

2005 Urban Water Management Plan

March 2007

Valley of the Moon Water District

BROWN AND
CALDWELL



MADDAUS WATER
MANAGEMENT

Weber Analytical



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April 2, 2007

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CALDWELL

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1017/127280.005

Subject: Valley of the Moon, Urban Water Management Plan

Dear Mr. Kumar:

Brown and Caldwell is pleased to submit this final 2005 Urban Water Management Plan. We are also submitting the Plan to the California Department of Water Resources and the State Library. Please do not hesitate to contact me if you have any questions or comments at (916) 853-5306.

Sincerely,

BROWN AND CALDWELL



Paul Selsky, P.E.
Vice President

PS:DM:ds

Enclosure

cc w/enclosure: Matthew Damos, P.E., Sonoma County Water Agency
Kim Rosmaier, California Department of Water Resources
Government Publications Section, California State Library

**VALLEY OF THE MOON
WATER DISTRICT**

2005 URBAN WATER MANAGEMENT PLAN

March 2007

Prepared by:

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TABLE OF CONTENTS

SECTION 1 INTRODUCTION	1-1
1.1 Urban Water Management Planning Act	1-1
1.2 Resource Maximization and Import Minimization.....	1-1
1.3 Coordination	1-2
1.4 Public Participation and Plan Adoption.....	1-2
1.5 Plan Organization.....	1-3
1.6 Assumptions	1-3
SECTION 2 DESCRIPTION OF EXISTING WATER SYSTEM.....	2-1
2.1 Description of Service Area	2-1
2.2 Climate	2-1
2.3 Water Supply Facilities.....	2-3
2.4 Distribution System.....	2-4
2.4.1 Storage.....	2-4
2.4.2 Pump Stations	2-6
SECTION 3 PROJECTED WATER USE	3-1
3.1 Employment, Land Use, and Population.....	3-1
3.1.1 Employment Characteristics	3-1
3.1.2 Land Use Characteristics	3-1
3.1.3 Population Projections.....	3-1
3.2 Water Use	3-2
3.2.1 Water Use by Customer Type.....	3-2
3.2.2 Water Sales to Other Agencies	3-3
3.2.3 Unaccounted-for Water and Additional Water Use	3-3
3.2.4 Conservation Savings	3-4
3.2.5 Total Water Use	3-4
3.3 Demand on Wholesale Supply.....	3-5
SECTION 4 WATER SUPPLY	4-1
4.1 Surface Water	4-1
4.1.1 Description	4-1
4.1.2 Physical Constraints.....	4-1
4.1.3 Legal Constraints	4-2
4.2 Groundwater	4-3
4.2.1 Description	4-4
4.2.2 Physical Constraints.....	4-8
4.2.3 Legal Constraints	4-9
4.3 Desalination.....	4-9
4.4 Transfer and Exchange Opportunities.....	4-9
4.5 Projected Water Supplies.....	4-10
4.6 Water Supply Reliability.....	4-11
4.7 Water Quality Impacts on Future Water Supply.....	4-13

TABLE OF CONTENTS (continued)

SECTION 5 RECYCLED WATER..... 5-1

 5.1 Coordination 5-1

 5.2 Wastewater Quantity and Disposal..... 5-2

 5.2.1 Wastewater Collection and Treatment..... 5-2

 5.2.2 Wastewater Disposal 5-4

 5.3 Recycled Water Use..... 5-4

 5.3.1 Existing Recycled Water Use 5-4

 5.3.2 Potential and Projected Recycled Water Use..... 5-5

 5.3.3 Promotion of Recycled Water Use..... 5-7

SECTION 6 WATER CONSERVATION..... 6-1

 6.1 BMP Implementation 6-1

 6.2 Water Conservation Assumptions and Modeling..... 6-2

SECTION 7 WATER SUPPLY VERSUS DEMAND COMPARISON..... 7-1

 7.1 Normal Water Supply vs. Demand Comparison 7-1

 7.2 Dry Year Water Supply vs. Demand Comparison..... 7-2

SECTION 8 REFERENCES..... 8-1

LIST OF APPENDICES

Appendix A Urban Water Management Plan Public Hearing Notice and Resolution

Appendix B Valley of the Moon Water Use and Conservation Analysis

 1) Weber Analytical, Valley of the Moon Historical Water Use, August 17, 2005

 2) Maddaus Water Management, Revised Customer Water Demand Projections
 Summary of Data Inputs, Assumptions and Results, November 22, 2005

 3) Maddaus Water Management, Revised Tier One Conservation Measure
 Evaluation Summary of Data Inputs, Assumptions and Results, May 30, 2006

 4) Maddaus Water Management, FINAL Tier Two and New Development
 Conservation Measure Evaluation Summary of Data Inputs, Assumptions and
 Results, November 2, 2006

Appendix C Best Management Practices Report Filing

Appendix D Water Shortage Contingency Plan

TABLE OF CONTENTS (continued)

LIST OF TABLES

Table 1-1. (DWR Table 1) Coordination with Appropriate Agencies 1-2

Table 2-1. (DWR Table 3) Climate..... 2-3

Table 2-2. Well Data 2-3

Table 2-3. Characteristics of Existing Storage Facilities 2-4

Table 2-4. Characteristics of Pump Stations 2-6

Table 3-1. (DWR Table 2) Population – Current and Projected 3-2

Table 3-2. (DWR Table 12) Past, Current, and Projected Water Deliveries ^a 3-3

Table 3-3. (DWR Table 14) Additional Water Uses and Losses, ac-ft/yr 3-4

Table 3-4. Conservation Savings, ac-ft/yr 3-4

Table 3-5. (DWR Table 15) Total Water Use^a, ac-ft/yr 3-4

Table 3-6. (DWR Table 19) District Demand Projections to Wholesale Suppliers, ac-ft/yr ... 3-5

Table 4-1. (DWR Table 6) Amount of Groundwater Pumped by the District – ac-ft/yr 4-8

Table 4-2. (DWR Table 7) Amount of Groundwater Projected to be Pumped
 by the District – ac-ft/yr 4-8

Table 4-3. (DWR Table 5) District Groundwater Pumping Rights – ac-ft/yr..... 4-9

Table 4-4. (DWR Table 11) Transfer and Exchange Opportunities – ac-ft/yr 4-10

Table 4-5. (DWR Table 17) Future Water Supply Projects - ac-ft/yr 4-10

Table 4-6. (DWR Table 4) Planned Water Supplies – ac-ft/yr..... 4-10

Table 4-7. (DWR Table 8) Year 2030 Supply Reliability - Percent of Normal ac-ft/yr 4-11

Table 4-8. (DWR Table 9) Basis of Water Year Data..... 4-11

Table 4-9. (DWR Table 10) Description of the Factors in Inconsistency of Supply..... 4-12

Table 4-10. (DWR Table 20) Wholesaler Identified and Quantified Existing and
 Planned Sources of Water - ac-ft/yr..... 4-12

Table 4-11. (DWR Table 21) Wholesaler Supply Reliability – ac-ft/yr..... 4-12

Table 4-12. (DWR Table 22) Factors Resulting in Inconsistency of Wholesaler’s Supply 4-13

Table 4-13. (DWR Table 39) Current and Projected Water Supply Changes due to
 Water Quality – Percentage..... 4-14

Table 5-1. (DWR Table 32) Participating Agencies 5-1

Table 5-2. (DWR Table 33) Wastewater Collection and Treatment by SVCSD – ac-ft/yr^a 5-2

Table 5-3. (DWR Table 34) Disposal of Wastewater (Non-Recycled) by SVCSD ac-ft/yr..... 5-4

Table 5-4. (DWR Table 37) Recycled Water Use by SVCSD - ac-ft/yr 5-5

Table 5-5. (DWR Table 35a) Recycled Water Uses by SVCSD – Actual ac-ft/yr..... 5-5

Table 5-6. (DWR Table 35b) Recycled Water Uses – Potential ac-ft/yr 5-7

Table 5-7. (DWR Table 36) Projected Future Use of Recycled Water – ac-ft/yr 5-7

Table 5-8. (DWR Table 38) Methods to Encourage Recycled Water Use – ac-ft/yr 5-8

Table 6-1. California Urban Water Conservation Council Best Management Practices 6-2

Table 6-2. Tier 2 BMPs..... 6-4

Table 7-1. (DWR Table 40) Projected Normal Water Supply – ac-ft/yr..... 7-1

Table 7-2. (DWR Table 41) Projected Normal Water Demand – ac-ft/yr 7-1

Table 7-3. (DWR Table 42) Projected Supply and Demand Comparison – ac-ft/yr 7-2

Table 7-4. (DWR Table 43) Projected Single-Dry Year Water Supply – ac-ft/yr 7-2

TABLE OF CONTENTS (continued)

LIST OF TABLES (continued)

Table 7-5.	(DWR Table 44) Projected Single-Dry Year Water Demand – ac-ft/yr.....	7-2
Table 7-6.	(DWR Table 45) Projected Single-Dry Year Supply and Demand Comparison – ac-ft/yr.....	7-3
Table 7-7.	(DWR Table 46) Projected Supply during Multiple-Dry Year Period Ending in 2010 – ac-ft/yr.....	7-3
Table 7-8.	(DWR Table 47) Projected Demand Multiple-Dry Year Period Ending in 2010 - ac-ft/yr.....	7-3
Table 7-9.	(DWR Table 48) Projected Supply and Demand Comparison during Multiple-Dry Year Period Ending in 2010 – ac-ft/yr	7-3
Table 7-10.	(DWR Table 49) Projected Supply during Multiple-Dry Year Ending in 2015 – ac-ft/yr.....	7-4
Table 7-11.	(DWR Table 50) Projected Demand Multiple-Dry Year Period Ending in 2015 - ac-ft/yr.....	7-4
Table 7-12.	(DWR Table 51) Projected Supply and Demand Comparison during Multiple-Dry Year Period Ending in 2015- ac-ft/yr	7-4
Table 7-13.	(DWR Table 52) Projected Supply during Multiple-Dry Year Period Ending in 2020 – ac-ft/yr.....	7-4
Table 7-14.	(DWR Table 53) Projected Demand Multiple-Dry Year Period Ending in 2020 – ac-ft/yr.....	7-4
Table 7-15.	DWR Table 54) Projected Supply and Demand Comparison during Multiple-Dry Year Period Ending in 2020 – ac-ft/yr	7-5
Table 7-16.	(DWR Table 55) Projected Supply during Multiple-Dry Year Period Ending in 2025 – ac-ft/yr.....	7-5
Table 7-17.	(DWR Table 56) Projected Multiple-Dry Year Period Ending in 2025 - ac-ft/yr.....	7-5
Table 7-18.	(DWR Table 57) Projected Supply and Demand Comparison during Multiple-Dry Year Period Ending in 2025 – ac-ft/yr	7-5
Table 7-19.	Projected Supply during Multiple-Dry Year Period Ending in 2030 – ac-ft/yr.....	7-6
Table 7-20.	Projected Multiple-Dry Year Period Ending in 2030 – ac-ft/yr.....	7-6
Table 7-21.	Projected Supply and Demand Comparison during Multiple-Dry Year Period Ending in 2030 – ac-ft/yr.....	7-6

LIST OF FIGURES

Figure 2-1.	Valley of the Moon Water District Service Area	2-2
Figure 2-2.	District Water Supply Facilities	2-5
Figure 4-1.	Groundwater Basins.....	4-5
Figure 5-1.	Sonoma Valley County Sanitation District Facilities.....	5-3

LIST OF ACRONYMS AND ABBREVIATIONS

ABAG	Association of Bay Area Government's
Act	Urban Water Management Act
ac-ft	acre-feet
ac-ft/yr	acre-feet per year
Agency	Sonoma County Water Agency
BMP	best management practice
CEQA	California Environmental Quality Act
cfs	cubic feet per second
DHS	California Department of Health Services
District	Valley of the Moon Water District
DWR	California Department of Water Resources
EIR	Environmental Impact Report
ETo	evapotranspiration
gpm	gallons per minute
hp	horsepower
MCL	maximum contaminant level
MG	million gallons
mgd	million gallons per day
MOU	Memorandum of Understanding
PG&E	Pacific Gas and Electric
Plan	Urban Water Management Plan
Restructured Agreement	Restructured Agreement for Water Supply
SWRCB	State Water Resources Control Board
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey

SECTION 1

INTRODUCTION

This Urban Water Management Plan (Plan) addresses the Valley of the Moon Water District (District) water system and includes a description of the water supply sources, magnitudes of historical and projected water use, and a comparison of water supply to water demands during normal, single-dry, and multiple-dry years. The District receives the majority of its water from Sonoma County Water Agency (Agency), which provides water principally from the Russian River to retail water customers in Sonoma and Marin Counties, California.

This section provides background information on the Plan, an overview of coordination with other agencies, and a description of public participation and Plan adoption.

1.1 Urban Water Management Planning Act

This Plan has been prepared in accordance with the Urban Water Management Act (Act), as amended, California Water Code, Sections 10610 through 10656. The Act requires every urban water supplier that provides water for municipal purposes to more than 3,000 connections or supplying more than 3,000 acre-feet (ac-ft) of water annually, to adopt and submit a plan every five years to the California Department of Water Resources (DWR). This Plan serves as a long-range planning document for the District's water supply. The Agency's urban water management plan should be consulted for details regarding the Agency's water supplies (Sonoma County Water Agency, 2006b).

1.2 Resource Maximization and Import Minimization

Water management tools have been used by the District to maximize water resources. The District has been participating with the Agency to implement water conservation measures. Additionally, the District is cooperating with groundwater basin studies that are being conducted in Sonoma County by the Agency and the United States Geological Survey (USGS). The District is also participating with the Agency in the development of a groundwater management plan.

1.3 Coordination

The Act requires the District to 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. The District coordinated the preparation of its Plan with its wholesale water supplier, the Agency, eight nearby water utilities that also utilize Agency water, and the Sonoma Valley County Sanitation District. In addition, the District coordinated the preparation of the water demand projections in this Plan with the Association of Bay Area Government’s (ABAG) demographic projections and the draft Sonoma County General Plan. Table 1-1 provides a summary of the District’s coordination with the appropriate agencies.

Table 1-1. (DWR Table 1) Coordination with Appropriate Agencies

	County Agencies		Wastewater Agencies	Other
	Sonoma County	Sonoma County Water Agency	Sonoma Valley County Sanitation District	Public Involvement
Participated in developing the plan		✓	✓	✓
Commented on the draft		✓	✓	
Attended public meetings		✓	✓	✓
Was contacted for assistance	✓	✓	✓	
Was sent a copy of the draft plan	✓	✓	✓	✓
Was sent a notice of intention to adopt	✓		✓	✓
Not involved/No information				

1.4 Public Participation and Plan Adoption

The District encouraged community and public interest involvement in the Plan update through public hearings and inspection of the draft document. Public hearing notifications were published in the Sonoma Index Tribune. A copy of the published Notice of Public Hearing is included in Appendix A. The public hearing on March 6, 2007, provided an opportunity for all residents and employees in the service area to learn and ask questions about their water supply and the District’s plans for providing a reliable, safe, high-quality water supply. Copies of the draft Plan were made available for public inspection at the District’s office.

This Plan was adopted by the District’s Board of Directors on March 6, 2007. A copy of the adopted resolution is provided in Appendix A.

1.5 Plan Organization

This section provides a summary of the sections in the Plan. Section 2 provides a description of the service area, climate, water supply facilities, and distribution system. Section 3 presents historical and projected water use. Section 4 describes surface and groundwater supplies. Section 5 describes recycled water. Section 6 addresses water conservation. Section 7 provides a comparison of future water supply to demand. Appendices A through D provide relevant supporting documents.

1.6 Assumptions

The evaluation and conclusions in this Plan are based in part upon assumptions made by the Agency regarding their water supply. The Agency's urban water management plan should be consulted for information about these assumptions.

SECTION 2

DESCRIPTION OF EXISTING WATER SYSTEM

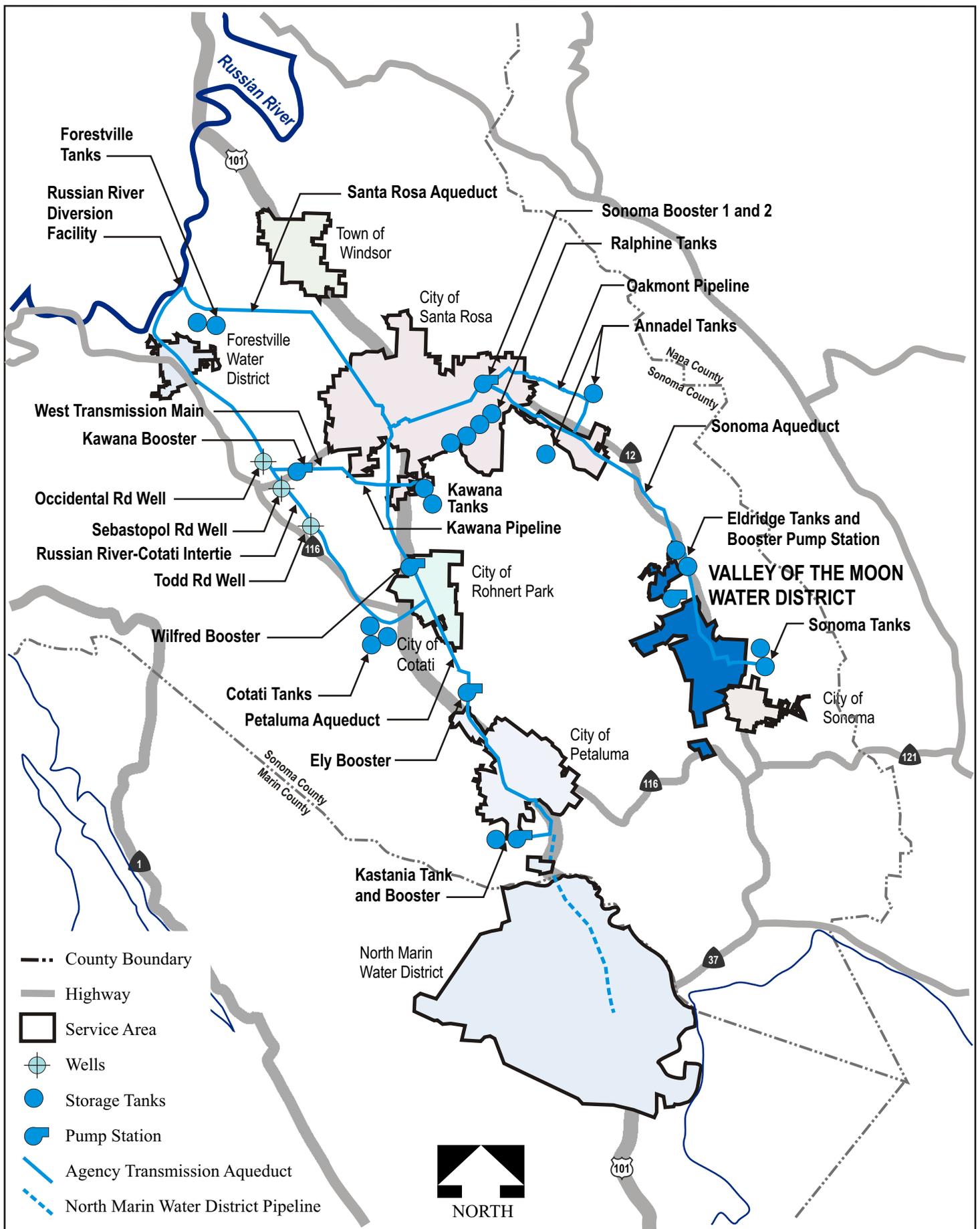
This section describes the District's service area, climate, and water supply facilities. Section 4 describes the quantities of water available to the District.

2.1 Description of Service Area

The District's service area extends from the Trinity Oaks Subdivision, located just north of the town of Glen Ellen, to the Temeclec Subdivision located at the southern end of the Sonoma Valley, which is a span of over nine miles and encompasses a total area of approximately 7,545 acres. The District provides potable water to approximately 23,000 people. Figure 2-1 presents the District's service area and the Agency's transmission system.

2.2 Climate

The District's climate is tempered by its proximity to the Pacific Ocean. In common with much of the California coastal area, the year is divided into wet and dry seasons. A majority of the annual precipitation normally falls during the wet season, October to May, with a large percentage of the rainfall typically occurring during three or four major winter storms. Winters are cool, and below-freezing temperatures seldom occur. Summers are warm and the frost-free season is fairly long. Annual precipitation averages 29.6 inches. Table 2-1 summarizes monthly average evapotranspiration rates (ET_o) at the Bennett Valley station and monthly rainfall and temperatures at the Sonoma station.



	PROJECT	127280-005	SITE	UWMP 2005, Valley of the Moon Water District	Figure 2-1
	DATE	3-2-07	TITLE	Valley of the Moon Water District Service Area	

Table 2-1. (DWR Table 3) Climate

	Standard average ETo ^a , in	Average rainfall ^b , in	Average temperature ^b , °F
January	0.82	6.44	47.23
February	1.44	5.26	51.27
March	2.87	3.89	53.56
April	4.31	1.83	56.56
May	5.26	0.69	61.48
June	6.14	0.25	67.07
July	6.30	0.03	70.10
August	5.76	0.11	69.80
September	4.25	0.31	68.06
October	3.10	1.58	62.23
November	1.38	4.03	53.14
December	0.86	5.20	47.33
Annual	42.49	29.63	58.95

Notes:

^aData represents the monthly average from October 2000 to December 2005 and was recorded from Bennett Valley CIMIS Station 158.

ETo, or evapotranspiration, is the loss of water from evaporation and transpiration from plants.

^b1952-2005 data recorded at Sonoma Station from NOAA website www.wrcc.dri.edu

2.3 Water Supply Facilities

The District receives most of its water supply from the Agency's Sonoma Aqueduct. The Agency's water supply is provided by diversions of water from the Russian River in addition to supplemental water from three groundwater wells located in the Santa Rosa Plain. The Agency's urban water management plan should be consulted for details regarding the Agency's water supply. The District maintains a local source of supply, which is used only in periods of high demand, in addition to the water purchased from the Agency. Figure 2-2 identifies the locations of the District's water system facilities. The District's water supply facilities include ten Agency aqueduct turnouts, three active wells, and two standby wells. Well characteristics are shown in Table 2-2. Additional details regarding sources of water are included in Section 4.

Table 2-2. Well Data

Well Number	Name	Capacity (gpm ^a)	Status
W-1	Donald	110	Active
W-2	Verano	N/A	Abandoned
W-3	Mountain Avenue	110	Active
W-4	Park Avenue	100	Active
W-5	Agua Caliente	120	Active
W-6	Trinity Oaks	50	Standby (poor water quality)
W-7	Larbre well	160	Leased well/Active

Note:

^agpm is equivalent to gallons per minute

2.4 Distribution System

Distribution facilities owned by the District include 11 storage reservoirs, 8 booster pump stations, and approximately 85 miles of water mains and appurtenances for purveying water within the service area.

2.4.1 Storage

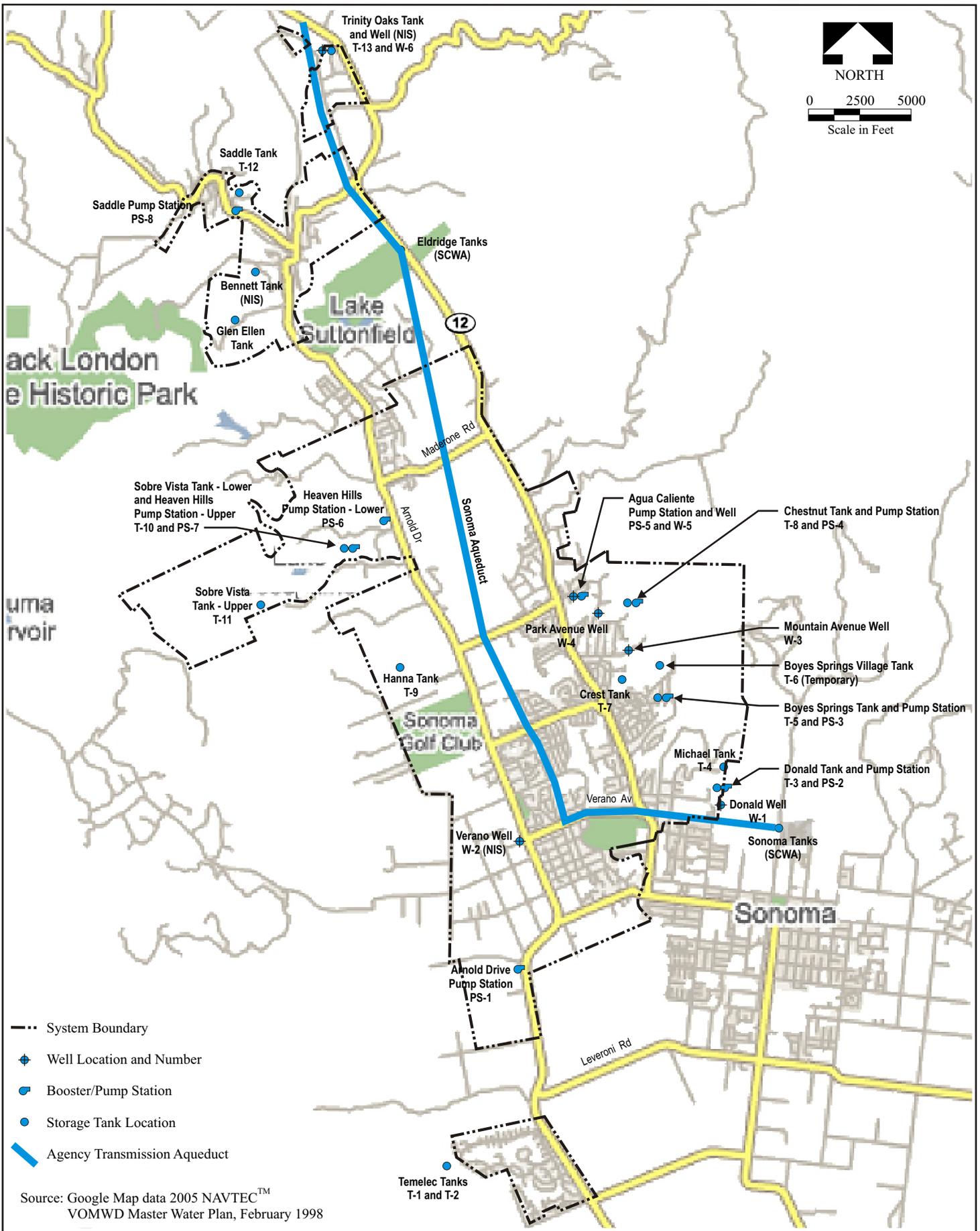
Storage facilities operated by the District include 11 water storage reservoirs, ranging in size from 15 thousand to 2 million gallons (MG), with a total storage capacity of 4.91 MG. The tanks, several over 85 years old, are constructed of redwood, concrete, bolted steel, and welded steel. Additionally, water for the District as well as for the City of Sonoma is provided by the Agency's Eldridge and Sonoma Tanks (see Figure 2-2), which have a combined capacity of 18 MG. Characteristics of the District's storage facilities are presented in Table 2-3.

