							
25	Transfer to Water Capital Replacement			0	0	0	0	0
26	Transfer to Water Rate Stabilization			100,000	100,000	100,000	100,000	100,000
27	Total Transfers			100,000	100,000	100,000	100,000	100,000
28	**Total Revenue Requirements**			**$ 4,127,000**	**$ 4,256,000**	**$ 4,375,300**	**$ 4,511,400**	**$ 4,647,400**
29	Net Annual Cash Balance			55,800	70,000	57,700	32,100	9,200
30	Beginning Fund Balance			0	0	0	0	0
31	Net Cumulative Fund Balance			$ 55,800	$ 70,000	$ 57,700	$ 32,100	$ 9,200
32	Debt Service Coverage (1.15x)			1.22	1.24	1.23	1.19	1.16

2.10.1 Test Year Revenue Requirements

In analyzing the Water Fund's cost of service for allocation to its customer classes, the annual revenue requirements for FY 13/14 is selected as the Test Year requirements to demonstrate the development of cost-of-service water rates. Based on achieving the Water Fund's principal goals within the Study Period, the cash flow in Tables 2-10, 2-11 and 2-12 serves as the basis for the analyses presented herein.

3 Cost of Service Allocation

The revenue requirements to be derived from rates for water service are synonymous with the definition of the Cost of Service (COS). In developing equitable rate structures, revenue requirements are allocable to the various customer classifications according to the service rendered. Allocations of these requirements to customer classes should take into account the quantity of water consumed, peak flows, number of customers, and other relevant factors. Input on cost allocations were obtained from staff and discussed with the Ad Hoc Rate Committee. Additional information regarding cost allocations may be found in the District's *Staff Report* for the Water and Sewer Rate Study dated March 2013. The total costs of service to be recovered from water user rates for the Test Year FY 13/14 are summarized in Tables 3-1. Table 3-2 and 3-3 represent the cost of service to be recovered from potable and non-potable rates for the Test Year.

Table 3-1. Cost of Service

Line No.	Description	Operating Expense	Capital Cost	Total Cost
		($)	($)	($)
	Revenue Requirements			
1	O&M Expenses	3,791,200	0	3,791,200
2	Water Supply	10,170,200	0	10,170,200
3	Debt Service	0	1,208,600	1,208,600
4	Transfers	700,000	0	700,000
5	Subtotal	14,661,400	1,208,600	15,870,000
	Less Revenue Requirements Met from Other Sources			
6	Other Operating Revenue	79,500	0	79,500
7	Other Non-Operating Revenue	502,100	0	502,100
8	Transfers	0	0	0
9	Subtotal	581,600	0	581,600
	Adjustments			
10	Adjustment for Annual Cash Balance	(114,300)	0	(114,300)
11	Subtotal	(114,300)	0	(114,300)
12	Cost of Service to be Recovered from Rates	$ 14,194,100	$ 1,208,600	$ 15,402,700

Shown in line 5 is the total revenue requirement that corresponds with the Table 2-10 line 28. In order to derive the revenue requirement that will need to be recovered by the rates, it is necessary to deduct revenues from other sources as shown in lines 9 and 11. Line 10 represents the net annual cash balance for the utility during the Test Year. In this case, the $114,300 indicates that the Water Fund is projecting a positive cash balance for the year. Line 12 represents the total costs that are to be recovered from rates.

Table 3-2. Potable Cost of Service

Line No.	Description	Operating Expense	Capital Cost	Total Cost
		($)	($)	($)
	Revenue Requirements			
1	O&M Expenses	2,535,500	0	2,535,500
2	Water Supply	8,094,200	0	8,094,200
3	Debt Service	0	513,300	513,300
4	Transfers	600,000	0	600,000
5	Subtotal	11,229,700	513,300	11,743,000
	Less Revenue Requirements Met from Other Sources			
6	Other Operating Revenue	61,500	0	61,500
7	Other Non-Operating Revenue	309,800	0	309,800
8	Transfers	0	0	0
9	Subtotal	371,300	0	371,300
	Adjustments			
10	Adjustment for Annual Cash Balance	(58,500)	0	(58,500)
11	Subtotal	(58,500)	0	(58,500)
12	Cost of Service to be Recovered from Rates	$ 10,916,900	$ 513,300	$ 11,430,200

Table 3-3. Non-Potable Cost of Service

Line No.	Description	Operating Expense	Capital Cost	Total Cost
		($)	($)	($)
	Revenue Requirements			
1	O&M Expenses	1,255,700	0	1,255,700
2	Water Supply	2,076,000	0	2,076,000
3	Debt Service	0	695,300	695,300
4	Transfers	100,000	0	100,000
5	Subtotal	3,431,700	695,300	4,127,000
	Less Revenue Requirements Met from Other Sources			
6	Other Operating Revenue	18,000	0	18,000
7	Other Non-Operating Revenue	192,300	0	192,300
8	Transfers	0	0	0
9	Subtotal	210,300	0	210,300
	Adjustments			
10	Adjustment for Annual Cash Balance	(55,800)	0	(55,800)
11	Subtotal	(55,800)	0	(55,800)
12	Cost of Service to be Recovered from Rates	$ 3,277,200	$ 695,300	$ 3,972,500

3.1 FUNCTIONAL COST COMPONENTS

The cost of providing water service should be analyzed by system function in order to properly allocate the costs to the various classes of customers and subsequently design rates. As a basis for allocating costs of service among customer classes, costs may be separated into the following four basic functional cost components: (1) “Base”; (2) “Extra Capacity”; (3) “Customer”; and (4) “Direct Assignment”.

- Base costs represent operating and capital costs of the system associated with service to customers to the extent required for a constant, or average annual rate of use.
- Extra Capacity costs represent those operating costs incurred in meeting demands in excess of average, and capital related costs for additional plant and system capacity beyond that required for the average rate of use.
- Customer costs are defined as those that tend to vary in proportion to the number of customers connected to the system. These include meter reading, billing, collecting and accounting, and maintenance and capital costs associated with meters and services.
- Directly assigned costs are costs specifically identified as those incurred to serve a specific customer group(s). The separation of costs of service into these principal categories facilitates allocating such costs to the various customer classes on the basis of the respective service requirements of each class.

3.2 ALLOCATION TO COST COMPONENTS

Each element of cost is allocated to functional cost components on the basis of the parameter or parameters having the most significant influence on the magnitude of that element of cost. O&M expense items are allocated directly to appropriate cost components, while the allocation of capital and replacement costs is based upon a detailed allocation of related capital investment. The separation of costs into functional components provides a means for distributing such costs to the various classes of customers on the basis of their respective responsibilities for each particular type of service.

Black & Veatch performed the following steps to derive the allocation percentages for apportioning the District's O&M and capital costs. As noted above, elements that are allocated directly to their cost component include customer costs and direct assigned costs.

For volume-related cost allocations, the first step in determining the allocation percentages is to assign system peaking factors. The base element is equal to the average daily demand (ADD) and assigned a value of 1.0. The District's maximum day (max day) demand is estimated to be 1.70 times the ADD. Thus, the max day is assigned a value of 1.70. The maximum instantaneous usage is approximated by the maximum hourly (max hour) usage and is estimated to be 2.25 times the ADD. Thus, max hour is assigned a value of 2.25. These peaking factors are based on the District's Draft Integrated Facilities Master Plan and discussions with District staff.

Cost components that are solely base-related, are allocated 100 percent to base. Cost components that are designed to meet max day requirements, such as reservoirs, are allocated to base and max day factors as follows:

- Base = (1.0/1.7) x 100 = 58.8%
- Max Day = (1.7 – 1.0)/1.7 x 100 = 41.2%

Cost components that are designed to meet max hour design requirements, such as Distribution, are allocated in a similar fashion, as follows:

- Base = (1.0/2.25) x 100 = 44.4%
- Max Day = (1.70 – 1.0)/2.25 x 100 = 31.1%
- Max Hour = (2.25 – 1.70)/2.25 x 100 = 24.4%

3.2.1 Allocation of Operating and Maintenance Expense

In the allocation of O&M expense and investment, costs are allocated directly to cost components to the extent possible. General and administrative cost elements are then allocated on the basis of the allocation of other costs to which they are most nearly related. Table 3-4 and 3-5 represents the allocation of O&M to the functional cost components. Upon allocation to function cost components, revenues from other sources as shown in Table 3-2 and 3-3 lines 9 and 11 are subtracted. The direct assignment represents fire protection.

3.2.2 Allocation of Capital Investments

The estimated investment in water system facilities is allocated to appropriate cost components as a basis for the further distribution of capital related costs to the various customer classes. The allocation of estimated net system investment of $513,300 serving potable water customers and $695,300 serving non-potable water for the Test Year is shown in Table 3-6 and 3-7. The annual net system investment is allocated to the functional costs based on the total water system assets.

Table 3-4. Allocation of Potable O&M Expenditures

Line No.	Description	Total Costs	Common to All Customers: Base	Extra Capacity		Customer		Fire Protection
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.	
		($)	($)	($)	($)	($)	($)	($)
	Operating Expenses							
1	Production							
2	Water Purchase	7,773,000	7,773,000	0	0	0	0	0
3	Production Power	321,200	321,200	0	0	0	0	0
4	Salaries and Benefits	1,235,100	432,200	308,800	308,800	123,500	61,800	0
5	Contracts & Professional Services							
6	Outside Contracts	364,800	109,400	91,200	91,200	36,500	36,500	0
7	Professional Services	135,100	40,500	33,800	33,800	13,500	13,500	0
8	Services & Supplies	148,800	41,900	1,800	1,800	47,100	56,200	0
9	Utilities	35,700	16,100	8,900	8,900	0	1,800	0
10	Pipeline Repairs	116,300	46,500	46,500	23,300	0	0	0
11	Materials & Supplies	84,400	42,200	16,900	16,900	4,200	4,200	0
12	Repair Parts & Equipment Maintenance	60,000	30,000	12,000	12,000	3,000	3,000	0
13	Transfers	600,000	600,000	0	0	0	0	0
14	Total O&M Expenses	$ 10,874,400	$ 9,453,000	$ 519,900	$ 496,700	$ 227,800	$ 177,000	$ 0
	Less Other Revenue							
15	Miscellaneous Revenues	371,300	322,700	17,800	17,000	7,800	6,000	0
16	Other Adjustments	(58,500)	(50,800)	(2,800)	(2,700)	(1,200)	(1,000)	0
17	Net Operating Expenses	$ 10,561,600	$ 9,181,100	$ 504,900	$ 482,400	$ 221,200	$ 172,000	$ 0

Table 3-5. Allocation of Non-Potable O&M Expenditures

Line No.	Description	Total Costs	Common to All Customers: Base	Extra Capacity		Customer		Fire Protection
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.	
		($)	($)	($)	($)	($)	($)	($)
	Operating Expenses							
1	Production							
2	Water Purchase	1,282,600	1,282,600	0	0	0	0	0
3	Production Power	642,700	642,700	0	0	0	0	0
4	Recycled Water	150,700	150,700	0	0	0	0	0
5	Salaries and Benefits	665,000	166,100	299,300	166,300	13,300	20,000	0
6	Contracts & Professional Services							
7	Outside Contracts	211,400	126,900	63,400	21,100	0	0	0
8	Professional Services	124,600	74,700	37,400	12,500	0	0	0
9	Services & Supplies	113,300	55,900	2,300	900	21,700	32,500	0
10	Utilities	8,400	3,700	3,400	1,300	0	0	0
11	Pipeline Repairs	32,600	9,800	16,300	6,500	0	0	0
12	Materials & Supplies	56,500	16,900	28,300	11,300	0	0	0
13	Repair Parts & Equipment Maintenance	43,900	13,100	22,000	8,800	0	0	0
14	Transfers	100,000	100,000	0	0	0	0	0
15	Total O&M Expenses	$ 3,431,700	$ 2,643,100	$ 472,400	$ 228,700	$ 35,000	$ 52,500	$ 0
	Less Other Revenue							
16	Miscellaneous Revenues	210,300	155,700	25,200	21,000	4,200	4,200	0
17	Other Adjustments	(55,800)	(27,700)	(9,900)	(17,600)	(300)	(300)	0
18	Net Operating Expenses	$ 3,277,200	$ 2,515,100	$ 457,100	$ 225,300	$ 31,100	$ 48,600	$ 0

Table 3-6. Allocation of Potable Capital Costs

Line No.	Description	Total Costs	Common to All Customers: Base	Extra Capacity		Customer		Fire Protection
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.	
		($)	($)	($)	($)	($)	($)	($)
	Plant Assets							
1	Water Production	47,200	47,200	0	0	0	0	0
2	Pumping	7,700	3,400	2,400	1,900	0	0	0
3	Treatment	19,300	11,400	7,900	0	0	0	0
4	Transmission & Distribution	357,700	78,600	159,000	111,300	0	0	8,900
5	Meters	42,700	0	0	0	42,700	0	0
6	Fire Hydrants	18,400	0	0	0	0	0	18,400
7	Land	11,800	11,800	0	0	0	0	0
8	General Plant	8,500	3,800	2,100	2,100	0	400	0
9	Total Plant Assets	$ 513,300	$ 156,200	$ 171,400	$ 115,300	$ 42,700	$ 400	$ 27,300
	Less Other Revenue							
10	Miscellaneous Revenues	0	0	0	0	0	0	0
11	Other Adjustments	0	0	0	0	0	0	0
12	Net Capital Expenses	$ 513,300	$ 156,200	$ 171,400	$ 115,300	$ 42,700	$ 400	$ 27,300

Table 3-7. Allocation of Non-Potable Capital Costs

Line No.	Description	Total Costs	Common to All Customers: Base	Extra Capacity		Customer		Fire Protection
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.	
		($)	($)	($)	($)	($)	($)	($)
	Plant Assets							
1	Water Production	3,300	3,300	0	0	0	0	0
2	Pumping	1,100	700	200	200	0	0	0
3	Treatment	559,600	329,200	230,400	0	0	0	0
4	Transmission & Distribution	73,700	36,300	25,400	12,000	0	0	0
5	Meters	57,600	25,600	17,900	14,100	0	0	0
6	Fire Hydrants	0	0	0	0	0	0	0
7	Land	0	0	0	0	0	0	0
8	General Plant	0	0	0	0	0	0	0
9	Total Plant Assets	$ 695,300	$ 395,100	$ 273,900	$ 26,300	$ 0	$ 0	$ 0
	Less Other Revenue							
10	Miscellaneous Revenues	0	0	0	0	0	0	0
11	Other Adjustments	0	0	0	0	0	0	0
12	Net Capital Expenses	$ 695,300	$ 395,100	$ 273,900	$ 26,300	$ 0	$ 0	$ 0

3.3 UNITS OF SERVICE

The total cost responsibility for each customer class may be established by developing unit costs of service for each cost function and subsequently assigning those costs to the customer classes based on the respective service requirements of each. To properly recognize the cost of service, each customer class is allocated its share of base, maximum day and maximum hour costs. The number of units of service required by each customer class provides a means for the proportionate distribution of costs previously allocated to respective cost categories.

Base costs vary with the volume of water used and are distributed to customer classes on that basis. Extra Capacity costs are those associated with meeting maximum rates of water use, and is distributed to customer classes on the basis of the respective class capacity requirements in excess of average rates of use. Customer costs, which consist of meter related, billing, collection and accounting costs, are allocated to the various classes on the basis of the number of bills and equivalent meters. Equivalent meter ratios are established by the American Water Works Association annual M6; "Water Meters - Selection, Installation, Testing and Maintenance". The estimated number of equivalent meters for each customer class is based on the total number of various sizes of meters serving respective classes and the ratio of the cost of meters for the various sizes to the cost of 5/8-inch meters. Private fire protection costs are allocated on the basis of equivalent fire hydrants.

The extra capacity units are determined based on a capacity factor between maximum day and maximum hour to average day. Generally, residential customers experience a higher maximum to average demand ratio than the industrial customer class. Maximum hour usage information by individual customer class is not available. As such, assumptions for maximum day and maximum hour ratios for each customer class have been made based on experience with other water utilities with similar characteristics.

3.4 COST OF SERVICE ALLOCATIONS

The costs of service are distributed to the various customer classes by applying the unit costs of service to respective service requirements. The total unit costs of service applied to the respective requirements for each customer class results in the total cost of service for each customer class.

3.4.1 Units Costs of Service

The Test Year unit cost of service for each functional cost component is based on the total cost divided by the applicable units of service as shown in Tables 3-8 and 3-9. In lines 1 and 2, the total costs represent the cost to be recovered from rates shown in Table 3-2 and 3-3 line 13. Line 5 represents the unit costs that are used in allocating the costs to the specific customer classes.

3.4.2 Distribution of Costs of Service to Customer Classes

The customer class responsibility for service is obtained by applying the unit costs of service to the number of units for which the customer class is responsible. This process is illustrated in Tables 3-10 and 3-11, in which the unit costs of service are applied to the customer class units of service.

Table 3-8. Potable Units Costs of Service

Line No.	Description	Total Costs	Common to All Customers: Base	Extra Capacity		Customer		Fire Protection
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.	
		($)	($)	($)	($)	($)	($)	($)
	Potable - Unit Cost of Service							
1	Net Operating Expense	10,916,900	9,536,400	504,900	482,400	221,200	172,000	0
2	Capital Costs	513,300	156,100	171,500	115,300	42,700	400	27,300
3	Total Cost of Service	$ 11,430,200	$ 9,692,500	$ 676,400	$ 597,700	$ 263,900	$ 172,400	$ 27,300
4	Units of Service (Total)		3,566,700	5,148	5,575	12,696	96,948	993
5	Cost per Unit		$ 2.72	$ 131.38	$ 107.20	$ 20.79	$ 1.78	$ 27.48
6	per Unit		HCF	HCF/Day	HCF/Day	Eq. Meter	Bill	Eq. Hydrant

Table 3-9. Non-Potable Units Costs of Service

Line No.	Description	Total Costs	Common to All Customers: Base	Extra Capacity		Customer	
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.
		($)	($)	($)	($)	($)	($)
	Non-Potable Unit Cost of Service						
1	Net Operating Expense	3,277,200	2,515,100	457,100	225,300	31,100	48,600
2	Capital Costs	695,300	401,500	278,500	15,300	0	0
3	Total Cost of Service	$ 3,972,500	$ 2,916,600	$ 735,600	$ 240,600	$ 31,100	$ 48,600
	Cost per Unit						
4	O&M - All less Production		$ 0.17	$ 79.91	$ 42.50	$ 30.01	$ 13.87
5	O&M - Production Only		$ 0.85	$ 0.00	$ 0.00	$ 0.00	$ 0.00
6	O&M - Production Only (Blended AG)		$ 1.69	$ 0.00	$ 0.00	$ 0.00	$ 0.00
7	Capital - All less Production, T&D		$ 0.17	$ 44.18	$ 0.04	$ 0.00	$ 0.00
8	Capital - Production and Transmission		$ 0.01	$ 2.60	$ 0.00	$ 0.00	$ 0.00
9	Capital - Distribution		$ 0.01	$ 3.78	$ 4.09	$ 0.00	$ 0.00
10	Recycled Water		$ 0.37	$ 13.83	$ 32.67	$ 0.00	$ 0.00
11	per Unit		HCF	HCF/Day	HCF/Day	Eq. Meter	Bill

Table 3-10. Distribution of Costs to Potable Customer Class

Line No.	Description	Total Costs	Common to All Customers: Base	Extra Capacity		Customer		Fire Protection
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.	
		($)	($)	($)	($)	($)	($)	($)
	Potable Customer Classes							
	C02 District Owned - Municipal Irrigation							
1	Units		500	1	1	21	24	0
2	Allocation of costs of service	2,100	1,400	200	100	400	0	0
	C03 District Owned - Temp Construction							
3	Units		0	0	0	0	0	0
4	Allocation of costs of service	0	0	0	0	0	0	0
	C04 District Owned - Comm/Ind Water							
5	Units		200	1	0	37	24	0
6	Allocation of costs of service	1,400	500	100	0	800	0	0
	PI0 Municipal Irrigation (Class V)							
7	Units		242,200	464	829	736	2,484	0
8	Allocation of costs of service	827,800	658,200	61,000	88,900	15,300	4,400	0
	PI1 Agriculture Irrigation							
9	Units		256,600	387	176	695	984	0
10	Allocation of costs of service	783,100	697,300	50,800	18,800	14,500	1,700	0
	PI2 Residential Irrigation (Class V)							
11	Units		71,900	118	177	234	1,680	0
12	Allocation of costs of service	237,800	195,400	15,500	19,000	4,900	3,000	0
	PP0 Temp Construction							
13	Units		5,700	12	3	146	180	0
14	Allocation of costs of service	20,700	15,500	1,600	300	3,000	300	0

Table 3-10. Distribution of Costs to Potable Customer Class (Cont)

Line No.	Description	Total Costs	Common to All Customers: Base	Extra Capacity		Customer		Fire Protection
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.	
		($)	($)	($)	($)	($)	($)	($)
	Potable Customer Classes							
	PP1 Temp Municipal							
15	Units		0	0	0	0	0	0
16	Allocation of costs of service	0	0	0	0	0	0	0
	PW0 Residential Water Class (Class I)							
17	Units		2,073,000	2,556	2,556	9,314	87,276	0
18	Allocation of costs of service	6,476,500	5,633,400	325,200	179,400	183,400	155,100	0
	PW1 Residential Water (Out of Bounds)							
19	Units		1,300	3	0	9	36	0
20	Allocation of costs of service	4,200	3,500	400	0	200	100	0
	PW2 Residential Water Master Meter Class II							
21	Units		174,700	215	215	225	204	0
22	Allocation of costs of service	531,200	474,700	28,300	23,100	4,700	400	0
	PW3 Commerical / Industrial Water (Class II)							
23	Units		261,400	394	251	627	2,340	0
24	Allocation of costs of service	806,300	710,400	51,800	26,900	13,000	4,200	0
	PW4 Commercial Water (Out of Bounds)							
25	Units		0	0	0	0	0	0
26	Allocation of costs of service	0	0	0	0	0	0	0
	PW5 Public Water							
27	Units		174,700	287	574	144	180	0
28	Allocation of costs of service	577,300	474,700	37,700	61,600	3,000	300	0

Table 3-10. Distribution of Costs to Potable Customer Class (Cont)

Line No.	Description	Total Costs	Common to All Customers: Base	Extra Capacity		Customer		Fire Protection
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.	
		($)	($)	($)	($)	($)	($)	($)
	Potable Customer Classes							
	PW6 Domestic Agriculture							
29	Units		304,500	709	793	509	1,536	0
30	Allocation of costs of service	1,019,000	827,500	93,200	85,000	10,600	2,700	0
	Public Fire							
31	Units		0	79	868	0	0	977
32	Allocation of costs of service	130,300	0	10,400	93,000	0	0	26,900
	PP5 Fire Service (Class VI)							
33	Units		0	1	14	487	132	16
34	Allocation of costs of service	12,500	0	200	1,600	10,100	200	400
35	TOTAL COSTS OF SERVICE	$ 11,430,200	$ 9,692,500	$ 676,400	$ 597,700	$ 263,900	$ 172,400	$ 27,300

Table 3-11. Distribution of Costs to Non-Potable Customer Class

Line No.	Description	Total Costs	Common to All Customers: Base	Extra Capacity		Customer		Fire Protection
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.	
		($)	($)	($)	($)	($)	($)	($)
	Non-Potable Customer Classes							
	C01 District Owned - Residential Landscape							
1	Units		0	0	0	2	12	0
2	Allocation of costs of service	300	0	0	0	100	200	0
	NP0 Commercial Agriculture (Class I)							
3	Units		815,400	1,787	1,005	65	48	0
4	Allocation of costs of service	1,273,100	990,600	233,100	46,900	1,900	600	0
	NP1 Commercial Agriculture (Class VI)							
5	Units		651,700	1,428	1,250	39	24	0
6	Allocation of costs of service	472,300	229,700	182,700	58,300	1,200	400	0
	NP2 Landscape Irrigation (Class II)							
7	Units		10,500	35	39	2	12	0
8	Allocation of costs of service	19,400	12,800	4,500	1,800	100	200	0
	NP3 Residential Landscape (Class III)							
9	Units		287,900	552	986	571	3,060	0
10	Allocation of costs of service	527,300	349,800	72,000	46,000	17,100	42,400	0
	NP5 Blended Agriculture (Class V)							
11	Units		431,200	1,300	413	358	336	0
12	Allocation of costs of service	1,087,500	883,200	169,600	19,300	10,700	4,700	0
	NP6 LV Landscape Irrigation							
13	Units		236,500	518	1,231	0	12	0
14	Allocation of costs of service	402,600	284,300	65,700	52,400	0	200	0

Table 3-11. Distribution of Costs to Non-Potable Customer Class (Cont)

Line No.	Description	Total Costs	Common to All Customers: Base	Extra Capacity		Customer		Fire Protection
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.	
		($)	($)	($)	($)	($)	($)	($)
	Non-Potable Customer Classes							
	RC1 Commercial Agriculture (Class IV)							
15	Units		347,200	380	0	133	48	0
16	Allocation of costs of service	133,200	127,900	5,300	0	0	0	0
	RC2 Landscape Irrigation (Class II)							
17	Units		87,600	144	480	33	12	0
18	Allocation of costs of service	50,000	32,300	2,000	15,700	0	0	0
	RC4 Recycled Out of Bounds Surplus (Class V)							
19	Units		17,900	54	10	83	48	0
20	Allocation of costs of service	7,600	6,600	700	300	0	0	0
21	TOTAL COSTS OF SERVICE	$ 3,972,500	$ 2,916,600	$ 735,600	$ 240,600	$ 31,100	$ 48,600	$ 0

3.5 ADEQUACY OF EXISTING RATES TO MEET COSTS OF SERVICE

Presented in Tables 3-12 and 3-13 is a comparison of the allocated cost of service and revenue under existing rates by major customer class for the potable and non-potable systems in total. The indicated revenue increase required over existing rates for each user class indicates where the emphasis should be directed in the subsequent rate design of water service user rates.

In Table 3-12, a 7.5 percent overall increase and in Table 3-13, a 71.5 percent overall increase are considered necessary to meet the projected revenue requirements for the FY 13/14 Test Year after the incorporation of the pass-through on March 1, 2013. The large increase associated with the non-potable system is mainly due to the shift in debt service costs that were associated with the expansion of non-potable facilities. These overall level of revenue needs to be produced by the proposed rates developed and presented in subsequent sections of this report.

Table 3-12. Potable Comparison of COS to Existing Revenue

Line No.	Description	Allocated COS	Fire Svc Allocation	Adjusted COS	Rev under Exst Rates	Indicated Rev Increase
		($)	($)	($)	($)	(%)
	Potable Customer Classes					
1	C0, PI, PP, PW - District, Irrig, Temp, CII	3,269,000	19,200	3,288,200	2,931,800	12.2%
2	PP - Temp Municipal	0	0	0	0	0.0%
3	PW - Residential	7,007,700	96,900	7,104,600	6,829,500	4.0%
4	PW - Out of Bounds	4,200	100	4,300	4,900	-12.2%
5	PW - Domestic Agriculture	1,019,000	14,100	1,033,100	866,500	19.2%
6	Total P Water System	11,299,900	130,300	11,430,200	10,632,700	7.5%

Table 3-13. Non-Potable Comparison of COS to Existing Revenue

Line No.	Description	Allocated COS	Contract Allocation	Adjusted COS	Rev under Exst Rates	Indicated Rev Increase
		($)	($)	($)	($)	(%)
	Non-Potable Customer Classes					
1	C0, NP - District, Ag, Irrig	2,280,300	84,600	2,364,900	1,069,900	121.0%
2	NP - Commercial Agriculture	472,300	(118,600)	353,700	303,500	16.5%
3	NP - Blended Agriculture	1,087,500	39,000	1,126,500	814,400	38.3%
4	RC - Commercial Agriculture	133,200	(5,000)	128,200	128,500	-0.2%
5	Total NP Water System	3,973,300	0	3,973,300	2,316,300	71.5%

Evaluating the large increases required by non-potable, the District decided to use funds from the rate stabilization fund to help transition non-potable rates to cost of service rates. Shown in Tables 3-14, is the adjusted comparison that demonstrates the rate stabilization fund allocation (RSF allocation) to each customer class. The allocation helps lower the costs to be recovered from rates.

Table 3-14. Non-Potable Adjusted Comparison of COS to Existing Revenue

Line No.	Description	Allocated COS	Contract Allocation	RSF Allocation	Adjusted COS	Rev under Exst Rates	Indicated Rev Increase
		($)	($)	($)	($)	($)	(%)
	Non-Potable Customer Classes						
1	C0, NP - District, Ag, Irrig	2,279,800	99,800	(996,600)	1,383,000	1,069,900	29.3%
2	NP - Commercial Agriculture	472,100	(141,400)	0	330,700	303,500	9.0%
3	NP - Blended Agriculture	1,087,400	46,500	(204,300)	929,600	814,400	14.1%
4	RC - Commercial Agriculture	133,200	(4,900)	0	128,300	128,500	-0.2%
5	Total NP Water System	3,972,500	0	(1,200,900)	2,771,600	2,316,300	19.7%

4 Proposed Rate Adjustments

The initial consideration in the derivation of rate schedules for water service is the establishment of equitable charges to the customers commensurate with the cost of providing that service. While the cost of service allocations to customer classes should not be construed as literal or exact determinations, they offer a guide to the necessity for, and the extent of, rate adjustments. Practical considerations sometimes modify rate adjustments by taking into account additional factors such as the extent of bill impacts, and historical local policies and practices.

4.1 EXISTING RATES

The Water Fund's existing rates consists of a meter service charge and usage charge which is uniform or tiered commodity rate depending on the customer classes. In addition, there is a meter charge for fire service connections and uniform commodity charge for pressure zone 4 and 5. A summary of existing potable and non-potable water rates was presented earlier in this report in Table 2-3.

4.2 PROPOSED RATES

The costs of service analysis described in preceding sections of this report provide a basis for the design of water rates. As observed in Table 3-13 and 3-14, the cost of providing service compared to the revenues received from different customer classes is not uniform. That is, for some customer classes the cost of providing service is greater than the revenues received. The rate schedules for FY 13/14 shown in Table 4-1, 4-2 and 4-3 take into consideration Water Fund objectives and are designed to slowly address the revenue recovery imbalance in different customer classes.

The water rates for all customer classes will keep the current rate structure which consists of a monthly meter service charge plus a commodity rate. The monthly service charge will be based on meter size. The commodity rates incorporate the amount of water consumed. A unit represents 100 cubic feet of water. Under the inclining tier rate structure, users pay different commodity rates for different block usages.

The inclining tiered rate structure used for residential customers is designed to allow the Water Fund to recuperate the additional costs incurred as the demand increases. For example, the demand during the summer months increases when compared to winter demand. As a result it costs more to operate the water system because more groundwater wells must be operated and more import water must be purchased, thereby requiring more resources.

In addition, the pressure zone surcharge will remain in effect as a surcharge on top of the usage rate for all customers in zones 4 and 5. The associated pumping charge will not change.

Table 4-1. Proposed Water Rates for Test Year

Description	Proposed FY 13/14
Monthly Meter Service Charge	
Potable/Non-Potable Irrigation/Blended Ag	($/monthly)
3/4" (MM)	5.55
3/4"	11.56
1"	19.26
1.5"	38.54
2"	61.66
3"	134.87
4"	231.21
6"	346.82
8"	578.03
Domestic Agricultural	
3/4"	17.11
1"	24.81
1.5"	44.09
2"	67.21
3"	140.42
4"	236.76
6"	352.37
8"	583.58
Fire Service	
1"	43.61
1.5"	43.61
2"	43.61
3"	43.61
4"	43.61
6"	87.20
8"	156.98
10"	261.68

Description	Proposed FY 13/14
Commodity Charge - Potable Water Service Classifications	
	($/HCF)
Residential, Master Meter, Domestic Ag First 12 Units	2.46
Residential, Master Meter, Domestic Ag 13 Units & Higher	2.69
Commercial/Industrial/Public	2.69
Municipal Irrigation/Residential Irrigation	2.69
Fire Service/Other	2.69
Agricultural Irrigation	
MWD Full Service Rate	2.69
MWD Tier 2 Rate	3.28
Temporary Construction and Temporary Agricultural	2.69
Temporary Municipal	3.28
Emergency Water Service	4.06
Commercial/Industrial and Public Out of Bounds	3.32
Residential Out of Bounds First 12 Units	2.81
Residential Out of Bounds 13 Units and Higher	3.32
Commodity Charge - Non-Potable/Recycled Water Service Classifications	
Non-Potable Commercial Agricultural	0.89
Non-Potable Landscape Irrigation Water	0.89
Non-Potable Residential Landscape	0.89
Non-Potable Temporary Construction	0.89
Non-Potable Commercial Agricultural (contractual)	0.50
Blended Non-Potable Agricultural	
MWD Full Service Rate	2.03
MWD Tier 2 Rate	2.29
Recycled Commercial Agricultural	0.89
Recycled Landscape Irrigation	0.89
Recycled Commercial Agricultural (contractual)	0.37
Recycled Surplus Water (Served Outside District)	0.89

Table 4-2. Proposed 5-Year Meter Service Charge

Customer Class	Proposed				
	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
	$/mo	$/mo	$/mo	$/mo	$/mo
Potable/Non-Potable Irrigation/Blended Agricultural					
3/4" (MM)	5.55	5.90	6.11	6.32	6.55
3/4"	11.56	12.29	12.72	13.17	13.64
1"	19.26	20.48	21.20	21.95	22.72
1.5"	38.54	40.98	42.42	43.91	45.46
2"	61.66	65.57	67.87	70.25	72.73
3"	134.87	143.41	148.44	153.66	159.09
4"	231.21	245.86	254.48	263.43	272.73
6"	346.82	368.79	381.72	395.15	409.10
8"	578.03	614.65	636.19	658.58	681.83
Domestic Agricultural					
3/4"	17.11	18.19	18.83	19.49	20.18
1"	24.81	26.38	27.31	28.27	29.27
1.5"	44.09	46.88	48.53	50.23	52.01
2"	67.21	71.47	73.97	76.58	79.28
3"	140.42	149.31	154.55	159.99	165.63
4"	236.76	251.76	260.58	269.75	279.28
6"	352.37	374.69	387.82	401.47	415.64
8"	583.58	620.55	642.30	664.90	688.37

Table 4-3. Proposed 5-Year Commodity Rates

Customer Class	Proposed				
	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
	$/HCF	$/HCF	$/HCF	$/HCF	$/HCF
Potable Water Service Classification					
Residential, Master Meter, Domestic Agricultural First 12 Units	2.46	2.66	2.80	2.94	3.08
Residential, Master Meter, Domestic Agricultural 13 Units and Higher	2.69	2.90	3.05	3.19	3.34
Commercial/Industrial/Public	2.69	2.90	3.05	3.19	3.34
Municipal Irrigation/Residential Irrigation	2.69	2.90	3.05	3.19	3.34
Fire Service/Other	2.69	2.90	3.05	3.19	3.34
Agricultural Irrigation					
MWD Full Service Rate	2.69	2.90	3.05	3.19	3.34
MWD Tier 2 Rate	3.28	3.54	3.72	3.89	4.07
Temporary Construction and Temporary Agricultural	2.69	2.90	3.05	3.19	3.34
Temporary Municipal	3.28	3.54	3.72	3.90	4.08
Emergency Water Service	4.06	4.37	4.60	4.82	5.05
Commercial/Industrial and Public Out of Bounds	3.32	3.58	3.76	3.94	4.13
Residential Out of Bounds First 12 Units	2.81	3.03	3.19	3.34	3.50
Residential Out of Bounds 13 Units and Higher	3.32	3.58	3.76	3.94	4.13

Table 4-3. Proposed 5-Year Commodity Rates (Cont)

Customer Class	Proposed				
	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
	$/HCF	$/HCF	$/HCF	$/HCF	$/HCF
Non-Potable / Recycled Water Service Classification					
Non-Potable Commercial Agricultural	0.89	1.08	1.26	1.45	1.64
Non-Potable Landscape Irrigation Water	0.89	1.08	1.26	1.45	1.64
Non-Potable Residential Landscape	0.89	1.08	1.26	1.45	1.64
Non-Potable Temporary Construction	0.89	1.08	1.26	1.45	1.64
Non-Potable Commercial Agricultural (contractual)	0.50	0.54	0.59	0.60	0.61
Blended Non-Potable Agricultural					
MWD Full Service Rate	2.03	2.24	2.46	2.67	2.88
MWD Tier 2 Rate	2.29	2.53	2.78	3.02	3.25
Recycled Commercial Agricultural	0.89	1.08	1.26	1.45	1.64
Recycled Landscape Irrigation	0.89	1.08	1.26	1.45	1.64
Recycled Commercial Agricultural (contractual)	0.37	0.38	0.38	0.39	0.40
Recycled Surplus Water (Served Outside District)	0.89	1.08	1.26	1.45	1.64

4.2.1 Meter Service Charge

The meter service charge includes a portion of the cost of meter maintenance, reading customer meters, issuing bills, general fire protection costs, and accounting/financial administrative costs associated with customer account. As noted previously, the meter service charge increases with increasing meter size. The meter ratio used follows those recommended by AWWA and recognizes that as meter size increases, so does the capacity. For example, customers with a 4" meter have an expectation of being able to use more water (at a higher flow capacity) than customers are with a 5/8" meter. Consequently, the District's water system must be prepared to provide each customer the level of service expected from his or her meter connection when the tap is turned on.

4.2.2 Fire Service

As part of the services provided by the Water Fund, eleven accounts that have a private water line connection as well as 977 fire hydrants that are tied to the water system for fire protection. To meet fire protection demands, the District must design, operate and maintain a water system that can meet peak fire demand requirements. Public hydrants are of beneficial use for all customers therefore costs are allocated to each customer class. Private fire services are charged based on the diameter of the line that connects to the water system. The results of the cost-of-service analysis conducted herein indicate that an increase from current fire service charges is necessary in order to achieve full cost recovery as shown in Table 4-4.

Table 4-4. Proposed Fire Water Rates

Customer Class	Proposed				
	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
	$/mo	$/mo	$/mo	$/mo	$/mo
Fire Service					
1"	43.61	46.38	48.00	49.69	51.45
1.5"	43.61	46.38	48.00	49.69	51.45
2"	43.61	46.38	48.00	49.69	51.45
3"	43.61	46.38	48.00	49.69	51.45
4"	43.61	46.38	48.00	49.69	51.45
6"	87.20	92.73	95.98	99.35	102.86
8"	156.98	166.92	172.77	178.85	185.17
10"	261.68	278.26	288.01	298.15	308.67

4.2.3 Water Pass-Through Charge

As part of the design of the rate structure, the District examined the existing pass-through calculation. A pass-through charge is designed to provide the Water Fund the ability to automatically adjust the user rate charges whenever the cost per acre-foot (AF) of water supplied increased due to changes in the CMWD's acre-foot charge for treated water, and fixed charges such as a readiness charge, a connection charge, or a demand charge.

Assembly Bill 3030 (AB 3030), signed into law in 2008 by the Governor of California, amended Government Code 53756 stating that any agency providing water, sewer, or refuse collection service may adopt a schedule of fees or charges authorizing automatic adjustments that pass through increases in wholesale charges for water or adjustments for inflation. Based on AB 3030, certain requirements passing through the increased cost of purchased wholesale water must be met. These requirements include (based on Government Code 53756):

- The schedule of fees or charges for a property-related service for a period not to exceed five years.
- The schedule of fees or charges may include a schedule of adjustments, including a clearly defined formula for adjusting for inflation. Any inflation adjustment to a fee or charge for a property-related service shall not exceed the cost of providing that service.
- The schedule of fees or charges for an agency that purchases wholesale water from a public agency may provide for automatic adjustments that pass through the adopted increases or decreases in the wholesale charges for water established by the other agency.
- Notice of any adjustment pursuant to the schedule shall be given not less than 30 days before the effective date of the adjustment.

Based on AB 3030, the noticing requirement does not need to follow California Constitution article XIII D set forth by Proposition 218.

Based on a review of AB 3030 and California Constitution articles XIII D, the District has decided to use the following formula to pass through increases in wholesale water charges. The formula is as follows:

Pass Through Charge =

$$\frac{\textit{(Revised Supply Cost) * (Revised Water Supplied) – (Planned Supply Costs) * (Planned Water Supplied)}}{\textit{Revised Water Supplied}}$$

- *Revised Supply Cost* = cost of water based on provided water purveyor rates, basin pumping percentage for the current year, and electricity costs
- *Revise Water Supplied* = water consumption for current year
- *Planned Supply Cost* = estimated cost of water based on provided water purveyor rates, basin pumping percentage at the time of the rate study, and electricity costs
- *Planned Water Supplied* = estimated water demand at the time of the rate study

4.3 REVENUE RECOVERY UNDER PROPOSED RATES

As previously discussed, the proposed rate schedule shown in Table 2-9 would increase rate revenues by the average system-wide cumulative increase of 32.5 percent for potable and 87.5 for non-potable over the Study Period and maintain current cost recovery by customer class, as indicated in Tables 4-5 and 4-6. It should be noted that the cumulative percentages assumes the adoption of the pass-though mechanism.

Table 4-5. Potable Comparison of COS to Projected Revenue

Line No.	Description	Adjusted COS	Rev under Proposed Rates	Percent Recovery
		($)	($)	(%)
	Potable Customer Classes			
1	C0, PI, PP, PW - District, Irrig, Temp, CII	3,288,200	3,119,800	94.9%
2	PP - Temp Municipal	0	0	0.0%
3	PW - Residential	7,104,600	7,282,600	102.5%
4	PW - Out of Bounds	4,300	5,200	120.9%
5	PW - Domestic Agriculture	1,033,100	1,023,500	99.1%
6	Total P Water System	11,430,200	11,431,100	100.0%

Table 4-6. Non-Potable Comparison of COS to Projected Revenue

Line No.	Description	Adjusted COS	Rev under Proposed Rates	Percent Recovery
		($)	($)	(%)
	Non-Potable Customer Classes			
1	C0, NP - District, Ag, Irrig	1,625,200	1,625,300	100.0%
2	NP - Commercial Agriculture	353,700	353,700	100.0%
3	NP - Blended Agriculture	979,000	979,000	100.0%
4	RC - Commercial Agriculture	128,200	128,200	100.0%
5	Total NP Water System	3,086,100	3,086,200	100.0%

4.4 TYPICAL BILLS AND BILL IMPACTS UNDER PROPOSED CHARGES

A comparison of typical bills under the proposed schedule of water user rates with those under existing rates is shown in Tables 4-7. The typical bill represents the average monthly usage for a single family residential at different water usage levels.

Table 4-7. Typical Bill

Line No.	Description	Usage	Existing Rates	Proposed Rates	Percent Adjustment
		(HCF)	($)	($)	(%)
1	Single Family Residential, 3/4" Meter	0	8.60	11.56	34.4%
2		5	20.45	23.86	16.7%
3		10	32.30	36.16	12.0%
4		18	53.18	57.22	7.6%
5		20	58.56	62.60	6.9%
6		30	85.46	89.50	4.7%
7		40	112.36	116.40	3.6%
8		50	139.26	143.30	2.9%

4.5 NEIGHBORING WATER UTILITIES

Presented in Table 4-8 are the proposed rates compared to rates of neighboring cities/agencies, for a single family residential customer with a ¾" meter consuming 18 units monthly. Based on the comparison, the District is currently one of the lowest water providers in the area. With the proposed rate increases, the District continues be one of the lowest water providers of the surveyed communities. All surveyed community rates are current as of January 2013. The District existing bill for 18 units is $53.18 and is anticipated to increase to $57.22 which remains below the respective average of the other water utilities, $69.20.

Table 4-8. Comparison to Neighboring Utilities

Water Provider	Existing Rate
	($/mo)
Camrosa Water District (Existing)	53.18
Camarillo	55.71
Camrosa Water District (Proposed)	57.22
Thousand Oaks	57.86
Oxnard	73.58
Cal American	77.25
Simi Valley	57.86
Moorpark	56.14
Port Hueneme	106.02

5 Wastewater Rate Study

5.1 REVENUE AND REVENUE REQUIREMENTS

The Wastewater Fund provides wastewater collection and treatment services to the District's customers. To meet the costs associated with providing wastewater services to its customers, the Wastewater Fund derives revenue from a variety of sources including wastewater user charges, special services, and interest earned from the investment of available funds. The level of future revenue generated in the study is projected through a combination of an analysis of historical and future system growth in terms of number of equivalent dwelling units (EDU).

With revenue derived from the various sources, the Wastewater Fund meets the cash requirements of operation and maintenance (O&M); debt service and reserve payments on bond indebtedness; and recurring annual capital expenditures for replacements, system betterments, and extensions not debt financed. O&M expenses are those expenditures necessary to maintain the system in good working order. Routine annual capital expenditures, which include equipment replacements, consist of recurring annual replacements, minor extensions, and betterments which are normally revenue financed. Other capital costs include principal and interest payments, bond covenant-required payments, and the costs of infrequent major capital improvements paid directly from annual operating revenues.

5.2 CUSTOMER EDU PROJECTIONS

The Wastewater Fund provides wastewater services to the various customer classes inside and outside District boundaries. The following provides a brief description of the major types of customers:

- District customers are residential, commercial, industrial, and municipal which reside within the boundaries and benefit directly from the collection and treatment wastewater system.
- District customers through Thousand Oaks are residential and agricultural which reside outside the boundaries and therefore receive treatment services from the City of Thousand Oaks.

Based on a detailed review of historical growth patterns and planning estimates in the District's Draft *2011 Integrated Facilities Master Plan*, the number of customer EDUs is projected to increase by average of 0.2 percent for the Study Period. Over the past few years, the District has experienced slowed growth in the area as a result of economic conditions. Projected customer EDUs are shown in Table 5-1.

Table 5-1. Number of Customer EDUs

Line No.	Description	Fiscal Year Ending June 30, FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
		(EDUs)	(EDUs)	(EDUs)	(EDUs)	(EDUs)
	CWD Customers					
1	PW0 Residential Water Class (Class I)	5,191	5,204	5,217	5,230	5,243
2	PW1 Residential Water (Out of Bounds)	0	0	0	0	0
3	PW2 Residential Water Master Meter Class II	2,416	2,422	2,428	2,434	2,440
4	PW3 Commerical / Industrial Water (Class II)	349	350	351	352	353
5	PW4 Commercial Water (Out of Bounds)	0	0	0	0	0
6	PW5 Public Water	40	40	40	40	40
7	PW6 Domestic Agriculture	6	6	6	6	6
8	PWX CSUCI	740	740	740	740	740
9	Total EDUs	8,742	8,762	8,782	8,802	8,822
	CWD Customers through Thousand Oaks					
10	PW0 Residential Water Class (Class I)	16	16	16	16	16
11	PW6 Domestic Agriculture	2	2	2	2	2
12	Total EDUs	18	18	18	18	18
13	**Total Wastewater EDUs**	**8,760**	**8,780**	**8,800**	**8,820**	**8,840**

5.3 REVENUE UNDER EXISTING RATES

The primary source of revenue for the Wastewater Fund is derived from wastewater user rates. Other revenue sources include special services, interest earned from the investment of available funds and other miscellaneous revenues. The level of future revenue is projected based on an analysis of historical system growth in terms of number of EDUs.

Projections of future wastewater revenue are based on an analysis of historical and forward looking trends for customer EDU growth. The number of customer EDUs is applied to the applicable rates to determine wastewater sales revenue. Charges are applied monthly and a schedule of the Wastewater Fund's existing rate structure is shown in Table 5-2.

Table 5-2. Existing Wastewater Rates

Description	Existing FY 11/12
Service Charge	($/monthly)
CWD Customers	27.35
CWD Customers through Thousand Oaks	39.40

Table 5-3 represents a summary of projected wastewater revenue under existing rates and charges. As shown, the revenue generated is anticipated to slowly increase over the Study Period in conjunction with the increase in number of EDUs. The projected wastewater revenue increases from $2,874,600 in FY 13/14 to $2,900,900 in FY 17/18. This represents an overall increase of roughly 0.9 percent for the Study Period.

Table 5-3. Revenue under Existing Water Rates

Line No.	Description	Fiscal Year Ending June 30, FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
		($)	($)	($)	($)	($)
	CWD Customers					
1	PW0 Residential Water Class (Class I)	1,701,900	1,706,200	1,710,400	1,714,700	1,719,000
2	PW1 Residential Water (Out of Bounds)	0	0	0	0	0
3	PW2 Residential Water Master Meter Class II	792,100	794,100	796,000	798,000	800,000
4	PW3 Commerical / Industrial Water (Class II)	114,400	114,800	115,100	115,400	115,700
5	PW4 Commercial Water (Out of Bounds)	0	0	0	0	0
6	PW5 Public Water	13,100	13,100	13,100	13,100	13,100
7	PW6 Domestic Agriculture	2,000	2,000	2,000	2,000	2,000
8	PWX CSUCI	242,600	242,600	242,600	242,600	242,600
9	Total Revenue	$ 2,866,100	$ 2,872,800	$ 2,879,200	$ 2,885,800	$ 2,892,400
	CWD Customers through Thousand Oaks					
10	PW0 Residential Water Class (Class I)	7,600	7,600	7,600	7,600	7,600
11	PW6 Domestic Agriculture	900	900	900	900	900
12	Total Revenue	$ 8,500	$ 8,500	$ 8,500	$ 8,500	$ 8,500
13	**Total Wastewater Revenue**	**$ 2,874,600**	**$ 2,881,300**	**$ 2,887,700**	**$ 2,894,300**	**$ 2,900,900**

5.4 OTHER REVENUE

In addition to revenue from rates, the Wastewater Fund obtains revenue from other sources. These revenues include special services, interest earned from the investment of available funds and other miscellaneous revenues In total these sources represent roughly 1.4 percent of the Wastewater Fund's total revenue. It is anticipated that these revenues will remain relatively constant for the duration of the Study Period.

5.5 OPERATING AND MAINTENANCE EXPENSES

Table 5-4 summarizes the Wastewater Fund's projected operating and maintenance expense (O&M) for the Study Period. These expenses include costs related to production, salaries and benefits, contracts and professional services, and services and supplies. All O&M expenditures are projected to increase between 2 to 3 percent annually from the Wastewater Fund's budget for FY 11/12, a range that is consistent with historical inflationary rates. The FY 12/13 budget reflects decrease in operating costs as the District sought to minimize expenditures. Operation of the Salinity Pipeline is an exception to this philosophy: the District anticipates increased costs due to new system additions, which will be operational January 2014. In general, salaries escalate at 2 percent annually, benefits escalate at 3 percent annually, and contract services and supplies escalate at 2 to 3 percent annually.

Table 5-4. O&M Expenses

Line No.	Description	Fiscal Year Ending June 30, FY 13/14 ($)	FY 14/15 ($)	FY 15/16 ($)	FY 16/17 ($)	FY 17/18 ($)
1	Production	0	0	0	0	0
2	Salaries & Benefits	1,023,100	1,046,600	1,070,500	1,095,100	1,120,300
3	Contracts & Professional Services	663,800	677,100	690,600	704,400	718,500
4	Services & Supplies	368,300	377,500	388,800	400,600	412,600
5	Utilities	172,700	177,000	182,300	187,800	193,400
6	Salinity Management Pipeline	8,500	17,300	17,600	17,900	18,200
7	Total O&M Expenses	$ 2,236,400	$ 2,295,500	$ 2,349,800	$ 2,405,800	$ 2,463,000

5.6 DEBT SERVICE REQUIREMENTS

Table 5-5 represents the Wastewater Fund's existing debt service obligations. This table shows both principal and interest requirements on the existing debt over the Study Period. It is common practice for utilities to utilize debt to finance large capital improvement projects. By financing the cost of the projects, the Wastewater Fund is able to fund large projects immediately and spread the payment over a specified time frame, thereby helping to offset the impact on rate-payers. Debt service represents about 19.7 percent of total Wastewater Fund's expenditures. Based on the revenue bond requirements, the debt service coverage ratio is set at 1.15x net revenues for the Wastewater Fund.

Table 5-5. Debt Service

Line No.	Description	Fiscal Year Ending June 30, FY 13/14 ($)	FY 14/15 ($)	FY 15/16 ($)	FY 16/17 ($)	FY 17/18 ($)
1	Revenue Bond, Series 2011A	203,900	205,825	202,675	203,900	204,400
2	Refunding Revenue Bond, Series 2012	432,000	435,100	429,500	430,000	429,900
3	Total Long Term Debt	$ 635,900	$ 640,925	$ 632,175	$ 633,900	$ 634,300

5.7 CAPITAL IMPROVEMENT PROGRAM

Traditionally the District develops a multi-year Capital Improvement Program (CIP) covering its capital commitments for a specified time frame of 5 to 10 years. In the process of conducting this study, the District decided to defer major capital projects for the Study Period. Therefore, there is only minor CIP planned between FY 13/14 and FY 17/18.

5.7.1 Capital Financing

Typically expenditures for the CIP are met from a combination of available funds on hand, revenue bonds, SRF loans, grants, revenues derived from user rates, and interest earnings. In FY 11/12, the District used long-term debt financing (revenue bond) to expand the chlorination facility. Shown in Tables 5-6 are the fund balance in the capital improvement fund and capital replacement fund. Note that the balance for the capital improvement fund doesn't fluctuate as a result of no planned CIP. The capital replacement fund fluctuates slightly as result of excess funds in the operating fund that are transferred into the capital replacement fund.

Table 5-6. Capital Fund Balances

Line No.	Description	Fiscal Year Ending June 30, FY 13/14 ($)	FY 14/15 ($)	FY 15/16 ($)	FY 16/17 ($)	FY 17/18 ($)
1	Capital Improvement	2,270,200	2,270,200	2,270,200	2,270,200	2,270,200
2	Capital Replacement	1,288,200	1,513,100	1,763,100	2,027,800	2,242,600
3	Total Cash Balance	$ 3,558,400	$ 3,783,300	$ 4,033,300	$ 4,298,000	$ 4,512,800

5.8 OTHER OPERATING REQUIREMENTS

In addition to O&M and CIP commitments, the Wastewater Fund incurs some additional costs which make up the revenue requirements.

5.8.1 Capital Contributions

In addition to the CIP, the Wastewater Fund recognizes the need to perform recurring/annual maintenance to maintain the functionality and reliability of the wastewater system. This maintenance, routine capital outlay usually covers the replacement of small portions of collection mains; additions and replacements of operating equipment, lift station and superstructure maintenance, and other miscellaneous items. These capital outlays are such that they occur in a system regardless of system growth. As standard practice, the District sets a minimum target of $250,000 to be contributed to the capital replacement. Also, any excess cash in the operating fund is directly contributed to the capital replacement fund.

5.8.2 Transfers

The Wastewater Fund occasionally transfers funds to the rate stabilization fund when excess fund in the operating fund occur. The rate stabilization fund helps stabilize rate increases during economic downturns and unexpected costs. Since such transfers do not represent direct operating expenses for the Wastewater Fund, they are included herein as below-the-line cash flow items and not included as O&M expenses in the calculation of projected debt service coverage. Table 5-8 (Line 26) represents these transfers on an annual basis throughout the Study Period.

5.8.3 Reserves

Currently, the Wastewater Fund has no stated fiscal policy with respect to operating reserves. The Wastewater Fund transfers excess operating funds to the capital replacement fund. While this allows the District to maintain the wastewater system, it requires that rates on any given year be set to cover the complete O&M, debt service and pay as you go (PAYGO) expenditures. It is a standard industry practice to maintain an operating reserve of 90-days of operating expenses, which would require an average target level of $275,000 to $300,000 during the Study Period.

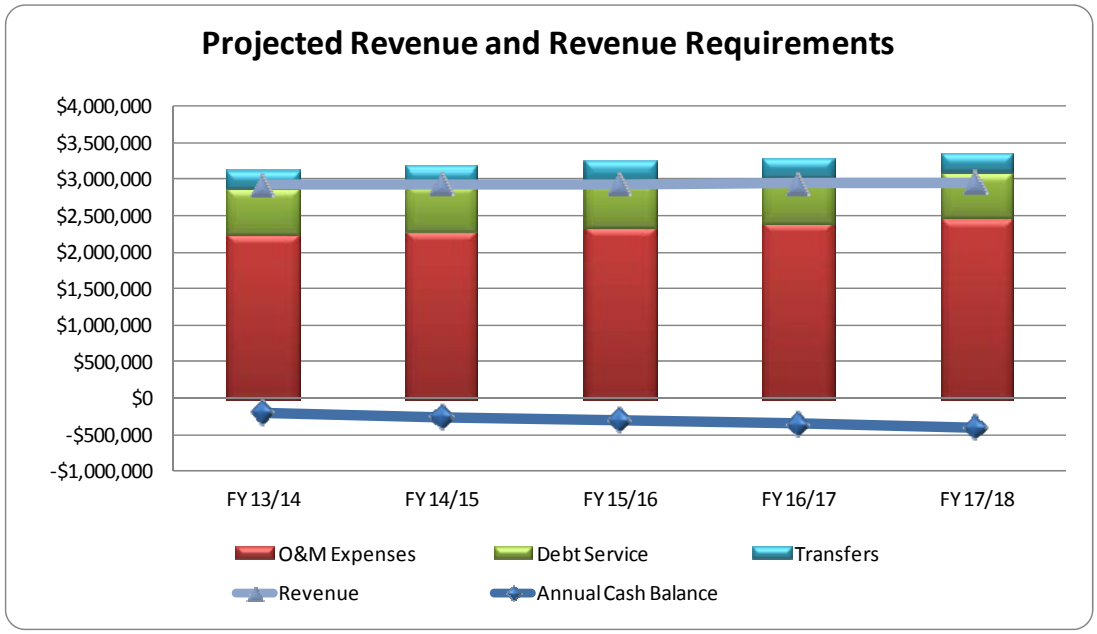
The Wastewater Fund has a stated policy with respect to the capital reserves. The policy states that the Wastewater Fund will strive to maintain a minimum reserve balance of at least next year's CIP costs and a maximum of ½ of total CIP costs for the next 5-years costs. Therefore, the reserve balance varies from year to year.

5.9 PROJECTED OPERATING RESULTS

The revenue requirements of the Wastewater Fund consist of system O&M expense, debt service requirements on existing debt, transfers, and capital contributions.

In the analysis, it was important to identify the state of the Wastewater Fund if no revenue increases were to occur. Under the status quo scenario, the Wastewater Fund would not impose any revenue increases over the Study Period. As shown in Figure 5-1, the status quo conditions means that the Wastewater Fund will operate at an annual deficit position thus tapping into its rates stabilization reserves. In addition, since the Wastewater Fund has debt service commitments, the District would need to extract from the capital funds or implement some type of revenue increase.

Figure 5-1. Status Quo



In order to avoid deficit positions, the Wastewater Fund examined various options for revenue increases that would meet revenue requirements. Based on the goals and objectives outlined earlier in this report, the District arrived at the revenue increases shown in Table 5-7. The revenue increases represents the total revenue adjustment needed to meet revenue requirements. The revenue adjustment does not represent adjustments to the individual rates.

Table 5-7. Revenue Increases

Fiscal Year	Revenue Adjustment	Effective Month
FY 13/14	8.0%	July
FY 14/15	2.0%	July
FY 15/16	2.0%	July
FY 16/17	2.0%	July
FY 17/18	0.0%	July

Table 5-8 reflects the selected option into the operating cash flow. The District selected this option as it incorporates the capital contribution and keeps the Wastewater Fund at positive cash flow over the Study Period.

The operating fund is divided into revenue and revenue requirements. In lines 3 to 7, the required annual revenue increases arrived in Table 5-7 are presented. Lines 12 and 15 represent other revenues, which include special services, and other miscellaneous revenue. In line 18, the

total revenues generated from existing rates, revenue from increases and other operating revenue are shown.

In the revenue requirement section, O&M, debt service, and transfers are shown and discussed earlier. Line 27 represents that total revenue requirement that will need to be met through revenue. The net cumulative balance is indicated in line 30. The District strives to be revenue neutral with respect to the net cumulative balance. Other wastewater utilities desired minimum operating reserve balance. The industry standard is 90 days of O&M expenditures. As shown in line 30, the annual net cumulative balance is slightly positive which allows the Wastewater Fund to supplement the capital replacement and rate stabilization funds. Under this scenario the debt service coverage based on the 1.15x requirement is met in all years as shown on line 31 in Table 5-8. The requirement is set forth by the lending institution and is based on mandatory expenses only. Items such as transfers are excluded. Figure 5-2 presents the major components of the operating fund.

Figure 5-2. Operating Cash Flow

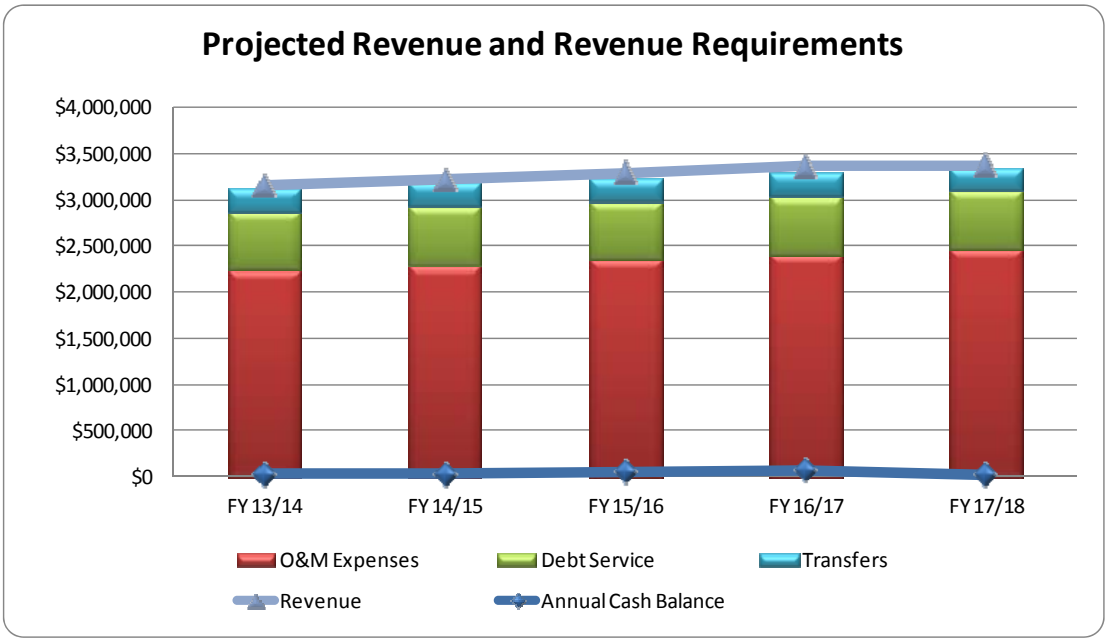


Table 5-8. Operating Cash Flow

Line No.	Description			Fiscal Year Ending June 30, FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
	Revenue							
	Rate Revenue							
1	Revenue from Existing Rates			2,874,600	2,881,300	2,887,700	2,894,300	2,900,900
2	Year	Months Effective	Rate Adj					
3	FY 13/14	12	8.0%	230,000	230,500	231,000	231,500	232,100
4	FY 14/15	12	2.0%		62,200	62,400	62,500	62,700
5	FY 15/16	12	2.0%			63,600	63,800	63,900
6	FY 16/17	12	2.0%				65,000	65,200
7	FY 17/18	12	0.0%					0
8	Increased Revenue Due to Adjustments			230,000	292,700	357,000	422,800	423,900
9	Subtotal Rate Revenue			3,104,600	3,174,000	3,244,700	3,317,100	3,324,800
	Other Operating Revenue							
10	Special Services			19,300	19,300	19,300	19,300	19,300
11	Miscellaneous			7,100	7,100	7,100	7,100	7,100
12	Subtotal Other Operating Revenue			26,400	26,400	26,400	26,400	26,400
	Non-Operating Revenue							
13	Taxes			0	0	0	0	0
14	Interest			20,900	20,900	20,900	20,900	20,900
15	Subtotal Non-Operating Revenue			20,900	20,900	20,900	20,900	20,900
	Transfers							
16	Transfer from Rate Stabilization			0	0	0	0	0
17	Subtotal Non-Operating Revenue			0	0	0	0	0
18	**Total Revenue**			**$ 3,151,900**	**$ 3,221,300**	**$ 3,292,000**	**$ 3,364,400**	**$ 3,372,100**
	Revenue Requirements							
	Operating & Maintenance							
19	O&M Expenses			2,236,400	2,295,500	2,349,800	2,405,800	2,463,000
20	Subtotal O&M			2,236,400	2,295,500	2,349,800	2,405,800	2,463,000
	Debt Service							
21	Existing Revenue Bonds			635,900	640,900	632,200	633,900	634,300
22	Proposed Revenue Bonds			0	0	0	0	0
23	Total Debt Service			635,900	640,900	632,200	633,900	634,300
	Transfers							
24	Transfer to Water Capital Replacement			250,000	250,000	250,000	250,000	250,000
25	Transfer to Rate Stabilization			0	0	0	0	0
26	Total Transfers			250,000	250,000	250,000	250,000	250,000
27	**Total Revenue Requirements**			**$ 3,122,300**	**$ 3,186,400**	**$ 3,232,000**	**$ 3,289,700**	**$ 3,347,300**
28	Net Annual Cash Balance			29,600	34,900	60,000	74,700	24,800
29	Beginning Fund Balance			0	0	0	0	0
30	Net Cumulative Fund Balance			$ 29,600	$ 34,900	$ 60,000	$ 74,700	$ 24,800
31	Debt Service Coverage (1.15x)			1.44	1.44	1.49	1.51	1.43

5.9.1 Test Year Revenue Requirements

In analyzing the Wastewater Fund's cost of service for allocation to its customer classes, the annual revenue requirements for FY 13/14 is selected as the Test Year requirements to demonstrate the development of cost-of-service wastewater rates. Based on achieving the Wastewater Fund's principal goals within the Study Period, the cash flow in Tables 5-8 serves as the basis for the analyses presented herein.

6 Cost of Service Allocation

The revenue requirements to be derived from rates for wastewater service are synonymous with the definition of the Cost of Service (COS). In developing equitable rate structures, revenue requirements are allocable to the various customer classifications according to the service rendered. Allocations of these requirements to customer classes should take into account the quantity of sewage produced, wastewater flow strengths, number of customer EDUs, and other relevant factors. Additional information regarding cost allocations may be found in the District's *Staff Report* for the Water and Sewer Rate Study dated March 2013. The total costs of service recovered from wastewater user rates for the Test Year FY 13/14 are summarized in Tables 6-1.

Table 6-1. Cost of Service

Line No.	Description	Operating Expense	Capital Cost	Total Cost
		($)	($)	($)
	Revenue Requirements			
1	O&M Expense	2,236,400	0	2,236,400
2	Debt Service Requirements	0	635,900	635,900
3	Transfers	0	250,000	250,000
4	Subtotal	2,236,400	885,900	3,122,300
	Less Revenue Requirements Met from Other Sources			
5	Other Operating Revenue	26,400	0	26,400
6	Interest from Operations	20,900	0	20,900
7	Subtotal	47,300	0	47,300
	Adjustments			
8	Adjustment for Annual Cash Balance	(29,600)	0	(29,600)
9	Subtotal	(29,600)	0	(29,600)
10	Cost of Service to be Recovered from Rates	$ 2,218,700	$ 885,900	$ 3,104,600

Shown in line 4 is the total revenue requirement that corresponds with the Table 5-8 line 27. In order to derive the revenue requirement that will need to be recovered by the rates, it is necessary to deduct revenues from other sources as shown in lines 7 and 10. Line 8 represents the net annual cash balance for the utility during the Test Year. In this case, the $29,600 indicates that the Wastewater Fund is projecting a positive cash balance for the year. Line 10 represents the total costs that are to be recovered from rates.

6.1 FUNCTIONAL COST COMPONENTS

The cost of providing wastewater service should be analyzed by system function in order to properly allocate the costs to the various classes of customers and subsequently design rates. As a basis for allocating costs of service among customer classes, costs may be separated into the following four basic functional cost components: (1) "Base"; (2) "Strength"; (3) "Customer"; and (4) "Direct Assignment".

- Base costs represent operating and capital costs primarily associated with collection. The collection costs vary directly with the quantity of sewage produced.

- Strength costs represent those operating costs primarily associated with treatment. The treatment costs are specifically related to treatment of Biochemical Oxygen Demand (BOD) and Total Suspended Solid (TSS).
- Customer costs are defined as those that tend to vary in proportion to the number of customers connected to the system. These include billing, collecting and accounting.
- Directly assigned costs are costs specifically identified as those incurred to serve a specific customer group(s). The separation of costs of service into these principal categories facilitates allocating such costs to the various customer classes on the basis of the respective service requirements of each class.

6.2 ALLOCATION TO COST COMPONENTS

Each element of cost is allocated to functional cost components on the basis of the parameter or parameters having the most significant influence on the magnitude of that element of cost. O&M expense items are allocated directly to appropriate cost components, while the allocation of capital and replacement costs is based upon a detailed allocation of related capital investment. The separation of costs into functional components provides a means for distributing such costs to the various classes of customers on the basis of their respective responsibilities for each particular type of service.

6.2.1 Allocation of Operating and Maintenance Expense

In the allocation of O&M expense and investment, costs are allocated directly to cost components to the extent possible. Administrative cost elements are then allocated on the basis of the allocation of other costs to which they are most nearly related. Table 6-2 represents the allocation of O&M to the functional cost components. Upon allocation to function cost components, revenues from other sources as shown in Table 6-1 lines 7 and 9 are subtracted. The direct assignment represents District customers served through the City of Thousand Oaks (T.O.).

6.2.2 Allocation of Capital Investments

The estimated investment in wastewater system facilities is allocated to appropriate cost components as a basis for the further distribution of capital related costs to the various customer classes. The allocation of estimated net system investment of $885,900 serving wastewater customers for the Test Year is shown in Table 6-3. The annual net system investment is allocated to the functional costs based on the total wastewater system assets. Line 9 includes capital expenditures that are funded through user rates such as debt service, and transfers to capital fund. Since there are no planned CIP, the capital costs are mainly debt service and transfers.

Table 6-2. Allocation of O&M Expenditures

Line No.	Description	Total Cost	Common to All Customers				
			Volume	BOD	TSS	Customer	T.O.
1	Salaries and Benefits	1,023,100	352,900	255,800	255,800	153,500	5,100
2	Contracts & Professional Services						
3	Outside Contracts	486,100	265,400	109,400	109,400	0	1,900
4	Professional Services	177,700	97,000	40,000	40,000	0	700
5	Services & Supplies	154,700	57,000	48,800	2,500	46,400	0
6	Utilities	172,700	42,500	69,100	60,400	0	700
7	Materials & Supplies	157,000	141,200	7,900	7,900	0	0
8	Repair Parts & Equipment Maintenance	56,600	28,200	14,200	14,200	0	0
9	Total O&M Expenses	$ 2,227,900	$ 984,200	$ 545,200	$ 490,200	$ 199,900	$ 8,400
	Less Other Revenue						
10	Miscellaneous Revenues	47,300	20,900	11,600	10,400	4,200	200
11	Other Adjustments	(29,600)	(13,100)	(7,200)	(6,500)	(2,700)	(100)
12	Net Operating Expenses	$ 2,210,200	$ 976,400	$ 540,800	$ 486,300	$ 198,400	$ 8,300

Table 6-3. Allocation of Capital Costs

Line No.	Description	Total Cost	Common to All Customers				
			Volume	BOD	TSS	Customer	T.O.
	Plant Assets						
1	Collection	320,900	320,900	0	0	0	0
2	Lift Station	10,600	8,000	1,100	1,100	0	500
3	Treatment	523,800	104,800	209,500	209,500	0	0
4	Land	15,100	12,100	1,500	1,500	0	0
5	General Plant	15,500	12,400	1,500	1,500	0	0
6	Total Plant Assets	$ 885,900	$ 458,200	$ 213,600	$ 213,600	$ 0	$ 500
	Less Other Revenue						
7	Miscellaneous Revenues	0	0	0	0	0	0
8	Other Adjustments	0	0	0	0	0	0
9	Net Operating Expenses	$ 885,900	$ 458,200	$ 213,600	$ 213,600	$ 0	$ 500

6.3 UNITS OF SERVICE

The total cost responsibility for each customer class may be established by developing unit costs of service for each cost function and subsequently assigning those costs to the customer classes based on the respective service requirements of each. To properly recognize the cost of service, each customer class is allocated its share of base, strength, and customer costs. The number of units of service required by each customer class provides a means for the proportionate distribution of costs previously allocated to respective cost categories. Table 6-4 is a summary of the estimated units of service for the various customer classes.

Base costs vary with the volume of sewage produced and are distributed to customer classes on that basis. Strength costs are those associated with pollutant characteristics and is distributed to customer classes on the basis of loadings. Customer costs, which consist of billing, collection and accounting costs, are allocated to the various classes on the basis of the number of bills. The sewage produced is estimated based water consumption. The pollutant loadings are derived from monitored data and recommendations of the State Water Resources Control Board.

6.4 COST OF SERVICE ALLOCATIONS

The costs of service are distributed to the various customer classes by applying the unit costs of service to respective service requirements. The total unit costs of service applied to the respective requirements for each customer class results in the total cost of service for each customer class.

6.4.1 Units Costs of Service

The Test Year unit cost of service for each functional cost component is based on the total cost divided by the applicable units of service as shown in Tables 6-5. In lines 1 and 2, the total costs represent the cost to be recovered from rates shown in Table 6-1 line 10. Line 5 represents the unit costs that are used in allocating the costs to the specific customer classes.

6.4.2 Distribution of Costs of Service to Customer Classes

The customer class responsibility for service is obtained by applying the unit costs of service to the number of units for which the customer class is responsible. This process is illustrated in Tables 6-6 in which the unit costs of service are applied to the customer class units of service.

Table 6-4. Units of Service

Line No.	Description	Contributed Units	Contributed Volume	Treated Volume	BOD Loadings Factor	BOD Loadings Loading	TSS Loadings Factor	TSS Loadings Loading	Bills
	Units of Measure	(EDUs)	(HCF)	(HCF)	(mg/L)	(lbs)	(mg/L)	(lbs)	(bills)
	CWD Customers								
1	PW0 Residential Water Class (Class I)	5,191	1,059,958	423,983	170	449,700	155	410,000	62,292
2	PW1 Residential Water (Out of Bounds)	0	0	0	170	0	155	0	0
3	PW2 Residential Water Master Meter Class II	2,416	144,846	115,877	170	122,900	155	112,100	28,992
4	PW3 Commerical / Industrial Water (Class II)	349	78,288	70,459	180	79,100	225	98,900	4,188
5	PW4 Commercial Water (Out of Bounds)	0	0	0	180	0	225	0	0
6	PW5 Public Water	40	79,306	27,757	130	22,500	100	17,300	480
7	PW6 Domestic Agriculture	6	4,986	1,994	170	2,100	155	1,900	72
8	PWX CSUCI	740	58,409	20,443	130	16,600	100	12,800	8,880
9	Total	8,742	1,425,793	660,514		692,900		653,000	104,904
	CWD Customers through Thousand Oaks								
10	PW0 Residential Water Class (Class I)	16	20,444	8,178	170	8,700	155	7,900	192
11	PW6 Domestic Agriculture	2	3,021	1,208	170	1,300	155	1,200	24
12	Total	18	23,465	9,386		10,000		9,100	216
13	Total Wastewater System		1,449,258	669,900		702,900		662,100	105,120

Table 6-5. Units Costs of Service

Line No.	Description	Total Cost	Common to All Customers				
			Volume	BOD	TSS	Customer	T.O.
1	Net Operating Expense	2,218,700	984,900	540,800	486,300	198,400	8,300
2	Capital Costs	885,900	458,200	213,600	213,600	0	500
3	Total Cost of Service	$ 3,104,600	$ 1,443,100	$ 754,400	$ 699,900	$ 198,400	$ 8,800
4	Units of Service		660,514	692,900	653,000	104,904	9,386
5	Cost per Unit		$ 2.18 per HCF	$ 1.09 per lbs	$ 1.07 per lbs	$ 1.89 per bill	$ 0.94 per HCF

Table 6-6. Distribution of Costs to Customer Class

Line No.	Description	Total Cost	Common to All Customers				
			Volume	BOD	TSS	Customer	T.O.
	CWD Customers						
	PW0 Residential Water Class (Class I)						
1	Units		423,983	449,700	410,000	62,292	0
2	Allocation of costs of service	1,973,300	926,300	489,600	439,500	117,900	0
	PW1 Residential Water (Out of Bounds)						
3	Units		0	0	0	0	0
4	Allocation of costs of service	0	0	0	0	0	0
	PW2 Residential Water Master Meter Class II						
5	Units		115,877	122,900	112,100	28,992	0
6	Allocation of costs of service	562,000	253,200	133,800	120,200	54,800	0
	PW3 Commerical / Industrial Water (Class II)						
7	Units		70,459	79,100	98,900	4,188	0
8	Allocation of costs of service	353,900	153,900	86,100	106,000	7,900	0
	PW4 Commercial Water (Out of Bounds)						
9	Units		0	0	0	0	0
10	Allocation of costs of service	0	0	0	0	0	0
	PW5 Public Water						
11	Units		27,757	22,500	17,300	480	0
12	Allocation of costs of service	104,500	60,600	24,500	18,500	900	0

Table 6-6. Distribution of Costs to Customer Class (Cont)

Line No.	Description	Total Cost	Common to All Customers				
			Volume	BOD	TSS	Customer	T.O.
	PW6 Domestic Agriculture						
13	Units		1,994	2,100	1,900	72	0
14	Allocation of costs of service	8,800	4,400	2,300	2,000	100	0
	PWX CSUCI						
15	Units		20,443	16,600	12,800	8,880	0
16	Allocation of costs of service	93,300	44,700	18,100	13,700	16,800	0
	CWD Customers through Thousand Oaks						
	PW0 Residential Water Class (Class I)						
17	Units		0	0	0	0	8,178
18	Allocation of costs of service	7,700	0	0	0	0	7,700
	PW6 Domestic Agriculture						
19	Units		0	0	0	0	1,208
20	Allocation of costs of service	1,100	0	0	0	0	1,100
21	TOTAL COSTS OF SERVICE	$ 3,104,600	$ 1,443,100	$ 754,400	$ 699,900	$ 198,400	$ 8,800

6.5 ADEQUACY OF EXISTING RATES TO MEET COSTS OF SERVICE

Presented in Tables 6-7 is a comparison of the allocated cost of service and revenue under existing rates by major customer class and for the system in total. The indicated revenue increase required over existing rates for each major user class indicates where the emphasis should be directed. The 8.0 percent, overall increase is considered necessary to meet the projected revenue requirements for the FY 13/14 Test Year. This overall level of revenue needs to be produced by the proposed rates developed and presented in subsequent sections of this report.

Table 6-7. Comparison of Cost of Service to Existing Revenue

Line No.	Description	Allocated COS	Rev under Exst Rates	Indicated Rev Increase
	CWD Customers			
1	PW - Res, CII, Public, Ag, CSUCI	3,095,800	2,866,100	8.0%
	CWD Customers through Thousand Oaks			
2	PW - Res, Ag	8,800	8,500	3.5%
3	Total Wastewater System	3,104,600	2,874,600	8.0%

7 Proposed Rate Adjustments

The initial consideration in the derivation of rate schedules for wastewater service is the establishment of equitable charges to the customers commensurate with the cost of providing that service. While the cost of service allocations to customer classes should not be construed as literal or exact determinations, they offer a guide to the necessity for, and the extent of, rate adjustments. Practical considerations sometimes modify rate adjustments by taking into account additional factors such as the extent of bill impacts, and historical local policies and practices.

7.1 EXISTING RATES

The Wastewater Fund's existing rates consists of a flat rate per EDU which vary by either being inside the District boundaries or not. The main difference was associated with treatment. A summary of existing water rates was presented earlier in this report in Table 5-2.

7.2 PROPOSED RATES

The costs of service analysis described in preceding sections of this report provide a basis for the design of wastewater rates. As observed in Table 6-7, the cost of providing service compared to the revenues received from different customer classes is not uniform. That is, for some customer classes the cost of providing service is greater than the revenues received. The rate schedules for FY 13/14 shown in Table 7-1 take into consideration District objectives and are designed to address the revenue recovery imbalance in different customer classes.

Table 7-1. Proposed Wastewater Rates

Customer Class	Proposed FY 13/14
	$/mo
CWD Customer	29.51
CWD Customers through Thousand Oaks	40.74

Shown in Table 7-2 are the proposed 5-year wastewater rates.

Table 7-2. Proposed 5-Year Wastewater Rates

Customer Class	Proposed				
	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18
	$/mo	$/mo	$/mo	$/mo	$/mo
CWD Customer	29.51	30.10	30.70	31.32	31.32
CWD Customers through Thousand Oaks	40.74	41.67	42.50	43.35	43.35

7.3 REVENUE RECOVERY UNDER PROPOSED RATES

As previously discussed, the proposed rate schedule shown in Table 7-2 would increase rate revenues by the average system-wide cumulative increase of 14.6 percent over the study period and maintain current cost recovery by customer class, as indicated in Tables 7-3.

Table 7-3. Comparison of Cost of Service to Projected Revenue

Line No.	Description	Adjusted COS	Rev under Proposed Rates	Percent Recovery
	CWD Customers			
1	PW - Res, CII, Public, Ag, CSUCI	3,095,800	3,095,900	100.0%
	CWD Customers through Thousand Oaks			
2	PW - Res, Ag	8,800	8,800	100.0%
3	Total Wastewater System	8,800	8,800	100.0%

7.4 NEIGHBORING UTILITIES

Presented in Table 7-4 are the proposed rates compared to rates of neighboring cities and agencies, for a single family residential customer. With the proposed rate increases, the District continues be one of the lowest providers of the surveyed communities. All surveyed community rates are current as of January 2013. The District proposed single family residential bill is anticipated to be $29.51, which remains below the respective average of the other wastewater utilities of $51.98.

Table 7-4. Comparison to Neighboring Utilities

Wastewater Provider	Existing Rate
	($/mo/EDU)
Camrosa Water District	29.51
Camarillo Sanitary District	38.68
Santa Paula	77.21
Oxnard	45.62
Moorpark	24.00
Fillmore	90.38
Port Hueneme	36.00

CAMROSA WATER DISTRICT
BUILDING WATER SELF-RELIANCE

Board of Directors
Al E. Fox
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Jeffrey C. Brown
Division 2
Timothy H. Hoag
Division 3
Eugene F. West
Division 4
Terry L. Foreman
Division 5
General Manager
Tony L. Stafford

October 31, 2014

Ms. Katherine Mrowka
California Water Resources Control Board
Water Rights Division
1001 I Street, 14th Floor
P.O. Box 2000
Sacramento, CA 95812-2000

RE: Permit 20952, condition 25: Conejo Creek Water Conservation Plan

Dear Ms. Mrowka,

Please find enclosed "Report on Overall Irrigation Efficiency in the Areas of Camrosa Water District and Pleasant Valley County Water District Receiving Surface Water from the Conejo Creek" for Calendar Year 2013.

Our last report (submitted October 12, 2009) indicated that agricultural irrigation efficiencies in the Camrosa service area exceeded the overall 80-percent efficicency required by condition 25 of the City of Thousand Oaks's Permit 20952. Per your letter of November 10, 2009, Camrosa has reduced its reporting interval to every five years.

Advances in satellite imagery resolution and GIS software have helped in identifying crops and obtaining better data, but the variance in row crops within a calendar year continues to make a perfectly accurate assessment of agricultural efficiency difficult; estimates have therefore remained conservative, in order to avoid overstating efficiency. Nevertheless, as will be demonstrated below, irrigators in the Camrosa service area have maintained, and in some cases improved, their efficiency: Greenbelt efficiency is up to 99.93 percent and overall efficiency is at 95.10 percent.

The main drivers for this increased efficiency over the last five years since our last report are probably water availability and cost.

Pleasant Valley County Water District (PVCWD) has historically gotten the majority of its water from United Water Conservation District, but climatic drought, legislative pressures, and ongoing litigation have drastically reduced flows in the Santa Clara River, from which United diverts supply. To make up for those reduced deliveries, PVCWD is left with its groundwater resources; the district, however, is situated in one of the most severe pumping depression in the aquifer it overlays, and aquifer degradation and the threat of seawater intrusion place enormous pressure on PVCWD to restrict pumping as much as possible.

To this effect, PVCWD instituted in 2013 demand management measures to reduce water use, including reducing deliveries (from the normal 3 cfs to 1.0 cfs), limiting groundwater extractions, and restricting

pumping completely one day a week (Sunday). Also in 2013, new PVCWD water rates went into effect, further constricting water use by PVCWD customers.

Within the Camrosa service area, increased efficiency can be attributed to a new water rate schedule (implemented in 2012) that will bring non-potable water rates more in line with the cost of service; a not-insignificant increase that has correlated with a reduction in use.

Abnormally low rainfall and high evapotranspiration rates contributed to relatively high "water required" amounts in the efficiency calculations. Combining these climatic considerations with the strides made in raising the general level of conscientiousness with regard to water conservation and the various other efficiency drivers discussed above, irrigators in the Camrosa and PVCWD service areas have demonstrated a notable improvement in irrigation efficiency in CY2013.

In accordance with the Sustainable Groundwater Management Act (effective January 1, 2015), Camrosa plans on acting as the Groundwater Sustainability Agency for the Santa Rosa Basin. The attendant Groundwater Sustainability Plan could provide for more robust monitoring of the basin, which would in turn allow for more accurate efficiency calculation. Depending on the timing of that plan and the next required agriculture efficiency report, Camrosa may be able to provide even more accurate estimates of water use in some areas of the district.

If you have any questions regarding this report, please contact me at 805-482-6562 or IanP@camrosa.com.

Sincerely,

Ian Prichard, District Planner

Calendar Year 2013

Report on Overall Irrigation Efficiency in Areas of the Camrosa Water District and Pleasant Valley County Water District Receiving Surface Water from the Conejo Creek by SWRCB Permit No. 20952

The area of Ventura County to receive the benefits of SWRCB Permit No. 20952 for the use of surface water from the Conejo Creek is under three jurisdictions responsible for the management and delivery of local water resources. These jurisdictions are the Camrosa Water District (Camrosa), Pleasant Valley County Water District (PVCWD) and the City of Thousand Oaks (See attached Map). The City of Thousand Oaks (City) has placed approximately 200 acre-feet per year to beneficial use in a constructed wetlands project immediately downstream of its point of discharge. Use of surface water for these constructed wetlands is not considered as part of this report on irrigation efficiency since any excess water from the wetlands flows downstream to the principal diversion point for water distributed to Camrosa and PVCWD. Confidence in the data collected for this report is improving; the assumptions made regarding key parameters have stayed conservative. A major effort is being placed to refine the data and data collection methodologies. We have sent out inspectors to review the planted areas.

The Camrosa Service Area

The Camrosa Water District has been divided into six planning areas for the purposes of the District's master planning process. Illustration I is a map of these areas highlighting the boundaries of each division. Appendix A contains brief descriptions of each planning division. The planning divisions that received water from the Conejo Creek Project in 2013 are the Greenbelt, Camarillo Springs, and Campus Areas. Appendix B contains the associated net acreage planted in agriculture and type of crop for each planning subdivision. The tables contain the crop coefficient for each crop identified. Where the actual crop is unknown, it has in all cases been identified as either an orchard or row type crop, and the lowest crop coefficient was applied: lemons at 0.56 for orchards and chilies at 0.59 for row crops.

The estimated net acreage planted in each planning division has been assumed to be 90 percent for orchard crops, nurseries and hot houses, which discounts roads, outbuildings, and other utility areas; 75 percent for berry crops, assuming a nine-month season with the remaining months fallowed in preparation for the next year; and 70 percent for row crops, assuming three crops a year with three months fallowed (unless otherwise documented). Where more accurate information has been obtained notes are provided in the Appendix.

The 2013 CIMIS three-station ETo for Ventura County (stations 156, 152, and 198) was 49.08 inches. The effective rain for the same period as reported by the FCGMA was only 3.49 inches. Appendix B contains the calculated water requirements for the irrigated acreage in each planning division based upon the CIMIS data.

Table I below contains the water consumption for each planning division by water source. Note that many of the agricultural areas have access to multiple water sources. Previous reported years are included for reference.

Table I: Water Consumption by Planning Division (Camrosa)

	2014	2008	2007	2006	2005	2004	2003	2002	2001	2000
Greenbelt										
Imported (*)	699.27	1997.16	1903.88	1402.35	1037.17	1340.44	1233	1264.90	1326.44	1333.8
FCGMA (*)	1608.62	1338.283	1664.201	1356.24	798	867.307	864.75	1243.96	2078.53	2078.53
Other groundwater (**)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Recycled (*)	0									
Conejo Creek (*)	1259.73	1302.63	1128.41	1022.42	1580.69	1768.68		2600**	2600**	2600**
Total	5567.62	6638.07	6696.49	5781.01	5415.86	5976.427	5637.65	4508.86	5404.97	8012.33
Campus										
Imported (*)	0	369.75	367.83	322.6	483.8	517.63	454	445.4	0	0
FCGMA (*)	0							0	0	0
Other groundwater (**)	0							0	0	0
Recycled (*)	951.86	785.06	649.56	756.71	579.65	31.12	0	73	522	777
Conejo Creek (*)	186.63	60.11	51.87	98.3	0	644.63	640	800**	800**	800**
Total	1138.49	1214.92	1069.26	1177.61	1063.45	1193.38	1094	518.4	522	1577
CamSprings										
Imported (*)	96.34	495.19	1032.43	886.27	882.53	688.65	476.58	730.31	658.46	623.5
FCGMA (*)	0							0	0	0
Other groundwater (**)	0							0	0	250
Recycled (*)	0	0.00	0	32.34	19.58			0	0	0
Conejo Creek (*)	1789	1508.75	1431.22	972.56	743.68	1159.29	1016	1600**	1600**	1600**
Total	1885.34	2003.94	2463.65	1891.17	1645.79	1847.94	1492.58	730.31	658.46	2473.5
CWD Total	8591.45	9856.93	10229.401	8849.79	8125.1	9017.747	8224.23	5757.57	6585.43	12062.83
all numbers in acre-ffet	*(*) Metered sources*			*(**) Estimated sources*						

To date there is no reporting of private well operations outside the Fox Canyon Groundwater Management Agency (FCGMA). Therefore, private well production is not available at this time. However, as a result of the Sustainable Groundwater Management Act (effective January 1, 2015), this may change in the near future. Camrosa plans to act as the Groundwater Sustainability Agency and develop a Groundwater Sustainability Plan. The Act provides that such agencies may use the Groundwater Sustainability Plan as a tool to collect extraction data and therefore better manage its water resources. depending on the implementation date of that plan and the next required of these agricultural efficiency reports, Camrosa may at that time have even more complete data.

Table II contains the calculated irrigation efficiencies for each Camrosa Planning Division receiving Conejo Creek water. Previous reported years are included for reference.

Irrigation efficiency is the result of the equation: $\frac{Water\ Required}{Water\ Applied} = Efficiency$

Table II: Calculated Irrigation Efficiency (Camrosa)										
	2013	2008	2007	2006	2005	2004	2003	2002	2001	2000
Greenbelt										
Water Required	5,563.76	5,750.24	6,154.55	5,086.69	4,274.34	4,966.17	4,446.46	5,934.65	4,924.69	5,597.69
Water Applied	5,567.62	6,638.07	6,696.49	5,781.01	5,415.86	5,976.43	5,637.65	7,108.86	8,004.97	8,012.33
Efficiency	99.93%	86.63%	91.91%	87.99%	78.92%	83.10%	78.87%	83.48%	61.52%	69.90%
Campus										
Water Required	923.18	870.12	881.35	790.30	769.69	893.43	741.30	972.66	822.64	885.09
Water Applied	1,138.49	1,214.92	1,069.26	1,177.61	1,063.45	1,193.38	1,094.00	1,318.40	1,322.00	1,577.00
Efficiency	81.09%	71.62%	82.43%	67.11%	72.38%	74.87%	67.76%	73.78%	62.23%	56.10%
Cam5prings										
Water Required	1,693.34	2,028.58	2,032.34	1,439.62	1,193.35	1,383.95	1,143.07	1,500.45	1,254.35	1,323.33
Water Applied	1,885.34	2,003.94	2,463.65	1,891.17	1,645.79	1,847.94	1,492.58	2,330.31	2,258.46	2,473.50
Efficiency	89.82%	101.23%	82.49%	76.12%	72.51%	74.89%	76.58%	64.39%	55.54%	53.50%
Overall										
Overall Efficiency	95.21%	87.74%	88.65%	82.68%	76.77%	80.33%	76.98%	78.16%	60.44%	64.70%

The PVCWD Service Area

PVCWD is an area of 10,725 acres. Crop types include: orchards, primarily lemons; strawberries and other berries; row crops such as lettuces, carrots, onions, and broccoli. Historically the area has also been used for turf grass. Hot house tomatoes have taken over numerous crop areas. Other crops appear from time to time. PVCWD's water deliveries are metered, and all private groundwater pumpers are required to meter and report water consumption to the FCGMA. Growers within the PVCWD are not required by any agency to submit crop reports; therefore available data on crop types is limited to satellite imagery and field surveys.

PVCWD has not been subdivided into planning areas. Generally, there has been a decline in lemon orchards and a significant increase in strawberry plantings. Turf grass is grown in the southwestern area of the district and hot house tomatoes. For the purposes of this evaluation the estimated net acreage planted has been assumed to be 90 percent for orchard crops, nurseries, sod and hot houses, discounting roads, outbuildings, and other utility areas; 75 percent for berry crops, assuming a nine-month season with the remaining months fallowed in preparation for the next year; and 70 percent for row crops, assuming three crops a year with three months fallowed unless otherwise. Appendix C contains the net acreages and estimated water requirements for the PVCWD service area. The same CIMIS data (ETo and rainfall) were applied.

Table III contains the total water use in the PVCWD service area for CY2013. Previous reported years are included for reference.

Table III: Water Consumption, PVCWD

Source of Supply	2013	2008	2007	2006	2005	2004	2003	2002	2001	2000
United Water Conservation District	3,441	15,137	16,635	19,827	19,217	12,393	7,873	8,272	16,417	13,744
Groundwater Production	16,236	6,223	7,327	846	1,194	11,159	8,112	12,949	4,147	8,374
Private Groundwater Production	5,321	3,799	5,034	3,167	2,340	3,785	2,655	8,263	5,911	5,911
Conejo Creek	3,563	4,434	6,207	6,749	5,656	5,955	6,576	4012*	500*	500*
Total	**28,561**	**29,593**	**35,202**	**30,589**	**28,407**	**33,292**	**25,216**	**29,484**	**26,475**	**28,029**
(*) Estimated										

Table IV contains the calculated irrigation efficiency for the PVCWD service area for CY2013. Previous reported years are included for reference.

Table IV: Irrigation Efficiency, PVCWD

	2013	2008	2007	2006	2005	2004	2003	2002	2001	2000
Water Required	27,151	23,832	23,923	20,755	19,299	22,234	16,435	21,233	18,144	18,208
Water Applied	28,561	29,593	35,202	30,589	28,407	33,292	25,216	29,484	26,475	28,029
Efficiency	95.07%	80.53%	67.96%	67.85%	67.94%	66.78%	65.18%	72.02%	62.62%	63.80%

Irrigation Efficiency for Calendar Year 2013

Table V contains a summary and the calculated efficiency for the areas benefiting from Conejo Creek surface water through CY2013. Total overall efficiency is estimated at 95.10 percent. Table V illustrates the trend in irrigation efficiency throughout the reporting period.

This is our tenth report in fifteen years on the efficiency in the area. During this time, we have experienced some of the wettest years and some of the driest years in history; the last several years in particular have seen record-low rainfall. Yet, efficiency has increased steadily since 2001. We continue to monitor the watering practices and are developing water conservation programs or agricultural areas.

The cropping trend toward increased acreage planted in strawberries and raspberries creates another challenge in calculating irrigation efficiency. The extensive use of plastic and hoops alters both effective rain and factors such as ambient temperature, wind, solar radiation, and humidity used to calculate evapotranspiration. This is also an issue also in the PVCWD service area as the use of hot houses for tomatoes continues to increase.

Table V: Summary of Irrigation Efficiency (Camrosa and PVCWD)

Calendar Year 2013				
Planning Division	Net Irrigated Acres	Required Water	Applied Irrigation	Efficiency
Greenbelt	2,468	5,564	5,568	99.93%
Campus	422	923	1,138	81.09%
CamSprings	355	1,693	1,885	89.82%
PVCWD	9,273	27,151	28,561	95.07%
Total	**12,519**	**35,331**	**37,152**	**95.10%**

Calendar Year 2004				
Planning Division	Net Irrigated Acres	Required Water	Applied Irrigation	Efficiency
Greenbelt	2,266	4,966	5,976	83.10%
Campus	377	893	1,193	74.87%
CamSprings	568	1,384	1,848	74.89%
PVCWD	8,737	22,234	33,292	66.78%
Total	**11,949**	**29,477**	**42,310**	**69.67%**

Calendar Year 2008				
Planning Division	Net Irrigated Acres	Required Water	Applied Irrigation	Efficiency
Greenbelt	2,836	5,750	6,638	86.63%
Campus	372	870	1,215	71.62%
CamSprings	727	2,029	2,004	101.23%
PVCWD	8,714	23,832	29,593	80.53%
Total	**12,649**	**32,481**	**39,450**	**82.34%**

Calendar Year 2003				
Planning Division	Net Irrigated Acres	Required Water	Applied Irrigation	Efficiency
Greenbelt	2,085	4,446	5,638	78.87%
Campus	321	741	1,094	67.76%
CamSprings	520	1,143	1,493	76.58%
PVCWD	8,070	16,435	25,216	65.18%
Total	**10,996**	**22,766**	**33,440**	**68.08%**

Calendar Year 2007				
Planning Division	Net Irrigated Acres	Required Water	Applied Irrigation	Efficiency
Greenbelt	2,836	6,155	6,696	91.91%
Campus	372	881	1,069	82.43%
CamSprings	727	2,032	2,464	82.49%
PVCWD	8,714	23,923	35,202	67.96%
Total	**12,649**	**32,991**	**45,432**	**72.62%**

Calendar Year 2002				
Planning Division	Net Irrigated Acres	Required Water	Applied Irrigation	Efficiency
Greenbelt	2,085	5,935	7,109	83.49%
Campus	321	973	1,318	73.82%
CamSprings	520	1,500	2,330	64.38%
PVCWD	7,525	21,233	33,496	63.39%
Total	**10,451**	**29,641**	**44,253**	**66.98%**

Calendar Year 2006				
Planning Division	Net Irrigated Acres	Required Water	Applied Irrigation	Efficiency
Greenbelt	2,829	5,087	5,781	87.99%
Campus	372	790	1,178	67.11%
CamSprings	703	1,440	1,891	76.12%
PVCWD	9,004	20,755	30,589	67.85%
Total	**12,908**	**28,072**	**39,439**	**71.18%**

Calendar Year 2001				
Planning Division	Net Irrigated Acres	Required Water	Applied Irrigation	Efficiency
Greenbelt	2,085	4,925	8,005	61.52%
Campus	321	823	1,322	62.23%
CamSprings	508	1,254	2,258	55.54%
PVCWD	7,525	18,144	28,976	62.62%
Total	**10,439**	**25,146**	**40,561**	**62.00%**

Calendar Year 2005				
Planning Division	Net Irrigated Acres	Required Water	Applied Irrigation	Efficiency
Greenbelt	2,266	4,274	5,416	78.92%
Campus	377	770	1,063	72.41%
CamSprings	568	1,193	1,646	72.50%
PVCWD	8,737	19,299	28,407	67.94%
Total	**11,949**	**25,536**	**36,532**	**69.90%**

Calendar Year 2000				
Planning Division	Net Irrigated Acres	Required Water	Applied Irrigation	Efficiency
Greenbelt	2,190	5,655	8,012	70.60%
Campus	377	885	1,577	56.10%
CamSprings	510	1,323	2,474	53.50%
PVCWD	7,525	18,208	28,529	63.80%
Total	**10,602**	**26,071**	**40,592**	**64.20%**

Appendix A

Planning Divisions of the Camrosa Water District

The service area has been divided into six planning divisions, each of which has unique water use characteristics.

The mix of types of land use in each area are distinct; and water consumption data categories, within the Camrosa billing system, are maintained in a manner which leads to ease of analysis. Within each division land use categories are subdivided among Residential, Landscape, Domestic Agriculture, Commercial and Industrial, and Public (schools, parks, public landscaping). The Planning Divisions Map contains the boundaries of these various divisions.

The Mission Oaks area is north of the 101 Freeway and entirely within the city of Camarillo. Land use in the area is comprised of low to medium density residential housing, master metered residential communities (Leisure Village and Adolfo Camarillo Mobile Home Park), and commercial and light industrial areas. There are three schools in the area, including the Camarillo High School. Camrosa provides sewer service to this entire area.

The Camarillo Springs area is south of the 101 Freeway and entirely within the city of Camarillo. Land use in this area is comprised of medium and low-density residential housing; master metered residential housing (Camarillo Springs Mobile Home Park), commercial, and a large area of light industrial development. There is a golf course in the area and several landscaped common areas maintained by homeowners associations. The Camarillo Sanitation District provides sewer service to this entire area.

The Santa Rosa Valley area is the unincorporated area extending east from Hill Canyon Road to the intersection of Moorpark Road and Santa Rosa Road, then south and east to Olson Road. Land use in the area is rural residential with lots ranging from 1.0 to 40.0 acres. There is some agriculture in the area but most operations are small.

Tierra Rejada Valley is the unincorporated area and a small area within the city of Thousand Oaks north and east of the intersection of Moorpark Road and Santa Rosa Road. The area is primarily zoned Open Space and Agriculture; however there is a golf course and an increasing number of rural residential developments of multi-acre parcels.

The Campus area is the area south of the Camarillo city limits and east of Lewis Road. Land use in the area is agricultural and public (the CSUCI campus and the Lewis Road County development).

The Greenbelt area is the area directly east and south of the Camarillo City limits. It extends from the 101 Freeway on the south side of Conejo Creek and from Hilltop road east to Hill Canyon Road on both sides of the Conejo Creek. Land use in this area is Agriculture Exclusive and Open Space.

Appendix B: Camrosa Planning Division Efficiency Calculation Worksheets

Greenbelt	Orchard 90%			Berries 75%	Row Crops 70%							90%			
	Avocados	Lemons	Unknown	Strawberries	Lettuce	Broccoli	Chilies	Corn	Onions/ Celery/ Radishes	Unknown	Other	Hot House	Nursery	Sod	
	0.8	0.56	0.56	0.87	0.63	0.74	0.59	0.78	0.72	0.59	0.59	1.5	0.87	1	Total
2014 Acreage	369.73	669.92	1,146.58	409.85	-	-	-	-	-	206.61	26.19	-	33.67	-	2,862.55
Total Net Acreage	332.76	602.93	1,031.92	307.39	-	-	-	-	-	144.63	18.33	-	30.30	-	2,468.26
Water Required	930.39	1,180.05	2,019.68	986.14	-	-	-	-	-	310.88	39.41	-	97.22	-	5,563.76

CamSprings	Orchard 90%			Berries 75%	Row Crops 70%							90%			
	Avocados	Lemons	Unknown	Strawberries	Lettuce	Broccoli	Chilies	Corn	Onions/ Celery/ Radishes	Unknown	Other	Hot House	Nursery	Sod	
	0.80	0.56	0.56	0.87	0.63	0.74	0.59	0.78	0.72	0.59	0.59	1.50	0.87	1.00	Total
2014 Acreage	-	40.29	-	480.50	-	-	-	-	111.23	-	65.95	-	56.37	-	754.34
Total Net Acreage	-	36.26	-	360.38	-	-	-	-	77.86	-	46.17	-	50.73	-	571.40
Water Required	-	70.97	-	1,156.13	-	-	-	-	204.24	-	99.23	-	162.76	-	1,693.34

Campus	Orchard 90%			Berries 75%	Row Crops 70%							90%			
	Avocados	Lemons	Unknown	Strawberries	Lettuce	Broccoli	Chilies	Corn	Onions/ Celery/ Radishes	Unknown	Other	Hot House	Nursery	Sod	
	0.80	0.56	0.56	0.87	0.63	0.74	0.59	0.78	0.72	0.59	0.59	1.50	0.87	1.00	Total
2014 Acreage	-	72.00	-	186.23	-	-	-	-	-	34.10	197.35	-	-	-	489.68
Total Net Acreage	-	64.80	-	139.67	-	-	-	-	-	23.87	138.15	-	-	-	366.49
Water Required	-	126.83	-	448.09	-	-	-	-	-	51.31	296.95	-	-	-	923.18

Appendix C: PVCWD Efficiency Calculation Worksheets

PVCWD	Orchard 90%			Berries 75%	Row Crops 70%							90%			
	Avocados	Lemons	Unknown	Strawberries	Lettuce	Broccoli	Chilies	Corn	Onions/ Celery/ Radishes	Unknown	Other	Hot House	Nursery	Sod	
	0.80	0.56	0.56	0.87	0.63	0.74	0.59	0.78	0.72	0.59	0.59	1.50	0.87	1.00	**Total**
2014 Acreage	-	660.05	758.13	4,692.83	-	-	-	-	233.89	449.12	3,964.44	719.35	46.91	775.79	**12,300.51**
Total Net Acreage	-	594.05	682.32	3,519.62	-	-	-	-	163.72	314.38	2,775.11	647.42	42.22	698.21	**9,437.04**
Water Required	-	1,162.66	1,335.43	11,291.39	-	-	-	-	429.48	675.79	5,965.28	3,581.01	135.44	2,574.65	**27,151.14**

Illustration I

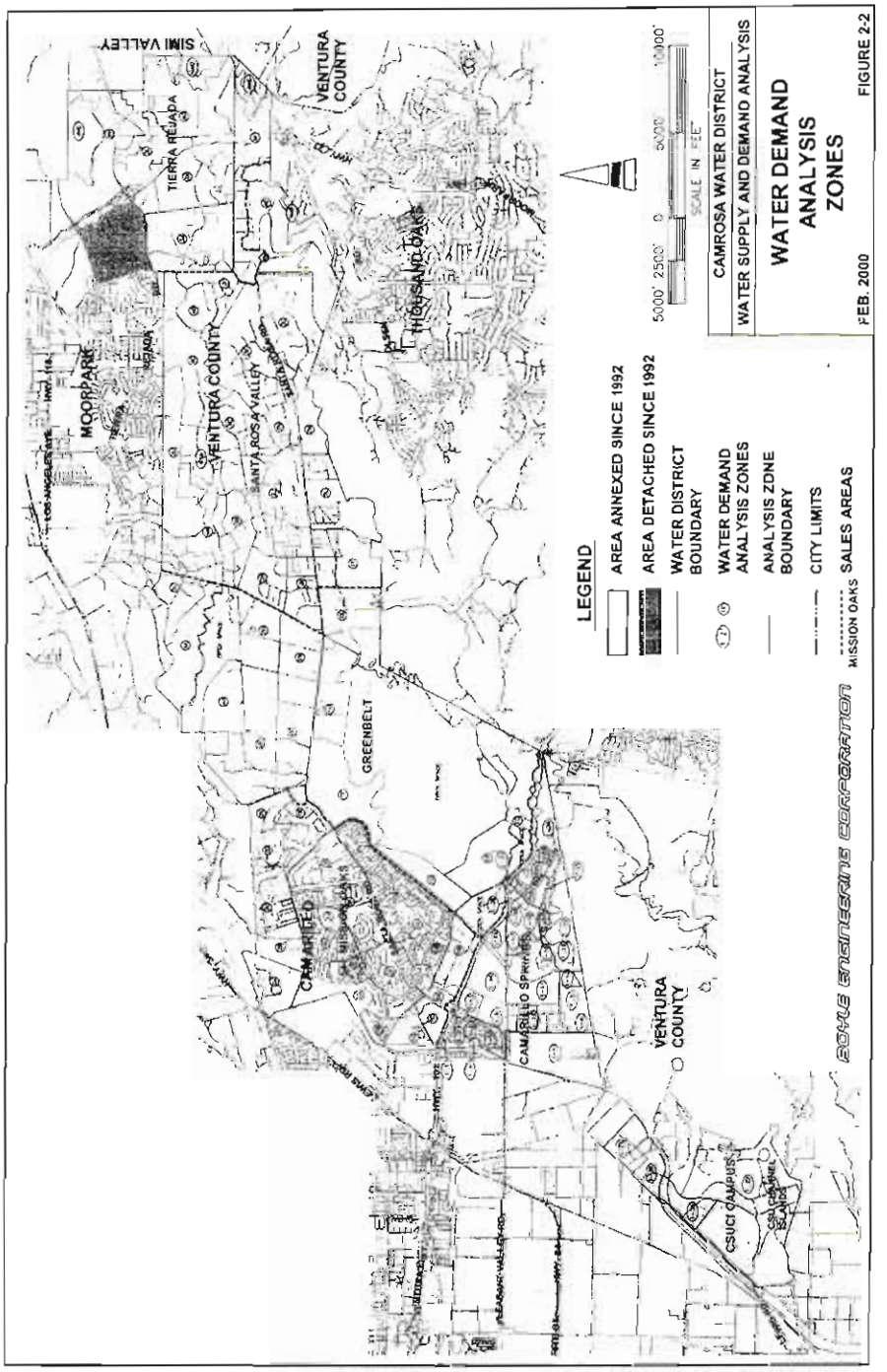


Illustration II

Camrosa Water District Planning Areas

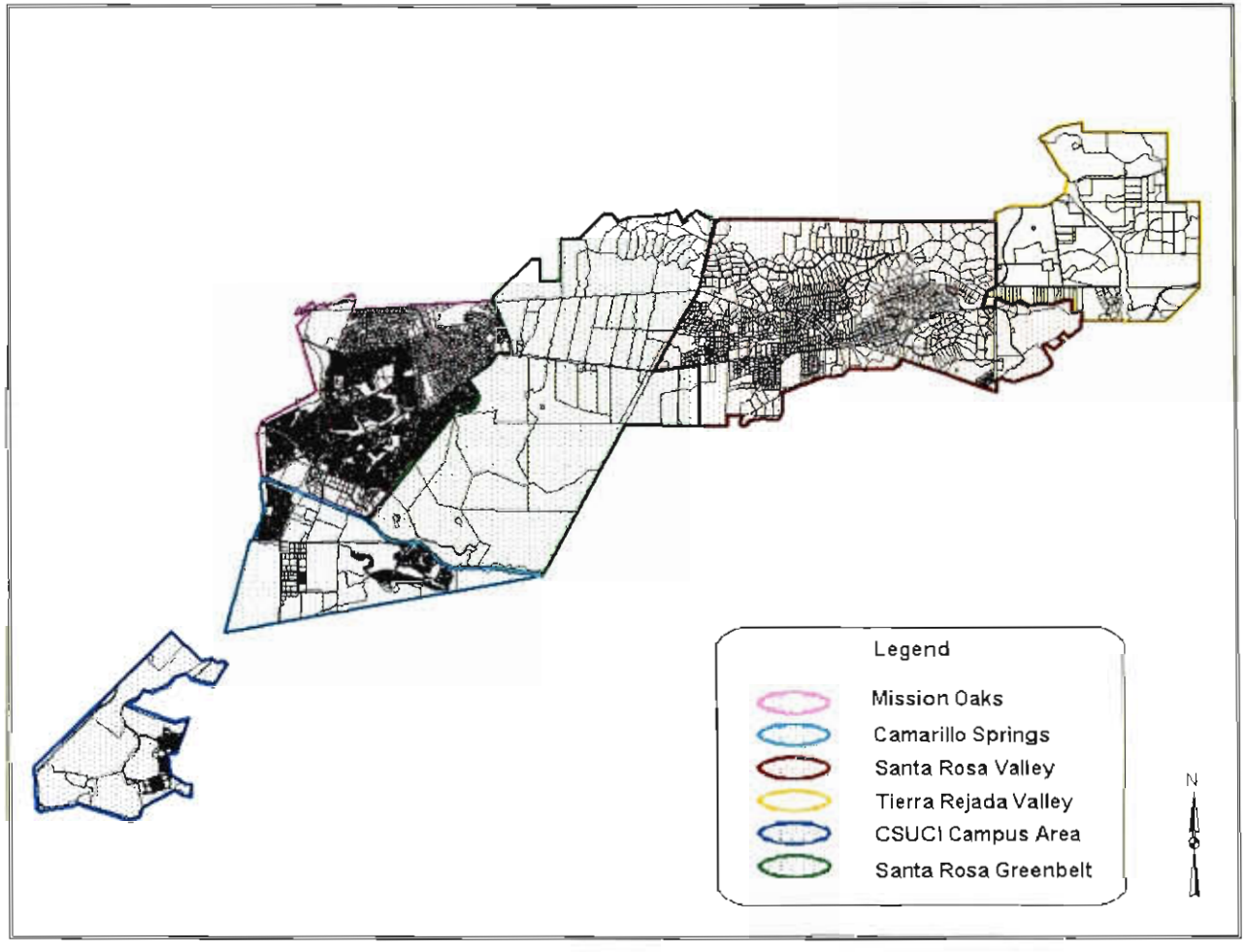
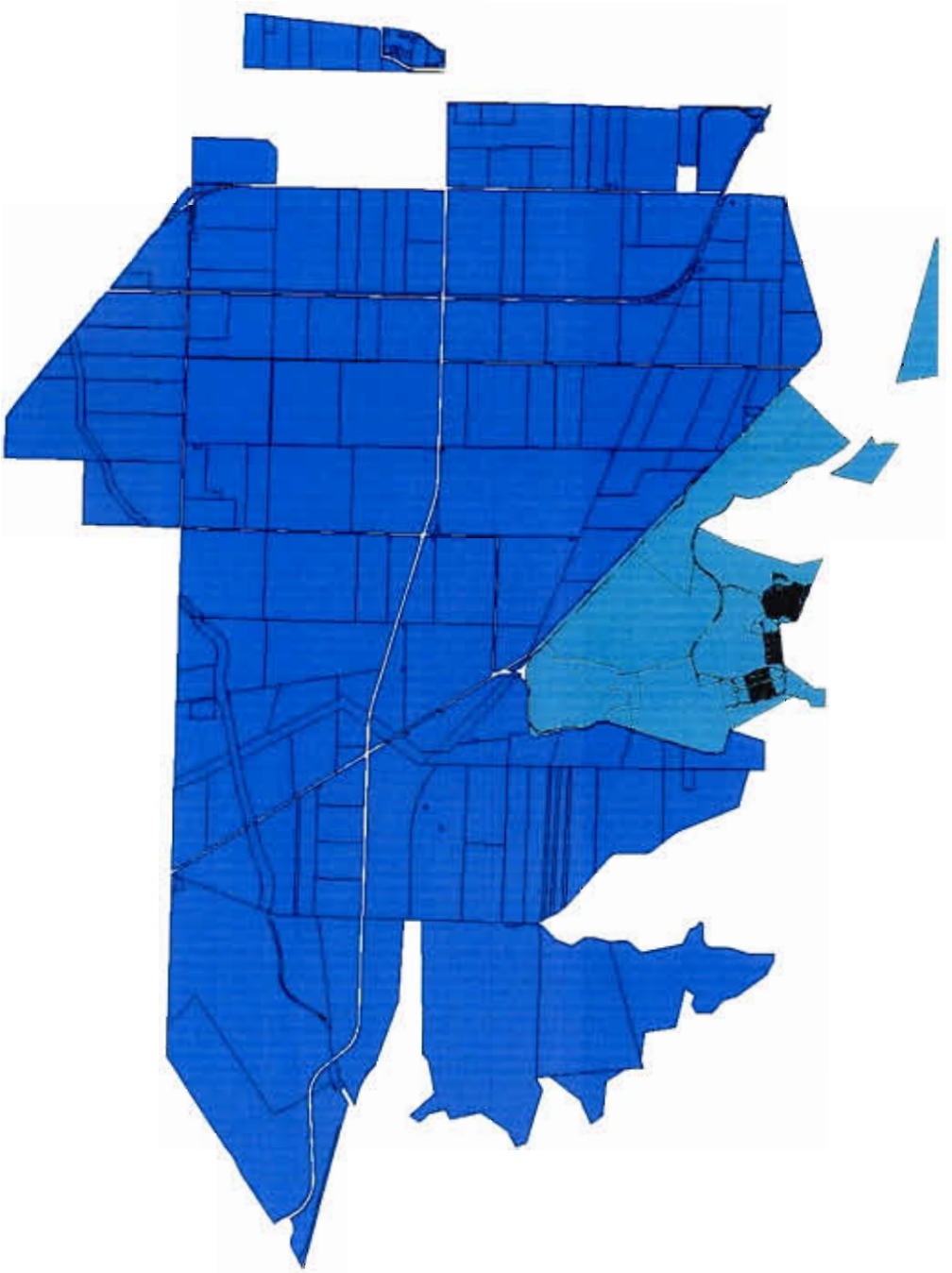


Illustration III

Pleasant Valley County Water District



Agreement Between the City of Thousand Oaks and the Camrosa Water District for the Beneficial Use of Water Pursuant to State Water Resources Control Board Water Right Decision 1638

This Agreement is entered into this 28 the day of May, 2013 by and between the City of Thousand Oaks, a California general law city (hereinafter referred to as "***City***"); and the Camrosa Water District, a county water district organized under the County Water District Law of the State of California (hereinafter referred to as "***Camrosa***").

RECITALS

A. The City and Camrosa have a common interest in maximizing the beneficial use of waters available for appropriation as described in the State Water Resources Control Board Water Right Decision 1638 and corresponding Water Right Permit 20952 issued by the State Water Resources Control Board to the City (hereinafter referred to as "***City Water Rights***").

B. The City and Camrosa have cooperated in harmonizing the legal, institutional, financial, and operational aspects of their joint relationships to maximize the use of water made available under the City Water Rights.

C. The City and Camrosa acknowledge that cooperatively they can most effectively maximize the beneficial use of the water available under the City Water Rights.

D. In anticipation of the State Water Resources Control Board's Water Right Decision 1638 and based on the City's original Water Right application, first the City and the Calleguas Municipal Water District ("***Calleguas***"), and then Calleguas and Camrosa, executed agreements to cooperate in the appropriation of water pursuant to the pending water right decision. Subsequent to the State Water Resources Control Board's Water Right Decision 1638, but prior to appropriation of water under Water Right Permit 20952, the City and Calleguas renegotiated their previous agreement incorporating portions of Water Right Decision 1638 and portions of the City's original water right application. Camrosa and Calleguas continued to operate under their previous agreement.

E. With Camrosa's assumption of full operation of the physical facilities necessary to appropriate the water pursuant to the City Water Rights, and the recoupment of Calleguas' capital investment in said facilities, the City, Calleguas and Camrosa have proven amenable to Calleguas ceding any and all control over or participation in the operation and management of said facilities, as outlined in any previous agreement pertaining thereto, and the City and Camrosa desire to re-establish and consolidate the terms of their contractual relationship consistent with the City Water Rights and the parties' relative roles in developing the City Water Rights.

F. In re-establishing the terms under this Agreement, the parties wish to make this Agreement substantially cost or revenue neutral to all parties as compared to the terms of the previous agreements. This Agreement shall be interpreted consistent with this purpose.

G. The parties acknowledge that through their cooperation to maximize the beneficial use of the waters available for appropriation under the City Water Rights, they have developed a water resource with regional significance.

NOW, THEREFORE, IT IS AGREED as follows:

1. Definitions

For the purposes of this Agreement, the following definitions shall apply:

a. "***City Measurement Station***" shall refer to the flume and measurement apparatus placed by the City below the confluence of the north and south forks of the Arroyo Conejo to measure the combined flows from the Hill Canyon Wastewater Treatment Plant and water flowing downstream from the forks of the Arroyo Conejo. This facility is owned and operated by the City.

b. "***Camrosa Diversion***" shall refer to the Conejo Creek Diversion structure located downstream and adjacent to the U.S. Highway 101 bridge over Conejo Creek and designated by Decision 1638 as the point of diversion for water appropriated pursuant to any water right or license pursuant to Water Right Decision 1638. This facility is owned and operated by Camrosa.

c. "***PVCWD Pipeline***" shall refer to the pipelines constructed by Camrosa and Calleguas which extend from the Camrosa Storage Ponds pump station to the point of connection to the intersection of Laguna Road and Las Posas Road. This pipeline is owned and operated by Camrosa.

d. "***Camrosa Storage Ponds***" shall refer to Camrosa's ponds located east of Conejo Creek and adjacent to Old Dairy Road.

e. "***Camrosa/Pleasant Valley Metering Stations***" shall refer to the water metering station where water is metered for delivery into the Pleasant Valley County Water District's (PVCWD) irrigation water distribution system and any other meters connected to the Camrosa pipeline delivering water to the service area of PVCWD. These facilities are owned and operated by Camrosa.

f. "***CFS***" shall mean cubic feet per second, a measurement of flowing water, which on a continuous basis equates to 724 acre feet per year, or 0.646 million gallons per day.

g. "***City Water Rights***" shall refer to the City's Water Right Permit 20952 issued by the State Water Resources Control Board pursuant to Water Right Decision 1638, and any subsequent license granted by the State Water Resources Control Board relating to the same.

2. Cooperation and Diligence in Perfecting Water Right License and Sharing Records

The parties agree to cooperate and exercise due diligence in meeting the requirements of the City Water Rights as specified below: (See Exhibit A for Calendar of routine actions required by the City's Water Rights and this Agreement)

a. The City shall be responsible for submitting such documentation to the State Water Resources Control Board as required to comply with Water Right Permit 20952, including without limitation Section 6 regarding complete application of water authorized by said Permit by December 31, 2025 or any extension granted thereto. In the event that the parties concur that additional water could be applied to beneficial use within the quantities limited by Water Right Permit 20952, Section 5; the City shall be responsible for petitioning the State Water Resources Control Board for an extension for a reasonable amount of time to put the full quantity of water provided by Water Right Permit 20952 to beneficial use.

b. The City shall be responsible for submitting annual progress reports to the State Water Resources Control Board to comply with Water Right Permit 20952, Sections 15 and 16. The City shall provide copies of said progress reports to Camrosa.

c. Camrosa shall keep metered records of dates of diversion, quantity of water diverted, and records documenting the bypass flow as required by Water Right Permit 20952, Sections 15 and 16, regarding quantification of flows. Such records shall be made available to the City for use in submitting its annual progress report above or as necessary to document water use under Water Right Permit 20952.

d. Camrosa shall be responsible for submitting to the State Water Resources Control Board all reports documenting compliance with Water Right Permit 20952, Section 12, regarding water use efficiency and conservation. Camrosa shall provide copies of said reports to the City.

e. The parties agree to share and provide the documents and information specified on Exhibit A attached to this Agreement and such other documents and information as the parties deem

reasonably necessary to maximize the water available under Water Right Permit 20952. It is the obligation of the City to timely advise Camrosa in writing of any such documents and information which are not specifically required in this Agreement.

3. Basis for Water Available for Sale

The City Water Rights provide the basis for the water available for sale by the City. Under Decision 1638, the quantity of water that the parties may put to beneficial use is described in terms of streamflow available at the Camrosa Diversion. That streamflow is quantified as:

Effluent discharged from the Hill Canyon Wastewater Treatment Plant

minus 2.0 CFS to account for channel losses en route to the point of diversion

minus 2.0 CFS dedicated by City to protect instream environmental resources

plus 4.0 CFS when the total streamflow at the Camrosa Diversion is greater than the sum of the effluent discharged from the Hill Canyon Treatment Plant plus the required downstream bypass of 6.0 CFS

minus 0.82 CFS to satisfy downstream Water Right License #12598, up to 306 acre feet per year.

As a practical matter, given the technical constraints in the continuous measurement and reconciliation of real-time flows, and various complicating factors, the parties agree that a reasonable and rational translation of Water Right Decision 1638's quantification of the City's Water Rights for the purposes of this Agreement is described in Section 4. Notwithstanding the foregoing, the City acknowledges and agrees that the City is ultimately responsible for maintaining the City's Water Rights including compliance with Water Right Decision 1638.

4. Quantification of Water Available for Sale

For the purposes of this Agreement, the parties agree that the water available for sale shall be determined annually and quantified as follows:

Twelve times the average monthly streamflow recorded at the City Measurement Station for the months of June, July, and August of the preceding year

minus 1448 acre feet to account for 2.0 CFS channel losses between the City Measurement Station and the Camrosa Diversion

minus 4344 acre feet to account for 6.0 CFS bypass downstream from the Camrosa Diversion

minus 306 acre feet to account for Water Right License #12598 downstream from the Camrosa Diversion (see Exhibit B for example calculation of water available).

5. Availability of Water and Purchase Commitments Among the Parties

   a. The City agrees to make available to Camrosa the total quantity of water available for sale as quantified in Section 4. Camrosa agrees to purchase from the City all such water made available to Camrosa under this Agreement for the price determined under Section 6 of this Agreement.

   b. Camrosa agrees to make the 6.0 CFS bypass releases downstream of the Camrosa Diversion as quantified in Section 4.

   c. Pursuant to Water Right Decision 1638, all water made available under this Agreement is limited to use within the boundaries of Camrosa and within the boundaries of the PVCWD.

6. Cost for Water Made Available

   a. The unit price per acre foot of water covered under this Agreement upon the Effective Date of this Agreement is $104.89 per acre foot.

   b. On September 1st of each year, the parties agree to adjust the unit price per acre foot of water as described in subsections c and d below.

   c. The adjusted unit price per acre foot of water shall be determined by adjusting the previous year's unit price per acre foot of water by the annual percentage change from the preceding July to July period in the Consumer Price Index (Los Angeles-Riverside-Orange County, All Urban Consumers) as published by the U.S. Bureau of Labor Statistics (See Exhibit B for sample calculation). Notwithstanding the foregoing, in no event shall the adjusted unit price be more than 107% of the previous year's unit price and in no event shall the adjusted unit price be less than 93% of the previous year's unit price.

   d. The adjusted unit price so determined shall then be the amount per acre foot applied to the water available for sale, as quantified pursuant to Section 4, until the next September adjustment.

7. Costs Related to the Operation and Maintenance of Facilities (See Exhibit C for map of facilities).

a. The City agrees to operate and maintain the City Measurement Station at its sole expense.

b. Camrosa agrees to operate and maintain the Camrosa Diversion, Camrosa Storage Ponds, and the related pump station at the Camrosa Storage Ponds at its sole expense.

c. Camrosa agrees to operate and maintain the PVCWD Pipeline. Routine maintenance of this pipeline will be at Camrosa's sole expense and shall include routine inspection and surveillance of pipeline right-of-way, valves, and other appurtenances and first response to reported emergencies.

8. Water Quality and Quantity Limitation

a. The parties acknowledge that the City cannot guarantee to Camrosa the quality of water downstream of the City Measurement Station. Camrosa agrees to hold the City harmless from any and all claims, lawsuits, demands, judgments or other liability arising out of, directly or indirectly, the use of the water delivered under this Agreement, including but not limited to impurities, pollution, or chemicals which may be introduced downstream of the City Measurement Station into the water made available under this Agreement.

b. The City agrees to exercise its best efforts to comply with the requirements of its National Pollution Discharge Elimination Permit (hereinafter referred to as "***NPDES Permit***") as well as all other applicable Federal, State and County statutes, laws and ordinances regarding the City's discharge of effluent to Conejo Creek and surface waters constituting water made available by the City under this Agreement.

c. In the event that the City cannot treat its effluent substantially to the standards in applicable NPDES Permit or other applicable Federal, State, or County regulation, or in the event that the City is aware of a sewage spill or any other hazardous material introduced into the City's drainage system that would impair the quality of water subject to this Agreement, the City will immediately notify Camrosa by telephone. In particular, in the event that any substance listed pursuant to Public Health and Safety Code Section 25249.8 is discharged, the City shall immediately notify Camrosa by telephone. Camrosa shall provide the City at all times a current listing of emergency telephone numbers. The City will further

notify by telephone Camrosa when water made available under this Agreement is no longer impaired and available for beneficial reuse.

d. Quantification of water impaired for reuse: Where water made available by the City at the City Measurement Station is rendered unusable for beneficial reuse due to failure to meet its NPDES Permit standards, hazardous materials spills, or standards in its municipal storm water permit, such water will be quantified by the City per day for every day or portion of any day when water is impaired for reuse and a pro-rated credit shall be applied to Camrosa for the cost of water as quantified in Section 6.

e. The parties recognize that certain actions by agencies with statutory authority to regulate the water governed by this Agreement may jeopardize the ability of the parties to place the City Water Rights to beneficial use. Examples of these actions include, but are not limited to: modification of the City Water Rights, new regulation on the use of surface water, or implementation of Clean Water Act standards limiting the beneficial uses of such water or requiring additional treatment facilities. Either party may, upon written notice of such action to the other parties, request consultation among the parties to negotiate such amendments to this Agreement as may be necessary to continue to maximize the beneficial use of water available to the parties under the City Water Rights. To the extent that any action by others limits the ability of the parties to place the City Water Rights to beneficial use, the provisions for payment under this Agreement, to the extent of such limitation, shall be suspended pending renegotiation of this Agreement.

f. The parties recognize that certain other conditions could substantially affect the balance of obligation and benefit among the parties such that the individual interests of one or more of the parties would no longer be rationally related to continued cooperation in maximizing the beneficial use of the water under the terms of this Agreement. Examples of these conditions include, but are not limited to: the inability of either party to deliver water due to distribution or treatment system failure, regulatory changes, or water quality degradation to the point that it is no longer acceptable to the customer base. In response to such changed conditions, either party may upon written notice of such action to the other party request consultation among the parties to negotiate such amendments to this Agreement as may be necessary to continue to maximize the beneficial use of water available to the parties under the City Water Rights. To the extent that any action by others limits the ability of the parties to place the City Water Rights to beneficial use, the provisions for payment of such water

under this Agreement shall be suspended pending renegotiation of this Agreement.

9. Schedule for Payments

a. City shall bill Camrosa no later than Octoher 1st for payment due for the period twelve months preceding measured from September 1st through August 31st. Payments shall be made to the City by Camrosa on or about November 15 of each year during the term of this Agreement. Payment for the last year (or any partial year) of this Agreement will be based upon the number of full months the water was made available by the City during the last year of the term of this Agreement.

10. Term of the Agreement

The term of this Agreement is forty (40) years from the Effective Date of this Agreement. The parties, by mutual consent, may extend the term of the Agreement for additional five-year periods.

11. Cooperation and Exchange of Information

The parties agree to cooperate, exchange information, and provide the availability of records necessary for the maintenance of the City Water Rights, administration of this Agreement, and operation of associated facilities.

12. Conservation Credits

From the Effective Date of this Agreement, Camrosa agrees to use reasonable efforts to secure conservation credits from the Fox Canyon Groundwater Management Agency for waters delivered by the project which offset the need to extract groundwater from the aquifers within the Fox Canyon Groundwater Management Agency. Camrosa agrees that one-half of the accumulated credits will be made available to the City.

13. Deliveries to PVCWD

Camrosa agrees to use reasonable diligence in providing surplus water, not needed by Camrosa, to the PVCWD.

14. Assignment

The parties agree that this Agreement may not be assigned without the written consent of all of the non-assigning parties.

15. Waiver: Remedies Cumulative

Failure by a party to insist upon the strict performance of any of the provisions of this Agreement by another party, irrespective of the length of time for which such failure continues, shall not constitute a waiver of such parties' rights to demand strict compliance by such other party in the future. No waiver by a party of a default or breach by another party or parties shall be effective or binding upon such party unless made in writing by such party, and no such waiver shall be implied from any omission by a party to take any action with respect to such default or breach. No express written waiver of a specified default or breach shall affect any other default or breach, or cover any other period of time, other than any default or breach and/or period of time specified. All of the remedies permitted or available to a party under this Agreement, or at law or in equity, shall be cumulative and alternative, and invocation of any such right or remedy shall not constitute a waiver or election of remedies with respect to any other permitted or available right or remedy.

16. Construction of Language of Agreement

The provisions of this Agreement shall be construed as a whole according to its common meaning and purpose of providing a public benefit and not strictly for or against any party. It shall be construed consistent with the provisions hereof, in order to achieve the objectives and purposes of the parties. Wherever required by the context, the singular shall include the plural and vice versa, and the masculine gender shall include the feminine or neutral genders or vice versa.

17. Mitigation of Damages

In all situations arising out of this Agreement, the parties shall attempt to avoid and minimize the damages resulting from the conduct of the other parties.

18. Governing Law

This Agreement, and the rights and obligations of the parties, shall be governed and interpreted in accordance with the laws of the State of California.

19. Captions

The captions or headings in the Agreement are for convenience only and in no other way define, limit or describe the scope or intent of any provision or section of the Agreement.

20. Authorization

Each party represents and warrants to the other that the execution, delivery, election to participate in, and performance of this Agreement (i) are within its powers, (ii) has been duly authorized by all necessary actions on its behalf and all necessary consents or approvals have been obtained and are in full force and effect; and (iii) binds said party and its respective administrators, officers, directors, agents, employees, successors, assigns, principals, joint ventures, insurance carriers, and any others who may claim through it under this Agreement.

21. Entire Agreement Between Parties

This Agreement supersedes any other agreements, either oral or in writing, between or among any of the parties hereto with respect to the beneficial use of water available for appropriation pursuant to State Water Resources Control Board Water Right Decision 1638, and contains all of the covenants and agreements between the parties with respect thereto. Any modifications of this Agreement will be effective only if it is in writing and signed by all of the parties to this Agreement.

22. Partial Invalidity

If any provision in this Agreement is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions will nevertheless continue in full force without being impaired or invalidated in any way. To the extent permissible the illegal or invalid provision shall be modified, amended, or construed to make it legal or valid and carry out the purposes of the parties hereto.

23. Relationship of the Parties

The relationship of the parties to this Agreement shall be that of independent contractors and in no event shall any party be considered a partner, officer, agent, servant or employee of any other party. Without limiting the foregoing, each party agrees to be solely responsible for any workers compensation, withholding taxes, unemployment insurance and any other employer obligations associated with the described work or obligations assigned to them under this Agreement.

24. Notices

Any notice required to be given hereunder shall be deemed to have been given by depositing said notice in the United States mail, postage prepaid, and addressed as follows:

To City:	City of Thousand Oaks Attn: Public Works Director 2100 Thousand Oaks Boulevard Thousand Oaks, CA 91362
To Camrosa:	Camrosa Water District Attn: General Manager 7385 Santa Rosa Road Camarillo, CA 93012

25. Effective Date.

This Agreement shall take effect on September 1, 2013, provided the following events have taken place (the "***Effective Date***"):

a. Upon due approval of this Agreement as required by its governing documents and applicable law, City shall execute this Agreement and deliver a duly executed original to Camrosa; and

b. Upon due approval of this Agreement as required by its governing documents and applicable law, Camrosa shall execute this Agreement and deliver a duly executed original to City; and

c. Upon receipt by Camrosa and City of (1) the Thousand Oaks – Calleguas Termination Agreement duly executed by City and Calleguas, and (2) the Camrosa – Calleguas Termination Agreement duly executed by Camrosa and Calleguas.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the Effective Date in Ventura County, California.

Dated: 6/5, 2013

CAMROSA WATER DISTRICT

By: Tony Stafford

Tony Stafford, General Manager

Dated: May 28, 2013

CITY OF THOUSAND OAKS

By: _____
Claudia Bill-de la Peña, Mayor

ATTEST:

_____
for Linda D. Lawrence, City Clerk

APPROVED AS TO ADMINISTRATION:

_____ for _____
Scott Mitnick, City Manager

APPROVED AS TO FORM:
Office of the City Attorney

_____
Christopher G. Norman, Assistant City Attorney

Exhibit A
Calendar of Annual Actions
(Agreement Section 2)

The following actions are required by the Agreement between the City of Thousand Oaks and the Camrosa Water District for the Beneficial Use of Water Pursuant to State Water Resources Control Board Water Right Decision 1638.

Month/Action	**Responsible Party**	**Send to**
January		
Daily & monthly diverted & by-pass flows at Camrosa Diversion	Camrosa	City
Water diversion at Camrosa Diversion Annual Report (daily and monthly for the previous calendar year)	Camrosa	City
February, March, April & May		
Daily & monthly diverted & by-pass flows at Camrosa Diversion	Camrosa	City
June		
Daily & monthly diverted & by-pass flows at Camrosa Diversion	Camrosa	City
Daily stream flows at City Measurement Station	City	Camrosa
Annual Progress Reports to SWRCB (due June 30)	City	SWRCB/Camrosa
July & August (August 31 is end of water year)		
Daily & monthly diverted & by-pass flows at Camrosa Diversion	Camrosa	City
Daily stream flows at City Measurement Station	City	Camrosa
September (1st is beginning of water year)		
Daily & monthly diverted & by-pass flows at Camrosa Diversion	Camrosa	City
Calculate average monthly stream flow based on June, July, and August	City	Camrosa
Calculate the adjusted unit price per acre foot of water (see Agreement Section 6 & Exhibit B)	City	Camrosa
Invoice for previous 12 months water usage, Sep 1-Aug 31 (due October 1- see Agreement Sections 4, 6 & 9, and Exhibit B)	City	Camrosa
October		
Daily & monthly diverted & by-pass flows at Camrosa Diversion	Camrosa	City
Compliance report for Water Right Permit 20952, Section 12 regarding water use efficiency. (every 5th year starting in 2014)	Camrosa	SWRCB/City
November		
Daily & monthly diverted & by-pass flows at Camrosa Diversion	Camrosa	City
Payment by Camrosa to City (due November 15)	Camrosa	City
December		
Daily & monthly diverted & by-pass flows at Camrosa Diversion	Camrosa	City

Exhibit B

Example Calculations of Quantity and Cost of Water Available for Sale
(Agreement Sections 4 and 6)

Example water available for sale quantity calculation:

(Example is for period September 1, 2012 through August 31, 2013)

Average daily flow for June, July and August 2012 = 11.48 mgd

Total water quantity = 11.48 mgd average flow x 365 days x 3.07 acre feet /mg = 12,864 acre feet

12,864 acre feet total water quantity
Less 1448 acre feet channel losses
Less 4344 acre feet downstream by-pass
Less 306 acre feet downstream existing water right

Equals 6,766 acre feet total water available for sale

(reduce total water available for sale further per Subsection 8d, if applicable)

Example water available for sale cost calculation:

(Calculation occurs in September of each year; example is for September 2013; CPI is for All Urban Consumers, Los Angeles – Riverside – Orange County, All Items, 1982-84 = 100)

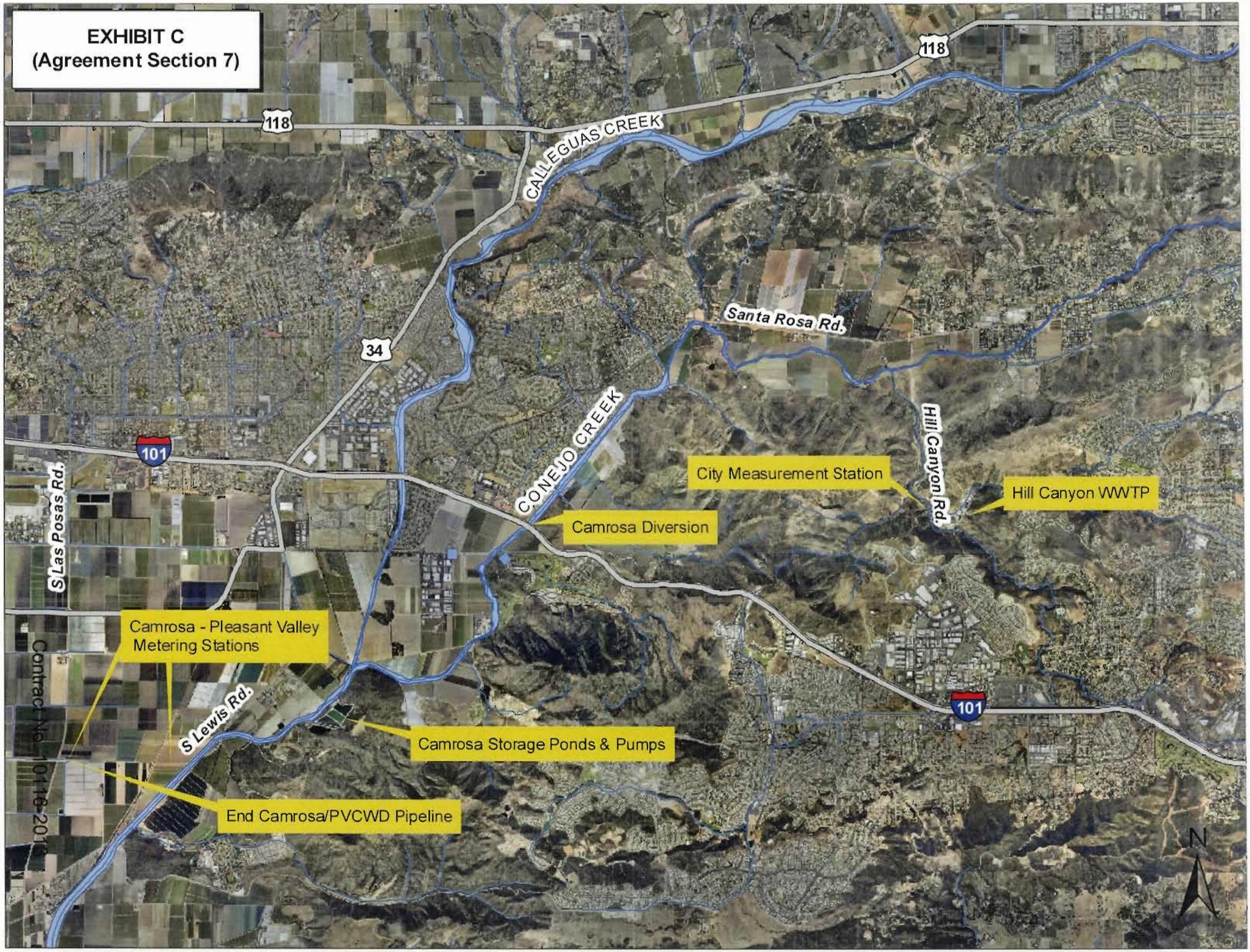
2012 price per acre foot of water = $ 102.90

July 2012 CPI = 235.776
July 2011 CPI = 231.303

Annual percent CPI change = (2012 CPI - 2011 CPI) / 2011 CPI x 100 = (235.776 – 231.303) / 231.303 x 100 = 1.93%

Adjusted unit price for water = 2012 unit price x 1 + annual percent CPI change (decimal) = $102.90 x 1.0193 = $104.89 per acre foot

Cost for water available for sale = total water available for sale x adjusted unit price for water = 6,766 acre feet x $104.89 per acre foot = $709,686



Contract No. 10116-2012

GROUNDWATER GEOLOGY AND YIELD ANALYSIS OF THE TIERRA REJADA BASIN

Report Prepared for:

Camrosa Water District

Report Prepared by:

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EXECUTIVE SUMMARY

Groundwater in the Tierra Rejada basin is derived from bedrock aquifers and has exhibited greatly differing ranges of water level responses over time in different portions of the basin. This study was principally conducted to provide a technical foundation for evaluation of basin yield.

Principal conclusions concerning basin yield are:

- Groundwater levels observed over a long-term base period including two wet-dry climatic cycles shows that average groundwater production was within the basin yield over the period 1944-1996.

- Current and recent conditions indicate that existing production and possibly new production can be managed within basin yield. It is unknown if production from a proposed new District well would result in total basin production greater than or less than the historic average over the base period 1944-1996.

- An increase in basin yield may be possible by active management of basin storage and pumping distribution.

In addition, hydrogeological findings of the study include:

- Bedrock structural geology strongly suggests that the watershed boundary – traditionally used as the boundary for recharge from precipitation – does not adequately encompass the larger bedrock recharge area that may be hydraulically connected with the principal producing aquifer zones in the Tierra Rejada basin. It is also notable that the surface watershed of Tierra Rejada valley is substantially larger than the areal extent of alluvium in the basin.

- In the western portion of the basin, long-term climatic trends are readily observed in corresponding changes in the basin's groundwater levels, over a wide range of pumping and precipitation conditions.

- In the eastern portion of the basin, long-term groundwater levels have exhibited more subdued response to climatic cycles, and are now at or near historic high levels.

- Limited water quality data for the basin show increases in TDS, chloride and sulfate during the last 10 years; concentrations are within drinking

water standards. Nitrate concentrations in 2008 exceeded the drinking water standard for four wells in the central portion of the basin.

An additional purpose of this study was to examine the possibility of pumping interference between the District's proposed new well and other nearby wells. Based on the aquifer test results following construction of the District's existing well, together with consideration of bedrock hydrogeology and characteristics of wells near the proposed new well, the anticipated pumping interference from a new pumping well on nearby well sites is expected to be less than 5 feet at a distance of 1,500 feet or more from the pumping well.

INTRODUCTION

The Tierra Rejada basin is within the Calleguas Creek watershed in Ventura County, California, and includes the upper reach of Arroyo Santa Rosa. Groundwater wells in the basin produce drinking water quality groundwater from volcanic and sedimentary bedrock formations.

This study provides a foundation for evaluating two technical subjects of interest to Camrosa Water District in the Tierra Rejada basin:

- Yield of the basin, and
- Potential well interference from a proposed, new District groundwater supply well.

Work conducted to address these subjects includes:

- Collection, processing and analysis of technical data principally concerning:
  - Groundwater levels,
  - Groundwater quality,
  - Well construction,
  - Well production,
  - Basin geology and structure, and
  - Precipitation.

  In addition, technical data from an aquifer pumping test (Schaaf, 1998) was reviewed and utilized for consideration of potential well interference associated with the proposed new District well.
- Cumulative departure analysis of precipitation data for determination of base periods (periods of long-term average hydrologic conditions, and including complete portions of wet and dry climatic conditions)
- Analysis of bedrock geology and geological structure, particularly to identify and characterize geological features that may be important to mechanisms and pathways of recharge from precipitation, groundwater

flow and groundwater gradients. This portion of work includes analysis of individual well completion reports and lithologic logs.

- Consideration of potential methods for estimation of yield, and application of the most appropriate method to evaluate basin yield. This work includes recommendations of work and data that might be desired for more quantitative treatments in the future.

The term "yield" as used in this analysis and report refers to the common notion of perennial yield (e.g., Todd and Mays, 2005), with the understanding that future improvements in basin management, infrastructure, supplemental water sources or similar factors can result in changes to basin yield.

Data used for the study includes publicly-available information concerning groundwater levels and groundwater quality, regional geologic mapping, an aquifer pumping test using the District's existing water supply well and a nearby monitoring well, and previous technical studies conducted for both the regional geology and groundwater resources of the Tierra Rejada basin. Work for the study also included acquisition of confidential state water well drillers' reports for portions of the study area (Appendix A).

GROUNDWATER GEOLOGY

Work for this study builds on previous technical analyses, in particular a master's thesis on the basin's hydrogeology (Schaaf, 1998). For certain general and background information, such as descriptions of geologic formations and basin setting, this report references the previous work rather than reproducing the complete descriptions.

Geology of the Tierra Rejada basin consists of an uppermost, thin veneer of alluvium, underlain by bedrock formations that are primarily either sandstone and related rocks (the Topanga Formation) or volcanic and volcaniclastic units (the Conejo Volcanics). The Topanga Formation unconformably overlies the Conejo Volcanics; both formations can have thickness of many hundreds of feet in the basin. Detailed descriptions of the stratigraphy can be found in Dibblee and Ehrenspeck (1990, 1992a&b, 1993) and Schaaf (1998). Both of the principal bedrock formations are water-bearing and host productive groundwater wells with water quality acceptable for domestic and irrigation purposes.

Beneath the two principal water-producing bedrock units is the Sespe Formation, which is also oriented with a moderate northward dip. This formation

is also water-bearing and where it extends upward to the south, it outcrops in the hills around Lake Bard.

GEOLOGIC STRUCTURE

Groundwater-producing bedrock formations of the Tierra Rejada basin are mostly organized as layered units which together are tilted moderately down to the north. At the northern margin of the basin, the units are sharply folded up against the Simi Fault, a regional east-west trending structure (Figure 1). Other segments of the Simi-Santa Rosa fault zone have been active in the late Quaternary or Holocene, based on geological relationships in folded areas transected by the faults (Blake, 1991).

It is unknown if the fault acts as a barrier to groundwater flow, but any permeability contrasts in the bedrock units will serve to inhibit northward flow across the upturned beds, as will fault gouge and related clays that may exist along the fault zone itself.

GROUNDWATER CONDITIONS

Groundwater levels are known from wells within the Tierra Rejada basin as well as from nearby, surrounding areas (Figure 1). Based on water level behavior from historical records together with geological characteristics, the principal producing aquifers appear to be unconfined in the Tierra Rejada basin.

In this context, recharge from deep percolation of precipitation is of principal importance to the basin hydrology – in Schaaf's (1998) analysis, 85% of the basin's 6,200 afy of "inflows" are from precipitation. Such previous estimates of basin precipitation are calculated from rainfall records (see Precipitation section below) as applied to the surface watershed boundary for the basin. It is likely that this amount of rainfall, and any associated calculation of percolation and recharge underestimate actual recharge because of the geologic structure in relation to surface topography.

South and southeast of the watershed boundary, topographic relief is mild, but the bedrock formations (principally the Sespe in the areas just south of the watershed boundary) dip to the north. This geometry, together with the generally stratified nature of the sedimentary Sespe Formation, suggest that precipitation in southern regions near the basin but outside its watershed boundary may contribute

to groundwater recharge and the subsurface flow regime of the Tierra Rejada basin.

In the main portion of the basin, previous studies have concluded that aquifer productivity diminishes considerably below about 700 feet depth, based largely on relatively transmissive units in the upper portion of the Conejo Volcanics, and on an acoustic well log acquired during construction of the District's well, which is one of the basin's deepest at 640 feet total depth (well 15N3; Schaaf, 1998). Whereas high-permeability zones such as those observed in the upper Conejo may not be present beneath existing well completions, it is certainly possible that deeper portions of the Conejo Volcanics include productive groundwater-bearing zones with acceptable water quality. The base of the basin's productive aquifer may be deeper than the maximum depth of existing wells in the basin.

GROUNDWATER LEVELS

Hydrologic data were acquired and reviewed from a range of sources, principally the California Department of Water Resources, Ventura County Public Works and Camrosa Water District.

Several important relationships and characteristics of the study area's groundwater regime are noted in water level data:

- Long-term water level records from approximately 1945 to present show basin water level changes of up to 150 feet; this magnitude of change is observed both as water level declines and increases, even in the same well over different parts of the historical hydrograph (Figure 2; see for example well 10R1 in Figure 2E).
- Water levels in the eastern and southern portions of the basin exhibit much less variation in water levels, particularly over several decades when other parts of the basin experienced greater variation in groundwater levels (Figure 2; see for example wells 12M3 and 14P1).
- Many wells with long-term historical water level records indicate current conditions are at or near historical high water levels, even for wells which experienced the greatest declines in water level from ~1945-1970 (Figure 2).

GROUNDWATER QUALITY

With exception of water quality reporting for the District's well, limited information exists from other wells to evaluate changes in water quality over time. The available data indicate groundwater in the basin is generally acceptable for domestic and agricultural irrigation uses, except recent data showing nitrate above the 45 mg/l drinking water standard (for NO_3) in four wells in the central portion of the basin (Ventura County, 2008, see figure 3-26 therein). Based on this result, the County considers the basin "nitrate impacted". The four wells with high nitrate had 2008 results of 52 to 72 mg/l NO_3,), but do not have uniformly distinguishing well construction characteristics (e.g., depth or depth of perforations).

For the District's existing well, water quality information reported annually for the last dozen years shows moderately increasing trends for TDS, sulfate and chloride, but within drinking water standards (Figure 3). Nitrate concentrations for the District's well have been consistently below 5 mg/l (NO_3), with no apparent upward trend. A single result of 61 mg/l in January 2001 appears anomalous and is not associated with a corresponding change in pumping rate.

Basin groundwater quality is likely also influenced by infiltrating surface water from creeks flowing though Tierra Rejada basin. A December 2009 surface water sample from the creek flowing into the basin from the south had acceptable water quality, with TDS of 1,056 mg/l, chloride of 152 mg/l, and nitrate of 14 mg/l.

PRECIPITATION

Daily precipitation data are available from several gauging stations relatively near to the Tierra Rejada basin. For this study, analysis of a precipitation station at Lake Bard was conducted together with evaluation of data from several stations in Moorpark and Simi valleys, and a station with a relatively long period of record in Fillmore. At Lake Bard, average annual precipitation for water years 1967-2008 was 15.1 inches.

CUMULATIVE DEPARTURE AND BASE PERIOD ANALYSIS

Cumulative departure analysis is a valuable tool for viewing long-term trends in precipitation relative to the associated long-term average. Figure 4 shows the cumulative departure curves for each of the gauging stations presented in this

study (numbers associated with the station names are gauging station numbers assigned by Ventura County).

A long-term period of relatively dry conditions prevailed for several decades beginning in the mid-1940's and continuing through the mid-1960's. This period of relative drought is seen widely in central and southern California, including a station with an even longer period of record in Santa Paula. Similarly, the more recent 1986-1991 drought is prominent in all the precipitation records.

With the benefit of the historical context provided by the station at Fillmore/Rancho Sespe, which has almost a century-long record, an evaluation of all nearby gauging locations finds that their periods-of-record include full portions of wet and dry climatic cycles. Cumulative departure curves were then evaluated to define "base periods" – a range of years that encompasses both wet and dry conditions and has long-term average hydrologic characteristics. For precipitation in the vicinity of Tierra Rejada basin, the base periods selected for study were (Figure 5):

- 1944 to 1996 (and potentially also extending to 2001);
- 1958 to 1998; and
- 1969 to 2006.

Sufficient water level data exist to examine basin groundwater conditions for the base periods selected. For the starting and ending years of a base period, the highest observed water levels in a well are compared to see what if any difference in water levels exists over the base period of average hydrologic conditions.

BASIN YIELD ANALYSIS

Several basin yield estimation methods are possible for the Tierra Rejada basin. For a range of technical reasons described below, and consistent with the project timeline and scope, a Water Level Change method was employed, utilizing groundwater levels and complementary technical data to describe the characteristics of groundwater fluctuations and the associated implications for long-term average basin yield.

Modified Hill Method. Some groundwater basins show a strong correlation between annual production and groundwater levels, allowing a simple and straightforward estimate of yield based on long-term water level changes. For the

Tierra Rejada basin, three considerations limit the utility of the Modified Hill Method for estimating yield:

- The paucity of well production information in the basin, other than from the District's relatively new well (15N3),
- Significant changes in historical land use and associated water demands, and
- The highly seasonal nature of precipitation, which in turn influences groundwater recharge and water levels in ways that are not well-accommodated by the method.

Water Balance Method. A detailed water balance is a commonly-employed method for quantifying a basin's main flow components – with implications for basin yield – but the method is subject to potential uncertainty with each piece of the equation (Figure 6; Peters, 1981 *cited in* DWR, 2002). In regard to water levels or gauged streamflow, such uncertainty might be relatively small, but components such as subsurface flow, recharge, aquifer storativity and well production can have potential errors large enough to make this method a poor predictor of yield. For the Tierra Rejada basin, four components of a water balance are very poorly known, and any corresponding basin yield estimates could readily be subject to error of 100% or more. Additional technical work could produce more accurate estimates for these four components (this subject is discussed further in the Recommendations section below), but it is not clear that such work would produce technical benefits to outweigh the uncertainty that would still remain with this method. Four sources of large potential error for a water balance approach in the Tierra Rejada basin are:

- Basin extractions from well production are largely unknown; regular, direct measurement of well production is only known for Camrosa Water District's existing and relatively recent water supply well (beginning in 1997). With over 50 years of unknown basin extractions, during a time that experienced significant land use conversions, historical water extractions in particular are a highly uncertain quantity.
- Recharge to the Tierra Rejada basin includes deep percolation of precipitation. However, the structural geology of the area's bedrock units, which form the principal aquifers for the basin, suggests the likelihood that the basin's recharge area is not coincident with, and is larger than, the basin's surface watershed. As a result, basin groundwater recharge, which is already subject to considerable potential error, is subject to even greater uncertainty for the Tierra Rejada basin.

- In addition to inputs and outputs, groundwater storage changes comprise the third leg of a water balance analysis. In the Tierra Rejada basin, aquifer storage is very poorly known because: (*i*) the base of the usable aquifer is very poorly defined, and (*ii*) storativity of the bedrock aquifer is mostly unknown, and can vary considerably within a bedrock aquifer.

- Subsurface flow into and out of the Tierra Rejada basin is known only approximately. The uncertainty about this condition is amplified by the dominance of bedrock structure and geology in the basin and the likelihood of significant temporal changes of underflows over the historical record.

Water Level Change Method. An alternative approach to estimating basin yield relies on long-term water level changes to guide an interpretation of basin responses to pumping and basin yield. Variations of this method emphasize periods with no net groundwater level change, and/or the nature of groundwater level changes over a relatively long-term base period that represents at least one full climatic cycle of wet and dry conditions (e.g., Yates et al., 2005; Santa Paula Basin Experts Group, 2003). Because two of the better-known characteristics of the Tierra Rejada basin during the historical record are groundwater levels and precipitation, a Water Level Change (Base Period) method was applied in this study for the evaluation of basin groundwater level changes and implications for yield.

Analysis of precipitation cumulative departure (see "Precipitation" section above) shows three periods during which overall climatic conditions included approximately relatively-equal amounts of wet and dry conditions over at least one full wet-dry climatic cycle. These base periods are developed from daily precipitation records from gauging stations at Lake Bard, Simi and Moorpark, as well as from a station with a longer period of record at Rancho Sespe (Fillmore) (Table 1). The base periods used in this study are (Figure 5): 1944 to 1996/2001; 1958 to 1998; and 1969 to 2006.

There are adequate groundwater level records to examine overall changes in basin water levels during each of these periods of approximately average climatic conditions. In cases where water level conditions are approximately the same at the start and end of the base period, production during this time is considered to be within basin yield. If groundwater levels are lower at the end of the base period, pumping may have been greater than yield.

BASE PERIOD 1944 – 1996/2001. The Fillmore/Sespe Ranch rain gauge experiences somewhat wetter weather (~20 in/yr average) compared with gauges

closer to the Tierra Rejada basin (~15 in/yr in Moorpark, Simi and at Lake Bard). But it is the longest precipitation record in regional proximity to the Tierra Rejada basin and affords perspective on relatively dry conditions that persisted in much of central and southern California during two decades beginning in the mid 1940's. This base period includes the most recent drought ending in 1991 and includes two climatic episodes of wet and dry conditions. The end of the base period can be chosen as 1996, when cumulative departure conditions return to the 1944 benchmark, or 2001 after five additional years with aggregate average precipitation conditions.

During the roughly half century of this base period, groundwater levels experienced declines measuring as much as 150 feet (well 10R1) from 1944 until the 1960's. Groundwater levels then steadily increased, and by 1996 were at or near 1994 levels. During this time, groundwater extractions changed considerably, first with the onset of significant new farming in the basin during the 1940's and 1950's, and then later with a reduction in agricultural groundwater extractions (Schaaf, 1998). A small amount of imported water was also added to basin supply beginning in the 1960's. In total, on average over the full base period, extractions have been accommodated by basin replenishments without significant change to groundwater levels, and the average extraction rate appears to be approximately within the basin yield.

BASE PERIOD 1958 – 1998. Detailed precipitation in Moorpark is known only from about 1950 to present, but includes a 40-year period from 1958 to 1998 with significant wet and dry periods. For groundwater wells with an adequately long period of record, this base period is characterized by an overall increase in groundwater levels in all parts of the basin, suggesting that over this period of approximately average climatic conditions, average basin pumping was less than yield.

BASE PERIOD 1969 – 2006. Near the southern basin boundary, a precipitation station at Lake Bard has recorded daily rainfall since 1966. During a base period of almost 30 years beginning in 1969, the station experienced many dry years through 1977, the regional drought during 1986-1991, and a number of relatively wet years during the 1990's.

This base period experienced the introduction of imported water to the basin (together with utilization of Lake Bard for regional water supply management) and, beginning the 1990's, new groundwater production from the District's well in the basin. Groundwater levels during the full base period experienced an overall increase in groundwater levels in all parts of the basin, suggesting that over this

period of approximately average climatic conditions, average basin pumping was less than yield.

IMPLICATIONS FOR BASIN YIELD

With changes to basin water supply (from imported water and previous wastewater treatment plant discharges) and particularly because of potentially significant but unknown historical changes in the amount of groundwater extractions, only general statements are warranted with regard to long-term pumping relative to basin yield. However, long-term base periods are still informative with regard to basin aquifer response. Using the longest available base period available (1944-1996/2001), which includes two complete sets of drought and recovery, groundwater levels are clearly able to rebound from periods of relative depletion, and apparently without adverse physical damage to the basin (such as from subsidence or influx of poor-quality groundwater).

Because the base period captures elements of both wet and dry climate cycles, full recovery of groundwater levels from the beginning to the end of the 1944-1996/2001 period demonstrates that the long-term average groundwater production during this time can be accommodated by the long-term basin recharge. The average production rate in this evaluation incorporates both long-term changes in groundwater pumping rates as well as increases to basin recharge and yield from imported water, through wastewater treatment plant discharges (which ended approximately 7 years ago) and any irrigation return flows.

Recent Basin Responses

Basin water level changes during the last decade are of special interest because the District has been producing an average of 540 afy from its well in the basin during the last five years, with average production of 470 afy since regular pumping began in 1997 (Figure 2D). Average annual precipitation at Lake Bard from 1997 to 2008 was 15.0 inches, slightly less than the full station record (15.1” from 1967 to 2008) or the base period average (15.3” from 1969-2006).

Since 1997, groundwater level declines are observed at the District’s and others’ wells, but eastern and southern areas of the basin have experienced little change in groundwater levels (e.g., wells 14P1 and 12M3; Figure 2). In the eastern Tierra Rejada basin, relatively stable or even rising groundwater levels are similar to recent water level behavior in western Simi Valley basin. While surface flow from Simi Valley toward Moorpark and Las Posas basin occurs along Arroyo Simi to the north of Tierra Rejada basin, there may exist subsurface flow in the bedrock aquifers from Simi to Tierra Rejada basin.

At the western margin of Tierra Rejada basin, fluctuations in groundwater levels at the District well are well-correlated with changes in production rates (Figure 2D; see, for example, water level responses during increased pumping in 2006). To some degree, water level changes here also reflect the cumulative departure curve for precipitation (Figure 2B). In this context, it appears that standard basin management practices could be used to ameliorate local pumping depressions or potentially also to accommodate increased basin production without long-term adverse effect in the Tierra Rejada basin.

DISCUSSION

This study makes three principal findings about groundwater yield of the Tierra Rejada basin, as well as a range of related findings important to the determination and further quantification of basin yield. Principal conclusions concerning yield are:

- Groundwater levels observed over a long-term base period including two complete wet-dry climatic cycles shows that average groundwater production was within the basin yield over the period 1944-1996.
- Current and recent conditions indicate that existing production and possibly new production can be managed within basin yield.
- An increase in basin yield may be possible by active management of basin storage and pumping distribution.

Principal, related findings concerning determination of basin yield are:

- Bedrock structural geology strongly suggests that the watershed boundary – traditionally used as the boundary for recharge from precipitation – does not adequately encompass a potentially larger bedrock recharge area hydraulically connected with the principal producing aquifer zones in the Tierra Rejada basin.
- In the western portion of the basin, long-term climatic trends are readily observed in corresponding changes in the basin's groundwater levels, over a wide range of pumping and precipitation conditions.
- In the eastern portion of the basin, long-term groundwater levels have exhibited more subdued response to climatic cycles, and are now at or near historic high levels.

- Limited water quality data for the basin show increases in TDS, chloride and sulfate during the last 10 years; concentrations are within drinking water standards. Nitrate concentrations in 2008 exceeded the drinking water standard for four wells in the central portion of the Tierra Rejada basin.

- Aquifer depth is poorly constrained and aquifer thickness may be greater than previously recognized, particularly in permeable structural zones that act as principal conduits for groundwater at depth.

Previous reports have estimated different components of a water balance, but none have estimated basin yield (e.g., Schaaf, 1998; DWR, 2004), nor made reliable groundwater production estimates for the basin.

ASSESSMENT OF POTENTIAL IMPACT – PROPOSED NEW DISTRICT WELL

As discussed above, it is possible that the Tierra Rejada basin can accommodate additional groundwater extractions within long-term basin yield. The District's proposed new well offers both opportunities and uncertainties in this regard:

- The closest known well – 14P1 – has experienced little water level change over many decades and is now at or near historic high water level (Figures 2A and 2I).

- It is unknown if production from the proposed well would result in total basin production greater than or less than the historical average over the base period 1944-1996 (refer to discussion in previous section).

- Well interference is possible from a new production well at the proposed District site, in addition to potential impacts of general water level lowering associated with potential pumping in excess of basin yield. In this regard, wells 14P1 and 14R1 are the closest existing wells that might be impacted (and could be used for monitoring). Based on the aquifer test results from Schaaf (1998), anticipated impacts from a new pumping well on water levels at these well sites are on the order of several feet or less.[*]

[*] Unfortunately, Schaaf's pumping test was not able to record any water levels in the pumping well (the District supply well), nor in the observation well after the first 12 hours of test production. Based on the available data, the observation well, which is ~130 feet from the District supply well, was estimated to have experienced a total water level decline of 40 feet during approximately 30 hours of pumping at a

- With an existing well in the basin, the District's proposed additional well may afford some flexibility for managing basin pumping stresses, depending on well production characteristics and District infrastructure interconnections and capacities.

RECOMMENDATIONS

For more quantitative evaluation of hydrologic characteristics of the basin, three recommendations follow logically from the results of this study:

- Estimates of historical groundwater production would be useful for gauging relative basin pumping stress over time. Such estimates would likely be most reliably derived from historical aerial photographs, if available, together with regional crop water use characteristics.

- Regular monitoring of a few additional, existing groundwater wells would improve understanding of basin-wide groundwater levels and gradients (assuming such wells can be accessed and are suitable for testing and instrumentation). Regular water quality sampling should be continued, particularly at locations with known water quality impacts (e.g., nitrate).

- Further quantitative analysis of any potential well interference between the District's proposed new production well and other wells could be conducted, and nearby existing wells in this portion of the basin could be instrumented for detailed monitoring.

constant rate of ~1,100 gpm. For comparison, the District's proposed new wellsite is approximately 1,500 feet or more from the nearest wells (e.g., 14P1 and 14R1).

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Schaaf, J.P., 1998, Hydrogeology of the Tierra Rejada groundwater basin, Ventura County, California: MS Thesis, CSU-Northridge, 141 p.

Todd, D.K., and L.W. Mays, 2005, Groundwater Hydrology (Third Edition). John Wiley & Sons, 636 p.

Ventura County Watershed Protection District, 2008, Annual Report of the Water and Environmental Resources Division, Groundwater Section, 137 p.

Yates, E.B., M.B. Feeney and L.I. Rosenberg, 2005, Seaside groundwater basin – update on water resource conditions. Report for Monterey Peninsula Water Management District, 123 p.

APPENDIX A – CONFIDENTIAL SUPPORTING INFORMATION (WELL COMPLETION REPORTS)

Water well drillers' construction/completion reports were acquired for the following wells in the study area:

2N-19W- 14D1, 14P1

2N-19W- 15B1, 15F2, 15G1, 15H1, 15H2, 15H3, 15M1, 15N1, 15N2, 15N3**, 15Q1

2N-19W- 10R1, 10R2

2N-19W- 11J1, 11J2, 11J3*

2N-19W- 12F1, 12F2, 12F3, 12F4, 12M1, 12M2*, 12M3, 12M4, 12N1*, 12N2*, 12P1

2N-19W- 21C1, 21C2, 21F2, 21H1

*Only the well "index card" was available from DWR.

**Curiously, the District's existing well – 15N3 – was not among those DWR provided for section 15. I have seen this well mislabeled elsewhere as being in range 20W, and it may be similarly misfiled at DWR. For this study, well completion information for this well was provided by the District; borehole electric and acoustic logs are reproduced in Schaaf (1998).

Table 1. Precipitation stations used for base period analysis.

Station	*Period of Record (Water Year)*	*Base Period*	*Base Period Average Annual Precipitation (in)*
Fillmore / Rancho Sespe	1913-2003	1944-1996/2001	18.8
Moorpark Everett	1956-Present	1958-1998	14.5
Lake Bard	1967-Present	1969-2006	15.3

Figure 1A. Map showing the Tierra Rejada alluvium-bedrock boundary, surface watershed and nearby groundwater basins.

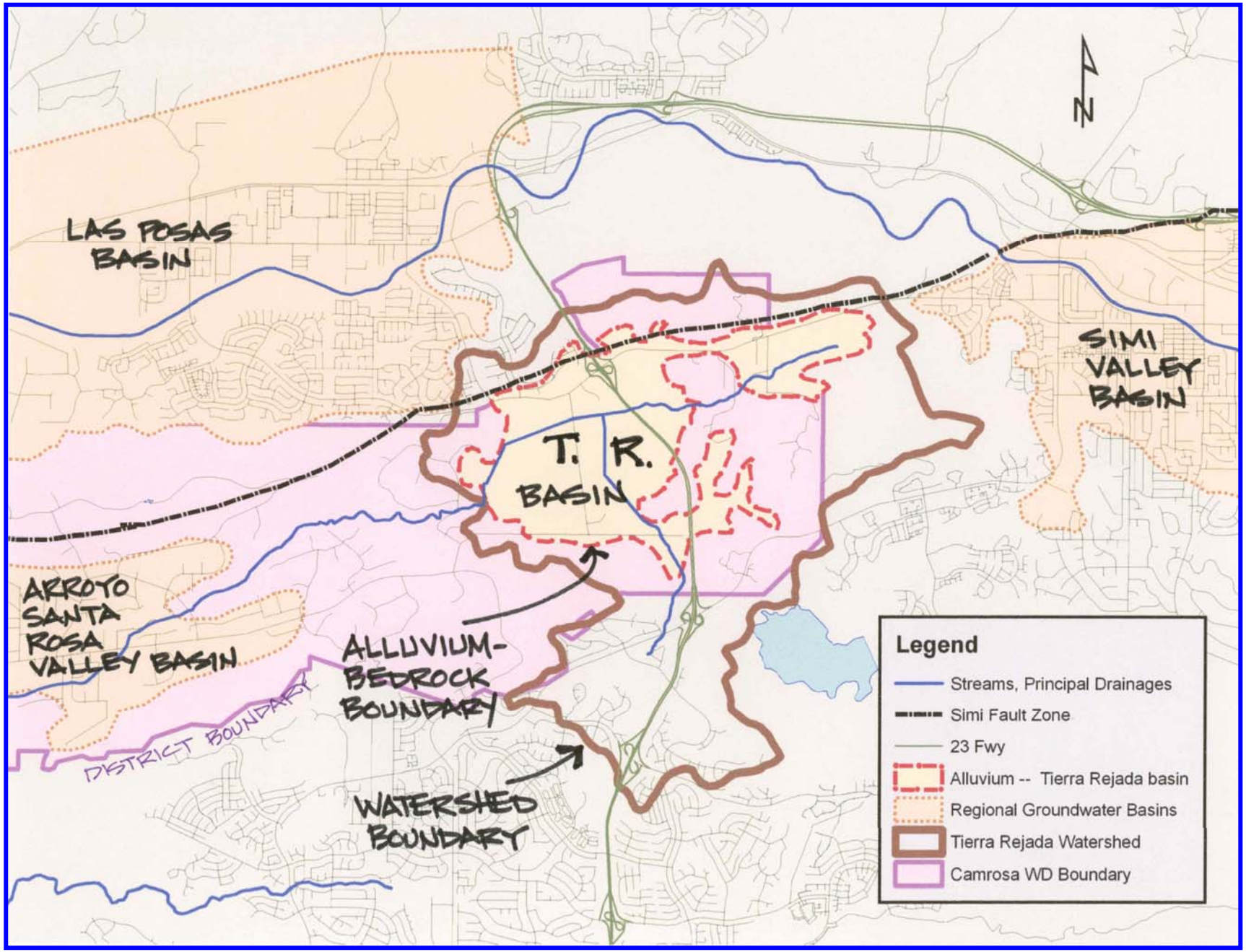

Figure 1B. Tierra Rejada basin map showing groundwater wells.

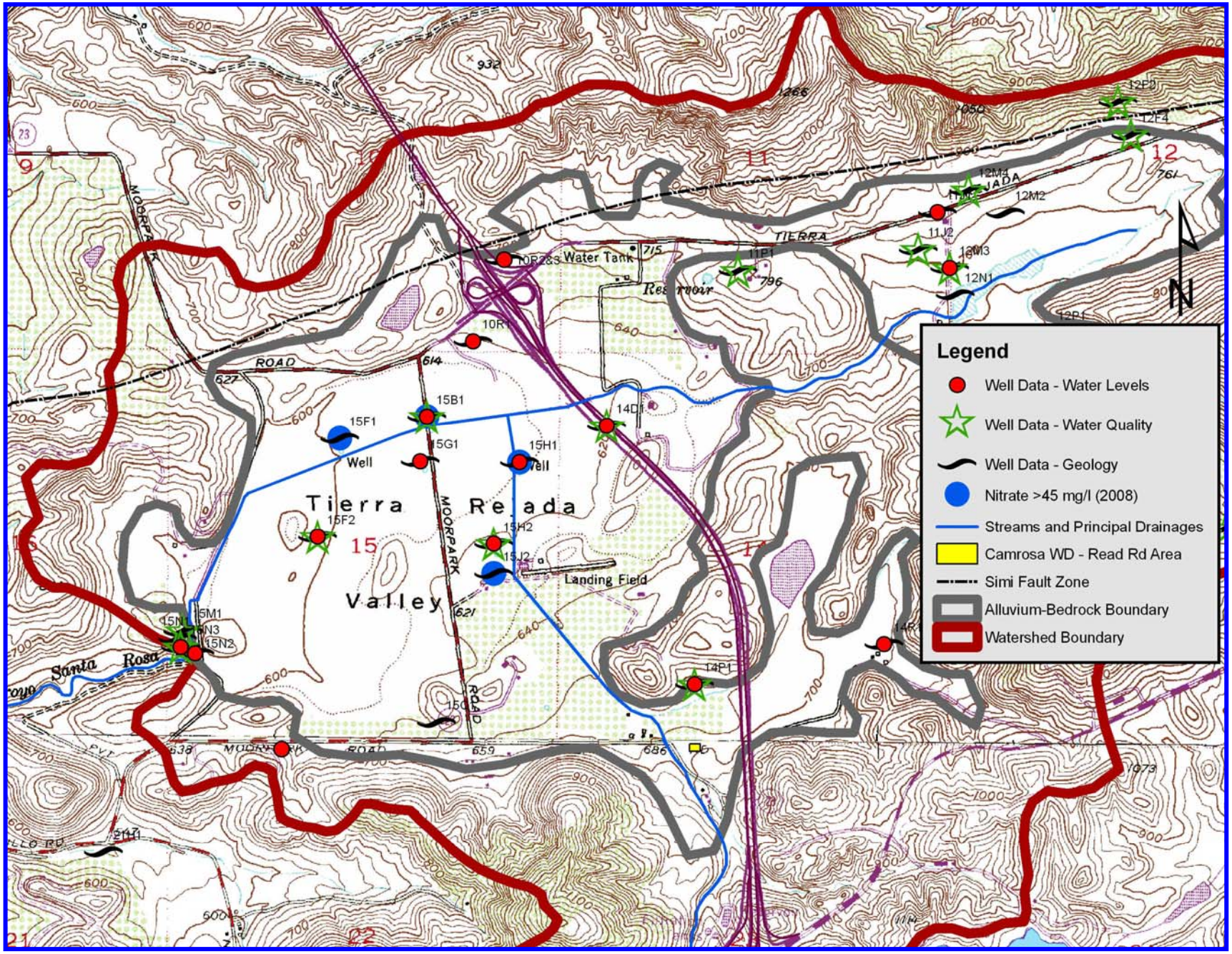

Figure 2. Water level hydrographs for the Tierra Rejada basin. See Figure 1B for well locations.

2A: Water level hydrographs for several wells in the basin.

2B: Water level hydrographs for several wells in the basin, showing also cumulative departure of precipitation.

2C: Water level hydrographs for several wells in the basin, showing also cumulative departure of precipitation and base periods selected for study.

2D: Hydrograph for District well 15N3, showing also monthly production.

Figures 2E – 2: Individual hydrographs for all wells with historical water level data. All are plotted at the same vertical and horizontal scale.

2E: Hydrograph for well 10R1.

2F: Hydrograph for well 11J1.

2G: Hydrograph for well 12M3.

2H: Hydrograph for well 14D1.

2I: Hydrograph for well 14P1.

2J: Hydrograph for well 14R1.

2K: Hydrograph for well 15B1.

2L: Hydrograph for well 15F2.

2M: Hydrograph for well 15G1.

2N: Hydrograph for well 15H1.

2P: Hydrograph for well 15H2.

2Q: Hydrograph for well 15N2.

2R: Hydrograph for well 15N3.

Figure 2A

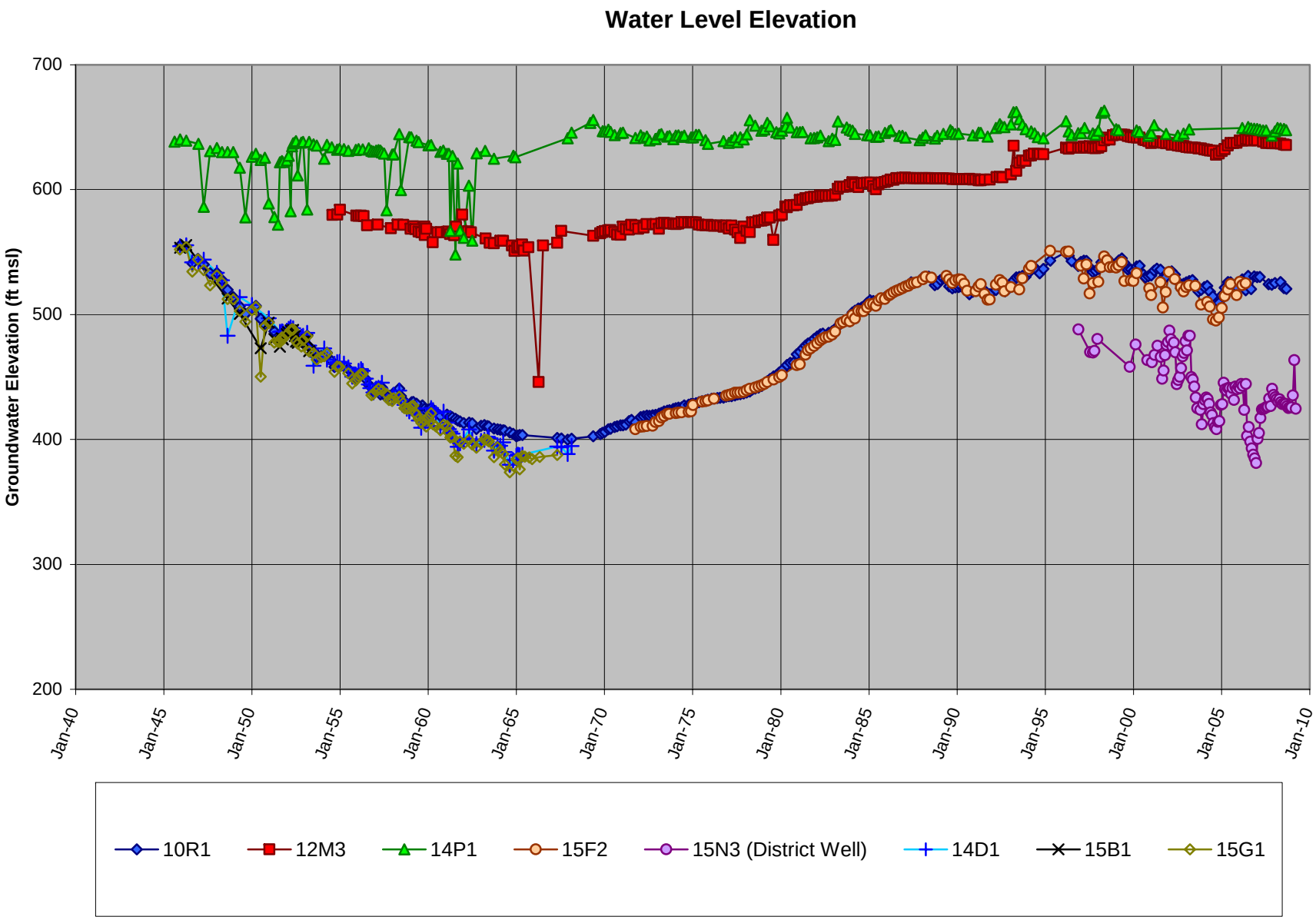
Water Level Elevation
Groundwater Elevation (ft msl)
700
600
500
400
300
200
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
10R1
12M3
14P1
15F2
15N3 (District Well)
14D1
15B1
15G1

Figure 2B

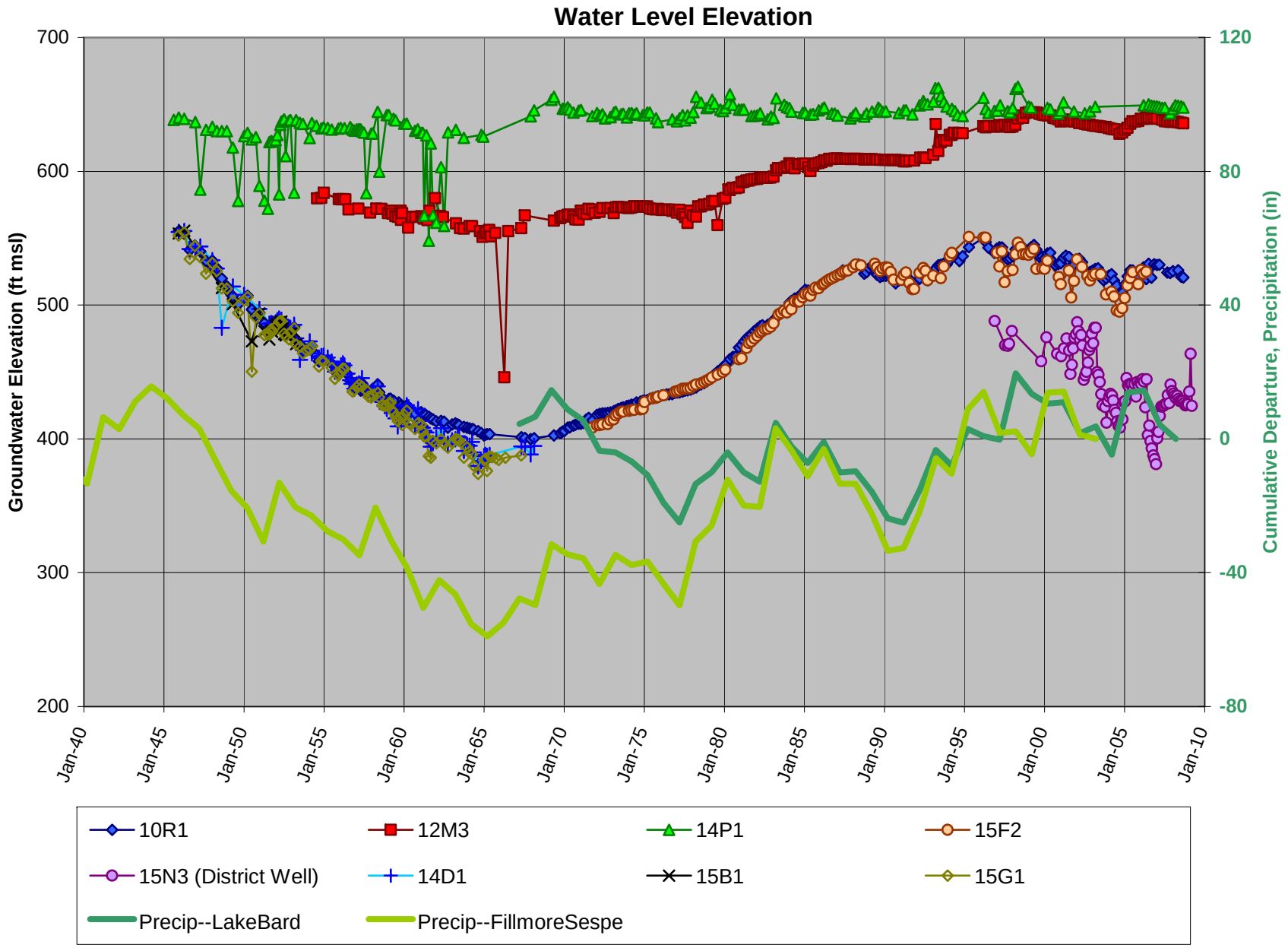
Water Level Elevation
Groundwater Elevation (ft msl)
Cumulative Departure, Precipitation (in)
700
600
500
400
300
200
120
80
40
0
-40
-80
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
10R1
12M3
14P1
15F2
15N3 (District Well)
14D1
15B1
15G1
Precip--LakeBard
Precip--FillmoreSespe

Figure 2C

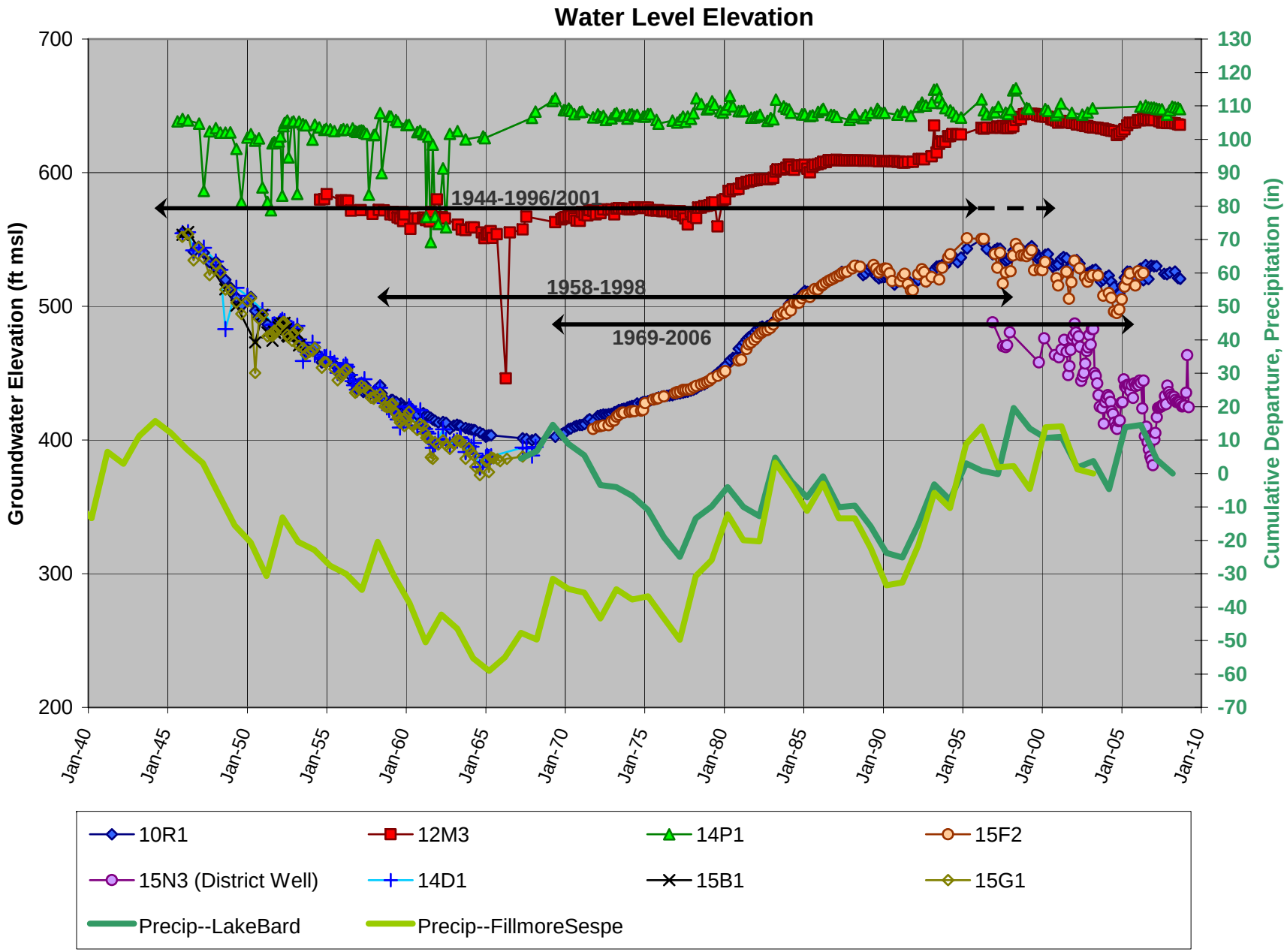
Water Level Elevation
Groundwater Elevation (ft msl)
Cumulative Departure, Precipitation (in)
700
600
500
400
300
200
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
1944-1996/2001
1958-1998
1969-2006
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
10R1
12M3
14P1
15F2
15N3 (District Well)
14D1
15B1
15G1
Precip--LakeBard
Precip--FillmoreSespe

Figure 2D

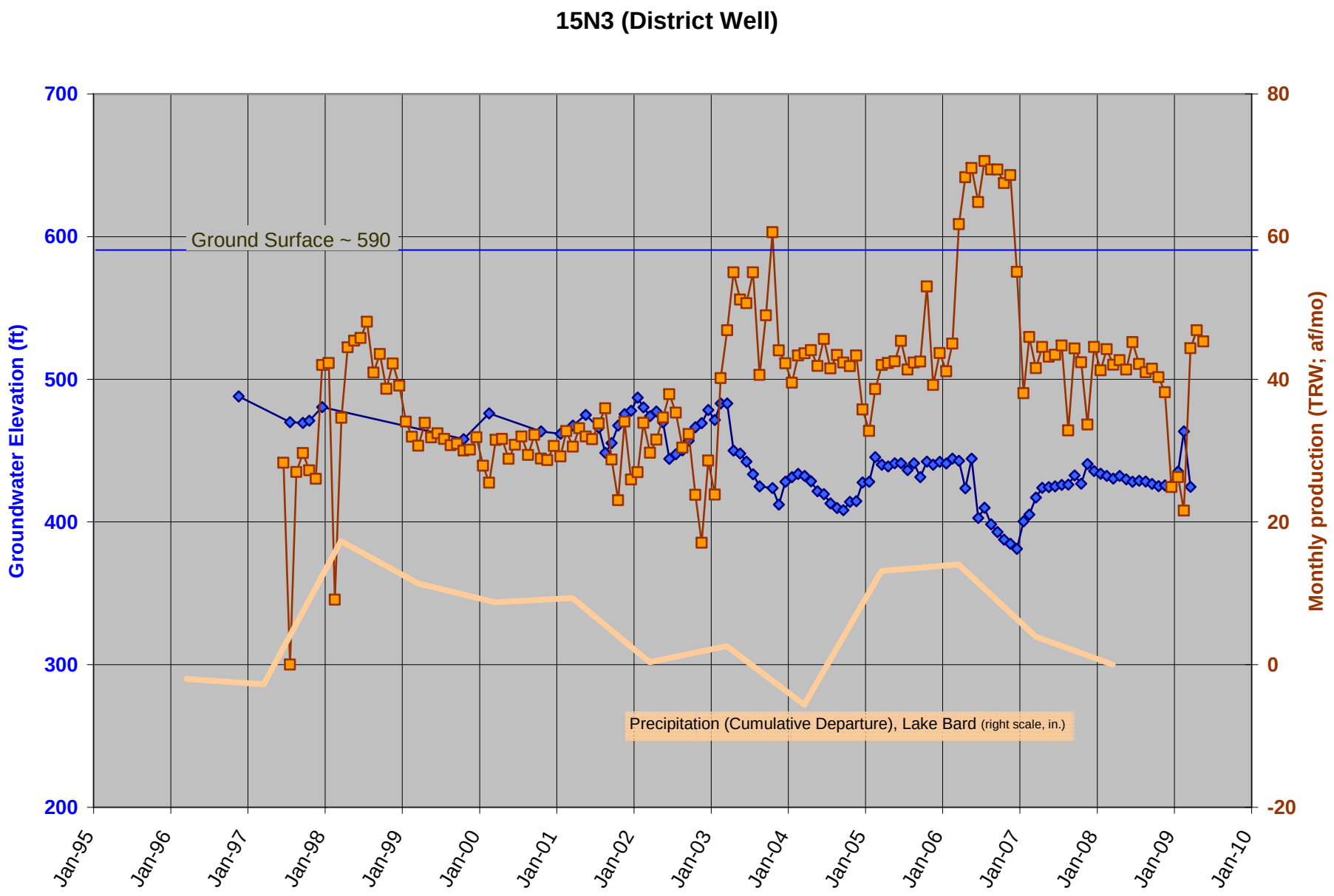
15N3 (District Well)
Groundwater Elevation (ft)
Monthly production (TRW; af/mo)
Ground Surface ~ 590
Precipitation (Cumulative Departure), Lake Bard (right scale, in.)
700
600
500
400
300
200
80
60
40
20
0
-20
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10