Table 2-3. Characteristics of Existing Storage Facilities

Tank No.	Tank name	Capacity (MG)	Type	Year built
T-1	Temelec 1	0.200	Welded Steel	1968
T-2	Temelec 2	1.000	Welded Steel	1985
T-3	Donald	0.200	Welded Steel	1963
T-4	Michael	0.015	Redwood	Pre-1909 - Abandoned
T-5	Boyes	0.210	Bolted Steel	1966 - Abandoned
T-6	Boyes Village	0.015 ^a	Polyethylene (temporary)	1996 - Abandoned
T-7	Crest	0.150	Redwood	Pre-1909 - Replaced with Bolli Tank
T-8	Chestnut	0.320	Welded Steel	1992
T-9	Hanna	2.000	Welded Steel	1977
T-10	Sobre Vista – Low	0.030	Concrete	Pre-1909
T-11	Sobre Vista – High	0.210	Bolted Steel	2002
T-12	Saddle	0.150	Redwood	1987
T-13	Trinity	0.030	Redwood	Pre-1909
T-14	Bolli A	0.400	Welded Steel	2002
T-15	Bolli B	0.400	Welded Steel	2002
T-16	Glen Ellen	0.500	Welded Steel	2006

Note:

^a Combined capacity of three temporary tanks.



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PROJECT	127280-005	SITE	UWMP 2005, Valley of the Moon Water District
DATE	3-2-07	TITLE	Water Supply Facilities

Figure
2-2

2.4.2 Pump Stations

The District has eight booster pump stations that lift water from the aqueduct zone to the upper service zones. Characteristics of these stations are presented in Table 2-4.

Table 2-4. Characteristics of Pump Stations

Station No.	Name	No. of Pumps	Motor Size (HP)	Pump Capacity (gpm)
PS-1	Arnold Drive	2	20	500
PS-2	Donald	2	7.5	100
		1	25	300
PS-3	Boyes Village	1	10	200 - Abandoned
PS-4	Chestnut	2	5	100
PS-5	Agua Caliente	2	10	100
PS-6	Heaven Hill – Low	2	5	110
PS-7	Heaven Hill – High	2	10	100
PS-8	Saddle	1	5	95
PS-9	Arnold Drive/Glen Ellen	2	25	600

The District's water system includes three hydro-pneumatic tanks, which provide a means to control well or pump operation based on tank pressure. The hydro-pneumatic tank (H-1) at the Trinity Oaks Well Site (W-6) has a capacity of 1,000 gallons, but is not in service. A 2,000 gallon hydro-pneumatic tank (H-2) at the Donald Tank site operates with the pumps at Booster Pump Station PS-2. The 3,000 gallon hydro-pneumatic tank (H-3) is located at the Chestnut Booster Pump Station (PS-4).

SECTION 3

PROJECTED WATER USE

This section presents information regarding demographics and projections of future District water demands.

3.1 Employment, Land Use, and Population

This section describes employment and land use characteristics and current and future population for the District's service area.

3.1.1 Employment Characteristics

Within the Agency's service area, employment is primarily in the public sector and in the service and manufacturing industries. Regionally, employment in the agricultural industry is related to vineyards, livestock, orchards, silage crops, and timber. The primary industrial activities in the region include telecommunications, wine production, timber and other agricultural product processing, gravel mining and processing, energy production, and miscellaneous manufacturing. Recreation and tourism are moderate and growing industries in the region.

3.1.2 Land Use Characteristics

Land use within the District's service area is primarily residential, but also includes agricultural, industrial, commercial, and recreational land uses. Sonoma County, by policy, concentrates urban growth within incorporated cities, not in the unincorporated area. Sonoma County has a voter-approved County-wide urban growth boundary and each city has an urban growth boundary. There are voter-approved taxes supporting open space acquisition in all of Sonoma County.

3.1.3 Population Projections

Population and employment projections were developed for the District. The population and employment forecasts are based on the draft Sonoma County General Plan. The population projections are described in the analysis performed by Maddaus Water Management, which is presented in Appendix B. Table 3-1 provides current and projected populations through the year 2030 for the District's service area.

Table 3-1. (DWR Table 2) Population – Current and Projected

Year	Population
2005	22,665
2010	23,359
2015	24,055
2020	24,753
2025	25,109
2030	25,466

3.2 Water Use

The Agency and the District worked together to develop a water demand analysis and water demand projections. The detailed water demand analysis and demand projections are presented in the evaluations performed by Weber Analytical and Maddaus Water Management, which are presented in Appendix B. The water demand projection process consisted of projecting future demographics, evaluating historical water use characteristics, defining alternative levels of water conservation efforts, and developing resulting water demand projections. The projections include consideration of the impacts of the plumbing code and current and future water conservation efforts.

The historical water use analysis consisted of evaluating the monthly water use per account for each customer category over a 9 year period. The analysis resulted in a weather normalized annual water use per account type, expressed as gallons per day per account. The demographic projections, water use characteristics, and alternative conservation efforts were integrated using the Decision Support System (DSS) model to develop resulting demand projections. The DSS model and the water conservation assumptions are described in Section 6.

3.2.1 Water Use by Customer Type

Water uses in the District include single-family, multi-family, business, residential and commercial irrigation, and institutional customers. The projected water use incorporates the water savings from past and current water conservation efforts, including plumbing code enforcement. The past, current, and projected numbers of connections and deliveries to the District's customers by sector are presented in Table 3-2.

Table 3-2. (DWR Table 12) Past, Current, and Projected Water Deliveries ^a

		Water Use Sectors								
		Single-Family	Multi-family	Business	Irrigation Residential	Irrigation Commercial	Institutional	New Single-Family	Total	
2000 ^b	metered	# of accounts	5,983	398	147	18	9	24	N/A	6,579
		Deliveries ac-ft/yr	2,069	550	240	75	47	105	N/A	3,086
2005	metered	# of accounts	6,063	413	146	12	12	29	37	6,712
		Deliveries ac-ft/yr	2,206	721	256	54	19	112	15	3,384
2010	metered	# of accounts	6,063	426	151	12	12	29	224	6,917
		Deliveries ac-ft/yr	2,185	731	258	54	20	112	91	3,450
2015	metered	# of accounts	6,063	439	156	12	13	29	411	7,122
		Deliveries ac-ft/yr	2,160	738	260	54	20	112	167	3,513
2020	metered	# of accounts	6,063	451	160	12	13	29	599	7,328
		Deliveries ac-ft/yr	2,136	746	264	54	21	112	243	3,576
2025	metered	# of accounts	6,063	458	163	12	13	29	695	7,434
		Deliveries ac-ft/yr	2,114	745	265	54	21	112	282	3,593
2030	metered	# of accounts	6,063	464	166	12	14	29	791	7,539
		Deliveries ac-ft/yr	2,097	747	266	54	22	112	321	3,618

Notes:

^aThe water use includes plumbing code water savings, but not the other projected water conservation savings.

^bData based on historical record, with atypical decrease in water use per business and irrigation accounts from 2000 and 2004 due to economic and climatic fluctuations.

Source: See Appendix B.

3.2.2 Water Sales to Other Agencies

The District does not currently sell water to other agencies.

3.2.3 Unaccounted-for Water and Additional Water Use

Unaccounted-for water use is unmetered water use, such as that used for fire protection and training, system and street flushing, sewer cleaning, construction, system leaks, as well as that used by unauthorized connections. Unaccounted-for water use can also result from meter inaccuracies. Table 3-3 provides the estimated quantity of unaccounted-for system water losses. More details on the assumptions made to estimate system losses are presented in Appendix B.

The District does not use water for groundwater recharge to prevent salt water intrusion (saline barriers), or for other conjunctive uses.

Table 3-3. (DWR Table 14) Additional Water Uses and Losses, ac-ft/yr

Water Use	2010	2015	2020	2025	2030
Saline barriers	0	0	0	0	0
Groundwater recharge	0	0	0	0	0
Conjunctive use	0	0	0	0	0
Raw water	0	0	0	0	0
Recycled	0	0	0	0	0
Other	0	0	0	0	0
Unaccounted-for system losses	449	458	460	468	471
Total	449	458	460	468	471

3.2.4 Conservation Savings

Table 3-4 presents the projected water savings resulting from additional conservation activities beyond savings from the plumbing code as detailed in Appendix B.

Table 3-4. Conservation Savings, ac-ft/yr

Water Use	2010	2015	2020	2025	2030
Conservation savings ^a	151	220	249	264	271

^aWater savings from plumbing codes are not included.

3.2.5 Total Water Use

The projected water use for the District is presented in Table 3-5.

Table 3-5. (DWR Table 15) Total Water Use^a, ac-ft/yr

Water Use	2010	2015	2020	2025	2030
Total water use	3,748	3,751	3,787	3,797	3,817

Note:

Sum of Tables 3-2, 3-3, and 3-4.

^a The 2030 water use is equal to the 2030 gross demand, less savings for conservation activities (plumbing code, CUWCC “Tier 1” BMPs, “Tier 2” BMPs, and new housing standards) as described in Section 6.2. The 2030 water use reflects demand in an average weather year; actual demand may vary from these estimates based on the weather year. Water conservation savings includes both additional water conservation to be achieved after June 2004, and reductions in demand resulting from the continuation of water conservation measures implemented by the District as of June 2004. But for the embedded results of those existing conservation efforts, which are summarized in Appendix B, the 2010 to 2030 gross demand grand total figure would be higher. Pursuant to the Restructured Agreement for Water Supply (see Section 4.1.2), the District must implement the CUWCC BMPs for water conservation or alternative water conservation measures that secure at least the same level of water savings. The District has also agreed to use its best efforts to secure the implementation of any water conservation measures required by the Agency’s appropriate water rights permits or licenses or applicable law. Because the water conservation savings are projections, actual demand reduction and the manner in which the demand reduction is achieved may vary.

3.3 Demand on Wholesale Supply

Table 3-6 provides the projected amount of water that the District expects to purchase from the Agency to meet water demands in the future. The District will use local groundwater and recycled water supplies to supply the difference between demand and the Agency water supply.

Table 3-6. (DWR Table 19) District Demand Projections to Wholesale Suppliers, ac-ft/yr

Wholesaler	2010	2015	2020	2025	2030
Sonoma County Water Agency	3,312	3,185	3,360	3,488	3,729

SECTION 4

WATER SUPPLY

The District uses surface water, groundwater, and in the future recycled water as its supply sources. Water delivered from the Agency's transmission system is augmented by recycled water and local groundwater sources to meet the District's water demand. This section describes the surface water and groundwater sources, quantities, supply constraints, and the reliability and water quality of the water supply sources. Recycled water use is described in Section 5.

4.1 Surface Water

This section briefly describes the physical constraints to the Agency's surface water supply and the legal background and constraints to this supply. As described in Section 2, the Agency receives its surface water from the Russian River. More detailed information regarding the Agency's water supply and facilities can be found in the Agency's urban water management plan.

4.1.1 Description

The District receives its primary water supply from the Agency's transmission system. The Agency is supplied by the federal Russian River Project, which it operates along with the Agency's appurtenant water transmission system. The Coyote Valley Dam, which creates Lake Mendocino on the East Fork Russian River, and Warm Springs Dam, which creates Lake Sonoma on Dry Creek (a tributary to the Russian River), are the key elements of the Russian River Project. Water from the Russian River is diverted by the Agency near Forestville and conveyed via its transmission system (including diversion facilities, treatment facilities, pipelines, water storage tanks, booster pump stations, and groundwater wells) to its wholesale customers, including the District. Further detail on the District's water supply facilities and distribution system is included in Section 2.

4.1.2 Physical Constraints

The capacity of the Agency's transmission system is a physical constraint on the delivery of water to the District, particularly during high demand periods in the summer months. This physical constraint is addressed by the Memorandum of Understanding described in Section 4.1.3. Future

water supply projections are dependent upon planned infrastructure improvements being approved and constructed, as discussed in the Agency's urban water management plan.

4.1.3 Legal Constraints

The Agency's Russian River water supply is controlled and influenced by a variety of agreements and decisions. The Agency's urban water management plan should be consulted for details regarding these arguments and decisions. This section of the plan describes the issues that influence the District's water supply.

Water Rights. Four SWRCB permits¹ currently authorize the Agency to store up to 122,500 ac-ft/yr of water in Lake Mendocino and up to 245,000 ac-ft/yr of water in Lake Sonoma, and to divert and redivert 180 cubic feet per second (cfs) of water from the Russian River at the Agency's Wohler and Mirabel facilities, up to 75,000 ac-ft/yr. The Agency has applied to the SWRCB to increase the Agency's Russian River diversion limit from 75,000 to 101,000 ac-ft/yr.

In the early 1990s, the Agency initiated a water project to increase the amount of water released from Lake Sonoma and diverted from the Russian River and to expand the transmission system. A challenge to the EIR for the water project was partially successful, and the Agency is in the process of preparing an EIR for a new water project. The new water project must undergo environmental review in accordance with the California Environmental Quality Act (CEQA) and obtain project approval before it can proceed. The Draft EIR is anticipated to be released for public review in 2007. Final EIR certification and project approval could be considered by the Board of Directors by June 2008.

Restructured Agreement for Water Supply. The *Restructured Agreement for Water Supply* (Restructured Agreement), which was executed in 2006, generally provides for the finance, construction, and operation of existing and new diversion facilities, transmission lines, storage tanks, booster pumps, conventional wells, and appurtenant facilities. The Restructured Agreement provides the contractual relationship between the Agency and its eight contractors, including the District, and includes specific maximum amounts of water that the Agency is obligated to supply to its water contractors. Maximum water allocations for each of the Agency's water contractors set forth within the

¹ SWRCB Permits Numbers 12947A, 12949, 12950, and 16596.

Restructured Agreement were premised on the Agency's diversion/rediversion water rights being increased to 101,000 ac-ft/yr and on the construction of the new facilities authorized by the Restructured Agreement. The water allocation for the District under the Restructured Agreement is 3,200 ac-ft/yr with a maximum month of 8.5 mgd. Section 3.5 of the Restructured Agreement provides a method for allocating water among these parties during periods of shortage. The District has adopted a water shortage methodology, consistent with Section 3.5, which is presented in Appendix D.

Memorandum of Understanding Regarding Water Transmission System Capacity Allocation during Temporary Impairment. The maximum delivery allocations in the Restructured Agreement assume the construction of certain additional facilities and approval by the SWRCB of increased Agency diversion from the Russian River up to 101,000 ac-ft/yr. Existing transmission system constraints have necessitated the development of an additional agreement to govern maximum water allocations during the summer months. The *Memorandum of Understanding Regarding Water Transmission System Capacity Allocation during Temporary Impairment* (Temporary Impairment MOU) is in effect between the Agency and its primary customers, including the District, until September 30, 2008. The Temporary Impairment MOU allocates the existing 92 mgd of transmission system capacity among the parties during the "summer months" of June through September. The District's allocation is a peak month of 4.9 mgd during the June to September period. The Temporary Impairment MOU also contains mechanisms for enhancing operational coordination among the Agency's customers to balance demands on the Agency's transmission system during times of high water use.

Other Agreements. Currently, the District receives transferred water from the Forestville Water District under temporary agreement. The agreement, which lasts through 2009, allows the District to receive up to 500 ac-ft/yr of the Forestville Water District's allocated Agency water if the water is not being used (Kumar, 2004b).

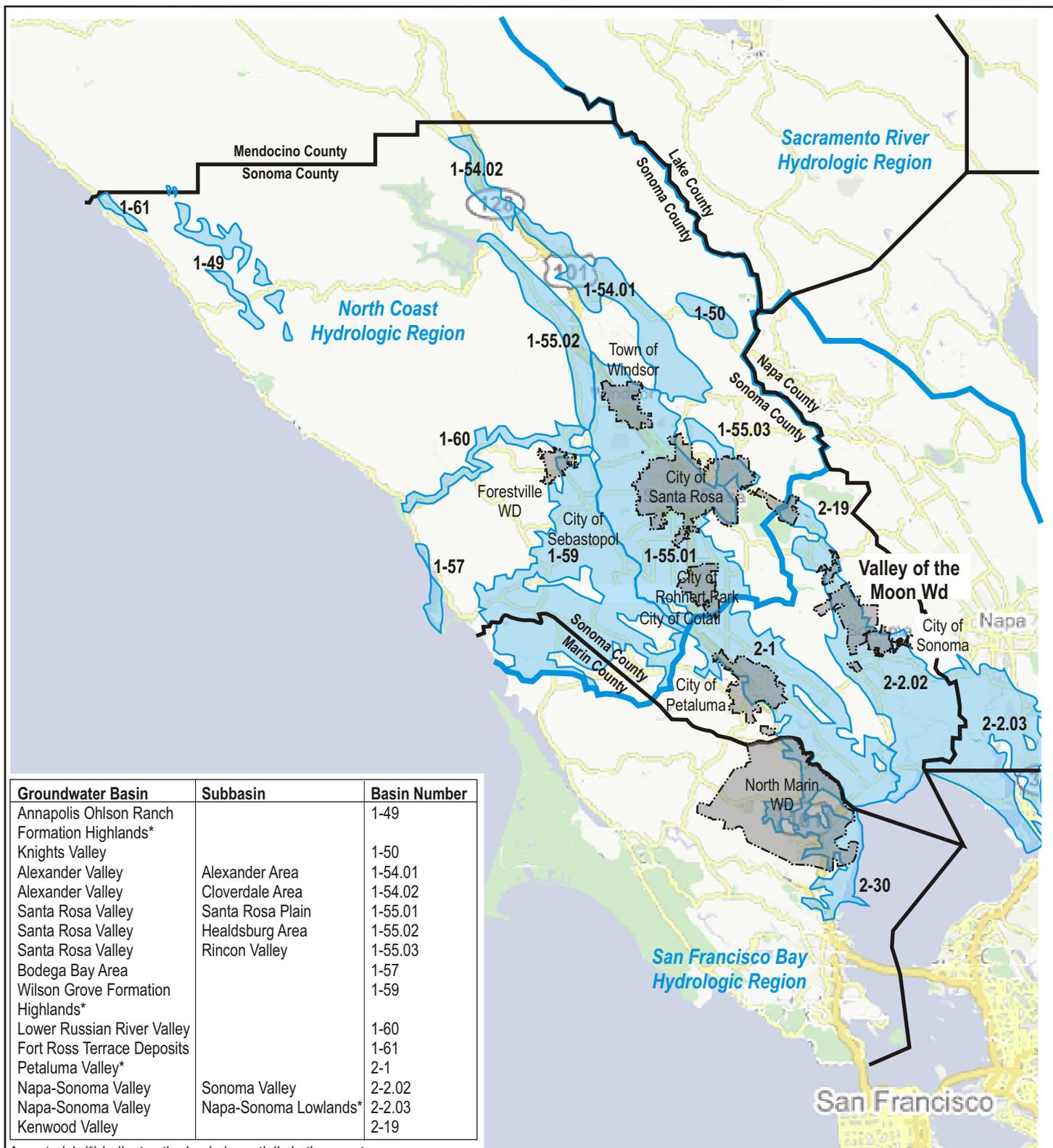
4.2 Groundwater

This section provides a description of the District's groundwater supply as well as the physical and legal constraints of this supply. The groundwater supply facilities are described in Section 2. The groundwater basin that supplements the Agency's supply is described in the Agency's Plan (SCWA, 2006b) and is not repeated in this Plan.

4.2.1 Description

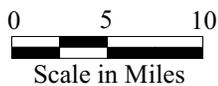
Groundwater basin studies are being conducted within Sonoma County by the Agency and the USGS and other stakeholders in the Alexander Valley Basin, Sonoma Valley Basin, and the Santa Rosa Plain Subbasin. In 2001, the Agency's Board of Directors authorized the Agency to enter into an agreement with the USGS to develop a cooperative study to characterize the Sonoma and Alexander Valley basins. Within the Sonoma Valley, both the District and the City of Sonoma served as cooperating agencies for the study, providing data and input throughout the study period. The first basin studies, including the Sonoma Valley and Alexander Valley, have recently been completed (USGS, 2006a and b). The Sonoma Valley study, summarized below, is designed to improve understanding of the groundwater resources and facilitate improved groundwater management strategies.

The Sonoma Valley Groundwater Subbasin (2-2.02) is a subbasin of the Napa-Sonoma Valley Groundwater Basin. The basin drains south-southeast and is thus part of the San Francisco Bay Hydrologic Region (DWR, 2003) (Figure 4-1). The USGS recently completed its evaluation of the geology, water levels, water quality, surface water and groundwater interactions, and recharge areas of the Sonoma Valley Subbasin. In addition, a groundwater model was developed for the Sonoma Valley to assist in identifying problem areas within the basin (USGS, 2006a). In general, the Sonoma Valley Groundwater Subbasin appears to be limited in the amount of water it can store, given the predominately fine-grained materials that comprise the basin. In Sonoma Valley, the USGS estimated that pumping in the basin has generally increased from approximately 6,200 ac-ft/yr, since the basin was last studied in 1974, to 8,400 ac-ft/yr in 2000 (approximate 25 percent increase in pumping). The USGS study did not indicate whether overdraft was occurring (the condition where the long-term discharge including pumping exceeds recharge). The USGS noted that the relatively small decrease in storage between 1974 and 2000 explains the localized nature of water level declines. The USGS noted a significant increase in pumping since 2000 that should be further evaluated. Although the USGS concluded that groundwater quality is generally acceptable within the basin, there were some localized problems identified in the basin. In particular the USGS identified the migration of high-saline water along the southern end of the basin and localized areas of thermal waters (USGS, 2006a).



Groundwater Basin	Subbasin	Basin Number
Annapolis Ohlson Ranch Formation Highlands*		1-49
Knights Valley		1-50
Alexander Valley	Alexander Area	1-54.01
Alexander Valley	Cloverdale Area	1-54.02
Santa Rosa Valley	Santa Rosa Plain	1-55.01
Santa Rosa Valley	Healdsburg Area	1-55.02
Santa Rosa Valley	Rincon Valley	1-55.03
Bodega Bay Area		1-57
Wilson Grove Formation Highlands*		1-59
Lower Russian River Valley		1-60
Fort Ross Terrace Deposits		1-61
Petaluma Valley*		2-1
Napa-Sonoma Valley	Sonoma Valley	2-2.02
Napa-Sonoma Valley	Napa-Sonoma Lowlands*	2-2.03
Kenwood Valley		2-19

An asterisk (*) indicates the basin is partially in the county.



- County Line and Name
- System Boundary and Name
- Hydrologic Region Boundary
- Groundwater Basin and Number

Source: Google Map data 2005 NAVTEC™
DWR Bulletin 118, 2003 Update

BROWN AND CALDWELL	PROJECT 127280-005	SITE UWMP 2005, Valley of the Moon Water District	Figure 4-1
	DATE 3-2-07	TITLE Groundwater Basins	

Based on the Agency/USGS groundwater study results, the Agency funded a stakeholder assessment conducted by the Center of Collaborative Policy, a non-profit organization associated with the McGeorge Law School and California State University Sacramento to evaluate interest in developing a groundwater management plan. The Agency also developed a work plan for a groundwater management plan that would comply with AB3030 and SB1938 guidelines. In June 2006, the Agency's Board of Directors authorized the Agency to initiate a groundwater management planning process in the Sonoma Valley to help ensure the long-term sustainability of the basin's groundwater resources. In addition, the Board of Directors approved concurrent actions authorizing execution of a "Cooperative Agreement to Provide Funding and Support Information for Sonoma Valley Groundwater Management Planning Process" between the Agency, County of Sonoma, Sonoma Valley County Sanitation District, the District, and City of Sonoma. Also, the Board authorized a Memorandum of Understanding to "Work Cooperatively to Improve Surface and Groundwater Management and to Promote Conjunctive Use Projects and Programs in Sonoma County" between the Agency, County of Sonoma, and DWR. A Basin Advisory Panel comprised of local stakeholders has been formed to work with the Center of Collaborative Policy to develop a groundwater management plan for consideration by the Agency's Board of Directors.

The water-bearing deposits underlying the District include younger and older Quaternary alluvium deposits, the Huichica and Glen Ellen Formations, and the Sonoma Volcanics. The thickness and extent (if any) of the Miocene to Pliocene Petaluma Formation beneath the District is unknown, and the Mesozoic Franciscan Complex bedrock is not exposed or encountered in wells (USGS, 2006a).

The younger Quaternary alluvium consists of stream channel, flood plain, alluvial fan, and salt marsh deposits of late Pleistocene to recent age. The younger alluvium has a large percentage of loose sand and gravel yielding water easily to wells; however, it is only a thin veneer and most wells penetrate the full thickness (Kunkel and Upson, 1960; USGS, 2006a).