Figure 2E

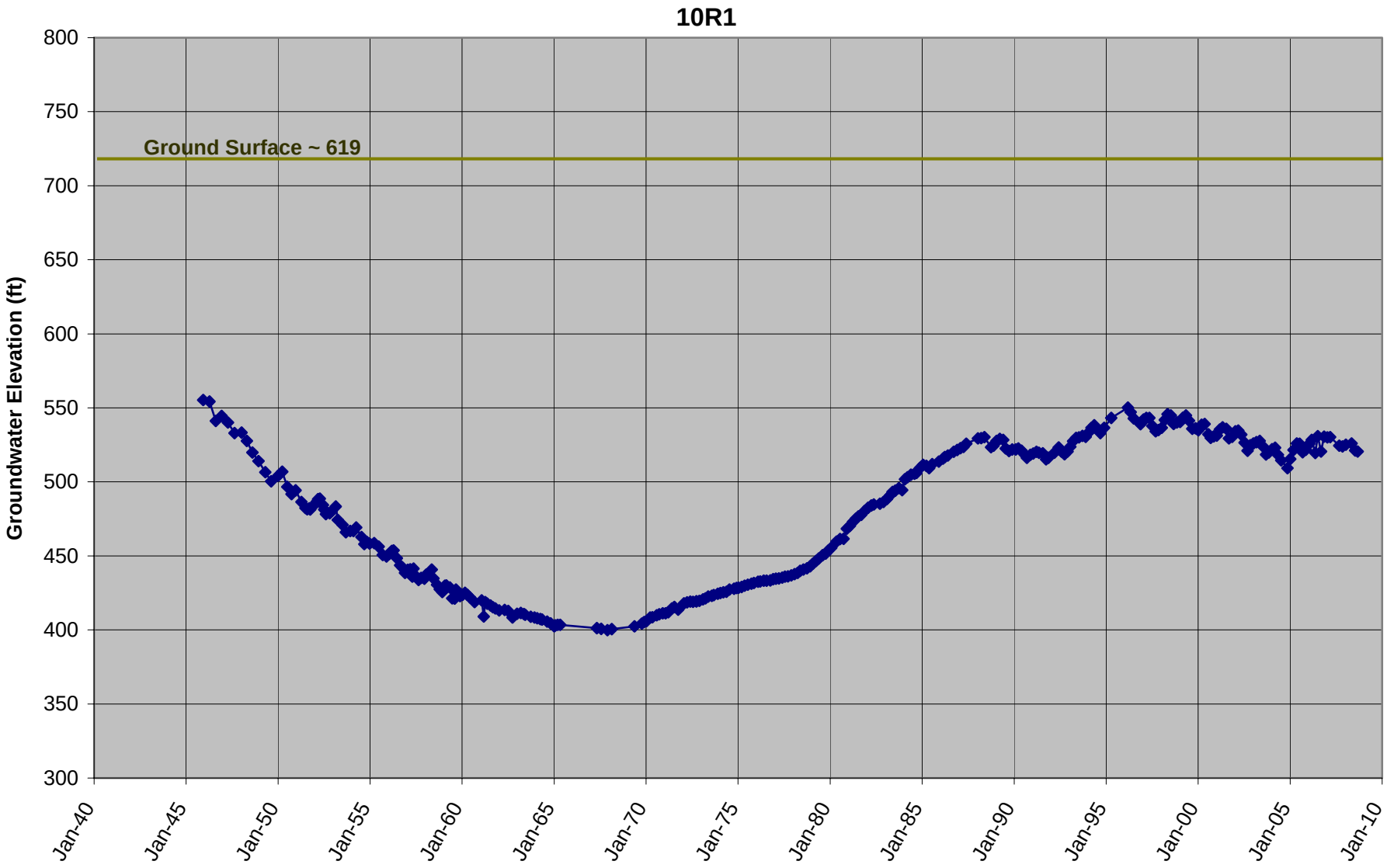
10R1
Ground Surface ~ 619
Groundwater Elevation (ft)
800
750
700
650
600
550
500
450
400
350
300
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 2F

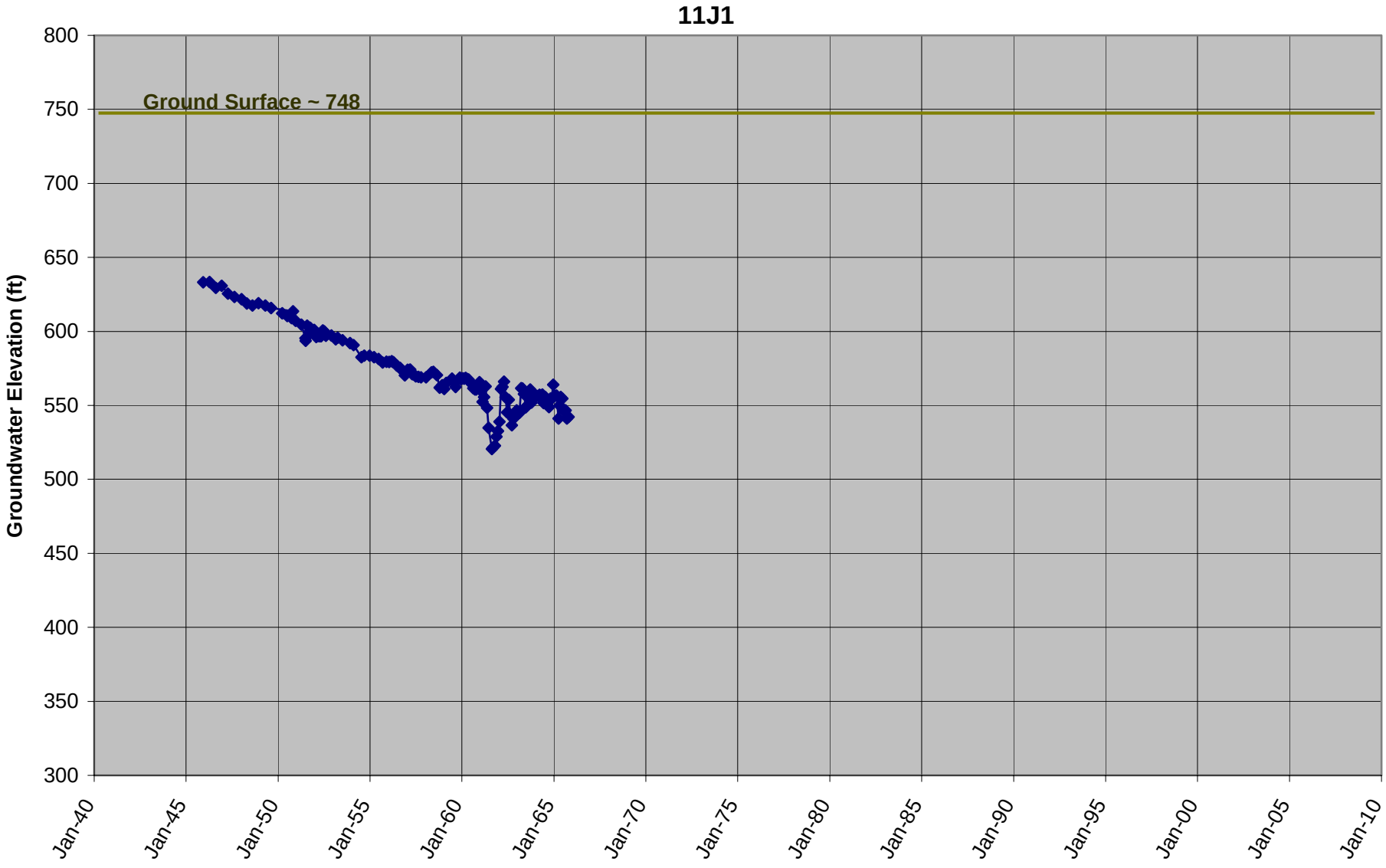
11J1
Ground Surface ~ 748
Groundwater Elevation (ft)
800
750
700
650
600
550
500
450
400
350
300
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 2G

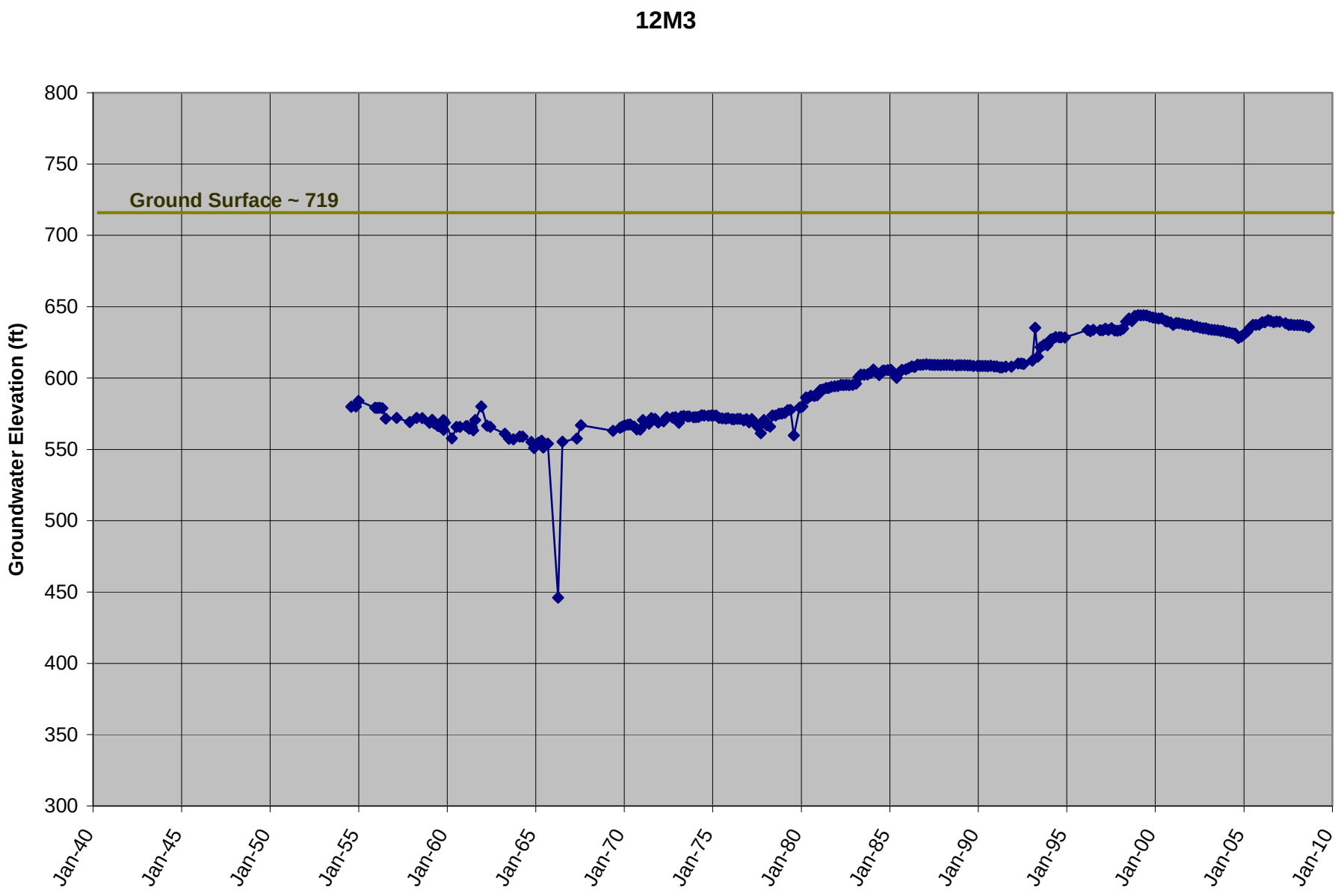
12M3
Ground Surface ~ 719
Groundwater Elevation (ft)
800
750
700
650
600
550
500
450
400
350
300
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 2H

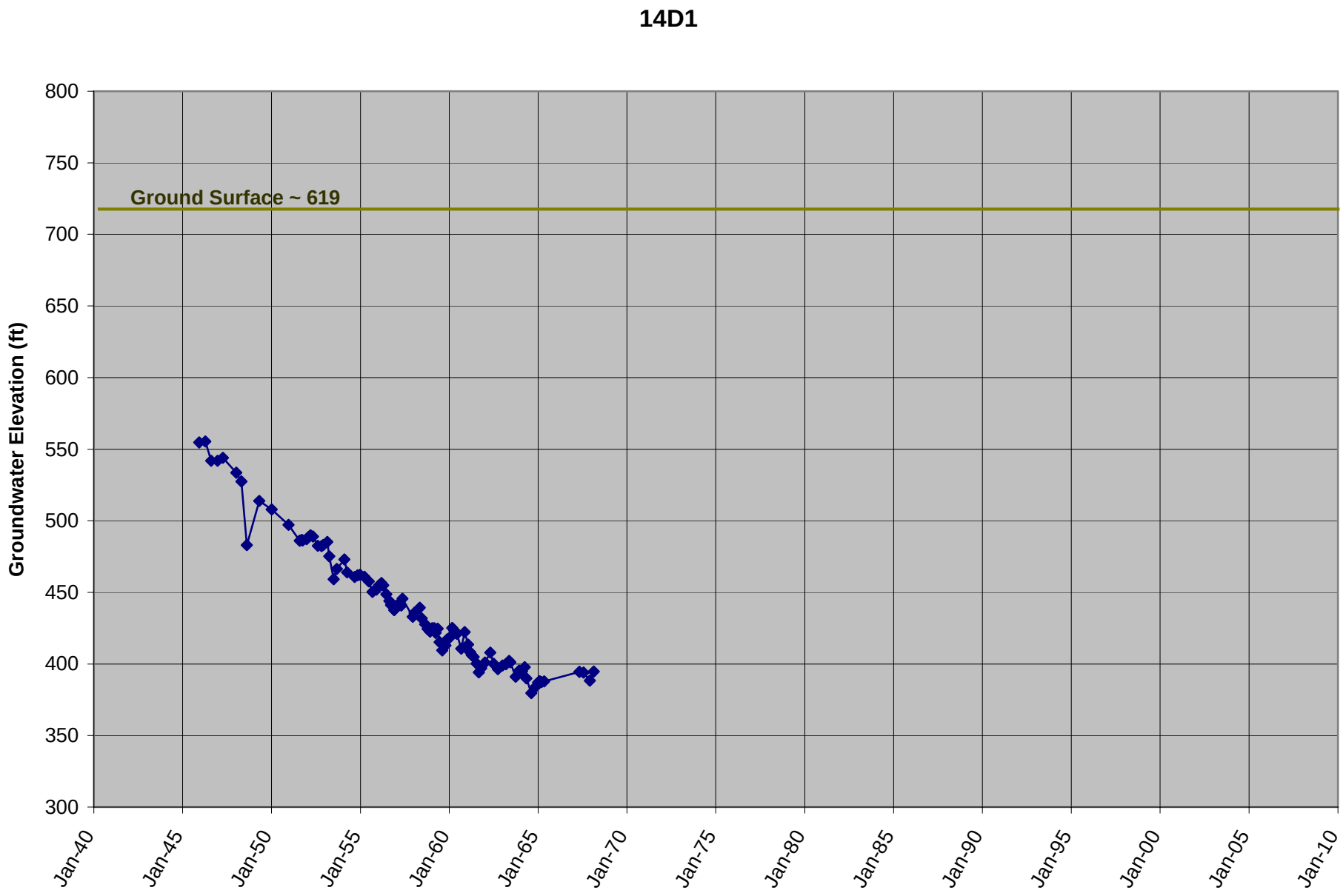
14D1
Ground Surface ~ 619
Groundwater Elevation (ft)
800
750
700
650
600
550
500
450
400
350
300
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 2I

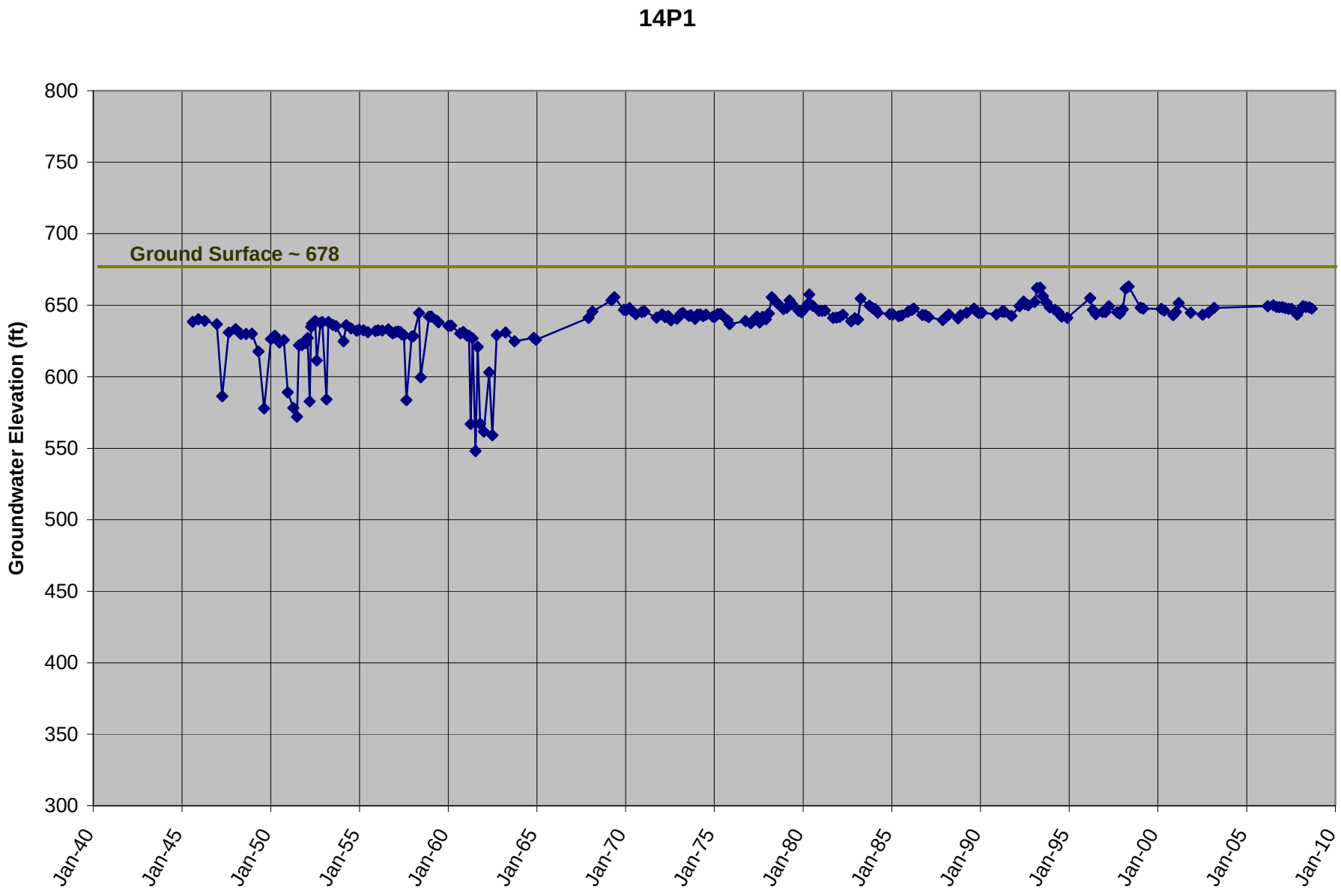
14P1
Ground Surface ~ 678
Groundwater Elevation (ft)
800
750
700
650
600
550
500
450
400
350
300
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 2J

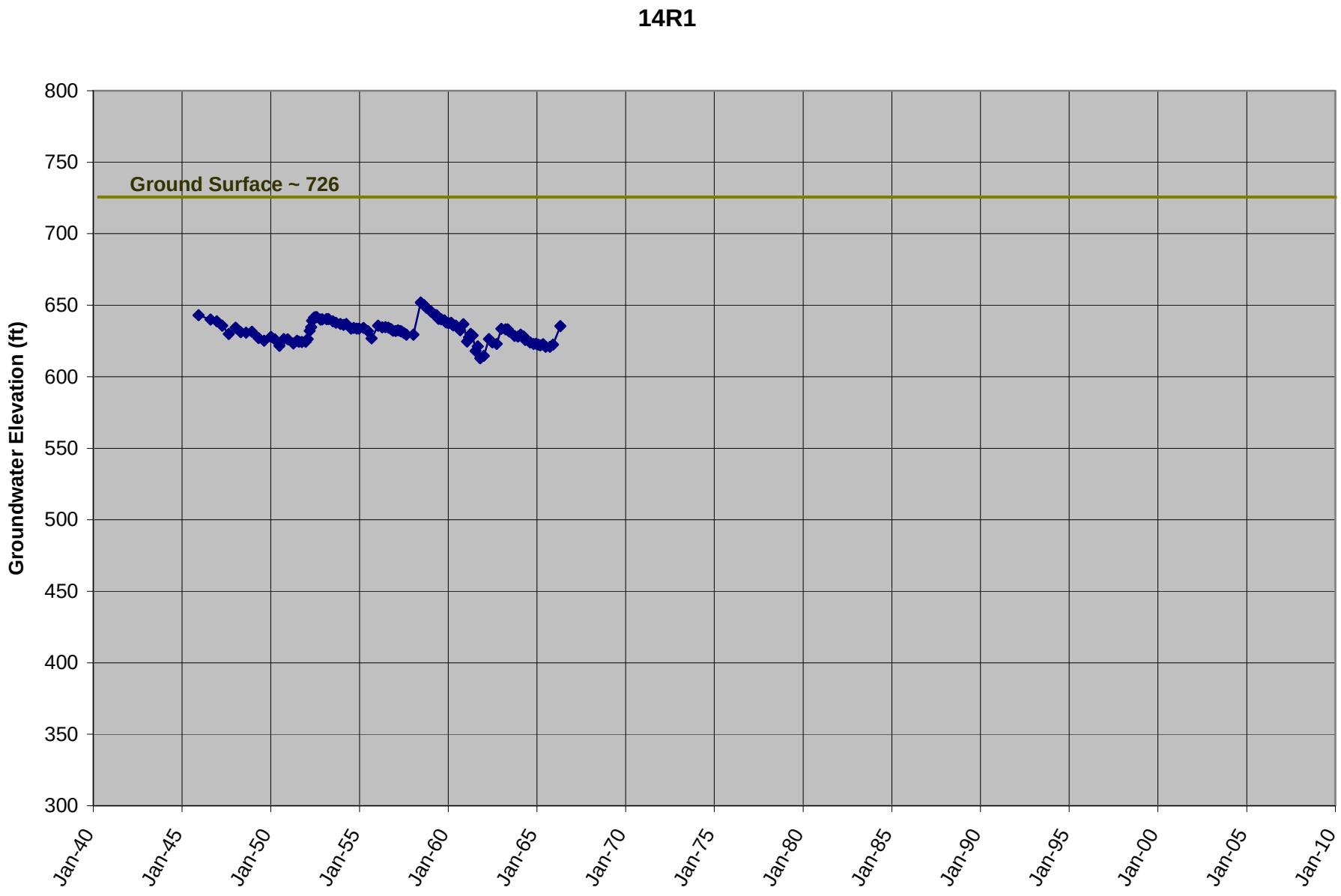
14R1
Ground Surface ~ 726
Groundwater Elevation (ft)
800
750
700
650
600
550
500
450
400
350
300
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 2K

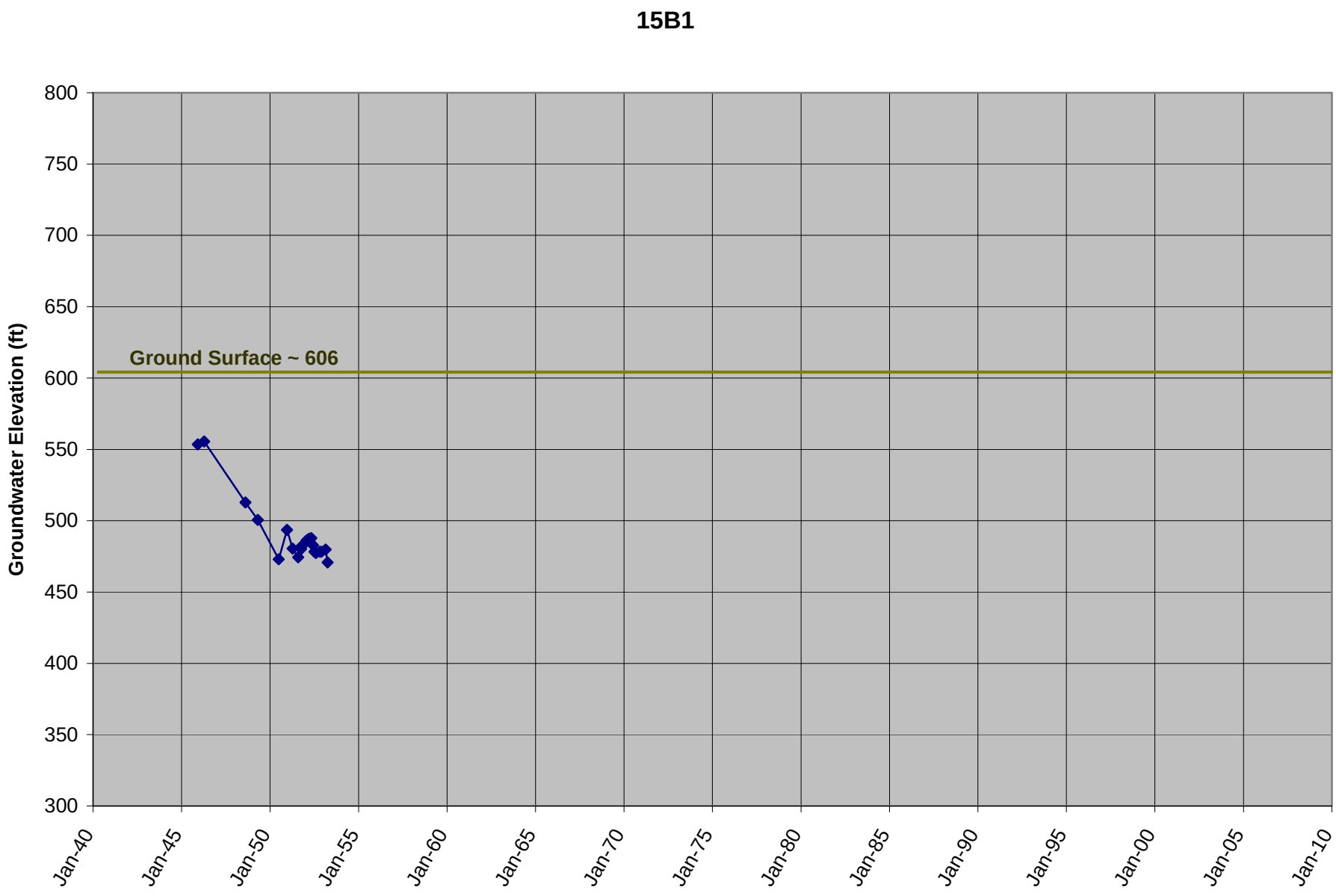
15B1
Groundwater Elevation (ft)
800
750
700
650
600
550
500
450
400
350
300
Ground Surface ~ 606
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 2L

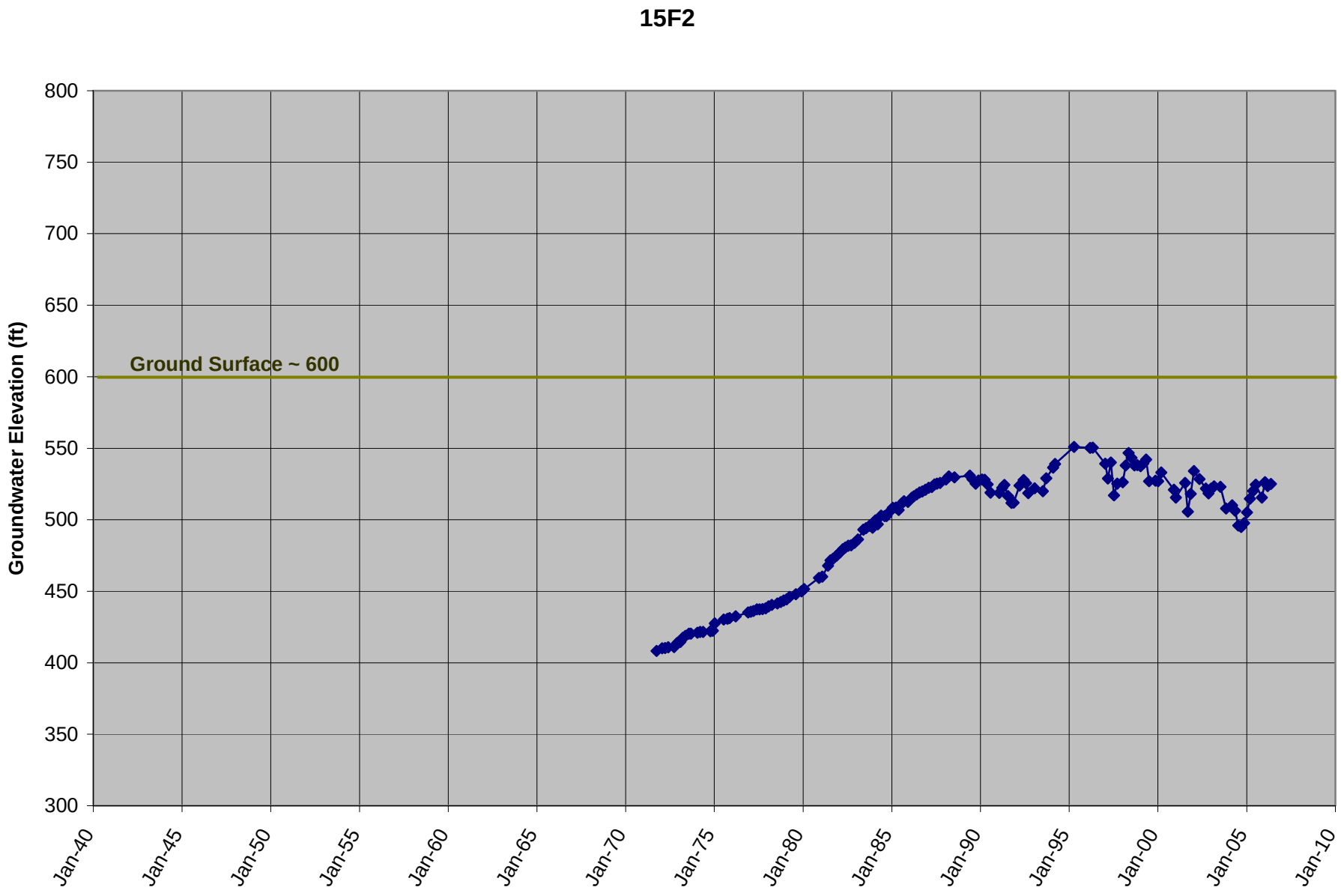
15F2
Groundwater Elevation (ft)
800
750
700
650
600
550
500
450
400
350
300
Ground Surface ~ 600
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 2M

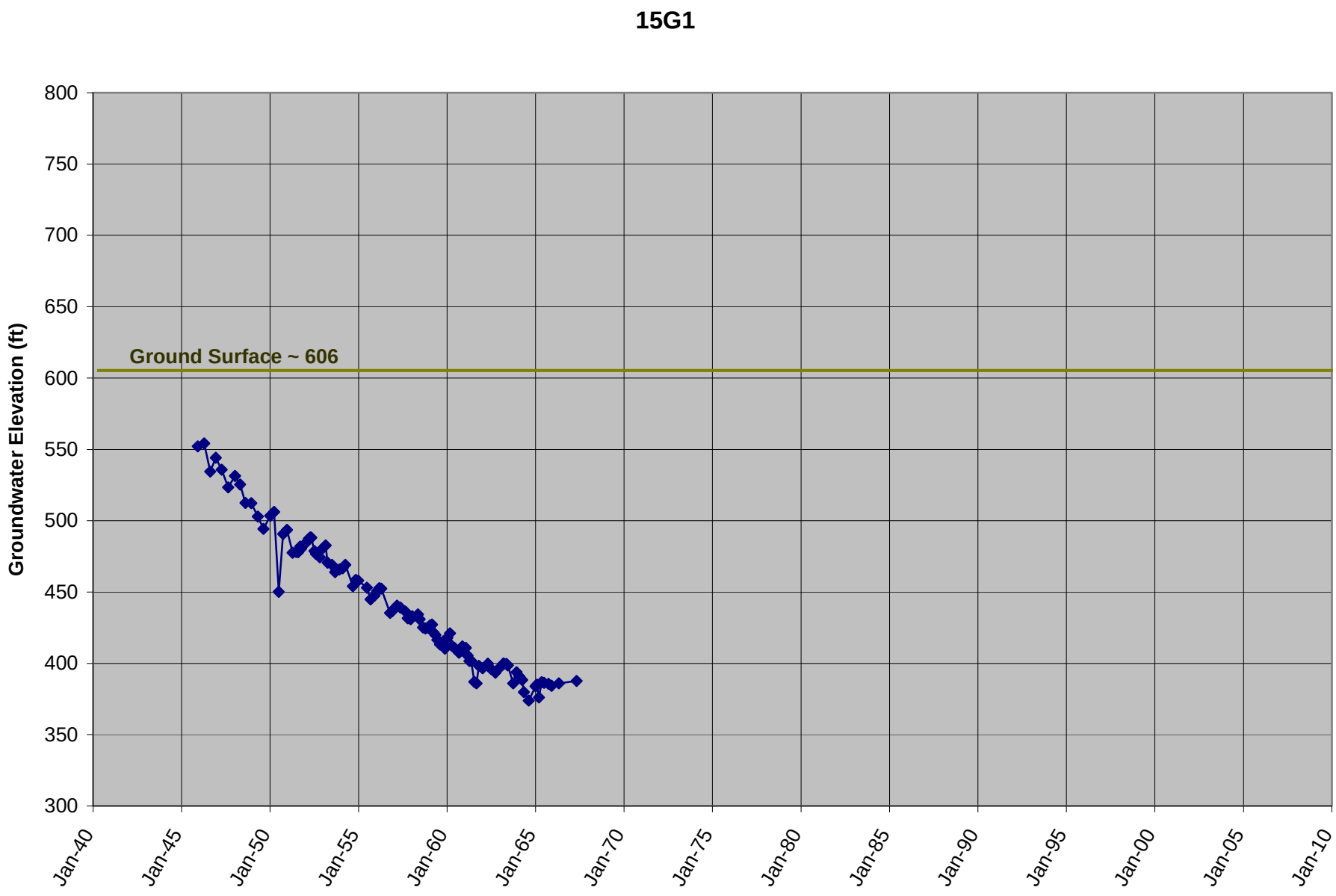
15G1
Groundwater Elevation (ft)
800
750
700
650
600
550
500
450
400
350
300
Ground Surface ~ 606
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 2N

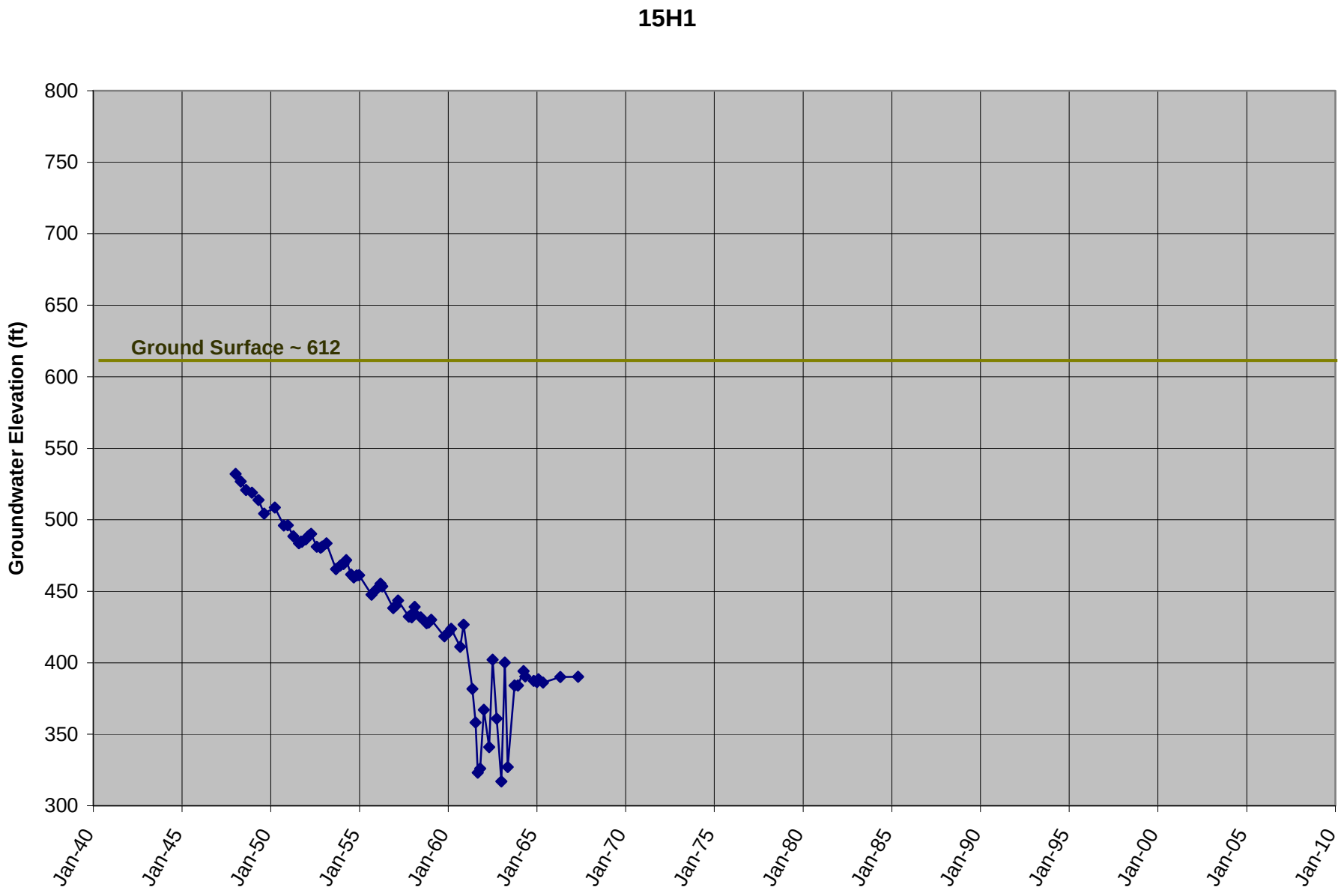
15H1
Groundwater Elevation (ft)
800
750
700
650
600
550
500
450
400
350
300
Ground Surface ~ 612
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 2P

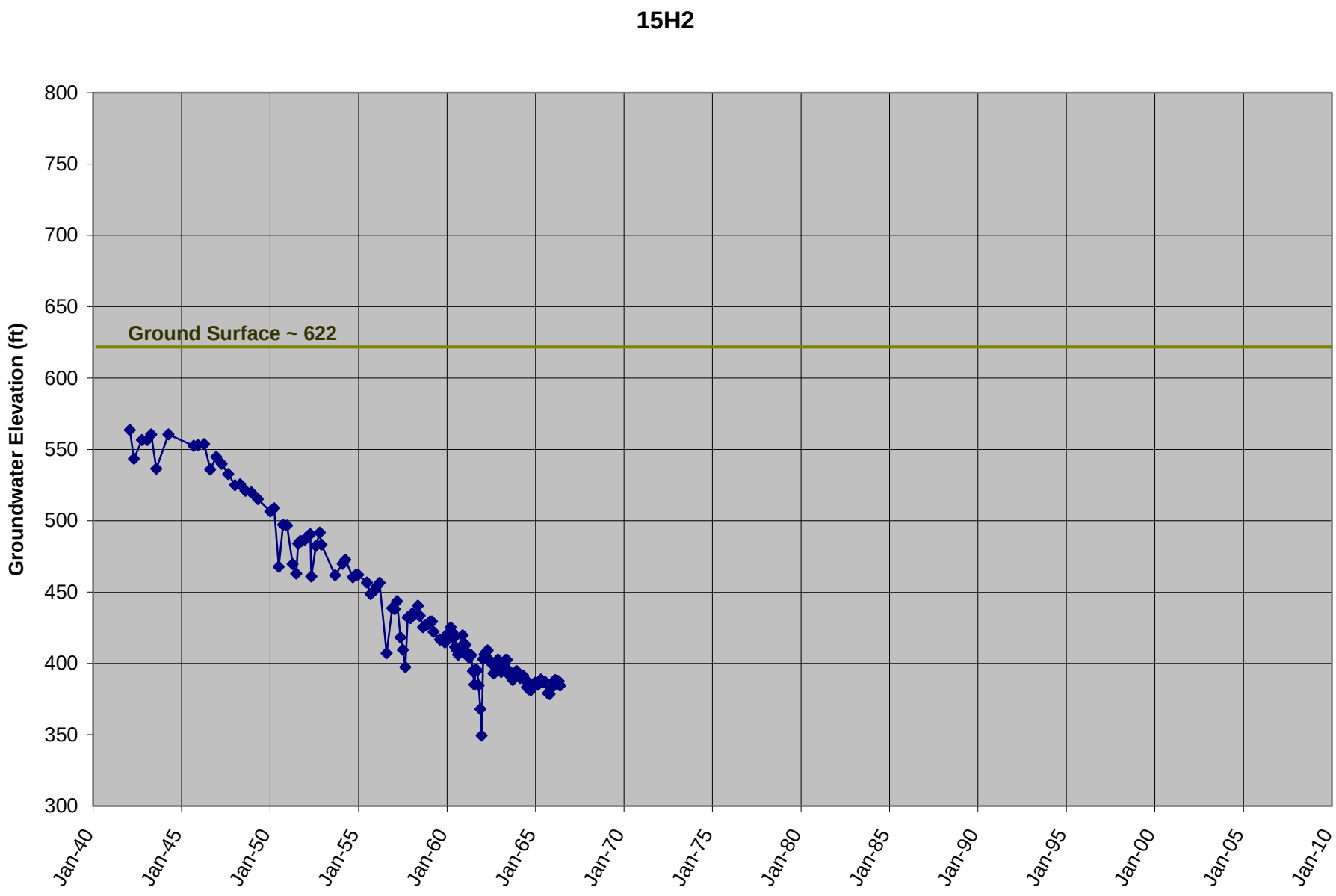
15H2
Groundwater Elevation (ft)
800
750
700
650
600
550
500
450
400
350
300
Ground Surface ~ 622
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 2Q

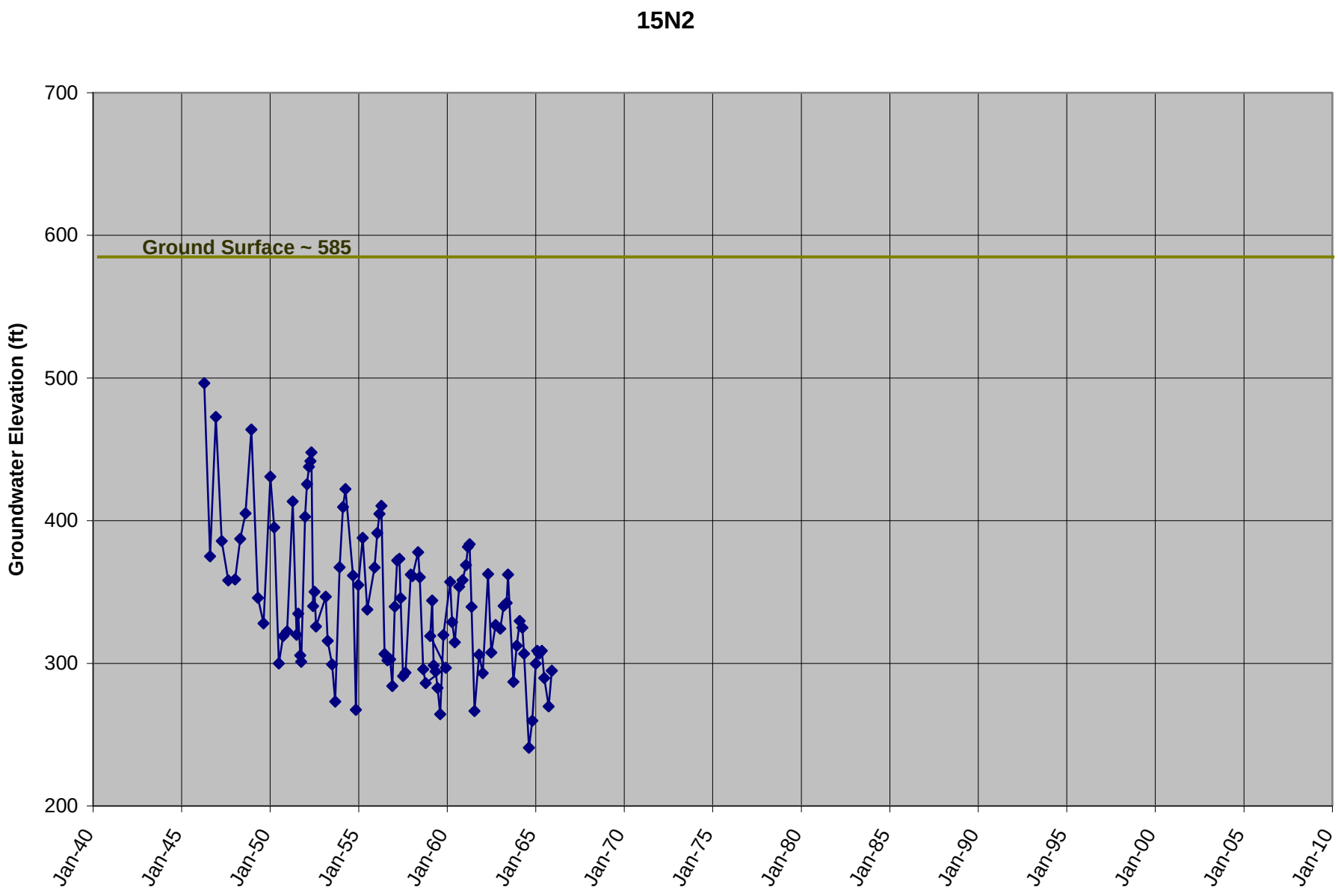
15N2
Ground Surface ~ 585
Groundwater Elevation (ft)
700
600
500
400
300
200
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 2R

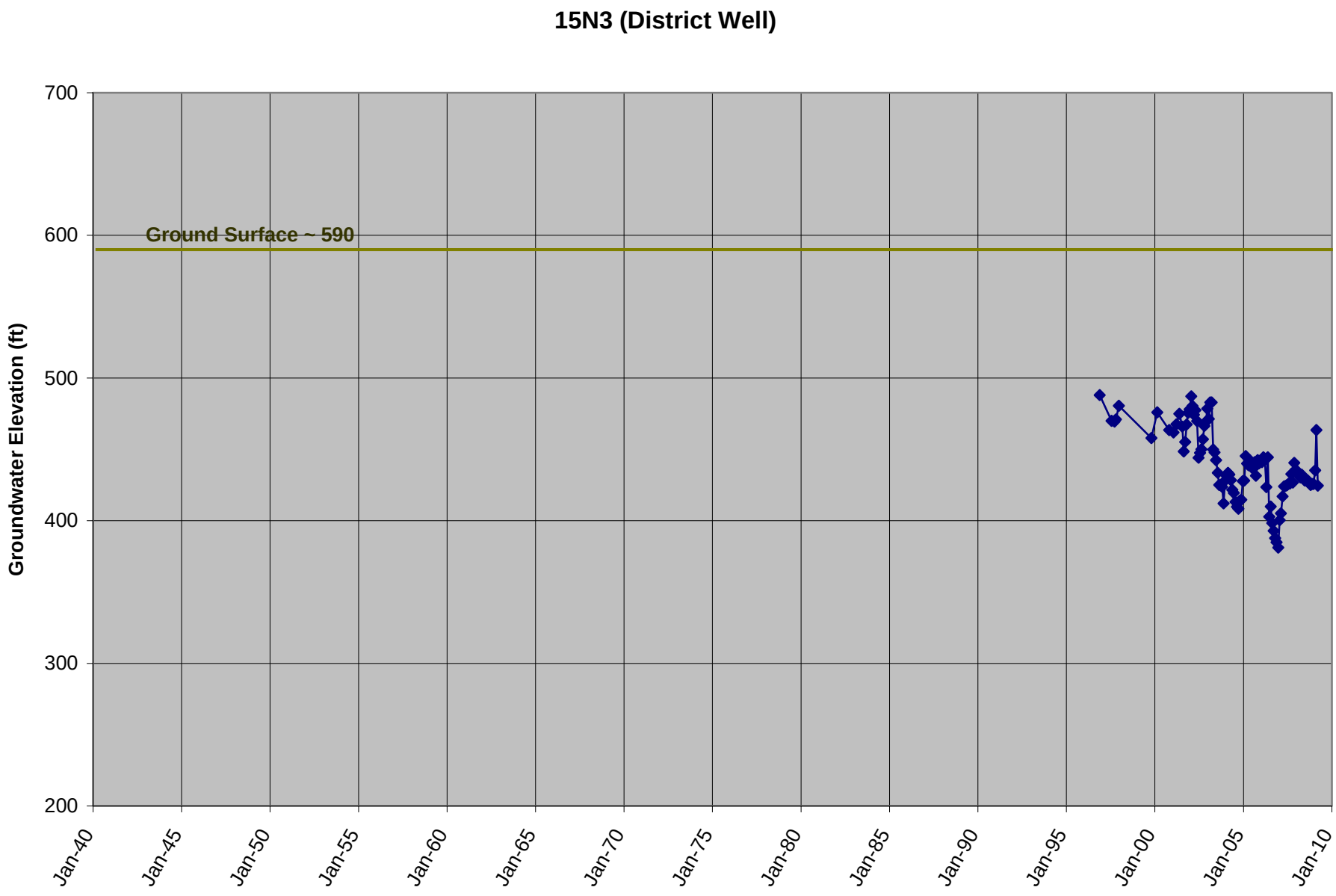
15N3 (District Well)
Ground Surface ~ 590
Groundwater Elevation (ft)
700
600
500
400
300
200
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 3. Water quality hydrographs for the District's Tierra Rejada well (15N3). See Figure 1 for well locations.

3A: TDS.

3B: Nitrate.

3C: Chloride.

3D: Sulfate.

Figure 3A

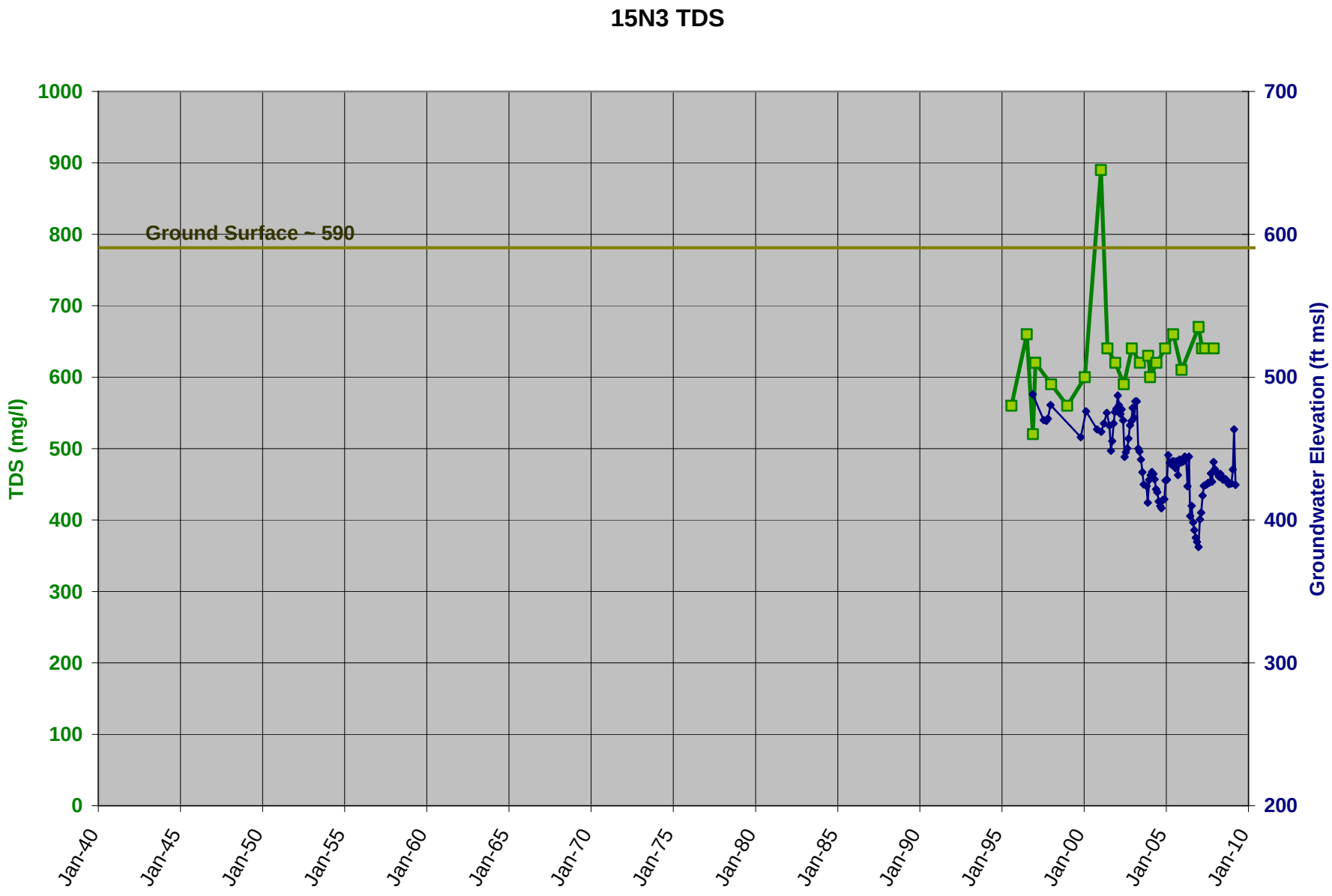
15N3 TDS
Ground Surface ~ 590
TDS (mg/l)
Groundwater Elevation (ft msl)
1000
900
800
700
600
500
400
300
200
100
0
700
600
500
400
300
200
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 3B

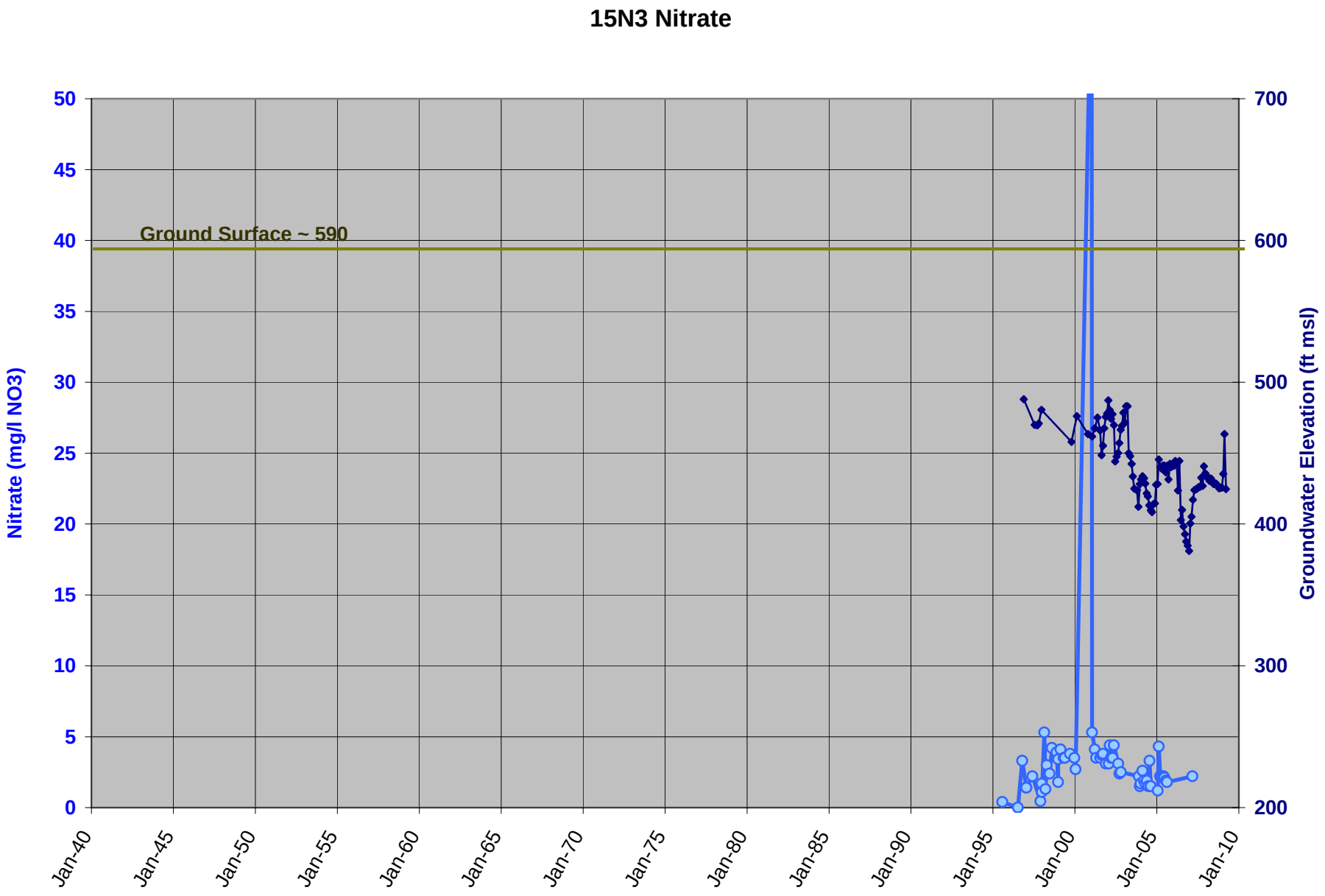
15N3 Nitrate
Ground Surface ~ 590
Nitrate (mg/l NO3)
Groundwater Elevation (ft msl)
50
45
40
35
30
25
20
15
10
5
0
700
600
500
400
300
200
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 3C

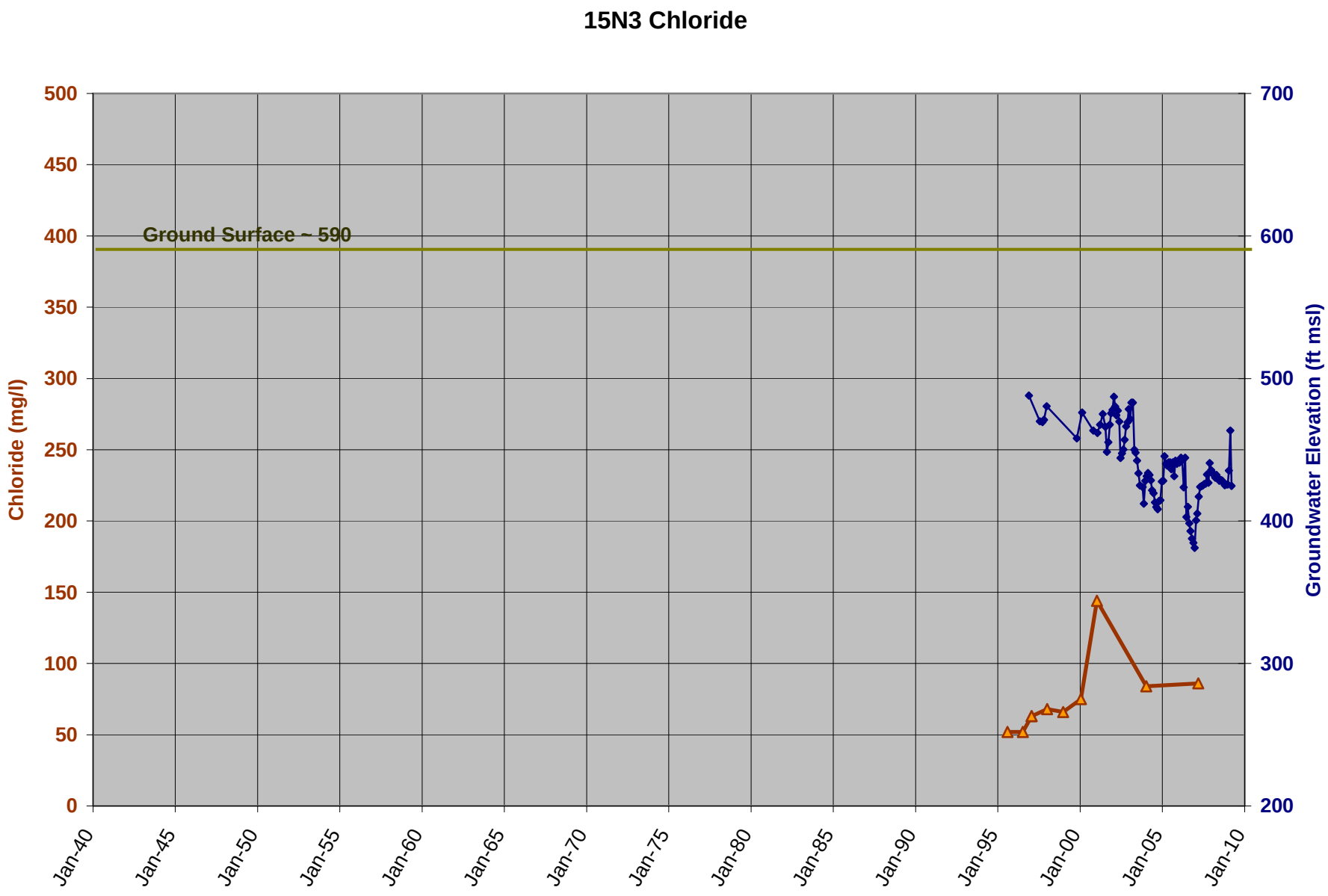
15N3 Chloride
Ground Surface ~ 590
Chloride (mg/l)
Groundwater Elevation (ft msl)
500
450
400
350
300
250
200
150
100
50
0
700
600
500
400
300
200
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 3D

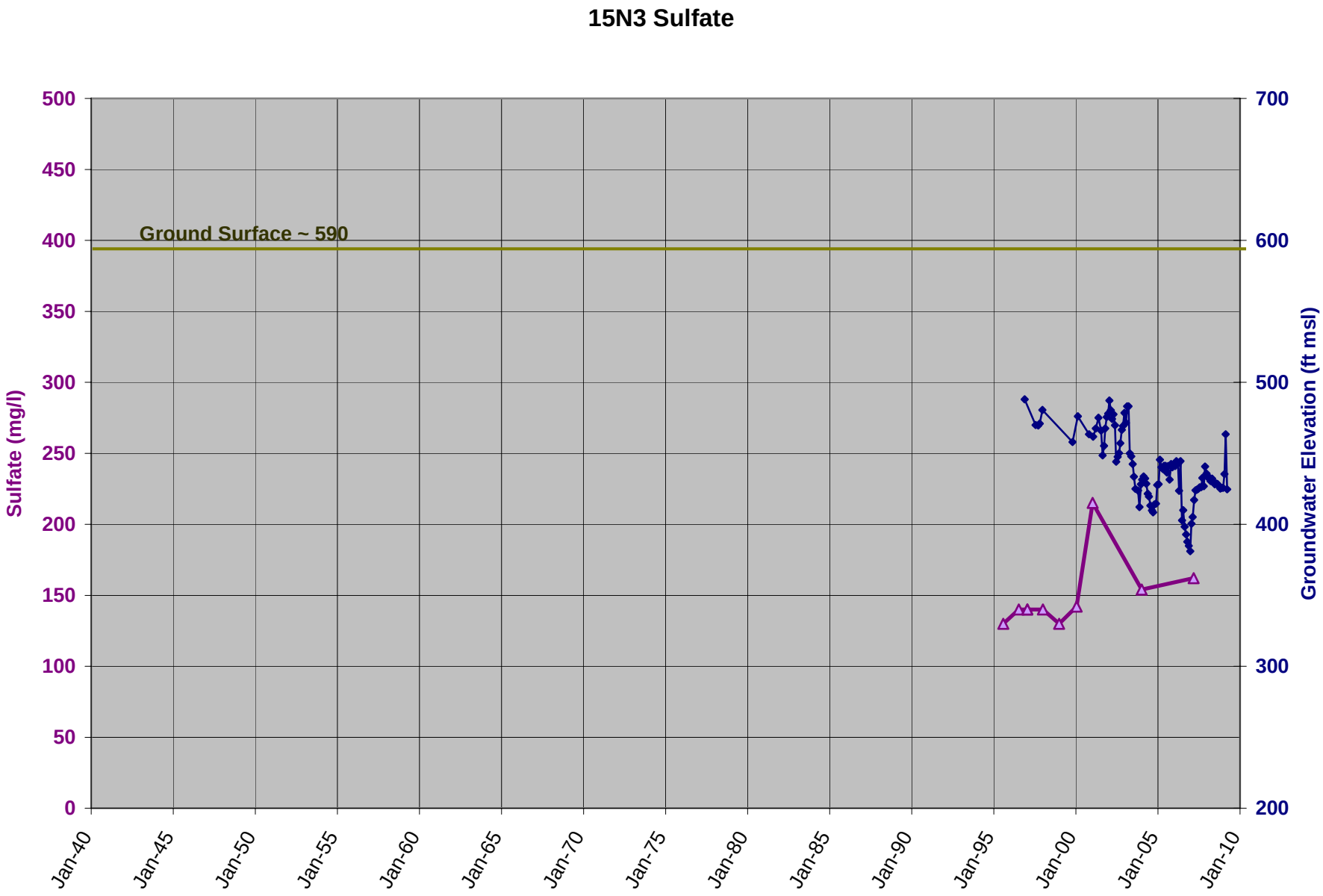
15N3 Sulfate
Ground Surface ~ 590
Sulfate (mg/l)
Groundwater Elevation (ft msl)
500
450
400
350
300
250
200
150
100
50
0
700
600
500
400
300
200
Jan-40
Jan-45
Jan-50
Jan-55
Jan-60
Jan-65
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10

Figure 4. Precipitation cumulative departure for precipitation stations.

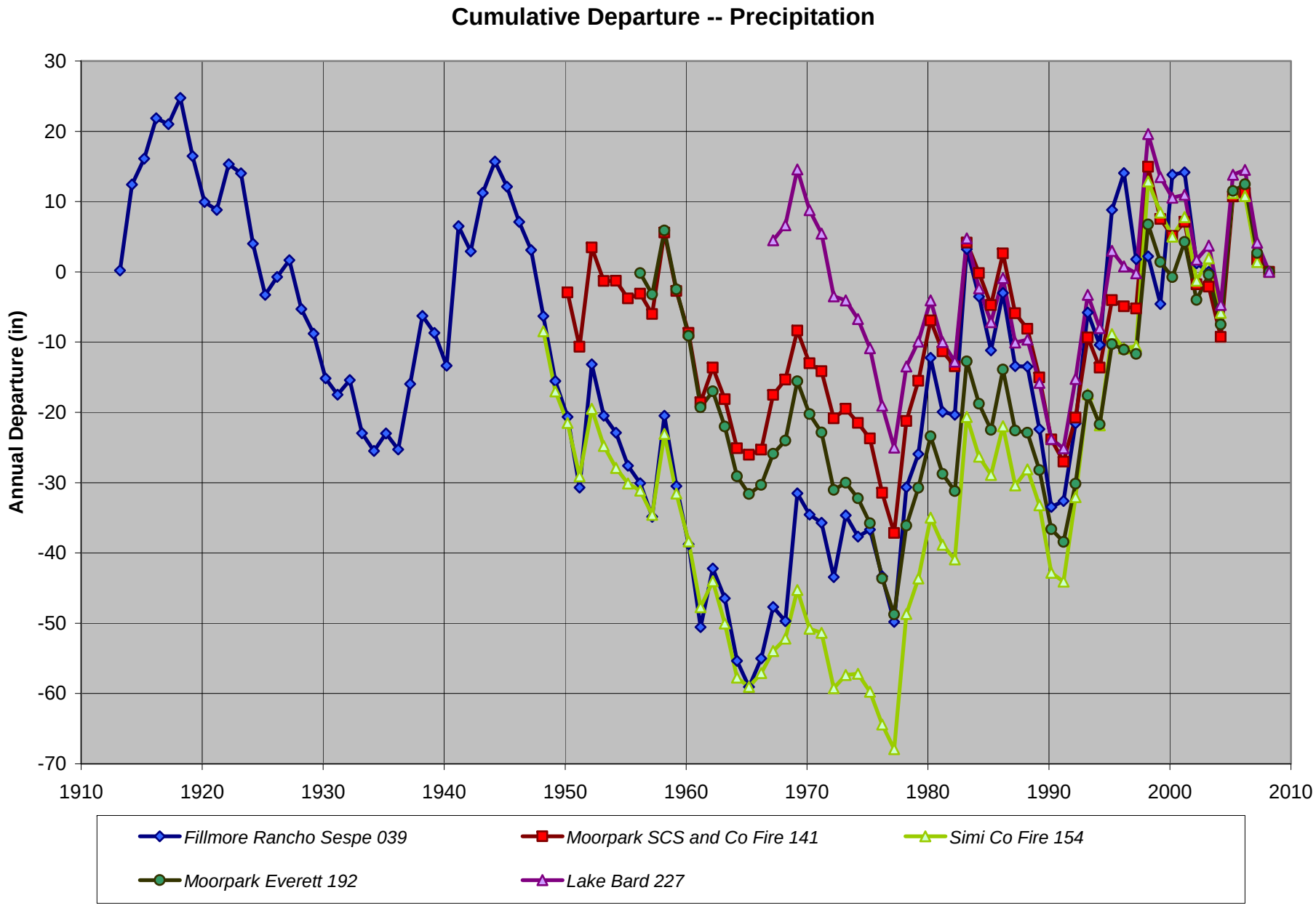

Figure 5A. Precipitation cumulative departure for precipitation at Fillmore/Rancho Sespe, showing base period 1945-1996/2001.

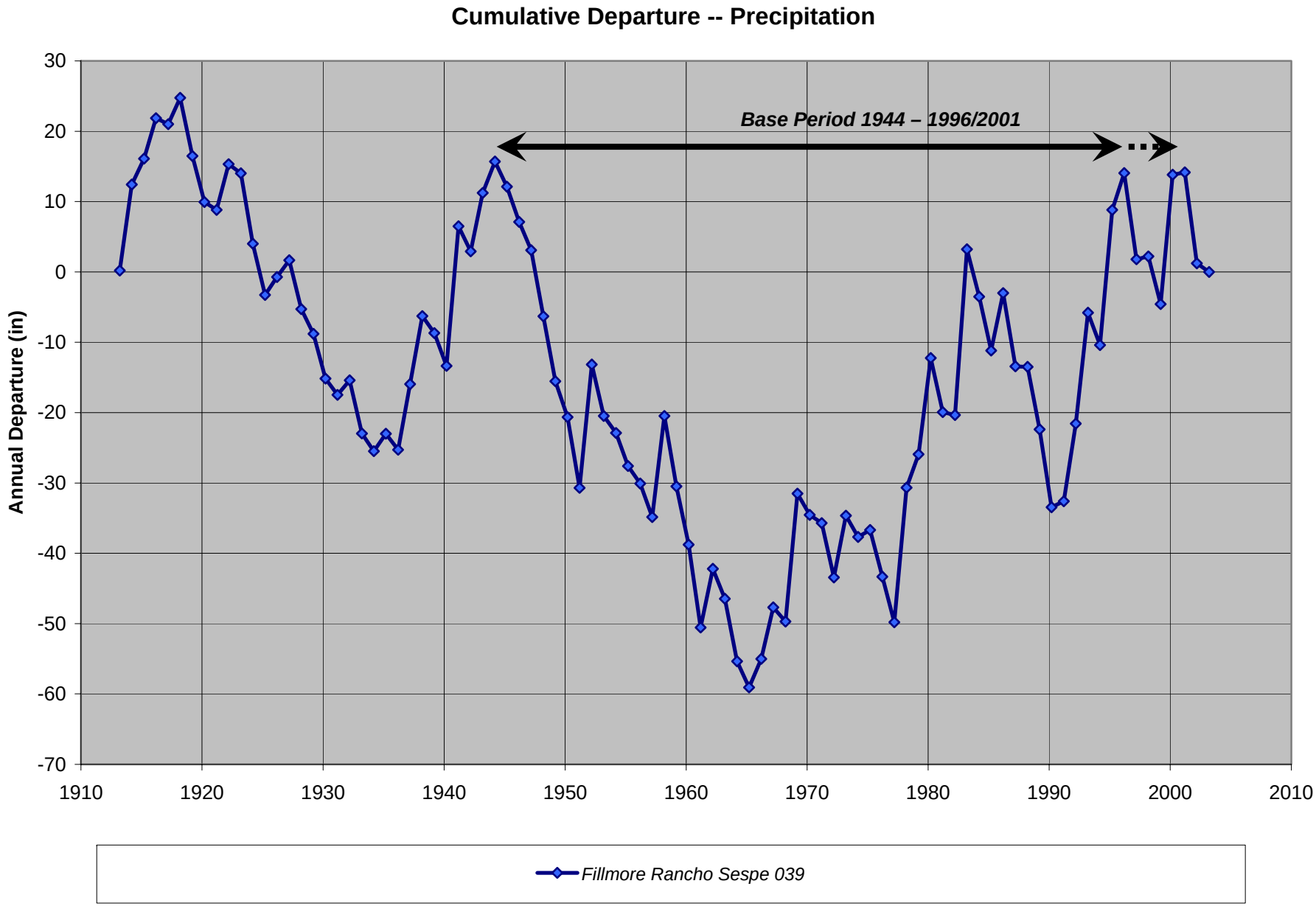

Figure 5B. Precipitation cumulative departure for precipitation at Moorpark and Lake Bard, showing base periods 1958-1998 and 1969-2006, respectively.

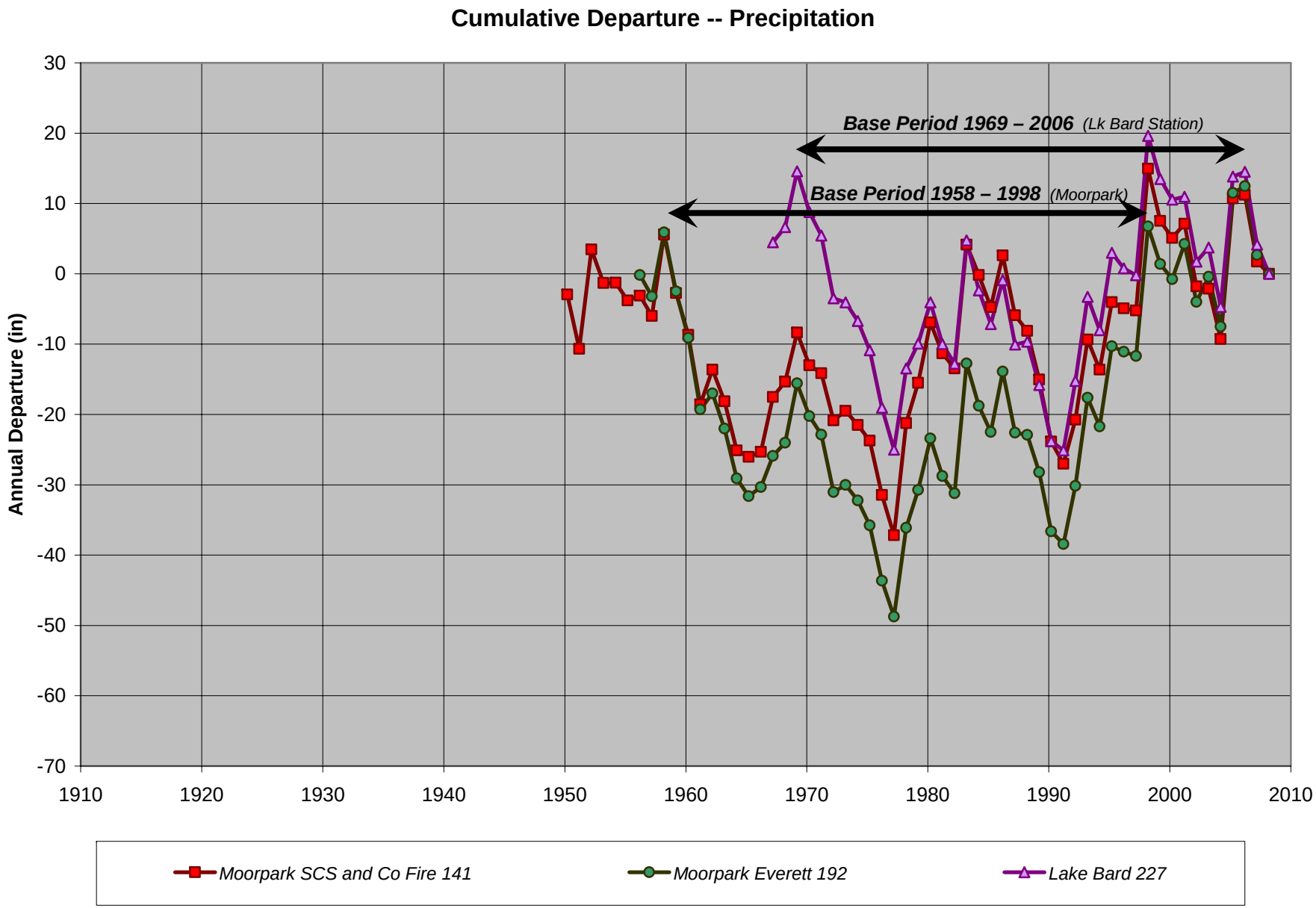

Figure 6. List of potential uncertainty for different components of a basin water balance (from DWR, 2002; after Peters, 1981)

TABLE 28*
RELATIVE RANGE OF ERROR OF ESTIMATE OF HYDROLOGIC QUANTITIES

Components	Range of Percent Error
Gaged Streamflow	5-10
Ungaged Streamflow	10-200
Gaged : Imported Water	5-10
Exported Water	5-10
Wastewater or Drainage	5-10
Precipitation Volume, annual	5-30
Consumptive Use: Municipal	10-25
Industrial	5-20
Irrigation	5-25
Native Vegetation	10-70
Phreatophtyes	10-30
Subsurface Inflow or Outflow	10-100
Change of Storage (Specific Yield - Water Level)	5-40
Pumpage	20-100
Artificial Recharge	2-50
Deep Percolation of Precipitation	Unknown

*From: Peters, 1981.

The accuracy of the water budgets is limited primarily by the accuracy of the assumptions and the data used. All estimates for the various components of the water budget are subject to probable error. There is greater probable error in some items than in others because of the method of estimating used. Table 28, from Peters (1981), which gives the relative range of error in estimating hydrologic quantities, shows that deep percolation of precipitation is the component of the budget most subject to probable error. Although uncertainties (probable error) in individual components can be large in some cases, the estimated amounts in the water budgets are not all simultaneously overestimating or underestimating their actual values.

Memorandum

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TO: Lucia M. McGovern
Chair, Management Committee
Stakeholders Implementing TMDLs in the Calleguas Creek Watershed
City of Camarillo/Camarillo Sanitary District
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Camarillo CA 93010

CC: Joe Deakin, City of Simi Valley
Ashli Desai, LWA

SUBJECT: CCW Salts TMDL Year 7 Interim Milestone Salt Balance Evaluation

The Calleguas Creek Watershed Salts TMDL (TMDL) became effective on December 2, 2008 and the TMDL implementation plan requires a progressive improvement in the watershed salt balance. Reductions in the salt imbalance are tracked as percent reductions in the mass of stranded salts (TDS, chloride, sulfate) starting with an estimated baseline mass of stranded salts. Interim milestones in the TMDL require demonstration that implementation actions have reduced the salt imbalance by the dates and percentages as follows:

- 20% reduction by December 2, 2011 (3 years after the TMDL effective date)
- 40% reduction by December 2, 2015 (7 years after the TMDL effective date)
- 70% reduction by December 2, 2018 (10 years after the TMDL effective date)

On December 2, 2011, the Stakeholders Implementing TMDLs in the Calleguas Creek Watershed (Stakeholders) submitted a compliance letter to address the first interim milestone related to the salt balance. The compliance letter included (1) a summary of progress on implementation actions addressing the salt imbalance, (2) an estimation of the watershed salt balance based (for most terms) on the 12-month period ending August 31, 2011, (3) a revision of the baseline salt balance based on a recalculation of the salt load from extractions of confined groundwater in 2007, and (4) a comparison of the 2011 and baseline salt balances.

This memorandum was prepared to address the second interim milestone in the TMDL. This letter provides an update of the actions taken by the Stakeholders to achieve compliance with the TMDL, a presentation of the current watershed salt balance, and a discussion of temporal trends in the salt balance and the effect of drought. This memorandum provides information to the Regional Water Board regarding to the status of compliance with the TMDL requirements for the following responsible parties of the TMDL.

Wastewater Permittees	MS4 Permittees	Other Entities Specifically Identified
Camrosa Water District	City of Camarillo	Members of Ventura County Irrigated Lands Group (VCAILG)
Camarillo Sanitary District	City of Moorpark	US Navy
Ventura County Waterworks District No. 1	City of Oxnard	
City of Simi Valley	City of Simi Valley	
City of Thousand Oaks	City of Thousand Oaks	
	Ventura County Watershed Protection District	
	County of Ventura	
	Caltrans	

Status of TMDL Implementation Actions

As part of the TMDL development, an initial list of implementation actions were identified by Stakeholders with a tentative schedule. In recent years, a number of new issues and programs have begun to influence the implementation of the Salts TMDL and the appropriate implementation actions. New wastewater treatment plant permits that include time schedule orders (TSOs) with specified implementation actions, the ongoing drought, additional focus on groundwater sustainability and quality (e.g., through the Sustainable Groundwater Management Act and Salt and Nutrient Management Plans), and the watershed planning requirements likely to be included in the upcoming MS4 permit renewal have all resulted in some reevaluation of the proposed implementation actions in the TMDL. While the Stakeholders have completed or made progress on all of the actions that are still believed to be beneficial for addressing salt impairments in Calleguas Creek Watershed and that are still under consideration, other strategies and actions have evolved as part of the implementation process. The status of TMDL implementation actions identified in the TMDL is shown in Table 1 with a description of modifications that have occurred in response to the new issues and programs identified above.

In addition, the Stakeholders are working on the development of an integrated implementation plan for all TMDLs in the watershed. Additional actions that will support TMDL implementation which have been identified as part of this process are discussed below the table. Eventually this plan will likely be proposed to replace the plan identified in the TMDL.

Table 1. Status of Implementation Actions Scheduled through Year 7*

Schedule	Action	Status
2 yrs.	Agricultural BMPs Begin Implementation of Best Management Practices for agriculture	Ongoing Members of VCAILG are in the seventh year of implementing best management practices in accordance with approved Water Quality Management Plans to address salts and other pollutants. A process for focusing BMP training and outreach based on detailed evaluation of water quality outcomes in agricultural drains and receiving waters has been developed and will be incorporated into the WQMP. Planning for distributed small scale agricultural desalters has begun.
2 yrs.	Salinity Management Pipeline Complete of Phase 1 construction (outfall to Camrosa Water Reclamation Plant)	Complete
3 yrs.	Water Conservation. Augment water conservation programs	Ongoing All the parties have implemented or augmented existing water conservation programs. Water conservation has significantly reduced imported water usage in municipal areas. *See text for a list of specific water conservation actions and progress*.
3 yrs.	RWRMP-Phase 1 Expand the recycled water transmission and distribution system in the Southern Reaches of the watershed.	Ongoing Expansion of the recycled water system has begun and has provided a mechanism to systematically reduce imported water use. Additional phases of the expansion will continue throughout the implementation period. The additional recycled water will be used to offset existing demand in the City with 1.5 MGD of the anticipated 3.5 MGD being used to offset existing demand. The Camarillo Effluent Diversion Pipeline Project (see below) is underway which increases capacity for delivery of recycled water.
3 yrs.	RWRMP-Phase 1 Development of existing and new water blending facilities to allow the provision of water at the quality requested by agriculture to protect the beneficial use	Ongoing New sources of recycled water are being developed on the Oxnard plain for blending for agricultural use.
3 yrs.	RWRMP-Phase 1 Pump and treat unconfined aquifers in the Pleasant Valley Basin near Channel Islands University (CSUCI) that currently contain water with high salts concentrations and discharge brine to the SMP.	Complete The 1 MGD Round Mountain Water Treatment Plant has been built and began operations in August 2014.

Schedule	Action	Status
3 yrs.	RWRMP-Phase 1 Develop existing and new water blending facilities by Camrosa.	No longer needed This action is no longer part of the implementation plan. The change will not impact the overall salt balance as these facilities were designed to facilitate the use of recycled water and did not independently remove salts.
3 yrs.	RWRMP-Phase 1 Relocate the wastewater discharge point for the Camarillo WRP and Camrosa WRF to downstream of Potrero Road Bridge on the Calleguas Creek.	No longer needed This action is no longer part of the implementation plan. The Camarillo Sanitary District and Camrosa Water District have determined that building the outfall was not necessary to implement the TMDL. The SMP will provide a sufficient alternative discharge location if all of the water from either treatment plant cannot be recycled as anticipated in the TMDL.
3 yrs.	RWRMP-Phase 1 Install pumping facilities and pipelines to connect Camarillo WTP to the Camrosa recycled water system. Discontinuation of direct discharge of effluent to Conejo Creek by Camarillo WRP.	Modified Project Underway City of Camarillo is undertaking a modified project with the same benefits. The Effluent Diversion Pipeline Project involves construction of a pipeline to convey treated effluent from the Camarillo WTP to the SMP, and another pipeline to convey treated effluent to recycled water customers. The project would result in increased capacity to convey recycled water and cessation of discharges of effluent to Conejo Creek. The May 2014 TSO for the Camarillo WRP modified the completion dates for building the connection from the WRP to the SMP, and onset of discharge to the SMP, to December 2014 and December 2015, respectively. Delays in the project have occurred due to concerns brought forward during the CEQA document approval phase, and prolonged right-of-way acquisition from two property owners. The project's construction was split into two phases because of the unanticipated delays. Phase 1 is the pipeline portion between the treatment plant and Pancho Road has been completed and operational since March 2014. Phase 2 is the pipeline portion between the Pancho Road and Lewis Road. The Phase 2 pipeline is 100% designed and construction is anticipated in 2016.
3 yrs.	RWRMP-NR-Phase 1 Blending of imported State Project Water with poorer quality groundwater from the shallow South Las Posas Basin aquifer to obtain water of sufficient quality for agricultural use.	Ongoing Blended water has been provided to agricultural users in the Las Posas Basin since the effective date of the TMDL.
5 yrs.	Salinity Management Pipeline Complete Phase 2 construction (to Moorpark)	Significant Progress on Construction Phase II-A and Phase II-C complete. Phase II-B behind schedule pending resolution of rights-of-way complexities. Phase II-D construction beginning. In addition, the SMP has been realigned to allow access by both the Cities of Thousand Oaks and Simi Valley.

Schedule	Action	Status
6 yrs.	RWRMP-Phase 2 Treatment of water produced from the Santa Rosa Basin to reduce the salt concentrations. The treated water will be used to supplement Camrosa Water District's potable water deliveries. Brine to be discharged through the SMP	Underway A desalter is in the planning stages for the Santa Rosa Basin. Two locations are being considered. The plan includes construction of a spur on the SMP from the Camarillo area along Upland Road to the project area. Camrosa Water District will commission a feasibility study in early 2016.
7 yrs.	RWRMP-NR-Phase 2 Construction of a groundwater desalter facility near Moorpark to pump and treat poor quality groundwater in the South Las Posas Basin. Brine from the treatment will be discharged to the SMP.	Underway Ventura County Waterworks District 1 (VCWWD1) has drilled several test wells and is conducting other studies to determine well yields and best locations for the wells for the Moorpark desalter. VCWWD1 is coordinating with the City of Moorpark related to the construction of the desalter and future orientation of the brine line. Agricultural parcels have been identified for well locations and CEQA has started. In addition, Zone Mutual Water Company has completed several feasibility studies regarding distributed and centralized desalters to provide water for irrigation in the Las Posas Basin.
7 yrs.	RWRMP-NR-Phase 2 Construction of a groundwater desalter facility in Camarillo near the intersection of Lewis and Upland Road. During phase 2, groundwater from two existing wells will be treated and brine discharged to the SMP.	Underway CEQA was completed for the North Pleasant Valley Desalter in 2015. Approvals are being sought from the Fox Canyon GMA for the groundwater extractions.
10 yrs.	Water Softeners* Implement programs to reduce use of water softeners by 10% in southern reaches and 25% in northern reaches.	Early Planning Underway City of Camarillo planning to implement a water softener rebate program once funding source has been identified

*Although water softener reductions are not scheduled in the TMDL to be completed until year 10, they are included in the table owing to early planning by the City of Camarillo

Specific water conservation actions by municipalities in the Calleguas Creek Watershed not identified in the table above are listed below.

City of Camarillo

- The city has observed a 20% reduction in water use, and intends to maintain use at that level (or below).

- The city is currently providing funds to the Metropolitan Water District water conservation rebate program for changing out fixtures and turf removal.

- The city plans for new development to pay a water conservation fee to fund an existing customer rebate program to incentivize water conservation measures such as turf removal, new appliances, or new fixtures. This effort was approved by City Council in November 2015 and supplemental rebate program, available to City water customers, would begin in 2016.

City of Moorpark

- The city is currently implementing a drought action plan adopted July 1, 2015.

- The city is considering placing a recycled water line under a planned multi-use trail segment which would allow for delivery to a greater proportion of the city.

City of Simi Valley

- Conservation efforts resulted in Water use was reduced by 26-30% below average use during recent months.

- The city is evaluating shallow groundwater desalting once the SMP is operational (Phase 4 of RWRMP-NR).

- City park landscaping is being converted to drought tolerant plants

City of Thousand Oaks

- Imported water use city-wide has decreased by over 30% in recent months owing to ongoing water conservation efforts.

- A groundwater study was initiated by the director of public works and fully funded. Few areas are believed to have high enough quality water for drinking water use, but treatment is being considered.

- Sixty acres of turf have been converted to native plants in park areas.

- The city has a forestry and landscape master plan that will drive median retrofits with native plants and depressions in 2016.

- The city currently has a series of procedures or prohibitions such as no flushing from hydrants and no surface flushing that has reduced water use and discharge to receiving waters.

- Use of local groundwater is planned to offset use of imported water in the Ventu Parkway area.

Watershed Salt Balance Calculation Methods

Overview

In anticipation of interannual variation in the salt imbalance, and in order to evaluate the progressive effects of extraordinary drought conditions on the terms of the salt balance, a decision was made to calculate annual salt balances for a three year period leading up to the December 2015 deadline. Fiscal years (i.e., July-June) were selected as the most feasible basis for the calculations because they aligned best with the monitoring and reporting periods for the various entities that contribute data for the salt balances (e.g., Fox Canyon Groundwater Management Agency, Calleguas Creek Watershed TMDL Monitoring Program (CCWTMP), municipal drinking water agencies). Consequently, this interim milestone report provides the estimated salt balances for the following three 12-month periods:

- July 2012-June 2013
- July 2013-June 2014
- July 2014-June 2015

The salt balances were calculated by using available data to estimate the following inputs and exports of salts from the portion of the CCW watershed in which surface water quality objectives for salts apply (salt balance area):

<u>Inputs</u>

- Imported water
    - Salts in imported water purveyed by Calleguas Municipal Water District (CMWD)
    - Inputs of salt from the Santa Clara River Watershed (groundwater and surface water) purveyed by United Water Conservation District (UCWD)
- Additions of salt to municipal water supply
- Salts in extractions of confined groundwater
- Sulfate in pesticide applications

<u>Exports</u>

- Stream export
    - Load of salt discharged via Calleguas Creek
    - Load of salt discharged via Revolon Slough
- Salt discharged through the Salinity Management Pipeline (SMP)

Salt inputs to Calleguas Creek downstream of Potrero Road and to Revolon Slough downstream from Laguna Road do not contribute to the watershed salt imbalance addressed by the TMDL. Therefore, a GIS shapefile was created which represented the geographical area that pertains to the salt balance for CCW (Salt Balance Area). This shapefile excluded portions of the watershed downstream from Potrero Road (for Calleguas Creek) and Laguna Road (for Revolon Slough). The stream export data used in the salt balance are from CCWTMP sites at the border of the Salt Balance Area (for Calleguas Creek), or just downstream from the border of the Salt Balance Area

(for Revolon Slough). The datasets used to derive the input terms of the annual salt balances were adjusted (where necessary) so that they excluded groundwater pumping and deliveries or applications of water or salt to areas outside the Salt Balance.

Explanations of the data sources and approaches for calculating the terms of the salt balance are provided below.

Salts in Imported Water Purveyed by CMWD

Sources of Imported Water. When the first interim salt balance was computed in 2011, imported water purveyed to local water districts by Calleguas Municipal Water District (CMWD) was derived from three sources: (1) direct deliveries from Metropolitan Water District (MWD) Jensen Treatment Plant, (2) MWD water temporarily stored locally in Lake Bard (treated at the Lake Bard Water Filtration Plant), and (3) extractions from the Las Posas Aquifer Storage and Recovery Wellfield (ASRW)[1]. Owing to extreme drought conditions and reduced deliveries through the State Water Project, starting in March 2014, MWD delivered to CMWD a blend of water from the State Water Project (Jensen treatment plant effluent) and water from the Colorado River Aqueduct (via the Weymouth Treatment Plant).

Volumes. Annual spreadsheets containing the monthly water deliveries (acre feet/month) to 21 local water purveyors were obtained from CMWD. Delivery volumes were adjusted to reflect the proportion of each local purveyor's service area that falls within the Salt Balance Area.[2] The sales volumes in the spreadsheets did not distinguish how much water from each of the four imported water "sources" (Jensen, Weymouth, and Lake Bard treatment plant effluents, and ASRW water) were provided to each of the 21 local water purveyors. The proportional contribution of source waters to the monthly deliveries was derived using percentages reported in the annual Consumer Confidence Reports (CCRs) for CMWD. ASRW extractions represented a minor contribution (up to a maximum of 1%) of imported water deliveries in the Salt Balance Area during the three fiscal years examined.[3]

Each month, some water extracted from the ASRW was discharged as waste as part of normal operations rather than used as part of water deliveries. Monthly volumes for waste discharge were obtained from annual extraction and pumping data reports for the ASRW from CMWD.

Salt Concentrations. Salt concentrations in Jensen Treatment Plant effluent were obtained from monthly "Table D" reports from MWD. Starting in March 2014, when MWD deliveries were a blend of SWP and Colorado River water, monthly salt concentrations were obtained from

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[1] The water extracted from the ASRW represents a variable blend of local confined groundwater and previously injected water from MWD, and thus some of the salt load in ASRW deliveries is not derived from imported water *per se*. However, because extractions of confined groundwater within the Salt Balance Area are also considered inputs to the salt balance, the treatment of the total ASRW salt load as a watershed input is appropriate; the wells in the ASRW were excluded from the dataset used separately to estimate confined groundwater extractions.

[2] A GIS shapefile was developed in 2011 (during the first interim salt balance calculation) outlining the service areas for Ventura County water purveyors.

[3] ASRW volumes constitute part of the imported water supply for 10 of the 17 local water purveyors whose service areas pertain wholly, or in part, to the Salt Balance Area: City of Oxnard, Berylwood Heights Mutual Water Company, City of Camarillo, Camrosa Water District, Crestview Mutual Water Company, Pleasant Valley Mutual Water Company, Ventura County Water Works Districts # 1 and 19, Zone Mutual Water Company, and Solano Verde Mutual Water Company.

sampling conducted at the entry point of the blended water into the CMWD distribution system.[4] Annual averages of salt concentrations in Lake Bard Water Treatment Plant effluent were calculated using available sample results (2-3 samples per year) provided by CMWD in spreadsheets used internally to generate the CMWD CCRs. Quarterly average salt concentrations from ASRW wells were extracted from spreadsheets of raw well data provided by CMWD. These quarterly averages represented data from 4-15 wells, depending on the month.