The older Quaternary alluvium is composed of lenticular deposits of poorly sorted clay, silt, sand, and gravel, and is late Pleistocene in age. The older alluvium underlies the younger alluvium and is separated by an erosional unconformity (Kunkel and Upson, 1960). Wells that encounter sands and gravels in the older alluvium can yield as much as 500 to 1,000 gpm (Luhdorff & Scalmanini, 1999).

According to the USGS, the Quaternary alluvium may be as much as 300 feet in the center of the valley (USGS, 2006a).

Underlying the Quaternary alluvium is the Glen Ellen Formation of late Pliocene to early Pleistocene age. The Glen Ellen Formation was deposited by alluvial fans and is composed of poorly sorted lenticular beds of clay, silt, sand, and gravel. Much of the material was derived from the Sonoma Volcanics. The Glen Ellen Formation interfingers with the Sonoma Volcanics and the underlying Huichica Formation, and is up to 900 feet thick. Permeability is generally relatively low, but water obtained from the lenses of gravel can locally be sufficient for municipal use (USGS, 2006a).

The Huichica Formation is interbedded with and partly older than the Glen Ellen Formation. The Huichica is early Pleistocene to Pliocene in age and was deposited as alluvial fans by streams that drained uplifted areas of the Sonoma Volcanics. The formation also contains a thick body of clay and silt representing possible lake or swamp deposition. There are lenses of boulders or gravel with fine material within the fine grained deposits. The Huichica's thickness exceeds 1,000 feet in parts of the valley (USGS, 2006a). Large quantities of water are not able to be pumped from the formation and are mostly developed for domestic use (Kunkel and Upson, 1960 and Luhdorff & Scalmanini, 1999).

The Miocene to Pliocene Sonoma Volcanics consist of a variable sequence of volcanoclastic tuffs, lahars, debris and mudflows, and sedimentary units interbedded with volcanic flows of andesite, basalt, and rhyolite (USGS, 2006a). The significant aquifers in the volcanics are the tuffs which include pumice beds (Kunkel and Upson, 1960). The Sonoma Volcanics are highly variable in terms of yield. The District has four wells completed in this formation that yield between 90 and 300 gpm.

Recharge occurring in the Sonoma Volcanics is mainly from surface outcroppings in the mountains that border the Sonoma Valley (USGS, 2006a). Alluvium is recharged from percolation through sediments in local creeks and surface runoff (Luhdorff & Scalmanini, 1999).

The District pumps groundwater from a total of five wells, including four active District-owned wells and one additional leased well, that supplement the water obtained from the Agency. Groundwater in Sonoma Valley is often high in iron and manganese (Luhdorff & Scalmanini, 1999).

Water quality is discussed further in Section 4.7. The District is currently using its groundwater wells to help meet demand, while the Agency’s approval for increased annual entitlement is pending. It is the District’s intent to use its wells solely to meet peak summer month demands. The District is also actively looking for potential new well sites (Kumar, 2004a), and has recently completed a test well in the Glen Ellen Formation. The amounts of groundwater pumped in the last five years and future pumping projections are shown in Tables 4-1 and 4-2.

DWR did not identify “critical conditions of overdraft” in the Sonoma Valley groundwater basin in Bulletin 118 – 80 (DWR, 1980), and has not evaluated overdraft conditions since that date (DWR, 2003). California’s Water Code Section 10631(b) only requires that urban water management plans state DWR’s characterization of the basin with respect to overdraft. While this plan also summarizes other available information (including previous groundwater studies and investigations) and evaluates limited data, it is beyond this plan’s scope to make an independent assessment of basin conditions with respect to overdraft. However, the District’s groundwater supply is considered to be reliable based on the available data.

Table 4-1. (DWR Table 6) Amount of Groundwater Pumped by the District – ac-ft/yr

Basin Name (s)	2000	2001	2002	2003	2004	2005
Sonoma Valley	774	580	560	467	434	371
Percent of Total Water Supply	22	16	16	14	12	10

Note:
Source: Valley of the Moon Water District. Annual Water Production and Sales Report (2000-2004).

Table 4-2. (DWR Table 7) Amount of Groundwater Projected to be Pumped by the District – ac-ft/yr

Basin Name(s)	2010	2015	2020	2025	2030
Sonoma Valley	436	566	428	309	83
Percent of Total Water Supply	12	15	11	8	2

Notes:
It is projected that the District could pump up to 600 ac-ft/yr during a single-dry year. See Tables 4-7 and 7-4.

4.2.2 Physical Constraints

Two areas in the basin appear to have groundwater depressions: the Fowler Creek area and the Buena Vista area (USGS, 2006a; Luhdorff & Scalmanini, 1999). The District does not currently have groundwater wells in these areas, and they are not being considered for future groundwater supply. Pumping should also be avoided in the southern portion of the basin, where the Bay Mud

and underlying alluvium may be hydraulically connected to San Pablo Bay, due to the potential for salt water intrusion (Luhdorff & Scalmanini, 1999).

4.2.3 Legal Constraints

There are no legal constraints on the District's use of its groundwater supply. The District has no groundwater pumping restrictions as shown in Table 4-3. The District has one permitted leased well; the lease will expire in 2009. It is assumed that the lease will be renewed.

Table 4-3. (DWR Table 5) District Groundwater Pumping Rights – ac-ft/yr

Basin Name	Pumping Right – ac-ft/yr
Sonoma Valley	Not limited
Total	Not limited

Note:
 Source: DWR, 2003.

4.3 Desalination

There are currently no plans for desalination, and no desalination for future water supply is anticipated. However, the District is within approximately 15 miles of the San Pablo Bay; therefore, desalination of bay water (as is currently being pilot tested by Marin Municipal Water District) is a possibility. Brackish or impaired groundwater is also present between Petaluma and San Pablo Bay; therefore, desalination of groundwater is also a possibility. Nevertheless, no desalinated water supplies are projected for this Plan.

4.4 Transfer and Exchange Opportunities

Water transfers between the Agency's water contractors are authorized under the Restructured Agreement. Such transfers and exchanges between Agency water contractors have been necessary in the past and may continue to be necessary in the future to improve water reliability.

Currently, the District receives transferred water supply from the Forestville Water District under a temporary agreement (Table 4-4). The agreement, which lasts through 2009, allows the District to receive up to 500 ac-ft/yr of the Forestville Water District's allocated Agency water if the water is not being used (Kumar, 2004b).

Table 4-4. (DWR Table 11) Transfer and Exchange Opportunities – ac-ft/yr

Transfer Agency	Transfer or Exchange	Short term	Proposed Quantities	Long term	Proposed Quantities
Forestville Water District to Valley of the Moon Water District	500	500	500	0	0
Total	500	500	500	0	0

4.5 Projected Water Supplies

This section provides projections of the future water supply quantities available to the District. Future water supplies from the Agency are dependent upon planned infrastructure improvements being approved and constructed, which are described in the Agency’s urban water management plan. Future projects that will contribute to the District’s local water supply are summarized in Table 4-5. Table 4-6 summarizes the current and projected water supplies available to the District.

Table 4-5. (DWR Table 17) Future Water Supply Projects - ac-ft/yr

Project Name	Projected Start Date	Projected Completion Date	Normal year ac-ft to agency	Single-dry year yield ac-ft	Multiple-Dry Year		
					Year 1 ac-ft	Year 2 ac-ft	Year 3 ac-ft
One well	2006	2008	200	200	200	200	200

Recycled water use that serves as potable water offset is projected to be zero until 2030. Recycled water use is described in further detail in Section 5.

Table 4-6. (DWR Table 4) Planned Water Supplies – ac-ft/yr

Water Supply Sources	2010	2015	2020	2025	2030
Sonoma County Water Agency	3,312	3,185	3,360	3,488	3,729
Supplier produced groundwater ^a	436	566	428	309	83
Supplier surface diversions	0	0	0	0	0
Transfers in or out	0	0	0	0	0
Exchanges in or out	0	0	0	0	0
Recycled water (projected use) ^b	0	0	0	0	5
Desalination	0	0	0	0	0
Other	0	0	0	0	0
Total	3,748	3,751	3,787	3,798	3,817

Notes:

^a It is projected that the District could pump up to 600 ac-ft/yr during a single-dry year. See Tables 4-7 and 7-4.

^b Recycled water reported is for urban reuse only.

4.6 Water Supply Reliability

This section presents the projected supplies available during single-and multiple-dry water years. The District’s surface water supply from the Agency is subject to reductions during dry years. The reliability of the Districts’ water sources is summarized in Table 4-7.

Table 4-7. (DWR Table 8) Year 2030 Supply Reliability - Percent of Normal ac-ft/yr

Sources	Normal Water Year	Single-Dry Water Year	Multiple-Dry Water Years			
			Year 1	Year 2	Year 3	Year 4
Sonoma County Water Agency	3,729	3,036	3,729	3,729	3,729	3,729
Groundwater wells	83	600	83	83	83	83
Transfers in or out	0	0	0	0	0	0
Recycled water	5	5	5	5	5	5
Total	3,817	3,641	3,817	3,817	3,817	3,817
Percent of Normal	100	95	100	100	100	100

Table 4-8 lists the years upon which the data in Table 4-7 are based.

Table 4-8. (DWR Table 9) Basis of Water Year Data

Water Year Type	Base Year(s)
Normal Water Year	1962
Single-Dry Water Year	1977
Multiple-Dry Water Years	1990-1993

Factors resulting in inconsistency of supply are summarized in Table 4-9. Alternatives to replace inconsistent sources may potentially include the development of groundwater wells, aquifer storage and recovery, use of recycled water, and increased conservation. Water quality issues are not anticipated to have a significant impact on water supply reliability. If applicable in the future, chemical contamination and the lowering of maximum contaminant levels (MCLs) for naturally occurring constituents can be mitigated by constructing new treatment facilities.

Table 4-9. (DWR Table 10) Description of the Factors in Inconsistency of Supply

Name of supply	Legal	Environmental	Water Quality	Climatic
Sonoma County Water Agency ^a	Current supply is available at a consistent level of use with regard to these factors. Future supply increase may not be consistent due to delays in construction, in approval of water rights application, or in environmental documentation.		None	Drought could result in a reduction of surface water supply.
Groundwater	None	None	None	None
Recycled water	None	None	None	None

^a See Agency's urban water management plan for details.

Agency provided projections that quantify wholesale water availability to the District through 2030 are presented in Table 4-10.

Table 4-10. (DWR Table 20) Wholesaler Identified and Quantified Existing and Planned Sources of Water - ac-ft/yr

Wholesaler sources	2010	2015	2020	2025	2030
Sonoma County Water Agency	3,312	3,185	3,360	3,488	3,729

A water supply reliability comparison for the Agency supply is made in Table 4-11, considering three water supply scenarios: normal water year, single-dry water year, and multiple-dry water years.

Table 4-11. (DWR Table 21) Wholesaler Supply Reliability – ac-ft/yr

Wholesaler	Normal Water Year	Single-Dry Water Year	Multiple-Dry Water Years			
			Year 1	Year 2	Year 3	Year 4
Sonoma County Water Agency	3,729	3,036	3,729	3,729	3,729	3,729
Percent of Normal	100	81	100	100	100	100

Note:
 This table represents 2030 projections.

Factors resulting in inconsistency of the Agency’s supply to the District are included in Table 4-12.

Table 4-12. (DWR Table 22) Factors Resulting in Inconsistency of Wholesaler’s Supply

Name of supply	Legal	Environmental	Water Quality	Climatic
Sonoma County Water Agency	Current supply is available at a consistent level of use with regard to these factors. Future supply increase may not be consistent due to delays in construction, in approval of water rights application, or in environmental documentation.		None	Drought could result in a reduction of surface water supply.

4.7 Water Quality Impacts on Future Water Supply

The quality of the District’s water deliveries is regulated by the California Department of Health Services (DHS), which requires regular collection and testing of water samples to ensure that the quality meets federal and state regulatory standards and does not exceed MCLs. Both the District and the Agency perform water quality testing, which has consistently yielded results within the acceptable regulatory limits.

Groundwater in Sonoma Valley is generally high in iron and manganese. Iron and manganese are regulated under the Secondary Drinking Water Standards MCLs because they are an aesthetic concern rather than a health risk. These metals can cause staining of plumbing fixtures and clothing. Both iron and manganese concentrations are below the MCLs in all of the District’s wells (Luhdorff & Scalmanini, 1999).

The quality of existing surface water and groundwater supply sources over the next 25 years is expected to be adequate. Surface and groundwater will continue to be treated to drinking water standards and no impacts to water supplies due to water quality deficiencies are foreseen to occur in the next 25 years. Table 4-14 summarizes the current and projected water supply changes due to water quality.

Table 4-13. (DWR Table 39) Current and Projected Water Supply Changes due to Water Quality – Percentage

Water Source	2005	2010	2015	2020	2025	2030
Sonoma County Water Agency	0	0	0	0	0	0
Groundwater	0	0	0	0	0	0
Recycled water	0	0	0	0	0	0
Total	0	0	0	0	0	0

SECTION 5 RECYCLED WATER

Water recycling is the treatment and management of municipal, industrial, or agricultural wastewater to produce water that can be reused for beneficial uses and offset demands for potable water supplies. Water recycling provides an additional source of water that can be used for purposes such as irrigation, groundwater recharge, industrial uses, and environmental restoration. “Recycled water” is defined in the California Water Code as “water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur.” DHS sets the water quality criteria for specific uses of recycled water in Title 22 of the California Code of Regulations.

This section provides information on the amount of generated wastewater, existing disposal of wastewater, the quantity of recycled water potentially available, and existing and future potential uses for recycled water.

5.1 Coordination

The District works with a number of local agencies responsible for water supply and wastewater collection and treatment. The Agency completed the Sonoma Valley Recycled Water Feasibility Study on behalf of the District, City of Sonoma, and Sonoma Valley County Sanitation District (SVCS D) (Sonoma County Water Agency, 2006a). Additionally, the District completed an Environmental Impact Report for the Sonoma Valley Recycled Water Project in 2006, and approved the project in December 2006.

Table 5-1. (DWR Table 32) Participating Agencies

Agency Type	Agency Name	Plan Development Role
Wholesale Water Supplier	Sonoma County Water Agency	Provided recycled water supply and demand information
Local Water Supplier	City of Sonoma	Provided recycled water supply and demand information
Wastewater Provider	Sonoma Valley County Sanitation District	Provided recycled water supply and demand information

5.2 Wastewater Quantity and Disposal

This section provides information on the amount of wastewater collected and treated within the District’s service area. Wastewater collection and treatment within the District’s service area is provided by SVCSD. The service area for SVCSD includes both Valley of the Moon and the City of Sonoma.

5.2.1 Wastewater Collection and Treatment

SVCSD collects and treats wastewater within its service area, which includes the unincorporated communities of Glen Ellen in the north to Schellville in the south, as shown on Figure 5-1. SVCSD operates a secondary treatment plant in the southern portion of the Sonoma Valley. The SVCSD serves approximately 16,452 equivalent single-family dwelling units with an average dry weather flow of 2.5 mgd (Sonoma County Water Agency, 2006a). In two to three years, SVCSD plans to upgrade the treatment facility to a tertiary treatment facility by installing a filtration system (Sonoma County Water Agency, 2006a). The current and projected volume of collected wastewater and the amount that meets recycled water standards from the SVCSD service area is shown in Table 5-2.

Wastewater from the District’s service area contributes a portion of these amounts.

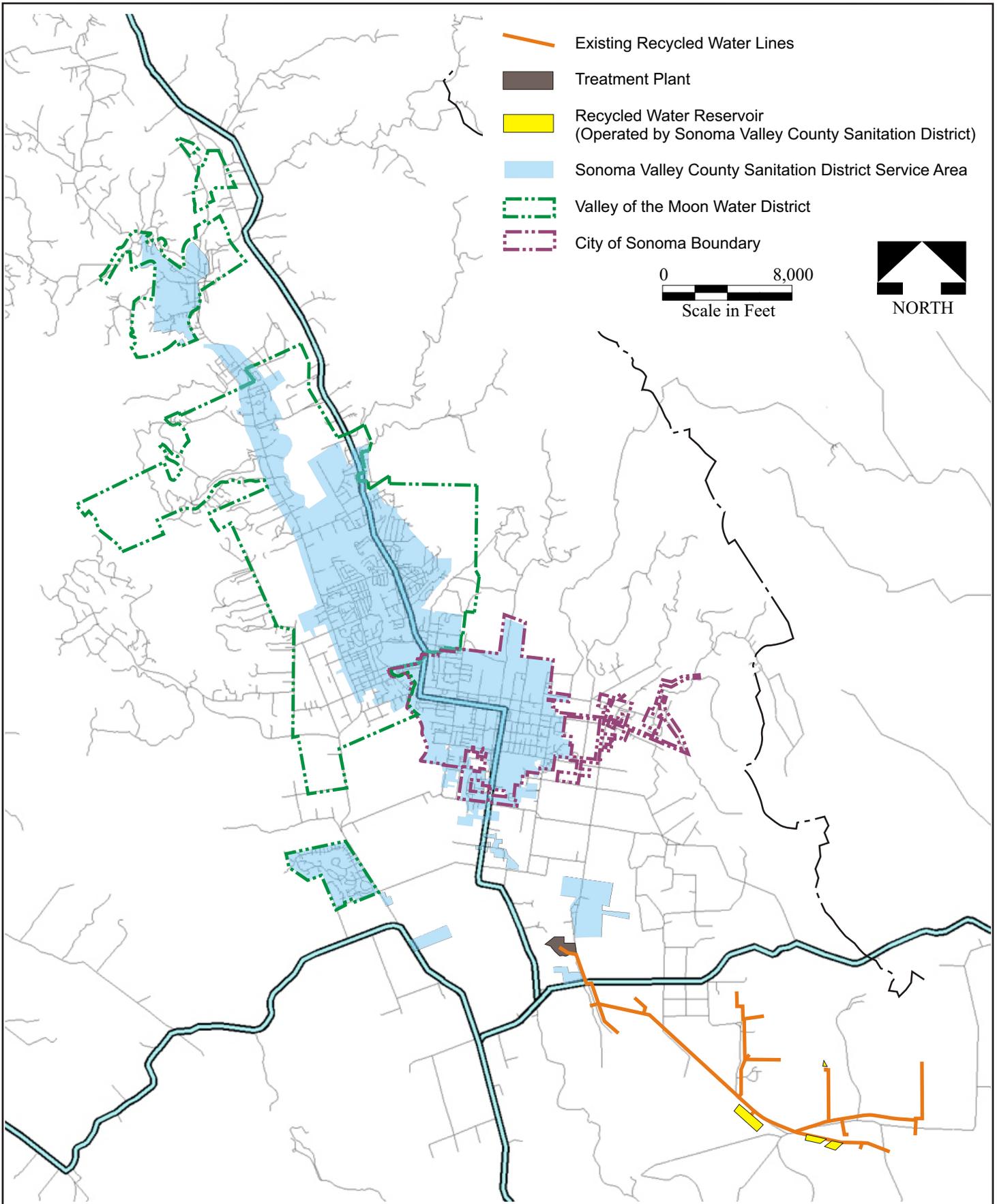
Table 5-2. (DWR Table 33) Wastewater Collection and Treatment by SVCSD – ac-ft/yr^a

	2000	2005	2010	2015	2020	2025	2030
Wastewater collected and treated in service area	4,500	4,500	4,750	5,000	5,250	5,500	5,550
Quantity that meets recycled water standard	4,500	4,500	4,750	5,100	5,250	5,500	5,550

Notes:

Source: Sonoma Valley Recycled Water Feasibility Study, 2006.

^a Includes wastewater from both Valley of the Moon Water District and the City of Sonoma.



-  Existing Recycled Water Lines
-  Treatment Plant
-  Recycled Water Reservoir
(Operated by Sonoma Valley County Sanitation District)
-  Sonoma Valley County Sanitation District Service Area
-  Valley of the Moon Water District
-  City of Sonoma Boundary

0 8,000

 Scale in Feet



Source: SCWA, Draft Sonoma Valley Recycled Water Feasibility Study, January 2005

P:\27000\127280 - Sonoma County Water Agency\UWMPs\City of Sonoma\figures

BROWN AND CALDWELL	PROJECT	127280-005	SITE	UWMP 2005, Valley of the Moon Water District	Figure 5-1
	DATE	3-2-07	TITLE	Sonoma Valley County Sanitation District Facilities	

5.2.2 Wastewater Disposal

The current National Pollutant Discharge Elimination System (NPDES) permit regulated by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) permits SVCSD to discharge its secondary treated wastewater effluent into Schell Slough, a tributary to San Pablo Bay, from November through April. Schell Slough is a tidal estuary which receives freshwater flow from Schell Creek during wet weather months, but is only flushed by tidal action during dry weather months. During the dry weather season of May through October, discharge into Schell Slough is not permitted, and treated wastewater is used for wetlands enhancement and irrigation of pastures and vineyards. The current and projected annual volume of disposed wastewater for the entire SVCSD service area is shown in Table 5-3.

Table 5-3. (DWR Table 34) Disposal of Wastewater (Non-Recycled) by SVCSD ac-ft/yr

Method of disposal	Treatment Level	2005	2010	2015	2020	2025	2030
Schell Slough of San Pablo Bay	Secondary	3,330	0	0	0	0	0
Schell Slough of San Pablo Bay	Tertiary	0	3,250	1,250	950	600	150
Total		3,330	3,250	1,250	950	600	150

Notes:
Wastewater disposal volumes are weather dependent, dry years will produce less volume while wet years will produce higher volumes. An average year is shown in this table.

5.3 **Recycled Water Use**

This section describes existing and potential recycled water use in the District.

5.3.1 Existing Recycled Water Use

There is no current recycled water use within the District. SVCSD currently supplies approximately 1,000 to 1,200 ac-ft/yr to vineyards, dairies, pastures, and wetlands in southern Sonoma Valley. Currently the SVCSD has approximately 635 ac-ft of recycled water storage (Sonoma County Water Agency, 2006a).

Projections for the recycled water use for 2005 were not made in the 2000 Urban Water Management Plan. Therefore, a comparison to projections for 2005 and actual use cannot be made. Table 5-4 shows actual recycled water use by SVCSD in 2005.

Table 5-4. (DWR Table 37) Recycled Water Use by SVCSD - ac-ft/yr

Type of Use	2005 Actual Use, ac-ft/yr
Agriculture	1,200
Landscape	0
Wildlife Habitat	0
Wetlands	0
Industrial	0
Groundwater Recharge	0
Other (type of use)	0
Total	1,200

Note:
No projections were made in the 2000 Urban Water Management Plan.

Recycled water use by water use category is listed in Table 5-5.

Table 5-5. (DWR Table 35a) Recycled Water Uses by SVCSD – Actual ac-ft/yr

Type of Use	Treatment Level	2005 Water Use, ac-ft/yr
Agriculture ^a	Secondary	1,200 ^c
Urban Landscape ^b	0	0
Wildlife Habitat	0	0
Wetlands	0	0
Industrial	0	0
Groundwater Recharge	0	0
Other (type of use)	0	0
Total	Secondary	1,200

Note:
^a Agricultural use offsets groundwater pumping.
^b Urban landscape use offsets potable water demand.
^c This use is outside of the District.

5.3.2 Potential and Projected Recycled Water Use

The Sonoma Valley Recycled Water Feasibility Study provided a study of potential recycled water use alternatives for SVCSD (Sonoma County Water Agency, 2006a). The alternatives listed in the plan specific to recycled water include urban reuse, agricultural reuse, and wetland restoration. Recycled water use for urban, agricultural, and wetland areas were investigated.

Urban Reuse

Up to 350 ac-ft/yr of recycled water could be used within the District's service area for urban reuse and potentially offset potable water use which otherwise would be supplied by either private groundwater wells or District supplied water. Some of the larger potential recycled water users within the District include the Sonoma Mission Inn Golf Course which uses an estimated

266 ac-ft/yr of groundwater, Altimira High School (11 ac-ft/yr), Sonoma Greens Homeowners Association (17 ac-ft/yr), and Hanna Boys Center (31 ac-ft/yr). These urban reuse values do not include urban reuse in the City of Sonoma.

Agricultural Reuse

An additional 1,500 ac-ft/yr of water could be used for agricultural areas currently supplied by metered water and out-lying agricultural areas surrounding the District's service area which are currently supplied by privately-owned groundwater wells. The agricultural lands being considered for recycled water irrigation include vineyards, dairies, and pasturelands.

Wetland Restoration

The California State Coastal Conservancy (Conservancy), the U.S. Army Corps of Engineers, San Francisco District (USACE), and the California Department of Fish and Game (CDFG) propose to restore a mosaic of tidal wetland and managed pond habitat at the 9,460-acre Napa River Unit of the Napa-Sonoma Marshes Wildlife Area using recycled water. The volume of recycled water required for this wetland restoration project is estimated to be the volume currently being discharged into Schell Slough by the SVCSD. Although this use does not offset potable water uses, it does help create wildlife habitat and recreation resources while reducing the impact of discharging nutrient rich recycled water directly to Schell Slough of San Pablo Bay.

The volume of potential recycled water use, based on the projected amount available, is shown in Table 5-6. However, a major factor that determines the use of recycled water and implementation of recycled water projects is the financial feasibility of connecting users to the system. Recycled water distribution systems require additional pipelines, storage tanks, and pumps. Proximity to the production of the recycled water and the distribution system is a major factor in considering use of recycled water. In addition, recycled water users must make their own investment in constructing and operating the on-site irrigation pipelines and sprinkler systems with the necessary warning signs, backflow prevention, and associated health and safety requirements. The projected future use of recycled water within the District's service area for the next 25 years is shown in Table 5-7.

Table 5-6. (DWR Table 35b) Recycled Water Uses – Potential ac-ft/yr

Type of Use	Treatment Level	2010	2015	2020	2025	2030
Agriculture ^a	Tertiary	1,500	2,500	3,000	3,500	4,000
Urban Landscape ^b	Tertiary	350	350	350	350	350
Wildlife Habitat		0	0	0	0	0
Wetlands		0	0	0	0	0
Industrial		0	0	0	0	0
Groundwater Recharge		0	0	0	0	0
Total		1,850	2,850	3,350	3,850	4,350

Notes:

Source: Sonoma Valley Recycled Water Feasibility Study, SCWA, 2006a.

^a Agricultural use offsets groundwater pumping. Agricultural use quantities are combined with the City of Sonoma and includes areas in and around the Valley of the Moon and City of Sonoma service areas.

^b Urban landscape use is for areas located in the District service area only. Urban landscape use offsets potable water demand on both private wells and District supply.

Table 5-7. (DWR Table 36) Projected Future Use of Recycled Water – ac-ft/yr

Type of Use	2010	2015	2020	2025	2030
Agriculture ^a	1,500	2,500	3,000	3,500	4,000
Urban Landscape ^b	0	0	0	0	5
Wildlife Habitat	0	0	0	0	0
Wetlands	0	0	0	0	0
Industrial	0	0	0	0	0
Groundwater Recharge	0	0	0	0	0
Other (type of use)	0	0	0	0	0
Total	1,500	2,500	3,000	3,500	4,005

Notes:

Source: Sonoma Valley Recycled Water Feasibility Study, SCWA, 2006a.

^a Agricultural use offsets groundwater pumping. Agricultural use quantities are combined with the City of Sonoma and includes areas in and around the Valley of the Moon and City of Sonoma service areas.

^b Urban landscape use is for areas located in the District service area only. Urban landscape use offsets potable water demand.

5.3.3 Promotion of Recycled Water Use

The Agency and its contractors encourage recycled water use by collecting, as part of Agency water rates, funds to be held in a special reserve for recycled water projects carried out by its water contractors and other Agency customers. A total of \$4,187,464 has been disbursed between the program's inception on July 1, 2000 and June 30, 2005. It is anticipated another \$8,812,536 will be disbursed in the next five years of program operation. Methods to encourage recycled water use and the projected amount of resulting recycled water use are listed in Table 5-8.

Table 5-8. (DWR Table 38) Methods to Encourage Recycled Water Use – ac-ft/yr

Methods	Ac-ft/yr of use projected to result from action				
	2010	2015	2020	2025	2030
Financial Incentives	0	0	0	0	5
Total	0	0	0	0	5

SECTION 6

WATER CONSERVATION

This section provides a description of the District's water conservation program and its best management practices (BMPs) or water demand management measures. The District utilizes water conservation BMPs as a method to reduce water demands, thereby reducing water supply need for the District. This section also describes the water conservation assumptions used to develop the water demand projections that are presented in Section 3.

6.1 BMP Implementation

The District is a member of the California Urban Water Conservation Council (CUWCC). The CUWCC was created to assist in increasing water conservation statewide, under a Memorandum of Understanding (MOU). As signatory to the MOU, the District has pledged their good faith effort towards implementing BMPs identified in the CUWCC MOU Regarding Urban Water Conservation. The two primary purposes of the MOU are as follows:

- a. to expedite implementation of reasonable water conservation measures in urban areas, and
- b. to establish assumptions for use in calculating estimates of reliable future water conservation savings resulting from proven and reasonable conservation measures. Estimates of reliable savings are the water conservation savings that can be achieved with a high degree of confidence in a given service area.

The Agency is the only wholesale water agency in the state to have all its water contractors signatory to the CUWCC MOU. The District signed the CUWCC MOU on October 1, 2001, and submits annual BMP reports to the CUWCC in accordance with the MOU. The MOU requires that a water utility implement only the BMPs that are economically feasible. If a BMP is not economically feasible, the utility may request an economic exemption for that BMP. The City has not requested economic exemption from any BMP at this time.

Table 6-1 lists the CUWCC's 14 BMPs and identifies which BMPs are performed by the District and the BMPs that are performed with assistance from the Agency.

Table 6-1. California Urban Water Conservation Council Best Management Practices

Best Management Practices, BMP	Valley of the Moon Water District	Sonoma County Water Agency ^a
BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers	✓	✓
BMP 02: Residential Plumbing Retrofit	✓	✓
BMP 03: System Water Audits, Leak Detection, and Repair	✓	
BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing	✓	
BMP 05: Large Landscape Conservation Programs and Incentives	✓	✓
BMP 06: High-Efficiency Washing Machine Rebate Programs	✓	✓
BMP 07: Public Education Programs	✓	✓
BMP 08: School Education Programs	✓	✓
BMP 09: Conservation Programs for Commercial, Industrial, and Institutional Accounts	✓	✓
BMP 10: Wholesale Agency Assistance Programs		✓
BMP 11: Conservation Pricing	✓	
BMP 12: Conservation Coordinator	✓	✓
BMP 13: Water Waste Prohibition	✓	
BMP 14: Residential ULFT Replacement Programs	✓	✓

Note:

^a These programs are being run in part by Sonoma County Water Agency.

Urban water suppliers that are members of the CUWCC may submit their most recent BMP Annual Reports for reporting years 2003-04 to meet the requirements of DWR Water Code Section 10631 (f). DWR also recommends that urban water suppliers include the Coverage Reports identifying the water supplier's progress on meeting the coverage requirement for quantifiable BMPs. The District's Water Supply and Reuse data, Accounts and Water Use data, and annual BMP Reports for 2003 and 2004, and the BMP Activity History, Base Year Data, and 2003 – 2004 Coverage Reports are presented in Appendix C. The Water Shortage Contingency Plan can be found in Appendix D.

6.2 Water Conservation Assumptions and Modeling

The water demand projections presented in Section 3 were developed based on certain assumptions regarding the future implementation of water conservation measures or BMPs. The District has previously committed to implementing all of the CUWCC BMPs. The CUWCC BMPs are currently in various stages of completion. Water conservation measures that are not part of the CUWCC BMPs are also assumed to be implemented for this analysis. These measures are identified as Tier 2 BMPs. New development standards that focus on low water using requirements for new single family housing are also assumed. These assumed future water conservation activities were integrated with the current water use characteristics and the population growth projections using the Decision

Support System (DSS) model. The analysis projects the future water demands based on four levels of increasing conservation effort: (1) current unit water use and the projected water savings from future plumbing retrofits as required by the plumbing code, (2) Tier 1 BMP efforts to date and remaining Tier 1 BMP efforts, (3) future Tier 2 BMP efforts, and (4) adoption of new development standards. The water demand projections presented in Section 3 assume that approximately half of the water savings from Tier 2 BMPs and 100 percent of savings from the new development standards would occur. The District will use its best effort to implement these additional water conservation measures. Existing water conservation savings due to past implementation efforts are included in the baseline projection. Because the water conservation savings are projections, actual demand reduction and the manner in which the demand reduction is achieved may vary. Table 6-2 presents the Tier 2 BMPs. The analysis is presented in Appendix B.

The BMP modeling analysis and demand projections were performed using the CUWCC approved DSS model, a Microsoft® Office spreadsheet based program run from Windows XP. The DSS model has been used elsewhere in northern California, including a recent project for the San Francisco Public Utilities Commission. The DSS model has been designed to provide a detailed planning evaluation framework for water demand management programs. The DSS model performs a cost-effectiveness evaluation of each BMP using the data on market potential for each conservation measure and the assumptions for each conservation measure variable. The DSS analysis projects on an annual basis the water savings and the dollar values of the benefits and costs that would result from implementing the BMPs. The DSS model components consist of the following steps:

1. Establish customer base-year water use conditions by customer-billing category and then by end use.
2. Establish service area conditions for evaluation of conservation measures by creating a database of service area data relevant to the conservation measures to be evaluated.
3. Conduct model calibration to current water use conditions by end use fixture models.
4. Use the service area data to perform a benefit and cost evaluation of each BMP.
5. Develop water demand projections assuming the implementation of the selected BMPs.

Table 6-2. Tier 2 BMPs

No. #	Measure Title
1	Rain-sensor (shut off device) retrofit on irrigation controllers
2	Cash for Grass (turf removal program)
3	Financial Incentives for Being Below Water Budget
4	Financial Rebates for Irrigation Meters
5	Smart Irrigation Controller Rebates
6	Financial Incentives/ Rebates for Irrigation Upgrades
7	Hotel retrofit (w/financial assistance) - CII Existing
8	Offer new accounts reduced connection fees for installing efficient process equipment for selected businesses (restaurants, laundry mat, food/groceries and hospital)
9	Synthetic Turf Rebate
10	High Efficiency Toilet (HET)
11	Dishwasher New Efficient
12	CII Rebates - replace inefficient water using equipment
13	0.5 gal/flush urinals in new buildings
ND1	Rain-sensor shut off device on irrigation controllers
ND2	Smart Irrigation Controller
ND3	High Efficiency Toilet (HET)
ND4	Dishwasher New Efficient
ND5	Clothes washing machines requirement for new residential
ND6	Hot Water on Demand
ND7	High efficiency faucets and showerheads
ND8	Landscape and irrigation requirements

ND = new development

SECTION 7

WATER SUPPLY VERSUS DEMAND COMPARISON

This section provides a comparison of the projected water supply and demand for the District from 2005 through 2030. Water supply to demand comparisons are also provided for single-dry year and multiple-dry year scenarios. The water demands are developed in Section 3, water supplies are defined in Section 4, and recycled water supplies are presented in Section 5 of this report.

Decreased water use resulting from water conservation is accounted for in Section 3. The overall conclusion is that the District has adequate water supply through the 2030 planning horizon of this Plan, except for single-dry years, starting in 2020. In single-dry years starting in 2020, the District will have to reduce water demands as described in the Water Shortage Contingency Plan contained in Appendix D, utilize local water supply sources, or both. The magnitude of these single-dry year potential shortfalls is estimated to be 15 percent of normal demand by 2030.

7.1 Normal Water Supply vs. Demand Comparison

The analysis compares the projected normal water supply and customer demands from 2010 to 2030, in five-year increments. The projected normal climate year water supply and demands are presented in Tables 7-1 and 7-2, respectively.

Table 7-1. (DWR Table 40) Projected Normal Water Supply – ac-ft/yr

	2010	2015	2020	2025	2030
Supply ^a	3,748	3,751	3,787	3,798	3,817
Percent of year 2005	98%	98%	99%	99%	100%

^a from Table 4-6.

Table 7-2. (DWR Table 41) Projected Normal Water Demand – ac-ft/yr

	2010	2015	2020	2025	2030
Demand ^a	3,748	3,751	3,787	3,798	3,817
Percent of year 2005 ^b	98%	98%	99%	99%	100%

^a From Table 3-5.

^b Based on 2005 demand of 3,825 ac-ft/yr.

The comparison of projected water supply and demand is presented in Table 7-3. As Table 7-3 shows, there is adequate water supply in normal years to meet demands through 2030.

Table 7-3. (DWR Table 42) Projected Supply and Demand Comparison – ac-ft/yr

	2010	2015	2020	2025	2030
Supply totals	3,748	3,751	3,787	3,798	3,817
Demand totals	3,748	3,751	3,787	3,798	3,817
Difference	0	0	0	0	0
Difference as percent of Supply	0%	0%	0%	0%	0%
Difference as percent of Demand	0%	0%	0%	0%	0%

7.2 Dry Year Water Supply vs. Demand Comparison

Tables 7-4 through 7-6 provide a comparison of a single-dry year water supply with projected total water use over the next 25 years, in five-year increments. As shown in Table 7-6, in single dry years starting in 2025, water demands will exceed water supplies. During these single dry years, the District would reduce water demands as described in Appendix D.

Table 7-4. (DWR Table 43) Projected Single-Dry Year Water Supply – ac-ft/yr

	2010	2015	2020	2025	2030
Supply ^a	3,748 ^b	3,751 ^b	3,821 ^c	3,576 ^d	3,641 ^e
Percent of projected normal	100%	100%	87%	86%	85%

^a The allocation of the difference in supply versus demand will be governed by Section 3.5 of the Restructured Agreement as outlined in the Water Shortage Contingency Analysis contained in Appendix D.

^b Based on normal year supplies as shown in Table 4-6.

^c Based on 3,216 ac-ft/yr supply from the Agency and 600 ac-ft/yr. of groundwater.

^d Based on 2,971 ac-ft/yr supply from the Agency and 600 ac-ft/yr. of groundwater.

^e From Table 4-7.

Table 7-5. (DWR Table 44) Projected Single-Dry Year Water Demand – ac-ft/yr

	2010	2015	2020	2025	2030
Demand	3,748	3,751	3,787	3,798	3,817
Percent of projected normal	100%	100%	100%	100%	100%

Table 7-6. (DWR Table 45) Projected Single-Dry Year Supply and Demand Comparison – ac-ft/yr

	2010	2015	2020	2025	2030
Supply totals	3,748	3,751	3,816	3,571	3,641
Demand totals	3,748	3,751	3,787	3,798	3,817
Difference ^a	0	0	29	-227	-176
Difference as percent of Supply	0%	0%	1%	-6%	-5%
Difference as percent of Demand	0%	0%	1%	-6%	-5%

^a The allocation of the difference in supply versus demand will be governed by Section 3.5 of the Restructured Agreement as outlined in the Water Shortage Contingency Analysis contained in Appendix D.

Tables 7-7 through 7-18 compare the total water supply available in multiple-dry water years with projected total water use over the next 25 years, in one-year increments. As these tables show, there is adequate water supply during multiple dry years to meet demands through 2030.

Table 7-7. (DWR Table 46) Projected Supply during Multiple-Dry Year Period Ending in 2010 – ac-ft/yr

	2006	2007	2008	2009	2010
Supply	3,748	3,748	3,748	3,748	3,748
Percent of projected normal	100%	100%	100%	100%	100%

Table 7-8. (DWR Table 47) Projected Demand Multiple-Dry Year Period Ending in 2010 - ac-ft/yr

	2006	2007	2008	2009	2010
Demand	3,748	3,748	3,748	3,748	3,748
Percent of projected normal	100	100	100	100	100

Table 7-9. (DWR Table 48) Projected Supply and Demand Comparison during Multiple-Dry Year Period Ending in 2010 – ac-ft/yr

	2006	2007	2008	2009	2010
Supply totals	3,748	3,748	3,748	3,748	3,748
Demand totals	3,748	3,748	3,748	3,748	3,748
Difference	0	0	0	0	0
Difference as percent of Supply	0%	0%	0%	0%	0%
Difference as percent of Demand	0%	0%	0%	0%	0%

Table 7-10. (DWR Table 49) Projected Supply during Multiple-Dry Year Ending in 2015 – ac-ft/yr

	2011	2012	2013	2014	2015
Supply	3,751	3,751	3,751	3,751	3,751
Percent of projected normal	100%	100%	100%	100%	100%

Table 7-11. (DWR Table 50) Projected Demand Multiple-Dry Year Period Ending in 2015 - ac-ft/yr

	2011	2012	2013	2014	2015
Demand	3,749	3,749	3,750	3,750	3,751
Percent of projected normal	100	100	100	100	100

Table 7-12. (DWR Table 51) Projected Supply and Demand Comparison during Multiple-Dry Year Period Ending in 2015- ac-ft/yr

	2011	2012	2013	2014	2015
Supply totals	3,751	3,751	3,751	3,751	3,751
Demand totals	3,749	3,749	3,750	3,750	3,751
Difference	2	2	1	1	0
Difference as percent of Supply	0%	0%	0%	0%	0%
Difference as percent of Demand	0%	0%	0%	0%	0%

Table 7-13. (DWR Table 52) Projected Supply during Multiple-Dry Year Period Ending in 2020 – ac-ft/yr

Water Supply Sources	2016	2017	2018	2019	2020
Supply	3,787	3,787	3,787	3,787	3,787
Percent of projected normal	100%	100%	100%	100%	100%

Table 7-14. (DWR Table 53) Projected Demand Multiple-Dry Year Period Ending in 2020 – ac-ft/yr

	2016	2017	2018	2019	2020
Demand	3,758	3,765	3,773	3,780	3,787
Percent of projected normal	100%	100%	100%	100%	100%

Table 7-15. DWR Table 54) Projected Supply and Demand Comparison during Multiple-Dry Year Period Ending in 2020 – ac-ft/yr

	2016	2017	2018	2019	2020
Supply totals	3,787	3,787	3,787	3,787	3,787
Demand totals	3,758	3,765	3,773	3,780	3,787
Difference	30	22	15	7	0
Difference as percent of Supply	1%	1%	0%	0%	0%
Difference as percent of Demand	1%	1%	0%	0%	0%

Table 7-16. (DWR Table 55) Projected Supply during Multiple-Dry Year Period Ending in 2025 – ac-ft/yr

	2021	2022	2023	2024	2025
Supply	3,798	3,798	3,798	3,798	3,798
Percent of projected normal	100%	100%	100%	100%	100%

Table 7-17. (DWR Table 56) Projected Multiple-Dry Year Period Ending in 2025 - ac-ft/yr

	2021	2022	2023	2024	2025
Demand	3,789	3,792	3,794	3,796	3,798
Percent of projected normal	100	100	100	100	100

Table 7-18. (DWR Table 57) Projected Supply and Demand Comparison during Multiple-Dry Year Period Ending in 2025 – ac-ft/yr

	2021	2022	2023	2024	2025
Supply totals	3,798	3,798	3,798	3,798	3,798
Demand totals	3,789	3,792	3,794	3,796	3,798
Difference	8	6	4	2	0
Difference as percent of Supply	0%	0%	0%	0%	0%
Difference as percent of Demand	0%	0%	0%	0%	0%

Table 7-19. Projected Supply during Multiple-Dry Year Period Ending in 2030 – ac-ft/yr

	2026	2027	2028	2029	2030
Supply	3,817	3,817	3,817	3,817	3,817
Percent of projected normal	100%	100%	100%	100%	100%

Table 7-20. Projected Multiple-Dry Year Period Ending in 2030 – ac-ft/yr

	2026	2027	2028	2029	2030
Demand	3,802	3,806	3,810	3,813	3,817
Percent of projected normal	100	100	100	100	100

Table 7-21. Projected Supply and Demand Comparison during Multiple-Dry Year Period Ending in 2030 – ac-ft/yr

	2026	2027	2028	2029	2030
Supply totals	3,817	3,817	3,817	3,817	3,817
Demand totals	3,802	3,806	3,810	3,813	3,817
Difference	16	12	8	4	0
Difference as percent of Supply	0%	0%	0%	0%	0%
Difference as percent of Demand	0%	0%	0%	0%	0%

SECTION 8 REFERENCES

- Brejle & Race. VOMWD Master Water Plan February 1998.
- California Department of Water Resources. 1982. Evaluation of Ground Water Resources: Sonoma County. DWR Bulletin 118-4. February.
- California Department of Water Resources. 2003. California's Groundwater Bulletin 118-Update. October.
- California Department of Water Resources. 2005. Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan. January.
- California Irrigation Management Information System (CIMIS), 2004. www.cimis.com.
- Kumar, Krishna. 2004a. Memorandum for Workshop on Long-Term Water Supply and Demand. Submitted to Valley of the Moon Water District Board of Directors.
- Kumar, Krishna. 2004b. Letter to George Roberts (General Manager of Forestville Water District) Regarding Emergency Assistance – Water Supply. July.
- Kunkel, Fred and Upson, J.E. 1960. Geology and Ground Water in Napa and Sonoma Valleys Napa and Sonoma Counties, California, USGS Water Supply Paper 1495.
- Luhdorff and Scalmanini Consulting Engineers. 1999. Master Plan for Ground-Water Development and Management: Valley of the Moon Water District. April.
- Luhdorff and Scalmanini Consulting Engineers and Winzler and Kelly Consulting Engineers. 2005. City of Rohnert Park Water Supply Assessment. January.
- Sonoma County Water Agency. 2006a. Sonoma Valley Recycled Water Feasibility Study.
- Sonoma County Water Agency. 2006b. 2005 Urban Water Management Plan.

Sonoma County Water Agency. 2005. Final MOU dated 06-21-05 Compared to Existing MOU dated 3-2-01. Memorandum of Understanding Regarding Water Transmission System Capacity Allocation During Temporary Impairment.

Sonoma County Water Agency. 2004. Water Supply Workshop, Sonoma County Water Agency Staff Report. November.

Sonoma County Water Agency. 2001. Eleventh Amended Agreement for Water Supply. January.

Sonoma County Water Agency. 2000a. Urban Water Management Plan 2000.

Sonoma County Water Agency. 2000b. Memorandum of Understanding Regarding Water Transmission System Capacity Allocation During Temporary Impairment.

Weber Analytical VOMWD Final Report Water Demand Forecasts 2003-2025, February 2003.

Valley of the Moon Water District. 2005. Urban Water Shortage Contingency Plan.

APPENDIX A

Urban Water Management Plan Public Hearing Notice and Resolution

CERTIFICATION OF PUBLICATION IN
"The Sonoma Index-Tribune"
(Published every Tuesday and Friday)
in the
SUPERIOR COURT
of the
STATE OF CALIFORNIA
In and For the County of Sonoma

FEB 20 2007

"NOTICE OF PUBLIC HEARING"

COUNTY OF SONOMA

STATE OF CALIFORNIA, The undersigned does hereby certify and declare: That at all times hereinafter sworn, deposes and says: That at all times hereinafter mentioned she was a citizen of the United States, over the age of eighteen years and a resident of said county and was at all said times the principal clerk of the printer and publisher of The Sonoma Index-Tribune, a newspaper of general circulation, printed and published in the City of Sonoma, in said County of Sonoma, State of California; that The Sonoma Index-Tribune is and was at all times herein mentioned, a newspaper of general circulation as that term is defined by Section 6000 of the Government Code; its status as such newspaper of general circulation having been established by Court Decree No. 35815 of the Superior Court of the State of California, in and for the County of Sonoma, Department No. 1 thereof; and as provided by said Section 6000, is published for the dissemination of local and telegraphic news and intelligence of a general character, having a bona fide subscription list of paying subscribers, and is not devoted to the interest, or published for the entertainment or instruction of a particular class, profession, trade, calling, race or denomination, or for the entertainment and instruction of such classes, professions, trades, callings, races or denominations; that at all said times said newspaper has been established, printed and published in the said City of Sonoma, in said County and State at regular intervals for more than one year preceding the first publication of this notice herein mentioned; that said notice was set in type not smaller than non-pareil and was preceded with words printed in black face type no smaller than non-pareil, describing and expressing in general terms, the purport and character of the notice intended to be given; that the "Notice of Public Hearing" of which the annexed is a printed copy, was published in said newspaper at least two consecutive times, commencing on the 13th day of February, and ending on the 16th day of February, 2007, to-wit February 13, 16, 2007.

* * *

I HEREBY CERTIFY AND DECLARE UNDER THE PENALTY OF perjury that the foregoing is true and correct.

EXECUTED this 16th day of February, 2007 at Sonoma, California

Signed

Megan O'Donnell

Chief Clerk

Notice of Public Hearing

Valley of the Moon Water District

Hearing Topic: 2005 Urban Water Management Team

Date: March 6, 2007, 6:45pm

Location: Board of Directors Chambers
Valley of the Moon Water District
19039 Bay Street
El Verano, CA 95433

The Valley of the Moon Water District Board of Directors will hold a hearing on March 6, 2007 at 6:45 p.m. to receive comments on the 2005 Draft Urban Water Management Plan (Plan). The purpose of the Plan is to consolidate information regarding water supply and demand, provide public information, and improve statewide water planning. The Plan may be reviewed at the following locations:

Valley of the Moon Water District Office, 19039 Bay Street, El Verano, CA

Valley of the Moon Water District's web page at <http://www.vomwd.com>

Oral and written testimony will be taken at the hearing. Written comments may also be submitted to the General Manager of the Valley of the Moon Water District, P.O. Box 280, El Verano, CA 95433, for receipt prior to the hearing.

2-13 Pub. Feb. 13 & 16, 2007

(2t)

RESOLUTION NO. 070301

**RESOLUTION OF THE BOARD OF DIRECTORS OF THE VALLEY OF THE MOON
WATER DISTRICT ADOPTING THE URBAN WATER MANAGEMENT PLAN 2005**

WHEREAS, the Urban Water Management Planning Act, California Water Code Section 10610 *et seq.*, requires that every urban water supplier directly or indirectly supplying water for municipal purposes to more than 3,000 customers prepare an Urban Water Management Plan, the primary objective of which is to plan for the conservation and efficient use of water; and

WHEREAS, the Valley of the Moon Water District (District) staff, with the assistance of the Sonoma County Water Agency (Agency) consultants Brown and Caldwell, Maddaus Water Management, and Weber Analytical, has prepared an Urban Water Management Plan (UWMP 2005) for the District to meet the requirements of Urban Water Management Planning Act, in accordance with guidelines developed by the California Department of Water Resources; and

WHEREAS, District staff and consultants who prepared the UWMP 2005 have the training, experience, and expertise necessary to prepare a plan meeting the requirements of the Urban Water Management Planning Act; and

WHEREAS, the UWMP 2005 must be adopted after public review and a public hearing by the District's Board of Directors and must be filed with the Department of Water Resources; and

WHEREAS, the District has prepared a draft UWMP 2005, and commencing on February 6, 2007, made that draft UWMP 2005 available for public review, in compliance with the requirements of the Act;

WHEREAS, the District, on March 6, 2007, held a duly noticed public hearing before this Board and received comments; and

WHEREAS, District staff, Agency consultants, and the Board have reviewed and considered the comments made on the draft UWMP 2005, and the Board has reviewed and considered the final UWMP 2005, the District's staff reports, and the presentations by District staff and consultants; and

WHEREAS, the UWMP 2005 was prepared in accordance with, and meets the requirements of, the Urban Water Management Planning Act, and the facts, assumptions, and analyses in the UWMP 2005 are reasonable and supported by substantial evidence;

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the Valley of the Moon Water District hereby finds, determines, and declares as follows:

1. All of the above recitals are true and correct.
2. The Urban Water Management Plan 2005 is hereby approved and adopted.