Salt Load Calculation. Volume weighted mean concentrations for the blended imported water supply were computed for each month using the source-specific salt concentration data described above and the monthly proportional contributions of each source water to total deliveries. The volume-weighted concentrations were multiplied by the total monthly delivery volume to the Salt Balance Area to obtain monthly loads in water purveyed by CMWD. The monthly salt loads in ASRW waste discharges were computed separately and added to the purveyed salt load to obtain monthly total salt loads from imported water sources. Monthly loads were binned by fiscal year.

Salt Inputs from the Santa Clara River (SCR) Watershed

Sources Salts from the Santa Clara River Watershed enter the Salt Balance Area through deliveries of surface water and groundwater by the United Water Conservation District. Blends of surface water from the Freeman Diversion and groundwater from wells in the Saticoy area are purveyed to growers within the Salt Balance area through the Pumping Trough Pipeline (PTP) and to the Pleasant Valley Water District (PVWD). UWCD's Saticoy wells extract water from the Oxnard Forebay basin and are located outside the Salt Balance Area. Saticoy well water contributed to UWCD deliveries only through August 2013.[5] Santa Clara River surface water deliveries by UWCD ceased after April 2014 owing to concerns about quagga mussels in the Santa Clara River watershed downstream from Lake Piru.

Volumes UWCD provided spreadsheets listing the monthly deliveries (acre-feet) from their Saticoy wells and from the Freeman Diversion to both the PTP and the PVWD. GIS shapefiles were created for the service areas of the PTP and PVWD and used to derive the percentage of each service area that falls within the Salt Balance Area. Monthly deliveries were weighted by these percentages (51% for PVWD; 38% for PTP) before calculating the monthly salt loads.

Salt Concentrations Semi-annual salt concentration data for the four Saticoy wells was provided by UWCD and used to generate fiscal year average concentrations for 2012/2013 and 2013/2014. Monthly salt concentrations were available for surface water at the Freeman Diversion and used to compute fiscal year averages.

Salt Load Calculation Using the pertinent monthly delivery volumes and fiscal year salt concentrations described above, a Saticoy-well-based load and Freeman Diversion-based load was derived for each month for both the PTP and PVWD service areas within the Salt Balance Area. Monthly loads were binned by fiscal year.

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[4] Smith Road sampling location

[5] The Pumping Trough Pipeline is also supplied by groundwater from "Oxnard/Hueneme System" wells. The load from these wells was not computed using data from UWCD because confined groundwater extractions within the Salt Balance Area were separately identified using records from the Fox Canyon Groundwater Management Agency, and would include Oxnard Plain wells supplying the PTP, if pertinent.

Additions of Salt to Municipal Water Supply

General Approach The combined load of salt added to municipal water supplies through household and business use and through wastewater treatment was estimated as follows using data pertinent to each of the five POTWs in CCW:

[Salt Load in Treated Effluent] - [Salt Load in Water before Use]

Influent flow to each of the five CCW POTWs was used to calculate the pertinent portion of the water supply load (before use). Total municipal deliveries from purveyors to sewered areas cannot be used to compute the initial salt load because a non-trivial percentage of municipal water supply is used for outside irrigation. This term of the salt balance is only possible to estimate for sewered recipients of municipal water; it omits salts added to water supply for homes with septic tanks. Because salt concentration data is not usually available for POTW influent, the calculation relies on effluent quality, and therefore does not account for salts potentially sequestered in biosolids. POTW effluent included discharges to surface waters, percolation ponds, and/or reclaimed water supplies, depending on the POTW.

Salt Load in Water before Use The initial salt load in water used by sewered customers was calculated by multiplying the monthly influent flows for each POTW by mean salt concentrations in the blended water supply for the principal water purveyors supplying homes and businesses in the POTW service areas. Daily influent flows in MGD for almost every day during the three year period were provided by the five POTWs. Monthly influent flows (million gallons per month) were calculated as the monthly sums of daily flows. Where more than one source of water contributed to supply, monthly volume-weighted average salt concentrations were computed for the blended supply before multiplying by monthly influent volumes. Details about the data used to compute the water supply salt concentrations that pertain to each POTW are provided in Table 2. Monthly loads were aggregated into fiscal years.

Table 2. Summary of Data Used to Derive Volume-Weighted Salt Concentrations in Municipal Water Supplies

POTW	Principal Municipal Water Suppliers	Sources of Water	Sources of Salt Concentrations	Information about Water Source Proportions in Overall Supply
Simi Valley Water Quality Control Plant	Golden State Water Company	Imported water from CMWD (~90%) and Local Groundwater [a]	Golden State Water Company Annual CCRs [b]	Assumed that 22% and 78% of sewered locations were supplied by Golden State Water Company and VCWWD-8, respectively, based on respective sizes of the water districts' customer service areas.
	Ventura County Waterworks District 8 (VCWWD-8)	Imported water from CMWD (~99%) and Local Groundwater (Gillibrand Basin)	VCWWD-8 Annual CCRs [c]	

POTW	Principal Municipal Water Suppliers	Sources of Water	Sources of Salt Concentrations	Information about Water Source Proportions in Overall Supply
Hill Canyon Wastewater Treatment Plant	City of Thousand Oaks	Imported water from CMWD	Monthly quality of CMWD blend computed for imported water term	CMWD Annual CCRs
Moorpark Wastewater Treatment Plant	Ventura County Waterworks District 1 (VCWWD-1)	Imported water from CMWD (71-78%) and Local Groundwater (22-29%)	VCWWD-1 Annual CCRs [d]	VCWWD #1 Annual CCRs [e]
Camarillo Sanitary District WWTP	City of Camarillo	Local Groundwater (3 wells) (35-58%)	City of Camarillo Annual CCRs	City of Camarillo Water Department [f]
		Imported water from CMWD (42-64%)	Monthly quality of CMWD blend computed for imported water term	
Camrosa Water Reclamation Plant	Camrosa Water District	Local Groundwater (6 wells) (27-50%)	Camrosa Water District [g]	Camrosa Water District [g]
		Round Mountain Water Treatment Plant (Desalter) (up to 10%)		
		Imported water from CMWD (50-72%)		

[a] Golden State Water Company purveys a blend of local groundwater from the Simi Valley Basin and imported water purchased from CMWD. The percentages vary from month to month, but the blend is dominated by CMWD water.

[b] Boron concentrations are not provided in Golden State Water Company's CCRs. Because the blended water is predominantly CMWD water (~90%), boron concentrations in water from CMWD were applied to all months. In addition, water quality data for Golden State Water Company was not available for January-June 2015 Monthly concentrations for all salts in CMWD water (computed for the imported water term of the salt balance) were applied to Golden State Water Company monthly volumes in 2015.

[c] 2015 water quality data were not yet available. Because groundwater is a minor contribution to the VCWWD-8 water supply, monthly salt concentrations in CMWD water (computed for the imported water term of the salt balance) were applied to the complete volumes purveyed by VCWWD-8 in January-June 2015.

[d] 2015 water quality data were not yet available. Salt concentrations in groundwater for 2014 were applied to January-June 2015. Monthly concentrations of salts in CMWD water (computed for the imported water term of the salt balance) were applied to January-June 2015.

[e] The proportions of groundwater and imported water for January-June 2015 were not available. The average proportions from 2012, 2013, and 2014 were used.

[f] Richard Romero, personal communication, Oct 1, 2015.

[g] Comprehensive spreadsheets provided by Ian Pritchard, September 2015.

Salt Load in Treated Effluent

Records for daily effluent flow and monthly (or more frequent) effluent salt concentrations were obtained from the five POTWs. Daily flows were aggregated into monthly discharge. Monthly

discharge was multiplied by monthly average salt concentrations to yield monthly effluent loads. Monthly loads were binned into 12-month periods.

Salt Inputs from Extractions of Confined Groundwater

Overview Salt loads from confined groundwater pumping were calculated based on groundwater pumping data and water quality data for chloride, TDS, sulfate and boron for the July 2012-June 2015 time frame. The analysis assumed that 1) all groundwater pumped within the Salt Balance Area is used within the area and 2) no groundwater from wells outside the Salt Balance Area is used within the area, except the Saticoy well water imported by UWCD (which is accounted for in the SCR Watershed term).

Efforts were made to include only groundwater pumped from confined aquifers in this analysis. ArcGIS was used to match wells with corresponding groundwater sub basins as delineated by the USGS.[6] The Santa Rosa, Thousand Oaks, Simi Valley, Conejo Valley, and Tierra Rejada groundwater subbasins are predominantly unconfined aquifer systems.[7] Extractions from these subbasins were not included in the salt balance.[8] Salt inputs from confined groundwater extractions were thus assumed to come from the following four subbasins:

1. Oxnard Plain Forebay
2. Oxnard Plain
3. Pleasant Valley
4. Las Posas

A number of unconfined wells in the Oxnard Plain Forebay were identified during the work performed for the first interim milestone salt balance report in 2011; these wells were similarly omitted for the subsequent salt balance calculations presented herein. A new dataset was obtained in October 2015 that identified the aquifer systems in which wells were screened for many wells in the Oxnard Plain, Oxnard Forebay, Las Posas, and Pleasant Valley subbasins.[9] Wells that were identified as screened in the Upper ("UPPR") or Perched ("PRCH") aquifer systems in this dataset were omitted from the analysis. Extractions from wells identified as screened in the Lower ("LOWR") aquifer system, wells screened in both Upper and Lower aquifers ("BOTH") aquifer systems, and wells that did not have associated screening information were treated as extractions of confined groundwater. No screening information was available for 98%, 62%, 33%, and 56% of the wells ultimately used for the groundwater load calculation in the Las Posas, Oxnard Plain, Oxnard Plain Forebay, and Pleasant Valley basins, respectively. Consequently, some loading from

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[6] USGS, 2004. USGS FGDC Content Standards for Digital Geospatial Metadata- Version: FGDC-STD-001-1998. 445 National Center, Reston, VA 20192. Available online at: http://water.usgs.gov/GIS/metadata/usgswrd/XML/ca_provinces.xml#Metadata_Reference_Information

[7] California Department of Water Resources (DWR), 2003. Bulletin 118: California Groundwater, Hydrologic Region South Coast.

[8] Groundwater studies are being performed for the Simi Valley and Thousand Oaks basins, but the results were not available for consideration at the time of writing.

[9] Dataset was obtained in October 2015 and was compiled in support of the development of the Oxnard Plain and Pleasant Valley Salt and Nutrient Management Plan.

wells screened in unconfined groundwater layers in Oxnard Plain, Oxnard Forebay, Las Posas, and Pleasant Valley subbasins is likely included in the analysis to varying degrees.

Extraction volumes and water quality data from the ASRW were not included in this analysis because the salt imports from these wells were accounted for in the "Imported Water" term of the salt balance.

Extraction Volumes Several years of extraction volumes were obtained from the Fox Canyon Groundwater Management Agency (FCGMA) for individual wells within their jurisdiction. Extraction volumes are reported twice per year to the FCGMA as six-month pumping volumes. A GIS shapefile of FCGMA well locations was created and used to identify wells located in the Salt Balance Area. Extractions from wells that were identified as screened only in upper or perched aquifers (using the dataset described above) were omitted from further analysis.

Salt Concentrations Groundwater quality data was obtained from the Ventura County Watershed Protection District. Wells in each groundwater subbasin are sampled for chloride, sulfate, TDS and boron at varying intervals. Salt concentration data from wells that were identified as screened only in upper or perched aquifers (using the dataset described above) was omitted from further analysis.

Salt Loads Six-month chloride, sulfate, TDS and boron loads were calculated for each groundwater subbasin by pairing and multiplying six-month well extraction volumes with corresponding water quality data, when the water quality data was from the same well and sampled during the same six-month period. For extraction volumes that did not have paired water quality data, annual basin-wide water quality averages were multiplied by the six-month extraction volumes on a well by well basis. Six-month loads for each basin were then computed by summing the loads calculated from paired and unpaired extraction records. Six-month loads were binned by fiscal year.

Revision of 2011 Groundwater Loads During the computation of the groundwater loads covering the 3-year period from July 2012-June 2015, it appeared that the number of wells with records was lower in the FCGMA dataset for calendar year 2010 used to compute the salt balance for the first interim milestone[10] than the number of wells with records for more recent 12-month periods. FCGMA extraction records are subject to revision and updating. In order to avoid overestimating an increase in groundwater pumping after 2010 potentially based on incomplete pumping records for 2010, updated FCGMA extraction records for 2010 were obtained from the FCGMA in October 2015 and used to compute revised salt loads for all four of the pertinent basins for calendar year 2010, using a methodology identical to that described above for the more recent three fiscal years.

Salt Inputs from Pesticide Applications

Overview When the 2011 salt balance was estimated, masses of sulfur and chlorine in active ingredients in applications of pesticides were included as salt inputs based on the ultra-conservative assumption that elemental sulfur and chlorine within active ingredients was converted to sulfate or chloride, respectively, post-application. Consequently, the estimated sulfate and chloride loads from pesticides were overestimates. Nevertheless, the loads constituted less than

[10] Data was obtained from a FCGMA database query conducted by UCWD in October 2011.

0.1 percent of the watershed inputs of chloride and sulfate inputs to the Salt Balance Area in the 2011. Owing to the labor-intensive process required to identify the active ingredients, and associated chemical formulae, for the constantly changing assortment of commercial products applied in the county, a decision was made to compute loads only for applications of active ingredients that contained sulfate molecules in their chemical structure.

Application Records Pesticide application data were obtained for 2012-2015 from the Ventura County Agricultural Commissioner's Office (Ag Commission) Pesticide Use Report (PUR) database[11]. The PUR data provided several attributes about each pesticide application in the County including: the location of the application through a site ID, the commercial name of the pesticide used, and the amount applied (lbs or gallons). The Ag Commission also provided a GIS layer containing the geographic location of each site ID. This shapefile was edited to output a table of sites located within the Calleguas Creek Watershed. The 2012-2015 data from the PUR database was then sorted to remove records for any locations outside of the Calleguas Creek Watershed. Pesticide application sites with an area smaller than 0.1 acres were removed as their contribution was deemed to be insignificant.

Identification of Sulfate-containing Products The active ingredients,[12] EPA registration numbers, molecular formulae of active ingredients, and the percentage of active ingredient in commercial products were identified using the California Department of Pesticide Regulation's (CDPR) pesticide database,[13] cross-referencing commercial products with active ingredients identified during the 2011 salt balance work, and by utilizing numerous online sources.

Sulfate loads The sulfate content (percent weight) for applied pesticides was determined from the chemical formula of the active ingredients. The total mass of each product applied in the Salt Balance Area was computed for each fiscal year, and multiplied by the percent of active ingredient and the percent of sulfate in the active ingredient to derive sulfate loads in applications of each pertinent commercial product.

Many of the commercial products may contain sulfate, or other salts in their inactive ingredients. For example, the pesticide glyphosate is often applied as a crystalized isopropylamine or potassium salt. Sulfate applied to the Salt Balance Area through inactive ingredients was not estimated.

Dry Weather Stream Export of Salts

Overview. Consistent with the assumptions underlying the waste load allocations and load allocations in the Salts TMDL, export of salts from the Salt Balance Area in stream flow is considered to contribute to the watershed salt balance only during dry weather. The stream export data used in the salt balance are from CCW TMDL monitoring sites at the border of the Salt Balance Area on Calleguas Creek (03_UNIV), and just downstream from the border of the Salt Balance Area on Revolon Slough (04_WOOD). Continuous monitoring equipment for discharge

[11] Data provided by Chief Deputy Agricultural Commissioner Susan Johnson, 669 County Square Drive, Ventura, CA 93003. Provided July 2015.

[12] For example, the active ingredient of the commercial product "Roundup" is "glyphosate".

[13] California Department of Pesticide Regulation, http://www.cdpr.ca.gov/docs/label/epanum.htm Accessed July 2015.

and salt concentrations[14] (5-min intervals) was in place at these two monitoring locations during the entirety of the three-year period evaluated for the second interim salt balance report. The derivation of dry-weather salt exports from Revolon Slough and Calleguas Creek involved several steps for each fiscal year, as follows:

- determination of dry weather flow threshold for Calleguas Creek
- use of precipitation records and the dry weather threshold to develop a list of "dry days"
- derivation of mean daily flows (cfs) and mean daily salt concentrations (mg/L) from continuous monitoring data
- computation of daily loads (lbs/day) for each salt constituent at both sites
- summation of daily loads across "dry days" within fiscal years

Dry weather flow threshold. Consistent with the approach used to develop the Salts TMDL, dry weather is identified in part as days during which flow is less than the 86th percentile flow. As was done for the 2011 salt balance calculation, the 86th percentile flow at the base of the Salt Balance Area in Calleguas Creek was used as the flow threshold for identifying "dry day export" for both Calleguas Creek and Revolon Slough. A record of mean daily flows for all days in each fiscal year was used to identify the 86th percentile mean daily flow at 03_UNIV. Consistent with intensifying drought and diminishing base flows during dry weather, the 86th percentile flow threshold has trended downward since the first interim salt balance calculation, as follows:

86th percentile mean daily flows at 03_UNIV

2010/2011:	38 cfs[15]
2012/2013:	16.22 cfs
2013/2014:	10.91 cfs
2014/2015:	10.71 cfs

Development of Dry Day Lists**.** Dry weather days were defined as days which satisfied two criteria: (1) mean daily flows (cfs) in Calleguas Creek were below the 86th percentile for the applicable 12-month period, and (2) there was no appreciable precipitation in the Salt Balance Area on the day in question or the preceding day. Appreciable precipitation was defined very conservatively as occurrence of $\geq$ 0.10 inches of rain at two or more rain gages in the Salt Balance Area.[16, 17]

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[14] Concentrations for TDS, sulfate, chloride and boron (the latter at 04_WOOD) are derived from continuous records of EC using site-specific relationships between EC and each salt constituent ("surrogate relationships"). Details regarding the approach and the surrogate relationships are published each year in an appendix to the CCW TMDL Monitoring Program annual monitoring reports.

[15] Based on the 12-month interval Sept. 2010-August 2011. Required use of USGS flow data from co-located depth sensor at 03_UNIV during periods when CCWTMP equipment was not installed.

[16] Precipitation data obtained from the Ventura County Watershed Protection District data server at http://www.vcwatershed.net/hydrodata/gmap.php. Twenty-three rain gages were utilized for the screening.

Annual Dry Weather Loads. Starting with the beginning of compliance monitoring in summer 2012, records of mean daily flows and mean daily salt concentrations for Revolon Slough and Calleguas Creek are generated for every reporting year (July-June) during the processing of continuous monitoring data for the salts deliverables in the CCW TMDL Monitoring Program annual monitoring reports. These records, and the dry day lists described above, were used to generate cumulative loads of salts across all dry days for each fiscal year. [18]

Salinity Management Pipeline Exports

Starting officially in August 2014, Camrosa Water District's Round Mountain Water Treatment Plant (RMWTP), began to discharge brine to the Salinity Management Pipeline (SMP). The RMWTP is a 1 MGD brackish groundwater desalter located near the base of the Salt Balance Area in the Calleguas Creek subwatershed and is the first of the regional groundwater desalters planned for the Salt Balance Area to be built and begin operations. Daily volumes of RMWTP concentrate discharged to the SMP starting with October 1, 2014, and single average concentrate concentrations for TDS, sulfate, and chloride, were provided by Camrosa Water District. These data were used to compute an aggregate load (lbs/yr) to the SMP for each of the three salt constituents for the period Oct.1, 2014-June 30, 2014.

Watershed Salt Balance Results

Watershed salt balances are summarized in Tables 3-5 for TDS, chloride, and sulfate respectively, for all four of the annual periods for which salt balances have now been calculated since the TMDL became effective. The tables include the individual terms of the salt balance, the net annual salt imbalances (mass of stranded salts), and comparisons with the TMDL baseline stranded mass of salts. Salt balance components over time are illustrated in Figures 1-3. The groundwater loads for 2010 reflect the revised values obtained using more recent records from the FCGMA. Groundwater dominates watershed inputs for all of the salts except for chloride; groundwater and imported water from CMWD account for similar chloride loads.

The stranded mass of salts has increased since the first interim milestone salt balance calculation in 2011. The groundwater load for 2014/2015 is subject to upward revision because the dataset obtained in September 2015 did not include the complete pumping records for about 11% of active wells. Consequently, it is not currently possible to conclude whether there was a decrease in the mass of stranded salts after 2013/2014. Based on the salt balance in 2013/2014, the stranded masses of TDS, chloride and sulfate have increased since the first interim milestone report by 59%, 52%, and 49%, respectively.

The changes in the salt imbalance are primarily a function of changes in the loads in imported water, groundwater pumping, and stream export. The mass of salts added to municipal water supply during use in homes and businesses is a very static term in the salt balance. The mass of salts in water imported from the Santa Clara River Watershed declined since the first interim

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[17] The same criteria are used to generate the monthly mean dry weather salt concentrations published in the CCWTMP annual monitoring reports.

[18] Boron is not listed for Calleguas Creek Reaches 1-3 are not listed for boron. Consequently, the CCW TMDL Monitoring Program does not publish boron concentrations based on continuous monitoring of EC at 03_UNIV. To develop boron loads exported by Calleguas Creek for the salt balance calculation, quarterly dry weather grab samples for boron collected at 03_UNIV were averaged for each fiscal year and applied to all dry days within the fiscal year.

milestone report and is no longer a factor because concerns about quagga mussels have led to a cessation of water deliveries by UWCD to the PTP and Pleasant Valley Water District. One regional desalter (RMWTP) came on line in 2014, but its effect on the overall watershed salt balance has been minor so far.

Table 3. Watershed Balances for TDS

Salt Balance Term			TDS (lbs x 10^3)			
			2010/2011	2012/2013	2013/2014	2014/2015
Inputs	Imported Water	CMWD (State Water Project and Colorado River)	61,700	62,638	79,380	84,765
		UWCD (Surface and groundwater from Santa Clara River Watershed)	32,912	19,743	62	0
		Total	94,612	82,380	79,442	84,765
	Additions to Municipal Supply	Simi Valley Water Quality Control Plant	9,658	8,904	8,372	8,905
		Moorpark Wastewater Treatment Plant	1,253	2,776	2,342	3,417
		Hill Canyon Wastewater Treatment Plant	8,927	7,184	6,539	6,120
		Camarillo Wastewater Treatment Plant	5,518	6,307	6,133	5,388
		Camrosa Water Reclamation Plant	734	1,670	1,450	1,351
		Total	26,090	26,841	24,835	25,182
	Extractions of Confined Groundwater	Las Posas Basin	75,699	107,874	120,597	93,814 *
		Oxnard Plain Basin	22,999	29,125	40,450	30,612 *
		Oxnard Plain Forebay	1,779	2,043	2,966	11,925 *
		Pleasant Valley Basin	35,150	52,538	78,182	59,732 *
		Total	135,627	191,581	242,160	196,083 *
	Pesticides		N/A	N/A	N/A	N/A
Exports	Stream Export	Revolon Slough	49,671	48,068	33,595	22,561
		Calleguas Creek	16,975	12,757	11,034	10,061
		Total	66,646	60,825	44,629	32,622
	Salinity Management Pipeline	Round Mountain Water Treatment Plant	0	0	0	1,575
Net Balance		Annual Inputs	256,329	300,802	346,437	306,029*
		Annual Exports	66,646	60,825	44,629	34,197
		Mass Stranded	189,683	239,976	301,808	271,832*
		Baseline Mass Stranded	228,446	228,446	228,446	228,446
		Change in Mass Stranded compared to Baseline	-38,763 (-17%)	11,531 (5%)	73,362 (32%)	43,386* (19%)

*Subject to upward revision owing to incomplete pumping records for 2014/2015 when data set was acquired in September 2015.

Table 4. Watershed Balances for Chloride

Salt Balance Term			Chloride (lbs x 10^3)			
			2010/2011	2012/2013	2013/2014	2014/2015
Inputs	Imported Water	CMWD (State Water Project and Colorado River)	14,470	15,781	19,629	17,216
		UWCD (Surface and groundwater from Santa Clara River Watershed)	1,912	1,246	4	0
		Total	16,382	17,026	19,633	17,216
	Additions to Municipal Supply	Simi Valley Water Quality Control Plant	1,755	1,898	1,436	1,352
		Moorpark Wastewater Treatment Plant	368	953	940	1,060
		Hill Canyon Wastewater Treatment Plant	2,073	1,735	1,819	1,778
		Camarillo Wastewater Treatment Plant	1,680	1,419	1,546	1,285
		Camrosa Water Reclamation Plant	360	499	482	489
		Total	6,235	6,503	6,222	5,963
	Extractions of Confined Groundwater	Las Posas Basin	7,219	9,783	10,273	8,890*
		Oxnard Plain Basin	1,469	1,688	3,013	2,481*
		Oxnard Plain Forebay	98	98	137	591*
		Pleasant Valley Basin	4,624	7,297	10,609	7,824*
		Total	13,410	18,865	24,032	19,786*
	Pesticides		25**	N/A	N/A	N/A
Exports	Stream Export	Revolon Slough	2,478	2,416	1,708	1,275
		Calleguas Creek	3,209	2,453	2,151	2,117
		Total	5,687	4,868	3,859	3,392
	Salinity Management Pipeline	Round Mountain Water Treatment Plant	0	0	0	235
Net Balance		Annual Inputs	36,027	42,395	49,887	42,966*
		Annual Exports	5,687	4,868	3,859	3,628
		Mass Stranded	30,340	37,527	46,028	39,338*
		Baseline Mass Stranded	24,896	24,896	24,896	24,896
		Change in Mass Stranded compared to Baseline	5,444 (22%)	12,631 (51%)	21,132 (85%)	14,442* (58%)

*Subject to upward revision owing to incomplete pumping records for 2014/2015 when data set was acquired in September 2015.
**Overestimate owing to assumption of complete post-application conversion of chlorine atoms in active ingredients to chloride ions.

Table 5. Watershed Balances for Sulfate

Salt Balance Term			Sulfate (lbs x 10^3)			
			2010/2011	2012/2013	2013/2014	2014/2015
Inputs	Imported Water	CMWD (State Water Project and Colorado River)	12,197	10,803	15,709	22,159
		UWCD (Surface and groundwater from Santa Clara River Watershed)	15,326	9,574	30	0
		Total	27,524	20,377	15,740	22,159
	Additions to Municipal Supply	Simi Valley Water Quality Control Plant	3,744	2,943	2,763	2,607
		Moorpark Wastewater Treatment Plant	230	348	287	729
		Hill Canyon Wastewater Treatment Plant	1,758	1,135	860	860
		Camarillo Wastewater Treatment Plant	697	1,261	1,591	985
		Camrosa Water Reclamation Plant	141	246	203	142
		Total	6,569	5,933	5,703	5,323
	Extractions of Confined Groundwater	Las Posas Basin	25,809	37,186	39,187	32,321*
		Oxnard Plain Basin	9,022	10,962	13,019	10,304*
		Oxnard Plain Forebay	834	874	1,226	5,264*
		Pleasant Valley Basin	13,108	17,763	26,096	21,492*
		Total	48,772	66,785	79,528	69,381*
	Pesticides		568**	4	1	1
Exports	Stream Export	Revolon Slough	24,233	24,009	16,853	11,990
		Calleguas Creek	4,090	3,099	2,683	2,573
		Total	28,323	27,108	19,536	14,562
	Salinity Management Pipeline	Round Mountain Water Treatment Plant	0	0	0	615
Net Balance		Annual Inputs	82,865	93,095	100,971	96,863*
		Annual Exports	28,323	27,108	19,536	15,178
		Mass Stranded	54,542	65,987	81,435	81,685*
		Baseline Mass Stranded	66,714	66,714	66,714	66,714
		Change in Mass Stranded compared to Baseline	-12,172 (-18%)	-727 (-1%)	14,721 (22%)	14,971* (22%)

*Subject to upward revision owing to incomplete pumping records for 2014/2015 when data set was acquired in September 2015.
**Overestimate owing to assumption of complete post-application conversion of sulfur atoms in active ingredients to sulfate.

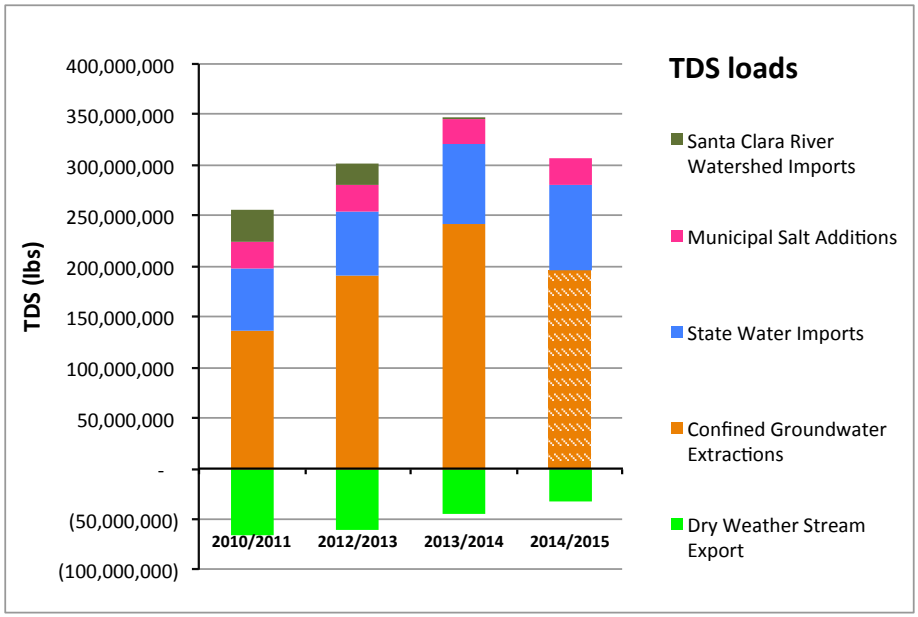

Figure 1. Trends in Salt Balance Terms for TDS. The groundwater load in 2014/2015 is subject to upward revision.

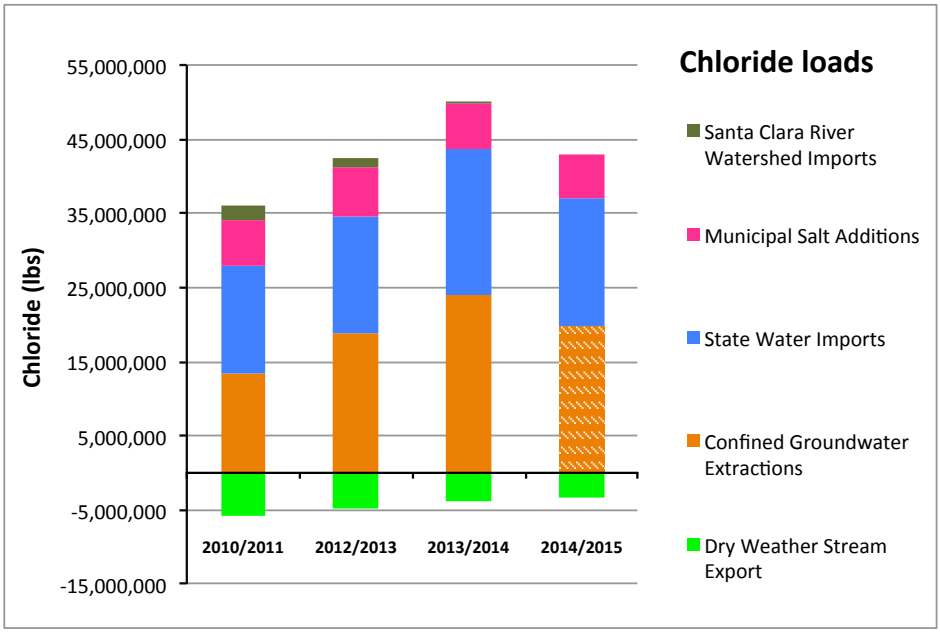

Figure 2. Trends in Salt Balance Terms for Chloride. The groundwater load in 2014/2015 is subject to upward revision.

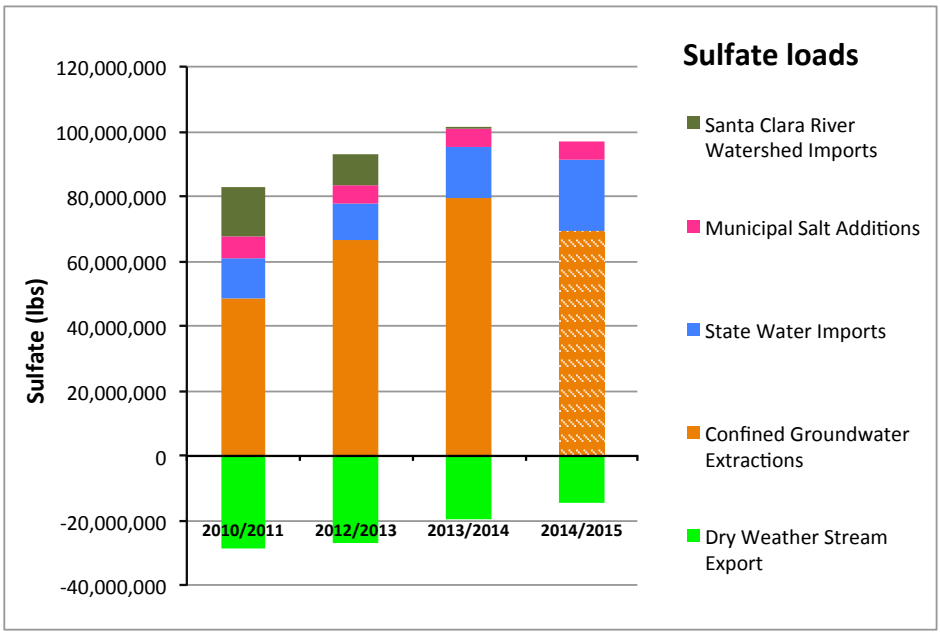

Figure 3. Trends in Salt Balance Terms for Sulfate. The groundwater load in 2014/2015 is subject to upward revision.

Trends in Groundwater Loads Increasing salt inputs from groundwater extractions are accounted for by increased pumping rates and (in some cases) increasing salt concentrations in groundwater. Extraction volumes for the four annual periods used to compute salt balances are compared in Table 6.

Table 6. Twelve-month Groundwater Extraction Volumes

Groundwater Basin	12-month Extractions (AF/yr)			
	Jan-Dec 2010	2012/2013	2013/2014	2014/2015
Las Posas	30,884	40,014	47,185	35,136
Oxnard Plain	8,318	11,513	16,186	11,744
Oxnard Plain Forebay	615	699	1,049	3,951
Pleasant Valley	11,004	14,386	21,125	15,860
Total	**50,821**	**66,612**	**85,545**	**66,691**

Owing to normal lags in the receipt of pumping records by the FCGMA, the data set provided by the FCGMA did not include all of pumping records for 2014/2015 for about 11 percent of the active wells in the Salt Balance Area. Consequently, groundwater extraction data for 2013/2014 may better represent recent conditions. Between 2010 and 2013/2014, groundwater extraction volumes increased by the following percentages:

Las Posas Basin 53%

Oxnard Plain Basin	95%
Oxnard Plain Forebay	71%
Pleasant Valley Basin	92%

Based on the population of wells used to derive the groundwater term of the salt balance, mean annual concentrations of some salt constituents have changed in some of the basins since the first salt balance was computed in 2011. Chloride concentrations are now higher in wells used for the salt balance term in all four basins, with the largest increases observed in the Oxnard Plain and Pleasant Valley basins. TDS and sulfate concentrations increased in used for the salt balance term in the Las Posas and Pleasant Valley basins. Salt concentrations in groundwater used to compute salt balances for the four annual periods are compared in Table 7.

Table 7. Mean Annual Salt Concentrations in Groundwater

Basin	2010	2012/2013	2013/2014	2014/2015	Overall Percent Change
			TDS (mg/L)		
Las Posas	887	956	918	982	10%
Oxnard Plain	1,033	933	923	967	-6%
Oxnard Plain Forebay	1,059	1,075	1,040	1,110	5%
Pleasant Valley	1,272	1,536	1,563	1,546	23%
			Chloride (mg/L)		
Las Posas	85	84	77	93	9%
Oxnard Plain	63	54	65	78	23%
Oxnard Plain Forebay	61	52	48	55	2%
Pleasant Valley	181	222	207	207	15%
			Sulfate (mg/L)		
Las Posas	300	323	293	337	12%
Oxnard Plain	417	352	308	328	-21%
Oxnard Plain Forebay	504	460	430	490	-3%
Pleasant Valley	511	556	566	613	20%

Trends in Imported Water Loads The load of salt in imported water purveyed by CMWD increased over the four year period between the 2010/2011 salt balance calculation and the most recent calculation (2014/2015). Annual loads of TDS, chloride, and sulfate increased over that period by 37%, 19%, and 82%, respectively. The increase in loads can be explained primarily by increases in the salt content of the imported water blend between July 2012-June 2015. Changes in salt content of the imported water blend is illustrated in Figure 4. The increases were most pronounced for sulfate and TDS; sulfate concentrations approximately tripled, and TDS concentrations almost doubled, over the three-year period. The changes in water quality were more pronounced after March 2014 when water from the Colorado River became part of the blend delivered by Metropolitan Water District to CMWD. A time series of monthly volumes of water purveyed by CMWD to customers within the Salt Balance Area is provided in Figure 5. Although there was a pronounced seasonal variation in CMWD deliveries, midsummer deliveries have

trended downward since July 2012, with a pronounced reduction between July 2014 and July 2015.

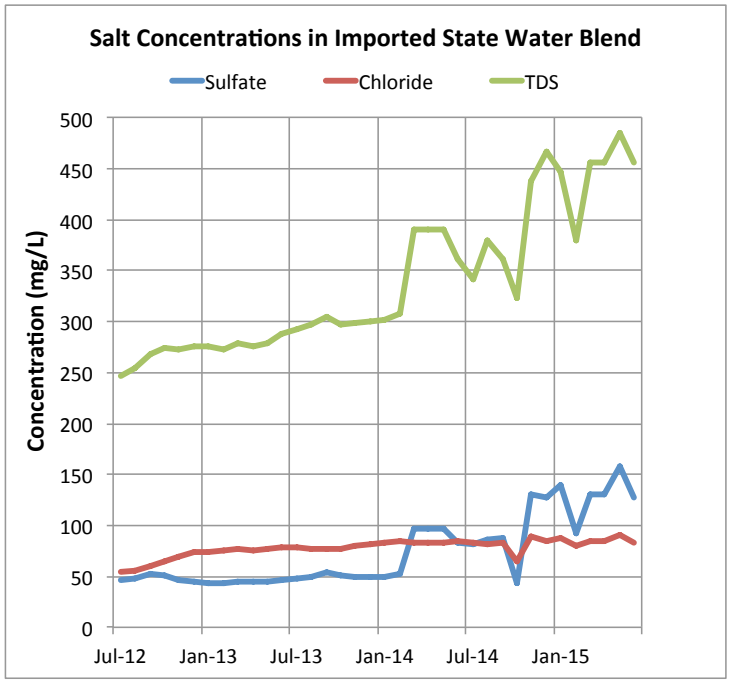

Figure 4. Monthly volume weighted mean concentrations in the blend of imported water purveyed by CMWD to customers in the Salt Balance Area.

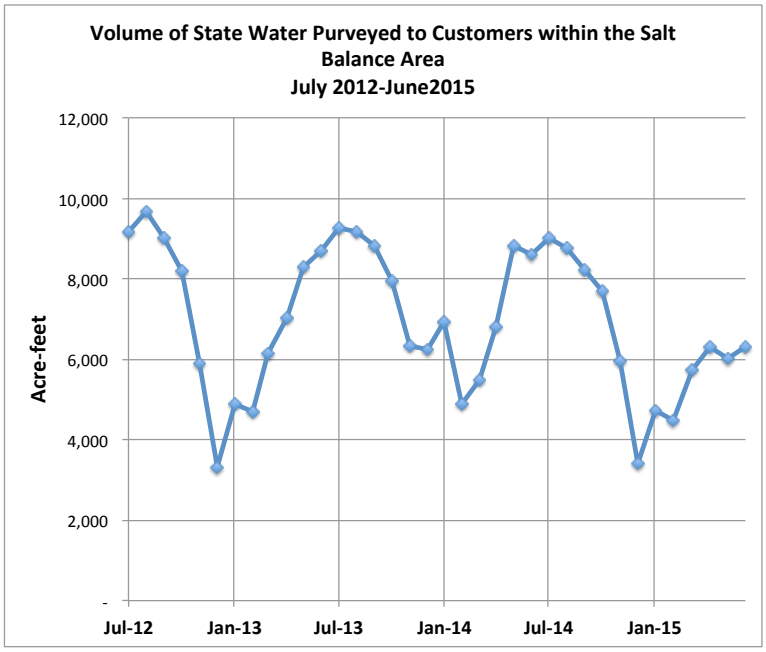

Figure 5. Monthly volumes of imported water purveyed by CMWD to customers in the Salt Balance Area. Volumes are a blend of water from the State Water Project, the ASRW, and (after March 2014) the Colorado River.

Trends in Streamwater Export The annual mass of salt exported from the Salt Balance Area during dry weather in surface water gradually decreased by about 50% between the time period used for the first salt balance calculation (2010/2011) and the most recent 12-month period evaluated (2014/2015). This trend is primarily a function of decreased flow rates in the Revolon Slough and Calleguas Creek. As shown in Figures 6 and 7, salt concentrations during dry weather have not trended up or down during the three year period July 2012- June 2015.

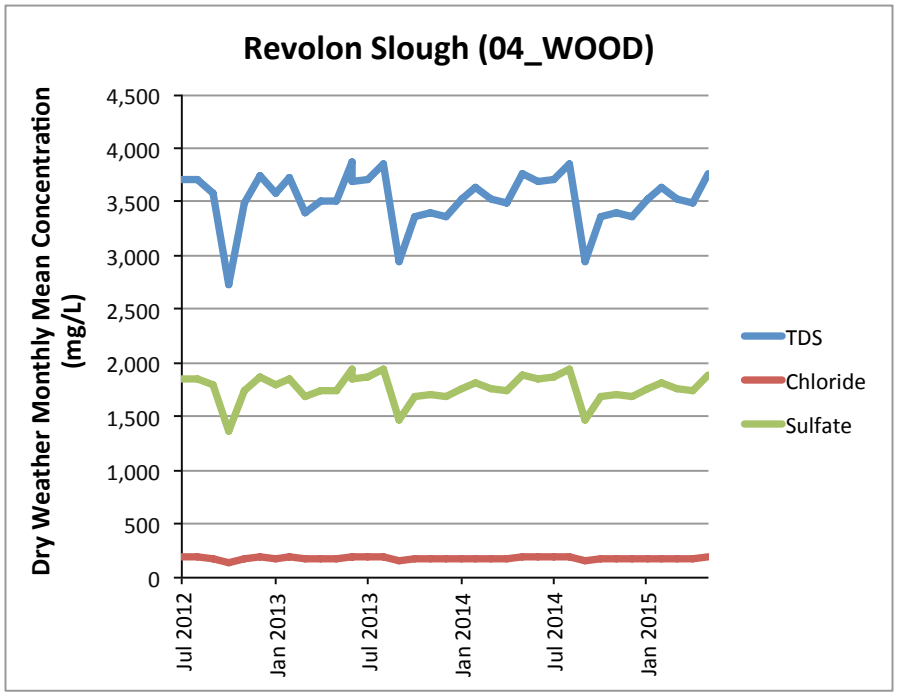

Figure 6. Monthly mean concentrations of salts during dry weather in Revolon Slough between July 2012- June 2015

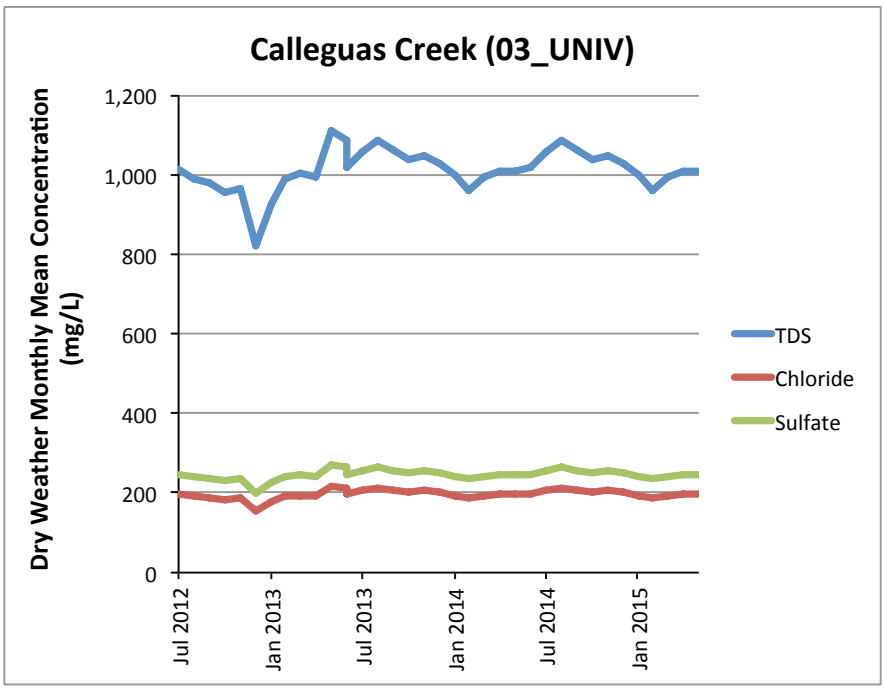

Figure 7. Monthly mean concentrations of salts during dry weather in Calleguas Creek between July 2012-June 2015.

Relationship between Precipitation and Stranded Mass of Salts

The major terms that are responsible for the recent increase in stranded salts (imported water, confined groundwater extractions, and stream export) are all sensitive to annual precipitation. The mean annual precipitation in the Salt Balance Area (average based on all 23 rain gages used to develop the dry day lists) has been significantly lower during the most recent three fiscal years than during the 12-month period that was the basis for the first interim milestone salt balance calculation, as follows:

Mean annual precipitation in the Salt Balance Area

2010/2011:	17.20 in. (based on Sept-Aug)
2012/2013:	6.17 in. (based on July-June)
2013/2014:	4.77 in. (based on July-June)
2014/2015:	8.24 in. (based on July-June)

The effect of drought on the salt balance is illustrated in Figures 8-10, which show an inverse relationship between annual precipitation and the annual stranded masses of TDS, chloride and sulfate.

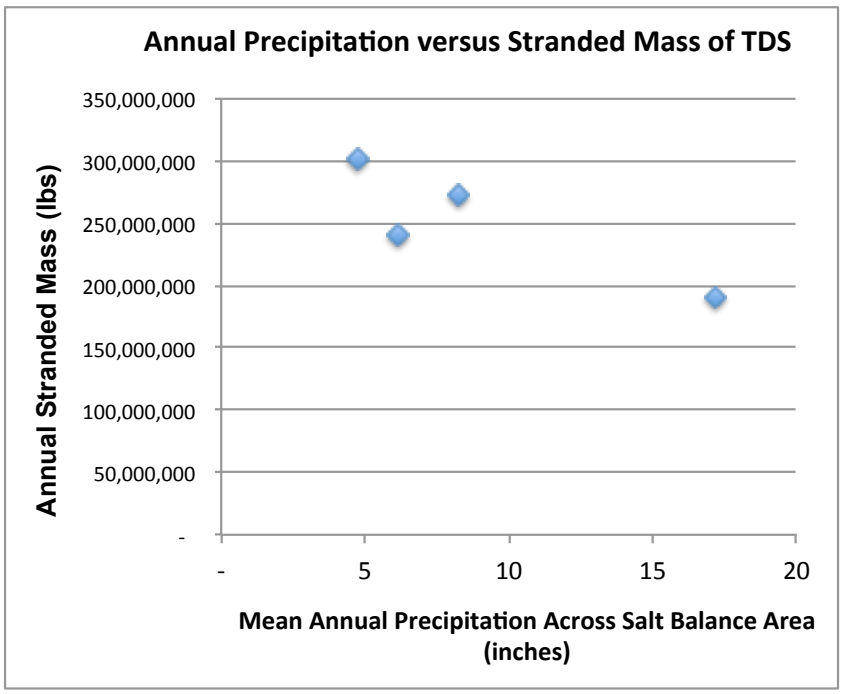

Figure 8. Relationship between Annual Precipitation and the Annual Stranded Mass of TDS. Precipitation values are the averages for 23 rain gages in the Salt Balance Area.

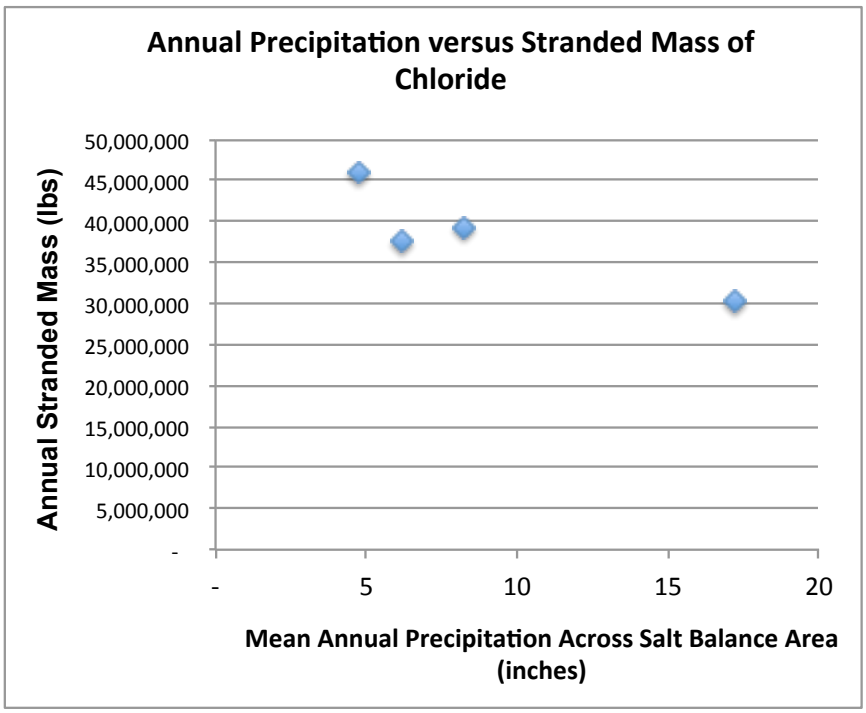

Figure 9. Relationship between Annual Precipitation and the Annual Stranded Mass of Chloride. Precipitation values are the averages for 23 rain gages in the Salt Balance Area.

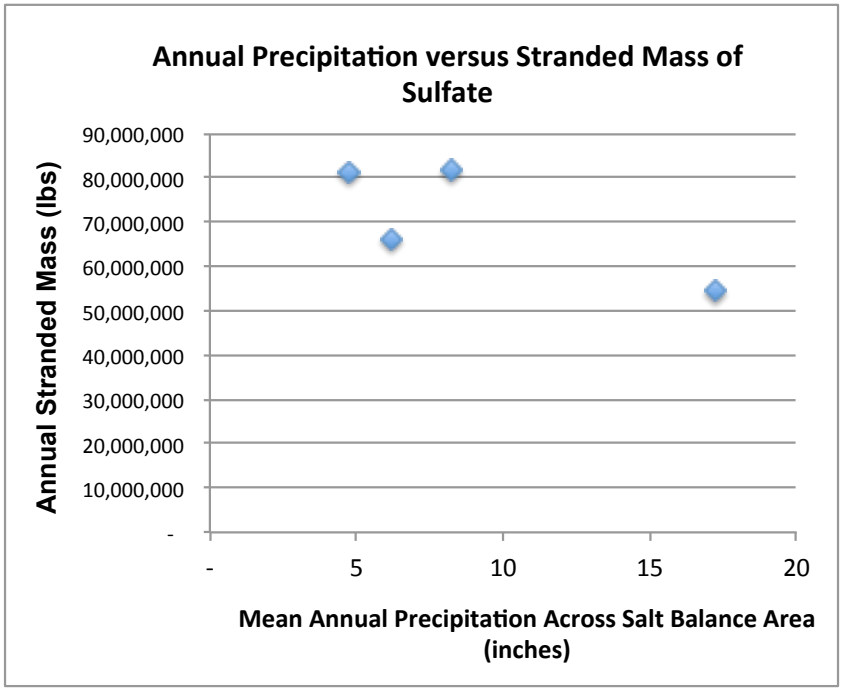

Figure 10. Relationship between Annual Precipitation and the Annual Stranded Mass of Sulfate. Precipitation values are the averages for 23 rain gages in the Salt Balance Area.

Summary

Adjustments to implementation actions to address salt loading in the watershed have been necessary to reflect changing watershed conditions and regulatory structure. Several key projects have been fully implemented including construction of several sections of the SMP, construction and start of operation of the Round Mountain Desalter, completion of CEQA and some pipeline segments for the connection between the Camarillo WRP and the SMP, and implementation of water conservation measures that have resulted in significant reductions in use of imported (and local) water supplies. Significant progress in the planning process for additional desalters (North Pleasant Valley and Moorpark desalters) has occurred, including drilling of test wells and selection of well sites, and the SMP is being realigned to allow more potential salt removal by the Cities of Thousand Oaks and Simi Valley. Additional and new strategies that will contribute to addressing the salt imbalance have been triggered by the need to create more local water supplies, including a number of groundwater studies and evaluation of alternatives to treat groundwater upstream of POTWs. Some delays in implementation actions have occurred, as recognized in the 2014 TSOs for the three POTWs that discharge to surface water. In particular, delays have occurred due to prolonged permitting issues related to groundwater management and concerns over impacts to surface water flow reductions that could negatively change habitat to endangered species. Nevertheless, stakeholders are still making progress on implementation actions that they have control over.

Evaluation of the salt balances during the implementation period to date clearly shows the influence of factors outside the Stakeholders' control on the salt balance. Several years of exceptional drought have impacted ability to show improvements in the watershed salt balance because salt loads in water supply have increased (despite the fact that imported water volumes have decreased) and salt exports in stream flow have decreased. This outcome confirms the TMDL analysis regarding the impacts of drought, and demonstrates a need to consider outside influences when evaluating compliance with interim TMDL requirements. Additionally, the increased emphasis and state mandates regarding water conservation, water recycling, and groundwater sustainability are likely to influence the way in which TMDL implementation is approached and may affect the trajectories of salt loading and export in the watershed. Finally, calculation of annual salt balances suggest that factors that may not have been fully considered during TMDL development may need to be tracked, and the appropriate time frames for aggregating salt balance terms may need to be revisited, to recognize the true cumulative impact of implementation actions. Factors that may need to be revisited include the accounting for flushing of stranded salts during wet weather events and the categorical treatment of salts in confined groundwater as a watershed input. As a result, there may be a need to reconsider the salt balance requirements in the TMDL and how drought periods are addressed when assessing compliance with those requirements.

Several factors indicate a need to reopen the Salts TMDL. They include the status of previously planned implementation actions, the nature and timing of new implementation actions, new information regarding the status of surface water, groundwater, and imported water supplies, and a demonstration of the effects of drought on the salt balance. A TMDL reopener should consider adjustments to the conceptual framework and procedures for calculating salt balances, revision of the baseline salt balance, revision of interim limits and final allocations, and revisions to implementation actions and the implementation schedule.

CAMROSA WATER DISTRICT
BUILDING WATER SELF-RELIANCE

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Resolution No: 15-07

A Resolution of the Board of Directors of Camrosa Water District

Declaring a Stage Three Water Supply Shortage in Accordance with Ordinance 40-10

Whereas, ***the State of California is in its fourth consecutive year of record-breaking drought, in response to which the Metropolitan Water District of Southern California reduced water allocations to member agencies by fifteen percent; and***

Whereas, ***the State Water Project allocation remains at twenty percent of requested deliveries for calendar year 2015; and,***

Whereas, ***approximately seventy percent of Camrosa's potable water supply is imported from the California State Water Project (SWP) via Calleguas Municipal Water District (Calleguas), a wholesale provider of Metropolitan Water District of Southern California (Metropolitan); and,***

Whereas, ***on January 17, 2014, Governor Edmund G. Brown, Junior, officially proclaimed a State of Emergency due to drought conditions, called on Californians to voluntarily reduce their water use by twenty percent, and directed state officials to take all necessary actions to alleviate drought impacts throughout the state; and,***

Whereas, ***on February 11, 2014, Metropolitan declared a Water Supply Alert calling for cities, counties, member agencies, and retail water agencies to implement extraordinary conservation through drought ordinances and other measures to mitigate use of storage reserves; and,***

Whereas, ***on February 11, 2014, the Camrosa Board of Directors adopted Resolution 14-01 calling all customers to voluntarily reduce water usage by twenty percent of the previous year's usage, to preserve both local and regional water reserves; and,***

Whereas, ***on July 15, 2014, the SWRCB adopted statewide emergency regulations prohibiting water waste and mandatory actions for water purveyors during the drought emergency; and,***

Whereas, *the Camrosa Water District adopted Ordinance 38-09, an ordinance of the Board of Directors establishing water shortage management policy prohibitions and restrictions on the use of water during periods of water shortage, on June 24, 2009; and,*

Whereas, *Ordinance 38 directs the implementation of the appropriate phase of the Water Supply Shortage or Water Emergency Plan contained in Ordinance 40-10, "Rules and Regulations Governing the Provision of Water and Sanitary Services," as determined by the Board of Directors; and,*

Whereas, *on August 27, 2014, the Camrosa Water District Board of Directors declared a Stage One Water Supply Shortage; and,*

Whereas, *on April 1, 2015, Governor Brown issued Executive Order B-29-15 ordering the State Water Resources Control Board to implement mandatory water reductions in potable urban usage through February 28, 2016; and,*

Whereas, *on May 5, 2015, the State Water Resouces Control Board adopted emergency regulations, to remain in effect for 270 days, that categorized water agencies and districts into conservation tiers based on residential per-capita water use in July, August, and September of 2014; and*

Whereas, *Camrosa is currently in the highest tier, Tier 9, which requires a 36-percent reduction in water use;*

Now, Therefore, Be It Resolved *by the Camrosa Water District Board of Directors that the District does hereby declare a Stage Three Water Supply Shortage; and,*

Be It Further Resolved *that the General Manager is authorized to implement a Stage Two Water Supply Shortage contained in Ordinance 40-10, including the following water use restrictions:*

1. *Leaks – No person may permit leaks of water that he/she has the authority to eliminate. Any detected leak, break or malfunction shall be corrected within 24 hours after a person discovers or receives notice from the District.*

2. *Limits on Watering Days – Water or irrigating of landscape or other vegetated area with potable water may be limited to three days per week on a schedule established and posted by the District.*

3. *Limits on Filling Residential Swimming Pools & Spas – Use of water to fill or refill swimming pools and spas shall be limited to maintain the level of water only when necessary. Draining of pools and spas or refilling shall be done only for health or safety reasons.*

4. *Substitution of Non-potable Water – No person shall permit the outdoor use of potable water for irrigation or dust abatement where non-potable or recycled water is available.*

Be It Further Resolved *that the General Manager is authorized to implement a Stage Three Water Supply Shortage contained in Ordinance 40-10, including the following water use restrictions:*

1. *Irrigation restrictions – Watering or irrigation of lawn, landscape or other vegetated area with potable water to two days a week.*

2. *New Potable Water Service – No new potable water service will be provided, no new temporary meters or permanent meters will be provided and no statements of immediate ability to serve or provide potable water service will be issued without mitigation measures approved by the General Manager that will offset the new demand.*

3. *Other Prohibited Uses – The District may implement other water use requirements as determined by the District to meet water supply shortage or water emergency conditions.*

Be It Further Resolved *that in addition to the restrictions identified in the declared Emergency Supply Shortage Stage, all restrictions of lesser stages also apply:*

Be It Further Resolved *that urban water users on potable water are required to reduce water use by 36 percent compared to their water use of 2013 and commercial agriculture customers on potable water have a reduction requirement of 16.5 percent.*

Adopted, Signed and Approved *this 28th day of May 2015.*

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Eugene F. West, President
Board of Directors
Camrosa Water District

ATTEST:

_____

Tony L. Stafford, Secretary
Board of Directors
Camrosa Water District

Water Quality Data

The data below lists all the drinking water contaminants that were **detected** during the 2014 calendar year. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in this table are from testing done January 1 through December 31, 2014. The State requires that we monitor for certain contaminants less frequently than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. As a result, some of the data, though representative of water quality, is more than one year old. Camrosa Water District monitors its water supplies for over 150 contaminants annually.

Primary Drinking Water Standards - Mandatory Health Related Standards

Parameter	Units	State MCL [MRDL]	PHG (MCLG) [MRDLG]	Camrosa Distribution System	Major Sources in Drinking Water
Clarity (A)					
Turbidity	NTU (TT)	Highest Single Value		0.27	Soil Runoff
		% of samples <0.3 NTU		100%	
Disinfection By-Products and Disinfectant Residuals (B)					
				Average / **Range**	
Total Chlorine Residual	ppm	[4]	[4]	Highest running annual average = 1.03 / ND-2.2	Drinking water disinfectant added for treatment
Haloacetic Acids	ppb	60	n/a	Local running annual average = 6.3 / 1-11	By-product of drinking water disinfection
Total Trihalomethanes	ppb	80	n/a	Local running annual average = 27.7 / 10.8-34.8	By-product of drinking water chlorination

Inorganic Chemicals

				Imported Surface Water Calleguas MWD		Blended Water		Woodcreek Well		Tierra Rejada Well		Major Sources in Drinking Water
			Percent of supply	45%		43%		8%		4%		
Parameter	**Units**	**State MCL [MRDL]**	**PHG (MCLG) [MRDLG]**	**Average**	**Range**	**Average**	**Range**	**Average**	**Range**	**Average**	**Range**	
Aluminum	ppb	1000	600	57	ND-110	ND	ND	ND	ND	ND	ND	Erosion of natural deposits, residue from water treatment process
Arsenic	ppb	10	0.004	2.2	2.2	ND	ND	4	4	4	4	Erosion of natural deposits; Runoff from orchards;
Barium	ppm	1	(2)	ND	ND-0.1	0.033	0.033	0.051	0.051	0.007	0.007	Erosion of natural deposits
Total Chromium	ppb	50	(100)	ND	ND	4	4	3	3	ND	ND	Erosion of natural deposits
Lead	ppb	15	0.2	ND	ND	ND	ND	7.5	7.5	0.4	0.4	Erosion of natural deposits
Nickel	ppb	100	12	ND	ND	3	3	3	3	4	4	Erosion of natural deposits
Mercury	ppb	2	1.2	ND	ND	ND	ND	ND	ND	0.04	0.04	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and cropland.
Fluoride	ppm	2.0	1	0.8	0.7-1.0	0.69	0.64-0.74	0.4	0.3-0.5	0.3	0.3-0.5	Erosion of natural deposits
Nitrate	ppm	45	45	2.7	2.7	26	9-32	9.5	6-13	5.5	3.3-9.0	Runoff and leaching from fertilizer use; leaching from septic tanks, sewage
Selenium	ppb	50	30	ND	ND	ND	ND	3	3	ND	ND	Discharge from refineries; erosion of natural deposits
Radionuclide												
Gross Alpha Activity	pCi/L	15	(0)	3	ND—5.0	n/a	n/a	3.9	3.9	3.2	3.2	Erosion of natural deposits
Gross Beta Activity	pCi/L	50	(0)	ND	ND—5.0	n/a	n/a	n/a	n/a	n/a	n/a	Decay of natural and manmade deposits
Uranium	pCi/L	20	0.43	2.0	2.0-3.0	n/a	n/a	2.8	2.8	n/a	n/a	Erosion of natural deposits
Organic Chemicals												
1,1-Dichloroethylene	ppb	6	10	ND	ND	1.5	1.5	ND	ND	ND	ND	Discharge from industrial chemical factories
Trichlorofluoromethane	ppb	150	700	ND	ND	0.8	0.8	ND	ND	ND	ND	Discharge from chemical factories; degreasing solvent; propellant and refrigerant
Trichlorotrifluoroethane	ppb	1200	400	ND	ND	.2	2	ND	ND	ND	ND	Discharge from metal degreasing sites and other factories; cleaning solvent; refrigerant

Secondary Drinking Water Standards - Aesthetic Standards

Parameter	Units	Secondary MCL	Notification Level	Average	Range	Average	Range	Average	Range	Average	Range	Major Sources in drinking Water
Turbidity (Monthly)	NTU	5.0	NS	ND	ND-0.1	0.27	0.09-0.29	0.35	0.21-0.7	0.3	0.19-0.65	Soil Runoff
Chloride	ppm	500	NS	86	85-86	113	91-151	147	130-170	80	78-96	Runoff / leaching from natural deposits
Odor Threshold (Units)	Units	3	NS	2.9	2.9	ND	ND	ND	ND	ND	ND	Naturally-occurring organic materials
Iron	ppb	300	NS	ND	ND	68	68	90	90	130	130	Leaching from natural deposits; industrial wastes
Sulfate	ppm	500	NS	86	80-91	129	93-151	178	144-211	158	148-168	Runoff / leaching from natural deposits
Total Dissolved Solids	ppm	1000	NS	360	346-375	618	470-738	806	701-888	562	469-662	Runoff / leaching from natural deposits
Additional Parameters (Unregulated)												
Total Hardness	ppm	NS	NS	171	121-254	345	282-380	458	442-490	419	412-433	
Sodium	ppm	NS	NS	71	69-72	85	85	116	116	49	49	
pH	pH units	NS	NS	8.2	8.1-8.3	7.7	7.6-7.8	7.6	7.3-7.9	7.8	7.4-8.0	

Household Lead and Copper Survey

		Action Level	PHG (MCLG)	No. of Samples Collected	90th percentile level detected	No. Sites exceeding A.L.		
Lead	ppb	15	(2)	30	1.7	0	**Survey conducted in 2013**	Internal corrosion of household water plumbing
Copper	ppm	1.3	0.17	30	0.28	0		Internal corrosion of household water plumbing

Abbreviations, Definitions, and Notes

n/a = Not Applicable; ND = None Detected; NS = No Standard; NTU = Nephelometric Turbidity Unit

ppm = parts per million, or milligrams per liter; ppb = parts per billion, or micrograms per liter; pCi/L = PicoCuries per Liter; NA = Not Analyzed

Primary Drinking Water Standard = MCLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Maximum Contaminant Level (MCL) = The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste

Maximum Contaminant Level Goal (MCLG) = The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.

Maximum Residual Disinfectant Level (MRDL) = The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG) = The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Public Health Goal (PHG) = The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Treatment Technique (TT) = A required process intended to reduce the level of a contaminant in drinking water.

Action Level (A.L.)= The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

(A) The turbidity level of the finished water shall be less than or equal to 0.5 NTU in 95% of the measurements taken each month and shall not exceed 1.0 NTU at any time.

(B) Compliance is based on a running annual average for each of 8 sample sites taken quarterly in the distribution system . Values reported reflect the highest and lowest single value in the distribution system (range) and the highest running annual average for all 8 sites.

Este informe contiene información muy importante sobre su agua potable. Traúzcalo o hable con alguien que lo entienda bien.

Dear Customer,

In compliance with the California Department of Public Health and the U.S. Environmental Protection Agency (EPA), this Consumer Confidence Report provides you with information about the sources and quality of your tap water in 2014. **The Camrosa Water District continues to *meet or exceed* federal and state drinking water standards**. We test your water for over 150 chemical constituents; the data tables appearing in this report contain only **detected** contaminants. This testing is in addition to **weekly and monthly testing**, to ensure the safety and integrity of our distribution system.

Camrosa is committed to providing reliable supplies of high quality, affordable drinking water to its customers. Inherent in this task is the ability to reduce dependence on imported drinking water. Due to the 4th year of significant drought, Southern California's imported water supplies remain uncertain now more than ever before. Camrosa's continuing work towards building self-reliance will develop and diversify our local sources of supply. This year alone, Camrosa has built and operates a brand new Reverse Osmosis Water Filtration Plant producing 1 million gallons per day of drinking water from previously unusable, local groundwater sources In addition, we are currently in the process of constructing another well and rehabilitating yet another well which is scheduled to go back online this summer. **We cannot battle the drought alone, we all need to increase our conservation efforts during this prolonged drought period.** For water conservation tips, please visit www.camrosa.com or www.bewaterwise.com.

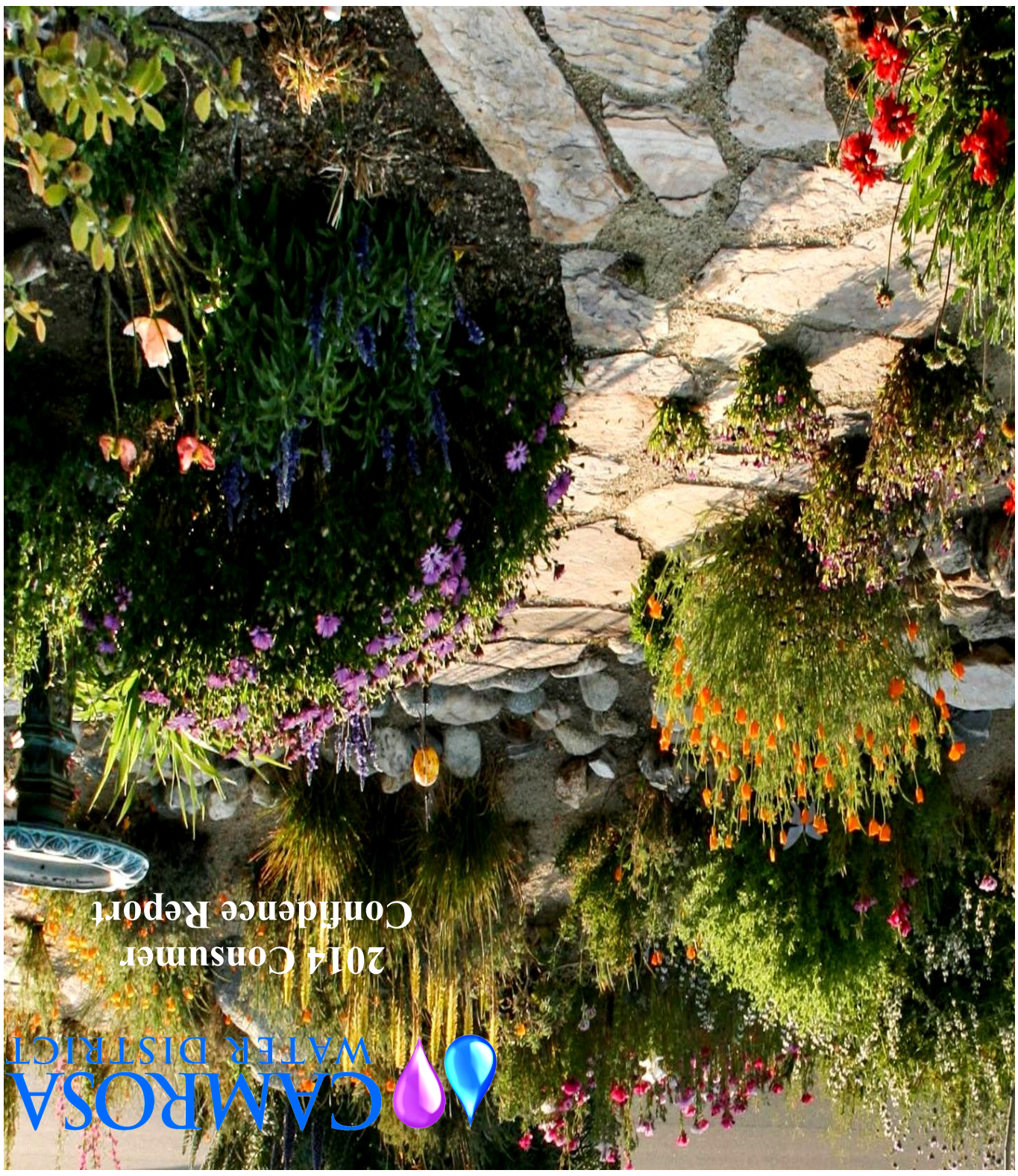
By improving our local water resources through infrastructure projects, collaboration with other regional water agencies, and with the help of our customers, we will continue to deliver safe and plentiful high quality drinking water for all the needs within the District.

If you have any questions or concerns about your water quality or anything appearing in this report, please contact me at (805) 482-8563. You may also view updated water quality information on our web site at www.camrosa.com.

Sincerely,

Michael J. Phelps
Water Quality Manager

Camrosa Water District is governed by a five member Board of Directors elected by you, the customers. The Board meets on the 2nd and 4th Thursdays of the month at 7385 Santa Rosa Road in Camarillo at 5:00 p.m. The Board agenda is posted at the front door of the office three days prior to the meeting. You can also access the agenda from our website at ***www.camrosa.com.***



Where does my water come from?

Camrosa Water District operates five wells in addition to importing water from Calleguas Municipal Water District (a distributor for the Metropolitan Water District of Southern California). About one-third of your water comes from these local wells and the rest is imported. Three of our wells are directly blended with imported water before being released into the distribution system, while the remaining two wells pump water directly into the system. Imported water is of higher quality than that found locally, but is more expensive as its source lies so far away. Camrosa uses a combination of imported and local water to provide its customers quality drinking water at a reasonable cost.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, and wells. As water travels over the surface of the land, or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

What contaminants can be found in drinking water?

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (1-800-426-4791).

Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, that can be naturally-occurring or a result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- Pesticides and herbicides, that may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, that are byproducts of industrial process and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- Radioactive contaminants, that can be naturally-occurring or be the result of oil and gas production and mining activities.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Camrosa is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

In order to ensure that tap water is safe to drink, the USEPA and the California Department of Public Health (Department) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that provide the same protection for public health.

An assessment of the drinking water sources for Camrosa Water District was completed in May, 2002. The sources are considered most vulnerable to the following activities associated with contaminants detected in the water supply: agricultural drainage and fertilization. In addition, the sources are considered most vulnerable to these activities: agricultural drainage ,fertilization, sewer collection , dry cleaning services, pesticides, petroleum storage and septic systems.
A copy of the complete assessment is available at the Camrosa Water District Office, 7385 Santa Rosa Rd. Camarillo, CA 93012. You may request a summary of the assessment be sent to you by contacting Michael Phelps at (805) 482-8563.

Who might be more susceptible to contaminants in drinking water?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Nitrate in drinking water at levels above 45 mg/L is a health risk for infants of less than six months of age. High nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate Levels above 45 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask advice from your health care provider.

While your drinking water meets the current EPA standard for arsenic, it does contain low levels of arsenic. The standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The California Department of Public Health continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

Pleasant Valley Groundwater Basin

- Groundwater Basin Number: 4-06
- County: Ventura
- Surface Area: 21,600 acres (33.7 square miles)

Basin Boundaries and Hydrology

This basin underlies Pleasant Valley in southern Ventura County. The basin is bounded on the north by the Camarillo and Las Posas Hills and on the south by the Santa Monica Mountains (CSWRB 1956). The eastern boundary is formed by a constriction in Arroyo Santa Rosa (CSWRB 1956). The basin is bounded on the west by the Oxnard subbasin of the Santa Clara River Groundwater Basin (CSWRB 1956). Ground surface elevations range from about 15 feet in the west to about 240 feet above sea level in the east (CSWRB 1956). Calleguas Creek and other tributary creeks drain the surface waters of the area westward toward the Pacific Ocean (CSWRB 1956). Average annual precipitation ranges from 12 to 16 inches.

Hydrogeologic Information

The primary water-bearing materials are alluvial sands and gravels of upper Pleistocene to Holocene age and the lower Pleistocene San Pedro Formation (CSWRB 1956). Permeable deposits within the upper Santa Barbara Formation underlie the San Pedro Formation and contain fresh groundwater of minor importance (CSWRB 1956). Average specific yield is about 10.5 percent.

Water Bearing Formations

Alluvium. The Pleistocene to Holocene age alluvium consists of silts and clays with lenses of more permeable sand and gravel. Groundwater is unconfined in this unit, but little is extracted.

San Pedro Formation. The Pleistocene age San Pedro Formation consists of an upper unit of fine silt and clay that forms an impermeable layer over an extensive 100 to 300 foot thick gravel unit in the lower San Pedro Formation called the Fox Canyon Aquifer (CSWRB 1956). The average specific yield of the gravels is about 10.5 percent for the confined basin and well yields average about 1,000 gal/min (Panaro 2000a).

Restrictive Structures

Faults and folds trend dominantly east-west through this basin. A change in sedimentary character of the upper alluvium system occurs across the Camarillo fault, with the alluvium on the north side of the fault containing a much higher percentage of sand and gravel. The Springville fault zone displaces and folds the Fox Canyon gravels along the northern boundary of the basin. Folds roughly parallel to the Springville fault zone and the Camarillo fault disturb the Fox Canyon gravels and cause them to crop out in the Camarillo Hills along the north side of the basin (CSWRB 1956).

Recharge Areas

Recharge to the basin comes dominantly from subsurface flow across the Springville fault zone, through Fox Canyon gravels from the Arroyo Santa Rosa Valley Basin, and through fractures in the volcanic rocks that comprise the Santa Monica Mountains to the south. A modest amount of irrigation water and septic system effluent also contribute to basin recharge.

Groundwater Levels Trends

During 1980 through 1999, groundwater levels fluctuated over a range of about 130 feet. Hydrographs show an annual cyclic rise and fall of water level of up to 70 feet with longer-term variations apparently following precipitation cycles. The basin was at a low level in 1991 and 1992, then recovered to moderate levels and has remained stable in the upper range of water level since then. In October 1999, the basin was estimated nearly 60 percent full (Panaro 2000a).

Groundwater Storage

Groundwater Storage Capacity. Total storage capacity is calculated at 1,886,000 af (DWR 1975; Panaro 2000a).

Groundwater in Storage. The basin was estimated to be 60 percent full in 1999 (Panaro 2000a) implying about 1,130,000 af of groundwater in storage.

Groundwater Budget (Type A)

For 1999, Panaro (2000b) estimated the applied water recharge to be 8,100 af/yr for irrigation return, approximately 18 af/yr for septic systems, and 3,300 af/yr from subsurface inflow. Average annual total extraction is estimated at 18,500 af (Panaro 2000a).

Groundwater Quality

Characterization. Groundwater has calcium as the major cation in solution and chloride, sulfate, and bicarbonate as the major anions (Panaro 2000a). Average TDS content is 1,110 mg/L with a maximum of 3,490 mg/L (Ventura County 2001). Water samples from for 10 public supply wells show TDS concentration ranging from 597 to 1,420 mg/L, with an average of 922 mg/L.

Impairments.

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	10	0
Radiological	10	1
Nitrates	10	0
Pesticides	10	0
VOCs and SVOCs	10	0
Inorganics – Secondary	10	10

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range:	Average: 1,000 gal/min (Panaro 2000b)
	Total depths (ft)	
Domestic	Range:	Average:
Municipal/Irrigation	Range:	Average:

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
Ventura County	Groundwater levels	9
Department of Health Services and cooperators	Title 22 water quality	12

Basin Management

Groundwater management:	Management of the basin is provided by the Fox Canyon Groundwater Management Agency, under the AB-2995 Groundwater Management Plan. (Panaro 2000b)
Water agencies	
Public	Ventura County, United Water Conservation District (UWCD)
Private	

References Cited

California State Water Resources Board (CSWRB). 1956. *Ventura County Investigation*. Bulletin 12. Two Volumes.

California Department of Water Resources (DWR). 1959. *Water Quality and Water Quality Problems, Ventura County*. Bulletin 75. 195 p.

Panaro, D. 2000a. Fox Canyon Groundwater Management Agency: Written Communication to R.R. Davis (DWR), March 2000.

_____. 2000b. Fox Canyon Groundwater Management Agency: Written Communication to B.C. Moniz (DWR), December 2000.

Ventura County Water Resources Division. 2001. www.ventura.org/vcpwa/wre/wrd

Additional References

California Department of Public Works (CDPW). 1933. *Ventura County Investigation.* Division of Water

Resources. Bulletin 46, 244 p.

Jennings, C.W., and Strand, R.G. 1969. *Geologic Map of California: Los Angeles Sheet.* Olaf P. Jenkins Edition: California Division of Mines and Geology, scale 1:250,000, 1 sheet.

Errata

Updated groundwater management information and added hotlinks to applicable websites. (1/20/06)

Arroyo Santa Rosa Valley Groundwater Basin

- Groundwater Basin Number: 4-7
- County: Ventura
- Surface Area: 3,730 acres (5.8 square miles)

Basin Boundaries and Hydrology

This basin underlies Arroyo Santa Rosa Valley, located in southern Ventura County. The basin is bounded on the north by the Santa Rosa fault, which cuts through the Las Posas Hills (Jennings and Strand 1969), on the south and east by the Santa Monica Mountains (CSWRB 1956), and on the west by Pleasant Valley Groundwater Basin where a constriction occurs in the Holocene alluvium (CSWRB 1956; Jennings and Strand 1969). Ground surface elevations range from about 200 feet in the west to about 400 feet above sea level in the east (CSWRB 1956). The major hydrologic features are Arroyo Santa Rosa and Conejo Creek which drain the surface waters westward toward the Pacific Ocean (CSWRB 1956). Average annual rainfall ranges from 14 to 16 inches.

Hydrogeologic Information

The water-bearing units in this basin are alluvium and parts of the San Pedro Formation (CSWRB 1956). Average specific yield is about 5 percent for the basin and well yields average 900 to 1,000 gal/min (CSWRB 1956; Panaro 2000a). Groundwater is dominantly unconfined in this basin, except in the lower San Pedro Formation in the western part of the basin (CSWRB 1956).

Water Bearing Formations

Alluvium. The Pleistocene to Holocene age alluvium is up to 200 feet thick and consists of gravel, sand, and clay (CSWRB 1956; DWR 1959).

San Pedro Formation. The alluvial gravel, sand, silt and clay of the Pleistocene age San Pedro Formation reach about 700 feet in thickness and contain lenticular sand and gravel beds that cannot be traced from well to well. In the western part of the basin, the lower San Pedro Formation contains a more continuous gravel bed that is about 100 feet thick and probably equivalent to the Fox Canyon aquifer found throughout basins to the west (CSWRB 1956; DWR 1959).

Restrictive Structures

The structure of this basin is dominated by the east-trending Santa Rosa syncline that folds the San Pedro and Santa Barbara Formations (CSWRB 1956). This syncline helps direct groundwater flow in the San Pedro Formation. The Santa Rosa fault zone places the semi-permeable Sespe and Topanga Formations against more permeable San Pedro Formation along the north side of the basin (CSWRB 1956). This juxtaposition causes a barrier to groundwater flow into the basin from the north. A sharp change in water level in the western part of the basin is likely due to a roughly north-trending fault that restricts groundwater flow (Panaro 2000b).

Groundwater Level Trends

Since 1980, groundwater levels have fluctuated in some wells as much as 115 feet; however, most wells only show a range of 30 to 40 feet. Hydrographs show an annual rise and fall of water level of about 20 feet with longer-term variations apparently not following precipitation cycles. In the western part of the basin, groundwater levels declined about 50 feet during 1992 through 1997 and recoved about 25 feet during 1998 through 1999. In the central part of the basin, groundwater levels fluctuated about 20 feet during the 1990s, and in the eastern part of the basin, groundwater levels rose about 115 feet during 1991 through 1999.

Groundwater Storage

Groundwater Storage Capacity. Estimates of total storage capacity range from about 94,000 to 103,600 af (Panaro 2000a). The more conservative estimate is consistent with an area of about 3,660 acres, about 500 feet of average saturated thickness, and an average specific yield of about 5 percent.

Groundwater in Storage. In 1999, the basin was an estimated at around 70 to 80 percent full, implying groundwater in storage of about 70,500 af (Panaro 2000a).

Groundwater Budget (Type A)

Limited estimates of recharge and pumping in the basin are available. Recharge is estimated at 1,200 to 2,900 af/yr for underflow, 4,100 to 5,200 af/yr for irrigation return, about 300 af/yr from septic systems, and less than 10 af/yr from leaking potable water pipes (Panaro 2000a). Pumping was estimated at less than 5,000 af for 1999 (Panaro 2000a).

Groundwater Quality

Characterization. According to the sampling of 7 public supply wells, TDS content ranges from 670 to 1,200 mg/L and averages 1,006 mg/L.

Impairments. Elevated sulfate and nitrate concentrations are observed in the groundwater (Panaro 2000b).

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	8	1
Radiological	8	0
Nitrates	8	5
Pesticides	8	0
VOCs and SVOCs	8	0
Inorganics – Secondary	8	2

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.

[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: to 1,200 gal/min, 900 to 1,000 gal/min (Panaro 2000a)	Average: 600 gal/min (CSWRB 1956)
	Total depths (ft)	
Domestic	Range:	Average:
Municipal/Irrigation	Range:	Average:

Active Monitoring Data

Agency	**Parameter**	**Number of wells /measurement frequency**
Ventura County	Groundwater levels	6/bimonthly
Department of Health Services and cooperators	Title 22 water quality	7

Basin Management

Groundwater management:	Camrosa Water District. Fox Canyon Groundwater Management Agency has a groundwater management plan under AB-2995.
Water agencies	
Public	Camrosa Water District, Fox Canyon Groundwater Management Agency
Private	

References Cited

California State Water Resources Board (CSWRB). 1956. *Ventura County Investigation*. Bulletin 12. Two Volumes.

California Department of Water Resources (DWR). 1959. *Water Quality and Water Quality Problems, Ventura County*. Bulletin 75. 195 p.

Jennings, C.W., and Strand, R.G., 1969, *Geologic Map of California: Los Angeles Sheet*, Olaf P. Jenkins Edition: California Division of Mines and Geology, scale 1:250,000, 1 sheet.

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_____. 2000b. Fox Canyon Groundwater Management Agency: Oral communication with T. M. Ross (DWR), September 29, 2000.

Additional References

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California Department of Water Resources (CDWR). 1959. *Water Quality and Water Quality Problems, Ventura County*. Bulletin 75. 195 p.

Errata

Updated groundwater management information and added hotlinks to applicable websites. (1/20/06)

Tierra Rejada Groundwater Basin

- Groundwater Basin Number: 4-15
- County: Ventura
- Surface Area: 4,390 acres (6.9 square miles)

Basin Boundaries and Hydrology

Tierra Rejada Groundwater Basin is near the headwaters of Arroyo Santa Rosa in southern Ventura County. This basin is bounded on the south and east by surface drainage divides and on the north and west by faults that restrict groundwater flow. An unnamed north-trending fault forms the western boundary and the east-trending Simi fault is the northern boundary (CSWRB 1956). Average annual precipitation ranges from 14 to 16 inches.

Hydrogeologic Information

Water Bearing Formations

Groundwater in the basin is found in alluvium and the Modelo, Topanga , and Conejo Formations.

Alluvium. Quaternary age alluvium is generally found only near the center of the valley where it is interpreted as about 25 feet thick (Schaaf 1998). This unit can bear water, but is not the major producer in the basin.

Modelo Formation. The Miocene age Modelo Formation consists of marine sandstone and shale. The unit reaches a thickness of 6,500 feet regionally and unconformably overlies the Topanga and Conejo Formations (CSWRB 1956).

Topanga and Conejo Formations. The Miocene age Topanga Formation and Conejo Formation are coeval intercalated deposits. The Topanga Formation contains sandstone, conglomerate and shale in this basin. The Conejo Formation consists of volcanic tuff, debris flow, and basaltic flow and breccia deposits that reach 2,000 feet thick in this basin (CSWRB 1956). The high porosity in the fractured basalt flows allows moderate production from these units. An average well yield of 172 gpm was estimated by Panaro (2000). Well yields in the basin reach 1,200 gpm. Specific yield was estimated at 11 percent (Schaaf 1998).

Restrictive Structures

The geologic structure of the basin is dominated by a westward plunging syncline. The volcanic rocks south and east of the basin dip from 10 to 30 degrees toward the center of the basin. North of the basin, the attitude of the volcanic rocks is nearly vertical. The volcanic rocks are terminated near the north boundary of the basin by the west-trending Simi fault, which acts as a groundwater barrier (CSWRB 1956. An unnamed north-trending fault displaces the volcanic rocks near the western side of the basin, forming a groundwater barrier and a displacement of water level of about 100 feet in the fractured volcanic rocks (CSWRB 1956).

Recharge Areas

Tierra Rejada Groundwater Basin is replenished by percolation of rainfall to the valley floor, stream flow, and irrigation return. Percolation of effluent from septic systems and a wastewater treatment plant add a minor amount of water to the basin.

Groundwater Level Trends

Groundwater moves westward through the basin. Most hydrographs of wells monitored in the basin display a marked rise in water levels since the 1970s, with some hydrographs indicating more than 100 feet of rise. Most hydrographs show 15 to 20 feet of annual variation about a stable mean water level between 1995 and 2001.

Groundwater Storage

Groundwater Storage Capacity. Groundwater storage capacity is estimated to be 39,320 af by Panaro (2000a) and greater than 80,000 af by Schaaf (1998).

Groundwater in Storage. In 1999, the basin was estimated at 75 percent full, or having 29,490 af of groundwater in storage (Panaro 2000a). About 80,000 af of groundwater in storage was estimated by Schaaf (1998), based on an average specific yield of 11 percent.

Groundwater Budget (Type A)

Panaro (2000a) estimates annual recharge from underflow of about 500 af/yr, irrigation return of about 675 af/yr, and discharge from a wastewater treatment plant of 125 af/yr. Annual production from wells is about 1,500 af/yr (Panaro 2000a). About 6,200 af/yr of inflow is estimated by Schaaf (1998), including 5,250 af/ yr from precipitation, 50 af/yr from stream flow, 280 af/yr from treated wastewater and 150 af/yr from imported water (Schaaf 1998). Outflow includes about 5,075 af/yr from evapotranspiration and consumptive use, 540 af/yr as surface outflow, 225 af/yr as subsurface outflow, and 370 af/yr as exported domestic supply water (Schaaf 1998).

Groundwater Quality

Characterization. Groundwater in this basin is characterized as magnesium-calcium bicarbonate (DWR 1959; Schaaf 1998), though the basin is also reported to contain calcium, magnesium and sodium in roughly equal amounts, with bicarbonate and sulfate as dominate anions (Ventura County 2001). In 1996, the maximum TDS concentration was 930 mg/L and the maximum nitrate concentration was 16 mg/L (Ventura County 2001). Water sampled from one public supply well in the basin had an average TDS content of 619 mg/L and a specific conductivity of 935 μmohs (Camrosa Water District 2001).

Impairments. High nitrate concentrations occur locally the basin (Panaro 2000a).

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: 6 - 1,200 gal/min (well completion reports)	Average: 172 gal/min (Panaro 2000a)
	Total depths (ft)	
Domestic	Range:	Average:
Municipal/Irrigation	Range: 250 - 800 ft	Average:

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
Ventura County	Groundwater levels	4 wells
Camrosa Water District	Miscellaneous water quality	1

Basin Management

Groundwater management:	Currently there is no management of the basin. (Panaro 2000)
Water agencies	
Public	Ventura County Groundwater Management Agency Camrosa Water District
Private	

References Cited

California State Water Resources Board (CSWRB). 1956. *Ventura County Investigation*. Bulletin 12. Two Volumes.

California Department of Water Resources (DWR). 1959. *Water Quality and Water Quality Problems, Ventura County*. Bulletin 75. 195 p.

Camrosa Water District. 2001. *Consumer Confidence Report.* www.camrosa.com.

Panaro, D. 2000a. Fox Canyon Groundwater Management Agency: Written Communication to B. C. Moniz (DWR), December 2000.

Schaaf, Joseph H. 1998. *Hydrogeology of the Tierra Rejada Groundwater Basin, Ventura County, California.* California State University, Northridge. Unpublished M.S. Thesis.

Ventura County. 2001. Ventura County Public Works. www.ventura.org/vcpwa. October 2001.

Additional References

California Department of Public Works (DPW). 1933. *Ventura County Investigation*. Division of Water

Resources. Bulletin 46, 244 p.

Errata

Changes made to the basin description will be noted here.

Pleasant Valley Groundwater Basin

- Groundwater Basin Number: 4-06
- County: Ventura
- Surface Area: 21,600 acres (33.7 square miles)

Basin Boundaries and Hydrology

This basin underlies Pleasant Valley in southern Ventura County. The basin is bounded on the north by the Camarillo and Las Posas Hills and on the south by the Santa Monica Mountains (CSWRB 1956). The eastern boundary is formed by a constriction in Arroyo Santa Rosa (CSWRB 1956). The basin is bounded on the west by the Oxnard subbasin of the Santa Clara River Groundwater Basin (CSWRB 1956). Ground surface elevations range from about 15 feet in the west to about 240 feet above sea level in the east (CSWRB 1956). Calleguas Creek and other tributary creeks drain the surface waters of the area westward toward the Pacific Ocean (CSWRB 1956). Average annual precipitation ranges from 12 to 16 inches.

Hydrogeologic Information

The primary water-bearing materials are alluvial sands and gravels of upper Pleistocene to Holocene age and the lower Pleistocene San Pedro Formation (CSWRB 1956). Permeable deposits within the upper Santa Barbara Formation underlie the San Pedro Formation and contain fresh groundwater of minor importance (CSWRB 1956). Average specific yield is about 10.5 percent.

Water Bearing Formations

Alluvium. The Pleistocene to Holocene age alluvium consists of silts and clays with lenses of more permeable sand and gravel. Groundwater is unconfined in this unit, but little is extracted.

San Pedro Formation. The Pleistocene age San Pedro Formation consists of an upper unit of fine silt and clay that forms an impermeable layer over an extensive 100 to 300 foot thick gravel unit in the lower San Pedro Formation called the Fox Canyon Aquifer (CSWRB 1956). The average specific yield of the gravels is about 10.5 percent for the confined basin and well yields average about 1,000 gal/min (Panaro 2000a).

Restrictive Structures

Faults and folds trend dominantly east-west through this basin. A change in sedimentary character of the upper alluvium system occurs across the Camarillo fault, with the alluvium on the north side of the fault containing a much higher percentage of sand and gravel. The Springville fault zone displaces and folds the Fox Canyon gravels along the northern boundary of the basin. Folds roughly parallel to the Springville fault zone and the Camarillo fault disturb the Fox Canyon gravels and cause them to crop out in the Camarillo Hills along the north side of the basin (CSWRB 1956).

Recharge Areas

Recharge to the basin comes dominantly from subsurface flow across the Springville fault zone, through Fox Canyon gravels from the Arroyo Santa Rosa Valley Basin, and through fractures in the volcanic rocks that comprise the Santa Monica Mountains to the south. A modest amount of irrigation water and septic system effluent also contribute to basin recharge.

Groundwater Levels Trends

During 1980 through 1999, groundwater levels fluctuated over a range of about 130 feet. Hydrographs show an annual cyclic rise and fall of water level of up to 70 feet with longer-term variations apparently following precipitation cycles. The basin was at a low level in 1991 and 1992, then recovered to moderate levels and has remained stable in the upper range of water level since then. In October 1999, the basin was estimated nearly 60 percent full (Panaro 2000a).

Groundwater Storage

Groundwater Storage Capacity. Total storage capacity is calculated at 1,886,000 af (DWR 1975; Panaro 2000a).

Groundwater in Storage. The basin was estimated to be 60 percent full in 1999 (Panaro 2000a) implying about 1,130,000 af of groundwater in storage.

Groundwater Budget (Type A)

For 1999, Panaro (2000b) estimated the applied water recharge to be 8,100 af/yr for irrigation return, approximately 18 af/yr for septic systems, and 3,300 af/yr from subsurface inflow. Average annual total extraction is estimated at 18,500 af (Panaro 2000a).

Groundwater Quality

Characterization. Groundwater has calcium as the major cation in solution and chloride, sulfate, and bicarbonate as the major anions (Panaro 2000a). Average TDS content is 1,110 mg/L with a maximum of 3,490 mg/L (Ventura County 2001). Water samples from for 10 public supply wells show TDS concentration ranging from 597 to 1,420 mg/L, with an average of 922 mg/L.

Impairments.