3. The General Manager is authorized and directed to provide a copy of UWMP 2005 to the Department of Water Resources and otherwise as required by Water Code section 10644(a)

THIS RESOLUTION PASSED AND ADOPTED THIS 6th DAY OF March, 2007, by the following votes:

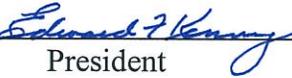
Director Kenny Aye

Director Bramfitt Aye

Director Prushko Aye

Director Smith Aye

Director Townsend Aye

By 
President

By 
Deputy Secretary

AYES 5

NOES 0

ABSENT 0

ABSTAIN 0

I HEREBY CERTIFY that the foregoing Resolution was duly adopted at a regular meeting of the Board of Directors of Valley of the Moon Water District held on the 6th day of March, 2007, of which meeting all Directors were notified and at which meeting a quorum was present at all times and acting.

By 
Deputy Secretary

APPENDIX B

Valley of the Moon Water Use and Conservation Analysis

- 1) Weber Analytical, Valley of the Moon Historical Water Use, August 17, 2005
- 2) Maddaus Water Management, Revised Customer Water Demand Projections Summary of Data Inputs, Assumptions and Results, November 22, 2005
- 3) Maddaus Water Management, Revised Tier One Conservation Measure Evaluation Summary of Data Inputs, Assumptions and Results, May 30, 2006
- 4) Maddaus Water Management, FINAL Tier Two and New Development Conservation Measure Evaluation Summary of Data Inputs, Assumptions and Results, November 2, 2006

Weber Analytical**VALLEY OF THE MOON HISTORICAL WATER USE****Water Production Data**

Water production data from the Valley of the Moon was acquired, as reported in ccf per month. The data for the years 2002 through 2004 are listed below, converted to million gallons per day (MGD). The average value MGD is also shown.

Year	Production, MGD
2002	2.33 3.11
2003	2.28 3.05
2004	2.34 3.13
Average	2.32 3.10

Water Billing Data

We developed six monthly water use tracking models from the historical water billing data using the monthly data provided by Valley of the Moon. We performed a regression analysis the time series of per account water use versus month that considered which weather variables best would account for variation in use due to the weather (weather normalization). Some general comments follow, and then brief comments on each billing category's model. The purpose of each model is to determine the average water use per account per day to forecast additional future water use as new accounts are added.

Valley of the Moon has seen a draft of the following and did provide comments that are noted in the text.

The data is for July 1997 through December 2004. The results are quite stable and the level of usage in the base period (normally 2002 to date) can be projected to annual water usage. We are providing a graph of the pattern of water use for each customer group with a few of our interpretive comments that can either be accepted or the City can provide a more knowledgeable interpretation. These graphs have four lines (two of them have five lines):

1. Weather normalized actual water use expressed in terms of gallons per day per 5/8 equivalent meter (gpd/a). The weather normalization statistically derives the impact of weather on water use and restates actual water use to the level it would be with normal weather. (Normal weather is based on long term average weather for each month.)
2. A 13 month weighted moving average is calculated that runs through the center of the data, giving an easy-to-visualize picture of the pattern of use.
3. An average of the last three years is given as a potential base point for demand projections and as a reference for viewing the stability or volatility of recent years. In two cases, more than one reference line is given.
4. A regression model forecast is given for the last two years of actual data by month and for 2005 just as a reference forecast. This forecast simply projects

the pattern of the prior three years without any consideration given to any conservation or other measures that the Town might take that would change the water use pattern.

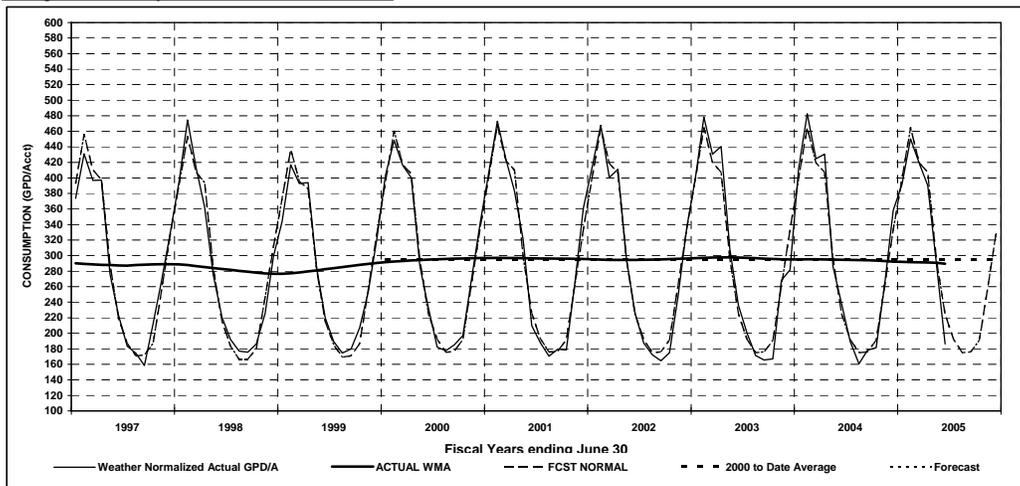
It has become clear, with the analysis of water use for each contractor, that some of their customer groups have evidenced declining water use per account in recent years. Weather in Sonoma County has been hotter and dryer in recent years than normal (normal = average of last 15 years) which drives up water use. Weather normalizing, therefore, has augmented the declining pattern.

We have strived to get local insight as to the cause of the downward drift in water use per account by showing the contractors graphs of their pattern of water use and asking for their feedback. We received quantitative information supporting reduced gpd/a from Santa Rosa relative to their MFR customer group. Other contractors concurred in our suspicions that certain downturns were the result of shifting customers from one customer group to another. The major shift was removing irrigation customers from the MFR or COM groups to a separate IRR group for irrigators. We couldn't pursue these issues any further since we are not authorized in this contract to evaluate the causes for aberrant patterns of water use, including those that might be related to conservation measures including water pricing.

Some additional information relating to the downward trend in water use (where applicable) might come to light in the process of identifying conservation measures that will be selected and implemented during the forecasted years through 2025.

VALLEY OF THE MOON

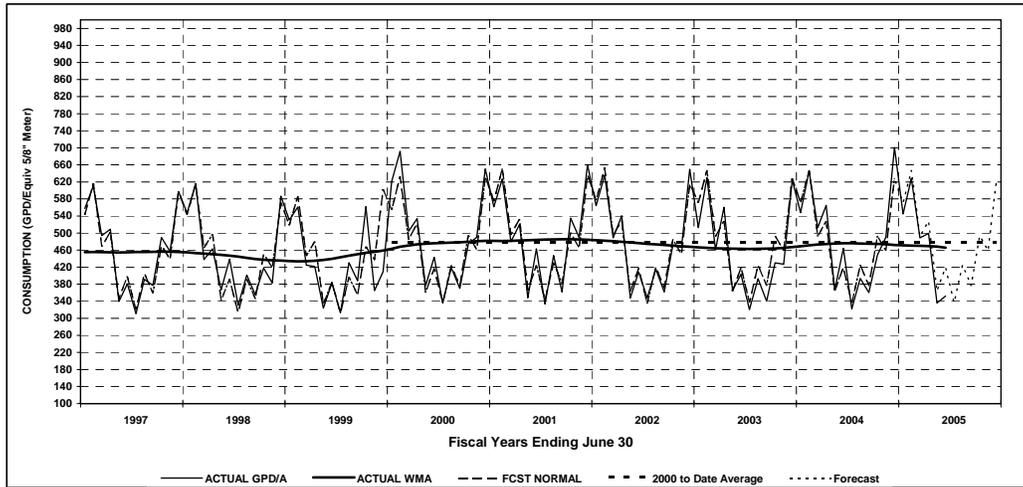
Single Family Residential (SFR)



We see the SFR category as basically very stable with a slight downward trend that we might attribute to “naturally occurring” conservation from the water efficient fixtures in new home customers and from home renovations. There could also be a modest effect from the recently implemented tiered rate structure, but we think it is too early to get an accurate assessment of that impact until at least after the summer of 2005.

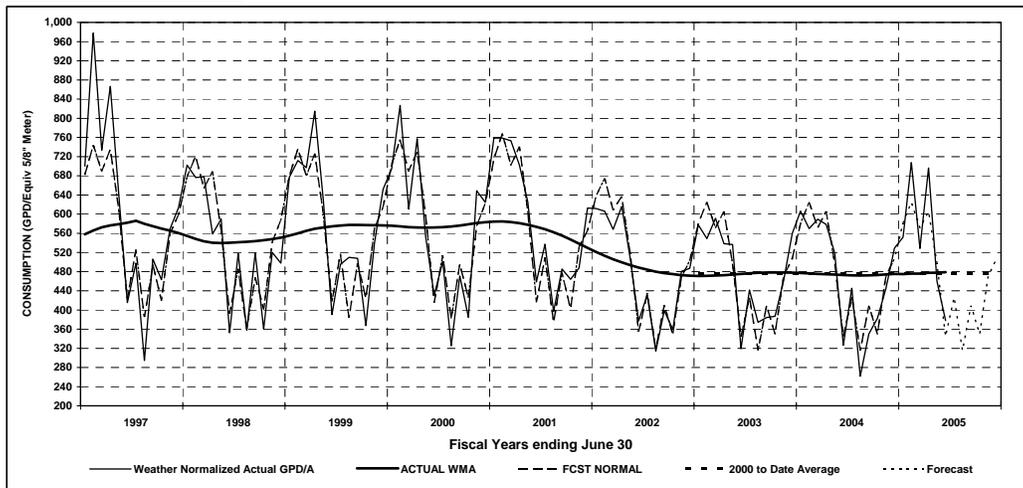
We suggest using the 295 gpd/a that is the average of the last 4.5 years (equivalent 5/8 inch meter).

Multifamily Residential (MFR)



The MFR customer group has a similar stable pattern of water use since 2000. The slight dip at the midpoint of fiscal 2005 (June 2004) could be just normal variation, or natural conservation, or a modest price response—or all three. We believe it is safe to project this level of volume per equivalent meter (474 gpd/e, as shown by the dashed line 2000 to date) into the future and then allow for whatever conservation measures are applied.

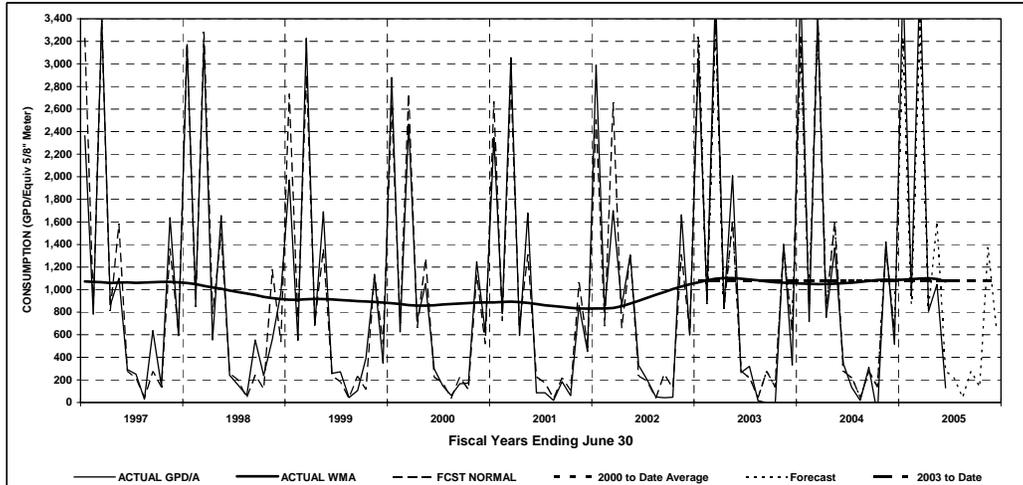
Commercial (COM)



Something happened in the transition from fiscal 2001 to 2002. We believe that is the time that the Irrigation customer accounts were set up or augmented. If the larger commercial irrigation customers were transferred from the Commercial to the Irrigation-Commercial customer group, the average usage in the Commercial would fall as shown in the above graph. Did this actually happen? In any case, the pattern of water use per equivalent meter since fiscal 2001 has been very steady and probably can be projected as the current rate of water use, without regard to future conservation efforts.

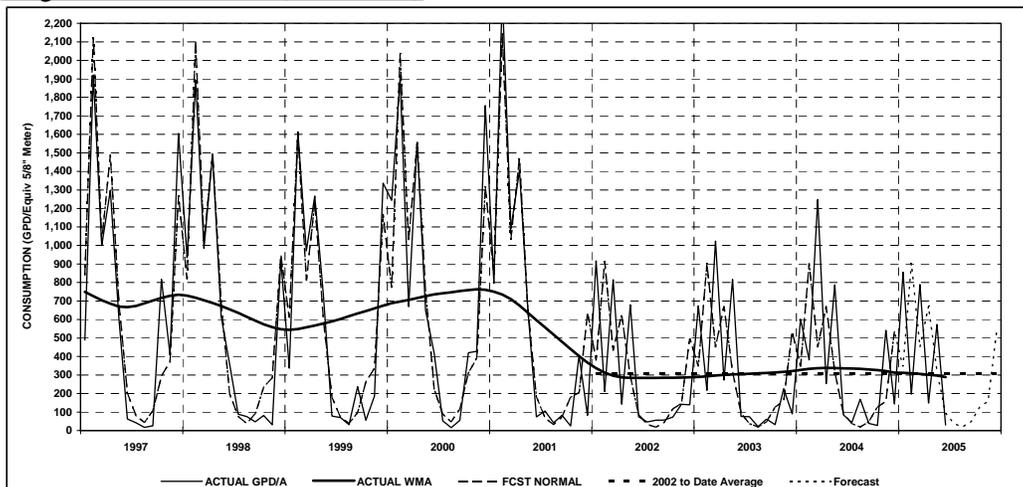
We suggest that the 474.9 gpd/equivalent 5/8 meter for Fiscal Years 2002 through six months of FY 2005 is a good base volume since the transition of accounts has apparently ended.

Irrigation Multifamily (MFR IRR)



There are only a dozen accounts in this category so that the addition or loss of even one account can have a measurable impact on the average use. It appears here that some of the Commercial irrigators who were transferred out of the Commercial customer category went to the MFR Irrigator group and, in that group, they were larger users than the others in that group, thus raising the average use. Is that so? We think the 1076.6 gpd/equiv 5/8 meter is a good number for the projection.

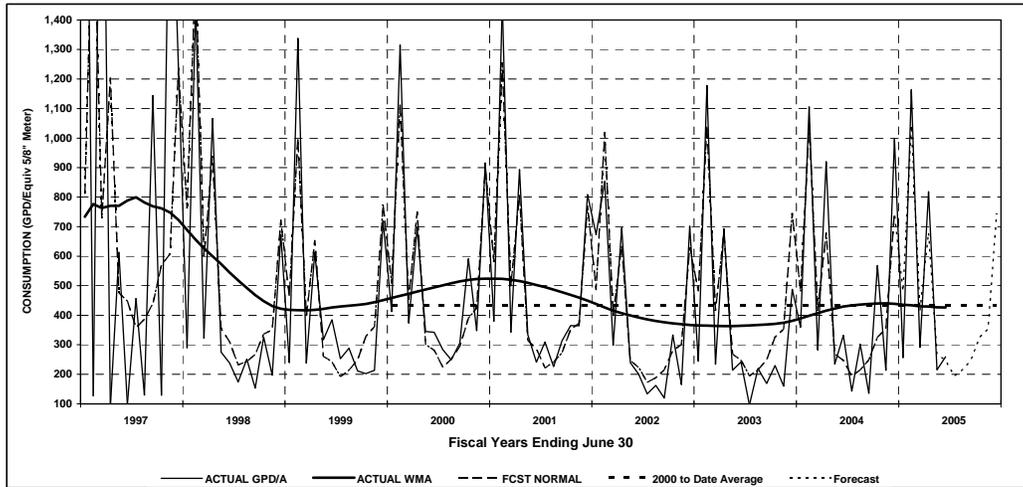
Irrigation Commercial (IRR COM)



It appears that the large irrigators that were transferred from the Commercial customer group (if that actually happened) were small relative to the established irrigators and brought down the gpd/equiv. It looks logical. Is that really what happened?

We suggest that the 308.7 gpd/equiv meter for 2002 to date is appropriate to use for the redefined customer group.

Institutional



This customer group is small, about 30 accounts, and using only 0.10 acre feet per year. We suggest that the average use since 1999 is as good a predictor as any for this small category. Whatever happened in 1998 to drop the volume is apparently gone and has stayed away.

We suggest that the 438.8 gpd/eqiv meter for this small group as shown for the period 2000 to date.



MEMORANDUM

Date: November 22, 2005

To: Krishna Kumar, Valley of the Moon Water District

From: William Maddaus, Maddaus Water Management

Subject: *Revised Customer Water Demand Projections
Summary of Data Inputs, Assumptions and Results*

LIST OF CHANGES SINCE NOVEMBER 6, 2005 MEMO

The following change has been made to the demand projections.

1. Accounted for a vacancy rate change of 2.06 percent estimated by Mr. Richard Rogers of Sonoma County planning department. We found that the vacancy rate in the 2000 census was reported to be 6.5 percent for your service area. We reviewed the historical water use pattern and find that for the period 2000 through 2004 the water use per residential account is very stable and constant. Thus the vacancy rate does not appear to have declined since 2000 (or we would have seen an increase in per account water use). Therefore we can justify an increase water use in single family and multifamily accounts equal to the reduction in the vacancy rate or 4.5 percent.

As a result the demand projection for 2030 has increased 3.7 percent from 3,943 AF/year reported in our last memo to a new value of 4,089 AF/year. (The new demand values are shown in Table 4-1 with the plumbing code included).

LIST OF CONTENTS

The following five pieces of information are included in this packet:

1. Future Population and Employment Projections (Attachment 1)
2. Historical Water Use and Demographic Data Inputs to the Model (Attachment 2)
3. Key Assumptions for the Model (Attachment 3)
4. Alternative Water Demand Projections (Attachment 4)
5. Demand Tables for Urban Water Management Plan (Attachment 5)

Each of these will be discussed in individual sections below. As this information has not been concurred with by local agencies, all of the provided information is subject to change.

1. FUTURE POPULATION AND EMPLOYMENT PROJECTIONS

Description of Population and Employment Forecasts (Attachment 1)

There are generally two main sources of population and employment projections that can be used in this model. Below is a list of the two data sources that can be used to generate future water demands.

Available Demographic Projections

- *Local General Plan (population and employment)* – Typically these plans, depending upon when they were published, have a population and jobs forecast for 2020 and build out. The Draft Sonoma County General Plan has a population and dwelling unit forecast for the Valley of the Moon (VOM) service area.
- *ABAG (population and employment)* - As mentioned above, ABAG recently published a report in 2005 that includes population and employment estimates for each city in the Bay Area. This report also provides projections for 2005, 2010, 2015, 2020, and 2025. The VOM area, being unincorporated, is a part of the entire Sonoma County unincorporated area. At the present time census track projections for the 2005 forecast are not available, but will be in the future.

At the VOM's request the current Draft Sonoma County General Plan was used as the source of population forecasts. The population used represents *Residential or Household* population and excludes institutionalized persons. These were in turned used for the demand projections. Employment forecasts were not available from this source.

2. WATER USE AND DEMOGRAPHIC DATA INPUTS TO MODEL

Description of "Water Use Data Input Sheet" (Attachment 2)

Attachment 2 is a two-page print out of an Excel spreadsheet. The purpose of this "Water Use Data Input Sheet" is to gather and document basic information about the individual service area. The data shown on the "Water Use Data Input Sheet" can be broken into two main categories, (a) current water use data and (b) demographic data. Each area is broken out below and helps to provide some basic definitions and assumptions.

(a) Water Use Data

- *Base Year* – This is the starting year for the analysis. For this project, the recent average weather normalized data was selected as the base year for two reasons:
 1. 2004 shows less of an effect of the recession.
(The year 2002-3 shows a dip in water demand in many areas due to reduction in economic activity)
 2. 2004 had relatively "normal" climate conditions – i.e. not a drought or excessively wet year, so weather adjustments were minor

- Average gal/day/acct- This is the amount of water in gallons that is used per day, per account.
- Indoor/outdoor water use – This is the amount of water per account split into the percent that is used indoors. The corresponding remaining percent of water is used outdoors.
- Consumption by customer class- This shows the annual amount of water used for an entire calendar year, broken down by customer class (Single Family, Multi Family, Commercial, Irrigation, etc)
- Provision for New Single Family Account Use– For selected agencies, and upon their specific request, a new category can be created to model water use of new single family homes. This value is held constant in the baseline projection and not subject to plumbing codes. It is assumed that all new homes are built to the current plumbing code with low flow showerheads and low flush (1.6 gallon per flush) toilets. The plumbing codes continue to work on the existing accounts. VOM has made such a request and has provided some data to document the requested level of use for new homes. The value used for new homes is 362 gallon/day/account.
- Unaccounted for water (UFW) - The difference between the amount of water purchased and the amount of water that was billed. Data provided by the agency was used, if provided, unless UFW was less than 7 percent, in which case 7 percent was used. A UFW of 11.5% was used based on data from annual CA DWR reports.
- Water Produced– This is the total amount of potable water produced by Forestville Water District. The water can come from multiple sources including amount purchased from SCWA, purchased from other agencies, local surface water, or obtained from groundwater. This does not include recycled water.
- Peak day factor – The ratio of water produced on the maximum day of the year to that produced on the average day. The value used in the recent SCWA Water Master Plan for agencies was used where available; otherwise a value of 1.6 was used. VOM has provided a value of 1.65 to be used for their demand forecast.

(b) Demographic Data

- Census 2000 – The 2000 Census data was used as a reference when determining population and household sizes for each individual city (and/or unincorporated area) serviced by the water agencies. The census shows a housing vacancy rate of 7 percent existed in 2000.
- Sonoma County Planning Department estimate– Sonoma County Planning (Mr. Richard Rogers) has made an estimate of the current service area population and dwelling units using GIS and Assessor Parcel maps. As mentioned above they have also made a forecast.

These estimates are used to establish the growth from the base year of 2004 to 2030. In a revision of the projections issued on October 16, 2005 Mr. Rogers has revised the figures to account for a vacancy rate of 2 percent going forward.

- Single and multi family dwelling units- The 2004 single family dwelling units is equal to the number single family accounts for 2004. The 2004 multi family dwelling unit estimate was calculated by applying a growth factor to the 2000 data as noted on the water use data sheet in Attachment 2.
- Procedure for service areas not contiguous with city boundaries – When a service area serves outside a city boundary, estimates were generated either from census data when available for the unincorporated areas, Department of Finance data, ABAG Projections, DWR reported data, General Plan or by the agency if known. If none of the six sources were available, then the modeling team worked with the agencies to make reasonable estimates.
- Employment data (ABAG) – The employment figures were gathered from the Association of Bay Area Governments (ABAG) report dated 2005. These numbers were developed regionally, and are based on the 2000 Census.

In summary, the key features of this sheet include the revised 2004 (baseline) level of water use, adjusted upwards by 4.5 percent to account for the decrease in vacancy rate, 2004 baseline accounts in each customer category, and forecasts for population growth provided by Sonoma County.

3. KEY ASSUMPTIONS FOR THE MODEL

Key Assumptions for the Model (Attachment 3)

The one page table shown in Attachment 3 shows some of the key assumptions used in the model. The assumptions having the most dramatic effect on the results are the natural replacement rate of fixtures, how residential or commercial future use is projected, and finally the percent of unaccounted for water.

4. WATER DEMAND PROJECTIONS

Development of the Water Demand Projections Table and Graph (Attachment 4)

Water demand projections were developed out to the year 2034 using the Demand Side Management Least Cost Planning Decision Support System (DSS) model. This model incorporates information from the:

- “Water Use Data Sheet” and the “Key Assumptions” shown in Attachments 2 and 3
- Questions asked of agencies
- Agency provided data
- 2000 Census data
- 2000 to 2004 Department of Finance population data
- Local General Plans
- Association of Bay Area Governments Projections

Attachment 4 shows the projected demands with and without plumbing codes and appliance standards. This page includes both a table and a graph. Each will be described below.

California law requires that for new construction after January 1, 1992 only fixtures meeting the following standards can be installed in new buildings:

- Toilet – 1.6 gal/flush maximum
- Urinals – 1.0 gal/flush maximum
- Showerhead and Faucets – 2.5 gal/min at 80 psi

Replacement of fixtures in existing buildings is governed by the Federal Energy Policy Act that requires only the above can be sold after January 1, 1994 for residential use and January 1, 1997 for commercial toilets. This law governs natural replacement.

New clothes washers are required to meet increased energy efficiency standards in 2004 and 2007. It is expected that this will lead to water efficiency improvements (efficient washers use at least 33% less water) by no later than 2007. We have assumed that by 2007, 30 percent of washers purchased will be efficient, by 2010, 50 percent purchased will be efficient, by 2015, 75 percent will be efficient, and by 2020, 100 percent purchased will be efficient.

Graph of projected demands (Figure 4-1)

Figure 4 shows the projection at five-year increments. The graph shows projections through 2034.

Table of water demand projections (Table 4-1)

The table of water demands projections includes:

1. The water demand projections are based on the future population and employment projections shown and described above in Attachment 4.

2. Table 1-1 shows the population and employment projections used to prepare the demand projections.
3. Projections were made *with and without* the plumbing codes.
4. Projections are for potable water only. It does not include recycled water use. Recycled water use and projections are included in Chapter 5 of UWMP.

Dry Year Demands

The demand projections reflect average weather conditions and **do not** reflect drier, hotter, non-drought conditions.

5. WATER DEMAND PROJECTIONS – 2005 URBAN WATER MANAGEMENT PLAN (UWMP) FORMAT

Conversion of the Water Demand Projections Table and Graph to 2005 UWMP Format (Attachment 5)

The 2005 Urban Water Management Plan Guidance Document from the California Department of Water Resources (Ca DWR) requests that future demand information be in a specific format. Provided in Attachment 5 are the five tables relating to future average day demands they requested. The demand projection shown is the “with Plumbing Code” demands and is otherwise the same as appeared in the above table and graph. The demand projections in the Urban Water Management Plan will be included in Chapter 3.

NEXT STEPS

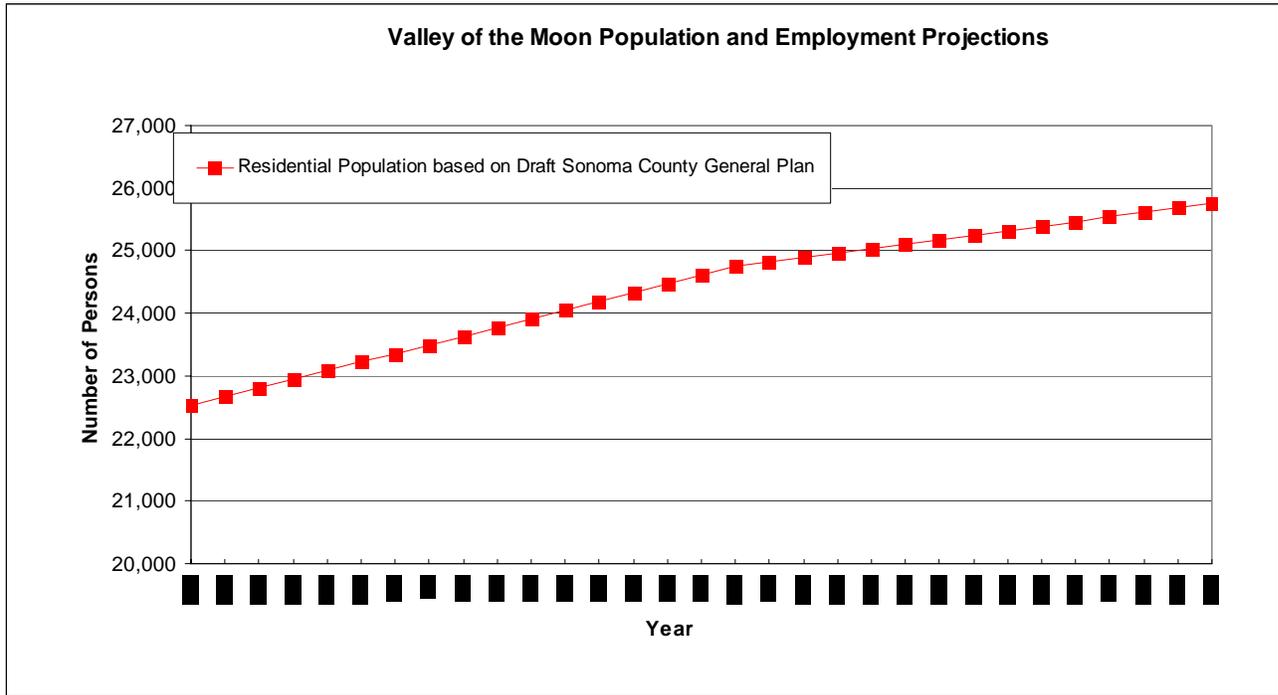
The following five steps remain to finalize the demand projections and evaluate conservation measures.

1. Contractor to concur with baseline projection
2. Evaluate Tier One conservation measures with the model
3. Develop projections with alternative levels of conservation
4. Provide information on the cost-effectiveness of water conservation
5. Identify individual agency projections with planned conservation

ATTACHMENTS

Attachment 1	Future Population and Employment Projections (Figure 1-1 and Table 1-1)
Attachment 2	Water Use Data Input Sheet
Attachment 3	Key Model Assumptions (Table 3-1)
Attachment 4	Alternative Water Demand Projections (Figure 4-1, Table 4-1)
Attachment 5	UWMP Tables for Chapter 3 (Ca DWR format)

Attachment 1 – Population and Employment Projections



**FIGURE 1-1
Population and Employment Projections for Valley of the Moon**

**TABLE 1-1
Population and Employment Results for Valley of the Moon**

Projection	Population						
	2004	2005	2010	2015	2020	2025	2030
Population	22,526	22,665	23,359	24,055	24,753	25,109	25,466
Employment	NA	NA	NA	NA	NA	NA	NA

Attachment 2 – Water Use Data Input Sheet (Page 2)

Valley of the Moon Water Service Area ¹					
Reconcile agency account billing data and census data					
Total Dwelling Units in Census 2000 for Valley of the Moon by Census Tract					
	2000 Units	No. Buildings	Service Area Billing Accounts - Year 2000³	Difference between billing and census data	Data Sources / Notes
Single family					
1-detached	6,009	6,009			
Subtotal	6,009	6,009	6,020	12	Billing accounts exceed estimate from the census When this happens some of the attached units and duplexes are classified by District as Single Family
Multi family					
1-attached	623	311			Assumes average of 2 units per account
2-units	296	148			Assumes average of 2 units per account
3-4 units	588	168			Assumes average of 3.5 units per account
5 to 9 units	67	10			Assumes average of 7 units per account
10 to 19 units	145	10			Assumes average of 15 units per account
20 to 49 more units	60	2			Assumes average of 50 units per account
50 or more units	515	7			Assumes average of 50 mobile home units per master meter
mobile homes	587	12			Meter for mobile home parks, assume 50 per park Must be more than one building on an MF meter.
Subtotal	2,881	667	398	-269	
	MF Average = 4.3	2000 Census Data units/building	7.2	2000 Billing Data units/account	This is a typical value of DUs/account
	Total SF + MF units = 8,889	Based on Sonoma MF units and Census SF units			
Alternatively the census tract breakdown of units may be in error. Assume County figures are correct.					
	2000 Group Quarters Data			2000 Census Data	
Institutionalized	117	Average household size		2.51	
Non-Institutionalized	527	Average household size of owner-occupied unit		2.44	
Total	643	Average household size of renter-occupied unit		2.60	
		Homeowner vacancy rate (percent)		0.8%	
		Rental vacancy rate (percent)		2.8%	
Population and Household Size in Census 2000 for Valley of the Moon Water District					
		Estimated Service Area Population 2004	Estimated Service Area Population 2004	Data Sources / Notes	
	Service Area 2000	2000	2004		
Total Population from Sonoma County data ⁶ =	22,050	22,646		Estimated growth from 2000 to 2004 (Sonoma County Projections):	2.70%
Subtract Group Quarters Population =	117	120		Estimated employment growth from 2000 to 2004: Water use for the institutionalized population is accounted for in nonresidential billing categories	NA
Residential Population =	21,933	22,526		Residential population shown corresponds to the city or cities represented by Census data	
Avg. Residential HHS ⁶ =	2.47	2.47			
MF Pop @ MF HHS ⁶ =	2.55	7,346	7,544	7,544	33.5%
SF Pop =	14,588	14,982	14,982	66.5%	Percent of Population that is MF
SF HHS ⁶ =	2.41	2.47	2.47	100.0%	Percent of Population that is SF
Estimate Service Area Dwelling Units for 2004			22,526	100.0%	
SF Res	6,063	Equals No. single family accounts in 2004			
MF Res	2,959	Equals No. of MF dwellings cell M21 plus growth in accounts for four years cell S35 (Estimated growth 2000 to 2004 (Sonoma County Projections))			
Total	9,022				
		Population	Employment		
2000 Census data for jurisdiction	22,050	NA	NA	No Employment Projection or historical data provided	
2000 ABAG (jurisdictional)	22,050	NA	NA	Employment developed from Household Data	
Son. County 2005 Projection (jurisdictional)	22,795	NA	NA	Assumed 1.0 job per household as similar to City of Sonoma General Plan Update May 2004 Table H-2 page 28	
2000 ABAG (subregional)	NA	NA	NA		
2005 ABAG Projection (subregional)	NA	NA	NA		
2003 Department of Finance Benchmark	NA	NA	NA	2000	8,570
2004 Department of Finance Benchmark	NA	NA	NA	2004	8,770
2004 Department of Finance Estimate	NA	NA	NA	2005	8,820
2005 Department of Finance Estimate	NA	NA	NA		
2004 Employment in Service Area (input to DSS Model) =		8,770		Service Area Employment	
Definitions / Abbreviations					
ABAG	Association of Bay Area Governments	HHS	household size		
DOF	Department of Finance	NA	not available		
DSS	Decision Support System Model	MF	multi family		
du	dwelling unit	MGD	million gallons per day		
FY	Fiscal Year	No.	number		
gcd	gallons per capita / per day	Pop	population		
gpd/a	gallons per day / per account	Res	residential		
gpd	gallons per day	SF	single family		
		UFW	unaccounted for water		

Attachment 3 – Key Model Assumptions

**TABLE 3-1
List of SCWA Baseline Demand Projection Assumptions for DSS Model**

Parameter	Model Input Value, Assumptions, and References
Base Year	2004
Peak Day Factor	1.65
Unaccounted for Water, % of Water Production	Calculated from historical production and sales data or 6.5%, whichever is greater; constant over time. VOM value 11.5%
Population Projection, 2005 to 2034	County of Sonoma Draft General Plan, revised October 16, 2005
Employment (Jobs) Projection 2005-2034	County of Sonoma Draft General Plan, revised October 16, 2005
Number of Water Accounts for Base Year	Data submitted by customers for 2004
Distribution of Water Use Among Categories	Data submitted by customers for most recent year
Indoor/Outdoor Water Use Split by Category, % of Total	Monthly data submitted by customers
Residential End Uses, %	AWWARF Report “Residential End Uses of Water” 1999
Non-Residential End Uses, %	Professional judgment and AWWARF Report “Commercial and Institutional End Uses of Water” 1999
Residential Fixture Efficiency (Current existing fixtures installed in residential units)	Census 2000, Housing age by type of dwelling plus natural replacement plus rebate program (if any). Reference "High Efficiency Plumbing Fixtures - Toilets and Urinals" Koeller & Company July 23, 2005. Reference Consortium for Efficient Energy (www.cee1.org)
Water Savings for Fixtures, gal/capita/day	AWWARF Report “Residential End Uses of Water” 1999
Non-Residential Fixture Efficiency (Current fixtures installed in non-residential facilities)	Census 2000, assume commercial establishments built at same rate as housing, plus natural replacement plus rebate program (if any)
Residential Frequency of Use Data, Toilets, Showers, Washers, Uses/user/day	Falls within ranges in AWWARF Report “Residential End Uses of Water” 1999
Non-Residential Frequency of Use Data, Toilets and Urinals, Uses/user/day	Estimated based using AWWARF Report “Commercial and Institutional End Uses of Water” 1999
Natural Replacement Rate of Fixtures	Residential Toilets 3% (newer toilets), 4% (older toilets) Commercial Toilets 4% Residential Showers 4% Residential Clothes washers 6.7% A 4% replacement rate corresponds to 25 year life of a new fixture based on data published in "High Efficiency Plumbing Fixtures - Toilets and Urinals" Koeller & Company July 23, 2005. A 4% replacement rate is also the CUWCC recommended value. A 6.67% replacement rate corresponds to 15 year washer life based on “Bern Clothes Washer Study, Final Report:, Energy Division, Oak Ridge National Laboratory, for U.S. Department of Energy, March 1998, Internet address: www.energystar.gov
Future Residential and Residential Irrigation Water Use	Based on Projected Population Growth
Future Business Water Use	Based on Projected Employment Growth
Future Institutional Water Use	Based on Projected Population Growth

Attachment 4 –Projected Potable Water Demands

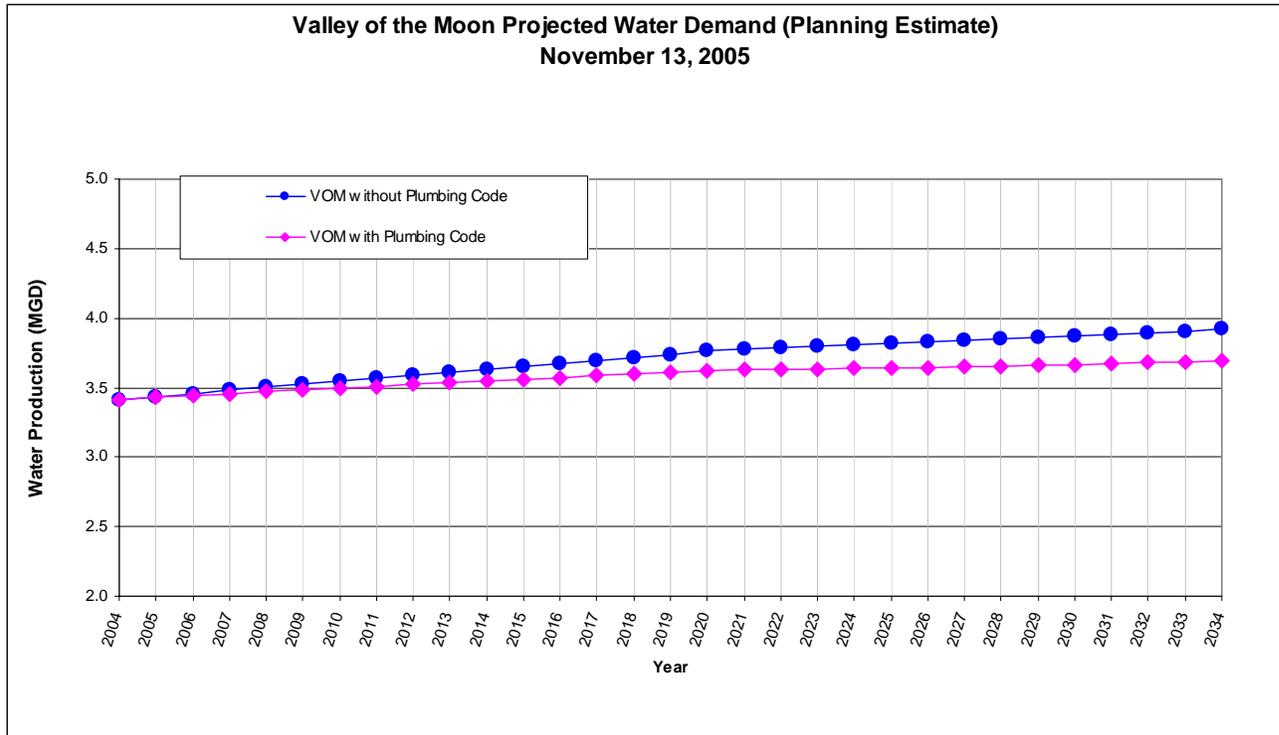


FIGURE 4-1
Baseline Potable Water Use Projections for Valley of the Moon

TABLE 4-1
Baseline Potable Water Use Results for Valley of the Moon

Data Source for Projection		Plumbing Code	Total Potable Water Production, Average Day (MGD)*						
Residential	Non-Residential		2004*	2005	2010	2015	2020	2025	2030
General Plan	General Plan	Included	3.40	3.41	3.48	3.54	3.61	3.63	3.65
General Plan	General Plan	Not Included	3.40	3.42	3.53	3.64	3.75	3.80	3.86

*Weather normalized. Total Water use is potable only. Does not include recycled water use. Recycled water use and projection is in Chapter 5 of UWMP.

Attachment 5 –Urban Water Management Plan Tables for Chapter 3 of UWMP - Valley of the Moon

Table 3-1 below provides population projections for the Valley of the Moon.

Table 3-1. (DWR Table 2). Population – Current and Projected

Year	Population
2005	22,665
2010	23,359
2015	24,055
2020	24,753
2025	25,109

3.2 Past, Current, and Future Water Use

3.2.1 Water Use By Customer Type

The historical and projected number of connections and deliveries to the District’s water distribution system, by sector is identified below on Table 3-2.

Table 3-2. (DWR Table 12). Past, Current and Projected Water Deliveries

			Water Use Sectors							
Year			Single Family	Multifa mily	Business	Irrigation Residential	Irrigation Commercial	Institutional	New Single Family	Total
2000	metered	# of accounts								
		Deliveries AF/Y								
2005	metered	# of accounts	6,063	413	146	12	12	29	37	6,712
		Deliveries AF/Y	2,206	721	256	54	19	112	15	3,384
2010	metered	# of accounts	6,063	426	151	12	12	29	224	6,917
		Deliveries AF/Y	2,185	731	258	54	20	112	91	3,450
2015	metered	# of accounts	6,063	439	156	12	13	29	411	7,122
		Deliveries AF/Y	2,160	738	260	54	20	112	167	3,513
2020	metered	# of accounts	6,063	451	160	12	13	29	599	7,328
		Deliveries AF/Y	2,136	746	264	54	21	112	243	3,576
2025	metered	# of accounts	6,063	458	163	12	13	29	695	7,434
		Deliveries AF/Y	2,114	745	265	54	21	112	282	3,593
2030	metered	# of accounts	6,063	464	166	12	14	29	791	7,539
		Deliveries AF/Y	2,097	747	266	54	22	112	321	3,618

3.2.2 Water Sales to Other Agencies

The City does not currently sell water to any other agency.

Table 3-3. (DWR Table 13). Sales to Other Agencies

Water Distributed	2000	2005	2010	2015	2020	2025	2030
N/A	0	0	0	0	0	0	0

3.2.3 Unaccounted-for Water and Additional Water Use

For this project unaccounted for water is defined to be the difference between water produced and water sold to customers. Unaccounted-for water use normally includes unmetered water use such as for fire protection and training, system and street flushing, sewer cleaning, construction, system leaks, and unauthorized connections. Unaccounted-for water can also result from meter inaccuracies.

Table 3-4. (DWR Table 14). Additional Water Uses and Losses, AF/yr							
Water Use	2000	2005	2010	2015	2020	2025	2030
Saline barriers	N/A						
Groundwater recharge	N/A						
Conjunctive use	N/A						
raw water	N/A						
recycled	N/A						
Unaccounted-for system losses	-	441	449	458	466	468	471
Total	-	441	449	458	466	468	471

3.2.4 Total Water Use

The total past, present and future water use for the system is shown in the table below.

Table 3-5. (DWR Table 15). Total Potable Water Use, AF/yr							
Water Use	2000	2005	2010	2015	2020	2025	2030
(Total of Tables 3-2, 3-3, 3-4)	-	3,825	3,900	3,970	4,041	4,061	4,089

*Total Water use is potable only. Does not include recycled water use. Recycled water use and projection is in Chapter 5 of UWMP.



MEMORANDUM

Date: May 30, 2006

To: Krishna Kumar, Valley of the Moon Water District

From: William Maddaus, Maddaus Water Management

Subject: *Revised Tier One Conservation Measure Evaluation
Summary of Data Inputs, Assumptions and Results*

INTRODUCTION AND PURPOSE

The purpose of this memorandum is to present an overview of the conservation evaluation process which has been completed for your agency. The evaluation was performed on the Tier One measures which correspond to the California Urban Water Conservation Best Management Practices (CUWCC BMPs). The conservation measures, where quantification is possible (BMP 1, 2, 3, 5, 6, 7, 9, and 14), were analyzed using the Least Cost Planning Decision Support System (DSS) Model. The remaining BMPs (4, 8, 10, 11, 12, and 13) are either of a qualitative nature or not applicable to your agency and were not included in this analysis other than to state if your agency is meeting the coverage requirements according to the CUWCC. These conservation measures were then organized into two programs showing historical and then future activity levels and associated cost for your agency.

Changes Since February 3, 2006 Memorandum

- The changes described in our memorandum dated March 3, 2006 have been implemented. Most of the changes related to prior conservation efforts and minor improvements in the presentation of results. The items listed immediately below resulted in a significant increase in estimated water savings from future planned water conservation activities.
- The CUWCC BMP 3, System Water Audits and Leak Detection was evaluated for your agency.
- The CUWCC BMP 14 was updated to include resale rates for Sonoma County.

CONTENTS

This technical memorandum provides a general overview for the methodology, assumptions, and results for the conservation analysis

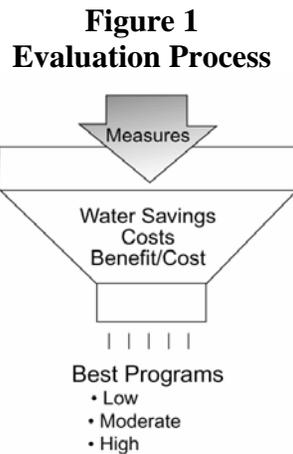
The following four pieces of information are included in this packet:

1. Overview of Evaluation Performance
2. Comparison of Individual Conservation Measures
3. Results of Tier One Conservation Analysis
4. Conclusions

Each of these will be discussed in individual sections below. As this information has not been concurred with by local agencies, all of the provided information is subject to change.

1. OVERVIEW OF EVALUATION PROCESS

During the evaluation process, water savings were estimated and costs for the measures were developed. Benefits and costs were compared in a formal present value analysis (PVA) and then conclusions were drawn about which measures produce cost-effective water savings. This process can be thought of as an economic screening process, shown in Figure 1. Packaging the best measures into alternative programs is how we are helping you to consider what level of conservation is appropriate for your agency.



Benefit-cost analysis has been used by many water agencies to evaluate and help select a water conservation measure best suited to local conditions. This analysis requires a locale-specific set of data, such as historical water consumption patterns by customer class, population and employment projections, age of housing stock, and prior conservation efforts.

The following eight steps were used to implement the methodology by expanding upon the same DSS model used to prepare the demand projections.

1. *Develop baseline water use projections without additional conservation.* Projections cover each key customer category and are broken down into indoor end uses and outdoor end uses. These were presented in previous memoranda. Note, the plumbing code refers to savings from the Energy Act; it is not the same as savings from BMP conservation.
2. *Identify possible water conservation measures* and screen the measures qualitatively to identify those that are applicable to the service area. Develop appropriate unit water savings and cost factors for each measure.
3. *Estimate the affected customers (or number of accounts) for each conservation measure* by dividing the measure's projected *customers* (or accounts) that implements the measure by the total service area *customers* (accounts). This factor is called the market penetration or installation rate.
4. *Estimate total annual average and peak day water savings.* The water savings are computed by multiplying unit water savings, per measure, by the market penetration or installation rate, and then multiplying by the number of units in a particular service area (such as dwelling units) targeted by a particular measure.
5. *Identify benefits to the water agency* including potential reduced water purchases (SCWA wholesale water rate for each agency).

6. *Quantify total benefits for each year* in the planning period by multiplying average water savings by the computed value of the benefits.
7. *Determine initial and annual costs to implement the measures* based upon pilot projects, local experience, and the costs of goods, services, and labor in the community. This is multiplied by the number of units participating each year and then added to overall administration and promotion costs to arrive at a total measure cost, which may be spread over a number of years.
8. *Compare benefits and costs of measures* by computing the present value of costs and benefits over the planning period.

2. COMPARISON OF INDIVIDUAL CONSERVATION MEASURES

Perspectives on Benefits and Costs

The determination of the economic feasibility of water conservation programs depends on comparing the costs of the programs to the benefits provided. The analysis was performed using the DSS model. The DSS model calculates savings at the end-use level; for example, the model determines the amount of water a toilet rebate program saves in daily toilet use for each single family account. For this evaluation benefits are based on reduced water purchases from SCWA at the current (2005) Sonoma Aqueduct rate of \$424.53 per acre-foot (\$1,303 per million gallons).

Present value analysis is used to discount costs and benefits to the base year. From this analysis benefit-cost ratios of each measure are computed. When measures are put together in programs the interactions are accounted for by multiplying water use reduction factors together at the end use level. A water use reduction factor is 1.0 minus the water savings, expressed as a decimal. This avoids double counting when more than one measure acts to reduce the same end use of water.

Benefit-cost analysis can be performed from several different perspectives, based on who is affected. For planning water conservation programs for utilities, the perspectives most commonly used for benefit-cost analyses include the utility and the community. The "utility" benefit-cost analysis is based on the benefits and costs to the water provider. The "community" benefit-cost analysis includes the utility benefit and costs together with account owner/customer benefits and costs. These include customer energy benefits and costs of implementing the measure, beyond what the utility pays.

The utility perspective offers two advantages for this analysis. First, it considers only the program costs that will be directly borne by the utility. This enables the utility to fairly compare potential investments for saving and supplying water. Second, because revenue shifts are treated as transfer payments, the analysis is not complicated with uncertainties associated with long-term rate projections and retail rate design assumptions. Because it is the water provider's role in developing a conservation plan that is paramount in this study, the utility perspective was primarily used to evaluate elements of the plan.

No evaluation perspectives are without shortcomings. The principal weakness of the utility perspective is that it does not count the benefits accrued or costs incurred outside of the utility. Therefore another perspective is also used – the community perspective. The community perspective is defined to include the utility costs and benefits and the customer costs and benefits. Costs incurred by customers striving to save water while participating in conservation programs are considered, and are the benefits received in terms of reduced energy bills (from water heating costs). Other factors external to the utility, such as environmental effects, are not included in the benefit-cost analysis. Because these external factors are often difficult to quantify, they are frequently excluded from economic analyses, including this one.

Present Value Parameters

The time value of money is explicitly considered. The value of all future costs and benefits is discounted to 2004 (the base year) at the real interest rate of 3.0%. The DSS model calculates this real interest rate, adjusting the current nominal interest rate (assumed to be approximately 6.1%) by the assumed rate of inflation (3.0%). Cash flows discounted in this manner are herein referred to as "Present Value" sums.