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	10	0
Radiological	10	1
Nitrates	10	0
Pesticides	10	0
VOCs and SVOCs	10	0
Inorganics – Secondary	10	10

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range:	Average: 1,000 gal/min (Panaro 2000b)
	Total depths (ft)	
Domestic	Range:	Average:
Municipal/Irrigation	Range:	Average:

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
Ventura County	Groundwater levels	9
Department of Health Services and cooperators	Title 22 water quality	12

Basin Management

Groundwater management:	Management of the basin is provided by the Fox Canyon Groundwater Management Agency, under the AB-2995 Groundwater Management Plan. (Panaro 2000b)
Water agencies	
Public	Ventura County, United Water Conservation District (UWCD)
Private	

References Cited

California State Water Resources Board (CSWRB). 1956. *Ventura County Investigation*. Bulletin 12. Two Volumes.

California Department of Water Resources (DWR). 1959. *Water Quality and Water Quality Problems, Ventura County*. Bulletin 75. 195 p.

Panaro, D. 2000a. Fox Canyon Groundwater Management Agency: Written Communication to R.R. Davis (DWR), March 2000.

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Additional References

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Jennings, C.W., and Strand, R.G. 1969. *Geologic Map of California: Los Angeles Sheet.* Olaf P. Jenkins Edition: California Division of Mines and Geology, scale 1:250,000, 1 sheet.

Errata

Updated groundwater management information and added hotlinks to applicable websites. (1/20/06)

Arroyo Santa Rosa Valley Groundwater Basin

- Groundwater Basin Number: 4-7
- County: Ventura
- Surface Area: 3,730 acres (5.8 square miles)

Basin Boundaries and Hydrology

This basin underlies Arroyo Santa Rosa Valley, located in southern Ventura County. The basin is bounded on the north by the Santa Rosa fault, which cuts through the Las Posas Hills (Jennings and Strand 1969), on the south and east by the Santa Monica Mountains (CSWRB 1956), and on the west by Pleasant Valley Groundwater Basin where a constriction occurs in the Holocene alluvium (CSWRB 1956; Jennings and Strand 1969). Ground surface elevations range from about 200 feet in the west to about 400 feet above sea level in the east (CSWRB 1956). The major hydrologic features are Arroyo Santa Rosa and Conejo Creek which drain the surface waters westward toward the Pacific Ocean (CSWRB 1956). Average annual rainfall ranges from 14 to 16 inches.

Hydrogeologic Information

The water-bearing units in this basin are alluvium and parts of the San Pedro Formation (CSWRB 1956). Average specific yield is about 5 percent for the basin and well yields average 900 to 1,000 gal/min (CSWRB 1956; Panaro 2000a). Groundwater is dominantly unconfined in this basin, except in the lower San Pedro Formation in the western part of the basin (CSWRB 1956).

Water Bearing Formations

Alluvium. The Pleistocene to Holocene age alluvium is up to 200 feet thick and consists of gravel, sand, and clay (CSWRB 1956; DWR 1959).

San Pedro Formation. The alluvial gravel, sand, silt and clay of the Pleistocene age San Pedro Formation reach about 700 feet in thickness and contain lenticular sand and gravel beds that cannot be traced from well to well. In the western part of the basin, the lower San Pedro Formation contains a more continuous gravel bed that is about 100 feet thick and probably equivalent to the Fox Canyon aquifer found throughout basins to the west (CSWRB 1956; DWR 1959).

Restrictive Structures

The structure of this basin is dominated by the east-trending Santa Rosa syncline that folds the San Pedro and Santa Barbara Formations (CSWRB 1956). This syncline helps direct groundwater flow in the San Pedro Formation. The Santa Rosa fault zone places the semi-permeable Sespe and Topanga Formations against more permeable San Pedro Formation along the north side of the basin (CSWRB 1956). This juxtaposition causes a barrier to groundwater flow into the basin from the north. A sharp change in water level in the western part of the basin is likely due to a roughly north-trending fault that restricts groundwater flow (Panaro 2000b).

Groundwater Level Trends

Since 1980, groundwater levels have fluctuated in some wells as much as 115 feet; however, most wells only show a range of 30 to 40 feet. Hydrographs show an annual rise and fall of water level of about 20 feet with longer-term variations apparently not following precipitation cycles. In the western part of the basin, groundwater levels declined about 50 feet during 1992 through 1997 and recoved about 25 feet during 1998 through 1999. In the central part of the basin, groundwater levels fluctuated about 20 feet during the 1990s, and in the eastern part of the basin, groundwater levels rose about 115 feet during 1991 through 1999.

Groundwater Storage

Groundwater Storage Capacity. Estimates of total storage capacity range from about 94,000 to 103,600 af (Panaro 2000a). The more conservative estimate is consistent with an area of about 3,660 acres, about 500 feet of average saturated thickness, and an average specific yield of about 5 percent.

Groundwater in Storage. In 1999, the basin was an estimated at around 70 to 80 percent full, implying groundwater in storage of about 70,500 af (Panaro 2000a).

Groundwater Budget (Type A)

Limited estimates of recharge and pumping in the basin are available. Recharge is estimated at 1,200 to 2,900 af/yr for underflow, 4,100 to 5,200 af/yr for irrigation return, about 300 af/yr from septic systems, and less than 10 af/yr from leaking potable water pipes (Panaro 2000a). Pumping was estimated at less than 5,000 af for 1999 (Panaro 2000a).

Groundwater Quality

Characterization. According to the sampling of 7 public supply wells, TDS content ranges from 670 to 1,200 mg/L and averages 1,006 mg/L.

Impairments. Elevated sulfate and nitrate concentrations are observed in the groundwater (Panaro 2000b).

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	8	1
Radiological	8	0
Nitrates	8	5
Pesticides	8	0
VOCs and SVOCs	8	0
Inorganics – Secondary	8	2

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.

[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: to 1,200 gal/min, 900 to 1,000 gal/min (Panaro 2000a)	Average: 600 gal/min (CSWRB 1956)
	Total depths (ft)	
Domestic	Range:	Average:
Municipal/Irrigation	Range:	Average:

Active Monitoring Data

Agency	**Parameter**	**Number of wells /measurement frequency**
Ventura County	Groundwater levels	6/bimonthly
Department of Health Services and cooperators	Title 22 water quality	7

Basin Management

Groundwater management:	Camrosa Water District. Fox Canyon Groundwater Management Agency has a groundwater management plan under AB-2995.
Water agencies	
Public	Camrosa Water District, Fox Canyon Groundwater Management Agency
Private	

References Cited

California State Water Resources Board (CSWRB). 1956. *Ventura County Investigation*. Bulletin 12. Two Volumes.

California Department of Water Resources (DWR). 1959. *Water Quality and Water Quality Problems, Ventura County*. Bulletin 75. 195 p.

Jennings, C.W., and Strand, R.G., 1969, *Geologic Map of California: Los Angeles Sheet*, Olaf P. Jenkins Edition: California Division of Mines and Geology, scale 1:250,000, 1 sheet.

Panaro, D. 2000a. Fox Canyon Groundwater Management Agency: Written Communication to R.R. Davis (DWR), March 21, 2000.

_____. 2000b. Fox Canyon Groundwater Management Agency: Oral communication with T. M. Ross (DWR), September 29, 2000.

Additional References

California Department of Public Works (CDPW). 1933. *Ventura County Investigation*. Division of Water Resources. Bulletin 46, 244 p.

California Department of Water Resources (CDWR). 1959. *Water Quality and Water Quality Problems, Ventura County*. Bulletin 75. 195 p.

Errata

Updated groundwater management information and added hotlinks to applicable websites. (1/20/06)

Tierra Rejada Groundwater Basin

- Groundwater Basin Number: 4-15
- County: Ventura
- Surface Area: 4,390 acres (6.9 square miles)

Basin Boundaries and Hydrology

Tierra Rejada Groundwater Basin is near the headwaters of Arroyo Santa Rosa in southern Ventura County. This basin is bounded on the south and east by surface drainage divides and on the north and west by faults that restrict groundwater flow. An unnamed north-trending fault forms the western boundary and the east-trending Simi fault is the northern boundary (CSWRB 1956). Average annual precipitation ranges from 14 to 16 inches.

Hydrogeologic Information

Water Bearing Formations

Groundwater in the basin is found in alluvium and the Modelo, Topanga , and Conejo Formations.

Alluvium. Quaternary age alluvium is generally found only near the center of the valley where it is interpreted as about 25 feet thick (Schaaf 1998). This unit can bear water, but is not the major producer in the basin.

Modelo Formation. The Miocene age Modelo Formation consists of marine sandstone and shale. The unit reaches a thickness of 6,500 feet regionally and unconformably overlies the Topanga and Conejo Formations (CSWRB 1956).

Topanga and Conejo Formations. The Miocene age Topanga Formation and Conejo Formation are coeval intercalated deposits. The Topanga Formation contains sandstone, conglomerate and shale in this basin. The Conejo Formation consists of volcanic tuff, debris flow, and basaltic flow and breccia deposits that reach 2,000 feet thick in this basin (CSWRB 1956). The high porosity in the fractured basalt flows allows moderate production from these units. An average well yield of 172 gpm was estimated by Panaro (2000). Well yields in the basin reach 1,200 gpm. Specific yield was estimated at 11 percent (Schaaf 1998).

Restrictive Structures

The geologic structure of the basin is dominated by a westward plunging syncline. The volcanic rocks south and east of the basin dip from 10 to 30 degrees toward the center of the basin. North of the basin, the attitude of the volcanic rocks is nearly vertical. The volcanic rocks are terminated near the north boundary of the basin by the west-trending Simi fault, which acts as a groundwater barrier (CSWRB 1956. An unnamed north-trending fault displaces the volcanic rocks near the western side of the basin, forming a groundwater barrier and a displacement of water level of about 100 feet in the fractured volcanic rocks (CSWRB 1956).

Recharge Areas

Tierra Rejada Groundwater Basin is replenished by percolation of rainfall to the valley floor, stream flow, and irrigation return. Percolation of effluent from septic systems and a wastewater treatment plant add a minor amount of water to the basin.

Groundwater Level Trends

Groundwater moves westward through the basin. Most hydrographs of wells monitored in the basin display a marked rise in water levels since the 1970s, with some hydrographs indicating more than 100 feet of rise. Most hydrographs show 15 to 20 feet of annual variation about a stable mean water level between 1995 and 2001.

Groundwater Storage

Groundwater Storage Capacity. Groundwater storage capacity is estimated to be 39,320 af by Panaro (2000a) and greater than 80,000 af by Schaaf (1998).

Groundwater in Storage. In 1999, the basin was estimated at 75 percent full, or having 29,490 af of groundwater in storage (Panaro 2000a). About 80,000 af of groundwater in storage was estimated by Schaaf (1998), based on an average specific yield of 11 percent.

Groundwater Budget (Type A)

Panaro (2000a) estimates annual recharge from underflow of about 500 af/yr, irrigation return of about 675 af/yr, and discharge from a wastewater treatment plant of 125 af/yr. Annual production from wells is about 1,500 af/yr (Panaro 2000a). About 6,200 af/yr of inflow is estimated by Schaaf (1998), including 5,250 af/ yr from precipitation, 50 af/yr from stream flow, 280 af/yr from treated wastewater and 150 af/yr from imported water (Schaaf 1998). Outflow includes about 5,075 af/yr from evapotranspiration and consumptive use, 540 af/yr as surface outflow, 225 af/yr as subsurface outflow, and 370 af/yr as exported domestic supply water (Schaaf 1998).

Groundwater Quality

Characterization. Groundwater in this basin is characterized as magnesium-calcium bicarbonate (DWR 1959; Schaaf 1998), though the basin is also reported to contain calcium, magnesium and sodium in roughly equal amounts, with bicarbonate and sulfate as dominate anions (Ventura County 2001). In 1996, the maximum TDS concentration was 930 mg/L and the maximum nitrate concentration was 16 mg/L (Ventura County 2001). Water sampled from one public supply well in the basin had an average TDS content of 619 mg/L and a specific conductivity of 935 μmohs (Camrosa Water District 2001).

Impairments. High nitrate concentrations occur locally the basin (Panaro 2000a).

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: 6 - 1,200 gal/min (well completion reports)	Average: 172 gal/min (Panaro 2000a)
	Total depths (ft)	
Domestic	Range:	Average:
Municipal/Irrigation	Range: 250 - 800 ft	Average:

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
Ventura County	Groundwater levels	4 wells
Camrosa Water District	Miscellaneous water quality	1

Basin Management

Groundwater management:	Currently there is no management of the basin. (Panaro 2000)
Water agencies	
Public	Ventura County Groundwater Management Agency Camrosa Water District
Private	

References Cited

California State Water Resources Board (CSWRB). 1956. *Ventura County Investigation*. Bulletin 12. Two Volumes.

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Ventura County. 2001. Ventura County Public Works. www.ventura.org/vcpwa. October 2001.

Additional References

California Department of Public Works (DPW). 1933. *Ventura County Investigation*. Division of Water

Resources. Bulletin 46, 244 p.

Errata

Changes made to the basin description will be noted here.

HOPKINS GROUNDWATER CONSULTANTS, INC.

PRELIMINARY HYDROGEOLOGICAL STUDY

NORTHEAST PLEASANT VALLEY BASIN SURFACE WATER AND GROUNDWATER STUDY SOMIS, CALIFORNIA

Prepared for:
CALLEGUAS MUNICIPAL WATER DISTRICT

November 2008

HOPKINS
GROUNDWATER
CONSULTANTS, INC.
THE WATER RESOURCE SPECIALISTS

November 7, 2008
Project No. 03-007-07

Calleguas Municipal Water District
2100 Olsen Road
Thousand Oaks, California 91360

Attention: Mr. Henry Graumlich
Manager of Special Projects

Subject: Preliminary Hydrogeological Study of the Pleasant Valley Groundwater Basin in Somis, California.

Dear Mr. Graumlich:

Hopkins Groundwater Consultants, Inc. (Hopkins) is pleased to provide this final report summarizing the findings, conclusions, and recommendations developed from the subject preliminary hydrogeological study of conditions that are resulting in groundwater recharge to the northeast Pleasant Valley Groundwater Basin. The study findings indicate that the Arroyo Los Posas surface flows percolate into the ground in the Somis area which is defined by the study as the Pleasant Valley Forebay. The resulting groundwater elevation rise, water quality change, and isotopic fingerprint, measured at the City of Camarillo Well B location indicate a direct connection to recharge from the increased surface water inflows since 1994. We trust the information contained in this report sufficiently describes our understanding of groundwater basin conditions in the northeast Pleasant Valley Groundwater Basin based on available data. If you have any questions or need any additional information, please give us a call.

Sincerely,

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EXECUTIVE SUMMARY

The preliminary groundwater study (Study) was conducted to develop a better understanding of the changing groundwater conditions observed in the northeast Pleasant Valley Groundwater Basin (PVB). The Study was conducted by Hopkins Groundwater Consultants, Inc. (Hopkins) in coordination with Calleguas Municipal Water District (CMWD) staff between October 2007 and December 2007. The Study consisted of; a) obtaining and analyzing existing groundwater and surface water data, b) collecting a groundwater sample from the City of Camarillo (City) Well B, and c) measuring surface flows and collecting a water sample from the Arroyo Los Posas.

The findings of the Study indicate that the Arroyo Los Posas percolates into the ground and ceases flowing most of the year in the vicinity of Somis, California. Available data indicate that the northeast PVB has been recovering since the mid 1990's and is being directly recharged by surface water infiltration along the arroyo. Historical water quality data indicate that the chemical character of groundwater sampled from the City's well has changed over the last 10 years and closely resembles the surface water quality in the arroyo. Tritium test results support the groundwater is a young age while the oxygen and hydrogen isotope analyses indicate the well water is of similar isotopic composition to historical surface water samples tested by other studies (Izbicki, 1997). The nitrogen isotope signatures indicate that the surface water and well water samples were very close in their isotopic ratios and tend to exhibit a nitrogen source that is likely dominated by nitrate from wastewater treatment plant effluent.

The Study concludes that the groundwater degradation and rapid water level rise documented in the City wells is a direct result of surface water recharge emanating from the Arroyo Los Posas. Recharge began when the East Los Posas Groundwater Basin (located upstream) was filled along the arroyo and began to overflow into the PVB in approximately 1994. The surface flows rapidly percolated through the coarse alluvial sediments that comprise the river bed and into the underlying Saugus and Los Posas Sand Formations that comprise the primary aquifer system in the PVB. Available data indicate that surface water inflow since the beginning of the 1990's has likely resulted in annual groundwater recharge on the order of 10,000 to 15,000 acre-feet per year. Water level data appear to indicate that subbasin boundaries may be present and restrict the lateral migration of water from the area of recharge which comprises the Pleasant Valley Forebay. The study concludes that water quality in this area of the PVB will likely not improve in the foreseeable future and that the City should consider the use of treatment to allow continued municipal use of this groundwater supply.

INTRODUCTION

This report summarizes the findings, conclusions, and recommendations developed from a preliminary hydrogeological study of groundwater recharge occurring in the northeast Pleasant Valley Groundwater Basin (PVB). The study was conducted by Hopkins Groundwater Consultants, Inc. (Hopkins) to assist the Calleguas Municipal Water District (CMWD) with developing an understanding of the conditions that are resulting in groundwater recharge from the Arroyo Las Posas/Calleguas Creek in an area recently recognized as the PVB Forebay. The area of study is located within the northeast portion of the PVB along the Arroyo Las Posas/Calleguas Creek reach which lies south of the Springville Fault Zone and north of the Camarillo Fault as shown on Plate 1 – Study Area Location Map.

The purpose of the study is to understand the changing groundwater conditions which are causing groundwater degradation in the northeast PVB and affecting the municipal use of groundwater in that area of the basin. The scope of work for the study was developed through conversations with Dr. Donald Kendall, General Manager with the CMWD, and Ms. Susan Mulligan, Manager of Engineering with the CMWD, and includes the following work tasks:

- Collect and review historical geology, hydrology, and hydrogeology data
- Develop a refined interpretation of the hydrogeology in the northeast portion of the Pleasant Valley Groundwater Basin
- Conduct creek flow measurements
- Collect creek water samples and well water samples for laboratory analysis
- Compile and present the data and study findings in this report

Included with this report are appendices that present technical information that was compiled and used by the study. These appendices include; Appendix A - Water Quality Data Appendix B – Aerial Photographs of Arroyo Las Posas, Appendix C - Stream Flow Survey, and Appendix D – Laboratory Test Results of Surface and Groundwater Analyses. A list of references used during the study is included at the end of this report.

FINDINGS

Historical Data

Initial work tasks for the study consisted of collecting and reviewing hydrogeological information in the northeastern PVB for the purpose of refining the historical understanding of

the subsurface materials and geological structures that form the aquifer system in this area of the basin. Data were collected from sources that include the Ventura County Watershed Protection District (County), United Water Conservation District (UWCD), City of Camarillo (City), CMWD, United States Geological Survey (USGS), and California Division of Mines and Geology (CDMG). From these data we reviewed the local stratigraphy and previous interpretations developed by other studies, interpreted and correlated available well logs (State well driller reports and geophysical surveys), reviewed historical water level measurements and available groundwater quality test results as part of our analysis to understand groundwater movement within this portion of the basin. We reviewed historical stream flow data provided from monitoring locations upstream of the observed groundwater recharge area. Based on these data we developed the following findings, conducted additional field work, and performed the analyses presented in the following sections of this report.

Hydrogeology

Local Geology

The geologic formation materials that comprise the aquifers which have historically supported groundwater production in the study area consist of Quaternary geologic age young and older alluvium, the Quaternary/Tertiary age Saugus Formation and the Las Posas Sand Formation which have been grouped by others as the San Pedro Formation (SWRB, 1953). The young and older alluvium is comprised of largely unconsolidated sediment locally deposited by outwash from the Camarillo Hills and flows in the Arroyo Las Posas. These alluvial deposits unconformably lie on top of marine and nonmarine mudstone, sandstone, and conglomerate deposits that comprise the Saugus and underlying Las Posas Sand Formations.

Numerous agencies have conducted studies to understand the geological conditions in the vicinity of the study area. For this study Hopkins primarily utilized the surface geology mapped by T.W. Dibblee, Jr. and the geological formations defined by this source which are presented as Plate 2 – Surface Geology Map. This information was combined with geologic mapping provided by CDMG (CDMG, 1973) which is presented as Plate 3 – Study Area Geological Structures and includes an interpretation with numerous buried features in the study area. These data were subsequently correlated with well log information and projected into hydrogeological cross-sections that were constructed to define water bearing units (aquifers) within the study area. The location of wells within the study area that provided historical data and the location of the hydrogeological cross-sections constructed for this study are shown on Plate 4 - Hydrogeological Cross-Section and Well Location Map. The subsurface hydrogeology inferred from data sources available for this study is shown on Plates 5 and 6 – Hydrogeological Cross-Section A-A' and B-B', respectively.

As shown on Plate 2, the active channel of the Arroyo Los Posas emerges from the Las Posas Valley and crosses through the river-eroded gap (at Somis) into the Pleasant Valley area.

The river bed is comprised of Recent alluvium that is predominantly a very coarse-grained sand and fine gravel material. These alluvial deposits unconformably lie on top of the Saugus and Las Posas Sand Formations (and possibly older alluvial deposits) which have been uplifted and are exposed in the Las Posas Hills to the east and the Camarillo Hills to west (see Plate 2). In the Somis gap area surface water in the arroyo readily percolates into the river bed alluvium (which is believed to be on the order of 60 to 100 feet thick) and into the underlying aquifers in the Saugus and Las Posas Sand Formations. For the purpose of this study we have named the Somis gap groundwater recharge area the PVB Forebay, and we are defining a forebay as the portion of an unconfined alluvial aquifer that allows surface water percolation to recharge aquifer zones that become confined by overlying aquitard or aquiclude layers outside the area of recharge.

Groundwater Basin Boundaries

The groundwater basin boundaries have been defined and redefined through time as additional information becomes available. This is exemplified by the delineation of the East and West Las Posas Basin (ELPB and WLPB) which were originally defined as the North Las Posas Basin. The groundwater basin boundaries utilized by this study were provided from the newly updated Fox Canyon Groundwater Management Agency (FCGMA) Groundwater Management Plan (FCGMA, 2007). The location of groundwater basin boundaries in and around the study area is shown on Plate 4 along with the approximate location of the inferred PVB Forebay. The Springville Fault effectively defines the northern boundary of the PVB. However, it is unclear how other inferred geologic structures in and around the northeast portion of the PVB affect groundwater movement.

Groundwater Conditions

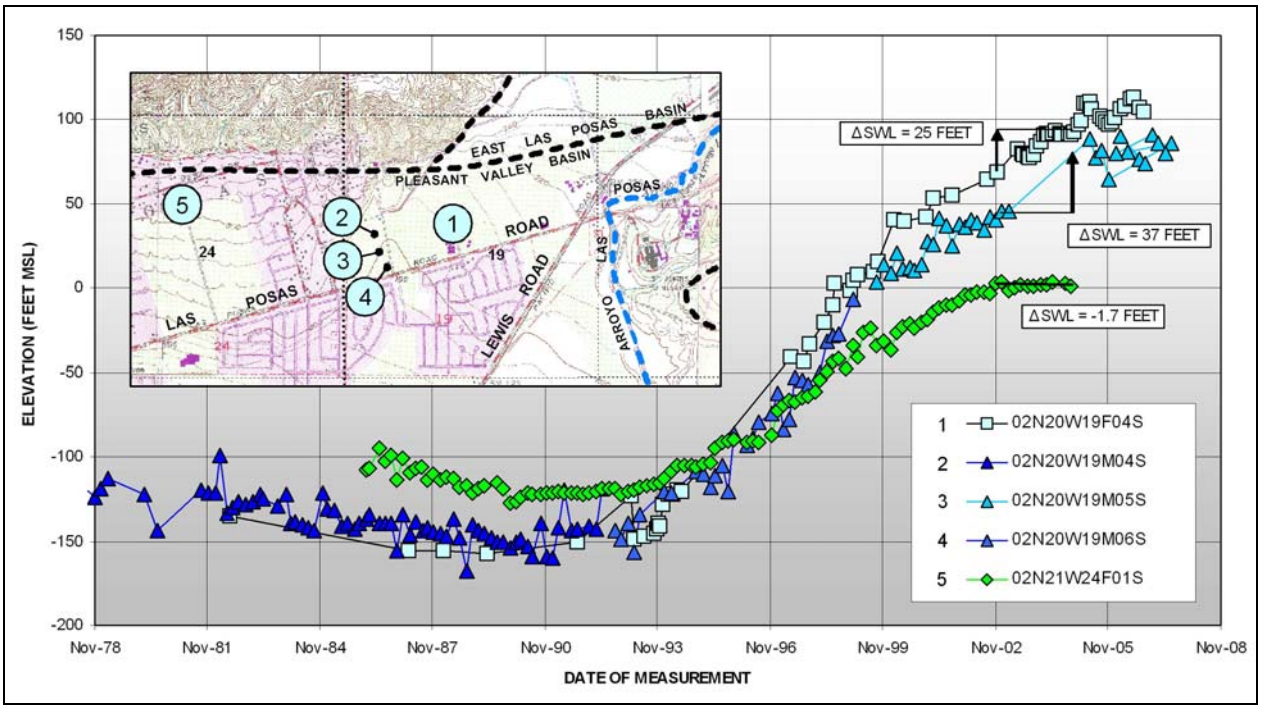
Groundwater conditions change over time as a response to recharge and discharge within the natural system. Historical changes in groundwater quality and groundwater levels have been monitored by the State, County, Cities, and UWCD. Available data from these sources have been combined to provide the basis of the analysis in this study.

Water Levels

Groundwater level measurements collected upstream of the study area provide important information for understanding the present conditions in the PVB Forebay. Groundwater levels measured in key wells located in the South Las Posas Basin and subsequently in the ELPB were observed to rise and then level off as the groundwater mound beneath the arroyo rose to the level of the active channel. The migration of the groundwater mound downstream along the arroyo is shown on Plate 7 – Groundwater Recharge Mound Hydrographs and is coincident with the live reach of the arroyo. Groundwater recharge within the live reach is supported year-round by discharges from shallow groundwater dewatering operations located in Simi Valley and wastewater effluent discharges to the arroyo from the Simi Valley wastewater treatment plant.

Water level data that indicate groundwater trends in the vicinity of the study area are provided by the 19 wells which are shown on Plate 8 – Groundwater Hydrographs. These data show water level trends from the mid 1980's through the year 2006. As indicated by these data, the water levels in the ELPB, and subsequently the PVB Forebay, have risen to levels substantially above sea level while wells in the surrounding areas have not. While all wells have shown a water level rise since the end of the 1986 to 1991 drought period, the recovery trend in most wells has flattened out in recent years. The water level trends observed in the PVB and WLPB wells indicate that natural recharge and pumping cutbacks have resulted in a general rise in basin water levels within the recent past (see Plate 8). However, the water levels in the PVB Forebay have continued to rise while the water levels in surrounding basins leveled off as the groundwater recharge and demand reached a balance.

Figure 1 – Forebay Water Level Trends



As previously mentioned, the North Las Posas Basin was segregated into the ELPB and WLPB which were largely delineated based on observed water level differences that indicated the presence of a flow barrier. As shown above in Figure 1, groundwater level recoveries at three well locations (City Well B [-19F04], Pleasant Valley Mutual Water Company wells [19M04, 05, 06], and a private well [24F01]) appear to show a diverging trend between 2002 and 2004 (the last 3 years of data). We believe this may indicate the presence of another

undocumented groundwater barrier which may partition the basin and impound groundwater in a relatively small area around the forebay and impede flow into adjacent portions of the PVB.

Water level data from the years 1986, 1994, and 2004 were utilized to construct groundwater contour maps that indicate the inferred groundwater gradient changes over time. The maps are provided as Plates 9 through 11 – 1986, 1994, and 2004 Groundwater Elevation Contour Maps, respectively. The interpretation of available groundwater data was conducted by using some of the inferred geological structures shown on Plate 3. While the scarcity of data points required some speculation to project water level changes between wells, we believe these interpretations are reasonable to explain the considerable changes that have occurred over the 18-year period. As shown on Plate 11, there is clearly a mound that has developed in the forebay area that does not appear to affect wells located to the east or west of the inferred forebay boundaries.

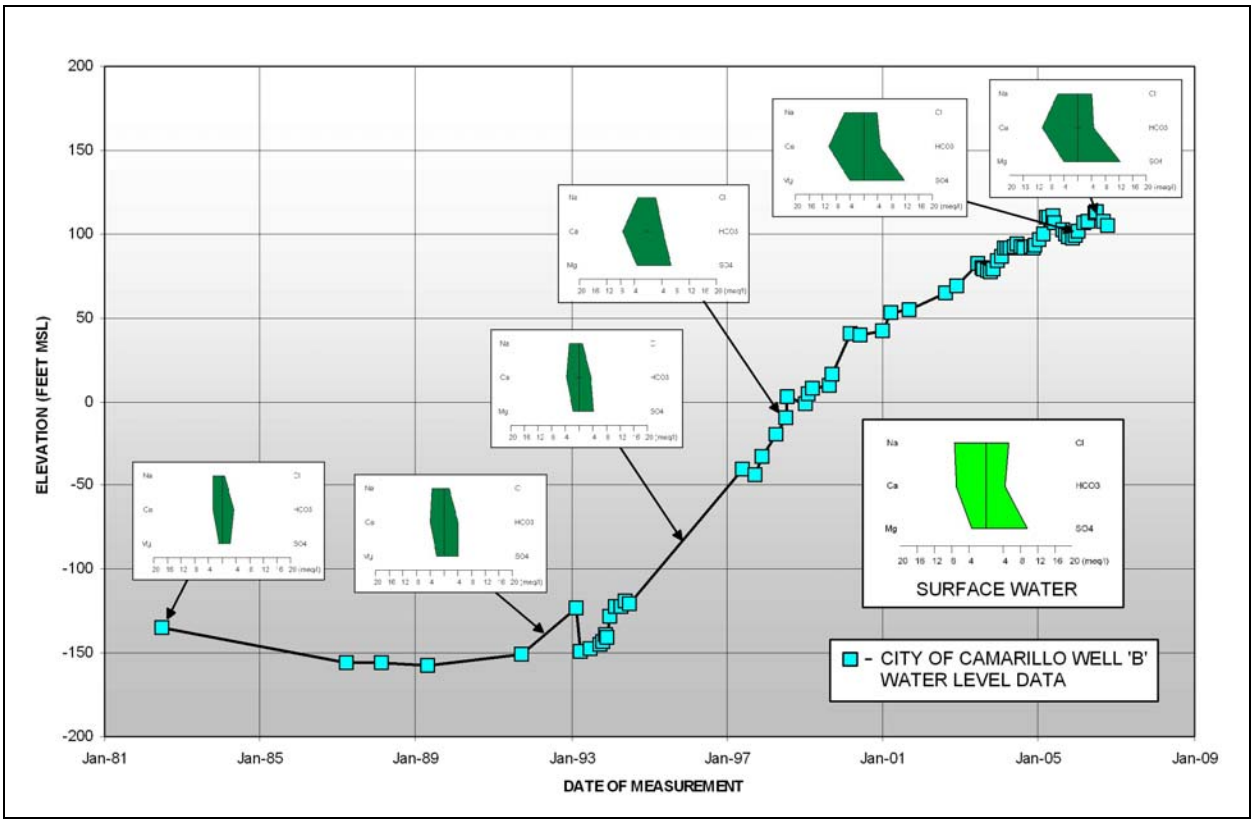
Future water level monitoring will be a key component to determine groundwater movement of recharge that originates in the PVB Forebay. However as shown on Plate 11, by 2004 the aggressive County well destruction program effectively removed 12 of the wells historically used for groundwater monitoring in the study area.

Water Quality

Groundwater quality is a dynamic property influenced by a combination of factors that include: a) the quality of the recharge sources (surface water infiltration, irrigation return flows, and subsurface inflow from adjacent basins, etc.), b) the mineralogy of the aquifer materials and their solubility under the specific aquifer conditions, c) the amount of time the water remains in the basin, and d) the dynamic changes in the aquifer that are caused by pumping. Sources of groundwater degradation in the PVB Forebay may include upwelling of poor quality water from the underlying bedrock (affecting the deepest aquifer zones during periods of low water levels), poor quality agricultural return flows, pore fluid seepage from silt and clay layers, subsurface inflows from the ELPB, and infiltration of surface flows from the Arroyo Las Posas. The primary sources of surface flow infiltration includes upstream discharges from shallow groundwater dewatering operations located in Simi Valley and wastewater effluent discharges to the arroyo from the Simi Valley wastewater treatment plant. These sources of surface flow blend with agricultural irrigation runoff and seasonal precipitation runoff prior to recharging the PVB Forebay.

The correlation between rising water levels and changes in the groundwater chemical character in City Well B is shown below in Figure 2. A stiff diagram comparison of the major anions and cations present in the surface water and groundwater samples collected for this study is shown on Plate 12 – Stiff Diagrams of Study Samples. As shown by the stiff diagrams on Figure 2 the present chemical character of the well water sample has changed to more closely resemble the surface water sample over the last 10 years ago.

Figure 2 – Groundwater Elevation and Chemical Character Change



Historical water quality data indicate that the groundwater in the study area ranges in quality and can generally be described as fair to poor quality for direct potable use. Appendix A contains graphical presentations of various general mineral constituents in all the City PVB wells. The total dissolved solids (TDS) concentration in the groundwater produced by the City wells has reportedly ranged from 366 to 1,420 milligrams per liter (mg/l). Plate A1 graphically presents available TDS data that begins in 1990. These data indicate that since the early 1990's there has been a significant increase in TDS concentration in both Wells A (State Well No. 02N20W19L05) and B (State Well No. 02N20W19F04) and only a minor increase in Well D (State Well No. 02N21W34C01). At the present time neither City Well A nor B can meet the State secondary maximum contaminant level (MCL) of 1,000 mg/l without blending or treatment. Plates A2, A3, and A4 show similar increasing trends for total hardness, sulfate, and chloride concentrations, respectively (see Appendix A). In recent years the groundwater produced from Wells A and B has exceeded the secondary MCL for sulfate (500 mg/l) while the sulfate concentration in Well D located in the main PVB remains below this level (see Plate A3).

Groundwater in the PVB is also demerited by concentrations of iron and manganese. Water produced from Well A exceeds the State secondary MCL's for both constituents by about 400 percent. Plates A5 and A6 (see Appendix A) show the historical trend for these two constituents in the City wells. These data indicate that water produced from Well D in the main PVB complies with drinking water standards for both constituents. The concentration of iron in groundwater from Well B is increasing but it is still below the MCL of 300 micrograms per liter (µg/l). The most recent data indicate that Well B has experienced a significant increase in manganese concentration and during the last 5 years values have ranged between 200 and 300 percent above the secondary MCL of 50 µg/l (see Plate B6).

The water produced from City Wells A and B presently has a calcium sulfate chemical character. However, through the years the chemical character has changed. The ionic composition in the groundwater from Well B varied through the 1990's and was tested as sodium-calcium bicarbonate (1990), sodium bicarbonate (1992), and calcium bicarbonate-sulfate (1995) (see Plate 12). The chemical character of groundwater from Well D has changed slightly from sodium-calcium bicarbonate (in the early 1990's) to the present calcium bicarbonate.

Changes in the produced water quality and chemical character are believed to result primarily from changes in pumping patterns and head conditions in the aquifer produced by these wells. The declining water quality in Well B appears to be a direct result of the rising water levels in the forebay portion of the basin. City Wells A and B produce from virtually the same aquifer zone(s) as well 02N20W19F02 shown in the hydrogeological cross-section on Plate 6. Well construction information is listed below in Table 1 – City Well Construction Details and indicates the well screen depths where the produced water quality is being degraded.

Table 1 – City Well Construction Details

STATE WELL NO.	CITY WELL NAME	CASING DIAMETER INCHES	PERFORATED INTERVAL (DEPTH IN FEET)
02N20W19F02	WELL C	18-INCH	444 TO 850
02N20W19L05	WELL A	18-INCH	467 TO 830
02N20W19F04	WELL B	18-INCH	449 TO 759
02N20W19F02	WELL D	18-INCH	700 TO 910

Surface Water Conditions

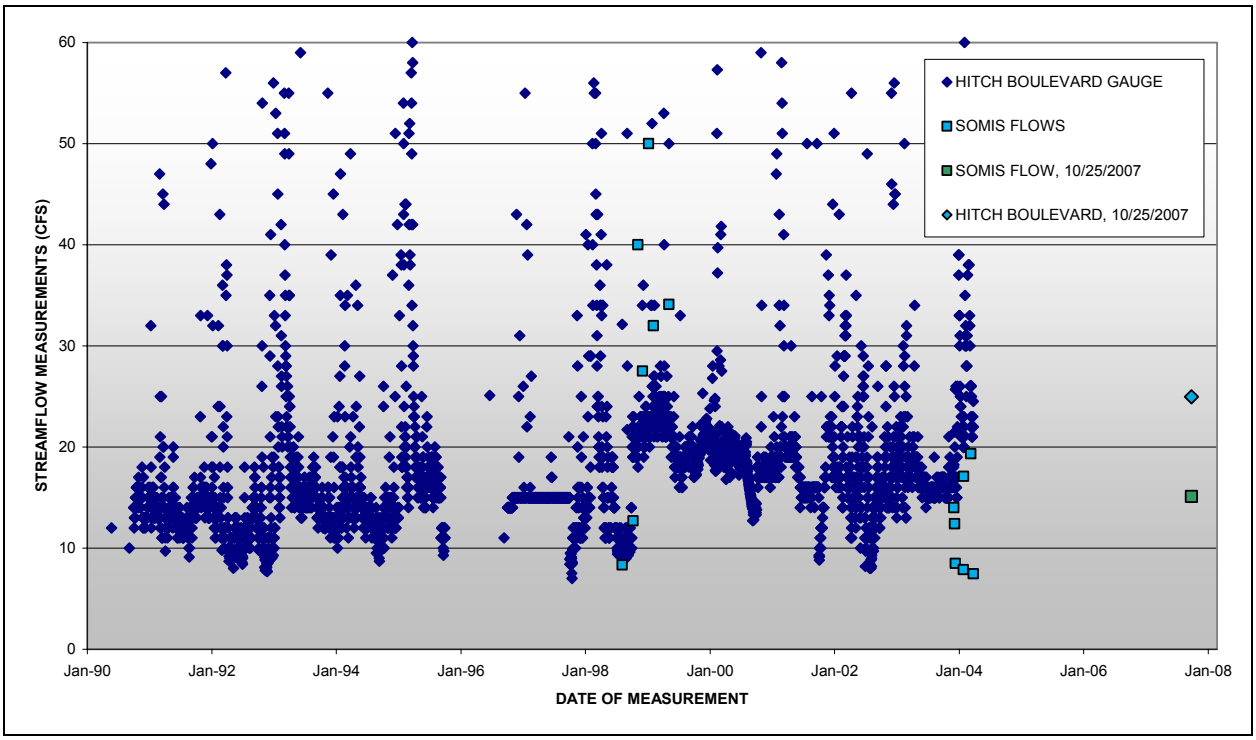
Surface water flows in the Arroyo Las Posas have recently been measured during detailed studies conducted for the Calleguas Creek Watershed Management Plan (WMP, 2004 and 2005). Data developed by these studies were utilized to understand the magnitude of flow that comes into the PVB Forebay area in the arroyo that is recharging the groundwater basin.

Stream Flow

Historical stream flow data have been collected by the County upstream of the study area where the Arroyo Las Posas flows under the Hitch Boulevard Bridge. Streambed conditions between the County gauging station and the Somis area where surface flows are recharging the PVB Forebay are shown on aerial photographs provided in Appendix B.

The Calleguas Creek Watershed Management Plan study (also referred to as the Conejo/Calleguas Creek Study [CCCS]) collected stream flow measurements at the Hitch Boulevard location as well as the same Somis gauging station that was used by this study. These data are presented along with the County stream flow data below in Figure 3.

Figure 3 – Stream Flow Measurements and Wastewater Discharges

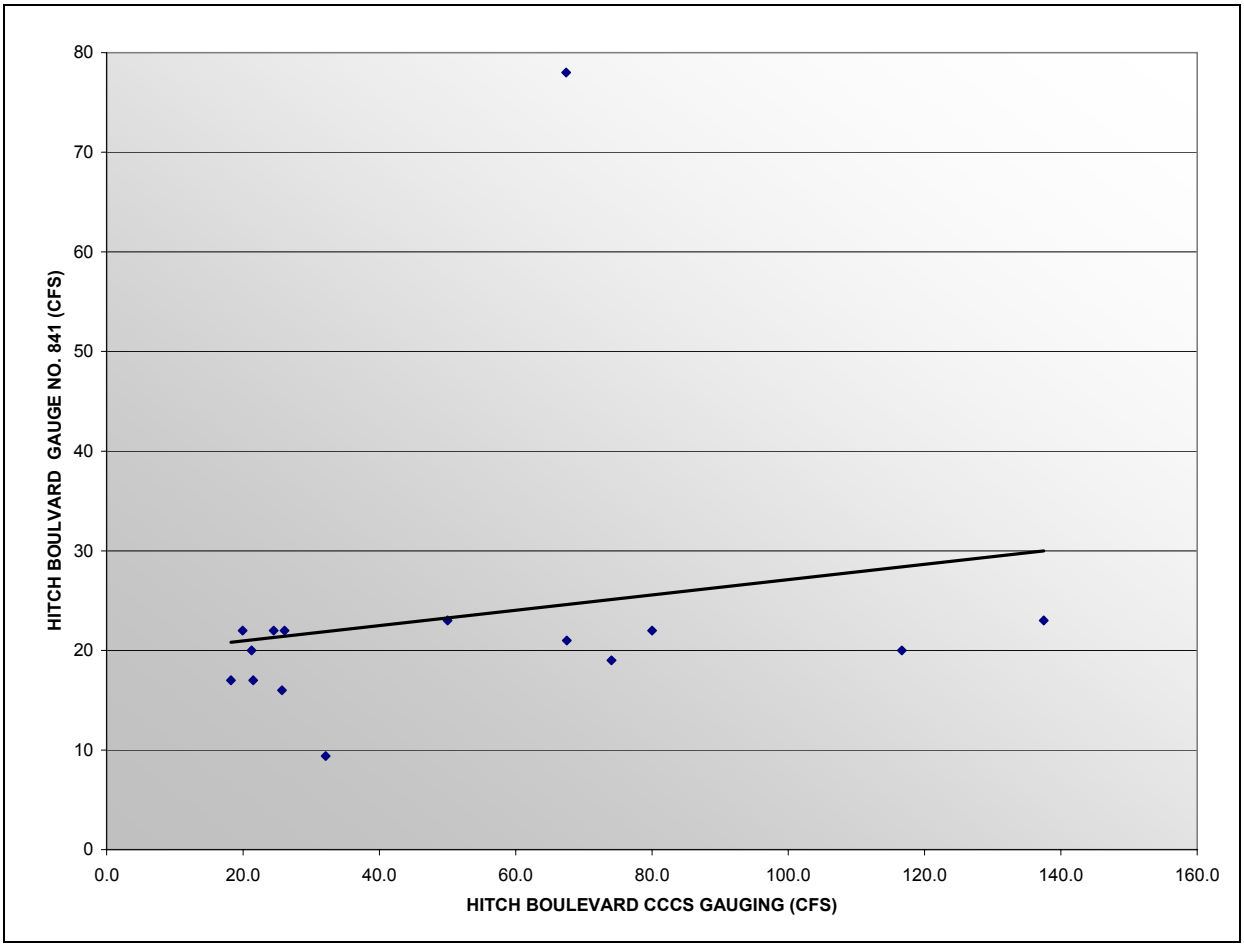


As shown by these data the arroyo commonly flows between 10 and 30 cubic feet per second (cfs). While summer flows are observed to dip below 10 cfs, winter flows often exceed

50 cfs (see Figure 3). Data available over the 13-year period between 1991 and 2003 indicate that over 24,000 acre-feet per year (afy) was measured by the County to flow past the Hitch Boulevard Gauge.

Stream flow measurements collected by in-stream methods were compared with the County Hitch Boulevard gauging station measurements (Station No. 841) and are presented below in Figure 4. As shown, the County gauge records are comparable at the lower flow rates but are considerably less than the watershed study measurements at higher flow rates. This variation may be a function of gauge position and/or configuration.

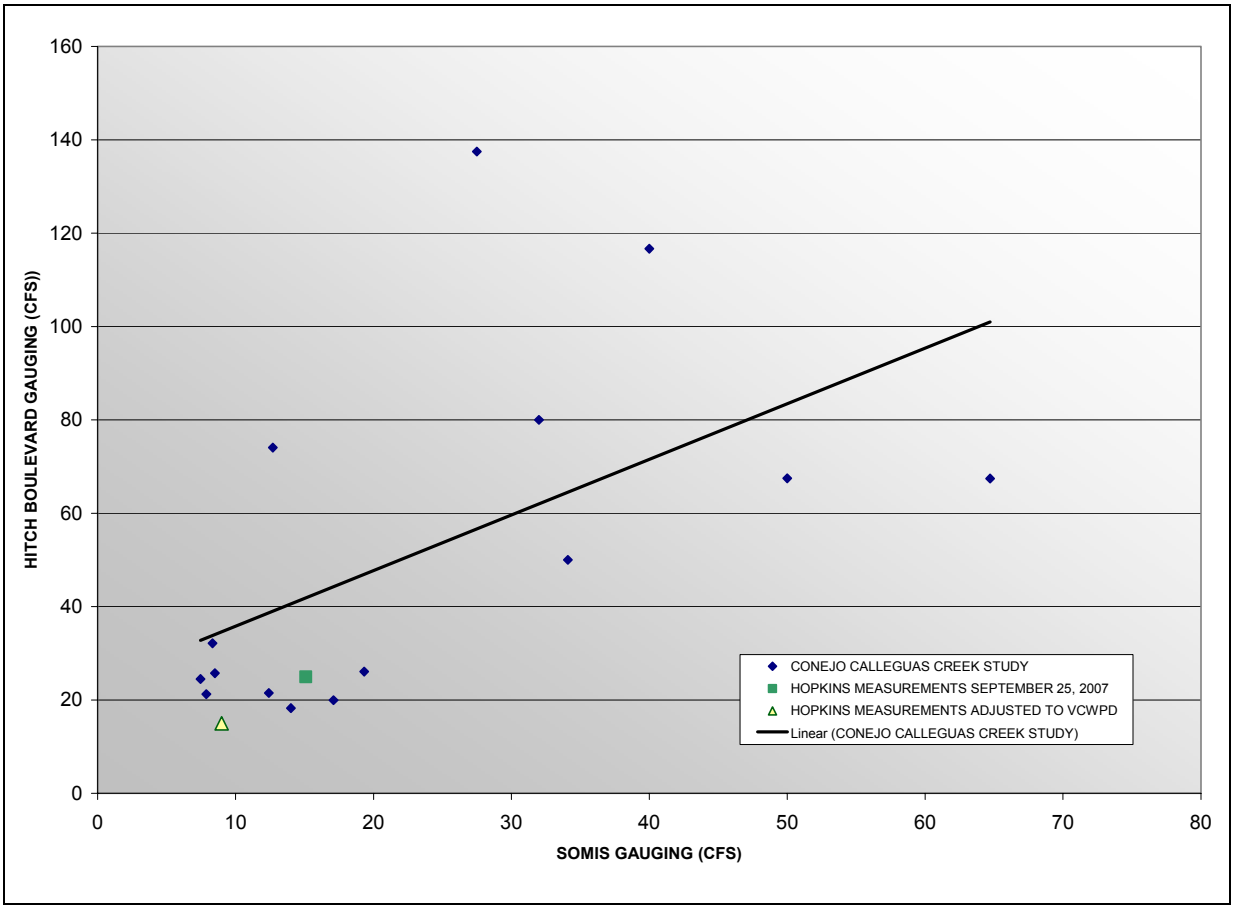
Figure 4 – Comparison of County Gauge and Watershed Study Data



To understand the magnitude of water that has historically been measured to pass Hitch Boulevard and flow into the PVB Forebay the watershed study measurements that were collected at both stations (Hitch Blvd. and Somis) on the same day were correlated. These data are

presented on Figure 5 below and indicate that roughly 55 percent of the water that flows past the County station is presently reaching the PVB Forebay. These data suggest that on average over 13,000 afy of water flows across the Forebay where a majority percolates and recharges groundwater.

Figure 5 – Correlation of Stream Flow Measurements



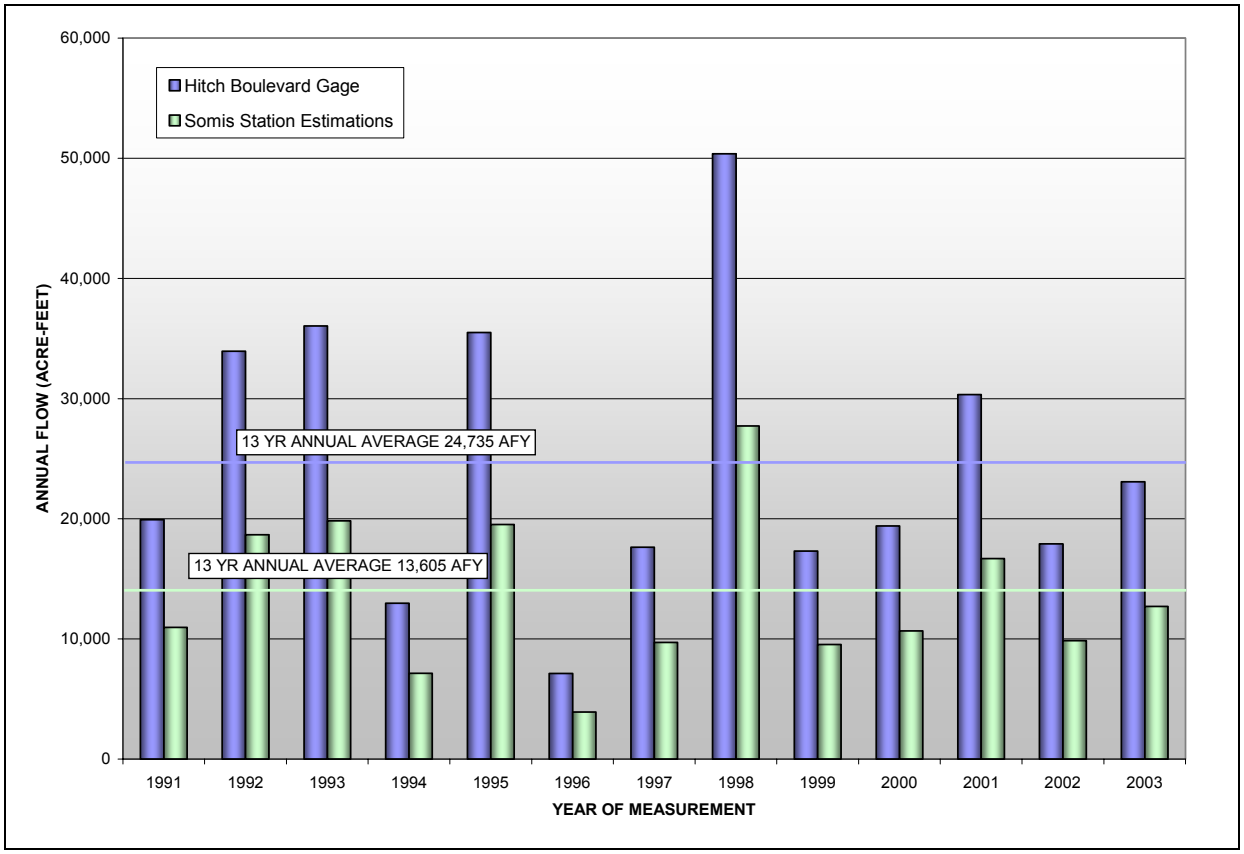
Based on the comparison of stream flow measurement methods (see Figure 4) the annual flow volumes shown in Figure 6 (which is calculated from daily County data) may be low. The factors that may presently influence the ability to accurately estimate historical flow volumes into the PVB Forebay are believed to include:

1. Prior to repair of the County gauge in 2004, many of the low flow measurements were not being accurately recorded by the station,

2. The average of 5 measurements during 2004 indicated that approximately 60 percent of the flow was passing the Somis gauging location,

3. Infiltration that is recharging the PVB Forebay upstream of the Somis station would not be measured at the present gauging location.

Figure 6 – Annual Stream Flow into PVB Forebay



Field Sampling and Laboratory Testing

Stream Flow Measurements

Field work conducted for this study was intended to generate information that would validate available historical data and obtain a recent comparison of flows at the Somis station. On September 25, 2007 Hopkins conducted 2 measurements of flow in the Arroyo Las Posas. Measurements were conducted downstream of the Hitch Boulevard Bridge near the existing County gauging station (No. 841) and approximately 200 feet south of a private bridge near the town of Somis, California. The stream flow measurement locations are indicated on Plate 7.

The survey measurement results are tabulated and provided in Appendix C along with photographs that document surface flow conditions at the time of the study and the stream flow measurement locations.

Utilizing a surveyor's tape and depth gauge, the creek bottom profile and water level was measured and recorded at each station. Depth measurements were collected at approximate 1 foot intervals (except where physical conditions required a different spacing). Subsequently these data were utilized to approximate the cross-sectional area of the creek at each location. An impeller type stream flow meter that provided electronic readings of flow velocity in feet-per-second was used to gauge the flow rate of the stream. The surveyor's tape was used as a guide for the location of the stream flow measurements. Flow rates were measured and recorded across the creek at approximate 1 foot intervals except where flow anomalies required a different spacing. The '6-tenths method' recommended by the USGS for stream flow-rate measurement was utilized to determine impeller depth setting and obtain an average flow of the stream at each point of measurement. The USGS asserts that an overall average flow rate of a column of water in a stream can be estimated by the measurement collected at a depth below the water surface that is equal to 0.6 times the total water depth.

The resulting stream flow readings are included on Figure 5 along with historical data and indicate that 25 cfs and 15 cfs were flowing at the Hitch Boulevard and Somis gauging stations, respectively. These data indicate that at the time of the study the flow at the Somis station was approximately 60 percent of the upstream measurement.

Subsequent comparison of the field measurement results of this study with County data collected by the automated gauge at Hitch Boulevard indicated that the County gauge measured approximately 60 percent of the flow measured for this study (15 cfs versus 25 cfs). To discern the origin of the discrepancy in flow calculation results, field verification measurements were performed by Hopkins and County staff on October 28, 2008. The results of both measurements were virtually identical and indicate a consistent bias in the instrumentation and/or method of measurement. Because the County utilizes a higher quality instrument for its measurements, we believe the County measurement is likely more accurate. A data point representing the County measurement at Hitch Boulevard and the adjusted value for the Somis Station measurement (60 percent flow) is included on Figure 5.

Water Quality Sampling and Testing

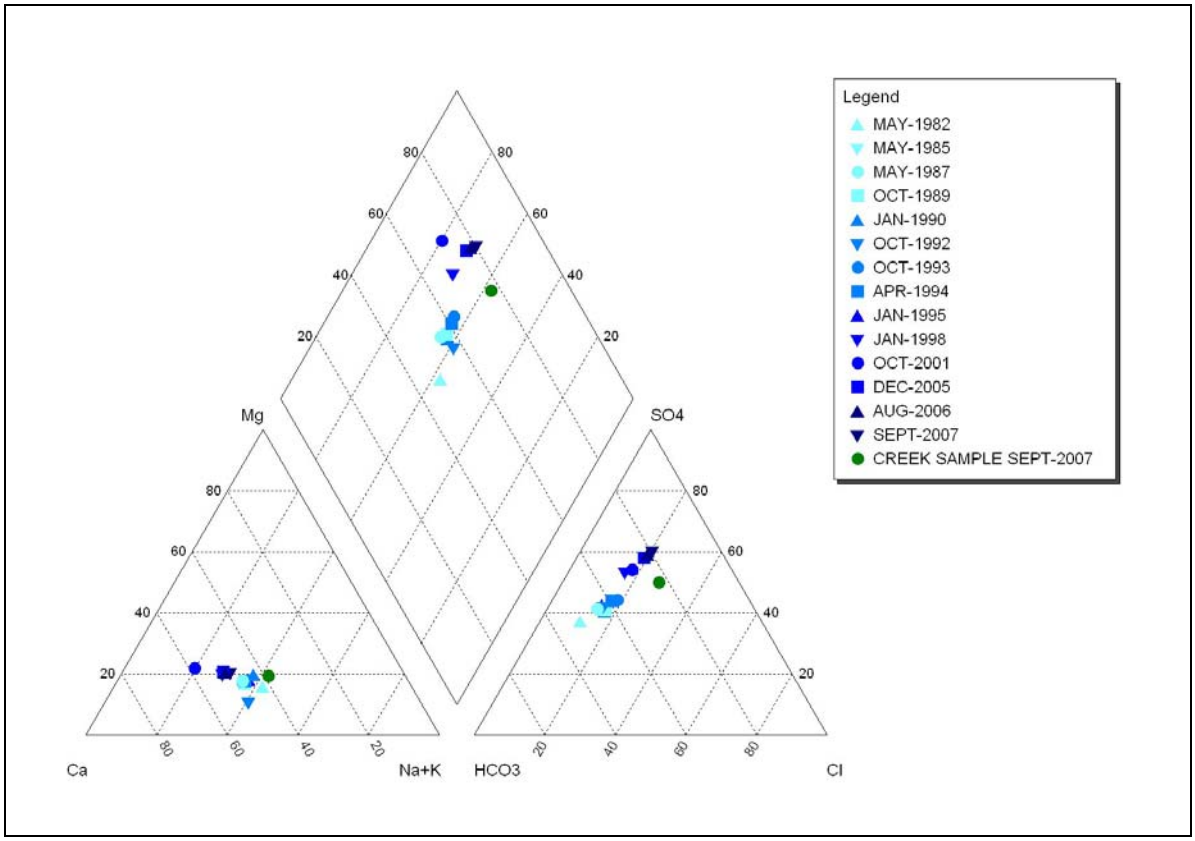
Prior to stream flow measurement, Hopkins collected samples of surface water from the Arroyo Las Posas at the Somis Gauging Station. After stream flow activities were concluded Hopkins collected samples of groundwater from the City of Camarillo's Well B. Samples were collected and preserved in accordance with laboratory specifications and submitted to FGL Environmental (FGL) of Santa Paula, California (for general-mineral analysis), Zymax Forensics (Zymax) of San Luis Obispo, California (for deuterium, nitrate and oxygen isotope analyses),

and Isotech of Champaign, Illinois (for tritium analysis). Copies of the laboratory report forms presenting test results are provided in Appendix D. The creek water quality likely reflects the influence of the rainfall event that occurred 3 days prior to the sampling event. The creek flow rates were observed to be noticeably greater after the rain event than the flows observed 1 week prior to the scheduled sampling.

General Mineral

Laboratory test results for the surface water sample indicate the Arroyo Las Posas flow at the time of the study had a sodium calcium-sulfate chemical character with a specific conductance of 1,700 micromhos per centimeter (mmhos/cm) and a total dissolved solids concentration of 1,180 mg/l. The creek water has a relatively high iron concentration of 840 µg/l.

Figure 7 – Trilinear Diagram of City Well B Water Quality Data



Laboratory test results for groundwater samples indicate the groundwater in the northeast PVB is historically of a calcium-sulfate chemical character. The groundwater from City Well B has a specific conductance of 1,930 mmhos/cm and a total dissolved solids concentration on the order of 1,440 mg/l. Data acquired from the study were combined with historical water quality

data from City Well B to provide a graphical presentation of the major anions and cations in the water samples which is shown above in Figure 7. As indicated by these data, the water quality in the City well has migrated over time toward the quality of the arroyo and has been influenced by changes in the arroyo recharge. A notable separation in quality is seen between the 1995 and 1998 sample events and can be seen as a grouping of chemical character prior to and after the time of these samples (see Figure 7).

Tritium

Tritium (^3H or T) is a radioactive isotope naturally produced in the atmosphere. The most important source of tritium for modern groundwater studies has been from thermonuclear weapons testing between 1952 and 1969. Tritium in groundwater is not significantly affected by geochemical processes, however given a half-life of 12.3 years, the usefulness of tritium as an age dating isotope diminishes over time. The most important use of tritium has historically been to distinguish between water that entered aquifers prior to 1953 and water that was in contact with the atmosphere after 1953. Because of the variable source of tritium and uncertainties due to possible mixing, tritium can not be used by this study for age dating in the conventional way.

Laboratory test results of the present tritium levels in the surface water and groundwater samples are presented below in Table 2 – Tritium Test Results. These results suggest the well water may be a blend of groundwater sources but also that a large component of the groundwater produced from the City well is from recent recharge.

Table 2 – Tritium Test Results

SAMPLE IDENTIFICATION	TRITIUM (TU)	STANDARD DEVIATION
CREEK SAMPLE	3.87	0.23
CITY WELL B SAMPLE	2.84	0.22

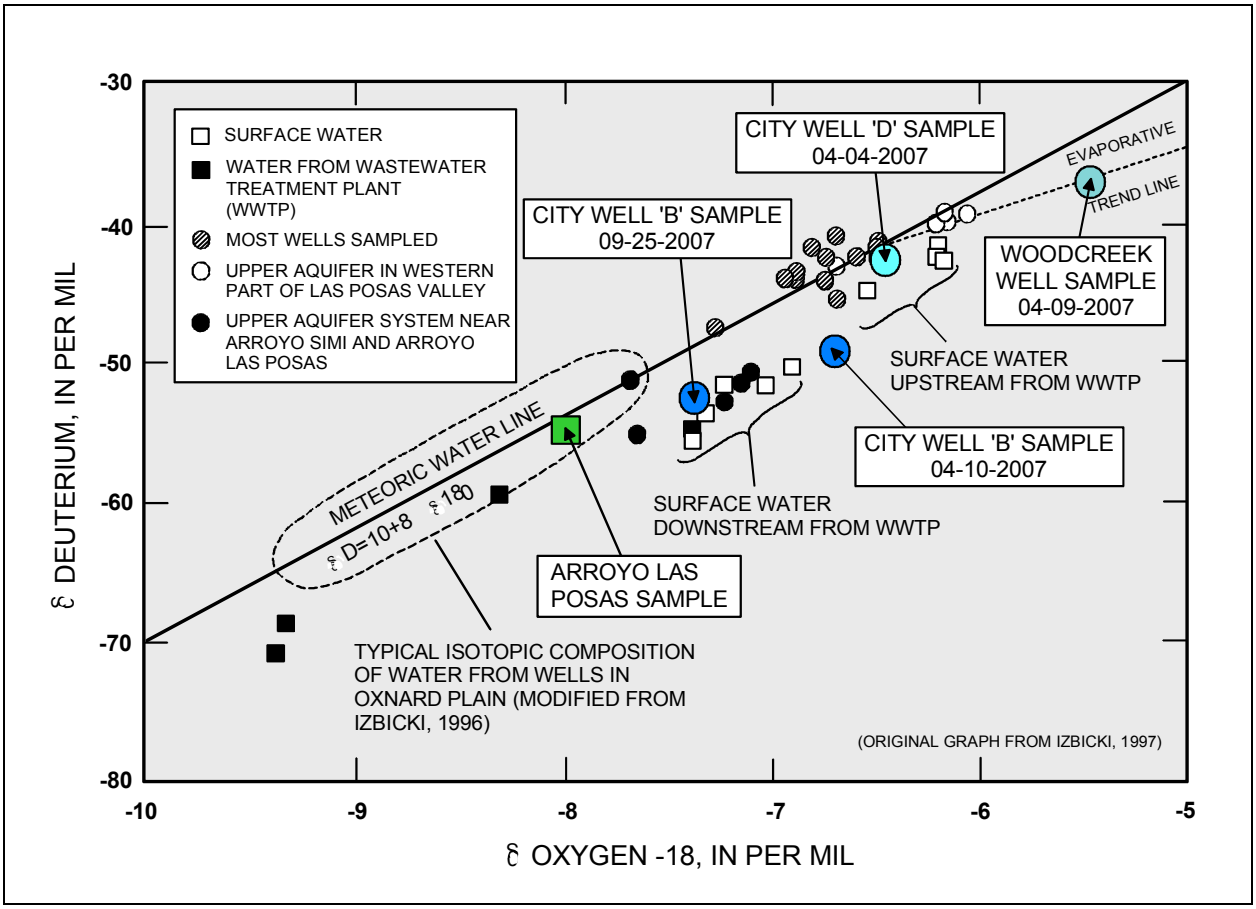
TU - Tritium Unit

Oxygen-18 ($\delta^{18}O$), Deuterium (δD), and Nitrogen ($\delta^{15}N$)

Isotopes are different forms of the same element which differ only in the number of neutrons contained in the nucleus of the atom. Although radioactive isotopes, like tritium, are unstable, most isotopes are stable. While different isotopes of an element have a nearly identical chemical behavior, the different physical properties can cause a slight variation in reaction rates and result in isotopic fractionation. Fractionation caused by physical and anthropogenic processes can result in different isotopic ratios forming in the same compound to create a specific "isotopic fingerprint."

The water samples collected during the study were analyzed for isotopes of oxygen, hydrogen, and nitrogen. The purpose of isotopic testing was to allow a comparison of present surface water and groundwater isotopic fingerprints with those from historical studies and to determine if upstream discharges from wastewater treatment plants can be linked to the recharge of groundwater in the PVB Forebay.

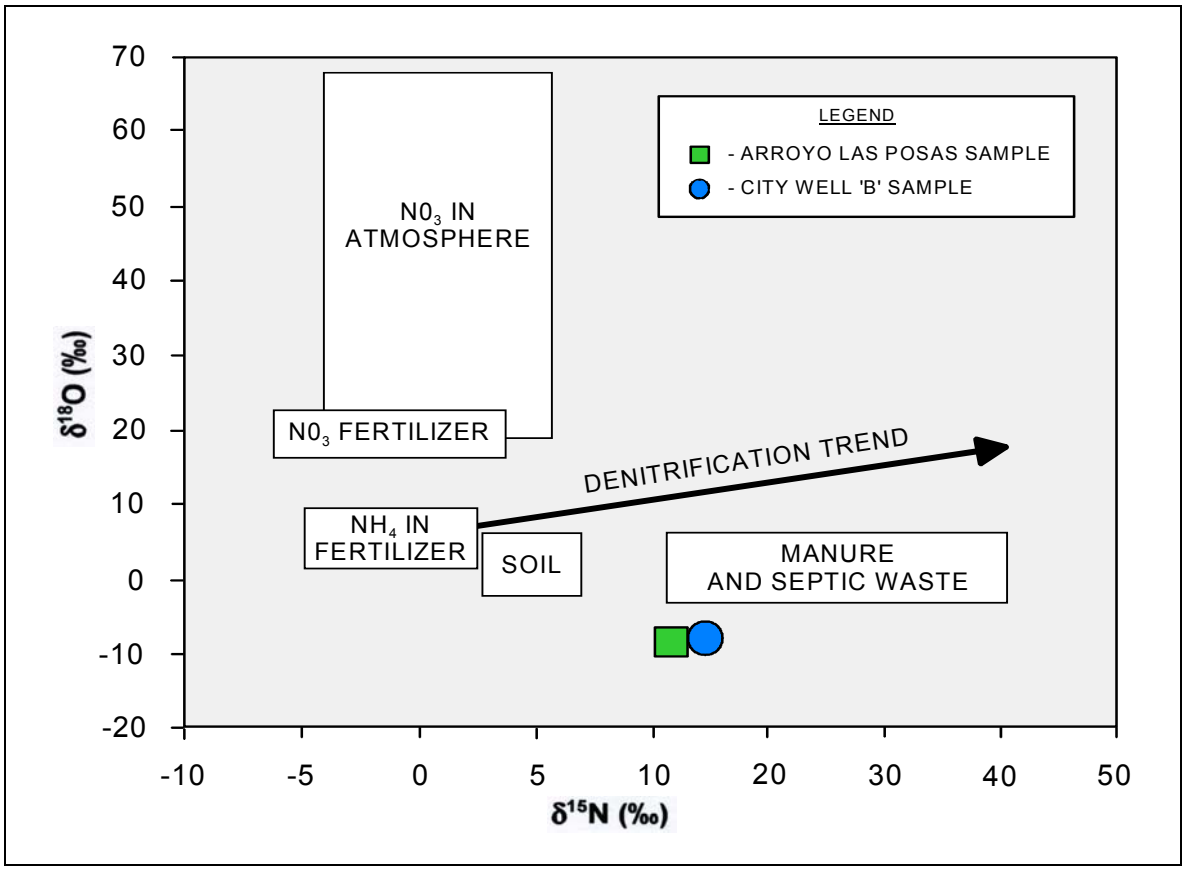
Figure 8 – Delta Oxygen-18 as a Function of Delta Deuterium



The alternating process of evaporation and condensation of water in the atmosphere occurs as part of the hydrologic cycle and results in fractionation of the naturally occurring oxygen and hydrogen isotopes. Past studies of local groundwater and surface waters have utilized these isotopes to evaluate the source and movement of water through aquifer systems within proximate groundwater basins (Izbicki, 1996 and 1997). Figure 8, shown above, compares the sample results obtained from this study with the results of water sampling conducted by the USGS in the Oxnard Plain and Las Posas Valley.

As indicated by these results, the groundwater sample has an isotopic fingerprint that closely resembles the surface water sampled downstream of the regional wastewater treatment plant during the 1997 study. The surface water samples were coincidentally taken at the same time the groundwater recharge from the Arroyo Los Posas was initially sustained in the PVB Forebay. As previously mentioned, the surface water sample for this study was collected within 3 days after a significant rain event. The surface water sample collected during the study appears to show the influence from rainwater. We anticipate that sampling of water in the arroyo will likely yield seasonal results that reflect the source(s) contributing most to its flow.

Figure 9 – Typical Isotope Signatures of Nitrate from Various Sources



Nitrogen in the atmosphere contains about one atom of the stable isotope ^{15}N per 273 atoms of ^{14}N. During various biochemical reactions that involve nitrogen, fractionation occurs. The fractionation processes are complex and not fully understood. However, nitrogen isotopes have been used to identify sources of nitrogen in natural waters. The interpretation of such results may be somewhat controversial (Drever, 1982).

Nitrates produced from different sources carry distinctly different nitrogen and oxygen isotopic compositions which can be used for source identification. Provided in Figure 9 above are the general fields that represent the range of delta oxygen-18 versus delta nitrogen-15 where nitrogen fractionation may be used to link nitrate to a particular source. As indicated, the surface water sample and well water sample were very close in their isotopic ratios and tend to exhibit a nitrogen source that is likely dominated by nitrate from wastewater treatment plant effluent.

CONCLUSIONS AND RECOMMENDATIONS

The findings of the study indicate that flows in the Arroyo Los Posas are presently percolating into the riverbed in a reach between Somis and Camarillo and recharging groundwater in an area described as the PVB Forebay. Recent observations indicate that except for extremely high river flow events the entire flow in the arroyo goes underground into the coarse-grained alluvial deposits that readily transmit water into the underlying Saugus and Los Posas Sand Formations. These formations comprise the primary aquifer system in the PVB. Available data since 1991 indicate that average annual groundwater recharge from the arroyo is likely in the range of 10,000 to 15,000 afy (see Figure 5).

The study concludes that the groundwater degradation and rapid water level rise (about 250 feet) documented in City Wells A and B is a direct result of surface water recharge from the Arroyo Los Posas. Substantial recharge began when the ELPB filled along the arroyo and began to overflow into the PVB in approximately 1994 (or before). Historical water quality data indicate that the chemical character of groundwater sampled from the City's well has changed and closely resembles the surface water quality in the arroyo which is a combination of sources including; a) upstream discharges from shallow groundwater dewatering operations located in Simi Valley b) effluent discharges to the arroyo from the Simi Valley wastewater treatment plant c) agricultural irrigation runoff, and d) seasonal precipitation runoff. Over the last 10 years the groundwater quality degradation resulting from arroyo recharge has caused numerous chemical constituents in City Wells A and B to exceed the MCL standards for drinking water (i.e., TDS, sulfate, iron, manganese, see Appendix A).

Tritium test results support the groundwater is a young age while the oxygen and hydrogen isotope analyses indicate the well water is of similar isotopic composition to upstream surface water samples tested by other studies (Izbicki, 1997)(see Figure 8). The nitrogen isotope signatures of the groundwater and surface water samples are characteristic of a legacy waste

water effluent source (see Figure 9). This is consistent with the observation that the arroyo base flows have been sustained largely by year-round discharges from upstream wastewater treatment plants after the winter storm flows subside (see Plate 3).

Water level data appear to indicate that potential groundwater flow boundaries may restrict the lateral flow of groundwater from the area of recharge located northeast of the City in the Somis area. The study concludes that water quality in this area of the PVB will likely not improve in the foreseeable future and that the City must consider the use of a treatment facility that can restore the potable quality of this groundwater supply. To the extent the PVB Forebay is connected to the main portion of the PVB south of the Camarillo Fault, water level and water quality changes of similar magnitude can be anticipated to occur.

If the PVB Forebay is constrained by no-flow/low-flow barriers that impede the lateral movement of groundwater then the water level will likely continue to rise until the partitioned portion of the basin fills. Upon filling the forebay could refuse some portion of the recharge and the surface flow could continue downstream and would cross the confined portion of the PVB (where it cannot percolate into the basin) and subsequently would flow to the ocean.

We recommend that future groundwater basin management efforts establish new monitoring wells to replace the County key wells destroyed in the 2004 well destruction program. Future basin monitoring efforts should reestablish a network of appropriately distributed wells that will facilitate the observation of groundwater conditions. Monitoring points may be established by seeking to obtain permission and access to allow measurement of existing well facilities within or proximate to the northeast PVB. The location of existing wells at the time of the study is indicated on Plate 13 – Proposed Monitoring Well Location Map. We recommend augmenting the areal distribution of these potential existing monitoring facilities with new monitoring wells constructed to facilitate future observations proximate to the PVB Forebay. The proposed areas for future monitoring well construction are shown on Plate 13. We recommend a well siting study be conducted to identify suitable locations for monitoring well construction within or proximate to the areas shown on Plate 13.

CLOSURE

This report has been prepared for the exclusive use of the Calleguas Municipal Water District and its agents for specific application to groundwater recharge in the northeast Pleasant Valley Groundwater Basin located in Somis, California. The findings, conclusions, and recommendations presented herein were prepared in accordance with generally accepted hydrogeological practices. No other warranty, express or implied is made.

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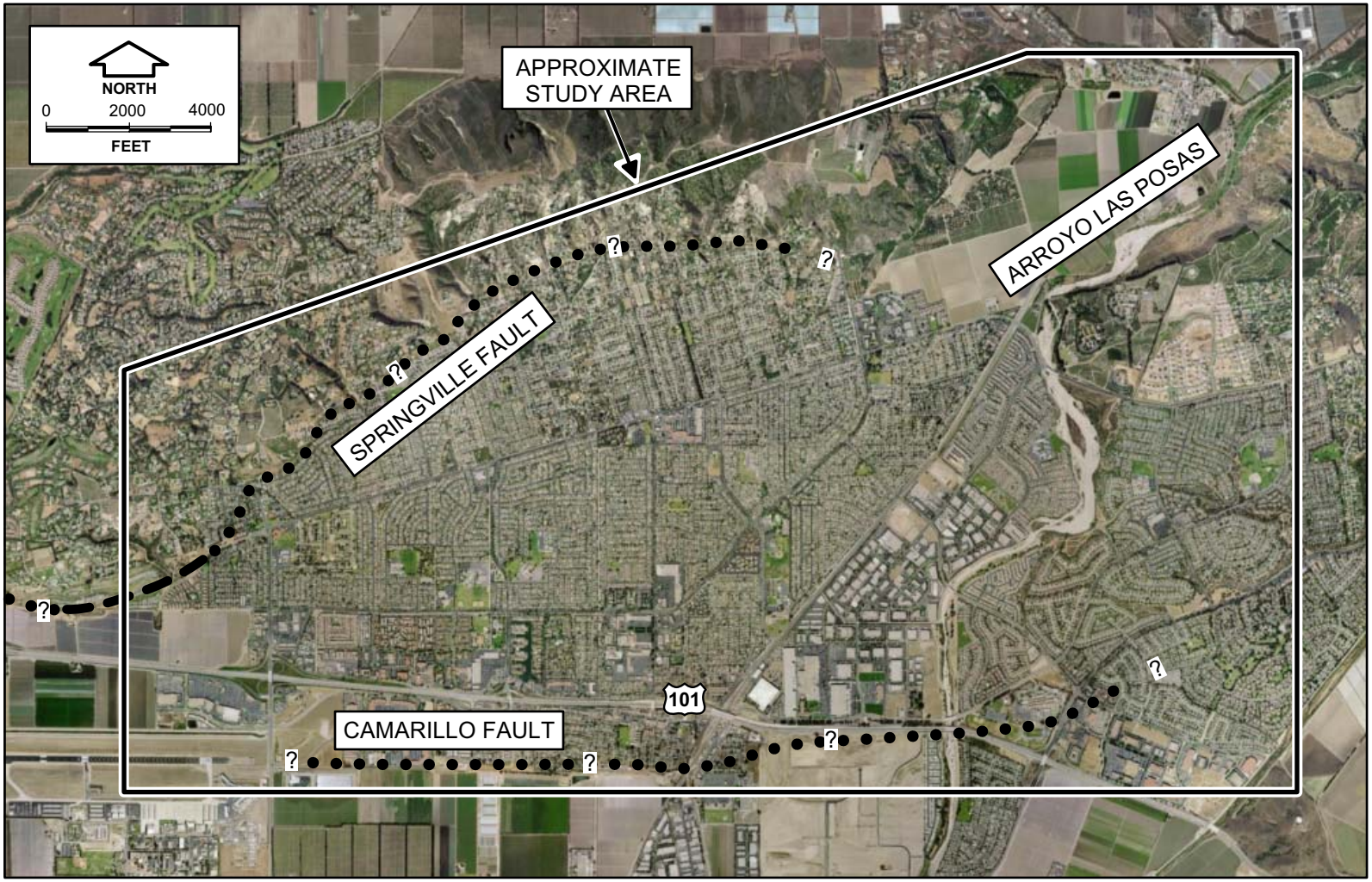
PLATES

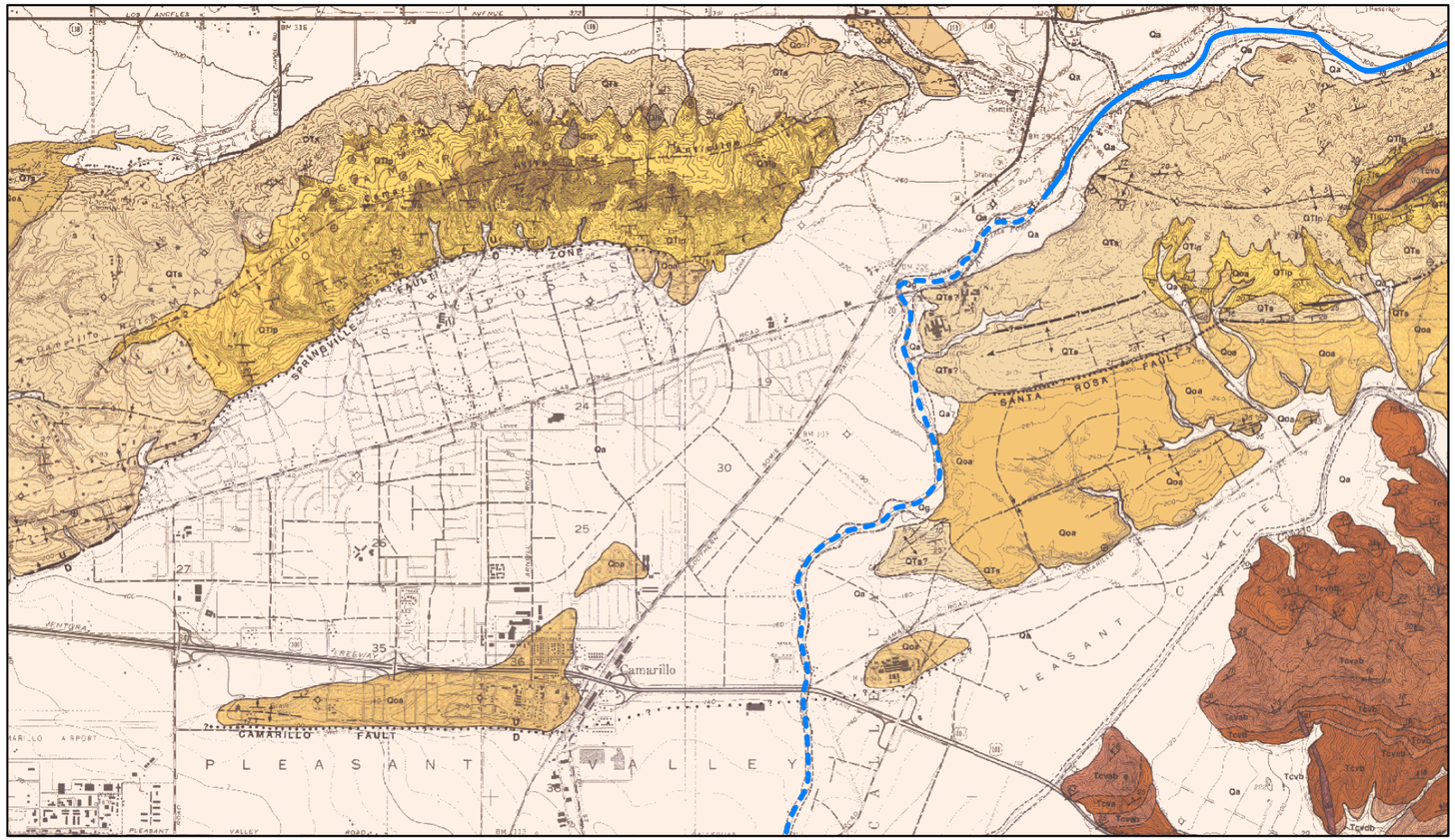


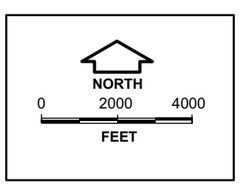
STUDY AREA LOCATION MAP
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

November 2008
Project No. 03-007-07

HOPKINS GROUNDWATER CONSULTANTS

PLATE 1





LEGEND

Qa / Qg — **SURFICIAL SEDIMENTS -**
Qa - valley and floodplain deposits of silt, sand and gravel
Qg - stream channel deposits of gravel, sand and silt

Qoa — **OLDER DISSECTED SURFICIAL SEDIMENTS -** remnants of weakly consolidated stream terrace and alluvial fan deposits of silt, sand and gravel

QTs — **SAUGUS FORMATION -** light gray to light brown pebble-cobble gravel, sand and clay

QTlp — **LAS POSAS SAND -** light gray to yellow-tan, fine to medium-grained massive sand

SYMBOLS

Formation contact - dashed where inferred or indefinite

Anticline - arrow on axis indicates direction of plunge

Syncline - arrow on axis indicates direction of plunge

Fault - dashed where indefinite or inferred, dotted where concealed

45 — Strike and dip of stratified rocks:

25 — inclined (approximate)

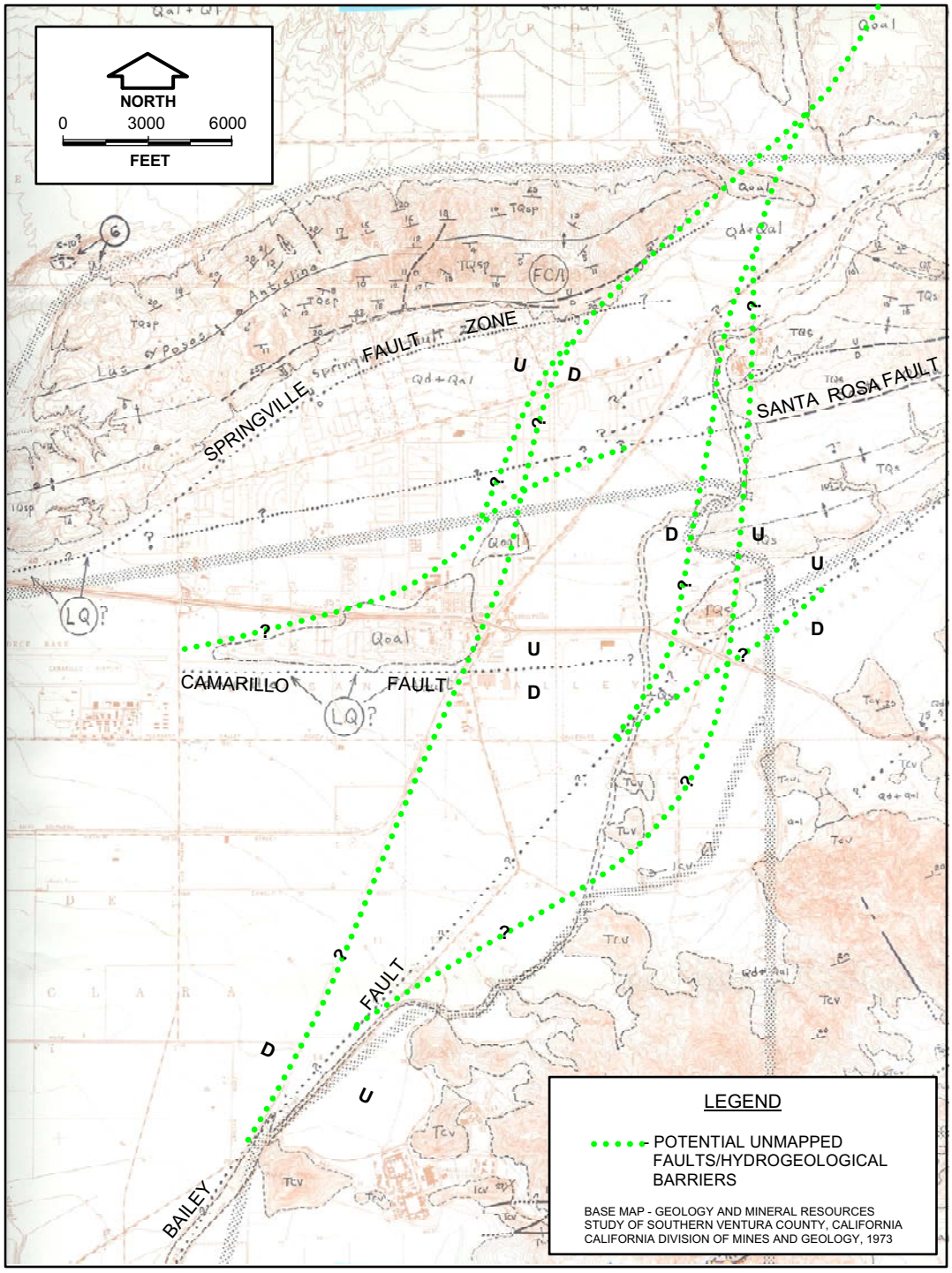
49 — overturned bedding

vertical bedding

- ARROYO LAS POSAS
(SOLID WHERE PERENNIAL
DASHED WHERE EPHEMERAL)

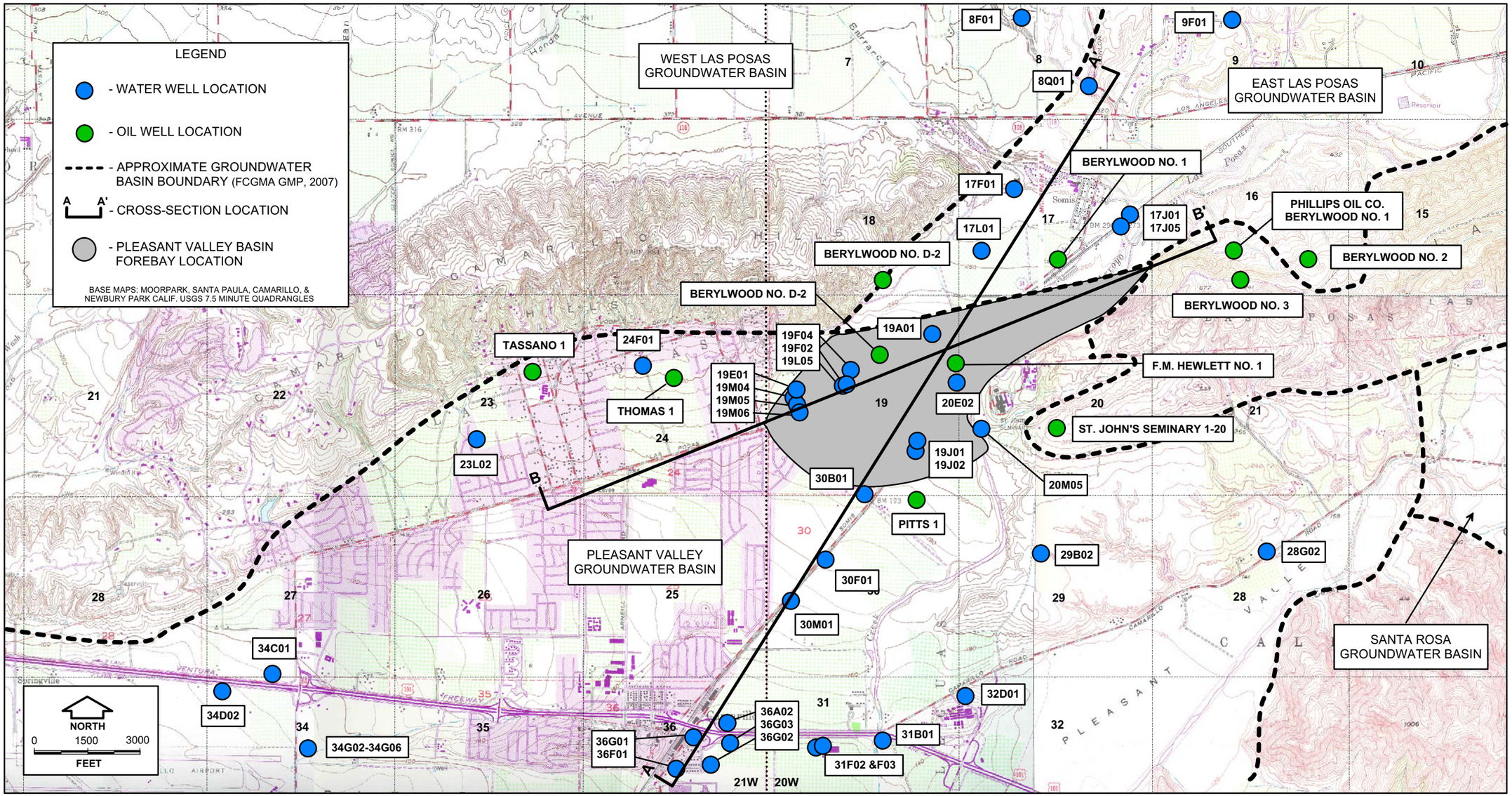
(Geology by THOMAS W. DIBBLEE, 1990 GEOLOGIC MAP OF THE CAMARILLO AND NEWBURY PARK, SANTA PAULA, AND MOORPARK QUADRANGLES)

SURFACE GEOLOGY MAP
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

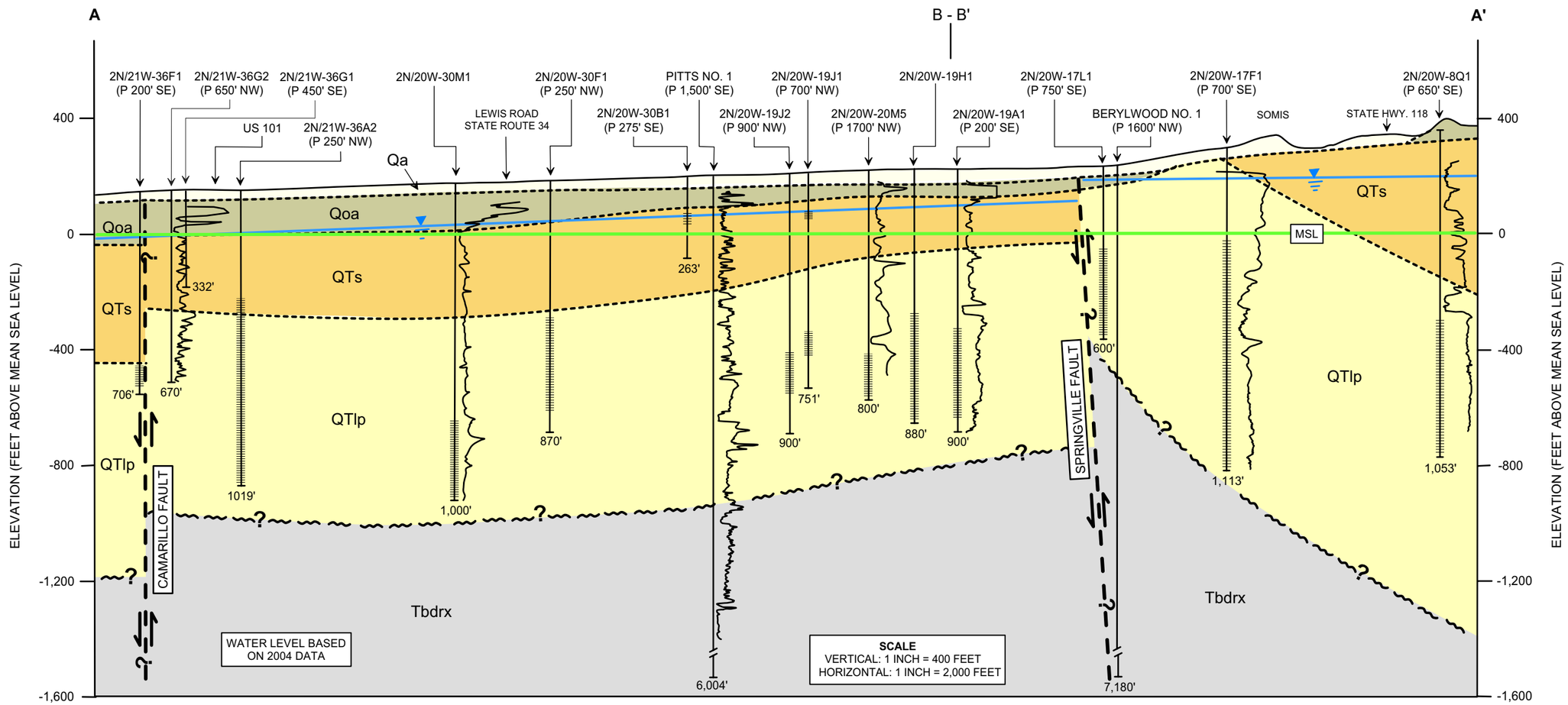


STUDY AREA GEOLOGICAL STRUCTURES
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

PLATE 3



HYDROGEOLOGICAL CROSS-SECTION AND WELL LOCATION MAP
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California