Assumptions about Costs

Costs were determined for each of the measures based on industry knowledge and past experience. Costs may include incentive costs, usually determined on a per-participant basis; fixed costs, such as marketing; variable costs, such as the costs to staff the measures and to obtain and maintain equipment; and a one-time set-up cost. The set-up cost is for measure design by staff or consultants, any required pilot testing, and preparation of materials that will be used in marketing the measure. Measure costs were estimated for each year between 2005 and 2030. Costs were spread over the time period depending on the length of the implementation period for the measure.

Lost revenue due to reduced water sales is not included as a cost because the conservation measures evaluated herein generally take effect over a span of time that is sufficient to enable timely rate adjustments, if necessary, to meet fixed cost obligations.

Water Savings

Data necessary to forecast water savings of measures include specific data on water use, demographics, market penetration, and unit water savings. Savings normally develop at a measured and predetermined pace, reaching full maturity after full market penetration is achieved. This may occur three to ten years after the start of implementation, depending upon the implementation schedule.

Where measures have a finite life, it was assumed that the agency would take steps to renew the measure by such actions as continuing to perform audits indefinitely so as to make the water savings permanent.

Overview of the CUWCC BMPs and Coverage Status

To begin the discussion of conservation analysis, it is important to understand the efforts that have been completed to date. *Table 1* shows the BMPs that have been either (a) completed (b) currently meeting the coverage requirements (c) not meeting coverage requirements or (d) not applicable. It is important to note that BMP 10 is not applicable for retail agencies.

Table 1
Current BMP Compliance for the Valley of the Moon Water District, as of June 30, 2005

CUWCC Best Management Practice Name	Meeting CUWCC Coverage Requirements (Compliance)	BMP Status
BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers	NO	Continue to pursue program.
BMP 02: Residential Plumbing Retrofit	NO	Have not reached 75% saturation (before 2005)
BMP 03: System Water Audits, Leak Detection and Repair	NO	If UFW higher than 10% BMP becomes a part of Tier One program.
BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing	YES	No unmetred accounts.
BMP 05: Large Landscape Conservation Programs and Incentives	COMPLETED	Began program on IRR accounts in 2005.
BMP 06: High-Efficiency Washing Machine Rebate Programs	COMPLETED	Have reached coverage requirement.
BMP 07: Public Information Programs	YES	Have public information program.
BMP 08: School Education Programs	YES	Have program.
BMP 09: Conservation Programs for CII Accounts	YES	Completed audits in 2005 (activity in 2005)
BMP 10: Wholesale Agency Assistance Programs	NOT APPLICABLE	Not wholesaler.
BMP 11: Conservation Pricing	YES	Have tiered rate structure.
BMP 12: Conservation Coordinator	YES	Complies with this BMP.
BMP 13: Water Waste Prohibition	YES	Water Conservation Ordinance complies with this BMP.
BMP 14: Residential ULFT Replacement Programs	YES	Continue to pursue program.

Conservation Measures Evaluated with the DSS Model

Table 2 is a table summarizing the 11 Tier One measures evaluated in the DSS Model. Some Tier One measures were split into components, such as indoor and outdoor savings (BMP 1) or single family and multi family (BMP 14). This was necessary to address all end uses in the model. The savings from the components of each measure are additive.

Table 2
Tier One Conservation measures Evaluated in the DSS Model

Measure Number	CA BMP Number	Target Customer Category	Measure	Short Description
1	1	RSF, RMF	Residential Water Surveys - Indoor	This is the <u>indoor</u> component of indoor and outdoor water surveys for existing single-family and multi family residential customers. Normally those with high water use are targeted and provided customized report to homeowner.
2	1	RSF, RMF	Residential Water Surveys - Outdoor	This is the <u>outdoor</u> component of indoor and outdoor water surveys for existing single-family and multi family residential customers. Normally those with high water use are targeted and provided customized report to homeowner.
3	2	RSF, RMF	Residential Retrofit	Provide owners of pre-1992 homes with retrofit kits that contain easy-to-install low flow showerheads, faucet aerators, and toilet tank retrofit devices, until saturation reaches 75%.
4	5a	RES IRR, COM IRR	Water Budgets	90% - 100% of all irrigators of landscapes with separate irrigation accounts would receive a monthly or bi-monthly irrigation water use budget.
5	5b	BUS, INS	Large Landscape Conservation Audits	All public and private irrigators of landscapes larger than one acre would be eligible for free landscape water audits upon request.
6	6	RSF	Clothes Washer Rebate	Homeowners would be eligible to receive a rebate on a new water efficient clothes washer.
7	7	RSF, NRSF	Public Information Program	Public education would be used to raise awareness of other conservation measures available to customers. Programs could include poster contests, speakers to community groups, radio and television time, and printed educational material such as bill inserts, etc.
8	9	BUS, INS	Commercial Water Audits	High water use accounts would be offered a free water audit that would evaluate ways for the business to save water and money.
9	14	RSF	Single Family Residential ULF Toilet Rebate	Homeowners would be eligible to receive a rebate to replace an existing high volume toilet with a new water efficient toilet.
10	14	RMF	Multi family Residential ULF Toilet Rebate	Homeowners would be eligible to receive a rebate to replace an existing high volume toilet with a new water efficient toilet.
11	3	All	System Water Audits, Leak Detection and Repair	Water provider will undertake annual system water audits and repair leaks proactively. The budget will be \$50,000 per year for 10 years with the net results unaccounted for water will be reduced below 10%.

Notes:

RSF = Residential Single Family
BUS = Business
COM = Commercial

RMF = Residential Multi Family
INS = Institutional
GOV = Government

NRSF = New Residential Single Family
RES IRR = Residential Irrigation
COM IRR = Commercial Irrigation

Measure Assumptions, Unit Costs, Market Penetration

Attachment 1 summarizes all the water savings and cost assumptions for each measure for your agency. Do note that the unit costs vary according to the type of account being addressed. For example, a measure might cost a different amount for a residential single family account, than a residential multi family account.

Comparison of Individual Measures

Tables 3 and 4 are tables summarizing the evaluation of Tier One conservation measures for your agency. *Table 3* presents results through-2004 and *Table 4* presents results of Tier One measure going forward from 2005 and continuing until they are completed as per compliance with the CUWCC MOU.

These tables show how much water the measures would save on a 30-year average basis, how much they would cost and what the benefit-cost ratios are *if the measures were run on a stand-alone basis, i.e. without interaction or overlap from other measures that might address the same end use(s)*. Note that measures with benefit-cost ratios less than 1.0 are defined to be “not cost-effective”. Water savings shown are averaged over the 30-year analysis period and may be higher or lower in a particular year. Other key statistics are the cost of water saved in dollars per million gallons (\$/MG), and the benefit-cost ratios. Benefits and costs are defined below:

- *Utility benefits and costs:* those benefits and costs that the utility would receive or spend.
- *Community benefits and costs:* community benefits equal utility benefits plus customer energy (cost to heat water) benefits. Community costs include utility and customer costs.
- *Water Benefits:* based on the 2005 cost of SCWA water to the agency.
- *Costs for the utility:* include measure set-up, annual administration of private contractor contracts or in-house staff, and payment of rebates or purchase of devices or services as specified in the measure design.
- *Customer costs:* include costs of implementing the measure and maintaining its effectiveness over the life of the measure. For example, customer costs for BMP 5b include retrofitting the irrigation system to achieve the water savings indicated by the landscape irrigation audit.

NOTE: Individual measure water savings are not additive in Tables 3 - 4 due to measure overlap.

From Tables 3 - 4 the following observations can be made:

- The most cost-effective Future Tier One measure is the landscape water budget program (BMP 5a), from the Utility perspective.
- For Future Tier One Conservation BMP 1a has the lowest benefit-cost ratio which is less than one, indicating it is not cost-effective.
- Toilet rebates in multi family have been more cost-effective than single family.

Table 3

Historical Tier One Conservation Measure Costs and Savings To 2004

Tier One Conservation Measure		Water Utility Benefit-Cost Ratio	Total Community Benefit-Cost Ratio	“30-year” Average Water Savings (MGD)	Cost of Savings per Unit Volume (\$/MG)	Estimated Historic Utility Cost
1	BMP 1a - Residential Water Surveys-Indoor	0.53	1.69	0.0000	\$1,700.48	\$152
2	BMP 1b - Residential Water Surveys-Outdoor	2.31	2.27	0.0011	\$389.13	\$1,652
3	BMP 2 - Residential Retrofit	3.15	18.38	0.0556	\$277.48	\$174,705
4	BMP 5a - Landscape Water Budgets	NC	NC	NC	NC	NC
5	BMP 5b - Large Landscape Conservation Audits	NC	NC	NC	NC	NC
6	BMP 6 - Washing Machine Rebate	1.08	0.35	0.0033	\$815.57	\$30,810
7	BMP 7 - Public Information	0.93	2.48	0.0006	\$1,379.97	\$9,474
8	BMP 9 - Commercial Water Audits	0.81	0.60	0.0115	\$1,080.87	\$140,400
9	BMP 14 - ULF Toilet Rebate- Single Family	1.25	0.50	0.0102	\$742.92	\$85,850
10	BMP 14 - ULF Toilet Rebate- Multi family	2.44	0.98	0.0052	\$379.35	\$22,164

*NC. No Interventions completed by 2004.

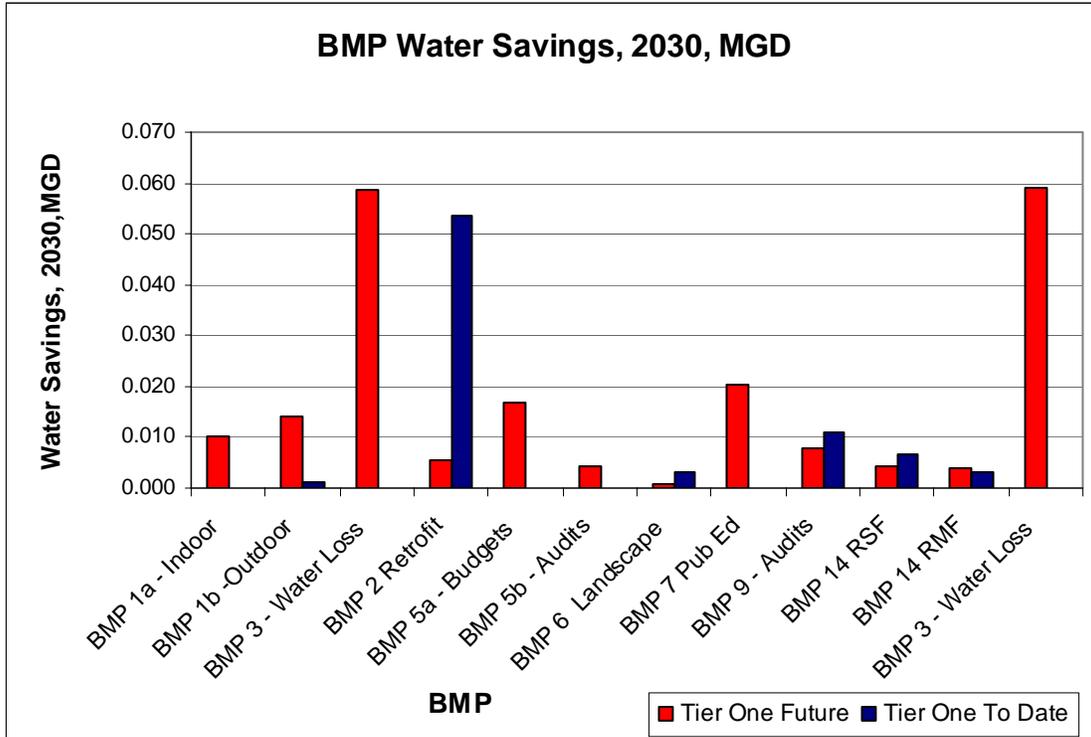
Table 4

Future Tier One Conservation Measure Costs and Savings 2005 to 2030

Tier One Conservation Measure		Water Utility Benefit-Cost Ratio	Total Community Benefit-Cost Ratio	“30-year” Average Water Savings (MGD)	Cost of Savings per Unit Volume (\$/MG)	First Five Years of Utility Cost (2005-2009)
1	BMP 1a - Residential Water Surveys-Indoor	0.64	2.04	0.0091	\$1,293.70	\$42,152
2	BMP 1b - Residential Water Surveys-Outdoor	0.87	0.78	0.0119	\$950.03	\$40,385
3	BMP 2 - Residential Retrofit	2.91	8.49	0.0051	\$285.32	\$17,875
4	BMP 5a - Landscape Water Budgets	5.49	5.49	0.0164	\$154.93	\$12,880
5	BMP 5b - Large Landscape Conservation Audits	0.52	0.34	0.0040	\$1,618.57	\$34,050
6	BMP 6 - Washing Machine Rebate	1.06	0.35	0.0010	\$820.95	\$9,555
7	BMP 7 - Public Information	0.92	2.39	0.0167	\$958.55	\$48,243
8	BMP 9 - Commercial Water Audits	0.81	0.54	0.0079	\$1,050.60	\$96,649
9	BMP 14 - ULF Toilet Rebate- Single Family	1.07	0.43	0.0054	\$802.99	\$46,085
10	BMP 14 - ULF Toilet Rebate- Multi family	2.50	1.00	0.0051	\$344.94	\$18,568
11	BMP 3 - System Water Audits Leak Detection and Repair	0.93	0.93	0.0433	\$820.33	\$250,000

Figure 2 is a graphical representation of 2030 BMP water savings for each BMP to-date (through 2004) and future (2005 to 2030). 2030 savings are “individual year” savings and are different from the “30-year average” savings shown in Tables 3 and 4.

Figure 2
Tier One Conservation Measure Water Savings



3. RESULTS OF TIER ONE CONSERVATION ANALYSIS

Descriptions of Programs

For the analysis of conservation, this study divided conservation savings from the Tier One measures (CUWCC BMPs) into two separate parts. The first part is all historical savings to date. The second part is future savings. The name and description of these programs is provided below.

Program Tier One to 2004 – Historical Conservation Savings

This program is a consolidation of prior efforts through the year 2004. It includes measures that correspond to your current program. Your base demand projection already reflects these savings, as they are part of your base demand.

Program Tier One Future – Future Conservation Savings for Tier One Measures

This program was designed to be the future program with full compliance for “Tier One Measures” including all the CUWCC BMPs. Future includes actual achievements in 2005 and then participation rates starting in 2006 in accordance with those specified in the California Urban Water Conservation Council’s Memorandum Of Understanding, which may be higher (or lower) than you are currently achieving. If you continue to implement the BMPs as planned, your future demands will be reduced by the amount of savings from Tier One future measures.

These programs are not intended to be rigid programs but rather to demonstrate the range in saving that could be generated if selected measures were run together. In this step we account for the overlap in water savings (and benefits) and estimate combined savings and benefits from programs or packages of measures.

Figure 3 shows how the Tier One prior efforts and the Tier One savings will change over time. In this representation the individual measures have been combined into overall programs that account for any measure overlap. It is noted that there is a slight decline in the prior Tier One measure savings that are affected by the plumbing codes (affecting toilets, showers, washing machines). This impact primarily affects BMPs 2, 6 and 14.

Tier One To-Date water savings are actually imbedded in the baseline 2004 water use that was arrived at in calibrating the water demand model. Therefore it is not possible to add the two curves in Figure 3. Only Tier One Future water savings should be considered as a way of meeting future water needs by 2030.

Table 5 presents key evaluation statistics compiled from the DSS model. Assuming all measures are successfully implemented, projected water savings for 2015 and 2030 in acre-feet and million gallons per day (MGD) are shown, as are the costs of achieving this reduction.

The costs are expressed three ways. Total present value over the 30-year period, the money utilities would need to budget in the first five years to get the program underway, and the cost of water saved.

The water savings are expressed as a percentage of the projected 2030 demand. Note that savings from Tier One measures slightly decline from 2015 to 2030 due to the plumbing code. For those Tier One measures that are not permanent and the savings would otherwise erode over time, additional expense is assumed to be planned to maintain the water savings constant.

The last column indicates the percentage of the new water demand for 2030 that each program could fill. In other words the amount of new water needed between 2005 and 2030 is 0.24 MGD (265 acre-feet) and Tier One Future could make up 33.4% of that need.

Figure 4 shows how the marginal returns change as more money is spent to achieve water savings. As the figure shows the cost versus savings curve is starting to decline after the completion of Tier One To-Date. This means that the added cost of going from that program to Tier One Future will save less per unit of expenditure. In other words Tier One Future is slightly less cost-effective as Tier One To-Date. This is confirmed by the lower benefit-cost ratio of Tier One Future relative to Tier One To-Date. Both programs, however, are cost-effective (Benefit-Cost Ratio greater than 1.0).

Figure 3
Tier One Conservation Measure Water Savings vs. Time

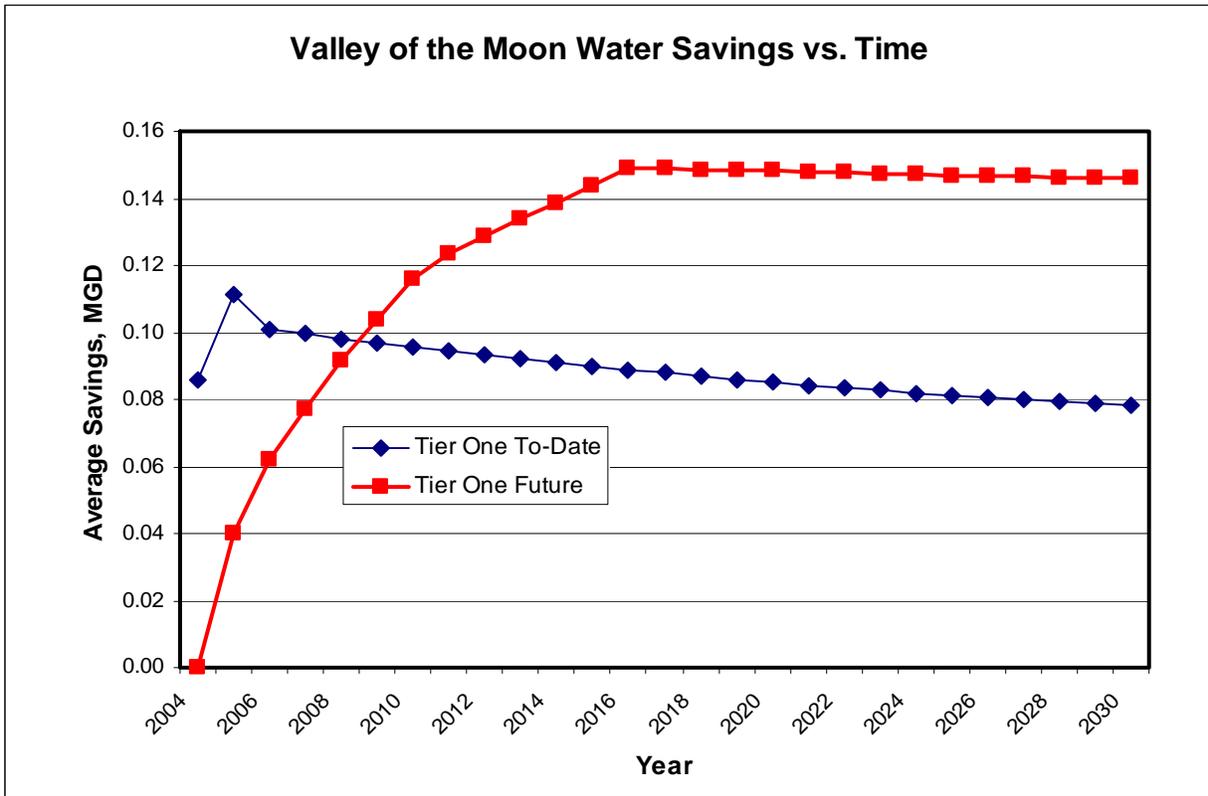


Figure 4
Present Value of Utility Cost versus Cumulative Water Saved in 2030

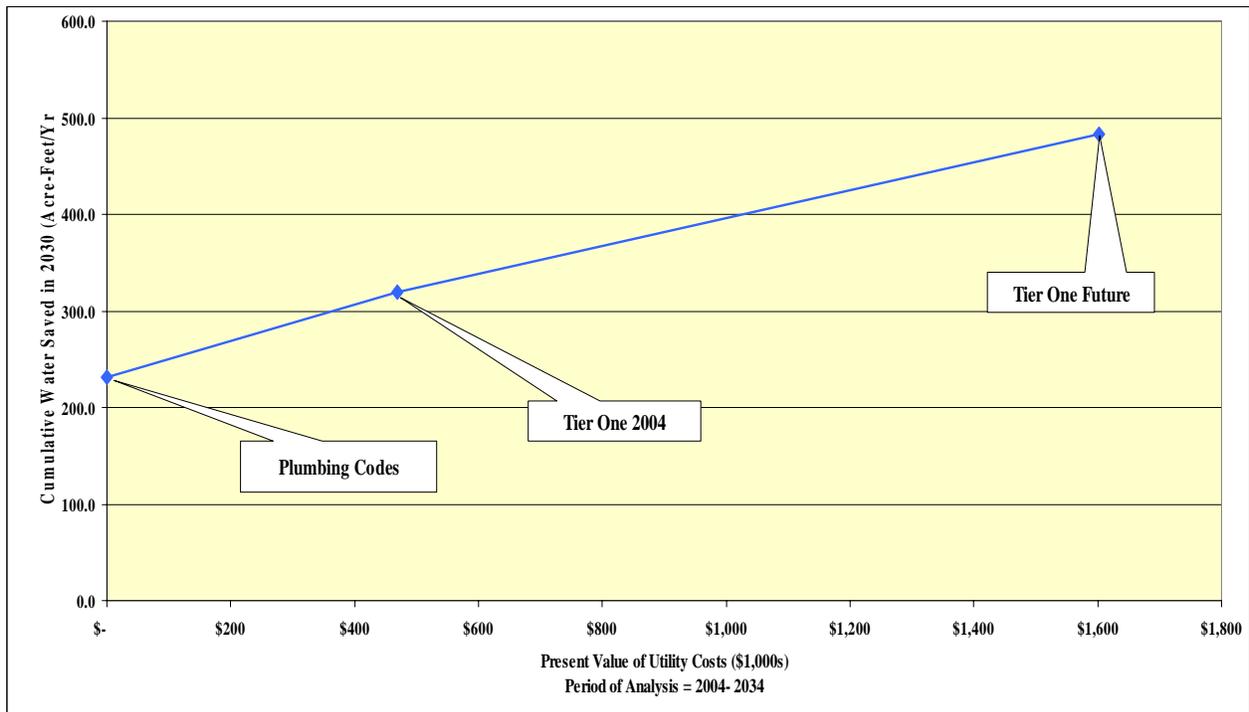


Table 5

Prior and Future Tier One Conservation Measure Programs - Costs and Savings

Conservation Program	Water Utility Benefit-Cost Ratio	2015 Water Savings (Acre-Feet/Yr)	2015 Water Savings (MGD)	2030 Water Savings (Acre-Feet/Yr)	2030 Water Savings (MGD)	2030 Indoor Water Savings (MGD)	2030 Outdoor Water Savings (MGD)	Total Water Savings as a % of Total Production in 2030	Present Value of Water Utility Costs (\$1,000s)	First Five Year Total Utility Costs (\$1,000s)	Cost of Water Saved (\$/AF)	% of New Water Needed from 2005 to 2030
Tier One To 2004	1.86	100.7	0.090	87.6	0.078	0.072	0.006	2.14%	\$ 469	\$ 465	\$ 155	NA
Tier One Future	1.02	161.0	0.144	163.5	0.146	0.099	0.047	4.00%	\$ 1,134	\$ 516	\$ 262	61.6%
Totals	1.27	261.7	0.234	251.1	0.224	0.171	0.053	6.14%	\$ 1,603	\$ 982	\$ 225	61.6%

Notes: Tier One measure savings are included in the baseline demand projections and are presented for information purposes only
 Present Value is determined using an interest rate of 3%
 Cost of water saved is present value of water utility cost divided by total 30-year water savings.
 First Five Year Cost for "Tier One to 2004" is 2004 to 2008
 First Five Year Cost for "Tier One Future" is 2005 to 2009

4. CONCLUSIONS

Relative Cost-Effectiveness of Programs

VOM's service area has relatively high per capita residential water use and a large proportion of outdoor water use. Consequently, residential conservation programs produce significant savings. Water use in the commercial sector is low, offering modest conservation potential. The CUWCC BMP 3, System Water Audits and Leak Detection produces high water savings. Overall conclusions are:

- Total savings from Tier One conservation programs would be about 6.1 percent in 2030 (251 AF as shown on Table 5), 2.1 percent of which have already been achieved. In other words continued implementation of Tier One programs will reduce water needs in 2030 by 4 percent.
- For Future Tier One measures, about half of the conservation potential in 2030 is in reducing indoor use; the rest is outdoor use reduction potential.
- Because of the projected relatively low growth rate in new accounts, future Tier One conservation could make up about 62 percent of the total future additional water needed by 2030, with benefit-cost ratio of 1.02 to 1.
- The average cost of water saved over 30-years is lower than the current price of SCWA water. Thus measures that are cost-effective at today's water rates will be more so if SCWA rates rise in the future.

NEXT STEPS

The following steps remain to be completed on evaluating conservation measures:

1. Review and approve, with comments, the Tier One measure evaluation for your agency.
2. Review and approve, with comments, the Tier Two measure evaluation for your agency, sent to you in a separate Technical Memorandum.