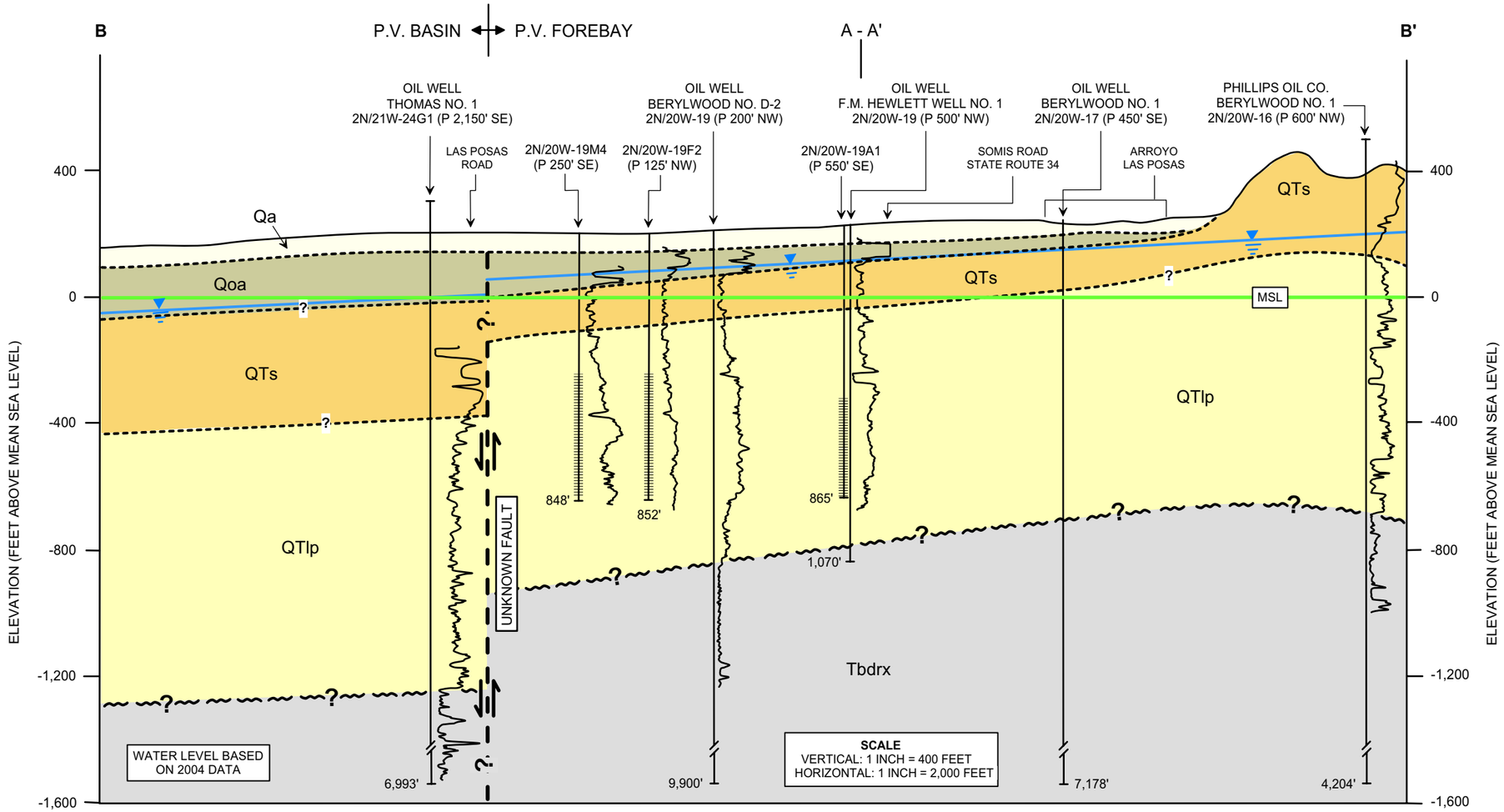
LEGEND

Qa	**SURFICIAL SEDIMENTS -** valley and floodplain deposits of silt, sand and gravel
Qoa	**OLDER DISSECTED SURFICIAL SEDIMENTS -** remnants of weakly consolidated stream terrace and alluvial fan deposits of silt, sand and gravel
QTs	**SAUGUS FORMATION -** light gray to light brown pebble-cobble gravel, sand and clay
QTlp	**LAS POSAS SAND -** light gray to yellow-tan, fine to medium-grained massive sand
Tbdrx	**UNIDENTIFIED BEDROCK -** effective base of alluvial aquifer

SYMBOLS

- Formation Contact
- Fault - Arrows indicate direction of slip
- Alluvium\Bedrock Contact
- Water Level
- MSL — Mean Sea Level

HYDROGEOLOGICAL CROSS-SECTION A-A'
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California



LEGEND

Qa	**SURFICIAL SEDIMENTS -** valley and floodplain deposits of silt, sand and gravel
Qoa	**OLDER DISSECTED SURFICIAL SEDIMENTS -** remnants of weakly consolidated stream terrace and alluvial fan deposits of silt, sand and gravel
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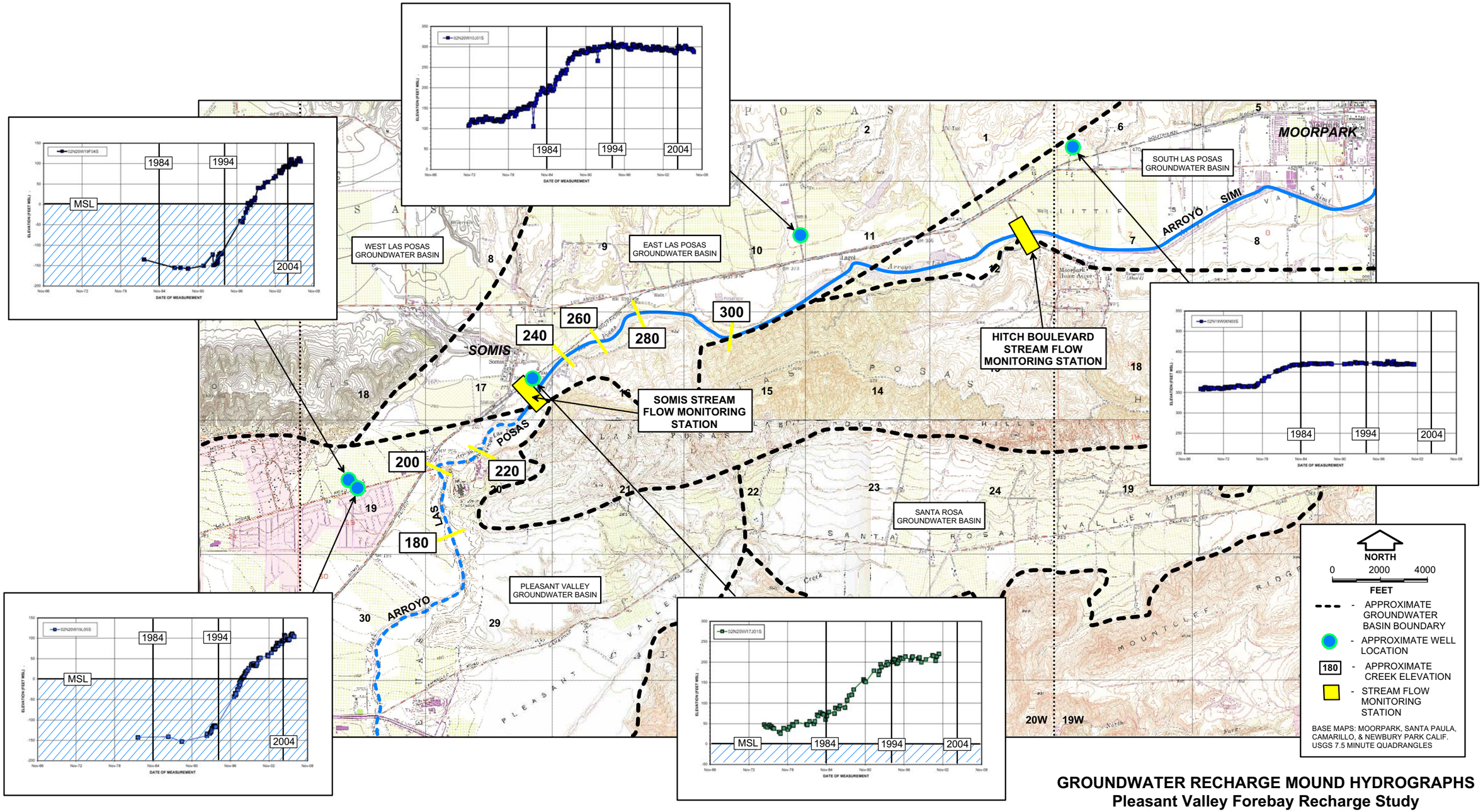
QTlp	**LAS POSAS SAND -** light gray to yellow-tan, fine to medium-grained massive sand
Tbdrx	**UNIDENTIFIED BEDROCK -** effective base of alluvial aquifer

SYMBOLS

- - - - - - - -	Formation Contact
⇆	Fault - Arrows indicate direction of slip
~ ~ ~	Alluvium\Bedrock Contact
▼	Water Level
MSL	Mean Sea Level
2N/20W-19A1 (P 550' SE)	WELL PROJECTED 550 FEET SOUTHEAST

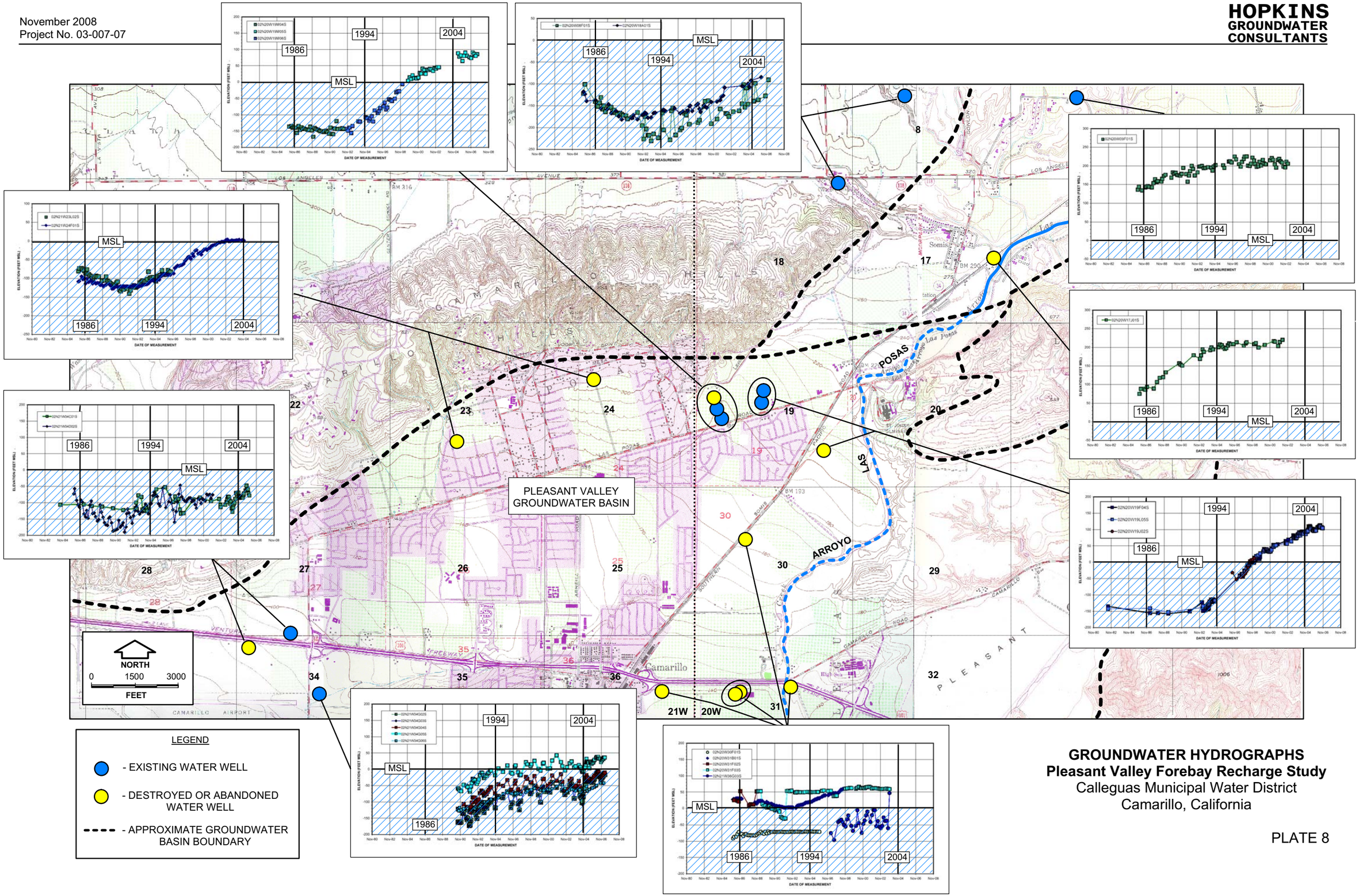
HYDROGEOLOGICAL CROSS-SECTION B-B'
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California



GROUNDWATER RECHARGE MOUND HYDROGRAPHS
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

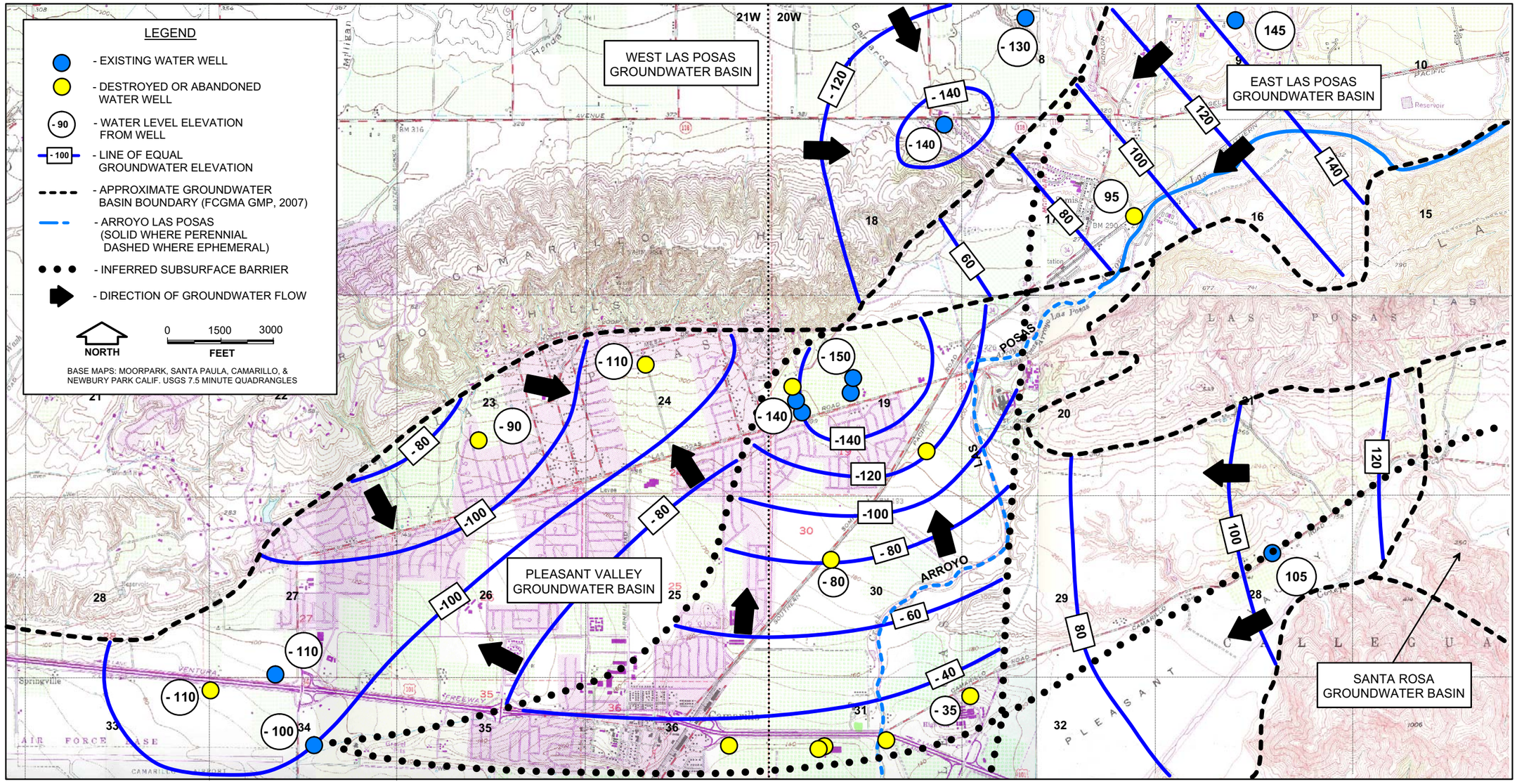
November 2008
Project No. 03-007-07

HOPKINS
GROUNDWATER
CONSULTANTS

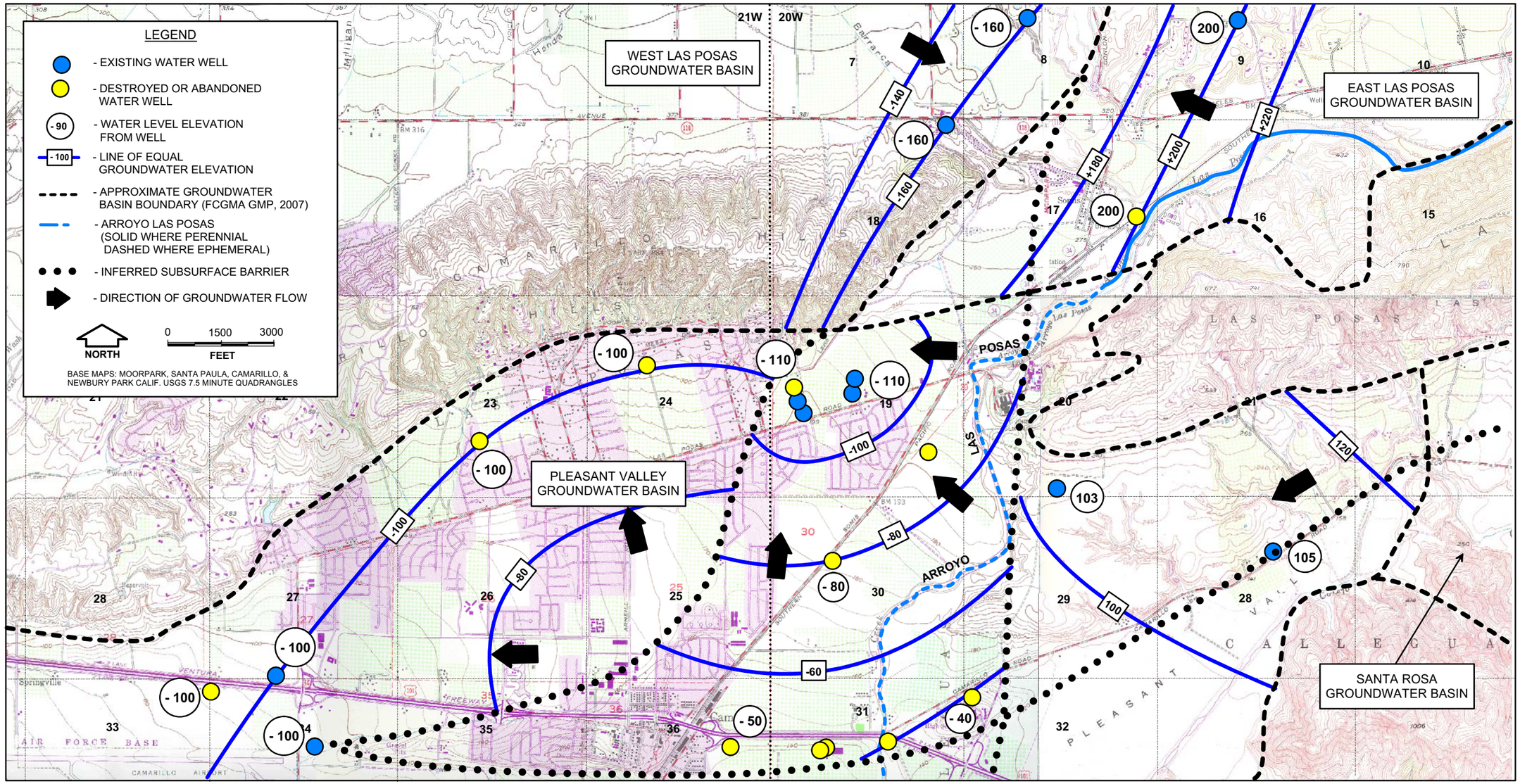


GROUNDWATER HYDROGRAPHS
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

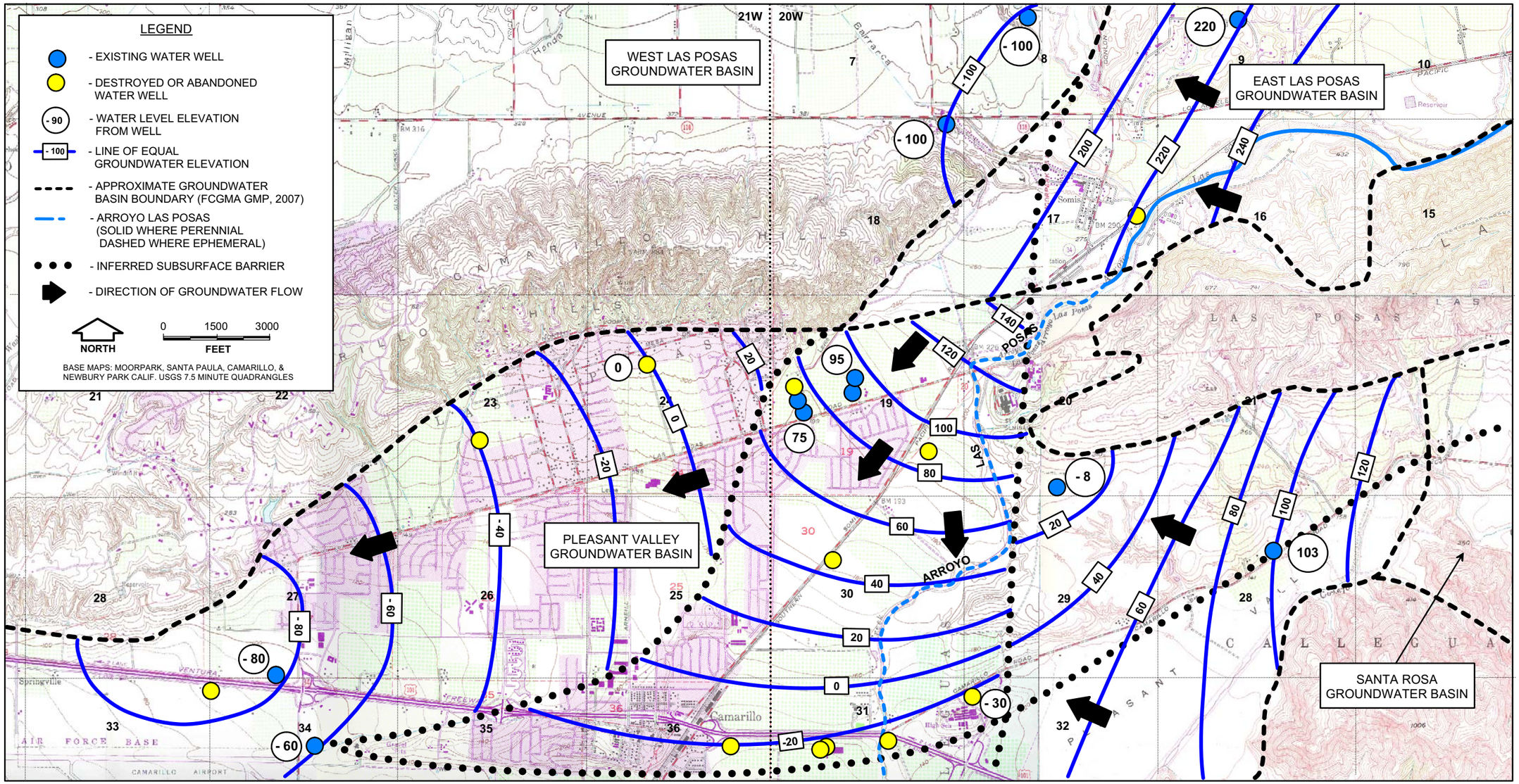
PLATE 8



1986 GROUNDWATER ELEVATION CONTOUR MAP
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

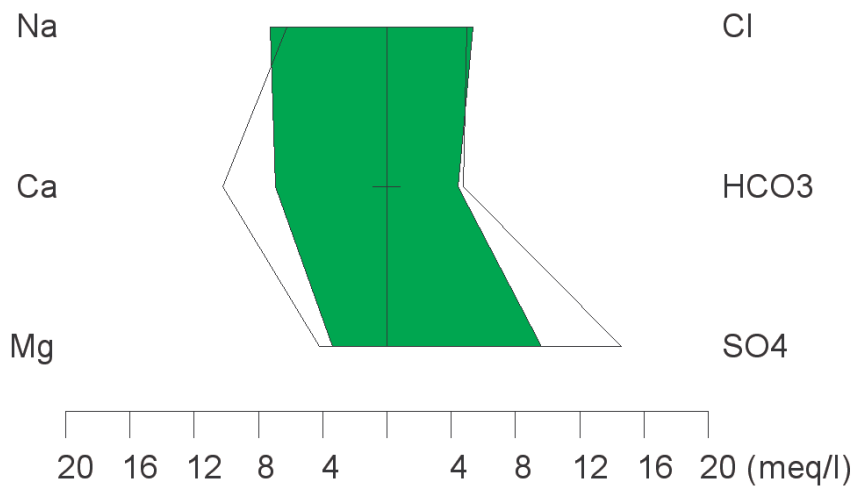


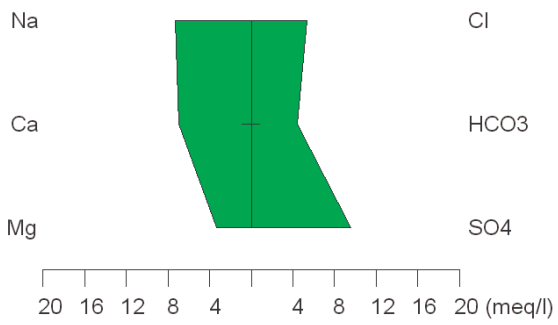
1994 GROUNDWATER ELEVATION CONTOUR MAP
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California



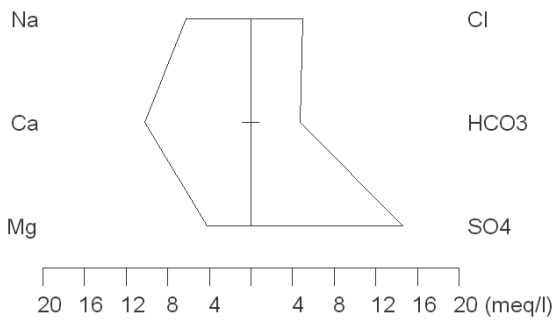
2004 GROUNDWATER ELEVATION CONTOUR MAP
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

PLATE 11





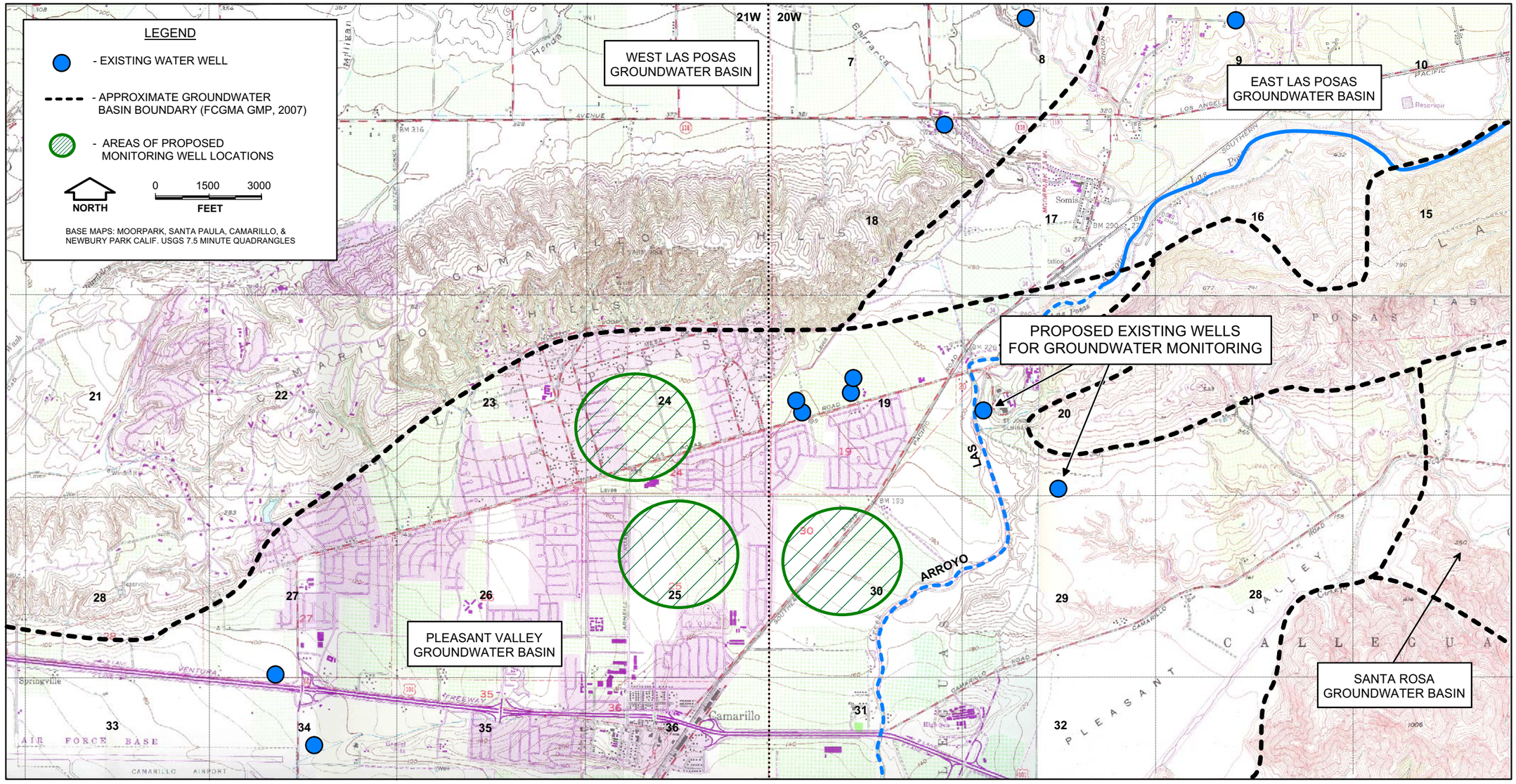
CREEK SAMPLE



WELL SAMPLE

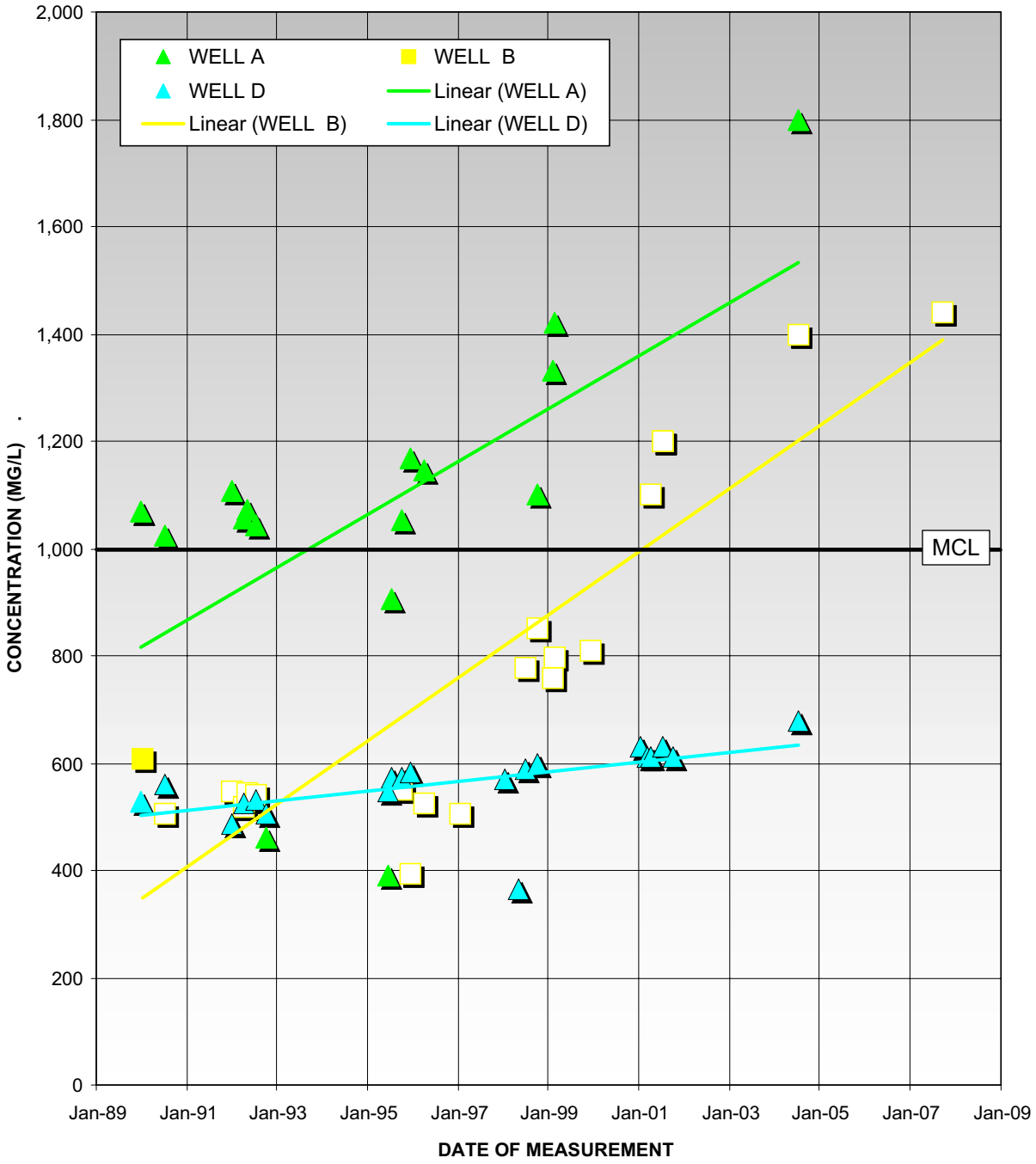
STIFF DIAGRAMS OF STUDY SAMPLES
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

PLATE 12



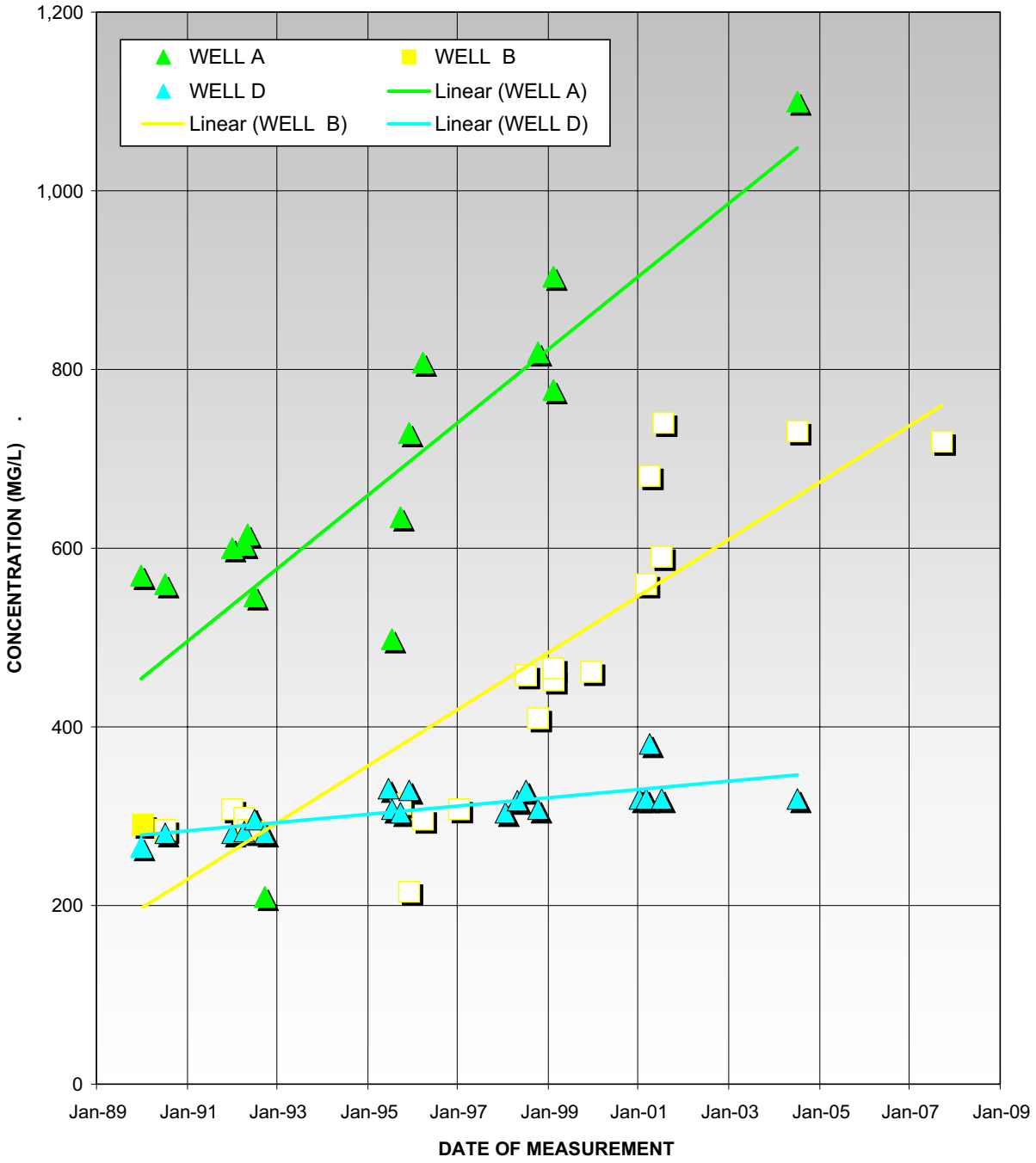
PROPOSED MONITORING WELL LOCATION MAP
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

APPENDIX A
WATER QUALITY DATA



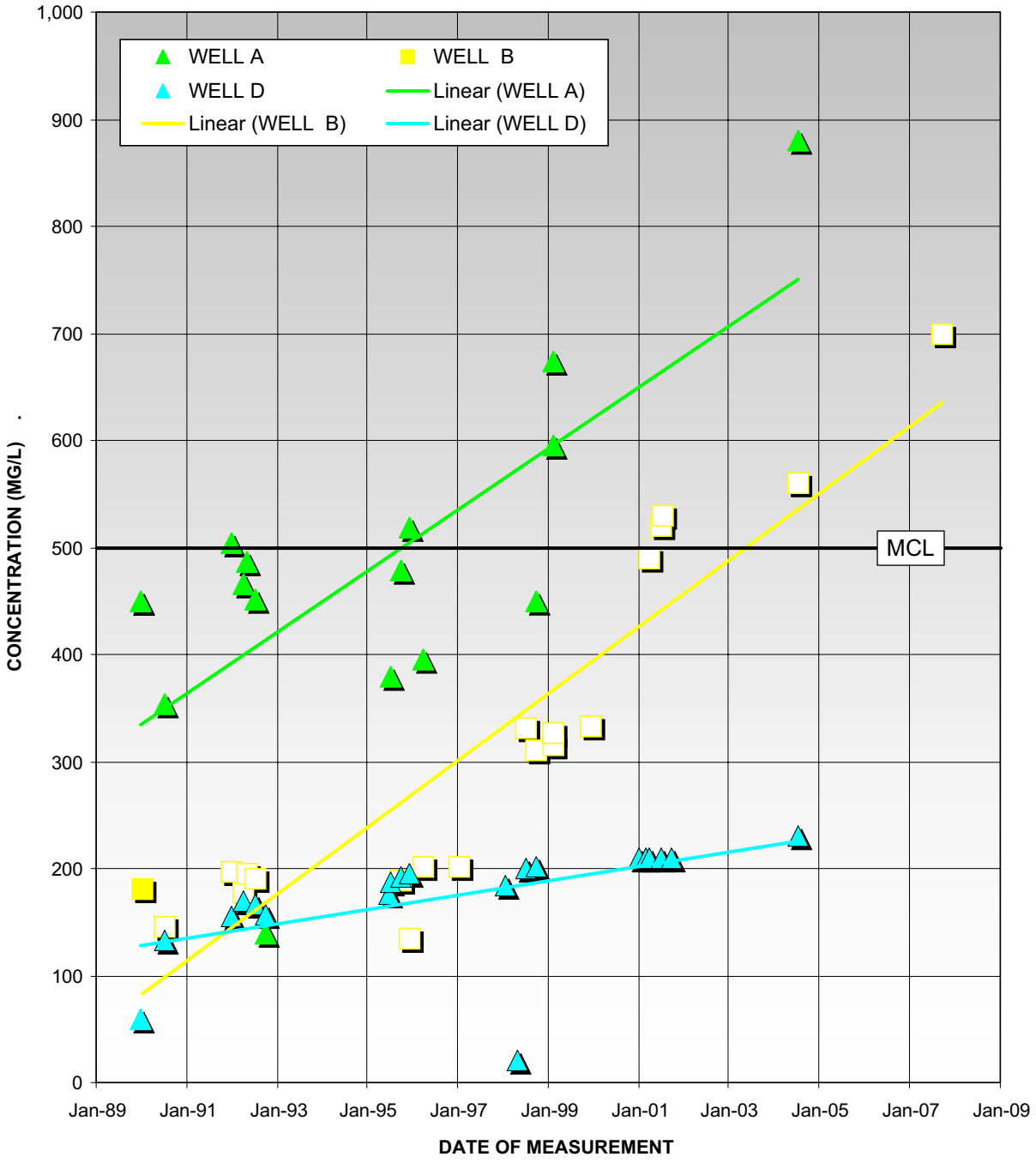
TOTAL DISSOLVED SOLIDS
CITY OF CAMARILLO WELLS
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

PLATE A1



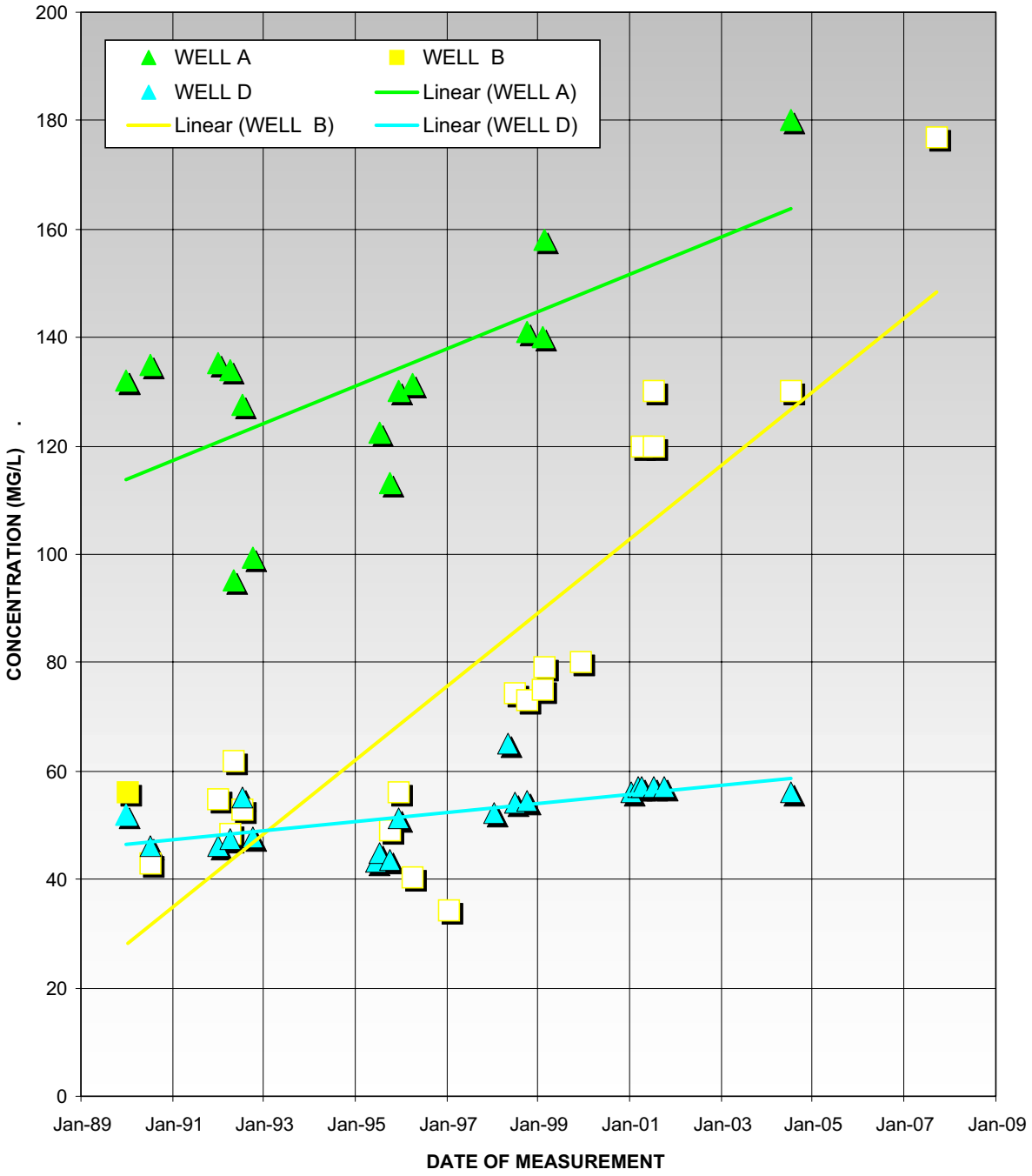
TOTAL HARDNESS (AS CaC03)
CITY OF CAMARILLO WELLS
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

PLATE A2



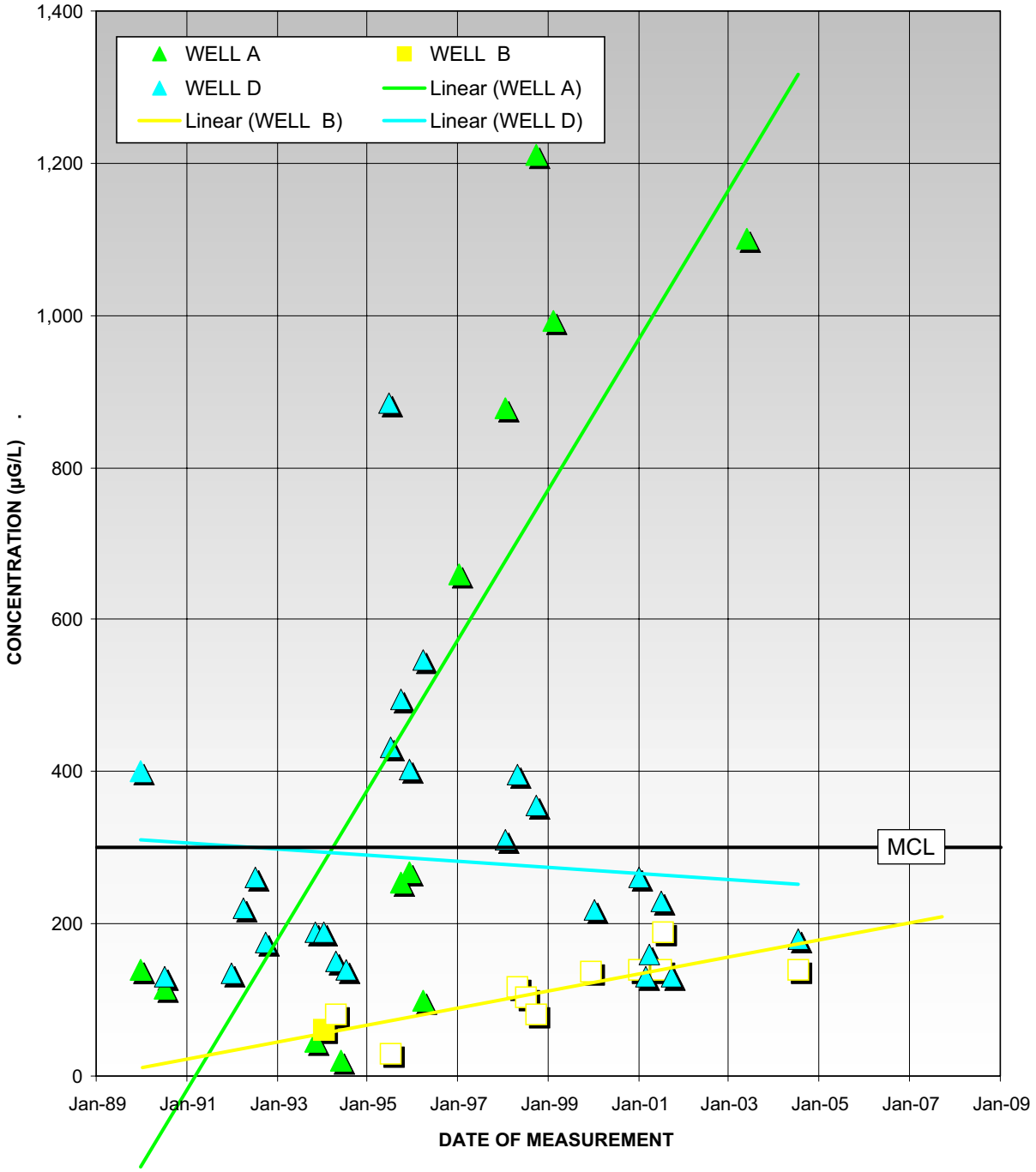
SULFATE
CITY OF CAMARILLO WELLS
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

PLATE A3



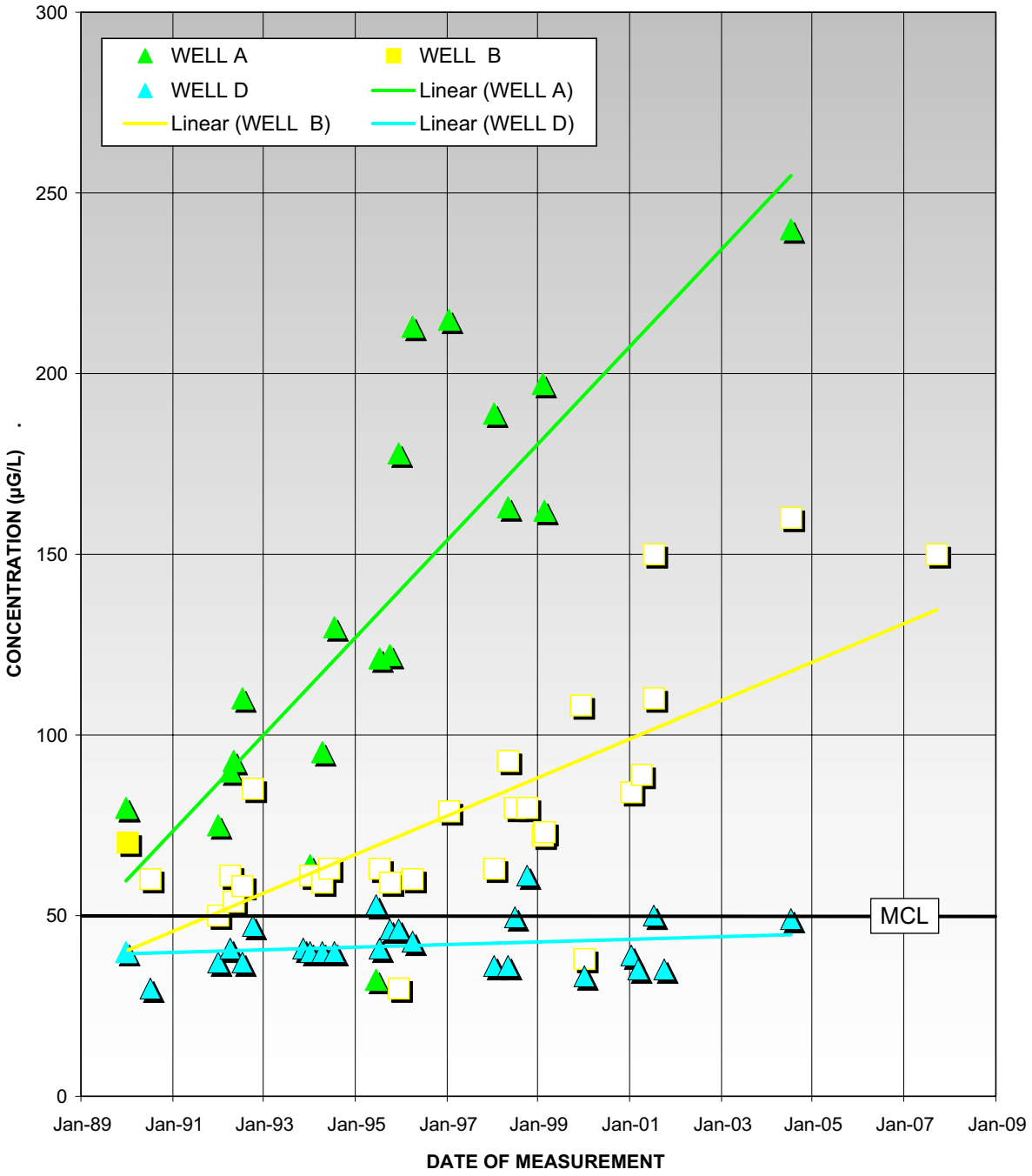
CHLORIDE
CITY OF CAMARILLO WELLS
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

PLATE A4



IRON
CITY OF CAMARILLO WELLS
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

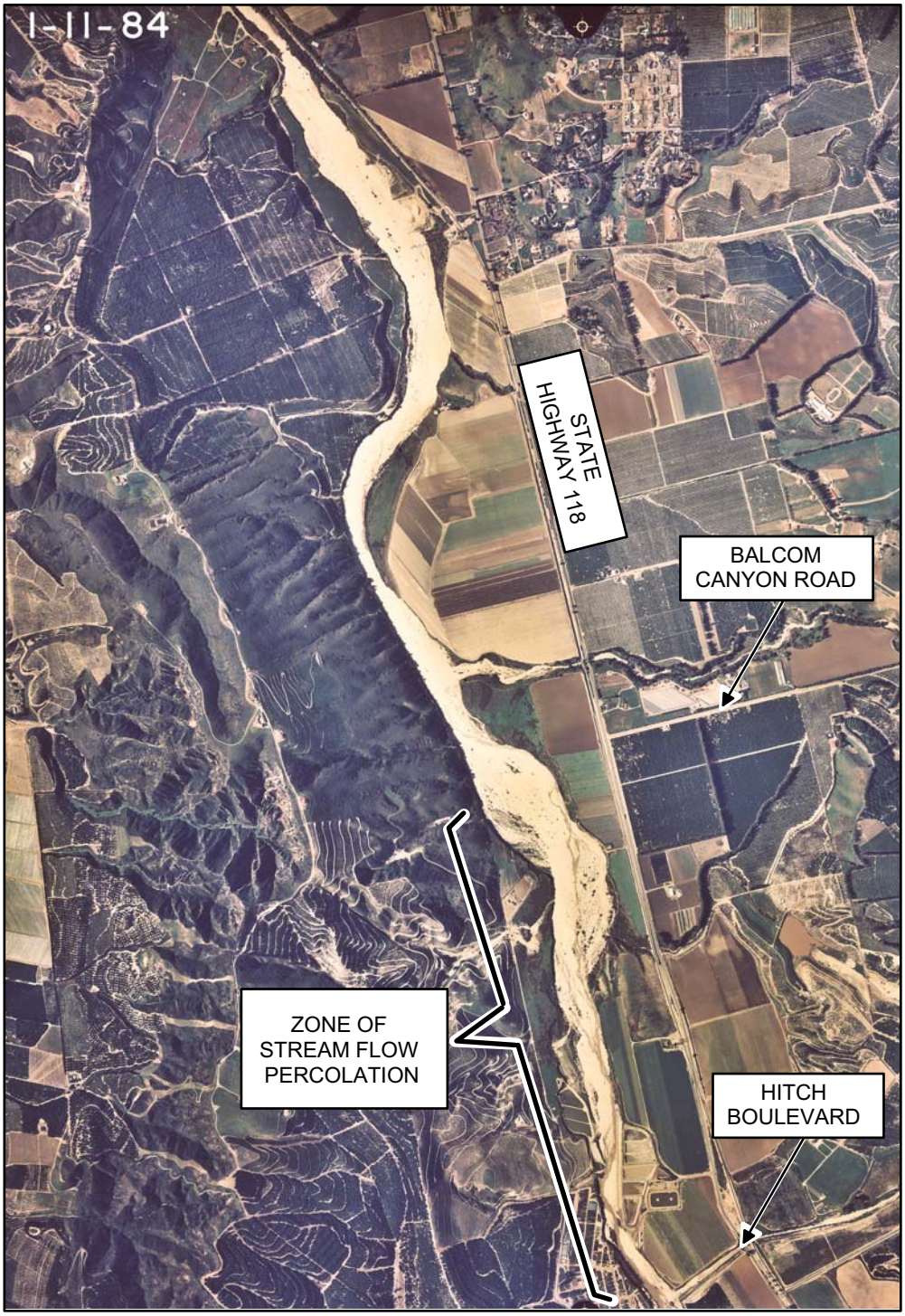
PLATE A5



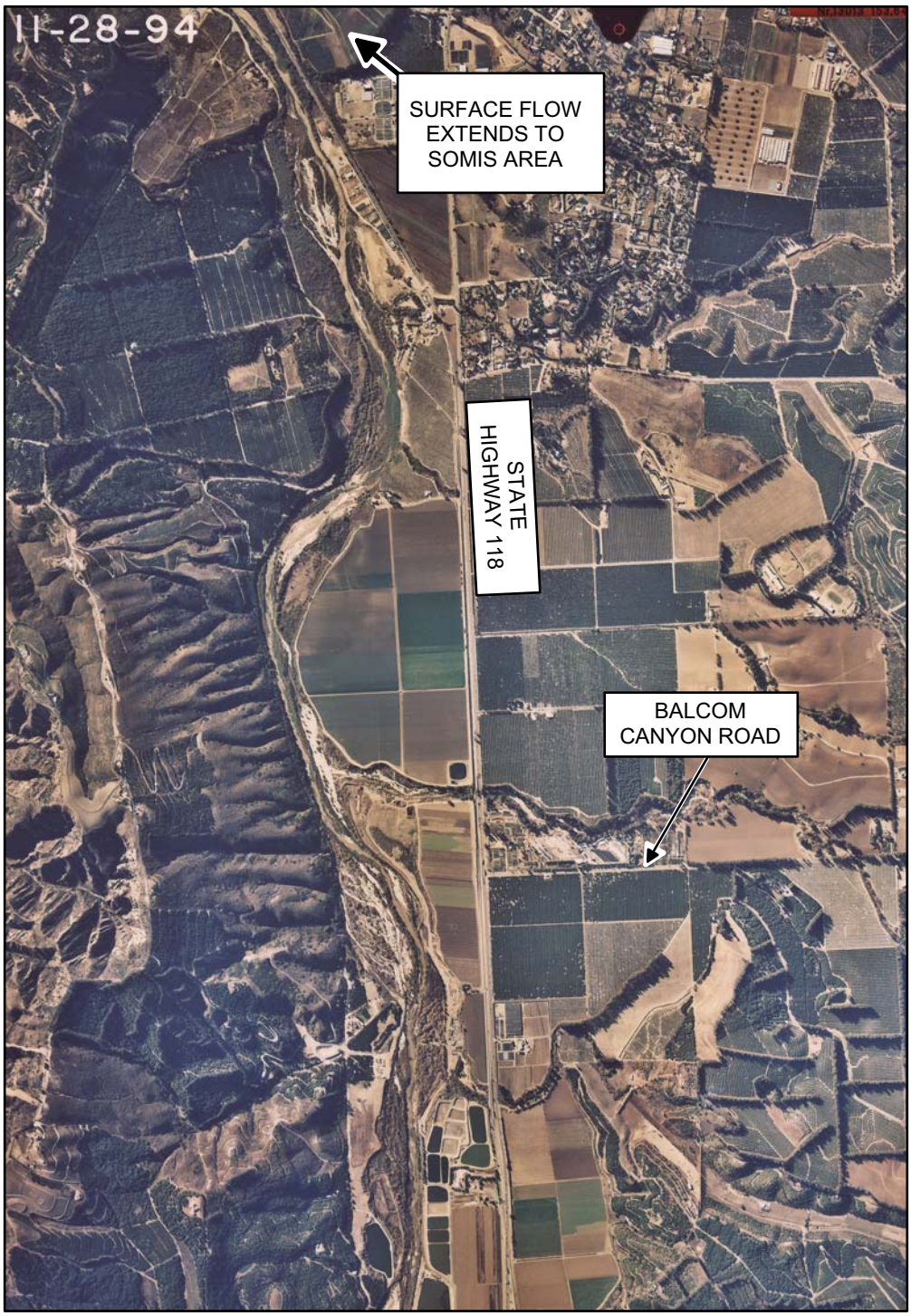
MANGANESE
CITY OF CAMARILLO WELLS
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

PLATE A6

APPENDIX B
AERIAL PHOTOGRAPHS OF ARROYO LAS POSAS



JANUARY 1984



NOVEMBER 1994

2005 (MONTH UNKNOWN)

APPENDIX C
STREAM FLOW SURVEY

Table C1 – Stream Flow Data

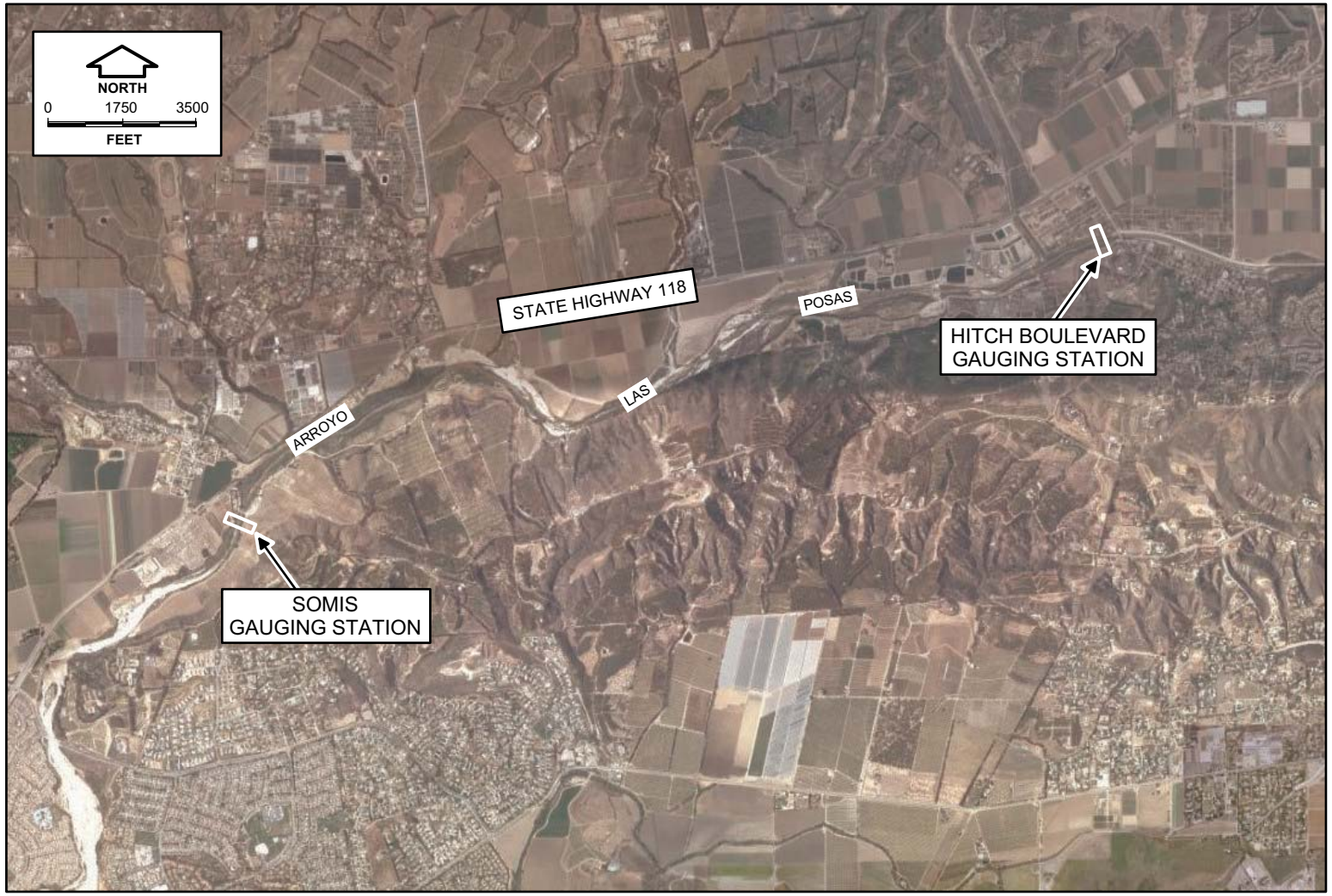
ARROYO LAS POSAS AT HITCH BOULEVARD GAUGING STATION			
SECTION	AREA (SQUARE FEET)	VELOCITY (FEET/SEC)	FLOW RATE (CFS)
1	0.350	1.45	0.508
2	0.338	1.93	0.651
3	0.430	1.83	0.787
4	0.500	1.67	0.835
5	0.580	1.95	1.131
6	0.688	2.05	1.409
7	0.615	1.62	0.996
8	0.465	1.65	0.767
9	0.445	1.88	0.837
10	0.490	1.70	0.833
11	0.450	1.96	0.882
12	0.450	2.13	0.959
13	0.440	2.08	0.915
14	0.495	2.59	1.282
15	0.655	2.50	1.638
16	0.580	2.28	1.322
17	0.655	2.15	1.408
18	0.880	2.60	2.288
19	1.045	2.40	2.508
20	1.020	2.45	2.499
21	0.465	1.11	0.516
		TOTAL RATE OF FLOW (CFS)	24.971
		TOTAL RATE OF FLOW (GPM)	11,207

ARROYO LAS POSAS AT SOMIS GAUGING STATION			
SECTION	AREA (SQUARE FEET)	VELOCITY (FEET/SEC)	FLOW RATE (CFS)
1	0.410	2.38	0.976
2	0.565	2.62	1.480
3	0.510	2.97	1.515
4	0.525	2.88	1.512
5	0.515	2.79	1.437
6	0.585	3.02	1.767
7	0.600	3.45	2.070
8	0.793	2.77	2.195
9	1.025	2.09	2.142
		TOTAL RATE OF FLOW (CFS)	15.094
		TOTAL RATE OF FLOW (GPM)	6,774

Table C2 – Stream Flow Data

DATE	HOPKINS MEASUREMENTS[1] HITCH BOULEVARD (CFS)	HOPKINS MEASUREMENTS[1] SOMIS (CFS)	VCWPD STREAM GAUGE READING HITCH BOULEVARD (CFS)	VCWPD MEASUREMENTS[2] HITCH BOULEVARD (CFS)
09/25/2007	25	15	15	NA[3]
10/28/2008	25	NA[3]	NA[3]	15

[1] – Measurement conducted with an impeller actuated flow meter.
[2] – Measurement conducted with a Pygmy meter having an axial cup actuator.
[3] – Not Available



STREAM GAUGING STATION LOCATION MAP
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

November 2008
Project No. 03-007-07

HOPKINS
GROUNDWATER
CONSULTANTS

PLATE C1

HITCH BOULEVARD GAUGING STATION
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

PLATE C2

SOMIS GAUGING STATION
Pleasant Valley Forebay Recharge Study
Calleguas Municipal Water District
Camarillo, California

PLATE C3

STREAM FLOW MEASUREMENTS AT HITCH BOULEVARD GAUGING STATION

STREAM FLOW MEASUREMENTS AT SOMIS GAUGING STATION

PRE-SURVEY CONDITION AT SOMIS STATION

TERMINATION OF STREAM FLOW

APPENDIX D
LABORATORY TEST RESULTS OF SURFACE AND GROUNDWATER ANALYSES

FGL ENVIRONMENTAL
GENERAL MINERAL ANALYSIS

October 25, 2007

Hopkins Groundwater Consultants Inc.
P. O. Box 3596
Ventura, CA 93006-3596

Lab ID : SP 0710727
Customer : 2-20807

Laboratory Report

Introduction: This report package contains total of 7 pages divided into 3 sections:

Case Narrative	(2 Pages)	: An overview of the work performed at FGL.
Sample Results	(2 pages)	: Results for each sample submitted.
Quality Control	(3 pages)	: Supporting Quality Control (QC) results.

Case Narrative

This Case Narrative pertains to the following samples:

Sample Description	Date Sampled	Date Received	FGL Lab ID #	Matrix
03-007-07 Creek Sample No.1	09/25/2007	09/25/2007	SP 0710727-001	SW
03-007-07 Well Sample No.2	09/25/2007	09/25/2007	SP 0710727-002	GW

Sampling and Receipt Information: All samples were received, prepared and analyzed within the method specified holding except those as listed in the table below. The holding time for pH is listed as immediate. Logistically this is very difficult to obtain. FGL policy is to analyze all samples requiring pH on the same day of receipt at the laboratory. If this presents any problem please call.

Lab ID	Analyte/Method	Required Holding Time	Actual Holding Time
SP 0710727-001	pH	15	406.2 Minutes
SP 0710727-002	pH	15	259.2 Minutes

All samples arrived on ice. All samples were checked for pH if acid or base preservation is required (except for VOAs). For details of sample receipt information, please see the attached Chain of Custody and Condition Upon Receipt Form.

Quality Control: All samples were prepared and analyzed according to the following tables:

Inorganic - Metals QC

200.7	10/01/2007:210057	All analysis quality controls are within established criteria.
	10/01/2007:209567	All preparation quality controls are within established criteria.

October 25, 2007
Hopkins Groundwater Consultants Inc.

Lab ID : SP 0710727
Customer : 2-20807

Inorganic - Wet Chemistry QC

2320B	09/28/2007:209945	All analysis quality controls are within established criteria.
	09/28/2007:209470	All preparation quality controls are within established criteria.
2510B	09/26/2007:209813	All analysis quality controls are within established criteria.
	09/26/2007:209352	All preparation quality controls are within established criteria.
2540 C,E	09/27/2007:209399	All preparation quality controls are within established criteria.
300.0	10/10/2007:210483	All analysis quality controls are within established criteria.
	10/08/2007:209789	All preparation quality controls are within established criteria.
4500-H B	09/25/2007:209335	All preparation quality controls are within established criteria.
4500HB	09/25/2007:209800	All analysis quality controls are within established criteria.
4500NO2B	09/25/2007:209804	All analysis quality controls are within established criteria.
	09/26/2007:209343	All preparation quality controls are within established criteria.
4500NO3F	09/27/2007:210013	All analysis quality controls are within established criteria.
	09/27/2007:209403	All preparation quality controls are within established criteria.
5540C	09/25/2007:209799	All analysis quality controls are within established criteria.
	09/25/2007:209337	All preparation quality controls are within established criteria.

Certification: I certify that this data package is in compliance with NELAC standards, both technically and for completeness, except for any conditions listed above. Release of the data contained in this data package is authorized by the Laboratory Director or his designee, as verified by the following electronic signature.

Approved By **Kelly A. Dunnahoo, B.S.**

Digitally signed by Kelly A. Dunnahoo, B.S.
Title: Laboratory Director
Date: 2007-10-25

ENVIRONMENTAL

ANALYTICAL CHEMISTS

October 25, 2007

Lab ID : SP 0710727-001
Customer ID : 2-20807

Hopkins Groundwater Consultants Inc.
P. O. Box 3596
Ventura, CA 93006-3596

Sampled On : September 25, 2007-10:43
Sampled By : B. Cosner
Received On : September 25, 2007-16:55
Matrix : Surface Water

Description : 03-007-07 Creek Sample No.1
Project : Water Monitoring

Sample Results - Inorganic

Constituent	Result	PQL	Units	Note	Sample Preparation Method	Sample Preparation Date/ID	Sample Analysis Method	Sample Analysis Date/ID
General Mineral P:1'4								
Total Hardness	516	2.5	mg/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Calcium	139	1	mg/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Magnesium	41	1	mg/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Potassium	8	1	mg/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Sodium	167	1	mg/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Total Cations	17.8	0.1	meq/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Boron	0.7	0.1	mg/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Copper	ND	10	ug/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Iron	840	50	ug/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Manganese	180	10	ug/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Zinc	ND	20	ug/L		200.7	10/01/07:209567	200.7	10/01/07:210057
SAR	3.2	0.1	meq/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Total Alkalinity (as CaCO3)	220	10	mg/L		2320B	09/28/07:209470	2320B	09/28/07:209945
Hydroxide	ND	10	mg/L		2320B	09/28/07:209470	2320B	09/28/07:209945
Carbonate	ND	10	mg/L		2320B	09/28/07:209470	2320B	09/28/07:209945
Bicarbonate	270	10	mg/L		2320B	09/28/07:209470	2320B	09/28/07:209945
Sulfate	460	10	mg/L		300.0	10/08/07:209789	300.0	10/10/07:210483
Chloride	189	5	mg/L		300.0	10/08/07:209789	300.0	10/10/07:210483
Nitrate	30.7	0.4	mg/L		4500NO3F	09/27/07:209403	4500NO3F	09/27/07:210013
Nitrite as N	ND	0.1	mg/L		4500NO2B	09/26/07:209343	4500NO2B	09/25/07:209804
Fluoride	0.3	0.1	mg/L		300.0	10/08/07:209789	300.0	10/10/07:210483
Total Anions	19.8	0.1	meq/L		2320B	09/28/07:209470	2320B	09/28/07:209945
pH	7.2	---	units		4500-H B	09/25/07:209335	4500HB	09/25/07:209800
Specific Conductance	1700	1	umhos/cm		2510B	09/26/07:209352	2510B	09/26/07:209813
Total Dissolved Solids	1180	20	mg/L		2540 C,E	09/27/07:209399	2540C	09/28/07:209924
MBAS (foaming agents)	ND	0.1	mg/L		5540C	09/25/07:209337	5540C	09/25/07:209799
Aggressiveness Index	12.1	0	--		4500-H B	09/25/07:209335	4500HB	09/25/07:209800
Langlier Index	0.2	0	--		4500-H B	09/25/07:209335	4500HB	09/25/07:209800

ND=Non-Detected. PQL=Practical Quantitation Limit. Containers: (P) Plastic Preservatives: H_2SO_4 pH < 2, HNO_3 pH < 2

ENVIRONMENTAL

ANALYTICAL CHEMISTS

October 25, 2007

Lab ID : SP 0710727-002
Customer ID : 2-20807

Hopkins Groundwater Consultants Inc.
P. O. Box 3596
Ventura, CA 93006-3596

Sampled On : September 25, 2007-13:10
Sampled By : B. Cosner
Received On : September 25, 2007-16:55
Matrix : Ground Water

Description : 03-007-07 Well Sample No.2
Project : Water Monitoring

Sample Results - Inorganic

Constituent	Result	PQL	Units	Note	Sample Preparation Method	Sample Preparation Date/ID	Sample Analysis Method	Sample Analysis Date/ID
General Mineral P:1'4								
Total Hardness	719	2.5	mg/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Calcium	204	1	mg/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Magnesium	51	1	mg/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Potassium	5	1	mg/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Sodium	143	1	mg/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Total Cations	20.7	0.1	meq/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Boron	0.5	0.1	mg/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Copper	ND	10	ug/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Iron	180	50	ug/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Manganese	150	10	ug/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Zinc	ND	20	ug/L		200.7	10/01/07:209567	200.7	10/01/07:210057
SAR	2.3	0.1	meq/L		200.7	10/01/07:209567	200.7	10/01/07:210057
Total Alkalinity (as CaCO3)	230	10	mg/L		2320B	09/28/07:209470	2320B	09/28/07:209945
Hydroxide	ND	10	mg/L		2320B	09/28/07:209470	2320B	09/28/07:209945
Carbonate	ND	10	mg/L		2320B	09/28/07:209470	2320B	09/28/07:209945
Bicarbonate	290	10	mg/L		2320B	09/28/07:209470	2320B	09/28/07:209945
Sulfate	700	10	mg/L		300.0	10/08/07:209789	300.0	10/10/07:210483
Chloride	177	5	mg/L		300.0	10/08/07:209789	300.0	10/10/07:210483
Nitrate	ND	0.4	mg/L		4500NO3F	09/27/07:209403	4500NO3F	09/27/07:210013
Nitrite as N	ND	0.1	mg/L		4500NO2B	09/26/07:209343	4500NO2B	09/25/07:209804
Fluoride	0.1	0.1	mg/L		300.0	10/08/07:209789	300.0	10/10/07:210483
Total Anions	24.3	0.1	meq/L		2320B	09/28/07:209470	2320B	09/28/07:209945
pH	7.1	---	units		4500-H B	09/25/07:209335	4500HB	09/25/07:209800
Specific Conductance	1930	1	umhos/cm		2510B	09/26/07:209352	2510B	09/26/07:209813
Total Dissolved Solids	1440	20	mg/L		2540 C,E	09/27/07:209399	2540C	09/28/07:209924
MBAS (foaming agents)	ND	0.1	mg/L		5540C	09/25/07:209337	5540C	09/25/07:209799
Aggressiveness Index	12.2	0	--		4500-H B	09/25/07:209335	4500HB	09/25/07:209800
Langlier Index	0.2	0	--		4500-H B	09/25/07:209335	4500HB	09/25/07:209800

ND=Non-Detected. PQL=Practical Quantitation Limit. Containers: (P) Plastic Preservatives: H_2SO_4 pH < 2, HNO_3 pH < 2

October 25, 2007 Lab ID : SP 0710727

Hopkins Groundwater Consultants, Inc. Customer : 2-20807

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Boron	200.7	10/01/2007:209567	MS	mg/L	4.000	91.5 %	75-125	
			MSD	mg/L	4.000	92.6 %	75-125	
			MSRPD	mg/L	800.0	1.0%	≤20.0	
	200.7	10/01/2007:210057	CCV	ppm	5.000	94.9 %	90-110	
			CCB	ppm		0.065	0.10	
			CCV	ppm	5.000	92.1 %	90-110	
			CCB	ppm		0.032	0.10	
Calcium	200.7	10/01/2007:209567	MS	mg/L	12.50	69.7 %	<¼	
			MSD	mg/L	12.50	63.9 %	<¼	
			MSRPD	mg/L	800.0	0.5%	≤20.0	
	200.7	10/01/2007:210057	CCV	ppm	25.00	93.9 %	90-110	
			CCB	ppm		0.02	1.0	
			CCV	ppm	25.00	93.3 %	90-110	
			CCB	ppm		0.02	1.0	
Copper	200.7	10/01/2007:209567	MS	ug/L	800.0	90.9 %	75-125	
			MSD	ug/L	800.0	90.5 %	75-125	
			MSRPD	ug/L	800.0	0.4%	≤20.0	
	200.7	10/01/2007:210057	CCV	ppm	1.000	93.8 %	90-110	
			CCB	ppm		0.0019	0.01	
			CCV	ppm	1.000	92.7 %	90-110	
			CCB	ppm		0.0019	0.01	
Iron	200.7	10/01/2007:209567	MS	ug/L	4000	88.7 %	75-125	
			MSD	ug/L	4000	89.0 %	75-125	
			MSRPD	ug/L	800.0	0.3%	≤20.0	
	200.7	10/01/2007:210057	CCV	ppm	5.000	92.9 %	90-110	
			CCB	ppm		-0.0119	0.05	
			CCV	ppm	5.000	92.3 %	90-110	
			CCB	ppm		-0.0097	0.05	
Magnesium	200.7	10/01/2007:209567	MS	mg/L	12.50	85.8 %	75-125	
			MSD	mg/L	12.50	83.4 %	75-125	
			MSRPD	mg/L	800.0	0.6%	≤20.0	
	200.7	10/01/2007:210057	CCV	ppm	25.00	91.4 %	90-110	
			CCB	ppm		0.02	1.0	
			CCV	ppm	25.00	90.8 %	90-110	
			CCB	ppm		0.02	1.0	
Manganese	200.7	10/01/2007:209567	MS	ug/L	800.0	87.9 %	75-125	
			MSD	ug/L	800.0	87.7 %	75-125	
			MSRPD	ug/L	800.0	0.2%	≤20.0	
	200.7	10/01/2007:210057	CCV	ppm	1.000	92.4 %	90-110	
			CCB	ppm		0.0016	0.01	
			CCV	ppm	1.000	91.6 %	90-110	
			CCB	ppm		0.0017	0.01	
Potassium	200.7	10/01/2007:209567	MS	mg/L	12.50	103 %	75-125	
			MSD	mg/L	12.50	102 %	75-125	
			MSRPD	mg/L	800.0	0.6%	≤20.0	
	200.7	10/01/2007:210057	CCV	ppm	25.00	94.5 %	90-110	
			CCB	ppm		-0.02	1.0	
			CCV	ppm	25.00	93.7 %	90-110	
			CCB	ppm		0.05	1.0	
Sodium	200.7	10/01/2007:209567	MS	mg/L	12.50	70.3 %	<¼	
			MSD	mg/L	12.50	59.2 %	<¼	
			MSRPD	mg/L	800.0	0.8%	≤20.0	
	200.7	10/01/2007:210057	CCV	ppm	25.00	90.7 %	90-110	
			CCB	ppm		0.15	1.0	
			CCV	ppm	25.00	89.7 %	90-110	

October 25, 2007 Lab ID : SP 0710727
Hopkins Groundwater Consultants, Inc. Customer : 2-20807

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Sodium	200.7	10/01/2007:210057	CCB	ppm		0.21	1.0	
Zinc			MS	ug/L	2000	90.2 %	75-125	
			MSD	ug/L	2000	90.9 %	75-125	
			MSRPD	ug/L	800.0	0.8%	≤20.0	
	200.7	10/01/2007:210057	CCV	ppm	1.000	91.9 %	90-110	
			CCB	ppm		0.0057	0.02	
			CCV	ppm	1.000	92.0 %	90-110	
			CCB	ppm		0.0063	0.02	
Wet Chem								
Alkalinity (as CaCO3)	2320B	09/28/2007:209470	Dup	mg/L		0.3%	3.42	
	2320B	09/28/2007:209945	ICV	mg/l	234.9	101 %	90-110	
			CCV	mg/l	234.9	100 %	90-110	
Bicarbonate	2320B	09/28/2007:209470	Dup	mg/l		0.3%	4.78	
Carbonate			Dup	mg/l		0.0	10	
Chloride	300.0	10/08/2007:209789	LCS	mg/L	25.00	105 %	90-110	
			MS	mg/L	500.0	116 %	86-128	
			MSD	mg/L	500.0	116 %	86-128	
			MSRPD	mg/L	100.0	0.05%	≤23.0	
	300.0	10/10/2007:210483	CCB	ppm		0.06	1	
			CCV	ppm	25.00	108 %	90-110	
			CCB	ppm		0.06	1	
			CCV	ppm	25.00	109 %	90-110	
Conductivity	2510B	09/26/2007:209813	ICB	umhos/cm		0.1	1	
			CCV	umhos/cm	998.0	101 %	95-105	
			CCV	umhos/cm	998.0	101 %	95-105	
E. C.	2510B	09/26/2007:209352	Blank	umhos/cm		ND	<1	
			Dup	umhos/cm		0.1%	0.372	
Fluoride	300.0	10/08/2007:209789	LCS	mg/L	2.500	110 %	90-110	
			MS	mg/L	50.00	118 %	81-126	
			MSD	mg/L	50.00	119 %	81-126	
			MSRPD	mg/L	100.0	0.4%	≤12.1	
	300.0	10/10/2007:210483	CCB	ppm		0.000	0.1	
			CCV	ppm	2.500	109 %	90-110	
			CCB	ppm		0.000	0.1	
			CCV	ppm	2.500	110 %	90-110	
Hydroxide	2320B	09/28/2007:209470	Dup	mg/l		0.0	10	
MBAS	5540C	09/25/2007:209337	MS	mg/L	1.000	100 %	90-110	
			MSD	mg/L	1.000	100 %	90-110	
			MSRPD	mg/L	1.000	0.0	≤0.1	
	5540C	09/25/2007:209799	CCB	mg/L		0.000	0.1	
			CCV	mg/L	1.000	100 %	99-101	
Nitrate + Nitrite as N	4500NO3F	09/27/2007:209403	MS	mg/L	4.000	61.0 %	5-285	
			MSD	mg/L	4.000	61.0 %	5-285	
			MSRPD	mg/L	4.000	0.0%	≤30.4	
	4500NO3F	09/27/2007:210013	CCB	mg/l		-0.011	0.1	
			CCV	mg/l	4.000	96.8 %	90-110	
			CCB	mg/l		-0.005	0.1	
			CCV	mg/l	4.000	95.5 %	90-110	
Nitrite as Nitrogen	4500NO2B	09/25/2007:209804	CCV	mg/L	0.1522	95.7 %	90-110	
			CCB	mg/L		-0.0007	0.1	
			CCV	mg/L	0.1522	96.6 %	90-110	
			CCB	mg/L		-0.0007	0.1	
	4500NO2B	09/26/2007:209343	MS	mg/L	0.4568	23.4 %	1-173	
			MSD	mg/L	0.4568	22.8 %	1-173	
			MSRPD	mg/L	0.4568	0.0028	≤0.1	
pH	4500-H B	09/25/2007:209335	Dup	units		0.8%	4.80	
	4500HB	09/25/2007:209800	CCV	units	8.000	101 %	95-105	

October 25, 2007 Lab ID : SP 0710727

Hopkins Groundwater Consultants, Inc. Customer : 2-20807

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
pH	4500HB	09/25/2007:209800	CCV	units	8.000	100 %	95-105	
Solids, Total Dissovled			Blank	mg/L		20	20	
			LCS	mg/L	1000	99.6 %	90-110	
			LCS	mg/L	1000	103 %	90-110	
			Dup	mg/L		1.6%	10.0	
Sulfate	300.0	10/08/2007:209789	LCS	mg/L	50.00	104 %	90-110	
			MS	mg/L	1000	115 %	78-137	
			MSD	mg/L	1000	115 %	78-137	
			MSRPD	mg/L	100.0	0.2%	≤12.3	
	300.0	10/10/2007:210483	CCB	ppm		1.08	2	
			CCV	ppm	50.00	106 %	90-110	
			CCB	ppm		1.06	2	
			CCV	ppm	50.00	106 %	90-110	

Definition

ICV	: Initial Calibration Verification - Analyzed to verify the instrument calibration is within criteria.
ICB	: Initial Calibration Blank - Analyzed to verify the instrument baseline is within criteria.
CCV	: Continuing Calibration Verification - Analyzed to verify the instrument calibration is within criteria.
CCB	: Continuing Calibration Blank - Analyzed to verify the instrument baseline is within criteria.
Blank	: Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.
LCS	: Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.
MS	: Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
MSD	: Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyted. The recoveries are an indication of how that sample matrix affects analyte recovery.
Dup	: Duplicate Sample - A random sample with each batch is prepared and analyzed in duplicate. The relative percent difference is an indication of precision for the preparation and analysis.
MSRPD	: MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.
ND	: Non-detect - Result was below the DQO listed for the analyte.
<¼	: High Sample Background - Spike concentration was less than one forth of the sample concentration.
DQO	: Data Quality Objective - This is the criteria against which the quality control data is compared.

FGL ENVIRONMENTAL

CHAIN OF CUSTODY
AND ANALYSIS REQUEST DOCUMENT

ORIGINAL

CLIENT DETAILS — SECTION I

Client: HOPKINS GROUNDWATER

☐ New Customer Customer Number:

Address: P.O. BOX 3596
VENTURA, CA 93006

Phone: 805-653-5306

FAX: 805-653-5346

Project name:

Contact person: C. HOPKINS

Billing Information (if different from above)

Name:

Address:

Phone:

FAX:

Contact person:

Purchase order/contract/FGL quote number:

Pre Log Required: yes ____ Frequency: Monthly ☐ Weekly ☐ Quarterly ☐ Other ☐

SAMPLING — SECTION II

Sampler (s): B. COSNER

Comp Sampler Set up Date: ____ Time: ____

Time: ____ Mileage: ____

Shipping Charge: ____ Pickup Charge: ____

REPORT INFORMATION — SECTION III

Rush Analysis (surcharge will apply):

☐ 5 Day ☐ 4 Day ☐ 3 Day
☐ 2 Day ☐ 24 hour

Rush pre-approval by lab: ____ initial

Electronic Data Transfer: yes ____ no ____

If yes, To: State ____ Client ____ Other ____

Lab number: 110727

SAMPLE INFORMATION — SECTION IV

Sample Number	Location/Description	Date Sampled	Time Sampled	Type of Sampling: Composite(C) Grab(G)	Number of Containers	Type of Containers: (G) Glass (P) Plastic (V) VOA (MT) Metal Tube	(P) Potable (NP) Non-Potable	(SW) Surface Water (MW) Monitoring Well (GW) Ground Water (TB) Travel Blank (WW) Wastewater (DW) Drinking Water	(S) Soil (SLG) Sludge (SLD) Solid (O) Oil	BacT: (Sys) System (SRC) Source (W) Waste	BacT: Routine (ROUT) Repeat (RPT) Other (OTH) Replace (RPL)	(LT) Leaf Tissue (PET) Petiole Tissue (PRD) Produce	Preservative: (1) NaOH + ZnAc, (2) NaOH, (3) HCl, (4) H2SO4, (5) HNO3, (6) Na2S2O3, (7) Other	ANALYSES REQUESTED: GW-MIN	To Lab D/I:
1	03-007-07 CREEK SAMPLE NO. 1	09-25-07	10:43	G	3	P	P	SW					4,5	X	
2	03-007-07 WELL SAMPLE NO. 2	09-25-07	13:10	G	3	P	P	GW					4,5	X	

REMARKS — SECTION V

CUSTODY — SECTION VI

Relinquished by and subject to the terms and conditions on the reverse of this document:

B. Cosner — Date 09-25-07 Time 16:31

Received by: [signature] — Date 9-25-07 Time 16:31

Relinquished by: [signature] — Date 9-25-07 Time 1655

Received by: [signature] — Date 9/25/07 Time 1655

Relinquished by: ____ Date ____ Time ____

Received by: ____ Date ____ Time ____

Relinquished by: ____ Date ____ Time ____

Received by: ____ Date ____ Time ____

CORPORATE OFFICE & LABORATORY
P.O. Box 272/853 Corporation Street
Santa Paula, CA 93061-0272
Tel. (805) 659-0910
FAX: (805) 525-4172

OFFICE & LABORATORY
2500 Stagecoach Road
Stockton, CA 95215
Tel. (209) 942-0181
FAX: (209) 942-0423

FIELD OFFICE
Visalia, California
Tel: (559) 734-9473
Mobile: (559) 737-2399
FAX (559) 734-8435

Santa Paula - Condition Upon Receipt (Attach to COC)

Sample Receipt:

1. Number of ice chests/packages received: OTC
   Note as OTC if received over the counter unpackaged.
2. Were samples received in a chilled condition? Temps: RoI / ____ / ____ / ____ / ____
   Acceptable is above freezing to 6° C. Also acceptable is received on ice (ROI) for the same day of sampling or received at room temperature (RRT) if sampled within one hour of receipt. Client contact for temperature failures must be documented below. If many packages are received at one time check for tests/H.T.'s/rushes/Bacti's to prioritize further review. Please notify Microbiology personnel immediately of bacti samples received.
3. Do the number of bottles received agree with the COC? Yes No N/A
4. Were samples received intact? (i.e. no broken bottles, leaks etc.) Yes No
5. Were sample custody seals intact? N/A Yes No

Sign and date the COC, obtain LIMS sample numbers, select methods/tests and print labels.

Sample Verification, Labeling and Distribution:

1. Were all requested analyses understood and acceptable? Yes No
2. Did bottle labels correspond with the client's ID's? Yes No
3. Were all bottles requiring sample preservation properly preserved? Yes No N/A FGL
4. Were all analyses within holding times at time of receipt? Yes No
5. Have rush or project due dates been checked and accepted? N/A Yes No

Attach labels to the containers and include a copy of the COC for lab delivery.

Sample Receipt, Login and Verification completed by (initials): _____

Discrepancy Documentation:

Any items above which are "No" or do not meet specifications (i.e. temps) must be resolved.

1. Person Contacted:_____ Phone Number:_____
   Initiated By:_____ Date:_____
   Problem:

   Resolution:

2. Person Contacted:_____ Phone Number:_____
   Initiated By:_____ Date:_____
   Problem:

   Resolution:

ZYMAX FORENSICS
DELTA OXYGEN-18, DELTA DEUTERIUM, AND DELTA NITROGEN-15 ANALYSES

ZymaX FORENSICS

REPORT OF ANALYTICAL RESULTS

Client:	Brian Cosner Hopkins Groundwater Consultants P.O.B. 3596 Ventura, CA 93006-3596	Lab Number: Received: Matrix:	40702 9/26/2007 Water
Project: Project Number: Collected by:	Isotopes 03-007-07 Client	Sample Description: See Below Analyzed: Method:	 10/26/2007 CF-IRMS

$\delta^{18}O$ δD

LAB NUMBER	SAMPLE DESCRIPTION	$\delta^{18}O$ ‰	δD ‰
40702-1	03-007-07 Creek Sample No.1	-8.0	-55.0
40702-2	03-007-07 Well Sample No.2	-7.4	-52.6
Analytical Precision (1-sigma)		0.2	0.7

Submitted by,
Zymax Forensics, a DPRA company

River He, PhD
Isotope Lab Manager

40702-1h2o.xls
RH D12.03 04

REPORT OF ANALYTICAL RESULTS

Client:	Brian Cosner Hopkins Groundwater Consultants P.O.B. 3596 Ventura, CA 93006-3596	Lab Number:	40702
		Received:	9/26/2007
		Matrix:	Water

Project:	Isotopes	Sample Description:	See Below
Project Number:	03-007-07	Analyzed:	10/31/2007
Collected by:	Client	Method:	CF-IRMS

$\delta^{15}N$ $\delta^{18}O$ (Nitrate)

LAB NUMBER	SAMPLE DESCRIPTION	$\delta^{15}N$ ‰
40702-1	03-007-07 Creek Sample No.1	10.9
40702-2	03-007-07 Well Sample No.2	12.4
Analytical Precision (1-sigma)		0.4

Submitted by,
Zymax Forensics, a DPRA company

River He, PhD
Isotope Lab Manager

40702-1NO3.xls
RH

ISOTECH LABORATORIES
TRITIUM ANALYSIS

Isotech Water Data

Job 8883

Project 03-007-07

Isotech Lab No.	Sample Name	Tritium TU	Std. Dev.
124384	Creek Sample #1	3.87	0.23
124385	03-007-07 Well Sample #2	2.84	0.22

EMERGENCY ORDINANCE – E

AN EMERGENCY ORDINANCE LIMITING EXTRACTIONS FROM GROUNDWATER EXTRACTION FACILITIES, SUSPENDING USE OF CREDITS AND PROHIBITING CONSTRUCTION OF ANY GROUNDWATER EXTRACTION FACILITY AND/OR THE ISSUANCE OF ANY PERMIT THEREFOR

The Board of Directors of the Fox Canyon Groundwater Management Agency, State of California, ordains as follows:

ARTICLE 1. Findings

The Board of Directors hereby finds that:

A. On January 17, 2014, the Governor of the State of California proclaimed a state of emergency due to current drought conditions and called on Californians to reduce their water usage by 20 percent. On March 1, 2014, the Governor signed into law emergency drought legislation that finds and declares that California is experiencing an unprecedented dry period and shortage of water for its citizens, local governments, agriculture, environment, and other uses.

B. The U.S. Drought Monitor has designated the territory of the Agency to be currently in a condition of exceptional drought.

C. The United Water Conservation District has reported that groundwater storage in the Oxnard Plain Basin Forebay dropped by 32,200 acre feet in the past year and groundwater levels are currently below sea level. Continued dry conditions and regulatory restrictions on diversions from the Vern Freeman Diversion will result in less water available for recharge of the Forebay.

D. On February 25, 2009, the Fox Canyon Groundwater Management Agency Board of Directors in response to a serious water resource problem constituting a very real and immediate threat to groundwater quality and quantity to the West, East, and South Las Posas Basins and any and all basins tributary thereto adopted Emergency Ordinance D, entitled An Emergency Ordinance to Impose a Temporary Moratorium on Construction of New Wells and to Provide an Upper Limitation to Efficiency Extraction Allocation Within the West, East, and South Las Posas Groundwater Basins Pending Development of a Basin-Specific Management Plan.

E. Emergency Ordinance D was replaced by Ordinance 8.6 which presumed the development of a Basin-Specific Management Plan. However, the threats to groundwater quality and quantity in the Las Posas Basins remain and have increased due to persistent drought conditions, and the lack of a Basin-Specific Management Plan.

F. The Agency's 2007 Update to its Groundwater Management Plan established basin yield at 100,000 acre-feet per year; however, average annual total extractions within the Agency for Calendar Years 2003 through 2012 were 124,586 acre-feet.

G. Due to persistent dry conditions, the Department of Water Resources on January 31, 2014, announced a 2014 State Water Project Allocation of zero percent.

H. The cumulative use of conservation credits has reduced the benefit of previous reductions in historical allocations, and could limit any benefit derived through this Emergency Ordinance.

I. The Board may adopt ordinances for the purpose of regulating, conserving, managing, and controlling the use and extraction of groundwater within the territory of the Agency.

J. The measures adopted in this emergency ordinance are necessary in order to improve and protect the quantity and quality of groundwater supplies within the territory of the Agency, to prevent a worsening of existing conditions, to allow time to implement a definite and long-term solution to improve groundwater conditions in the Agency and to bring groundwater extractions into balance with recharge.

K. This emergency ordinance is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines Sections 15307 and 15308 as an action taken "to ensure the maintenance, restoration, or enhancement of natural resources or the environment."

ARTICLE 2. Reduction of Groundwater Extractions

A. For the duration of this emergency ordinance, all Municipal and Industrial Operators' extraction allocations, regardless of type, shall be replaced with a Temporary Extraction Allocation (TEA) based on an operator's average annual reported extractions, not including any extractions that incurred surcharges, for Calendar Years 2003 through 2012.

B. For the Port Hueneme Water Agency (PHWA), their TEA shall be established according to the Agency's approved July 24, 1996 agreement and allocations contained within.

C. Temporary Extraction Allocations (TEA) shall be reduced in order to eliminate overdraft from the aquifer systems within the boundaries of the Agency for municipal and industrial uses. The reductions shall be as follows:

1. Beginning July 1, 2014	10% (TEA x 0.90/2)
2. Beginning January 1, 2015	15% (TEA x 0.85/2)
3. Beginning July 1, 2015	20% (TEA x 0.80/2)
4. Beginning January 1, 2016	20% (TEA x 0.80)

D. For reported extractions starting on August 1, 2014, all Agricultural Operators' extraction allocations, regardless of type, shall be replaced with an Annual Efficiency Allocation as provided in Section 5.6.1.2. of the Agency Ordinance Code, except that the annual irrigation allowances used to calculate the Irrigation Allowance Index shall be adjusted downward 25% from the allowances set forth in Resolution No. 2011-04 (Exhibit No. 1). For computing the irrigation allowance, the definition of Planted Acre may include designated areas that grew irrigated crops in the twelve months prior to August 1, 2014, but have subsequently been fallowed or are growing a non-irrigated crop.

E. On February 1, 2015, the Board may by Resolution undertake an additional adjustment to the annual irrigation allowances used to calculate the Irrigation Allowance Index, or other pumping restrictions in order to achieve a cumulative 10% reduction in pumping by Agricultural Operators.

F. On August 1, 2015, the Board may by Resolution undertake an additional adjustment to the annual irrigation allowances used to calculate the Irrigation Allowance Index, or other pumping restrictions in order to achieve a cumulative 20% reduction in pumping by Agricultural Operators.

G. Notwithstanding the extraction allocations established pursuant to Chapter 5.0 of the Agency Ordinance Code, all extractions in excess of the allocations established and adjusted by this emergency ordinance shall be subject to extraction surcharges.

H. The Executive Officer may, on written request from a land owner or operator, grant a variance from the requirements of this article based on a showing:

1. That there are special circumstances or exceptional characteristics of the owner or operator which do not apply generally to comparable owners or operators in the same vicinity; or
2. That strict application of the reductions as they apply to the owner or operator will result in practical difficulties or unnecessary hardships inconsistent with the general purpose of this emergency ordinance; or
3. That the granting of such variance will result in no net detriment to the aquifer systems.

ARTICLE 3. Limitation on Accrual and Use of Credits

Notwithstanding Section 5.7 of the Agency Ordinance Code, conservation credits shall not be obtained and may not be used to avoid paying surcharges for extractions while this emergency ordinance is in effect.

ARTICLE 4. Prohibition on New Extraction Facilities

The Board prohibits the issuance of any permit for construction of a groundwater extraction facility, other than a replacement, backup or standby facility which does not allow the initiation of any new or increased use of groundwater, within the territory of the Agency. The prohibition set forth shall not apply to any permit for which a completed application is on file with the Agency on or before February 26, 2014, or for any permit in furtherance of a pumping program approved by the Board. For the purpose of this Article 4, a new or increased use is one that did not exist or occur before the effective date of this emergency ordinance. The Board may grant exceptions to the prohibition set forth in this Article 4 on a case-by-case basis. Applications for exceptions shall conform to the requirements of Section 5.2.2.3. of the Agency Ordinance Code and will be approved only if the Board makes the findings set forth in Section 5.2.2.4. of the Agency Ordinance Code.

ARTICLE 5. Duration

This emergency ordinance shall remain in effect from the date of adoption and reviewed every eighteen months, unless superseded or rescinded by action of the Board or a finding by the Board that the drought or emergency condition no longer exists.

ARTICLE 6. Effective Date

This ordinance shall become effective immediately upon adoption by the vote of at least four members of the Board; otherwise it shall become effective on the thirty-first day after adoption.

PASSED AND ADOPTED this 11th day of April 2014 by the following vote:

AYES: 5
NOES: 0
ABSENT: 0

By: _____
Lynn Maulhardt, Chair, Board of Directors
Fox Canyon Groundwater Management Agency

ATTEST: I hereby certify that the above is a true and correct copy of Emergency Ordinance E.

By: _____
Jessica Kam, Clerk of the Board

Exhibit No. 1 – Current Irrigation Allowance Index and - Proposed Allowance Index Values (Adjusted 25%)

Irrigation Allowance Index Values (Adjusted 25%)*

Acre-Feet/Acre

		Oxnard (Z1)			Camarillo (Z2)			Santa Paula (Z3)		
		Typical	Dry	Wet	Typical	Dry	Wet	Typical	Dry	Wet
Includes leaching and DU = 0.8	**# of Crops**	*Total AF/A*	*Total AF/A*	*Total AF/A*	*Total AF/A*	*Total AF/A*	*Total AF/A*	*Total AF/A*	*Total AF/A*	*Total AF/A*
Spring Veg./Fall Celery	2	2.7	2.8	2.5	3.0	3.2	2.8	3.3	3.4	3.0
Summer Veg./Fall Veg	2	2.5	2.7	2.4	2.8	3.0	2.7	3.0	3.2	2.9
Spring Veg./Late Summer Veg./+part Late Fall Veg*	**2+plus**	2.9	3.1	2.8	3.3	3.5	3.1	3.6	3.8	3.4

		Oxnard (Z1)			Camarillo (Z2)			Santa Paula (Z3)		
		Typical	Dry	Wet	Typical	Dry	Wet	Typical	Dry	Wet
Crop		*Total AF/A*	*Total AF/A*	*Total AF/A*	*Total AF/A*	*Total AF/A*	*Total AF/A*	*Total AF/A*	*Total AF/A*	*Total AF/A*
Avocado - 20% Ground Shading	**1**	1.4	1.5	1.3	1.6	1.7	1.5	1.7	1.9	1.6
Avocado - 50% Ground Shading	**1**	2.0	2.2	1.9	2.3	2.5	2.1	2.5	2.8	2.3
Avocado - 70% Ground Shading	**1**	2.7	3.1	2.6	3.1	3.5	3.0	3.4	3.8	3.2
Blueberries 20% Ground Shading	**1**	1.4	1.4	1.3	1.5	1.8	1.5	1.8	1.9	1.7
Blueberries 50% Ground Shading	**1**	2.0	2.1	1.9	2.2	2.3	2.2	2.4	2.5	2.4
Blueberries 70% Ground Shading	**1**	2.7	2.9	2.6	3.1	3.3	3.0	3.4	3.6	3.2
Celery - Single Crop	**1**	1.5	1.6	1.4	1.7	1.8	1.5	1.8	1.9	1.6
Citrus - 20% Ground Shading	**1**	1.4	1.6	1.3	1.6	1.8	1.5	1.8	1.9	1.6
Citrus - 50% Ground Shading	**1**	1.9	2.0	1.8	2.2	2.3	2.0	2.4	2.5	2.2
Citrus - 70% Ground Shading	**1**	2.6	2.7	2.4	2.9	3.0	2.7	3.2	3.3	2.9
Lima Beans	**1**	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	0.9
Misc. Veg Greenhouse - Fall	**1**	0.9	0.9	0.8	1.0	1.0	0.9	1.0	1.1	1.0
Misc. Veg Greenhouse - Spr	**1**	1.0	1.1	0.9	1.1	1.2	1.1	1.2	1.3	1.2
Misc. Veg Greenhouse - Summer	**1**	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4
Misc. Veg Single Crop - Fall	**1**	1.0	1.1	1.0	1.1	1.2	1.0	1.2	1.3	1.1
Misc. Veg Single Crop - Spr	**1**	1.2	1.3	1.1	1.3	1.4	1.2	1.5	1.6	1.4
Misc. Veg Single Crop - Summer	**1**	1.5	1.5	1.5	1.7	1.7	1.6	1.8	1.9	1.8
Nursery (Non-Greenhouse)	**1**	3.2	3.4	3.1	3.6	3.8	3.5	4.0	4.2	3.8
Nursery (Greenhouse)	**1**	3.4	3.5	3.3	3.8	3.9	3.7	4.2	4.3	4.0
Raspberries - Tunnel	**1**	3.2	3.4	3.1	3.7	3.8	3.6	4.0	4.2	3.9
Sod	**1**	3.0	3.2	2.9	3.4	3.6	3.3	3.7	3.9	3.6
Strawberries-Main Season	**1**	2.3	2.5	2.2	2.6	2.7	2.4	2.8	2.9	2.6
Strawberries-Summer	**1**	1.4	1.4	1.3	1.5	1.6	1.4	1.6	1.7	1.5
Tomatoes - Peppers	**1**	1.7	1.7	1.6	1.9	1.9	1.8	2.1	2.1	2.0

*Adopted by FCGMA Board on April 11, 2014

CALENDAR YEAR 2014

ANNUAL REPORT

FOX CANYON GROUNDWATER MANAGEMENT AGENCY
ANNUAL REPORT FOR CALENDAR YEAR 2014

2014 Board of Directors	Representing	Alternate Directors
Steve Bennett	County Board of Supervisors	John Zaragoza
David Borchard	Agricultural & Farm Interests	David Schwabauer
Charlotte Craven (Vice Chair)	Incorporated Cities	Neal Andrews
Dr. Michael Kelley	Small Water Districts	Andrew Waters
Lynn Maulhardt (Chair)	United Water Conservation District	Robert Eranio

Current FCGMA Staffing is provided under contract by the Ventura County Watershed Protection District (VCWPD)

Jeff Pratt, P.E., Agency Executive Officer
Alberto Boada, Agency Counsel
Tully Clifford, P.E., Director, Watershed Protection District
Gerhardt Hubner, P.G., Deputy Director, Watershed Protection District
Rick Viergutz, C.E.G., Groundwater Manager, Watershed Protection District
Kathleen Riedel, C.E.G., Groundwater Specialist, Watershed Protection District
Jessica Kam, Agency Clerk of the Board
Tammy Butterworth, Agency Deputy Clerk of the Board
Mandi Freitas, Administrative Assistant

FCGMA offices are located in the Ventura County Government Center
Administration Building - Main Plaza Level
800 South Victoria Avenue
Ventura, California 93009-1610

Phone: (805) 654-2014
Fax: (805) 654-3350
E-mail: kathleen.riedel@ventura.org
Website: www.fcgma.org

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1.0 EXECUTIVE SUMMARY

This Executive Summary: touches on climatic conditions, conditions of basins, policy changes made, and groundwater extractions; and highlights some of the Fox Canyon Groundwater Management Agency's (FCGMA) accomplishments during 2014.

Calendar year 2014 was the fourth year (2011 through 2014) of below average rainfall, and was coupled with above average evapotranspiration (ETo).

Groundwater levels declined in the western half of the Agency between Fall 2013 and Fall 2014. In the Upper Aquifer System (UAS), water levels in Fall 2014 were below sea level in the Oxnard Plain Basin and most of the Oxnard Forebay and Pleasant Valley basins. In the Lower Aquifer System (LAS), water levels in Fall 2014 were below sea level in the Oxnard Plain Basin and most of the Oxnard Forebay, Pleasant Valley, and West Las Posas basins. Of the 16 Basin Management Objectives (BMOs) for water levels in the Oxnard Plain and Pleasant Valley basins, none were met. Of the 34 water quality (chloride, nitrate and total dissolved solids) BMOs monitored during 2014, 15 were met and 19 were not met.

The continuance of below average rainfall and declining groundwater levels led to the adoption of Emergency Ordinance E in April 2014. This Ordinance is designed to reduce groundwater extractions by reducing groundwater extraction allocations stepwise, with a 20% reduction from the Agency 10 year (2003 to 2012) average extractions. With the adoption of the Ordinance, the allocation systems for the second half of the year were replaced or modified for Municipal and Industrial (M&I) and Agricultural (AG) Well Operators.

Total reported groundwater extractions for 2014 were the second highest reported since 1990, only surpassed by reported extractions in 2013. As of June 10, 2015, reported extractions for 2014 were 149,715 acre-feet (AF), a 20% increase above the 1991 to 2013 average reported groundwater extractions of 124,963 AF per year (AFY). The extractions by user type and percent of 2014 total extractions are AG 71%, M&I 29%, and Domestic 0.2%.

Many significant actions took place during 2014. Specific accomplishments are listed in summary form below. The body of this Annual Report along with the attached tables and figures provide a more detailed description of such activities.

2.0 PURPOSE OF THE REPORT

The Fox Canyon Groundwater Management Agency Act [AB-2995], § 502, requires that "*The agency prepare annually or receive from its member agencies reports on groundwater and supplemental water supplies and conditions in the territory of the agency, including groundwater management and conjunctive use objectives and a plan for implementation of those objectives.*" The purpose of this report is to fulfill that obligation. In addition, this report summarizes the Agency's background and natural setting of lands within the FCGMA, and presents a synopsis of the technical and administrative groundwater resource management activities for 2014. Since the Agency's fiscal year is not concurrent with the calendar year or technical reporting year, this report includes only a brief summary of financial activities. Fiscal data for the first reporting period(s) covering 2014 can be found in the *Agency's Fiscal Year 2013-14 Year-End Final Budget Performance Report* presented to the Board of Directors in September 2014.

3.0 AGENCY OVERVIEW

3.1 Introduction

The FCGMA is a public agency tasked with managing groundwater resources in the southwestern portion of Ventura County, California (see Figure 1 – *Fox Canyon Groundwater Management Agency Boundary*). The FCGMA is an independent State "Special District," separate from the County of Ventura or any city government, with jurisdiction over all lands lying above the Fox Canyon aquifer (California Water Code, CWC, Appendix 121, § 102). The Agency was created in 1982 by the California Legislature via the Fox Canyon Groundwater Management Agency Act [AB-2995] for the express purposes of regulating, conserving, managing, and controlling the use and extraction of groundwater to help preserve resources, and to counter seawater intrusion beneath the Oxnard Plain. Groundwater resources within the boundary of the FCGMA are used by the cities of Ventura, Oxnard, Port Hueneme, Camarillo, and Moorpark, along with the unincorporated communities of Saticoy, El Rio, Somis, Moorpark Home Acres, Nyeland Acres, and Montalvo. The FCGMA is funded solely by fees paid by those who extract groundwater within the Agency's boundaries. These extraction fees are used by the Agency to administer and manage local underlying groundwater resources within several aquifers.

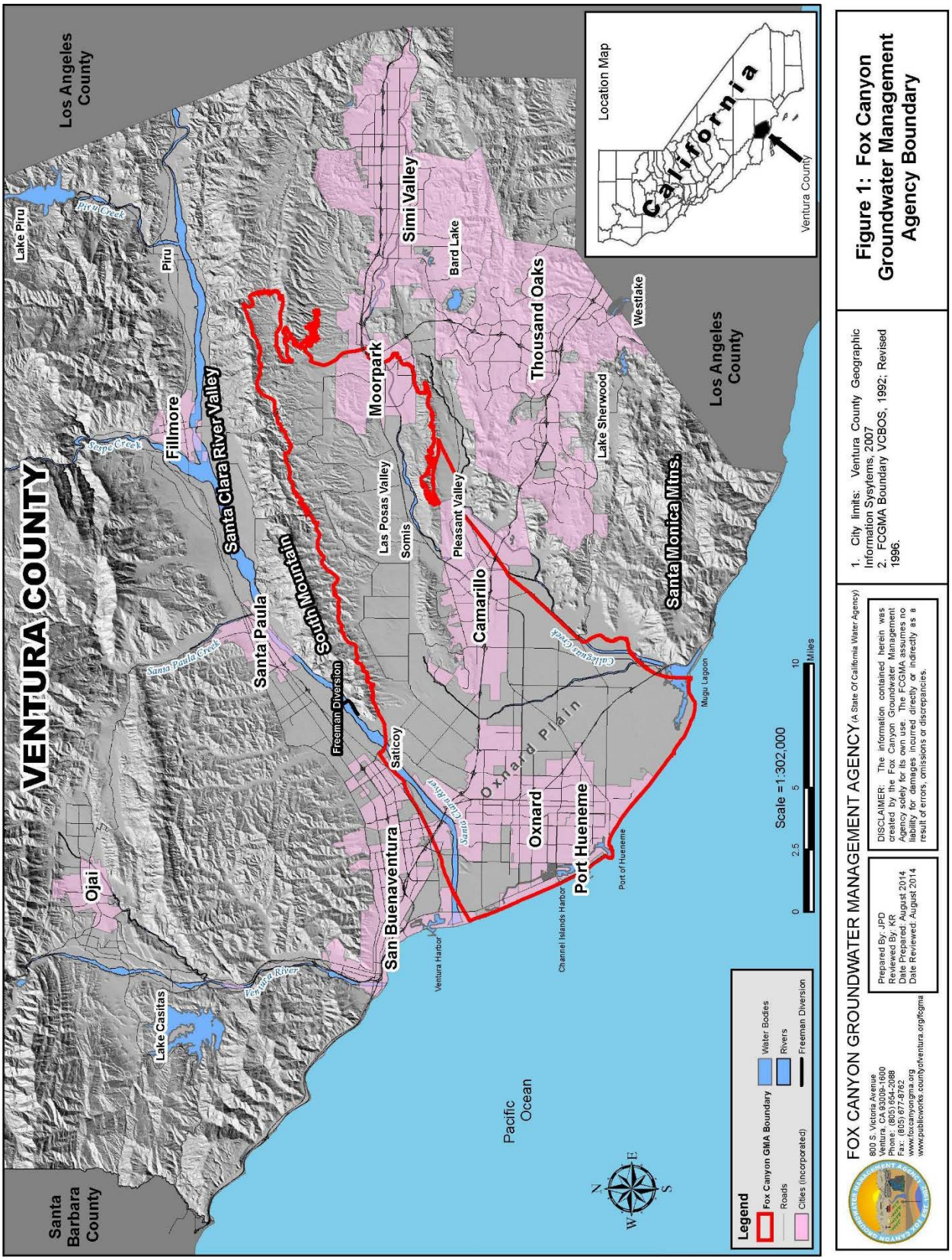
3.2 Origin and History of the Fox Canyon Groundwater Management Agency (FCGMA)

The unique geographic and geologic characteristics of Southern California have created a significant and valuable groundwater resource in the near-coastal and inland valley portions of Ventura County. Winter storms associated with the warm Mediterranean climate move inland from the Pacific Ocean and drop precipitation over the region, with greater amounts generally falling in the first quarter of the year (January-February-March) than during the last quarter (October-November-December). The topography and geology of the area allow surface run-off and percolating groundwater to flow south and westward towards the coastal Oxnard Plain where such water can percolate into permeable sandy alluvial aquifers that are bounded by impermeable clays or compacted silts. Groundwater beneath the Oxnard Plain is contained in several named aquifers that are primarily rimmed by upland and recharge areas to the north and east; the relatively impermeable rocks of the Santa Monica Mountains to the south and southeast; and the Pacific Ocean to the west and southwest.

Although the early indigenous people primarily relied on natural springs and available surface water, European settlers beginning in the early to mid-1800s recognized groundwater as a reliable resource. Beginning with shallow hand-dug (mostly windmill-driven) wells, the groundwater supply was developed to create one of the most prolific agricultural regions in California. In 2014, groundwater resources supported agricultural products in Ventura County is estimated to be valued at more than $2.1 billion (*Ventura County's Crop & Livestock Report 2013).* The Ventura County Agricultural Commissioner's Office, *2014 Crop & Livestock Report* should be available in July 2015.

The FCGMA was created by the State of California (legislative branch) in response to local and persistent overuse of groundwater resources resulting in declining water quality (especially in the southern part of the Oxnard Plain) first recognized in the early 1940's (DWR, 1954). Prior to the creation of the FCGMA, the California State Water Resources Control Board (SWRCB), as a condition to a State grant for the Seawater Intrusion Abatement Project, directed the United Water Conservation District (UWCD) and Ventura County as grantees to develop a Groundwater Management Plan for the purpose of controlling extractions, and balancing water supply and demand in both the UAS and LAS. Because of continuing overdraft by groundwater users and resulting seawater intrusion into aquifers beneath the Oxnard Plain, the Fox Canyon Groundwater Management Agency Act (AB-2995, Imbrecht) was passed on September 13, 1982, and became effective January 1, 1983. The Act (enabling legislation) is now contained in the State Water Code Appendix, Chapter 121 et seq. As directed by Article 2, § 202 of that

Figure 1 - Fox Canyon Groundwater Management Agency Boundary



FOX CANYON GROUNDWATER MANAGEMENT AGENCY (A State Of California Water Agency)

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Prepared By: JPD
Reviewed By: KR
Date Prepared: August 2014
Date Reviewed: August 2014

DISCLAIMER: The information contained herein was created by the Fox Canyon Groundwater Management Agency solely for its own use. The FCGMA assumes no liability for damages incurred directly or indirectly as a result of errors, omissions or discrepancies.

1. City limits: Ventura County Geographic Information Sysytems, 2007
2. FCGMA Boundary VCBOS, 1992; Revised 1996.

Figure 1: Fox Canyon Groundwater Management Agency Boundary

enabling legislation, the boundary of the FCGMA was established by Resolution of the Ventura County Board of Supervisors (VCBOS, 1982) on December 21, 1982 and became effective by recordation in the Ventura County Office of the Recorder (VCOR) on January 1, 1983. The boundary has been revised and legally re-recorded in 1996 and again in 2002 to reflect updated knowledge of the aquifer both geographically and to reflect subsequent hydrologic findings (VCOR, 1996; VCOR, 2002).

3.3 Mission Statement

The original State legislation created the FCGMA to manage groundwater in both over-drafted and potentially seawater–intruded areas within Ventura County. The prime objectives and purposes of the FCGMA are to preserve groundwater resources for: agricultural, municipal, and industrial uses in the best interests of the public; and the common benefit of all water users (FCGMA, 2007). Protection of water quality and quantity along with maintenance of long-term water supply are included in those goals and objectives. In 2006, the FCGMA formally adopted the following mission statement:

> *"The Fox Canyon Groundwater Management Agency (Agency), established by the State Legislature in 1982, is charged with the preservation and management of groundwater resources within the areas or lands overlying the Fox Canyon aquifer for the common benefit of the public and all agricultural, municipal and industrial users."*

3.4 Agency Operations and Personnel

The FCGMA is directed by an elected five (5) member Board of Directors, and staffed by technical and administrative personnel provided by the Ventura County Watershed Protection District (Table 1 – *Summary of FCGMA Personnel for Calendar Year 2014,* as of the end of the year).

As required by its enabling legislation, the Board of Directors for the FCGMA is composed of one member from each of the following four stakeholder groups:

- The Ventura County Board of Supervisors.
- The United Water Conservation District (UWCD) Board of Directors.
- The City Councils of the five incorporated cities that partially or totally overlie the Fox Canyon Aquifer. These cities include Ventura, Oxnard, Camarillo, Port Hueneme, and Moorpark.
- The seven[1] existing mutual water companies and special districts within the FCGMA, as identified in AB-2995. They include the governing boards of the following mutual water companies and special districts not governed by the County of Board of Supervisors, which are engaged in water activities, and whose territory at least in part overlies the territory of the Agency: (1) Alta Mutual Water Company, (2) Pleasant Valley County Water District, (3) Berylwood Mutual Water Company, (4) Calleguas Municipal Water District (CMWD), (5) Camrosa County Water District, (6) Zone Mutual Water Company, and (7) Del Norte Mutual Water Company.

These four stakeholder groups select the fifth Board Member from a list of at least five candidates nominated by the Ventura County Farm Bureau and Ventura County Agricultural Association acting jointly. This fifth member must reside in, and be "actively and primarily engaged in agriculture" within the territory of the Agency. The requirement "actively and primarily engaged in agriculture" means that farm members must derive at least 75% of their income from agriculture.

[1] An eighth mutual water company or special district, Anacapa Mutual Water Company, active at the passage of the enabling legislation (AB-2995), is no longer in existence.

Table 1 - Summary of FCGMA Personnel for Calendar Year 2014

NAMES	AFFILIATION	CONTACT NUMBER
DIRECTORS		
Steve Bennett	Ventura County Board of Supervisors	(805) 654-2703
David Borchard	Representing the Farming Interests	(805) 485-3525
Charlotte Craven (Vice Chair)	Representing the Five Cities within the Agency	(805) 482-4730
Dr. Michael Kelley	Representing the Small Water Districts within the Agency	(805) 890-6095
Lynn Maulhardt (Chair)	Representing the United Water Conservation District	(805) 485-5728
ALTERNATE DIRECTORS		
Neil Andrews	Cities	(805) 654-7827
Robert Eranio	United Water Conservation District	(805) 482-2001
David Schwabauer	Farmers	(805) 432-9375
Andrew Waters	Small Water Districts	(805) 526-9323
John Zaragosa	Representing the Ventura County Board of Supervisors	(805) 654-2613
STAFF		
Alberto Boada	Agency Legal Counsel	(805) 654-2578
Tammy Butterworth	Agency Deputy Clerk of the Board	(805) 654-2002
Tully Clifford, P.E.	Director, Watershed Protection District	(805) 654-2040
Mandi Freitas	Administrative Assistant	(805) 645-1372
Gerhardt Hubner, P.G.	WPD, Deputy Director, Water & Environmental Resources	(805) 654-5051
Jessica Kam	Clerk of the Board	(805) 654-2014
Jeff Pratt, P.E.	Agency Executive Officer	(805) 654-2073
Kathleen Riedel, C.E.G.	Groundwater Specialist	(805) 654-2954
Rick Viergutz, C.E.G.	WPD, Groundwater Resources Manager	(805) 650-4083

Notes:

1. Table lists active Board Members, Alternates and Staff at the end of 2014.
2. The notable staff changes for 2014 included: In January, Jessica Kam began serving as Clerk of the Board. Jessica Rivera, Interim Clerk of the Board, left in February. Mandi Freitas joined staff as an Administrative Assistant in May.

Five Alternate Board members are selected according to the same criteria and serve in the absence of the primary Board members. All Board members serve a two-year term, unless reappointed. In 2007, the Board offset the terms of the City Council and the Agricultural representatives from the remaining three representatives by one year to ensure continuity of Agency operations and to prevent a complete turnover of all FCGMA Directors at the same time.

There were no changes in the Members of the Board of Directors during 2014. There was a change in Alternate Director from UWCD; Mr. Robert Eranio replaced Mr. Daniel Naumann.

The Board normally conducts monthly public meetings, with additional public input received through various stakeholder-based committees. During 2014, there were ten (10) FCGMA Board meetings, six (6) Special Board meetings, one (1) Executive Committee meeting, and one (1) Fiscal Committee meeting.

The personnel, technical, financial, and legal needs of the FCGMA are provided under contract with the Ventura County Watershed Protection District and the Office of the County Counsel. The UWCD and Calleguas Municipal Water District (CMWD) provide additional technical resources to the Agency as

needed. UWCD is a public wholesale and retail water agency that also provides groundwater basin management activities in the Santa Clara River Valley, and northern and central Oxnard Plain. CMWD is a public wholesale water agency that also provides groundwater basin management activities in the Las Posas basins. In accordance with the enabling legislation, the FCGMA is not authorized to involve itself in activities normally undertaken by member agencies. Such activities include the construction, operation, and maintenance of capital facilities. Many facilities, such as dams, spreading grounds, pipelines, flood control structures, and surface water diversions are operated by UWCD, CMWD, Camrosa, and other member agencies both inside and outside the FCGMA boundary.

Notable staff changes during 2014 included: Jessica Rivera who served as Interim Clerk of the Board stepped down when Jessica Kam joined the staff as Clerk of the Board; and Mandi Freitas filled the vacant position as Administrative Assistant.

4.0 NATURAL SETTING

4.1 Location and Geographic Description of the FCGMA

The Agency Boundary encompasses a northeast-southwest oriented, wedge-shaped area of 183 square miles that widens to the west and is bounded to the north by the Santa Clara River and South Mountain. To the east, the Agency boundary is defined by uplifted Tertiary and Quaternary-age consolidated rocks north and east of the City of Moorpark. The southern edge of the Agency is bounded by the Bailey Fault and the uplifted Santa Monica Mountains (Dibblee, 1990). The western and southwestern limits are geographically limited by the Pacific Ocean coastline.

The eastern portion of the FCGMA bifurcates into two separate lobes east of the City of Camarillo. The longer northern lobe, which includes the Las Posas Valley, terminates east of the City of Moorpark near the central portion of the Happy Camp Syncline (Dibblee, 1992b and 1992c). The furthest eastern extent of the Agency terminates in the County's Happy Camp Canyon Regional Park northeast of the City of Moorpark. The shorter southern lobe, which includes the western portion of Pleasant Valley, terminates approximately one-third of the distance into the Santa Rosa Valley (on the west end) (Dibblee, 1990). These two valleys widen to the west and merge near the City of Camarillo to encompass the broader Oxnard Plain where the majority of groundwater extractions occur within the Agency. The Santa Clara River Valley intersects with the northeastern portion of the Oxnard Plain near the unincorporated area of Saticoy. The northern boundary of the Agency turns west-southwest across from South Mountain just north of the Santa Clara River at Saticoy, then parallels the river's course westward all the way to the Pacific Ocean. This latter stage of Santa Clara River flow is determined by the Oak Ridge Fault System, which also constitutes much of the northern Agency boundary line. Southwest of the City of San Buenaventura, the boundary crosses back to the south bank of the river just east of the Pacific Ocean.

4.2 Climate: Rainfall and Evapotranspiration

Groundwater extracted from the FCGMA aquifers is primarily used for agriculture; therefore, the volume of groundwater extracted in any given year is strongly influenced by the rainfall and evapotranspiration (ETo). In general, lower than average rainfall and higher than average ETo result in greater than average groundwater extractions.

The amount of rainfall reported for the Agency, for calendar year 2014, is an average of data collected at the five County of Ventura rainfall stations (Sta. 032A, 126A, 190, 175A, and 259)[2]. Based on past

[2] Data used is identified by County of Ventura as preliminary as final data was not available at the time that this report was being prepared. Rainfall data collected at Camarillo Airport rainfall station (VC Sta. 259) was not available for December, so the December value used is an average of four instead of five rainfall stations.

Agency rainfall totals and the 2014 averaged rainfall total of 10.05 inches, the long-term average rainfall for the period of 1985 to 2014 is 14.07 inches. Annual rainfall has been below the long-term average since 2011 (2011, 12.12 inches; 2012, 8.66 inches; 2013, 3.49 inches; and 2014, 10.05 inches).

Of the average annual total for 2014, 10.05 inches, 4.80 inches fell in the first half of the year and 5.25 inches fell in the second half of the year. More specifically, 5.22 inches of the average total fell in November and December 2014.

The Agency's 2014 ETo value is an average of data collected at three California Irrigation Management Information System (CIMIS) stations. During 2014, the Agency switched from using data collected at Sta. 198 - Santa Paula to data collected at the new CIMIS Weather Station - Sta. 217 - Moorpark. The ETo value for January through June is an average of data collected at CIMIS stations: Sta. 156 - Oxnard, Sta. 152 - Camarillo, and Sta. 198 - Santa Paula. The ETo value for July through December is an average of data collected at CIMIS stations: Sta. 156 - Oxnard, Sta. 152 - Camarillo, and Sta. 217 - Moorpark). The 2014 three-station average ETo is 52.21 inches. The average annual ETo value for 2014 was approximately 2% above the 51.34 inch long-term average (1997 through 2014).

5.0 GROUNDWATER

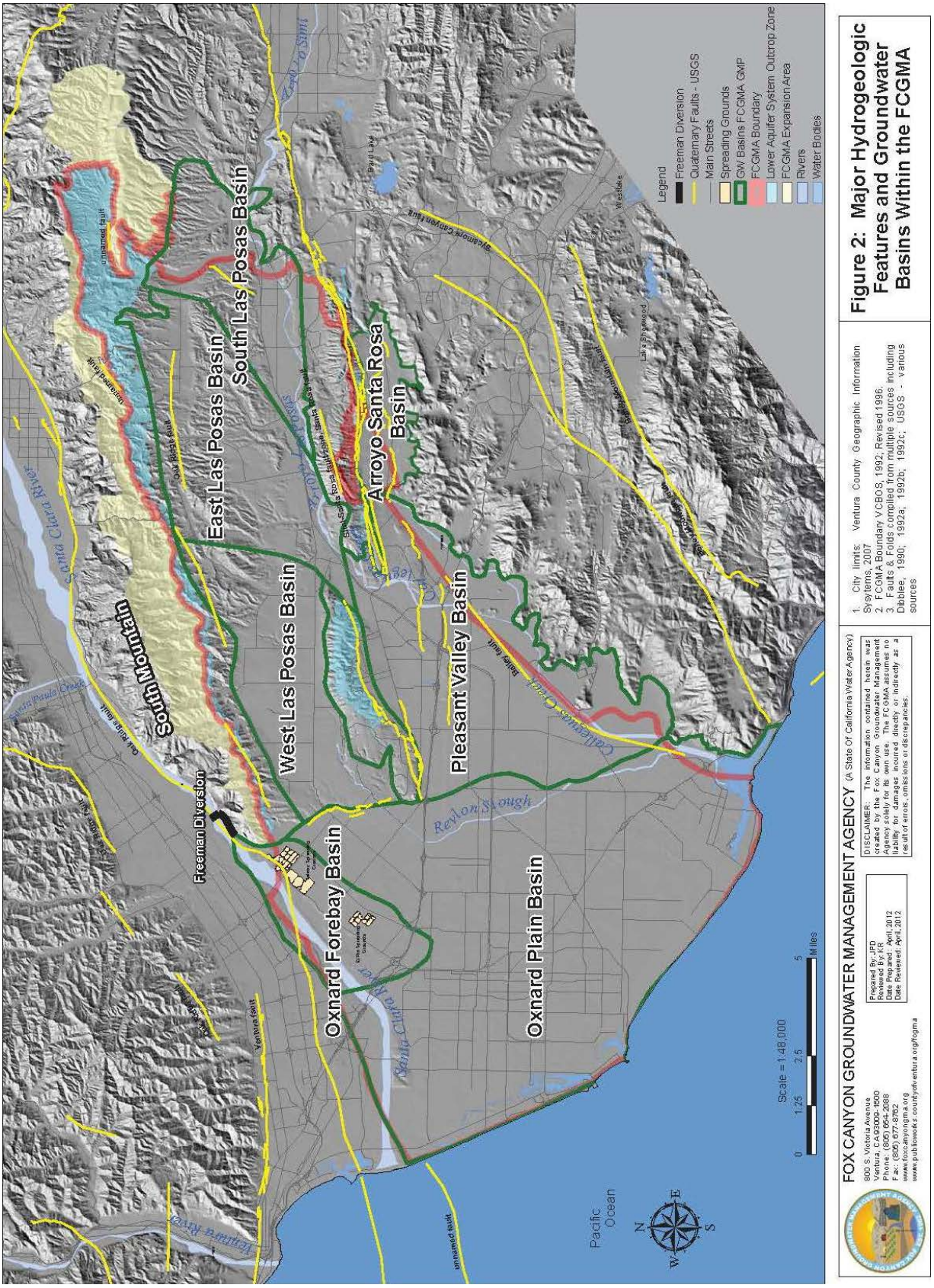
5.1 Geology and Hydrogeology of the FCGMA

The FCGMA is located near the western margin of the Transverse Ranges Geologic Province in Southern California. This geologic province is characterized by east-west oriented mountain ranges separated by valleys, faults, and basins. The east-west trending folds and faults are common throughout the province and their surface expression is evident at many locations within the FCGMA boundary (Figure 2 – *Major Hydrologic Features and Groundwater Basins within the FCGMA*). The water-bearing sediments that comprise the valley fill and alluvial plains within the FCGMA consist of significantly deep unconsolidated and semi-consolidated sediments that range from Pliocene to recent (Holocene) time in geologic age. The geologic formations from oldest to youngest include the Plio-Pleistocene-age Santa Barbara Formation (includes the Grimes Canyon aquifer), the Pleistocene-age San Pedro Formation (contains the Fox Canyon aquifer), and semi-consolidated and unconsolidated sediments of Upper-Pleistocene and recent (Holocene) ages (Hueneme, Mugu, Oxnard, and perched aquifers). Local and regional unconformities (i.e. gaps in the geologic sedimentation record caused by uplift and subsequent erosion) occur between each of these formations (DWR, 1976).

The topography in the eastern portion of the FCGMA consists of narrow steep-sided canyons that open into the broader east-west trending Las Posas Valley and Pleasant Valley areas. Moderate relief (typically 300 to 1,500 feet difference) between the bordering mountain highlands and the westward-sloping valley floors is typical of the area. The canyons and valley floors are partially filled by colluvium, unconsolidated fluvial sediments, and coalesced alluvial fans (also called a bajada or compound alluvial fan) comprised of material eroded from the surrounding uplifted Tertiary and Quaternary-aged sedimentary rocks. The alluvial deposits in the eastern portion of the Agency are typically less than 600 feet in thickness, and most such layers thin out in close proximity to surface exposures of bedrock. In the western portion of the FCGMA, the topography primarily consists of the broad, alluvial Oxnard Plain. The Oxnard Plain gently slopes to the southwest and continues beneath the Pacific Ocean. All of the semi-consolidated rocks comprising the various freshwater aquifers outcrop beneath the ocean, and during periods of positive offshore pressure gradients, groundwater discharges have been documented in this offshore area (Izbicki, 1992, 1996a, 1996b). The thickness of the collective usable aquifer zones beneath the Oxnard Plain is typically greater than 1,200 feet.

Two main drainages lie within the boundaries of the FCGMA. The Santa Clara River originates in the San Gabriel Mountains several miles east of Ventura County (in central Los Angeles County) and flows westward through the Santa Clara River Valley, which lies north and northeast of the FCGMA. The Santa

Figure 2 - Major Hydrogeologic Features and Groundwater Basins within the FCGMA



Clara River intersects the northwestern boundary of the FCGMA near the unincorporated area of Saticoy. The Santa Clara River supplies recharge to aquifers in the western third of the FCGMA by direct infiltration through the streambed, and infiltration of diverted river water in percolation ponds. A large man-made drop structure, operated by UWCD called the Vern Freeman Diversion, extends across the river and diverts river water via channels to off-stream percolation ponds (also owned and operated by UWCD) in the porous Oxnard Forebay Groundwater Basin. A majority of the river flows occur during runoff periods associated with winter storms, and this muddy, turbid water is difficult to capture and too silt-laden to be of any practical use for direct groundwater recharge. Calleguas Creek lies near the southern and southeastern boundaries of the FCGMA, and carries water during high-runoff periods, as well as nearly continuous discharge from upstream wastewater treatment plants in Simi Valley, Moorpark, Thousand Oaks, and Camarillo. Additional water is contributed to these streams by irrigation return flows and urban runoff. The Conejo Creek Diversion facility exists on a tributary to Calleguas Creek and surface water diverted from this location primarily supplements agricultural groundwater extractions in the Pleasant Valley area south of the City of Camarillo. Some Conejo Creek water also helps to add irrigation supply to the western end of the Santa Rosa Valley portion of eastern Camarillo. Although there are a number of small private reservoirs and County Watershed Protection District (WPD) stormwater retention basins, there are no major surface water lakes or reservoirs within the FCGMA boundary used for water supply needs.

Seven groundwater basins lie wholly or partially within the FCGMA:

1. Arroyo Santa Rosa Basin,
2. East Las Posas Basin,
3. Oxnard Forebay Basin,
4. Oxnard Plain Basin,
5. Pleasant Valley Basin,
6. South Las Posas Basin, and
7. West Las Posas Basin.[3]

Each basin has significant groundwater resources with unique physical and water quality characteristics (Izbicki et al., 2005). Descriptions of the physical, hydrogeologic, and water quality characteristics of each of these groundwater basins are more extensively described in the 2007 FCGMA Groundwater Management Plan.

There are six named aquifers in the FCGMA Boundary. From deepest to shallowest these are: (1) the Grimes Canyon aquifer, (2) the Fox Canyon aquifer, (3) the Hueneme aquifer, (4) the Mugu aquifer, (5) the Oxnard aquifer, and (6) the perched or semi-perched zone (DWR, 1976). These aquifers are grouped into a Lower Aquifer System (LAS), [Grimes Canyon, Fox Canyon, and Hueneme aquifers]; and the Upper Aquifer System (UAS), [Mugu and Oxnard aquifers]. The semi-perched zone is considered by some to be separate from the UAS because it is only locally extensive and of poorer quality than the deeper, more geographically extensive aquifers (Turner, 1975).

Faulting has significantly affected the local Tertiary and Quaternary-aged geologic formations, and the hydrogeology within the FCGMA reflects that. Significant faults that occur within or near the margins of the Agency include the Oak Ridge fault, the Berylwood fault, the Somis fault, the Springville fault, the Simi-Santa Rosa fault zone (includes Santa Rosa fault, Northern Simi fault, Southern Simi fault), the Camarillo fault, the Wright Road fault, the Epworth fault, and the Bailey fault. Although the general

[3] Historic references have segregated the southeastern portion of the Oxnard Plain into a separate basin identified as the Mugu Forebay Basin. This Basin is not shown in Figure 2 because like the Agency's Groundwater Management Plan, this document considers these areas as a single groundwater basin, the Oxnard Plain Basin. Data and discussions included in this annual report treat all rainfall, extraction, and credit information from both the Oxnard Plain Pressure Basin and the Mugu Forebay Basin as one single basin.

groundwater flow direction in FCGMA aquifers is to the southwest, faults and other structural features may form partial or complete barriers to groundwater flow, or cause local variability in flow direction.

A comprehensive hydrologic and geologic study that includes areas within the FCGMA boundary was prepared by Hanson and Koczot (2003). Groundwater models are currently being developed by UWCD and CMWD which will include the basins within the Agency boundary with the exception of the Arroyo Santa Rosa Basin.

5.2 Groundwater Resource Management

The FCGMA's enabling legislation (CWC, Appendix 121), established the ability of the FCGMA to perform groundwater management activities including, but not limited to, registration of extraction facilities (wells), control of groundwater extractions, regulation of extraction facility construction, prosecution of legal actions against unreasonable use of water resources, imposition of reasonable operating regulations, and collection of fees. Through this legislation and a series of ordinances the FCGMA has developed a groundwater record management system to record well facility owner/operator information; to collect and record extraction data; to regulate groundwater extraction through the application of an annual allocation system; to assign credits as an incentive for non-use of allocations and/or for direct replenishment actions; to collect civil penalties and surcharges for overuse of groundwater, and to collect groundwater extraction fees to fund the Agency.

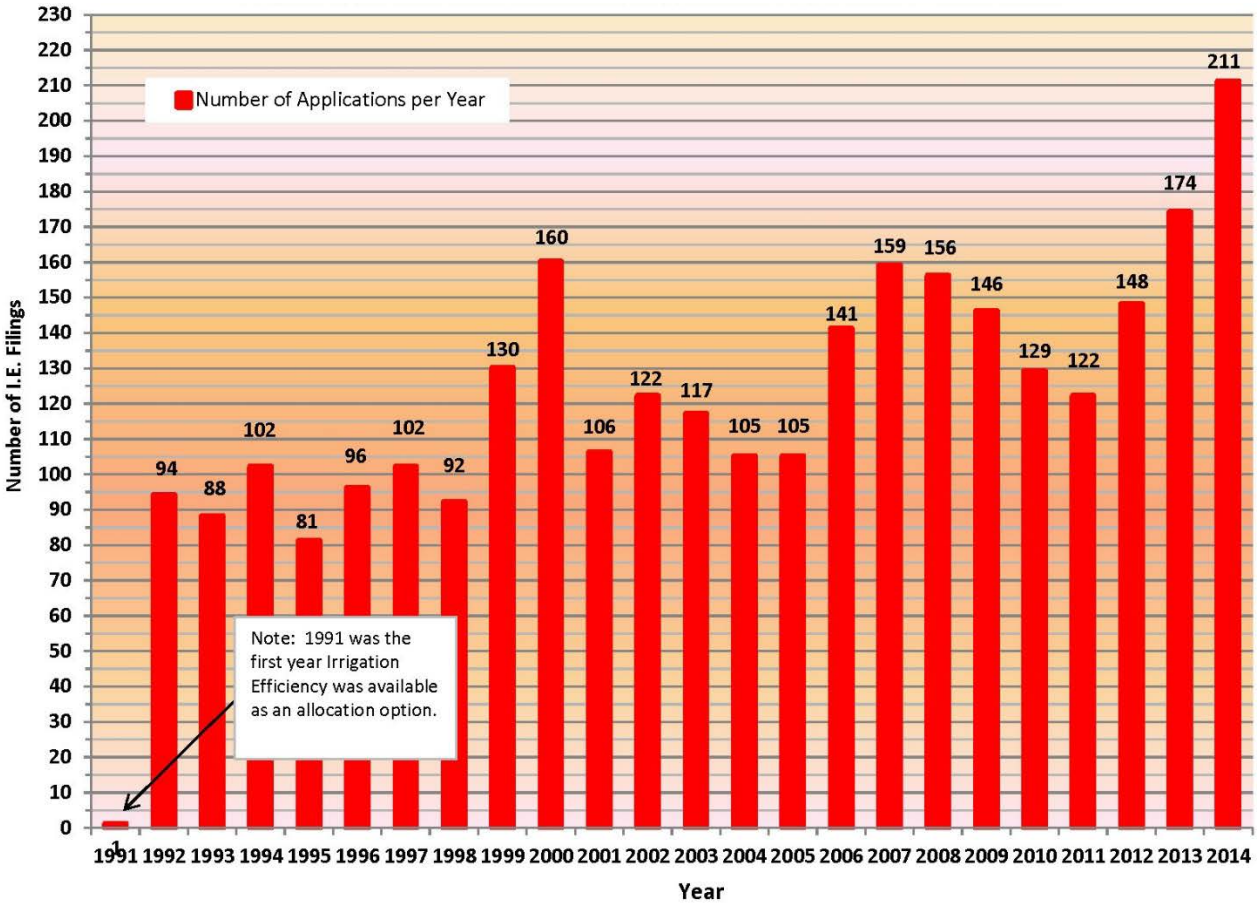
There were four specific groundwater allocation methods used by the FCGMA during 2014 (see the FCGMA Ordinance Code, and Emergency Ordinance E (Appendix A) for additional information). Allocation types include Historical Allocation (HA), Baseline Allocation (BA), Temporary Extraction Allocation (TEA) and Irrigation Allowance Index (IAI) Allocation. The type of allocation available depends upon the use of the groundwater, and the history of land and water use, as well as when the groundwater was extracted. During the first half of the year well owners and/or operators reported extractions using adjusted HA, BA, and IAI. During the second half of the year, following adoption and implementations of Emergency Ordinance E, the allocation system used by the operator user type is as follows: adjusted HA and BA for domestic users; TEA for municipal/industrial; and IAI for agricultural users.

Wells operated by Well Operators are grouped into three type categories: Agricultural (AG), Municipal & Industrial (M&I), and Domestic (DOM). The definition of each type is specified in the Ordinance Code.

- **Agricultural Facility:** *"a facility whose groundwater is used on lands in the production of plant crops or livestock for market, and uses incidental thereto*." During the first half of 2014, well operators of agricultural facilities were entitled to HA, BA, or IAI (Figure 3 – *FCGMA Annual Irrigation Allowance Index Applications*). They may also have used conservation credits[4] to avoid surcharges. During the second half of the year, all Agricultural Well Operators reported extractions using a reduced IAI. Conservation credits were not available for use during the second half of the year. Based on self-reported extraction data, in 2014, agricultural extraction facilities were responsible for approximately 71% of the reported groundwater extracted within the Agency (Table 2).
- **Municipal and Industrial User (M&I):** *"a person or other entity that used or uses water for any purpose other than agricultural irrigation."* An M&I operator is defined as *"an owner or operator that supplied groundwater for M&I use during the historical allocation period (1985-1989 inclusive), and did not supply a significant amount for agricultural irrigation during the historic*

[4] Conservation credits refer to unused Historical Allocation (HA), the difference between the total HA held by a registered extraction facility including any adjustments made by the Agency, minus the actual reported groundwater extraction reported by that facility in a particular year.

Figure 3 - FCGMA Annual Irrigation Allowance Index Application



period." An M&I Provider is defined as *"an entity or person which provides water for domestic, industrial, commercial, or fire protection purposes within the boundaries of the Agency."* During the first half of the year, M&I Operators may have been entitled to HA and/or BA, and could accumulate extraction credits for any unused HA. M&I users are not eligible for IAI. During the second half of the year: M&I Well Operators reported extractions using TEA; no conservation credits could be used to reduce surcharges; and no conservation credits were earned on unused adjusted HA. Based on self-reported extraction data, in 2014, M&I facilities were responsible for approximately 29% of the reported groundwater extracted within the Agency.

- **Domestic User or Domestic Extraction Facility:** *"a domestic extraction facility supplies a single family dwelling on one acre or less, with no income producing operations."* During 2014, Domestic Well Operators reported extractions using Adjusted HA and BA. Conservation credits could be used during the first half of the year, but not during the second half of the year. Typically, domestic users are responsible for a nominal pumping amount (less than 1%) of the total groundwater extracted within the Agency during any given calendar year. Based on self-reported extraction data, in 2014, domestic facilities were responsible for approximately 0.2% of the reported groundwater extracted within the Agency.

All extraction facility (well) operators are required to report their groundwater extraction on a semi-annual basis using an Agency provided Semi-Annual Extraction Statement (SAES). During 2014, for M&I and

Table 2 - Summary of Reported Groundwater Extractions and Well Use-Type within the FCGMA for Calendar Year 2014[2]

Groundwater Basin	Groundwater Use-Type	Total Reported Groundwater Extractions for 2014 (AF/Year)[2]	Percent of Individual Groundwater Basin Extractions	Portion of 2014 Groundwater Extractions (%)	Total Number of Wells[4]	Active Wells in Basin[5] (by use type)	Active Wells in Basin by Use (%)
Arroyo Santa Rosa	**Basin Total**	**1,494**	**100%**	**1.0%**	**20**	**10**	**50.0%**
	Agricultural	1,494	100.0%	1.0%	19	10	50.0%
	Domestic	0	0.0%	0.0%	1	0	0.0%
	M & I	0	0.0%	0.0%	0	0	0.0%
East Las Posas	**Basin Total**	**24,791**	**100%**	**16.6%**	**206**	**132**	**64.1%**
	Agricultural	21,819	88.0%	14.6%	150	94	45.6%
	Domestic	13	0.1%	0.0%	20	12	5.8%
	M & I	2,958	11.9%	2.0%	36	26	12.6%
Oxnard Plain Forebay	**Basin Total**	**20,133**	**100%**	**13.4%**	**149**	**83**	**55.7%**
	Agricultural	8,133	40.4%	5.4%	76	42	28.2%
	Domestic	19	0.1%	0.0%	9	6	4.0%
	M & I	11,981	59.5%	8.0%	64	35	23.5%
Oxnard Plain[3]	**Basin Total**	**65,784**	**100%**	**43.9%**	**607**	**320**	**52.7%**
	Agricultural	44,875	68.2%	30.0%	403	219	36.1%
	Domestic	237	0.4%	0.2%	88	51	8.4%
	M & I	20,672	31.4%	13.8%	116	50	8.2%
Pleasant Valley	**Basin Total**	**21,874**	**100%**	**14.6%**	**168**	**71**	**42.3%**
	Agricultural	16,706	76.4%	11.2%	124	47	28.0%
	Domestic	29	0.1%	0.0%	30	16	9.5%
	M & I	5,139	23.5%	3.4%	14	8	4.8%
South Las Posas	**Basin Total**	**1,884**	**100%**	**1.3%**	**44**	**17**	**38.6%**
	Agricultural	1,770	93.9%	1.2%	37	14	31.8%
	Domestic	1	0.1%	0.0%	3	1	2.3%
	M & I	113	6.0%	0.1%	4	2	4.5%
West Las Posas	**Basin Total**	**13,756**	**100%**	**9.2%**	**94**	**57**	**60.6%**
	Agricultural	11,782	85.7%	7.9%	71	42	44.7%
	Domestic	39	0.3%	0.0%	6	5	5.3%
	M & I	1,935	14.1%	1.3%	17	10	10.6%
	2014 Totals	**149,715**	**100%**	**100%**	**1,288**	**690**	**54%**

Notes:

AF = Acre-feet; 1 acre-foot equals 325,851 gallons

M & I - Municipal and Industrial

1. Table provides data on reported groundwater extractions, however approximately 4% of the well operator accounts were not reported.
2. Groundwater extractions are reported twice a year. Extractions are listed by basin and reported usage of the well.
3. Oxnard Plain Basin includes area formerly identified as Mugu Forebay Groundwater Basin.
4. Total number of wells ever registered with the FCGMA in each basin (included inactive and destroyed wells).
5. Wells reported as being used in each basin during 2014.

Domestic Operators, the two six-month SAES reporting periods covered January 1 through June 30 (-01 Period), and July 1 through December 31 (-02 Period). For Agricultural Operators, the first SAES reporting period covered January 1 through July 31 (-01 Period), and the second period covered August 1 through December 31 (-02 Period). Each SAES lists all wells under a particular operator code, any available allocations, the reported groundwater extraction (acre-feet) for each well, the application of any available credits, and the specific allocation method being used to calculate the permitted groundwater extraction. Based on the groundwater extraction reported, each operator is required by the Ordinance to calculate the extraction charge due, plus any surcharges, interest, or late penalties associated with their user account, and then remit payment to the FCGMA along with the completed SAES form.

5.3 Groundwater Extractions [5]

Groundwater extractions are self-reported to the Agency by the well owners or operators. At the time that this report was prepared, four (4) percent of the user accounts had not reported.

For the calendar year 2014, total groundwater extractions reported to the FCGMA were 149,715 acre-feet[6] (AF). The total annual reported groundwater extractions were 20% above the long-term average: 124,963 AF (1991 to 2013). Annual extraction data is presented in Table 3 – *Summary of Reported Extractions within the FCGMA Since 1983*, and in Figure 4 - *2014 Annual Rainfall and Reported Groundwater Extractions in the FCGMA*. Table 4 – *Comparison of Year 2014 Groundwater Extractions to Historic Reported Groundwater Extractions in the FCGMA* and Table 5 – *2014 FCGMA Allocations vs. Extractions by Account Primary Basin and Use Type* provide more detail.

Table 3 - Summary of Reported Extractions within the FCGMA Since 1983

Calendar Year	-01 Period Extractions [in AFY][1,2,3]	-02 Period Extractions [in AFY][1,2,3]	Total Annual Extractions [in AFY][1,2,3]	Historical Allocation Reduction Percent[4]
2014	84,886	64,829	149,715	25%
2013	64,598	88,741	153,339	25%
2012	59,864	75,290	135,154	25%
2011	54,331	65,835	120,166	25%
2010	54,852	71,479	126,331	25%
2009	63,036	82,972	146,008	20%
2008	63,695	75,360	139,055	15%
2007	59,604	77,337	136,941	15%
2006	43,655	69,457	113,113	15%
2005	41,692	64,906	106,597	15%
2004	59,357	70,805	130,161	15%
2003	46,122	69,540	115,662	15%
2002	61,642	70,515	132,158	15%
2001	43,703	58,497	102,200	15%
2000	48,203	75,022	123,225	15%
1999	49,659	81,130	130,788	10%
1998	37,316	68,530	105,846	10%
1997	63,322	70,014	133,335	10%
1996	45,907	57,636	103,543	10%
1995	42,028	61,738	103,766	10%
1994	60,484	77,720	138,205	5%
1993	45,574	73,274	118,849	5%
1992	44,589	70,636	115,225	5%
1991	61,638	82,843	144,481	0%
1990	79,074	99,262	178,336	0%
1989	78,301	100,251	178,553	NA
1988	73,102	87,909	161,010	NA
1987	82,682	82,586	165,268	NA
1986	57,585	84,137	141,722	NA
1985	78,339	84,281	162,620	NA
1984	36,377	35,506	71,883	NA
1983	285	28,984	29,269	NA
Totals =	**1,785,501**	**2,327,023**	**4,112,524**	

Notes:

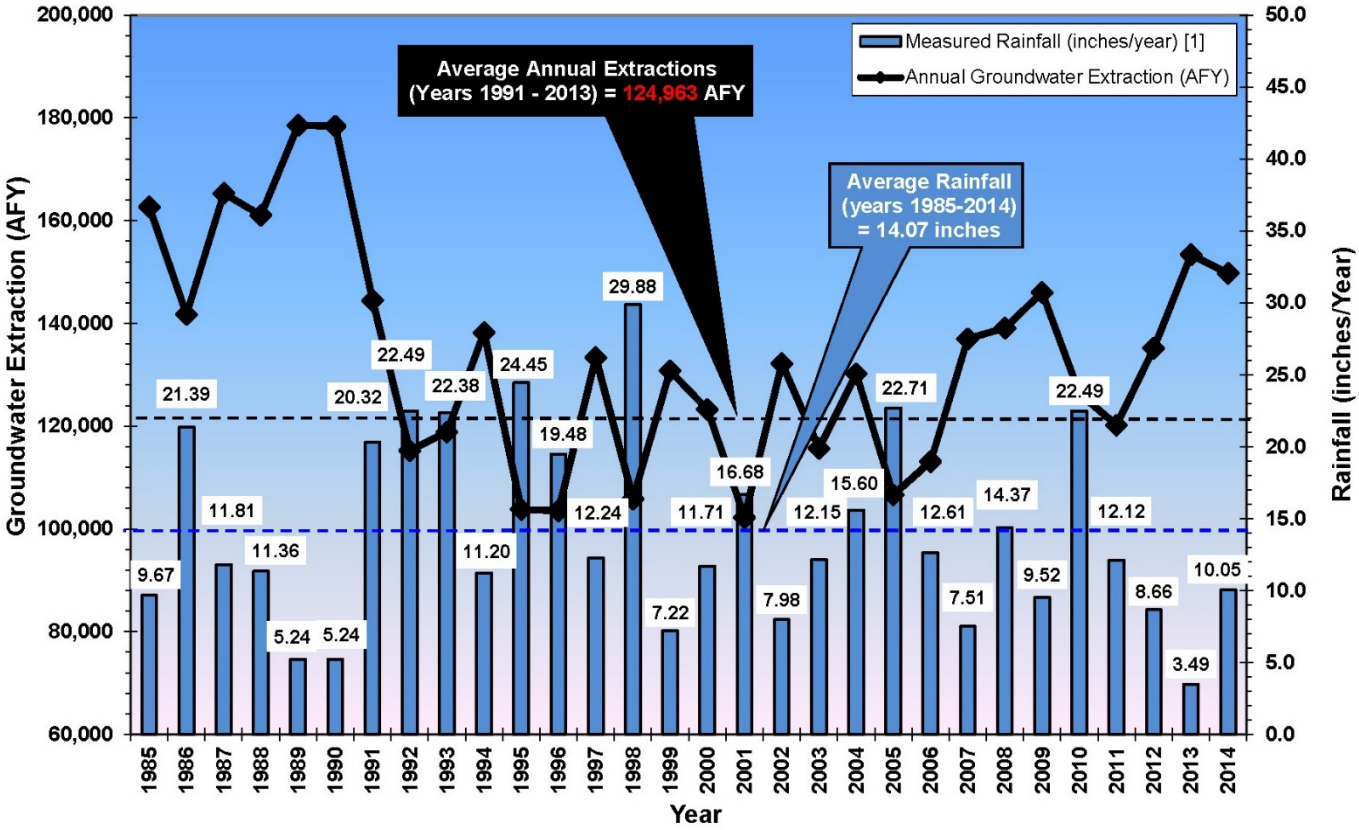
One acre-foot equals 325,851 gallons, AFY = Acre-feet per year

1. Table provides data on reported groundwater extractions. For 2014, extractions from approximately 4% of operator accounts were not reported (as of June 2015).
2. Starting in 2014, reporting periods are: (-01) January 1 - June 30, and (-02) July1 - December 31 for Domestic, and M&I Operators; (-01) January 1 - July 31, and (-02) August 1 - December 31 for Agricultural Operators.
3. Data for 1983 and 1984 provided by UWCD. Data determined to be incomplete due to low extraction values and low number of registered operators compared to proceeding years.
4. Reductions stipulated by FCGMA Ordinance and Resolutions.

[5] Tables 2, 3, 4 and 5 provide data on reported groundwater extractions. In 2014, approximately 4% of the operators did not report their extractions.

[6] One acre-foot (AF) equals 325,851 U.S. gallons at Standard Temperature and Pressure (STP).

Figure 4 - 2014 Annual Rainfall and Reported Groundwater Extractions in the FCGMA



[1] - Measured rainfall is the average of weather station annual recorded precipitation. Six stations used between 1991 - 2006, and five between 2007-2014. County gauges used for 1985-1990 and 2013-14.

Table 4 - Comparison of Year 2014 Reported Groundwater Extractions[1] to Historic Reported Groundwater Extractions in the FCGMA

	Annual Extraction (AF/Year)[2]	Extraction for -01 Periods (AF/Period)[2]	Extraction for -02 Periods (AF/Period)[2]
2014 Reported Extractions	**149,715**	**84,886**	**64,829**
Average Reported Extractions[3] (1991 - 2013)	124,963	52,820	72,142
Comparison of Current Year (2014) Reported Extractions to Average Reported Extractions (1991 - 2013)[3] (reported as %)	120%	161%	90%
Rank Comparing Current Year Extraction to Annual Extractions (1991 - 2013)	23rd out of 24th highest year	24	4

2014 is first year direct comparisons to previous 01 and 02 periods not possible. This is due to reporting period changes[2]

Notes:

AF = acre-feet; (one acre-foot equals 325,851 gallons)

1. Approximately 4% of the well operators had not reported as of June 2015.

2. Starting in 2014, reporting periods are: (-01) January 1 - June 30; and (-02) July1 - December 31 for Domestic, and Municipal and Industrial Operators; (-01) January 1 - July 31; and (-02) August 1 - December 31 for Agricultural Operators.

3. Average reported Agency-wide groundwater extractions per period and year from 1991 through 2013.

Table 5 - 2014 FCGMA Allocations vs. Extractions by Account Primary Basin and Use-Type

Groundwater Basin	Primary Use Type for Account[1]	Historical Allocation *(for all wells in each basin)* [2] (AF)	Adjusted Historical Allocation[3] (AF)	Baseline Allocations (AF)	2014-1 Total Available Allocation[4] (AF)	M&I Temporary Extraction Allocation for 2014-02[5] (AF)	2014 Allocations[6] (AF)	2014 Reported Extractions by Primary Type per Groundwater Basin (AF)[7]
Arroyo Santa Rosa (ASR)	AG	846	635	0	317	NA	NA	1,494
	DOM	0	0	0	0	NA	0	0
	M&I	0	0	0	0	0	0	0
East Las Posas (ELP)	AG	13,565	10,458	330	5,394	NA	NA	17,440
	DOM	129	102	33	67	NA	135	22
	M&I	3,004	2,759	55	1,407	2,350	3,757	3,494
Oxnard Plain Forebay (FOR)	AG	8,133	6,951	2	3,477	NA	NA	8,497
	DOM	545	195	17	106	NA	212	15
	M&I	19,635	21,464	201	10,832	7,268	18,101	11,916
Oxnard Plain Basin (OXP)	AG	59,591	51,310	66	25,688	NA	NA	46,657
	DOM	2,151	1,572	84	828	NA	1,656	69
	M&I	14,102	18,479	2,177	10,328	6,752	17,080	14,112
Pleasant Valley (PV)	AG	16,156	12,029	9	6,019	NA	NA	20,635
	DOM	540	252	19	135	NA	271	37
	M&I	5,240	4,776	1,383	3,080	2,565	5,645	5,138
South Las Posas (SLP)	AG	1,563	1,172	42	607	NA	NA	1,771
	DOM	0	0	0	0	NA	0	0
	M&I	541	392	0	196	30	226	113
West Las Posas (WLP)	AG	10,906	8,165	25	4,095	NA	NA	14,492
	DOM	12	5	16	11	NA	21	23
	M&I	1,603	1,661	385	1,023	1,942	2,965	3,793
Totals		**158,264**	**142,377**	**4,845**	**73,611**	**20,908**	**50,068**	**149,715**

NOTES: (totals or subtotals may not be exact due to rounding); NA means not applicable

1) Although some wells and accounts serve more than one use type, the main (or primary) use type for the account (Combination Code or "CombCode") is listed.

2) Total includes Historical Allocation (HA) as averaged after the 1985-1989 Base Period along with any adjustments and before any scheduled reductions.

3) Total includes Historical Allocation (HA) as averaged after the 1985-1989 Base Period along with any adjustments and after any scheduled reductions. The current scheduled reduction reduces Historic Allocations by 25%. The Adjusted Historic Allocation (AHA) presented is here is per operator account primary use and primary basin.

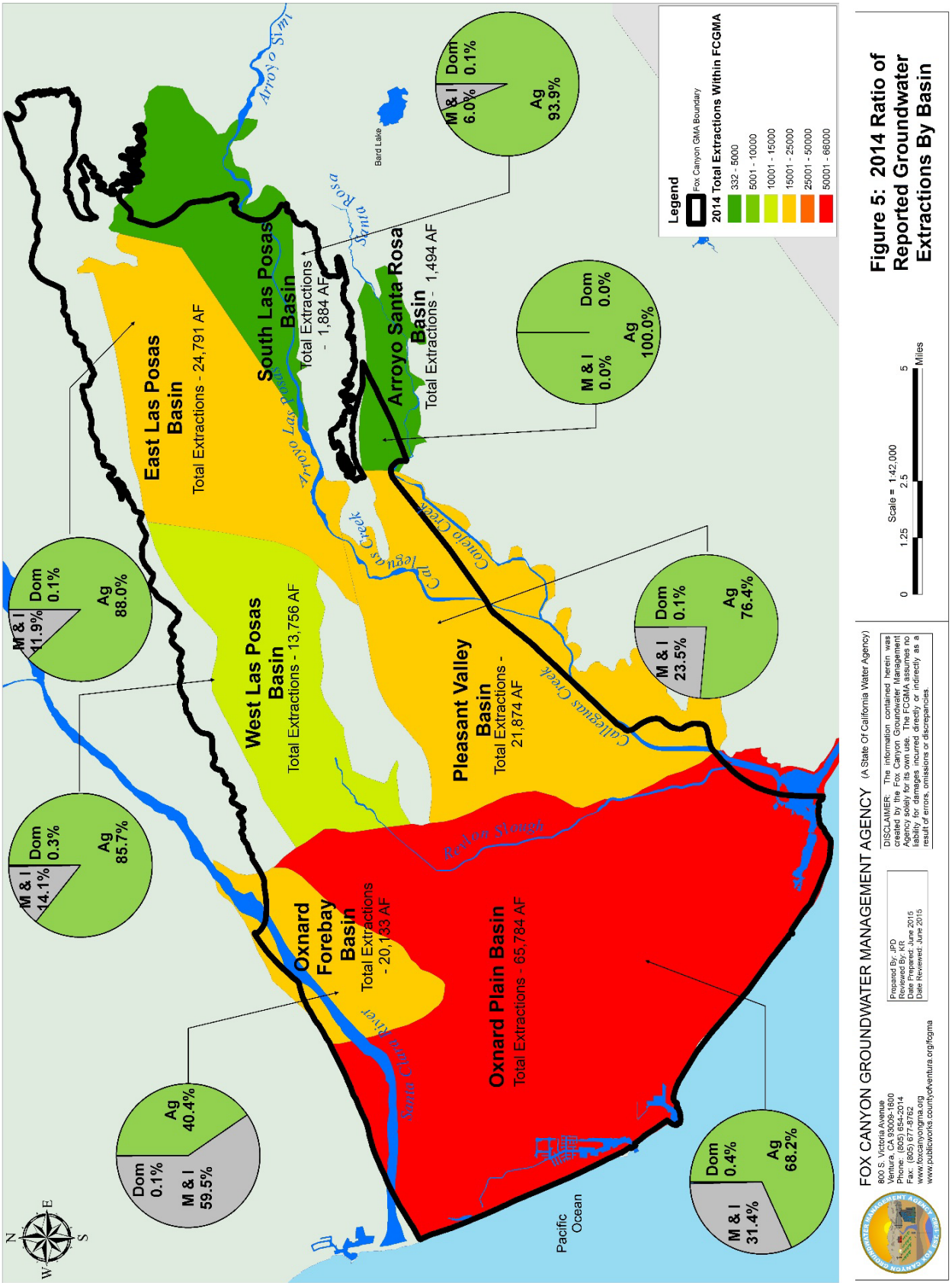
4) The Historical Allocation plus any adjustments minus scheduled reductions, plus any Baseline Allocation, then the total divided by two equals Total Available Allocation for the first half of year 2014.

5) Temporary Extraction Allocations apply to M&I Operators only. It is an average of 2003 to 2012 reported groundwater extractions, unless a variance has been granted.

6) Agricultural Irrigation Allowance Index (I.A.I.) allocations are not included, as the applications were filed and reviewed mid-year instead of at the end for the year. 2014-02 Irrigation Allowance Index (I.A.I.) allocation applications will be filed in August 2015.

7) Total reported groundwater extractions.

Figure 5 - 2014 Ratio of Reported Groundwater Extractions by Basin



5.3.1 **Groundwater Use in the FCGMA**

Self-reported extraction data in 2014 (see Table 2) indicates there were 468 active wells registered as agricultural, 131 active wells registered as M&I, and 91 active wells listed as domestic. When looking at 2014 reported extractions, approximately 71% of groundwater was used for agriculture, and roughly 29% for municipal uses. Agricultural operators collectively reported 106,579 AF of extractions (down from 106,941 AF in 2013). M&I operators reported 42,797 AF of extractions (down from 44,436 AF in 2013). The reported annual extraction by Domestic Well Operators was approximately 339 AF compared to 262 AF in 2013. It should be noted that Domestic[7] Well Operators are not required to use flowmeters to report groundwater extraction, providing the Ordinance Code criteria is met. Total domestic annual extractions are not considered to be a significant percentage (0.23%) in the annual groundwater total use within the Agency.

The FCGMA extraction data can also be used to reflect the ratio of groundwater use to use-type in each basin (Table 2 and Figure 5). The basins have been divided into three classifications based on primary groundwater use during 2014. These primary classifications are described as follows: agricultural-use; mixed-use; and M&I-use.

5.3.2 **Groundwater Use and Extraction by Basin**

The majority of groundwater extractions occur within the Oxnard Plain Basin. The primary use of the extracted groundwater is for agriculture. Additional detail regarding groundwater use by basin is presented in Figure 5 – *2014 Ratio of Reported Groundwater Extractions by Basin*.

5.3.2.1 Arroyo Santa Rosa (ASR): The Arroyo Santa Rosa is an agricultural-use basin as groundwater is primarily used for agricultural demand. All (100%) of the reported groundwater extractions (1,494 AF) were reported as used for agricultural purposes.

5.3.2.2 East Las Posas (ELP): The East Las Posas Basin is an agricultural-use basin, as groundwater is primarily used for agricultural demand. Reported use of the 24,791 AF of groundwater extracted: 88% Agricultural (21,819 acre-feet); 0.1 % Domestic (13 AF); and 11.9 % Municipal and Industrial (2,958 AF).

5.3.2.3 Oxnard Plain Forebay (FOR): The Oxnard Forebay Basin is an M&I use basin as groundwater is primarily used for M&I demand and a lesser amount to agricultural extraction, and only nominal volumes to domestic demands. Reported use of the 20,133 AF of groundwater extracted: 40.4% Agricultural (8,133 AF); 0.1 % Domestic (19 AF); and 59.5 % Municipal and Industrial (11,981 AF).

5.3.2.4 Oxnard Plain Basin (OXP): The Oxnard Plain Basin is a mixed-use basin. Significant groundwater extractions are by both agricultural and M&I operators and relatively little domestic extraction. Reported use of the 65,784 AF of groundwater extracted: 68.2% Agricultural (44,875 AF); 0.4 % Domestic (237 AF); and 31.4 % Municipal and Industrial (20,672 AF).

5.3.2.5 Pleasant Valley Basin (PVB): The Pleasant Valley Basin is a mixed-use basin. Significant groundwater extractions are by both agricultural and M&I operators and relatively little domestic extraction. Reported use of the 21,874 AF of groundwater extracted: 76.4% Agricultural (16,706 AF); 0.1 % Domestic (29 AF); and 23.5 % Municipal and Industrial (5,139 AF).

5.3.2.6 South Las Posas Basin (SLP): The South Las Posas Basin is an agricultural-use basin as groundwater is primarily used for agricultural demand. Reported use of the 1,884 AF of

[7] Wells for domestic use, serving a single-family residence, on a parcel of one acre or less, with no moneymaking operation on the site, are not required to use a flowmeter.

groundwater extracted: 93.9% Agricultural (1,770 AF); 0.1 % Domestic (one AF); and 6.0 % Municipal and Industrial (113 AF).

5.3.2.7 West Las Posas Basin (WLP): The West Las Posas Basin is an agricultural-use basin as groundwater is primarily used for agricultural demand. Reported use of the 13,756 AF of groundwater extracted: 85.7% Agricultural (11,782 AF); 0.3 % Domestic (39 AF); and 14.1 % Municipal and Industrial (1,935 AF).

5.4 Health of the Basins

There are many tools available to evaluate groundwater conditions/health of the basins; among these are water level surface maps and Basin Management Objectives (BMOs) Report Cards. The 2013 BMO Report Cards were presented to the Board during the April 23, 2014 FCGMA Board Meeting. The 2014 BMO Report Cards are included as Appendix B.

5.4.1 **Groundwater Levels**

During 2014, Agency staff prepared water level surface maps for the Upper Aquifer System (UAS) and Lower Aquifer System (LAS), using Fall 2013 groundwater data collected by the County of Ventura, United Water Conservation District (UWCD), Calleguas Municipal Water District (CMWD), and others. In preparation of the maps, an effort was made to use only data obtained from wells that were extracting groundwater exclusively from either the upper or lower aquifer systems. Initial contouring was generated using ESRI's ArcMap GIS software, with manual adjustments made to better reflect expected edge of basin conditions. The maps prepared are consistent in aerial extent, display of data collection points, contour intervals, and geographic reference information with those prepared in 2013 (Fall 1972 to Fall 2012, even years only). The maps for Fall 2013 and Fall 2014 (the latter prepared during 2015) are presented in Appendix C.

Between Fall 2013 and Fall 2014 groundwater levels declined in the western half of the Agency. In the Upper Aquifer System, water levels in Fall 2014 were below sea level in the Oxnard Plain Basin and most of the Oxnard Forebay and Pleasant Valley basins. In the Lower Aquifer System, water levels in Fall 2014 were below sea level in the Oxnard Plain Basin and most of the Oxnard Forebay, Pleasant Valley, and West Las Posas basins. Of the sixteen (16) Basin Management Objectives (BMOs) for water levels in the Oxnard Plain and Pleasant Valley basins, none were met.

5.4.2 **Groundwater Quality**

Water quality as presented in this section by basin and is relative to the BMO criteria established in the 2007 update of the GMP. Of the 34 water quality (chloride, nitrate and total dissolved solids) BMOs monitored during 2014, 15 were met and 19 were not met. The BMO Report Card for 2014 is included in this report as Appendix B. The BMO Report cards include the BMO monitoring wells plotted locations, and the associated objectives. A summary of the water quality conditions relative to the BMOs is presented below.

5.4.2.1 Arroyo Santa Rosa (ASR): The Arroyo Santa Rosa Basin has BMOs for nitrate (45 mg/L) and chloride (150 mg/L) to protect groundwater quality for potable and irrigation uses. The average nitrate concentrations were below the BMO at Well No. 25C05 by 2 mg/L and exceeded the BMO at Well No. 25D01 by 45 mg/L. The average chloride concentration exceeded the BMO of 150 mg/L at both monitoring locations, Well Nos. 25C05 and 25D01, by 31 mg/L and 9 mg/L respectively. Nitrate concentrations have declined at the location of Well No. 25C05 from above the BMO of 45 mg/L to just below the BMO at 43 mg/L. Based on the available data, nitrate concentrations have exceeded the BMO requirement at the location of Well No. 25D01 during past five years, with concentrations increasing from approximately 55 mg/L to 90 mg/L. Note

that 45 mg/L is the Maximum Contaminant Level for drinking water. Chloride concentrations have been increasing over the past five years, and exceeded the BMO in 2014 at both well locations.

5.4.2.2 East Las Posas (ELP): The East Las Posas Basin has BMOs for chloride and total dissolved solids (TDS) at three locations to protect groundwater quality for potable and irrigation uses. No data was available for one of the three BMO monitoring wells for 2014. Well No. 1E01 was destroyed under permit in 2013. A replacement monitoring well was selected in the interim for Well No. 1E01. Well No. 1E02 is approximately 310 feet south of Well No. 1E01 and perforated at roughly the same interval. Based on average chloride analytical results, the chloride BMO was met at one of the three BMO well locations. The TDS BMO was not met at the well locations in the southern portion of the East Las Posas Basin. Chloride and TDS concentrations over the last five years have generally been gradually increasing.

5.4.2.3 Oxnard Plain Forebay (FOR): The Forebay has BMOs for nitrate and TDS to protect groundwater quality for potable and irrigation uses. Average nitrate concentrations were above their respective BMOs at El Rio No. 5 (by over 55 mg/L) and El Rio No. 15 (by over 2 mg/L) respectively in 2014. Depending on the well, average TDS concentrations were above (El Rio No. 5) or below (El Rio No. 15) for their respective BMOs. At El Rio No. 5, the BMO was exceeded by 138 mg/L. At El Rio No. 15, the average concentration was below the BMO by 113 mg/L. The average TDS concentrations at El Rio No. 5 and El Rio No. 15 increased 310 and 82 mg/L respectively during 2014. During the last five years, the average nitrate and TDS concentrations of samples collected at both locations have increased.

5.4.2.4 Oxnard Plain Basin (OXP): The Upper Aquifer System has water quality BMOs at nine locations for chloride concentrations. These BMOs monitor saline intrusion (chloride is a direct indicator of intrusion). Consistent with past results, chloride BMOs were not met near Port Hueneme (BMO Well No. CM4) and Pt. Mugu (BMO Well Nos. CM1A and CM6. Chloride concentrations have generally been stable at seven of the nine BMO locations. The five-year trend in chloride concentrations at Pt. Mugu nested well location Well No. CM6-330, and decreasing at CM6 with chloride concentration increasing at Well No. CM6-200.

The Lower Aquifer System has BMOs for chloride concentrations, four along the coast and one at an inland location. Consistent with past results, chloride BMOs were not met near Port Hueneme (Well No. CM2) and Pt. Mugu (Well Nos. CM6 and CM1A. Chloride concentrations have generally been stable during the past five years, except at Pt. Mugu (Well Nos. CM6 and CM1A). Over the past five years, chloride concentrations have decreased at Well No. CM6 and increased at Well No. CM1A.

5.4.2.5 Pleasant Valley Basin (PVB): The Pleasant Valley Basin has a BMO for chloride concentrations at two locations. During 2014, the chloride BMO was met at both locations (111 mg/L and 106 mg/L). During the past five years, chloride concentrations at both locations have fluctuated and are currently above the five-year low concentration yet below the five-year high concentration. Over the past 20 years, chloride concentrations at the southern location have remained below the BMO, while concentrations at the northern location have fluctuated above and below the BMO of 150 mg/L.

5.4.2.6 South Las Posas Basin (SLP): The South Las Posas Basin has BMOs for chloride and TDS to protect groundwater quality for potable and irrigation uses. The one BMO well was not available for monitoring in 2014. BMO well, Well No. 6N03, has been abandoned by the owner. A replacement monitoring well was selected in the interim for Well No. 6N03. Well No. 7D02 is

approximately 920 feet south of Well No. 6N03 and perforated at roughly the same interval. Based on average chloride analytical results, the chloride BMO (160 mg/L) was met. The TDS BMO (1,500 mg/L) was also met. The available data for the South Las Posas Basin indicates that chloride concentrations over the last five years have been stable at the BMO location, while TDS average concentrations have slightly decreased in the South Las Posas Basin.

5.4.2.7 West Las Posas Basin (WLP): The West Las Posas Basin has BMOs for chloride and TDS to protect groundwater quality for potable and irrigation uses. No data was available for one of the two BMO monitoring wells for 2014. Well (Well No. 6R01) was down for repairs in 2014 and is expected to be operational in 2015. Based on the available data, the chloride BMO was met at one of the three BMO well locations in the East Las Posas Basin. The chloride and TDS BMOs were met. Chloride concentrations over the last five years have been stable at the BMO locations, while TDS average concentrations have slightly increased.

6.0 FCGMA PROGRAMS

6.1 Permitting and Registration of Wells

As of year-end 2014, the FCGMA had 1,296 wells identified by State Well Numbers listed within its boundary: 690 wells reported as active; 183 wells listed as inactive; 415 wells destroyed, and eight (8) additional well numbers assigned to permanent monitoring or cathodic protection wells. On an ongoing basis, FCGMA staff registers new wells permitted by the County of Ventura[8] and/or by the City of Oxnard. Regular updates to the status of existing wells are completed according to information self-reported by the well owners or operators.

Agency staff reviewed and processed 31 FCGMA groundwater extraction well applications for new extraction facilities, checking for compliance with the Ordinance Code. Agency staff also processed well registration documents. The FCGMA Ordinance Code requires registration of all groundwater extraction facilities in addition to semi-annual reporting of extraction volumes and payment of extraction fees.

6.2 Flowmeter Calibration Program

The FCGMA Ordinance Code requires the use of flowmeters for all extraction facilities except inactive wells and facilities supplying a single-family dwelling on a parcel one acre or less in size providing that property has no income producing operations (domestic wells). The use of accurate flowmeters for reporting groundwater extractions is critical to the FCGMA for a number of reasons. First, it provides a relatively uniform method of reporting for all stakeholders. Second, it increases the efficiency of data management. Third, it allows FCGMA staff to analyze the extraction and use of the groundwater resources to help make meaningful recommendations to the Board regarding its use.

Flowmeters have been required on non-exempt extraction facilities since July 1, 1994 following the adoption of Ordinance No. 3.1 on July 28, 1993. The current Groundwater Metering Program was officially launched via a revision of Chapter 3.0 in Ordinance 8.1 (July 2005), and the initial passage of Resolution No. 2006-01 (adopted in March 2006). The initial groundwater flowmeter calibration program began in earnest in 2007 and continued into 2009. Resolution No. 2008-04 (adopted May 2008) replaced the original Resolution No. 2006-01 to clarify the methods and rules governing the meter calibration program: Resolution No. 2008-04 was again revised at the September 24, 2008 Board meeting. A third

[8] Refers to wells permitted in accordance with the County of Ventura Ordinance No. 4184. All permitting in accordance with this ordinance is performed by the Ventura County Watershed Protection District. The City of Oxnard is the only other entity in Ventura County that issues water well permits.

round of Agency-wide flowmeter calibration testing was initiated in 2014. Staff continued to enforce flowmeter calibration requirements throughout 2014.

Data indicates approximately 690 (approximately 54%) of the 1,296 State Well Numbers listed in the FCGMA database were actively being used in 2014. In the past, well extractions were reported using water flowmeters, electrical power meters, or a consumptive-use method that estimated annual water use volume for domestic or farm use based on number of people in a home, or to help gauge water use by comparing the acres irrigated times average water use for a specific crop. Because of a concerted effort by the FCGMA, the only known wells within the Agency that still use consumptive use methods to report extractions are domestic wells that qualify for an exemption from flowmeter requirements. Per Agency records, 690 wells were active, four were exempt from the flowmeter requirement based on use, 155 flowmeters were due for calibration by the end of 2014; and calibration test data was current for approximately 531 flowmeters. In order to increase the effectiveness of the flowmeter program, the FCGMA took the following actions in 2014, which helped increase the compliance rate for calibrated Agricultural, and M&I, and Domestic well flowmeters:

- Mailed, for the Meter Calibration Program, 225 Initial Notices for testing of flowmeters associated with non-exempt wells, 64 Notices of Violation and 4 Civil Penalty Notices.
- Completed a field program for inspection of flowmeters (Las Posas basins).

6.3 FCGMA Groundwater Management Plan

The Groundwater Management Plan (GMP) identifies a series of short-term and long-term groundwater management projects and strategies designed to address the imbalance between water supply and demand. The GMP establishes BMOs (quantitative groundwater quality and quantity targets used to measure and evaluate the “health” of the basins and the potential effectiveness of various groundwater management strategies). The BMO Report Cards for 2014 are included in this report as Appendix B.

During 2014, progress was made towards implementing the following strategies, with the goal of managing the basins and meeting the Basin Management Objectives (BMO):

- South Las Posas Pump/Treat (pump poor quality water and blend/ treat it) – Ventura County Wastewater District No. 1 Moorpark Desalter Project moving forward. An informational update was provided to Board on July 23, 2014.
- Development of Brackish Groundwater in the Pleasant Valley - The City of Camarillo continued studies towards development of the brackish groundwater in the Pleasant Valley Basin. Agency staff reviewed and commented on North Pleasant Valley Desalter Groundwater Analysis and Modeling Final Report, and Draft Environmental Impact Report, submitted by the City of Camarillo.
- Verification of Extraction Reporting (verify accuracy of reporting) – Utilizing the FCGMA Online Software, the Agency sent approximately 868 Semi-Annual Groundwater Extraction Statements, keyed in data received, and followed-up with non-reporters. Ninety-seven non–reporter accounts (missing semi-annual extraction statement filings) were resolved. Notices of Violations were sent to 174 non-reporters.
- Utilized the Irrigation Allowance program and Emergency Ordinance E modified Irrigation Allowance program.
- Continued the 25% Pumping Reduction.

6.3.1 <u>Credits for Non-Use of Groundwater Resources</u>

There are a number of different credits earned for non-use of groundwater resources. They are listed below.

6.3.1.1 Conservation Credits: In the past, well owners or operators with Historical Allocation would take advantage of this credit system by not using the full Adjusted Historical Allocation (AHA) associated with their wells. The credits granted under this system are called Conservation Credits to designate that they were earned by not pumping the full allocation.

The Conservation Credit program was only in effect the first half of the year for all user types (prior to the implementation of Emergency Ordinance E). During the first half of the year, conservation credits could be used but not earned. Domestic users did earn conservation credits during the second half of the year. Beginning January 1, 2015 all use and accumulation of conservation credits is to be suspended while Emergency Ordinance E is in effect.

For 2014, more Conservation Credits were used than were earned. A net total of -8,551 AF of Conservation Credits were earned by operators within the Agency (see Table 6 - *Summary of Groundwater Conservation Credits Accumulated in the FCGMA since 1991*). Table 6 details the historical growth of accumulated Conservation Credits since the initiation of the FCGMA credit system in 1991, and Figure 6 - *Accumulation of FCGMA Conservation Credits Earned* graphically shows the growth.

Table 6 - Summary of Groundwater Conservation Credits Accumulated in the FCGMA Since 1991[1]

Year	Net Credits Earned[2] (AF)	Net Credit Balance (+ AF)
2014	-8,551	716,398
2013	-978	724,949
2012	9,194	725,927
2011	20,351	716,733
2010	24,058	696,382
2009	11,612	672,324
2008	75,423	660,712
2007	37,252	585,288
2006	48,166	548,037
2005	53,829	499,871
2004	39,893	446,042
2003	44,763	406,149
2002	40,396	361,386
2001	49,355	320,990
2000	39,132	271,635
1999	39,178	232,502
1998	27,632	193,324
1997	15,464	165,693
1996	29,903	150,228
1995	22,036	120,326
1994	17,283	98,290
1993	30,593	81,007
1992	29,069	50,414
1991	19,866	21,345
1990	1,478	1,478

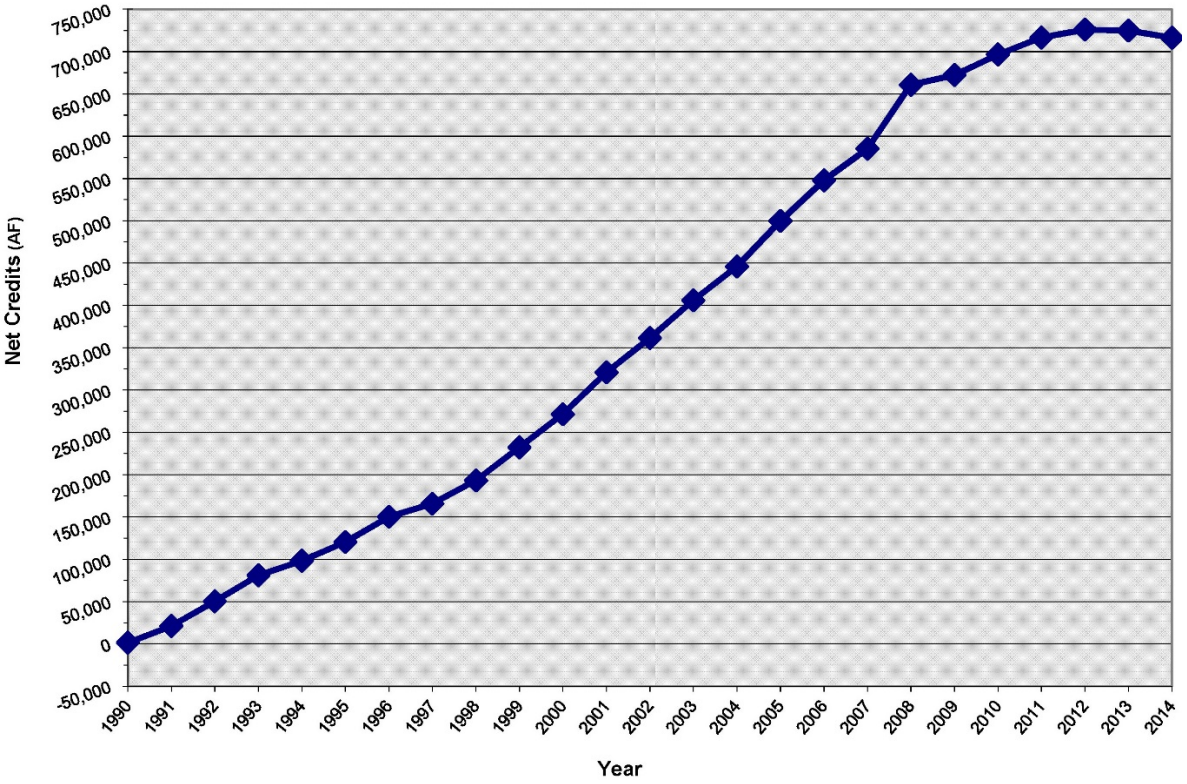
Notes:

AF = acre feet of water; 1 Acre-foot = 325,851 US gallons of water @ STP

1. Credit Program initiated in 1991. Credits are granted for extracting less water than allocation (credits not authorized with irrigation efficiency allocation).

2. Prior to 1998, operators were required to apply for credits. For 1999-2011 (present), credits are automatically granted for groundwater use of less than Adjusted Historical Allocation or for groundwater injected even if an operator did not file. Starting in 2012, credits are only earned when extraction statements are filed. Credits did not exist prior to 1990.

Figure 6 - Accumulation of FCGMA Conservation Credits Earned (values in acre-feet) [1]



[1] FCGMA database statistics for year end credit totals in each category.

6.3.1.2 Injection Credits: Operators that recharge aquifers within the FCGMA Boundary through direct injection of “foreign water” as defined in the Agency’s Ordinance Code, earn Injection Credits (in acre-feet) (also known as storage credits). During 2014, the FCGMA received and approved two Injection Credit requests. CMWD injected approximately 3,856 AF of water into the East Las Posas Basin. UWCD injected 59 AF into the Oxnard Forebay Basin.

6.3.1.3 In-Lieu Credits: The In-Lieu Credit Program provides for the transfer of credit (Conservation and Injection Credits) from the user of foreign water to the supplier in the amount of one acre-foot for each acre-foot of delivered water for direct use by the user. The water represented by the credits transferred is not available for use during the year being accounted for. During 2014, the FCGMA processed and approved six In-Lieu credit transfers (approximately 1994 AF).

6.3.1.4 Supplemental Municipal and Industrial (M&I) Water Program Credits: The Supplemental M&I Water Program allows for the transfer of credits (Conejo Credits) when Pleasant Valley County Water District (PVCWD) has diverted water from Conejo Creek. The surface water is diverted via the Calleguas Municipal Water District (CMWD) Conejo Creek Diversion constructed to enhance groundwater storage by allowing surface water, normally lost to the Ocean, to be used prior to and instead of extracting groundwater. The Conejo Credits are transferred from PVCWD to CMWD, which in turn transfers the credits to UWCD. The UWCD is then responsible for ensuring that water levels in key wells remain above the designated minimum level before the Conejo Credits are used to supply Supplemental M&I Water. The credits are used in order to offset surcharges for excess groundwater extractions and are called Supplemental M&I Credits. During 2014, there were no Supplemental M&I credit transfer requests.

6.3.1.5 Credit Transfers: Conservation credits were transferred associated with the UWCD Pumping Trough Pipeline (PTP) project in the Oxnard Plain Basin, for delivery of surface water or blended water in lieu of extraction of groundwater only. Agency staff processed 49 credit transfers approximately 3,294 AF.

The accumulation of credits represents a long-term resource management challenge for the Agency and its stakeholders. However, while Emergency Ordinance E is in effect, Conservation Credits cannot be earned or used.

7.0 AGENCY ACTIONS FOR CALENDAR YEAR 2014

7.1 Significant Agency Actions

7.1.1 **Adopted Changes to the Ordinance Code**

On April 11, 2014, with declining groundwater levels within the Agency, the FCGMA Board of Directors adopted Emergency Ordinance E: "*An Emergency Ordinance Limiting Extractions from Groundwater Extractions Facilities, Suspending Use of Credits and Prohibiting Construction of Any Groundwater Extraction Facility and/or the Issuance of Any Permit Therefor*." Emergency Ordinance E is included as Appendix A. This action followed the Governor of California proclaiming a state of emergency on January 17, 2014 because of the continued drought. The Governor called on Californians to reduce their water usage by 20 percent. On March 1, 2014, the Governor signed into law emergency drought legislation.

To implement Emergency Ordinance E, the following actions were completed or were in review during 2014:

- Article 2. Reduction of Groundwater Extractions: Granted Seven (7) Variances to Temporary Extraction Allocation (TEA), Denied Four (4) Variances, and Board Denied One (1) Variance Appeal
- Article 4. Prohibition on New Extraction Facilities: Board Granted Ten (10) Exceptions.
- Irrigation Allowance Index (for Crop Year 2014/15):
    - Pro-Rating of Water Use – Application Revised
    - Fallow Land Irrigation Allowance – Process Developed
    - Public Outreach – Developed Training Videos, and Held Training Sessions and Workshop, and Technical and Growers' Group meetings.
    - Upgrades to FCGMA Online Software – Significant Enhancements Completed

7.1.2 **Adopted Resolutions**

The FCGMA Board of Directors adopted three Resolutions during calendar year 2014 (Appendix A):

- Resolution No. 2014-01: "*A Resolution Establishing the Conejo Creek Water Pumping Program Involving Camrosa Water District and Pleasant Valley County Water District Using the Conejo Creek Diversion*";
- Resolution No. 2014-02: "*A Resolution Increasing Extraction Charges to $6.00 Per Acre-Foot*"; and

- Resolution No. 2014-03: "*A Resolution Supporting a Legislative Change in Maximum Allowable Extraction Charge*".

7.2 Project Reviews Performed in 2014

At times, Agency staff provides formal comments on proposed projects, within the Agency jurisdiction, to the County of Ventura Planning Department. In 2014, Agency staff provided, approximately four (4) project reviews to the County of Ventura Planning Department. Typically, proposed development projects are reviewed to identify the following groundwater-related issues: changes to the well ownership/operator, property-use changes that may affect or impact FCGMA extraction allocations, changes to land or crops, potential short or long-term impacts to water quality and/or water quantity, alterations or modifications in well status, changes to water distribution systems, and construction of structures that might impair infiltration of water to FCGMA aquifers. Projects may be approved with no further action needed, approved with conditions and/or modifications based in part on potential impacts to the FCGMA groundwater resources.

7.3 Other Activities Performed in 2014

The Agency performed and completed the following additional activities during 2014:

- List of Problems and Issues For Developing Measures for Long-Term Sustainable Groundwater Management – Board Adopted Possible Solutions and Priorities List

- Agency staff, working with the County Executive Office, drafted legislation granting the Agency authority to inspect any extraction facility within its boundaries, including the power to seek an inspection warrant; the legislation (SB 988) was adopted in 2014 and went into effect this year.

- 2013 Annual Report, including Fall Water Level Maps (Lower and Upper Aquifer Systems) and 2013 Annual Basin Management Objective Report Card – Completed

- Field Program for Inspection of Flowmeters (Las Posas Basins) – Completed

- New CIMIS Weather Station - Installed and Operational

- Sustainable Groundwater Management Act – Workshop Held

- Applications for Historical Allocation, and/or Credit Transfers - Processed
  - Approved Two (2) Ag to M&I Allocation Transfers
  - Denied One (1) M&I to M&I Allocation Transfer

- Informational Updates:
  - United Water Conservation District Groundwater Model;
  - Ventura County Wastewater District No. 1 Moorpark Desalter Project; and
  - City of Camarillo's North Pleasant Valley Desalter Project

- To improve stakeholder outreach and communication, staff attended stakeholder and Las Posas User Group meetings, and continued mailing of Semi-Annual Newsletters.

8.0 FINANCIAL STATUS OF THE AGENCY FOR 2014

The FCGMA's fiscal year begins July 1 and ends on June 30 of the next calendar year. Accordingly, the financial status information contained in this 2014 Annual Report covers the Fiscal Year period beginning July 1, 2013 and ending on June 30, 2014. Fiscal administration and oversight of the Agency's financial transactions is performed by Agency management in consultation with the Fiscal Services Section Central Services Department within the Ventura County Public Works Agency pursuant to an existing and ongoing contractual arrangement between the Agency and the County of Ventura.

Quarterly and year-end budget to actual performance reports are presented to the FCGMA Board of Directors for their information, review, and where necessary, adjustments. The information below highlights key fiscal performance metrics reported by Agency management during the 2013-14 Fiscal Year period.

Fiscal Year End Report June 30, 2014

- FCGMA revenues received in 2013-14 totaled $1,616,521. An amount that reflected a $302,649 or 22% increase versus 2012-13 adjusted actual revenues received.
- FCGMA expenditures incurred in 2013-14 totaled $ 957,871. An amount that reflected a $100,401, or 9.5% decrease below 2012-13 adjusted actual expenditures incurred by the Agency.

8.1 Financial Audits

Pursuant to § 26909, the audit requirements applicable to FCGMA are in the *Minimum Audit Requirements and Reporting Guidelines* for California Special Districts, as published by the Division of Accounting and Reporting, Office of the State Controller. Essentially, the minimum requirements reflect Generally Accepted Auditing Standards (GAAS), as described in the American Institute of Certified Public Accountants publication, *Audits of State and Local Governmental Units*.

Under GAAS, the FCGMA, which is a special purpose government engaged in the preservation and management groundwater resources for the common benefit within its boundary, is required to prepare its financial statements in an enterprise format. The FCGMA is funded primarily through user extraction charges (set at $4.00 per acre-foot during the first half of the year and set at $6.00 acre-foot during the second half of the year), and is operated on a cash-accounting basis. The only other income to the Agency is from surcharge fees, civil penalties, and accumulated interest earnings on Agency funds on deposit with the County Treasurer's Pooled Investment Fund.

In 2014, a biennial (2013-2014) financial audit schedule was conducted in late 2014, and will be available in mid-2015. Copies of the Agency's annual and biennial audit reports are available upon request.

9.0 REFERENCES

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APPENDIX A

Ordinances and Resolutions adopted by the Fox Canyon Groundwater Management Agency Board of Directors during Calendar Year 2014

- Emergency Ordinance E
- Resolution No. 2014-01
- Resolution No. 2014-02
- Resolution No. 2014-03
- Revised Irrigation Allowance Index Table for Emergency Ordinance E (Adjusted 25%)

EMERGENCY ORDINANCE – E

AN EMERGENCY ORDINANCE LIMITING EXTRACTIONS FROM GROUNDWATER EXTRACTION FACILITIES, SUSPENDING USE OF CREDITS AND PROHIBITING CONSTRUCTION OF ANY GROUNDWATER EXTRACTION FACILITY AND/OR THE ISSUANCE OF ANY PERMIT THEREFOR

The Board of Directors of the Fox Canyon Groundwater Management Agency, State of California, ordains as follows:

ARTICLE 1. Findings

The Board of Directors hereby finds that:

A. On January 17, 2014, the Governor of the State of California proclaimed a state of emergency due to current drought conditions and called on Californians to reduce their water usage by 20 percent. On March 1, 2014, the Governor signed into law emergency drought legislation that finds and declares that California is experiencing an unprecedented dry period and shortage of water for its citizens, local governments, agriculture, environment, and other uses.

B. The U.S. Drought Monitor has designated the territory of the Agency to be currently in a condition of exceptional drought.

C. The United Water Conservation District has reported that groundwater storage in the Oxnard Plain Basin Forebay dropped by 32,200 acre feet in the past year and groundwater levels are currently below sea level. Continued dry conditions and regulatory restrictions on diversions from the Vern Freeman Diversion will result in less water available for recharge of the Forebay.

D. On February 25, 2009, the Fox Canyon Groundwater Management Agency Board of Directors in response to a serious water resource problem constituting a very real and immediate threat to groundwater quality and quantity to the West, East, and South Las Posas Basins and any and all basins tributary thereto adopted Emergency Ordinance D, entitled An Emergency Ordinance to Impose a Temporary Moratorium on Construction of New Wells and to Provide an Upper Limitation to Efficiency Extraction Allocation Within the West, East, and South Las Posas Groundwater Basins Pending Development of a Basin-Specific Management Plan.

E. Emergency Ordinance D was replaced by Ordinance 8.6 which presumed the development of a Basin-Specific Management Plan. However, the threats to groundwater quality and quantity in the Las Posas Basins remain and have increased due to persistent drought conditions, and the lack of a Basin-Specific Management Plan.

F. The Agency's 2007 Update to its Groundwater Management Plan established basin yield at 100,000 acre-feet per year; however, average annual total extractions within the Agency for Calendar Years 2003 through 2012 were 124,586 acre-feet.

G. Due to persistent dry conditions, the Department of Water Resources on January 31, 2014, announced a 2014 State Water Project Allocation of zero percent.

H. The cumulative use of conservation credits has reduced the benefit of previous reductions in historical allocations, and could limit any benefit derived through this Emergency Ordinance.

I. The Board may adopt ordinances for the purpose of regulating, conserving, managing, and controlling the use and extraction of groundwater within the territory of the Agency.

J. The measures adopted in this emergency ordinance are necessary in order to improve and protect the quantity and quality of groundwater supplies within the territory of the Agency, to prevent a worsening of existing conditions, to allow time to implement a definite and long-term solution to improve groundwater conditions in the Agency and to bring groundwater extractions into balance with recharge.

K. This emergency ordinance is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines Sections 15307 and 15308 as an action taken "to ensure the maintenance, restoration, or enhancement of natural resources or the environment."

ARTICLE 2. Reduction of Groundwater Extractions

A. For the duration of this emergency ordinance, all Municipal and Industrial Operators' extraction allocations, regardless of type, shall be replaced with a Temporary Extraction Allocation (TEA) based on an operator's average annual reported extractions, not including any extractions that incurred surcharges, for Calendar Years 2003 through 2012.

B. For the Port Hueneme Water Agency (PHWA), their TEA shall be established according to the Agency's approved July 24, 1996 agreement and allocations contained within.

C. Temporary Extraction Allocations (TEA) shall be reduced in order to eliminate overdraft from the aquifer systems within the boundaries of the Agency for municipal and industrial uses. The reductions shall be as follows:

1. Beginning July 1, 2014	10% (TEA x 0.90/2)
2. Beginning January 1, 2015	15% (TEA x 0.85/2)
3. Beginning July 1, 2015	20% (TEA x 0.80/2)
4. Beginning January 1, 2016	20% (TEA x 0.80)

D. For reported extractions starting on August 1, 2014, all Agricultural Operators' extraction allocations, regardless of type, shall be replaced with an Annual Efficiency Allocation as provided in Section 5.6.1.2. of the Agency Ordinance Code, except that the annual irrigation allowances used to calculate the Irrigation Allowance Index shall be adjusted downward 25% from the allowances set forth in Resolution No. 2011-04 (Exhibit No. 1). For computing the irrigation allowance, the definition of Planted Acre may include designated areas that grew irrigated crops in the twelve months prior to August 1, 2014, but have subsequently been fallowed or are growing a non-irrigated crop.

E. On February 1, 2015, the Board may by Resolution undertake an additional adjustment to the annual irrigation allowances used to calculate the Irrigation Allowance Index, or other pumping restrictions in order to achieve a cumulative 10% reduction in pumping by Agricultural Operators.

F. On August 1, 2015, the Board may by Resolution undertake an additional adjustment to the annual irrigation allowances used to calculate the Irrigation Allowance Index, or other pumping restrictions in order to achieve a cumulative 20% reduction in pumping by Agricultural Operators.

G. Notwithstanding the extraction allocations established pursuant to Chapter 5.0 of the Agency Ordinance Code, all extractions in excess of the allocations established and adjusted by this emergency ordinance shall be subject to extraction surcharges.

H. The Executive Officer may, on written request from a land owner or operator, grant a variance from the requirements of this article based on a showing:

1. That there are special circumstances or exceptional characteristics of the owner or operator which do not apply generally to comparable owners or operators in the same vicinity; or
2. That strict application of the reductions as they apply to the owner or operator will result in practical difficulties or unnecessary hardships inconsistent with the general purpose of this emergency ordinance; or
3. That the granting of such variance will result in no net detriment to the aquifer systems.

ARTICLE 3. Limitation on Accrual and Use of Credits

Notwithstanding Section 5.7 of the Agency Ordinance Code, conservation credits shall not be obtained and may not be used to avoid paying surcharges for extractions while this emergency ordinance is in effect.

ARTICLE 4. Prohibition on New Extraction Facilities

The Board prohibits the issuance of any permit for construction of a groundwater extraction facility, other than a replacement, backup or standby facility which does not allow the initiation of any new or increased use of groundwater, within the territory of the Agency. The prohibition set forth shall not apply to any permit for which a completed application is on file with the Agency on or before February 26, 2014, or for any permit in furtherance of a pumping program approved by the Board. For the purpose of this Article 4, a new or increased use is one that did not exist or occur before the effective date of this emergency ordinance. The Board may grant exceptions to the prohibition set forth in this Article 4 on a case-by-case basis. Applications for exceptions shall conform to the requirements of Section 5.2.2.3. of the Agency Ordinance Code and will be approved only if the Board makes the findings set forth in Section 5.2.2.4. of the Agency Ordinance Code.

ARTICLE 5. Duration

This emergency ordinance shall remain in effect from the date of adoption and reviewed every eighteen months, unless superseded or rescinded by action of the Board or a finding by the Board that the drought or emergency condition no longer exists.

ARTICLE 6. Effective Date

This ordinance shall become effective immediately upon adoption by the vote of at least four members of the Board; otherwise it shall become effective on the thirty-first day after adoption.

PASSED AND ADOPTED this 11th day of April 2014 by the following vote:

AYES: 5
NOES: 0
ABSENT: 0

By: _____
Lynn Maulhardt, Chair, Board of Directors
Fox Canyon Groundwater Management Agency

ATTEST: I hereby certify that the above is a true and correct copy of Emergency Ordinance E.

By: _____
Jessica Kam, Clerk of the Board

Exhibit No. 1 – Current Irrigation Allowance Index and - Proposed Allowance Index Values (Adjusted 25%)

CURRENT Irrigation Allowance Index Values

Acre-Feet/Acre

Includes leaching and DU = 0.8	**# of Crops**	**Oxnard (Z1)**			**Camarillo (Z2)**			**Santa Paula (Z3)**		
		Typical	**Dry**	**Wet**	**Typical**	**Dry**	**Wet**	**Typical**	**Dry**	**Wet**
		Total AF/A	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***
Spring Veg./Fall Celery	2	3.6	3.8	3.3	4.0	4.2	3.7	4.3	4.6	4.0
Summer Veg./Fall Veg	2	3.4	3.6	3.2	3.8	4.0	3.6	4.1	4.3	3.9
Spring Veg./Late Summer Veg./+part Late Fall Veg*	**2+plus**	3.9	4.1	3.7	4.4	4.6	4.2	4.8	5.0	4.6

		Oxnard (Z1)			**Camarillo (Z2)**			**Santa Paula (Z3)**		
		Typical	**Dry**	**Wet**	**Typical**	**Dry**	**Wet**	**Typical**	**Dry**	**Wet**
Crop		***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***
Avocado - 20% Ground Shading	**1**	1.9	2.0	1.7	2.1	2.3	1.9	2.3	2.5	2.1
Avocado - 50% Ground Shading	**1**	2.7	3.0	2.5	3.1	3.4	2.8	3.3	3.7	3.0
Avocado - 70% Ground Shading	**1**	3.7	4.1	3.5	4.1	4.6	4.0	4.5	5.1	4.3
Blueberries 20% Ground Shading	**1**	1.8	1.9	1.8	2.1	2.3	2.0	2.3	2.5	2.2
Blueberries 50% Ground Shading	**1**	2.6	2.7	2.6	3.0	3.1	2.9	3.3	3.4	3.2
Blueberries 70% Ground Shading	**1**	3.6	3.8	3.5	4.1	4.3	3.9	4.5	4.7	4.3
Celery - Single Crop	**1**	2.0	2.1	1.8	2.2	2.3	2.0	2.4	2.5	2.2
Citrus - 20% Ground Shading	**1**	1.9	2.1	1.8	2.1	2.4	2.0	2.3	2.6	2.2
Citrus - 50% Ground Shading	**1**	2.5	2.7	2.4	2.9	3.0	2.7	3.1	3.3	2.9
Citrus - 70% Ground Shading	**1**	3.4	3.6	3.2	3.9	4.0	3.6	4.3	4.4	3.9
Lima Beans	**1**	1.0	1.1	1.0	1.2	1.2	1.2	1.3	1.3	1.3
Misc. Veg Greenhouse - Fall	**1**	1.2	1.3	1.1	1.3	1.4	1.2	1.4	1.5	1.3
Misc. Veg Greenhouse - Spr	**1**	1.3	1.4	1.2	1.5	1.6	1.4	1.6	1.7	1.6
Misc. Veg Greenhouse - Summer	**1**	1.6	1.6	1.6	1.8	1.8	1.8	1.9	1.9	1.9
Misc. Veg Single Crop - Fall	**1**	1.4	1.5	1.3	1.5	1.7	1.4	1.6	1.8	1.5
Misc. Veg Single Crop - Spr	**1**	1.6	1.7	1.5	1.8	1.9	1.7	1.9	2.1	1.8
Misc. Veg Single Crop - Summer	**1**	2.0	2.0	1.9	2.2	2.3	2.2	2.5	2.5	2.4
Nursery (Non-Greenhouse)	**1**	4.3	4.5	4.1	4.9	5.1	4.6	5.3	5.6	5.1
Nursery (Greenhouse)	**1**	4.5	4.6	4.3	5.1	5.2	4.9	5.6	5.7	5.4
Raspberries - Tunnel	**1**	4.3	4.5	4.2	4.9	5.1	4.7	5.4	5.5	5.2
Sod	**1**	4.0	4.2	3.9	4.5	4.8	4.4	5.0	5.2	4.8
Strawberries-Main Season	**1**	3.1	3.3	2.9	3.4	3.6	3.2	3.7	3.9	3.4
Strawberries-Summer	**1**	1.8	1.9	1.8	2.0	2.1	1.9	2.1	2.2	2.0
Tomatoes - Peppers	**1**	2.3	2.3	2.2	2.6	2.6	2.5	2.8	2.8	2.7

Proposed Irrigation Allowance Index Values (Adjusted 25%)

Acre-Feet/Acre

		Oxnard (Z1)			Camarillo (Z2)			Santa Paula (Z3)		
		Typical	Dry	Wet	Typical	Dry	Wet	Typical	Dry	Wet
Includes leaching and DU = 0.8	**# of Crops**	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***
Spring Veg./Fall Celery	2	2.7	2.8	2.5	3.0	3.2	2.8	3.3	3.4	3.0
Summer Veg./Fall Veg	2	2.5	2.7	2.4	2.8	3.0	2.7	3.0	3.2	2.9
Spring Veg./Late Summer Veg./+part Late Fall Veg*	**2+plus**	2.9	3.1	2.8	3.3	3.5	3.1	3.6	3.8	3.4

		Oxnard (Z1)			Camarillo (Z2)			Santa Paula (Z3)		
		Typical	Dry	Wet	Typical	Dry	Wet	Typical	Dry	Wet
Crop		***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***
Avocado - 20% Ground Shading	**1**	1.4	1.5	1.3	1.6	1.7	1.5	1.7	1.9	1.6
Avocado - 50% Ground Shading	**1**	2.0	2.2	1.9	2.3	2.5	2.1	2.5	2.8	2.3
Avocado - 70% Ground Shading	**1**	2.7	3.1	2.6	3.1	3.5	3.0	3.4	3.8	3.2
Blueberries 20% Ground Shading	**1**	1.4	1.4	1.3	1.5	1.8	1.5	1.8	1.9	1.7
Blueberries 50% Ground Shading	**1**	2.0	2.1	1.9	2.2	2.3	2.2	2.4	2.5	2.4
Blueberries 70% Ground Shading	**1**	2.7	2.9	2.6	3.1	3.3	3.0	3.4	3.6	3.2
Celery - Single Crop	**1**	1.5	1.6	1.4	1.7	1.8	1.5	1.8	1.9	1.6
Citrus - 20% Ground Shading	**1**	1.4	1.6	1.3	1.6	1.8	1.5	1.8	1.9	1.6
Citrus - 50% Ground Shading	**1**	1.9	2.0	1.8	2.2	2.3	2.0	2.4	2.5	2.2
Citrus - 70% Ground Shading	**1**	2.6	2.7	2.4	2.9	3.0	2.7	3.2	3.3	2.9
Lima Beans	**1**	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	0.9
Misc. Veg Greenhouse - Fall	**1**	0.9	0.9	0.8	1.0	1.0	0.9	1.0	1.1	1.0
Misc. Veg Greenhouse - Spr	**1**	1.0	1.1	0.9	1.1	1.2	1.1	1.2	1.3	1.2
Misc. Veg Greenhouse - Summer	**1**	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4
Misc. Veg Single Crop - Fall	**1**	1.0	1.1	1.0	1.1	1.2	1.0	1.2	1.3	1.1
Misc. Veg Single Crop - Spr	**1**	1.2	1.3	1.1	1.3	1.4	1.2	1.5	1.6	1.4
Misc. Veg Single Crop - Summer	**1**	1.5	1.5	1.5	1.7	1.7	1.6	1.8	1.9	1.8
Nursery (Non-Greenhouse)	**1**	3.2	3.4	3.1	3.6	3.8	3.5	4.0	4.2	3.8
Nursery (Greenhouse)	**1**	3.4	3.5	3.3	3.8	3.9	3.7	4.2	4.3	4.0
Raspberries - Tunnel	**1**	3.2	3.4	3.1	3.7	3.8	3.6	4.0	4.2	3.9
Sod	**1**	3.0	3.2	2.9	3.4	3.6	3.3	3.7	3.9	3.6
Strawberries-Main Season	**1**	2.3	2.5	2.2	2.6	2.7	2.4	2.8	2.9	2.6
Strawberries-Summer	**1**	1.4	1.4	1.3	1.5	1.6	1.4	1.6	1.7	1.5
Tomatoes - Peppers	**1**	1.7	1.7	1.6	1.9	1.9	1.8	2.1	2.1	2.0

Resolution 2014-01
of the
Fox Canyon Groundwater Management Agency

A RESOLUTION ESTABLISHING THE CONEJO CREEK WATER PUMPING PROGRAM INVOLVING CAMROSA WATER DISTRICT AND PLEASANT VALLEY COUNTY WATER DISTRICT USING THE CONEJO CREEK DIVERSION

WHEREAS, the Fox Canyon Groundwater Management Agency Ordinance Code allows an operator to obtain storage credits for water that has been determined by the Agency Board to be foreign water stored.

WHEREAS, Calleguas Municipal Water District ("Calleguas"), Camrosa Water District ("Camrosa"), the City of Thousand Oaks, and Pleasant Valley County Water District ("Pleasant Valley") entered into various agreements to cooperate in the appropriation and beneficial use of the recycled water and recaptured water, including the construction and operation of facilities ("Conejo Creek Project" or "Project") to convey recycled water and recaptured water (collectively, "Project Water") to Camrosa and Pleasant Valley.

WHEREAS, among the agreements referenced above was an agreement between Calleguas and Pleasant Valley in 1994 setting forth the terms by which Pleasant Valley may purchase from Calleguas certain Project Water diverted through the Project to Pleasant Valley for utilization within Pleasant Valley's jurisdictional boundaries ("1994 Agreement").

WHEREAS, the 1994 Agreement provided that certain credits may accrue to Pleasant Valley under Fox Canyon Groundwater Management Agency ("Agency") ordinances and that Pleasant Valley shall transfer, in accordance with Agency ordinances, an acre-foot of credits as earned to Calleguas for each acre-foot of water delivered to Pleasant Valley from the Conejo Creek Project.

WHEREAS, the Agency Board in May 28, 2003, determined, approved and conditioned that water diverted by the Conejo Creek Project is foreign water and that deliveries of surface water from the Conejo Creek Project to Pleasant Valley's storage reservoir qualify for credits.

WHEREAS, under the 2003 approved program, credits earned by Pleasant Valley for deliveries of Conejo Creek Project water to meet local irrigation demands in lieu of groundwater pumping were transferred from Pleasant Valley to Calleguas Municipal Water District which may in turn transfer those credits to United Water Conservation District ("United") under the Supplemental M&I Water Program.

WHEREAS, Calleguas and United intend to continue to utilize credits through the Supplemental M&I Program, but Calleguas wishes to terminate its future participation in the Conejo Creek Project and cease accruing additional credits after the 1994 Agreement is terminated.

WHEREAS, Camrosa and Pleasant Valley propose to enter into an agreement by which Camrosa will sell Conejo Creek Project Water to Pleasant Valley ("Water Sale Agreement").

The substantive provisions of the Water Sale Agreement generally mirror the provisions of the 1994 Agreement.

WHEREAS, the proposed Water Sale Agreement provides that, subject to Agency approval, Pleasant Valley shall transfer to Camrosa, pursuant to applicable Agency rules and regulations, credits as earned for each acre-foot of water delivered to Pleasant Valley from Camrosa through the Conejo Creek Project

WHEREAS, the Conejo Creek Project is recognized in the Agency's Groundwater Management Plan as one of several strategies for bringing the aquifers of the Agency into balance, and the proposed Water Sale Agreement will help ensure that Project Water will continue to be utilized by Pleasant Valley.

WHEREAS, the Agency Ordinance Code authorizes the adjustment of extraction allocations consistent with the goal of reaching safe yield.

WHEREAS, an Impact Analysis (Analysis), dated December 12, 2013, concludes: 1) Deliveries of Conejo Creek Project water to Pleasant Valley have significantly reduced groundwater pumping by Pleasant Valley; 2) Conejo Creek Project water has the added benefit of being drought-proof because of its component of recycled water; 3) Pumping is moved away from the pumping depression and the coast to a more-inland area of better stormwater recharge; 4) Without the agreement, Conejo Creek Project water is delivered elsewhere and Pleasant Valley pumping would increase to replace that water source, resulting in a further drop of groundwater elevations; and 5) thus, the Conejo Creek Water Pumping Program is a net advantage to the basin.

WHEREAS, to the extent that cumulative extractions by Camrosa never exceed deliveries to Pleasant Valley, the proposed Water Sale Agreement will result in a net benefit to the Pleasant Valley Basins.

NOW, THEREFORE, IT IS HEREBY ORDERED AND RESOLVED THAT:

1. The Board approves the Conejo Creek Water Pumping Program involving Camrosa Water District and Pleasant Valley County Water District using the Conejo Creek Diversion.

2. Camrosa's cumulative pumping extractions through this program shall never exceed the cumulative deliveries to Pleasant Valley through this program. *The transfer of credits between Pleasant Valley and Camrosa is approved, as set forth in the Pleasant Valley/Camrosa agreement attached hereto and made a part hereof by reference."*

3. Camrosa will actively meter extraction quantity and monitor:

    a. Water levels: Transducers in the Woodcreek Well and any new well Camrosa constructs in the PV Basin will record water levels on at least a monthly basis.
    b. Water quality: Camrosa will monitor at least annually the water quality of the Woodcreek Well and any new wells that are part of this Resolution.

4. Camrosa shall submit an Annual Report to the Agency by February 1st each year, which shall include:

a. Conejo Creek Project water delivery amounts to Pleasant Valley;
b. Credits retired in accordance with deliveries to Pleasant Valley;
c. Camrosa's cumulative deliveries to Pleasant Valley;
d. Well extractions under this program;
e. Water quality data;
f. Historical and past year water level well data from Camrosa's Pleasant Valley basin well(s); and
g. Drawdown analysis from extractions.

5. For the purpose of determining net impacts to the basin as a result of this agreement the Agency and Camrosa shall meet during the first week of May annually to review the contents of the Annual Report and its conclusion. If there are disagreements with the findings of net detriment, the matter may be referred to the FCGMA Board.

6. Camrosa will incrementally phase in extractions as follows:

   a. Calendar Year 2014: Extractions will be limited to 200 AF.
   b. Calendar Year 2015: Extractions will be limited to 1,000 AF.
   c. Calendar Year 2016: Extractions will be limited to 2,000 AF.
   d. Calendar Year 2017: If monitoring data indicates the basin will support it, extractions will be limited to 3,000 AF.
   e. Calendar Year 2018: If monitoring data indicates the basin will support it, extractions will be limited to 4,500 AF.
   f. All subsequent years: If monitoring data indicates the basin will support it, extractions will be limited to 4,500 AF annually.

7. Camrosa shall extract from Camrosa-owned wells and may supply groundwater so extracted within its service territory in accordance with Agency Resolution No. 2011-01.

8. The extractions referenced in this agreement are in addition to Camrosa's existing 806 AF yearly allocation currently being pumped at Woodcreek Well. The existing 806 AF allocation will be the first utilized for extraction.

9. This resolution will terminate on the same date as the agreement between Camrosa and Pleasant Valley regarding this program or 30 days after mutual agreement between the Agency and Camrosa.

On motion of Director Craven, seconded by Director Bennett, the foregoing resolution was passed and adopted on this 26th day of March 2014.

By: _____
Lynn E. Maulhardt, Chair, Board of Directors
Fox Canyon Groundwater Management Agency

ATTEST: I hereby certify that the above is a true and correct copy of Resolution No. 2014-01.

By: _____
Jessica Kam, Clerk of the Board

Resolution No. 2014-02
of the
Fox Canyon Groundwater Management Agency

A RESOLUTION INCREASING EXTRACTION CHARGES TO $6.00 PER ACRE-FOOT

WHEREAS, pursuant to the authority of the Fox Canyon Groundwater Management Agency Act Sections 121-102, *et seq.,* the Fox Canyon Groundwater Management Agency (the Agency) has been granted certain powers for the purposes of groundwater management within its boundaries; and

WHEREAS, the mission of the Fox Canyon Groundwater Management Agency includes the protection and preservation of the groundwater resources within the boundaries of the Fox Canyon Groundwater Management Agency; and

WHEREAS, the Fox Canyon Groundwater Management Agency Act, Sections 1001-1007, as amended, grant the Agency's Board of Directors the authority to levy groundwater extraction charges up to six dollars ($6.00) per acre-foot pumped per year on all water extracted within the Agency's boundaries; and

WHEREAS, Section 2.4.1 of Agency Ordinance No. 8.7, adopted by the Board of Directors on May 22, 2013, states that, "...all persons operating groundwater extraction facilities shall pay a groundwater extraction charge for all groundwater extracted after July 1, 1993, in the amount established by Resolution of the Board;" and

WHEREAS, the Agency's current groundwater extraction charge was set at $4.00 per acre-foot upon the adoption of Resolution No. 2005-06 by the Board of Directors during the June 22, 2005 meeting; and

WHEREAS, the 10-year average amount of groundwater now pumped is approximately 125,000 acre-feet per year; and

WHEREAS, the Agency has incurred increased costs required to administer and enforce its groundwater extraction management plans, policies, programs, resolutions and ordinances proactively, efficaciously and successfully; and

WHEREAS, the cost of running the Agency cannot be supported at the current $4.00 per acre-foot extraction charge; and

WHEREAS, the extraction charge is not a tax for purposes of Article XIII C of the California Constitution, or a fee or charge for purposes of Article XIII D of the California Constitution.

NOW, THEREFORE, IT IS HEREBY PROCLAIMED AND ORDERED that effective July 1, 2014, the groundwater extraction charge shall be six ($6.00) per acre-foot for groundwater extracted from facilities within the boundary of the Fox Canyon Groundwater Management Agency.

On motion by Director Craven, and seconded by Director Bennett, the foregoing resolution was passed and adopted on June 25, 2014 by the following vote.

AYES – Chair Maulhardt, Directors Craven, Bennett, and Kelley
NOES – Director Borchard
ABSTAINS – None
ABSENT - None

By: _____
Lynn E. Maulhardt, Chair, Board of Directors
Fox Canyon Groundwater Management Agency

ATTEST: I hereby certify that the above is a true and correct copy of Resolution No. 2014-02.

By: _____
Jessica Kam, Clerk of the Board

Resolution No. 2014-03
of the
Fox Canyon Groundwater Management Agency

A RESOLUTION SUPPORTING A LEGISLATIVE CHANGE IN MAXIMUM ALLOWABLE EXTRACTION CHARGE

WHEREAS, pursuant to the authority of the Fox Canyon Groundwater Management Agency Act Sections 121-102, *et seq.*, the Fox Canyon Groundwater Management Agency (the Agency) has been granted certain powers for the purposes of groundwater management within its boundaries; and

WHEREAS, the mission of the Fox Canyon Groundwater Management Agency includes the protection and preservation of the groundwater resources within the boundaries of the Fox Canyon Groundwater Management Agency; and

WHEREAS, the Fox Canyon Groundwater Management Agency Act, Sections 1001-1007, as amended, grant the Agency's Board of Directors the authority to levy groundwater extraction charges up to six dollars ($6.00) per acre-foot pumped per year on all water extracted within the Agency's boundaries; and

WHEREAS, Section 2.4.1 of Agency Ordinance No. 8.7, adopted by the Board of Directors on May 22, 2013, states that, "...all persons operating groundwater extraction facilities shall pay a groundwater extraction charge for all groundwater extracted after July 1, 1993, in the amount established by Resolution of the Board;" and

WHEREAS, the Agency's current groundwater extraction charge was set at $4.00 per acre-foot upon the adoption of Resolution No. 2005-06 by the Board of Directors during the June 22, 2005 meeting; and

WHEREAS, the Agency's 2007 Update to its Groundwater Management Plan established a basin safe yield of 100,000 acre-feet per year; and

WHEREAS, the 10-year average amount of groundwater now pumped is approximately 125,000 acre-feet per year; and

WHEREAS, the Agency has incurred increased costs required to administer and enforce its groundwater extraction management plans, policies, programs, resolutions and ordinances proactively, efficaciously and successfully; and

WHEREAS, the anticipated cost of running the Agency in the future cannot be supported at the current extraction charge; and

WHEREAS, the extraction charge is not a tax for purposes of Article XIII C of the California Constitution, or a fee or charge for purposes of Article XIII D of the California Constitution.

NOW, THEREFORE, IT IS HEREBY PROCLAIMED AND ORDERED that the Agency Executive Officer take those actions necessary to change West's Annotated California Code - Water Appendix, Chapter 121-1007 to allow an extraction charge range with a maximum of twenty-five dollars ($25.00) per acre-foot per year. Actual extraction charges will be set within the allowable range by Resolution of the Board of Directors.

On motion by Director Craven, and seconded by Director Bennett, the foregoing resolution was passed and adopted on June 25, 2014 by the following vote.

AYES – Chair Maulhardt, Directors Craven, Bennett, and Borchard
NOES – Director Kelley
ABSTAINS – None
ABSENT - None

By: _____
Lynn E. Maulhardt, Chair, Board of Directors
Fox Canyon Groundwater Management Agency

ATTEST: I hereby certify that the above is a true and correct copy of Resolution No. 2014-03.

By: _____
Jessica Kam, Clerk of the Board

Irrigation Allowance Index Values (Adjusted 25%)*

Acre-Feet/Acre

Includes leaching and DU = 0.8	**# of Crops**	**Oxnard (Z1)**			**Camarillo (Z2)**			**Santa Paula (Z3)**		
		Typical	**Dry**	**Wet**	**Typical**	**Dry**	**Wet**	**Typical**	**Dry**	**Wet**
		Total AF/A	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***
Spring Veg./Fall Celery	2	2.7	2.8	2.5	3.0	3.2	2.8	3.3	3.4	3.0
Summer Veg./Fall Veg	2	2.5	2.7	2.4	2.8	3.0	2.7	3.0	3.2	2.9
Spring Veg./Late Summer Veg./+part Late Fall Veg*	**2+plus**	2.9	3.1	2.8	3.3	3.5	3.1	3.6	3.8	3.4

		Oxnard (Z1)			**Camarillo (Z2)**			**Santa Paula (Z3)**		
		Typical	**Dry**	**Wet**	**Typical**	**Dry**	**Wet**	**Typical**	**Dry**	**Wet**
Crop		***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***	***Total AF/A***
Avocado - 20% Ground Shading	**1**	1.4	1.5	1.3	1.6	1.7	1.5	1.7	1.9	1.6
Avocado - 50% Ground Shading	**1**	2.0	2.2	1.9	2.3	2.5	2.1	2.5	2.8	2.3
Avocado - 70% Ground Shading	**1**	2.7	3.1	2.6	3.1	3.5	3.0	3.4	3.8	3.2
Blueberries 20% Ground Shading	**1**	1.4	1.4	1.3	1.5	1.8	1.5	1.8	1.9	1.7
Blueberries 50% Ground Shading	**1**	2.0	2.1	1.9	2.2	2.3	2.2	2.4	2.5	2.4
Blueberries 70% Ground Shading	**1**	2.7	2.9	2.6	3.1	3.3	3.0	3.4	3.6	3.2
Celery - Single Crop	**1**	1.5	1.6	1.4	1.7	1.8	1.5	1.8	1.9	1.6
Citrus - 20% Ground Shading	**1**	1.4	1.6	1.3	1.6	1.8	1.5	1.8	1.9	1.6
Citrus - 50% Ground Shading	**1**	1.9	2.0	1.8	2.2	2.3	2.0	2.4	2.5	2.2
Citrus - 70% Ground Shading	**1**	2.6	2.7	2.4	2.9	3.0	2.7	3.2	3.3	2.9
Lima Beans	**1**	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	0.9
Misc. Veg Greenhouse - Fall	**1**	0.9	0.9	0.8	1.0	1.0	0.9	1.0	1.1	1.0
Misc. Veg Greenhouse - Spr	**1**	1.0	1.1	0.9	1.1	1.2	1.1	1.2	1.3	1.2
Misc. Veg Greenhouse - Summer	**1**	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4
Misc. Veg Single Crop - Fall	**1**	1.0	1.1	1.0	1.1	1.2	1.0	1.2	1.3	1.1
Misc. Veg Single Crop - Spr	**1**	1.2	1.3	1.1	1.3	1.4	1.2	1.5	1.6	1.4
Misc. Veg Single Crop - Summer	**1**	1.5	1.5	1.5	1.7	1.7	1.6	1.8	1.9	1.8
Nursery (Non-Greenhouse)	**1**	3.2	3.4	3.1	3.6	3.8	3.5	4.0	4.2	3.8
Nursery (Greenhouse)	**1**	3.4	3.5	3.3	3.8	3.9	3.7	4.2	4.3	4.0
Raspberries - Tunnel	**1**	3.2	3.4	3.1	3.7	3.8	3.6	4.0	4.2	3.9
Sod	**1**	3.0	3.2	2.9	3.4	3.6	3.3	3.7	3.9	3.6
Strawberries-Main Season	**1**	2.3	2.5	2.2	2.6	2.7	2.4	2.8	2.9	2.6
Strawberries-Summer	**1**	1.4	1.4	1.3	1.5	1.6	1.4	1.6	1.7	1.5
Tomatoes - Peppers	**1**	1.7	1.7	1.6	1.9	1.9	1.8	2.1	2.1	2.0

*Adopted by FCGMA Board on April 11, 2014

APPENDIX B

- 2014 Annual Basin Management Objectives Progress Report Board Letter
- 2014 FCGMA Basin Management Objectives Report Cards

FOX CANYON GROUNDWATER MANAGEMENT AGENCY

A STATE OF CALIFORNIA WATER AGENCY

BOARD OF DIRECTORS
Lynn E. Maulhardt, Chair, *Director, United Water Conservation District*
Charlotte Craven, Vice Chair, *Councilperson, City of Camarillo*
David Borchard, *Farmer, Agricultural Representative*
Steve Bennett, *Supervisor, County of Ventura*
Eugene F. West, *Director, Camrosa Water District*

EXECUTIVE OFFICER
Jeff Pratt, P.E.

April 22, 2015

Board of Directors
Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, CA 93009-1600

SUBJECT: 2014 AGENCY ANNUAL BASIN MANAGEMENT OBJECTIVES (BMO) REPORT CARDS – *(New Item)*

RECOMMENDATION: Receive and file the Agency's staff report regarding the status of groundwater conditions relative to the Agency's Basin Management Objectives.

EXECUTIVE SUMMARY:
The 2007 Update to the FCGMA Groundwater Management Plan (GMP) established Basin Management Objectives (BMOs) for the basins within the Agency. BMOs are groundwater levels or water quality measurements (concentrations) at specific locations (as identified in the GMP) that serve as quantitative performance metrics for evaluating the effectiveness of the Agency's groundwater management strategies toward meeting its GMP goals.

The Agency's "Report Cards" for these BMOs have been updated with data collected during calendar year 2014. The Report Cards are used to communicate status of groundwater conditions and progress toward meeting the Agency's goals. This is accomplished by comparing groundwater levels and/or quality to the BMOs. Data collected in 2014 indicate that fifteen BMOs were met and 35 were not met. There was no data available for evaluating three of the BMO wells (located in the Las Posas Basins), as one well was destroyed, one was abandoned, and one is being repaired. The destroyed and abandoned wells were replaced in this interim period for the purpose of this BMO report card with nearby wells which were perforated in approximately the same aquifer zone. For comparison, in 2013, fourteen BMOs were met, and thirty were not met, and no data was available for evaluating eight BMOs.

Among the greatest exceedances of BMOs in calendar year 2014 were:

- Water levels below the BMO by 93 feet (average value) at PTP-1 (inland, Oxnard Plain Basin, Lower Aquifer System), and 90 feet (average value) at PV No.10 (Pleasant Valley Basin);
- Chloride concentrations exceeding the BMO by 16,250 mg/L at CM1A-220 (Pt Mugu–Oxnard Plain, Upper Aquifer System), and 10,700 mg/L at CM2-760 (Port Hueneme, Oxnard Plain Basin, Lower Aquifer System);
- Nitrate concentrations above the BMO by 45 mg/L at Well No. 25D01 (Arroyo Santa Rosa Basin); and
- TDS concentration above the BMO by 1,010 mg/L at Well Nos. 09F01 and 09R01 (East Las Posas Basin).

By comparing historical water level data, groundwater levels in the Upper and Lower Aquifer Systems in the Oxnard Plain Forebay and Oxnard Plain basins, and southern portion of the Pleasant Valley basin, were generally similar in 2014 to those recorded in 1989. Groundwater quality in late 2014 was generally similar to that during the 1999 to 2002 period, with approximately fifty percent of the average chloride concentrations below the BMO chloride concentration. In 2014, average rainfall (10.05 inches) was below the Agency's 1985 to 2014 average annual rainfall (14.01 inches). To date, the 2015 wet season is also experiencing below average rainfall, and as such it is anticipated that groundwater levels and water quality will decline further.

The primary areas of concern remain:

1. Oxnard Plain Basin and Pleasant Valley Basin: Depressed water levels continue to allow conditions under which salts from the ocean and/or other geologic sources can potentially migrate into the aquifers. Areas of greatest concern are the coastal portions of the Oxnard Plain Basin near Port Hueneme (especially the Lower Aquifer System) and Pt. Mugu (both Upper and Lower Aquifer Systems) and the Pleasant Valley Basin where saline intrusion has been previously documented. Salt migration would be expected to increase during an extended drought.

2. Las Posas Basins: Poor quality water continues to migrate northward into the East Las Posas Basin from sources in the South Las Posas Basin, although the current set of BMO locations is not situated so as to illustrate this movement.

3. Arroyo Santa Rosa Basin: High nitrate and chloride concentrations remain a concern in the Arroyo Santa Rosa Basin.

DISCUSSION OF GROUNDWATER CONDITIONS AND BMO STATUS BY BASIN:
The status of the BMOs for each basin is summarized below and on the respective report card (Item 4A). Further details are provided in the "Status Summary Table" located on each report card, where the status of each BMO is displayed quantitatively and visually. The geographic location of each BMO well can be found on the map located below the table on each report card. Time-series plots of groundwater levels and constituent concentrations are available upon request. It should be noted that of the 52 BMO status check locations identified in the GMP (representing two status checks at each of the 26 BMO monitoring wells or screened intervals), 2014 data was not available for six of the BMO status check locations (three monitoring wells) (two in the East Las Posas Basin, two in the West Las Posas Basin, and two in the South Las Posas Basin). Data from destroyed Well No. 1E01 in the East Las Posas Basin was supplemented with data from Well No. 1E02, which is located approximately 310 feet south of the location of BMO Well No.1E01. Data from abandoned Well No. 6N03 in the South Las Posas Basin was supplemented with data from Well No. 7D02, which is located approximately 920 feet south of the location of BMO Well No. 6N03.

The Agency BMO program relies on data collected and provided by others. The data collected in 2014, and used for this update report, was provided by United Water Conservation District, Calleguas Municipal Water District, Pleasant Valley County Water District, and Zone Mutual Water Company. Where data was not collected in 2014 (Well No. 6R01), the well operator (Ventura County Waterworks District) is working towards returning the well to service.

Oxnard Plain Forebay Basin (Forebay)

- BMOs: The Forebay has BMOs for nitrate and total dissolved solids (TDS) to protect groundwater quality for potable and irrigation uses. There are no established groundwater level BMOs for the Forebay.

- Status: Average nitrate concentrations were above their respective BMOs at El Rio No. 5 (by over 55 mg/L) and El Rio No. 15 (by over 2 mg/L) respectively in 2014. Depending on the well, average TDS concentrations were above (El Rio No. 5) or below (El Rio No. 15) for their respective BMOs. At El Rio No. 5 the BMO was exceeded by 138 mg/L. At El Rio No.15 the average concentration was below the BMO by 113 mg/L. The average TDS concentrations at El Rio No. 5 and El Rio No. 15 increased 310 and 82 mg/L respectively during 2014.

- Trends: During the last five years, the average nitrate and TDS concentrations of samples collected at both locations have increased.

Oxnard Plain Basin – Upper Aquifer System

- BMOs: The Oxnard Plain Basin – Upper Aquifer System has BMOs for groundwater levels and chloride concentrations along the coast and at one inland location. These BMOs monitor saline intrusion (sufficiently high water levels guard against intrusion, while chloride is a direct indicator of intrusion).

- Status: A comparison of 2013 and 2014 average annual water levels indicates the average annual water levels declined approximately three to thirteen feet. In 2014, water level BMOs were not met. The average water levels at the two northwestern wells (Well Nos. CM3 and A1) were one and fifteen feet below the BMO level. Of the seven wells in the southern portion of the basin, Well No. CM6-330 (Pt. Mugu area) had the lowest average water level, which was 45 feet below the BMO. The Pt. Mugu area is challenging because it lies furthest from the primary groundwater recharge area for the basin (e.g. the Forebay). As long as water levels remain consistently below BMOs, the risk for additional intrusion persists. Consistent with past results, chloride BMOs were not met near Port Hueneme (BMO Well No. CM4) and Pt. Mugu (BMO Well Nos. CM1A and CM6).

- Trends: In 2014, water levels were at their lowest levels during the five-year period. Water levels at the end of 2014 were roughly equivalent to those in 1989, and 1992 to 1993. Chloride concentrations have generally been stable at seven of the nine BMO locations. The five-year trend in chloride concentrations at Pt. Mugu nested well location Well No. CM6-330, and decreasing at CM6 with chloride concentration increasing at Well No. CM6-200.

Oxnard Plain Basin – Lower Aquifer System

- BMOs: The Oxnard Plain Basin – Lower Aquifer System has BMOs for groundwater levels and chloride concentrations along the coast and at one inland location. These BMOs monitor saline intrusion (sufficiently high water levels guard against intrusion, while chloride is a direct indicator of intrusion).

- Status: A comparison of 2013 and 2014 average annual water levels indicates that the average annual water levels declined approximately 16 to 36 feet. In 2014, water level BMOs were not met. Average water levels at the five locations were significantly below their respective BMOs (34 feet below near the northwest corner of the basin and 133 feet below near the shared basin boundary with the Pleasant Valley Basin). As long as water levels remain consistently below BMOs, the risk for additional intrusion persists. Consistent with past results, chloride BMOs were not met near Port Hueneme (Well No. CM2) and Pt. Mugu (Well Nos. CM6 and CM1A).

- Trends: In 2014, water levels were at their lowest levels during the five-year period. Water levels at the end of 2014 were roughly equivalent to those in 1992 to 1993. Chloride concentrations have generally been stable during the past five years, except at Pt. Mugu (Well Nos. CM6 and CM1A).

Over the past five years, chloride concentrations have decreased at Well No. CM6 and increased at Well No. CM1A.

Pleasant Valley Basin

- BMOs: The Pleasant Valley Basin has BMOs for groundwater levels and chloride concentrations. These BMOs monitor saline intrusion (sufficiently high water levels guard against intrusion, while chloride is a direct indicator of intrusion).

- Status: In 2014, water levels BMOs were not met at either BMO location. Average water levels remain significantly below the respective BMOs (101 to 130 feet below). The chloride BMO was met at both locations (111 mg/L and 106 mg/L).

- Trends: During the past five years, water levels at both locations have fluctuated but are roughly equivalent the average water level in 1993. Chloride concentrations at both locations have fluctuated and are currently above the five-year low concentration yet below the five-year high concentration. Over the past 20 years chloride concentrations at the southern location have remained below the BMO, while concentrations at the northern location have fluctuated above and below the BMO of 150 mg/L.

Arroyo Santa Rosa Basin

- BMOs: The Arroyo Santa Rosa Basin has BMOs for nitrate and chloride to protect groundwater quality for potable and irrigation uses.

- Status: The average nitrate concentrations were below the BMO at Well No. I 25C05 by 2 mg/L and exceeded the BMO at Well No. 25D01 by 45 mg/L. The average chloride concentration exceeded the BMO of 150 mg/L at both monitoring locations, Well Nos. 25C05 and 25D01, by 31 mg/L and 9 mg/L respectively.

- Trends: Nitrate concentrations have declined at the location of Well No. 25C05 from above the BMO of 45 mg/L to just below the BMO at 43 mg/L. Based on the available data, nitrate concentrations have exceeded the BMO requirement at the location of Well No. 25D01 during past 5-years, with concentrations increasing from approximately 55 mg/L to 90 mg/L. Note that 45 mg/L is the Maximum Contaminant Level for drinking water. Chloride concentrations have been increasing over the past 5 years, and exceeded the BMO in 2014 at both well locations.

Las Posas Basins

- BMOs: The Las Posas Basins have BMOs for chloride and TDS to protect groundwater quality for potable and irrigation uses.

- Status: No data was available for three of the six BMO monitoring wells for 2014. One of the wells (Well No. 1E01) was destroyed under permit in 2013. One (Well No. 6N03) has been abandoned by the owner. One well (Well No. 6R01) was down for repairs in 2014 and is expected to be operational in 2015. Replacement monitoring wells were selected in the interim for Well Nos. 1E01 and 6N03. Well No. 1E02 is approximately 310 feet south of Well No. 1E01 and perforated at roughly the same interval. Well No. 7D02 is approximately 920 feet south of Well No. 6N03 and perforated at roughly the same interval. Based on average chloride analytical results, the chloride BMO was met at one of the three BMO well locations in the East Las Posas Basin. The TDS BMO was not met at the well locations in the southern portion of the East Las Posas Basin. Chloride and TDS BMOs were met in the West Las Posas Basin (Well No. 08F01) and South Las Posas Basin (Well No. 07D02).

- Trends: In the East Las Posas Basin, chloride and TDS concentrations over the last five years have generally been gradually increasing. The available data for the West Las Posas and South Las Posas Basins indicate that chloride concentrations over the last five years have been stable at the BMO locations. TDS average concentrations have slightly increased in the West Las Posas Basin and slightly decreased in the South Las Posas Basin.

This letter has been reviewed by Agency Counsel. If you have any questions, please call Kathleen Riedel at (805) 654-2954, or me at (805) 654-2073.

Sincerely,

Jeff Pratt, P.E.
FCGMA Executive Officer

Attachment: Basin Management Objectives Report Cards (Item 4A)

FOX CANYON GMA BASIN MANAGEMENT OBJECTIVES REPORT CARD
OXNARD PLAIN FOREBAY
2014

Goal: Protect water quality at public drinking water wells (nitrate and TDS) and irrigation suitability (TDS). (Note TDS = total dissolved solids)

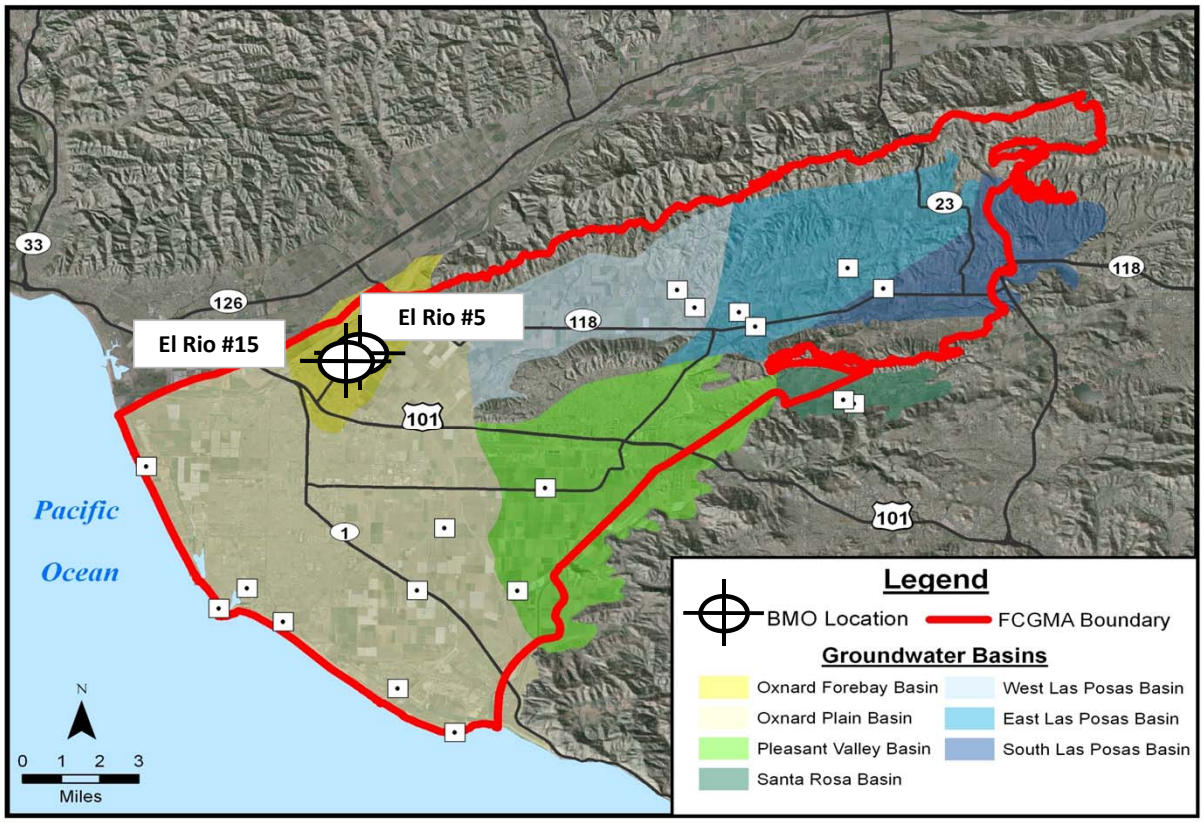
BMOs: Nitrate Concentration: 22.5 mg/L-NO_3 (50% of State of California MCL)

TDS Concentration: 1,200 mg/L (LARWQCB Basin Plan Objective)

Status Summary: In 2014, average nitrate concentrations were above the BMO at well El Rio #5 and at well El Rio #15. Average TDS concentrations were above the BMO at well El Rio #5 yet below the BMO at well El Rio #15. Declining water levels during 2014 have contributed to increasing nitrate and TDS concentrations, compared to those in 2013.

Status Summary Table

State Well Number (name)	Depth (ft)	Nitrate (mg/L)		TDS (mg/L)		5-yr Trend	
		BMO	2014 Ave	BMO	2014 Ave	Nitrate	TDS
02N22W23B02S (El Rio #5)	135-277	22.5	78	1,200	1,338	↑	↑
02N22W23C05S (El Rio #15)	140-310	22.5	25	1,200	1,087	↑	↑



FOX CANYON GMA BASIN MANAGEMENT OBJECTIVES REPORT CARD
OXNARD PLAIN - UPPER AQUIFER SYSTEM
2014

Goal: Prevent saline intrusion in the Oxnard and Mugu Aquifers. Primary source is seawater inflow via aquifer outcrops in submarine canyons near Port Hueneme and Pt. Mugu.

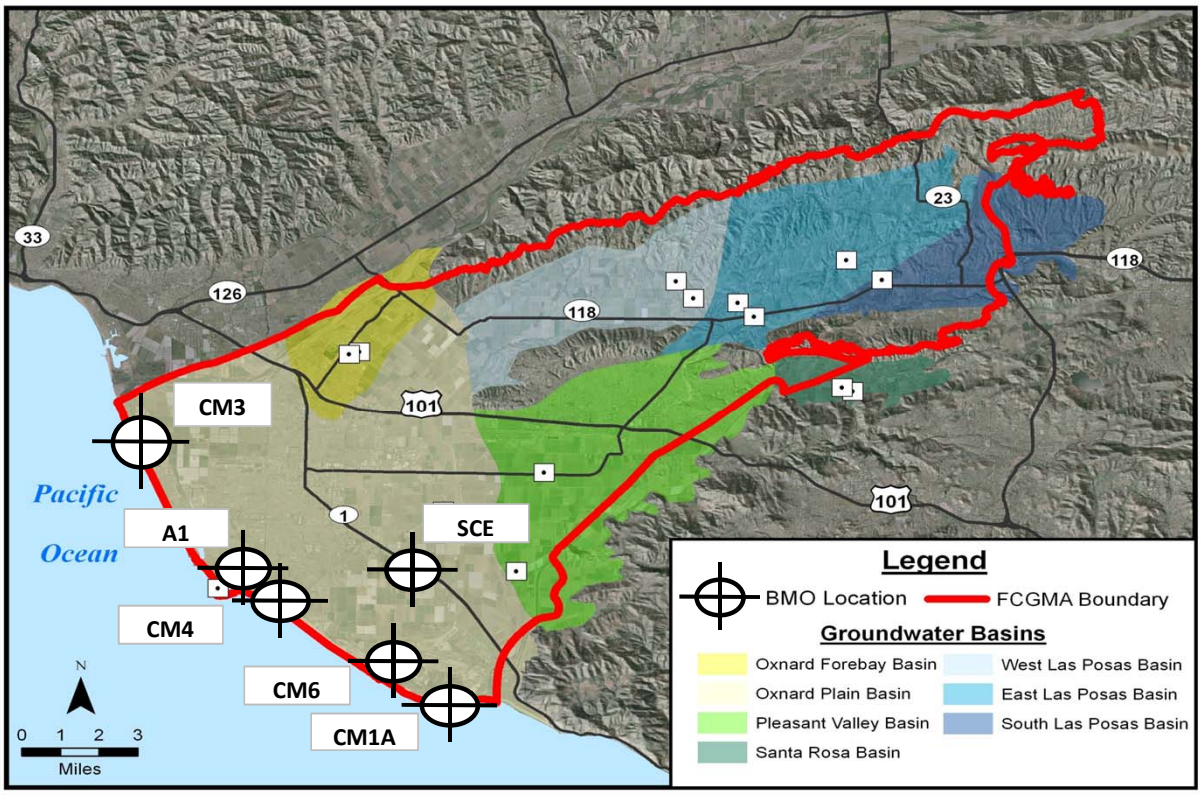
BMOs: Water Levels: Average groundwater elevations suffient to maintain slight seaward groundwater gradient. Elevation varies with location.

Chloride Concentration: 150 mg/L Chloride (LARWQCB Basin Plan Objective).

Status Summary: Water level BMOs were not met in 2014. A comparison of water levels indicates that water levels have declined at all nine monitoring locations over the past three years. Chloride BMOs were met at approximately 40% of the monitoring locations. Consistent with past results, chloride BMOs were not met near Port Hueneme (CM4) and Pt. Mugu (CM6 and CM1A).

Status Summary Table

State Well Number (name)	Depth (ft)	Water Level (ft msl)		Chloride (mg/L)		5-yr Trend	
		BMO	2014 Ave	BMO	2014 Ave	Water Level	Chloride
01N23W01C05S (**CM3**-145)	120-145	3	2	150	45	↓	→
01N22W20J08S (**A1**-195)	155-195	4	-6	150	139	↓	→
01N22W20J07S (**A1**-320)	280-320	8	-7	150	40	↓	→
01N22W28G05S (**CM4**-200)	180-200	5	-6	150	168	↓	→
01N22W28G04S (**CM4**-275)	255-275	8	-7	150	6,770	↓	→
01N21W19L12S (**SCE**-220)	200-220	5	-17	150	66	↓	→
01S22W01H04S (**CM6**-200)	180-200	5	-16	150	2,188	↓	↓
01S22W01H03S (**CM6**-330)	310-330	8	-37	150	2,655	↓	↑
01S21W08L04S (**CM1A**-220)	200-220	5	-10	150	16,400	↓	→



FOX CANYON GMA BASIN MANAGEMENT OBJECTIVES REPORT CARD
OXNARD PLAIN - LOWER AQUIFER SYSTEM
2014

Goal: Prevent saline intrusion in the LAS. Sources are seawater inflow via aquifer outcrops in submarine canyons near Port Hueneme and Pt. Mugu and marine sediments.

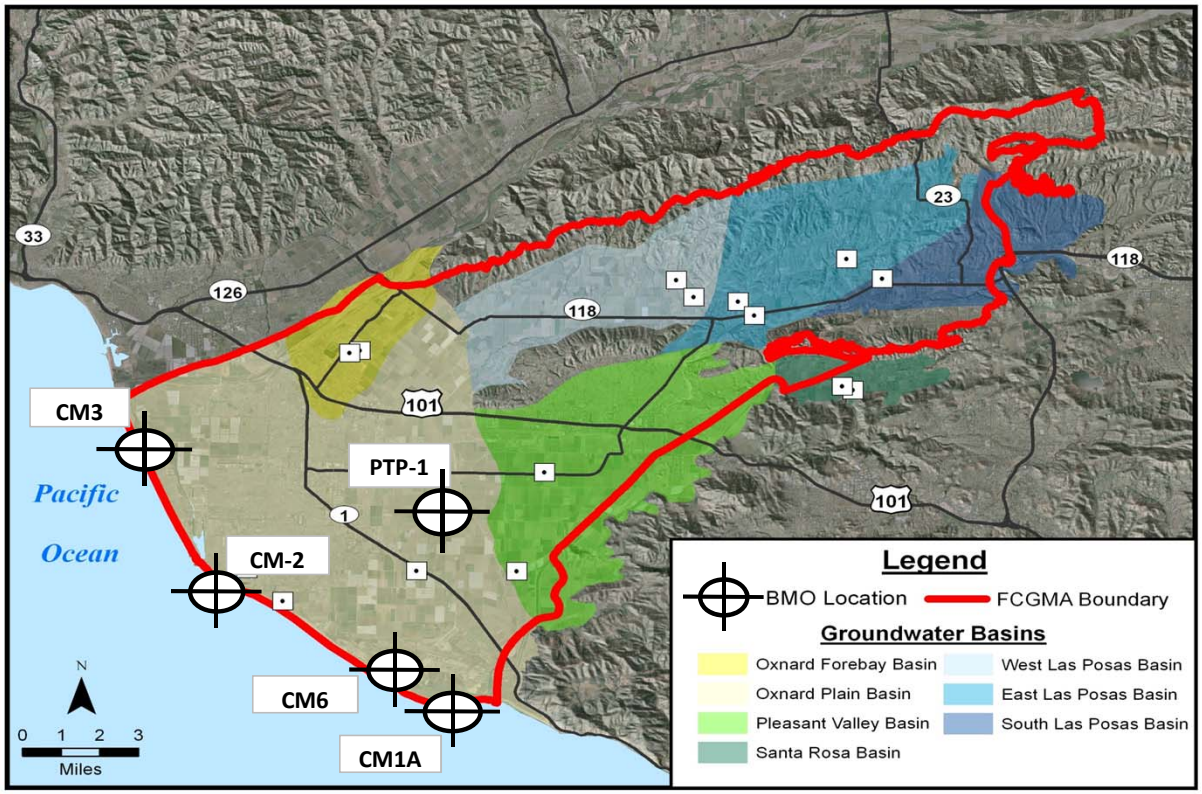
BMOs: Water Levels: Average groundwater elevations suffient to maintain slight seaward groundwater gradient. Elevation varies with location.

Chloride Concentration: 150 mg/L Chloride (LARWQCB Basin Plan Objective).

Status Summary: In 2014, water level BMOs were not met. Average water level at inland PTP-#1 location was below its respective BMO by 133 feet. As long as water levels remain depressed, the potential for saline intrusion remains. Consistent with the past, chloride BMOs were not met near Port Hueneme (CM2) and Pt. Mugu (CM1A) (areas of documented seawater intrusion).

Status Summary Table

State Well Number (name)	Depth (ft)	Water Level (ft msl)		Chloride (mg/L)		5-yr Trend	
		BMO	2014 Ave	BMO	2014 Ave	Water Level	Chloride
01N23W01C04S (**CM3**-695)	630-695	17	-17	150	36	↓	→
01N22W29D02S (**CM2**-760)	720-760	19	-26	150	10,850	↓	→
01S22W01H01S (**CM6**-550)	490-550	13	-65	150	227	↓	↓
01S21W08L03S (**CM1A**-565)	525-565	14	-80	150	6,013	↓	↑
01N21W07J02S (**PTP #1**)	590-1280	20	-113	150	41	↓	→



FOX CANYON GMA BASIN MANAGEMENT OBJECTIVES REPORT CARD
PLEASANT VALLEY BASIN
2014

Goal: Prevent inland migration of saline groundwater from coastal areas, underlying sources, and fine-grained interbeds.

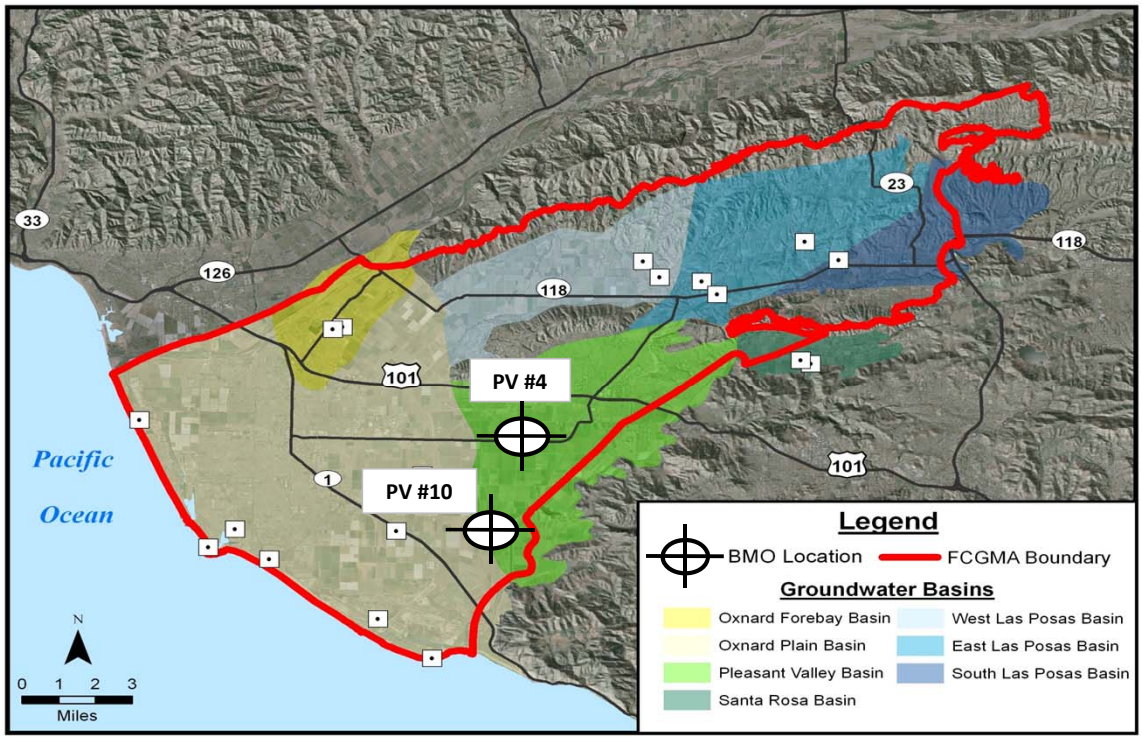
BMOs: Water Levels: Average groundwater elevations suffient to prevent landward migration from coastal areas and minimize vertical gradients.

Chloride Concentration: 150 mg/L Chloride (LARWQCB Basin Plan Objective).

Status Summary: In 2014, water level BMOs were not met at either location. Water levels have fluctuated annually yet the overall waterlevels have declined during the last 3 of the last 5 years, remaining significantly below the BMOs. The chloride BMO is met at both monitoring locations. Over the past 5-years, the chloride concentrations at both monitoring locations have fluctuated, yet are within the range of fluctuation.

Status Summary Table

State Well Number (name)	Depth (ft)	Water Level (ft msl)		Chloride (mg/L)		5-yr Trend	
		BMO	2014 Ave	BMO	2014 Ave	Water Level	Chloride
01N21W03K01S (**PV #4**)	403-1433	20	-81	150	111	↓	→
01N21W21H02S (**PV #10**)	503-863	20	-110	150	106	↓	→



FOX CANYON GMA BASIN MANAGEMENT OBJECTIVES REPORT CARD
ARROYO SANTA ROSA BASIN
2014

Goal: Meet LARWQCB Basin Plan Objectives for nitrate and chloride.

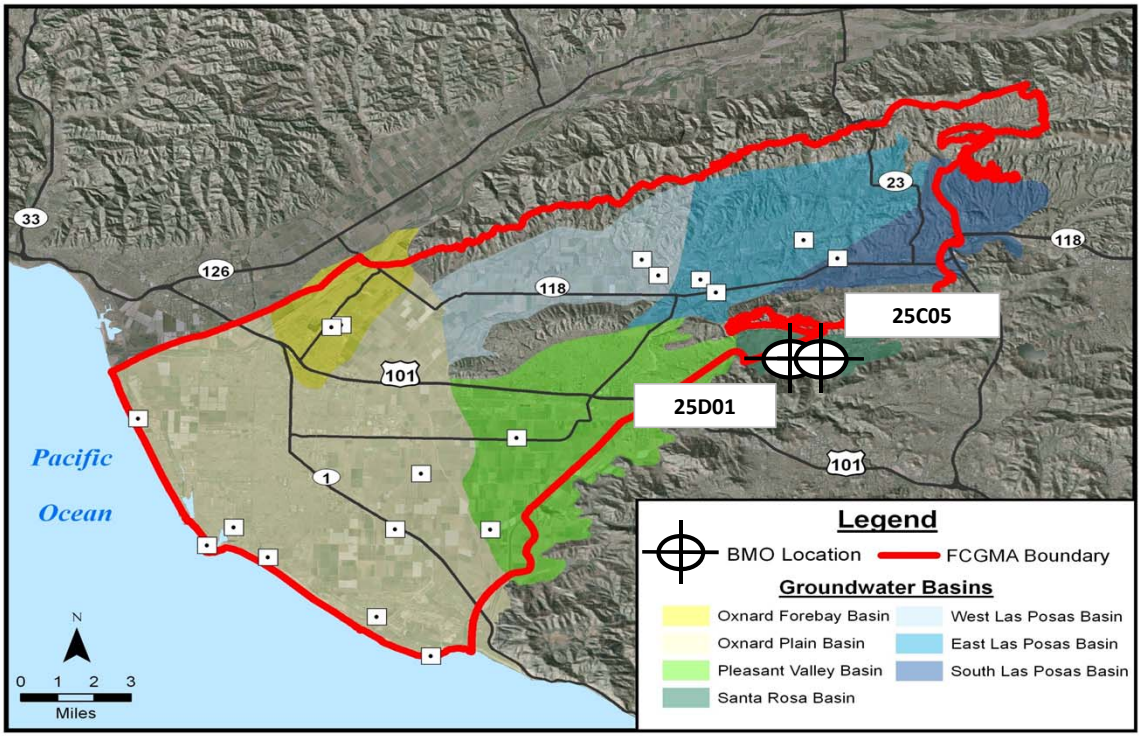
BMOs: Nitrate Concentration: 45 mg/L-NO_3 (LARWQCB Basin Plan Objective & State of CA MCL)

Chloride Concentration: 150 mg/L (LARWQCB Basin Plan Objective)

Status Summary: Based on the availble data, only one of the four BMOs was met in 2014. For the water quality sample collected from 25C05, the Nitrate concentration was just below its BMO (43 vs. 45 mg/L) and the chloride concentration was above the BMO (181 vs. 150 mg/L). For the water quality sample collected from 25D01, both the nitrate and chloride concentrations exceeded their BMOs 90 vs. 45 mg/L and 159 vs. 150 mg/L, repectively. Over the past 5 years: nitrate concentrations declined in well 25C01 and increased in well 25D01; and chloride concentrations have increased.

Status Summary Table

State Well Number (name)	Depth (ft)	Nitrate (mg/L)		Chloride (mg/L)		5-yr Trend *	
		BMO	2014 Ave	BMO	2014 Ave	Nitrate	Chloride
02N20W25C05S	160-260	45	43	150	181	↓	↑
02N20W25D01S	Unknown	45	90	150	159	↑	↑



FOX CANYON GMA BASIN MANAGEMENT OBJECTIVES REPORT CARD
LAS POSAS BASINS
2014

Goal: Maintain chloride and TDS concentrations suitable for irrigation of salt-sensitive crops, particulary avocados and berries. BMOs for SLP are equal to the concentrations observed in surface water in Arroyo Las Posas.

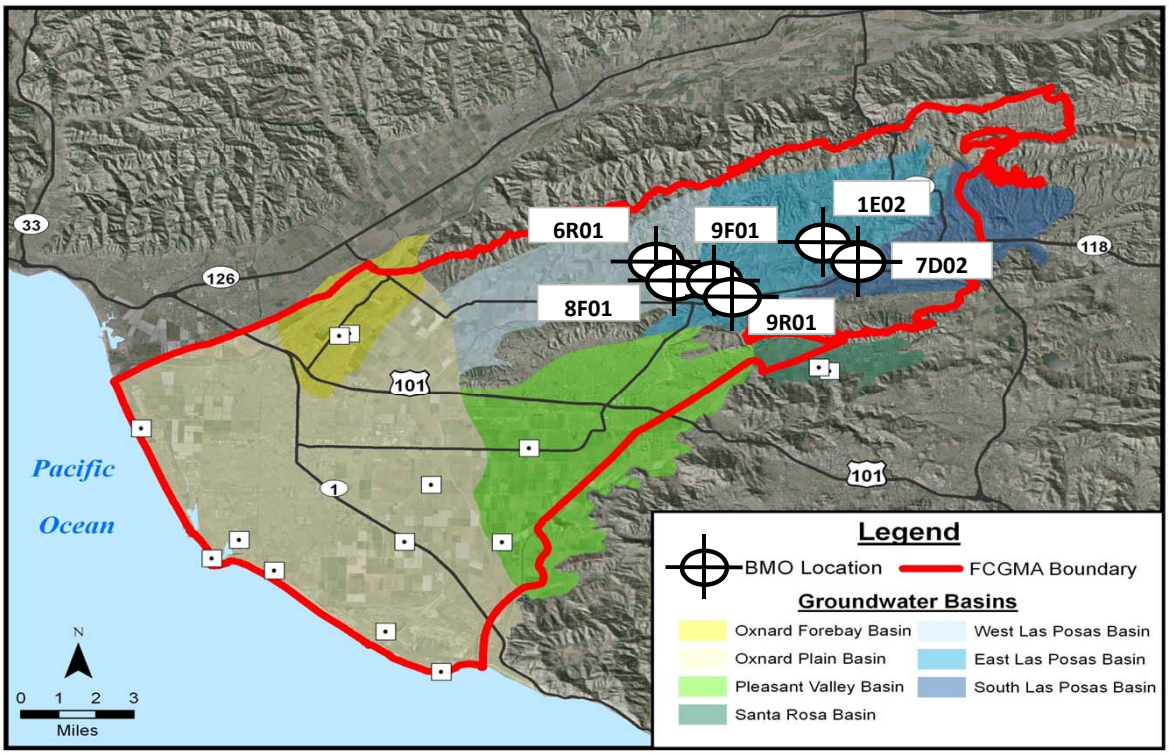
BMOs: Chloride Concentration: WLP & ELP: 100 mg/L; SLP: 160 mg/L.

TDS Concentration: ELP: 500 mg/L; WLP: 600 mg/L; and SLP: 1,500 mg/L.

Status Summary: BMO monitoring locations 1E01 and 6N03 have been replaced with 1E02 and 7D02 respectively. No data is available for BMO monitoring location 6R01 for 2014 (well being repaired). In the ELP Basin the chloride BMO is being met at only one monitoring location, and the TDS BMO is not being met. In the WLP Basin, both BMOs are being met at the one monitoing station. In the SLP Basin, the chloride BMO is being met, while the TDS BMO is not being met. The general five-year trend in the Las Posas basins is rising chloride and TDS concentrations.

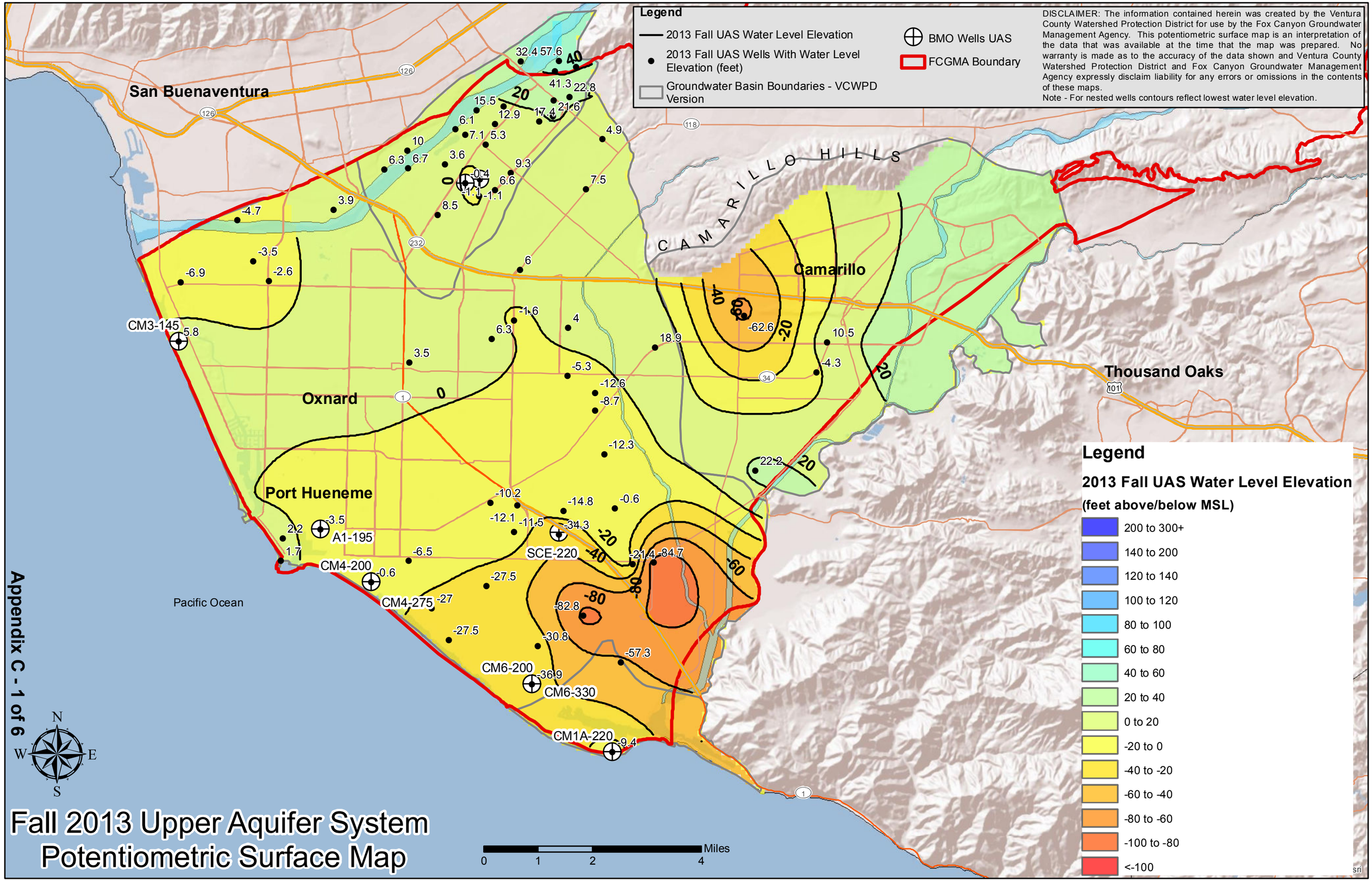
Status Summary Table

State Well Number (name)	Depth (ft)	Chloride (mg/L)		TDS (mg/L)		5-yr Trend	
		BMO	2014 Ave	BMO	2014 Ave	Chloride	TDS
02N20W09F01S (ELP)	906-1,290	100	175	500	1,510	↑	↑
02N20W09R01S (ELP)	456-724	100	191	500	1,510	↑	↑
02N20W01E02S (ELP) Replacement	680-1,000	100	98	500	757	↑	→
02N20W06R01S (WLP)	1,090-1,512	100	*No Data*	600	*No Data*	*Insufficient Data*	
02N20W08F01S (WLP)	752-1,406	100	11	600	384	→	↑
02N19W07D02S (SLP) Replacement	98-170	160	150	1500	1,240	→	↓

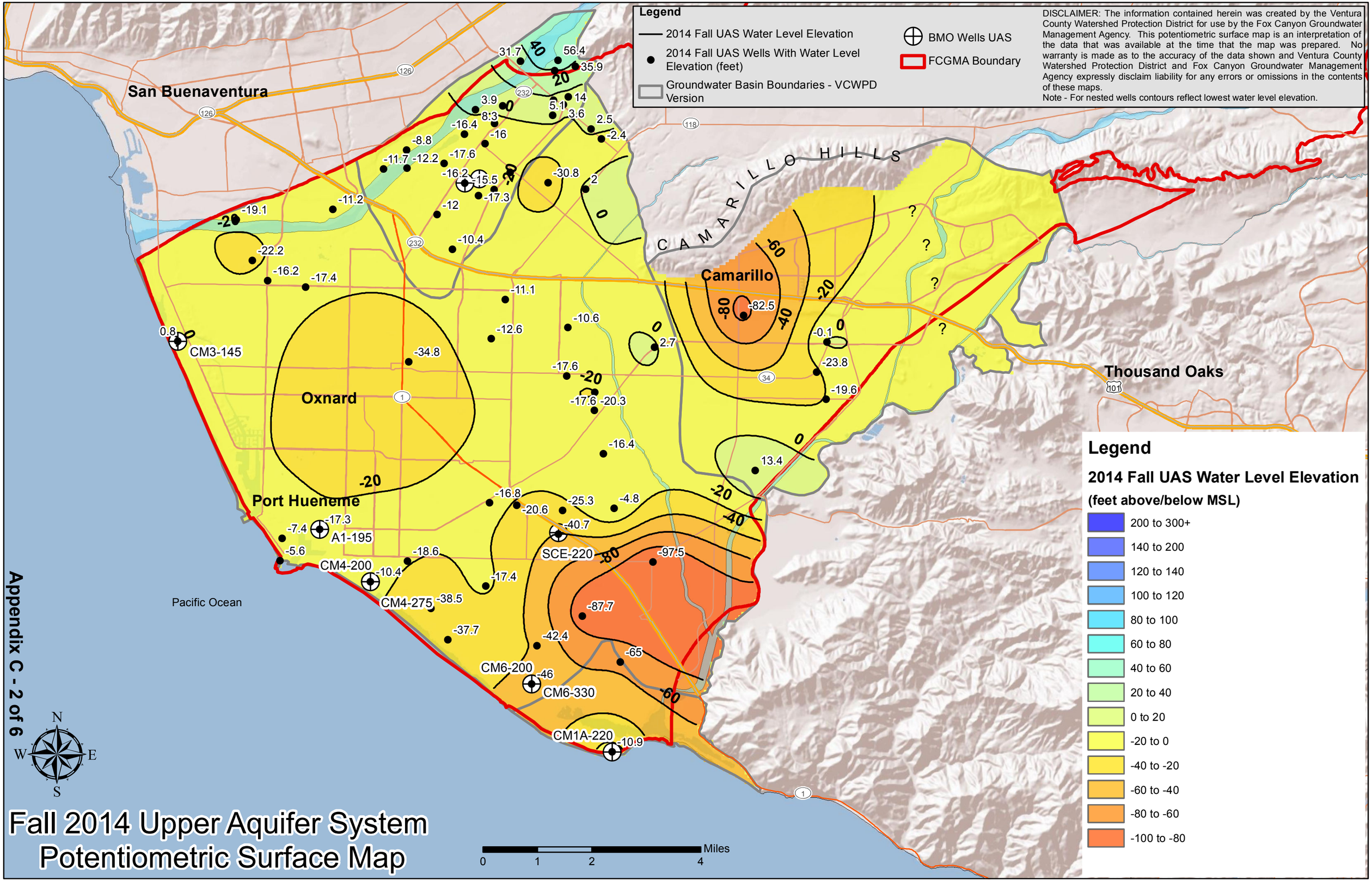


APPENDIX C

- Fall 2013 and 2014 Upper Aquifer System Potentiometric Surface Maps
- Fall 2013 and 2014 Lower Aquifer System Potentiometric Surface Maps
- Groundwater Levels Status Update Board Letter (without attachments)

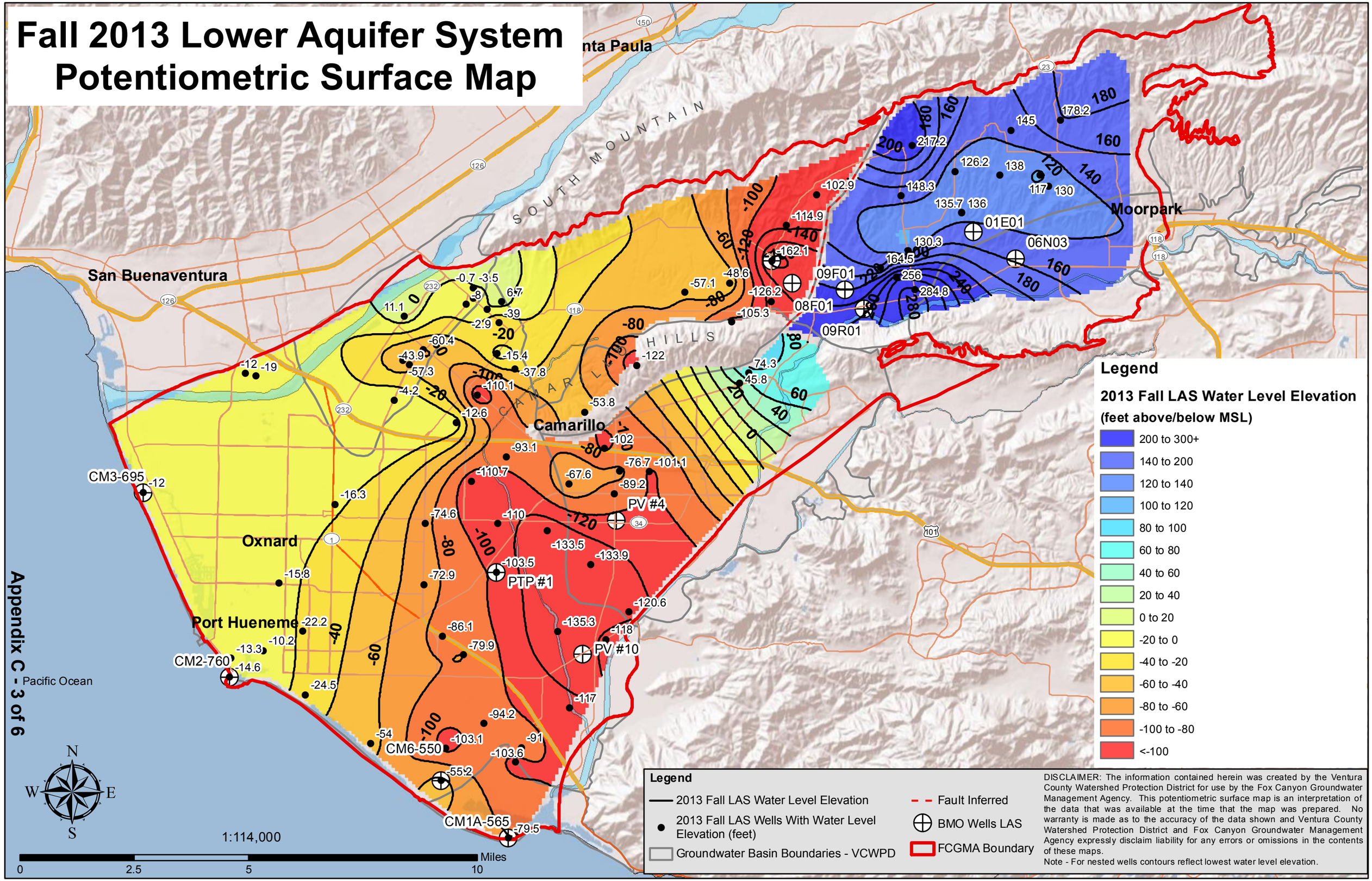


Fall 2013 Upper Aquifer System Potentiometric Surface Map

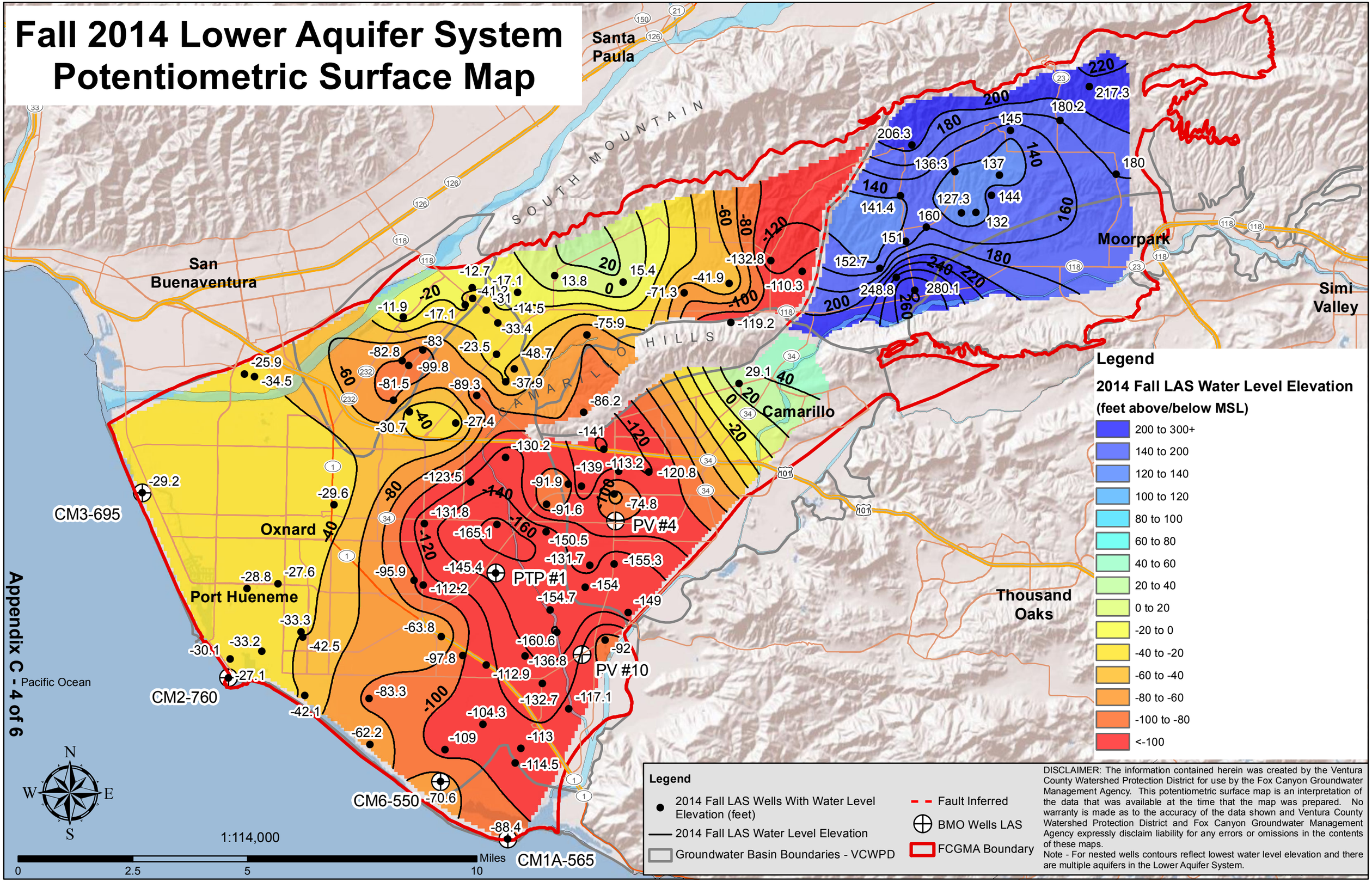


Fall 2014 Upper Aquifer System Potentiometric Surface Map

Fall 2013 Lower Aquifer System Potentiometric Surface Map



Fall 2014 Lower Aquifer System Potentiometric Surface Map



FOX CANYON GROUNDWATER MANAGEMENT AGENCY

A STATE OF CALIFORNIA WATER AGENCY

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EXECUTIVE OFFICER
Jeff Pratt, P.E.

March 25, 2015

Board of Directors
Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, CA 93009-1600

SUBJECT: GROUNDWATER LEVELS STATUS UPDATE – *(New Item)*

RECOMMENDATIONS: (1) Hear a presentation from Agency staff regarding the Fall 2014 Upper Aquifer System and Lower Aquifer System potentiometric surface maps; **(2)** Provide feedback; and **(3)** Receive and file the report.

BACKGROUND:
The potentiometric surface maps presented in this staff report are a continuation of the process of generating fall Upper Aquifer System (UAS) and Lower Aquifer System (LAS) potentiometric surface maps. The series of maps include potentiometric surface maps for both aquifer systems illustrating water levels back to 1972. The series includes maps for even years from 1972 to 2012, and annually beginning in 2013. The purpose of this report is for your Board to receive and file the latest maps so that they can be included in the Agency annual report, as well as to provide your Board with the latest information on Agency-wide water levels.

The potentiometric surface maps are a compilation groundwater data collected by the County of Ventura, United Water Conservation District (UWCD), Calleguas Municipal Water District (CMWD), and others. In preparing the maps, an effort was made to use only data obtained from wells that were extracting groundwater exclusively from either the upper or lower aquifer systems. Initial contouring was generated using ESRI's ArcMap GIS software, with manual adjustments made to better reflect expected edge of basin conditions. The maps prepared are consistent in aerial extent, display of data collection points, contour intervals, and geographic reference information with the other maps in the series. The potentiometric surface maps reflect an interpretation of groundwater and hydrogeologic conditions based upon the data available at the time the maps were generated.

DISCUSSION:
The process established in 2013 for developing potentiometric surface maps was followed in the development of the Fall 2014 UAS and LAS potentiometric surface maps. The potentiometric surface maps for the UAS and LAS, illustrating water levels, are attached (Item 8A and 8B). Draft potentiometric surface maps were sent to the original members of the technical committee on February 19, 2015. Comments were: received from UWCD staff and CMWD staff; discussed among the committee members; and incorporated as appropriate.

800 South Victoria Avenue, Ventura, CA 93009-1610
(805) 654-2014 FAX: (805) 654-3350
Website: *www.fcgma.org*

Water Level Comparisons

Oxnard Plain Forebay Basin, Oxnard Plain Basin, and Pleasant Valley Basin: A comparison of the Fall 2012, Fall 2013, and Fall 2014 potentiometric surface maps suggest that water levels have declined in the Oxnard Plain Forebay Basin, Oxnard Plain Basin, and Pleasant Valley Basin. The most dramatic changes are in two areas. One of the areas is in the vicinity of the eastern portion of the shared boundary between the Oxnard Plain Basin and the Pleasant Valley Basin. Water levels in that area declined over thirty (30) feet between Fall 2012 and 2013, and an additional twenty (20) to fifty (50) feet between Fall 2013 and 2014. The second area is west of the central portion of the eastern boundary of the Oxnard Plain Forebay Basin. Water levels in that area declined approximately 20 to 30 feet between Fall 2012 and 2013, and an additional twenty (20) to forty (40) feet between Fall 2013 and 2014. Water levels in the northern portion of the Pleasant Valley Basin declined approximately 40 between Fall 2012 and 2013, and an additional fifteen (15) feet between Fall 2013 and 2014.

East and West Las Posas Basins: Water levels rose and fell in different portions of the East and West Las Posas basins. An example of this is near the southeast corner of the West Las Posas Basin. In that area water levels fell between Fall 2012 and Fall 2013 but between Fall 2013 and Fall 2014 generally rose to approximately the Fall 2012 water levels. In the East Las Posas Basin, water levels generally declined between Fall 2012 and Fall 2013, but rose to approximately the Fall 2012 water levels between Fall 2013 and Fall 2014. It should be noted that a net amount of approximately 3,400 acre-feet of water was injected into the aquifers within the area of the Calleguas Municipal Water District's Aquifer Storage and Recovery (ASR) well field in the East Las Posas Basin during the period April through July 2014.

South Las Posas Basin and the Arroyo Santa Rosa Basin: There is insufficient data available to evaluate water level trends in the South Las Posas Basin and the Arroyo Santa Rosa Basin.

CONCLUSIONS:
Agency staff feel the Fall potentiometric maps provide a useful tool for looking at the bigger picture of groundwater conditions and trends at a regional or Agency–wide basis. Water levels overall declined in the western half of the Agency between Fall 2013 and Fall 2014.

This letter has been reviewed by Agency Counsel. If you have any questions, please call Kathleen Riedel at (805) 654-2954 or me at (805) 654-2073.

Sincerely,

Jeff Pratt, P.E.
FCGMA Executive Officer

Attachments: (1) Fall Upper Aquifer System Water Level (Potentiometric) Surface Maps – 2012 thru 2014 (Item 8A)
(2) Fall Lower Aquifer System Water Level (Potentiometric) Surface Maps – 2012 thru 2014 (Item 8B)