ATTACHMENTS

Attachment 1 Assumptions for the Tier One Measures (starting in 2005) Evaluated in the DSS Model

Attachment 1
Assumptions for Tier One Measures (starting in 2005) Evaluated in the DSS Model

	BMP 1a Residential Audits	BMP 1a Residential Audits	BMP 1b Residential Audits	BMP 1b Residential Audits	BMP 2 Plumbing Retrofits	BMP 3 System Audits & Leak Detection
Account Category	RSF	RMF	RSF	RMF	RSF / RMF	NA
Affected End Uses	Internal	Internal	External	External	Toilets, Faucets, Showers	NA
Percent Reduction in Water Use	5%	5%	10%	10%	5%/5%/21%	1.6%
CUWCC MOU Sign-on Year	2001	2001	2001	2001	2001	2001
Evaluation Start Year	2004	2004	2004	2004	2004	2007
Required Interventions Starting in 2005 (Accounts)	908	60	908	60	364/32	NA
Market Penetration by End Of Program,%	15	15	15	15	75	100%
Measure Life (years)	7	7	7	7	Permanent	Permanent
Initial Cost	\$ -	\$ -	\$ -	\$ -	\$ -	
Utility Unit Cost, per site one time cost	\$ 40.00	\$ 80.00	\$ 40.00	\$ 50.00	\$ 30.00	\$50,000/yr
Customer Unit Cost to achieve savings	\$ 10.00	\$ 30.00	\$ 5.00	\$ 20.00	\$ 0	--
Administration Cost, percent of unit cost	25%	25%	25%	25%	10%	--
Affected Units	dwelling unit	dwelling unit	dwelling unit	dwelling unit	1992 and older dwelling units	All
Comments						10-year program to lower UFW below 10%

Notes:

RSF = Residential Single Family
 RMF = Residential Multi Family
 BUS/COM= Commercial
 IND = Industrial
 IRR = Dedicated irrigation meters
 INS = Institutional/Public, buildings / grounds owned by the Water Utility or City
 NRSF = New Single Family Homes
 GOV = Government

Attachment 1
Assumptions for Tier One Measures (starting in 2005) Evaluated in the DSS Model

	BMP 5a Water Budgets	BMP 5b Water Audits	BMP 6 Washer Rebates	BMP 7 Public Education	BMP 9 CII Audits	BMP 14 Toilet Rebates
Account Category	RES/COM – IRR	BUS	RSF	RSF/RMF	COM/BUS/INS	RSF/RMF
Affected End Uses	Irrigation	Irrigation	Laundry	All	All	Internal
Percent Reduction in Water Use	15%	15%	34%	1%	12%	60%
CUWCC MOU Sign-on Year	2001	2001	2001	2001	2001	2001
Evaluation Start Year	2004	2004	2004	2004	2004	2004
Required Interventions Starting in 2005 (Accounts)	14/14	16	0	6074	6	337/40
Market Penetration by End Of Program, %	90	15	4.8	100	10	Match resale rate
Measure Life (years)	10	10	Permanent	2	Permanent	Permanent
Initial Cost	\$ -	\$ -	\$ -	\$ -	\$ -	NA
Utility Unit Cost, per site one time cost	\$ 400.00	\$ 1,500.00	\$ 75.00	\$ 2.50	\$ 4,000.00	\$50
Customer Unit Cost to achieve savings	\$ -	\$ 1,000.00	\$ 200.00	\$ -	\$ 2,000.00	\$75
Administration Cost, percent of unit cost	15%	30%	30%	25%	50%	included
Affected Units	Irrigation accounts	large landscape accounts	per dwelling unit	per dwelling unit	CII accounts	per toilet
Comments			BMP 6 complete			Complete in 2010

Notes:

- RSF = Residential Single Family
- RMF = Residential Multi Family
- BUS/COM= Commercial
- IND = Industrial
- IRR = Dedicated irrigation meters
- INS = Institutional/Public, buildings / grounds owned by the Water Utility or City
- NRSF = New Single Family Homes
- GOV = Government
- INS = Public, buildings / grounds owned by the Water Utility or City
- NRSF = New Single Family Homes



MEMORANDUM

Date: November 2, 2006

To: Krishna Kumar, Valley of the Moon Water District

From: William Maddaus, Maddaus Water Management

Subject: *FINAL Tier Two and New Development Conservation Measure Evaluation Summary of Data Inputs, Assumptions and Results*

INTRODUCTION AND PURPOSE

This final memorandum on the conservation evaluation process for your agency has been revised to better reflect the true avoided costs and benefits of saving water. The analysis has been changed by using a future cost of water from the Sonoma County Water Agency plus a value that represents the approximate cost of distributing this water to your customers. All other measure costs and water savings for Tier Two and New Development measures remain unchanged from the Draft memorandum.

The purpose of this memorandum is to present an overview of the conservation evaluation process which has been completed for your agency. The evaluation was performed on the Tier Two measures and potential New Development measures to make new single family homes more water efficient. The conservation measures were analyzed using the Least Cost Planning Decision Support System (DSS) Model. These conservation measures were then organized into three programs showing benefits, costs, and water savings for Tier One plus Tier Two measures, Tier One plus New Development measures, and finally Tier One plus Tier Two plus New Development measures for your agency. Each of these programs will be discussed in detail in this memorandum.

CONTENTS

This technical memorandum provides a general overview for the methodology, assumptions, and results for the conservation analysis.

The following four pieces of information are included in this packet:

1. Overview of Evaluation Process
2. Comparison of Individual Conservation Measures
3. Results of Tier Two and New Development Conservation Analysis
4. Conclusions

Each of these will be discussed in individual sections below.

1. OVERVIEW OF EVALUATION PROCESS

Selecting Conservation Measures to be Evaluated (Conservation Measure Screening):

A list of 75 potential conservation measures considered appropriate for this region was developed by Maddaus Water Management from known technology that included devices or programs (e.g., such as a new dual flush toilet) that would save water if installed by a water retailer, contractor, or customer. These measures are considered to be beyond the Tier One measures. A description of the potential conservation measure was developed that addressed the methods through which the device or program will be implemented, including the distribution method, or mechanism, that would be used to activate the device or program.

A screening process was undertaken to reduce the number of measures to a more manageable number and to eliminate those measures that are not as well suited to the Marin-Sonoma County area as other potential measures. Each potential measure was screened based on four qualitative criteria (below), scored on a scale of 1 to 5, with 5 being the most acceptable, and 20 being the maximum possible number of points for all criteria. The screening was completed by local conservation professionals, in a one day meeting in July 2005, facilitated by Maddaus Water Management.

Qualitative Criteria

The rating group used the following criteria to evaluate the measures:

- **Technology/Market Maturity** – Refers to whether the technology needed to implement the conservation measure, such as an irrigation control device, is commercially available and supported by the local service industry. A measure was scored low if the technology was not commercially available or high if the technology was widely available in the service area. A device may be screened out if it is not yet commercially available in the region.
- **Service Area Match** – Refers to whether the measure or related technology is appropriate for the area's climate, building stock, or lifestyle. For example, promoting Xeriscape gardens for multi-family or commercial sites may not be appropriate where water use analysis indicates little outdoor irrigation. Thus, a measure scored low in this category if it was not well suited for the area's characteristics and could not save water. A measure scored high in this criterion if it was well suited for the area and could save water.
- **Customer Acceptance/Equity** – Refers to whether retail customers within the wholesale customer service area would be willing to implement and accept the conservation measures. For example, would retail customers attend homeowner irrigation classes and implement lessons learned from these classes? If not, then the water savings associated with this measure would not be achieved and a measure with this characteristic would score low for this criterion. This criterion also refers to retail customer equitability (i.e., one category of retail customers receives benefit while another pays the costs without receiving benefits). Retail customer acceptance may be also based on convenience, economics, perceived fairness, or aesthetics.
- **Relative Effectiveness of Measure Available** – Refers to the selection of the most effective measure if alternate conservation measures address the same end use. If the

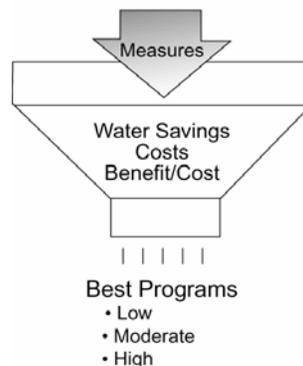
measures are equally effective the most appropriate was selected (e.g., the measure that was easier or less expensive to implement).

Measures with low scores were eliminated from further consideration, while those with high scores passed into the next evaluation phase (cost-effectiveness analysis using the DSS Model). To reduce the list to a more manageable number, normally a score of 17 or more was necessary to pass. The process reduced the measures to be evaluated further down to 22 new measures in addition to the 10 Tier One measures. Table 4 lists all 32 measures evaluated with the DSS Model.

Evaluation Process

During the evaluation process, water savings were estimated and costs for the measures were developed. Benefits and costs were compared in a formal present value analysis and conclusions were drawn about which measures produce cost-effective water savings. This process can be thought of as an economic screening process, shown in Figure 1. Packaging the best measures into alternative programs is how we are helping you to consider what level of conservation is appropriate for your agency.

Figure 1
Evaluation Process



Benefit-cost analysis has been used by many water agencies to evaluate and help select a water conservation measure best suited to local conditions. This analysis requires a locale-specific set of data, such as historical water consumption patterns by customer class, population and employment projections, age of housing stock, and prior conservation efforts.

The following nine steps were used to implement the methodology by expanding upon the same DSS model used to prepare the demand projections.

1. *Develop baseline water use projections without additional conservation.* Projections cover each key customer category and are broken down into indoor end uses and outdoor end uses. These were presented in previous memoranda. Note, the plumbing code refers to savings from the Energy Act; it is not the same as savings from BMP conservation.
2. *Identify possible water conservation measures* and screen the measures qualitatively to identify those that are applicable to the service area. Develop appropriate unit water savings and cost factors for each measure.
3. *Estimate the affected customers (or number of accounts) for each conservation measure* by dividing the measure's projected *customers* (or accounts) that implements the measure

by the total service area customers (accounts). This factor is called the market penetration or installation rate.

4. *Estimate total annual average and peak day water savings.* The water savings are computed by multiplying unit water savings, per measure, by the market penetration or installation rate, and then multiplying by the number of units in a particular service area (such as dwelling units) targeted by a particular measure.
5. *Identify benefits to the water agency* including potential reduced water purchases (SCWA wholesale water rate and distribution costs for each agency).
6. *Quantify total benefits for each year* in the planning period by multiplying average water savings for each measure by the computed value of the benefits.
7. *Determine initial and annual costs to implement the measures* based upon pilot projects, local experience, and the costs of goods, services, and labor in the community. This is multiplied by the number of units participating each year and then added to overall administration and promotion costs to arrive at a total measure cost, which may be spread over a number of years.
8. *Compare benefits and costs of measures* by computing the present value of costs and benefits over the planning period.
9. *Compile and compare packages containing various new measures.*

2. COMPARISON OF INDIVIDUAL CONSERVATION MEASURES

Perspectives on Benefits and Costs

The determination of the economic feasibility of water conservation programs depends on comparing the costs of the programs to the benefits provided. The analysis was performed using the DSS model. The DSS model calculates savings at the end-use level; for example, the model determines the amount of water a toilet rebate program saves in daily toilet use for each single family account. For this evaluation, benefits are based on reduced water purchases from SCWA at the forecasted 2020 Sonoma Aqueduct rate of \$921.72 per acre-foot¹ plus a value of \$437.09 per acre-foot² to represent water distribution costs (\$4,172 per million gallons total avoided cost).

Present value analysis is used to discount costs and benefits to the base year. From this analysis benefit-cost ratios of each measure are computed. When measures are put together in programs the interactions are accounted for by multiplying water use reduction factors together at the end use level. A water use reduction factor is 1.0 minus the water savings, expressed as a decimal. This avoids double counting when more than one measure acts to reduce the same end use of water.

Benefit-cost analysis can be performed from several different perspectives, based on who is affected. For planning water conservation programs for utilities, the perspectives most commonly used for benefit-cost analyses include the utility and the community. The "utility" benefit-cost analysis is based on the benefits and costs to the water provider. The "community" benefit-cost analysis includes the utility benefit and costs together with account owner/customer

¹ SCWA Future Water Supply Projects Financial Plan, 2004

² Appendix J, City of Petaluma Water Supply and Demand Analysis Report, Dodson Engineers, June 2006.

benefits and costs. These include customer energy benefits and costs of implementing the measure, beyond what the utility pays.

The utility perspective offers two advantages for this analysis. First, it considers only the program costs that will be directly borne by the utility. This enables the utility to fairly compare potential investments for saving and supplying water. Second, because revenue shifts are treated as transfer payments, the analysis is not complicated with uncertainties associated with long-term rate projections and retail rate design assumptions. Because it is the water provider's role in developing a conservation plan that is paramount in this study, the utility perspective was primarily used to evaluate elements of the plan.

No evaluation perspectives are without shortcomings. The principal weakness of the utility perspective is that it does not count the benefits accrued or costs incurred outside of the utility. Therefore another perspective is also used – the community perspective. The community perspective is defined to include the utility costs and benefits and the customer costs and benefits. Costs incurred by customers striving to save water while participating in conservation programs are considered, as well as the benefits received in terms of reduced energy bills (from water heating costs). Other factors external to the utility, such as environmental effects, are not included in the benefit-cost analysis. Because these external factors are often difficult to quantify, they are frequently excluded from economic analyses, including this one.

Present Value Parameters

The time value of money is explicitly considered. The value of all future costs and benefits is discounted to 2004 (the base year) at the real interest rate of 3.0%. The DSS model calculates this real interest rate, adjusting the current nominal interest rate (assumed to be approximately 6.1%) by the assumed rate of inflation (3.0%). Cash flows discounted in this manner are herein referred to as "Present Value" sums.

Assumptions about Costs

Costs were determined for each of the measures based on industry knowledge and past experience. Costs may include incentive costs, usually determined on a per-participant basis; fixed costs, such as marketing; variable costs, such as the costs to staff the measures and to obtain and maintain equipment; and a one-time set-up cost. The set-up cost is for measure design by staff or consultants, any required pilot testing, and preparation of materials that will be used in marketing the measure. Measure costs were estimated for each year between 2005 and 2030. Costs were spread over the time period depending on the length of the implementation period for the measure.

Lost revenue due to reduced water sales is not included as a cost because the conservation measures evaluated herein generally take effect over a span of time that is sufficient to enable timely rate adjustments, if necessary, to meet fixed cost obligations.

Water Savings

Data necessary to forecast water savings of measures include specific data on water use, demographics, market penetration, and unit water savings. Savings normally develop at a measured and predetermined pace, reaching full maturity after full market penetration is achieved. This may occur three to ten years after the start of implementation, depending upon the implementation schedule.

Conservation Measures Evaluated with the DSS Model

Upon inspection of the overall list of new measures it became apparent that some measures could be combined and others could be separated into two categories as follows:

- Measures that were voluntary and incentive based
- Measures that were regulatory and applied to new development only

This division was used to create two lists of measures that could be evaluated separately. Tier Two targets various types of customers and offers a range of incentives to enhance participation. New Development measures were targeted at single family homes (including town homes and condos), as this category represents the largest category of new development with the most water savings potential.

Table 1 is a table summarizing the 13 Tier Two measures, and 8 New Development measures evaluated in the DSS Model.

Table 1
Tier Two and New Development Conservation Measures Evaluated in the DSS Model

Measure Number	Target Customer Category	Measure	Short Description
T2 - 1	Existing Customers SF	Rain-sensor (shut off device) retrofit on irrigation controllers	Agency pays for the rain sensor, homeowner pays for the optional installation (\$35).
T2 - 2	Existing Customers SF, MF, CII	Cash for Grass (turf removal program)	Provide a rebate for customers who remove irrigated turf grass and replace it with low water using plants. The rebate would require that an appropriate irrigation system be installed for the replacement landscaping. Limited to \$500 rebate at \$1.00 per square foot.
T2 - 3	All Dedicated Irrigation Meter customers, IRR	Financial Incentives for Being Below Water Budget	For dedicated irrigation customers, link a landscape water budget to a retail water agency's rate schedule so that the dedicated irrigation meter customer pays less when their water use is at or under their water budget.
T2 - 4	Existing CII Customers with mixed water use (indoor and outdoor)	Financial Rebates for Irrigation Meters	Provide financial incentives/rebates for selected permits and equipment to convert mixed use meters to a separate dedicated irrigation meter. Model implementation program after City of Santa Rosa's Service Split program. Utility will provide a water budget for the new irrigation meter.
T2 - 5	Existing Customers SF, MF, CII, IRR	Smart Irrigation Controller Rebates	Provide an up to \$450 rebate for the purchase of a SMART irrigation controller and associated signal fees (up to \$150). Assume one controller for SF and two for all other customer categories. Minimum participant requirements: at least 500 sq ft of well maintained turf irrigated with an automatic irrigation control system.

T2 - 6	Existing Customers MF, CII, IRR	Financial Incentives/ Rebates for Irrigation Upgrades	For MF, CII, and IRR customers with landscape, provide rebates for selected types of irrigation equipment upgrade including rain sensors. Model program after water agencies such as EBMUD or Contra Costa Water District.
T2 - 7	Existing Customers: CII	Hotel retrofit (w/financial assistance) - CII Existing	Following a free water audit, offer the hotel a rebate for equipment identified that would save water. Provide a rebate schedule for certain efficient equipment such as air-cooled ice machines, steamers, washers, cooling towers, and spray rinse valves.
T2 - 8	New Customers: CII	Offer new accounts reduced connection fees for installing efficient process equipment for selected businesses (restaurants, laundry mat, food/groceries and hospital)	Offer reduced water and sewer connection fees to new facilities to install water efficient equipment in new facilities that goes above and beyond the building code requirements. Model program after Santa Rosa's BAT program.
T2 - 9	Existing Customers: SF (North Marin only) , IRR	Synthetic Turf Rebate	Provide a rebate for replacing existing turf with synthetic turf. Market program to all irrigation customers (and single family for North Marin only).
T2 - 10	Existing Customers: SF & MF	High Efficiency Toilet (HET)	Provide a rebate or voucher for the installation of a high efficiency toilet (HET). HET are defined as any toilet to flush 20% less than an ULFT and include dual flush technology. Rebate amounts would reflect the incremental purchase cost.
T2 - 11	Existing Customers: SF	Dishwasher New Efficient	Provide a rebate to encourage homeowners to replace old inefficient dishwashers with new efficient dishwashers (meeting certain water efficiency standards, such as gallons/load).
T2 - 12	Existing Customers: CII	CII Rebates - replace inefficient water using equipment	Provide a rebate for a standard list of water efficient equipment. Included would be x-ray machines, icemakers, air-cooled ice machines, steamers, washers, spray valves, efficient dishwashers, replace once through cooling, add conductivity meters on cooling towers, etc.
T2 - 13	New Customers: CII	0.5 gal/flush urinals in new buildings	Require that new building be fitted with 0.5 gpf urinals rather than the current standard of 1.0-gal/flush models.
ND1	New Customers: SF	Rain-sensor shut off device on irrigation controllers	Require-sensor or rain shut off devices with all new automatic irrigation system installations on new homes.
ND2	New Customers: SF	Smart Irrigation Controller	Require developers to provide the latest state of the art SMART irrigation controllers. These SMART controllers have on-site temperature sensors or rely on a signal from

			a central weather station that modifies irrigation times at least weekly.
ND3	New Customers: SF	High Efficiency Toilet (HET)	Require developers to install a high efficiency toilet (HET). HET are defined as any toilet to flush 20% less than an ULFT and include dual flush technology.
ND4	New Customers: SF	Dishwasher New Efficient	Require developers to install an efficient dishwasher (meeting certain water efficiency standards, such as gallons/load).
ND5	New Customers: SF	Clothes washing machines requirement for new residential	Building departments would be responsible to ensure that an efficient washer was installed before new home occupancy.
ND6	New Customers: SF	Hot Water on Demand	Require developers to equip new homes with a hot water on demand system or tankless hot water heaters, such as those made by Metland Systems and others. These systems use a pump placed under the sink to recycle water sitting in the hot water pipes to the water heater.
ND7	New Customers: SF	High efficiency faucets and showerheads	Require developers to install lavatory faucets that flow at no more than 1.5 gpm, kitchen faucets at 2.2 gpm, and showerheads at 2.0 gpm.
ND8	New Customers: SF	Landscape and irrigation requirements	Enforce a regulation that specifies that homes be landscaped according to Xeriscape principals, with appropriate irrigation systems. (Combines with Smart Controller listed above). Goal is overall 25% in irrigation water use.

Notes: ND = New Development
T2 = Tier Two
SF = Residential Single Family
MF = Residential Multi Family
CII = Commercial/Industrial/Institutional
IRR = Dedicated irrigation meters

Measure Assumptions, Unit Costs, Market Penetration

Attachment 1 summarizes all the water savings and cost assumptions for each measure for your agency. Do note that the unit costs vary according to the type of account being addressed. For example, a measure might cost a different amount for a residential single family account, than a residential multi family account.

Comparison of Individual Measures

Tables 2 and 3 are tables summarizing the evaluation of Tier Two and New Development conservation measures for your agency. **Table 2** presents results for Tier Two and **Table 3** presents results of New Development measures going forward from 2007.

These tables show how much water the measures would save on a 30-year average basis, how much they would cost and what the benefit-cost ratios are *if the measures were run on a stand-alone basis, i.e. without interaction or overlap from other measures that might address the same end use(s)*. Note that measures with benefit-cost ratios less than 1.0 are defined to be “not cost-

effective”. Water savings shown are averaged over the 30-year analysis period and may be higher or lower in a particular year. Other key statistics are the cost of water saved in dollars per million gallons (\$/MG), and the benefit-cost ratios. Benefits and costs are defined below:

- *Utility benefits and costs:* those benefits and costs that the utility would receive or spend.
- *Community benefits and costs:* community benefits equal utility benefits plus customer energy (cost to heat water) benefits. Community costs include utility and customer costs.
- *Water Benefits:* based on the 2020 cost of SCWA water to the agency plus distribution costs.
- *Costs for the utility:* include measure set-up, annual administration, and payment of rebates or purchase of devices or services as specified in the measure design.
- *Customer costs:* include costs of implementing the measure and maintaining its effectiveness over the life of the measure.

NOTE: Individual measure water savings are not additive in **Tables 2 and 3** due to measure overlap.

The column headings in **Tables 2 and 3** are defined as follows:

- *Water Utility Benefit-Cost Ratio = NPV of Utility of Benefits (based on reduced purchase of water from SCWA and distribution costs) divided by NPV of Utility Costs (see above)*
- *Total Community Benefit-Cost Ratio = NPV of Utility Benefits plus Customer Benefits (see above) divided by NPV of Utility plus Customer Costs (see above) where NPV = 30 year present value of annual costs discounted at 3 percent*
- *30-year Average Water Savings (MGD) = sum of annual average water savings (MGD) divided by 30 where MGD = million gallons per day*
- *Cost of Savings per Unit Volume (\$/MG) = NPV of Utility Costs divided by 30-year Average Water Savings * 365 where MG = million gallons*
- *Five Years of Utility Costs (2007-2011)= sum of annual costs for period shown, undiscounted*

From **Tables 2 and 3** the following observations can be made:

- The most cost-effective Tier Two measure is the Hotel Retrofit (w/financial assistance) for existing CII customers, from the Utility perspective.
- For Tier Two conservation the synthetic turf and new efficient dishwasher measures have a low benefit-cost ratios (which is less than one), indicating they are not cost-effective measures.
- The most cost-effective New Development measure is the Smart Irrigation Controller for new residential, from the Utility perspective.
- Ten out of 13 Tier Two measures are cost effective from the Utility perspective.
- Eight of the New Development measures are cost effective from the Utility perspective.

- Six of the Tier Two measures and two of the New Development measures are cost effective from the community perspective, indicating that all other measures have relatively high customer costs.

Table 2
Tier Two Conservation Measure Costs and Savings

Conservation Measure		Water Utility Benefit-Cost Ratio	Total Community Benefit-Cost Ratio	“30-year” Average Water Savings (MGD)	Cost of Savings per Unit Volume (\$/MG)	Five Years of Utility Cost 2007-2011
T2-1	Rain-sensor (shut off device) retrofit on irrigation controllers	4.63	1.93	0.0048	\$541.49	\$12,126
T2-2	Cash for Grass (turf removal program)	1.61	0.89	0.0020	\$1,556.42	\$33,334
T2-3	Financial Incentives for Being Below Water Budget	8.30	1.16	0.0086	\$274.23	\$0
T2-4	Financial Rebates for Irrigation Meters	7.00	3.89	0.0015	\$358.23	\$5,791
T2-5a	Smart Irrigation Controller Rebates	0.54	0.46	0.0032	\$4,371.89	\$35,470
T2-5b	Smart Irrigation Controller Rebates	1.49	1.37	0.0062	\$1,575.47	\$29,558
T2-6	Financial Incentives/ Rebates for Irrigation Upgrades	5.34	2.96	0.0019	\$439.47	\$3,390
T2-7	Hotel retrofit (w/financial assistance) - CII Existing	21.12	8.12	0.0022	\$110.96	\$1,002
T2-8	Offer new accounts reduced connection fees for installing efficient process equipment for selected businesses (restaurants, laundry mat, food/groceries and hospital)	6.40	0.71	0.0004	\$361.74	\$485
T2-9	Synthetic Turf Rebate	0.45	0.25	0.0006	\$5,159.74	\$12,134
T2-10	High Efficiency Toilet (HET)	1.00	0.58	0.0195	\$2,438.15	\$275,553
T2-11	Dishwasher New Efficient	0.26	0.04	0.0006	\$9,167.12	\$30,316
T2-12	CII Rebates - replace inefficient water using equipment	0.57	0.22	0.0002	\$4,159.68	\$2,606
T2- 13	0.5 gal/flush urinals in new buildings	3.29	0.37	0.0004	\$710.66	\$916

Table 3
New Development Conservation Measure Costs and Savings

Conservation Measure		Water Utility Benefit-Cost Ratio	Total Community Benefit-Cost Ratio	“30-year” Average Water Savings (MGD)	Cost of Savings per Unit Volume (\$/MG)	Five Years of Utility Cost 2007-2011
ND1	Rain-sensor shut off device on irrigation controllers	18.93	3.79	0.0050	\$121.78	\$2,056
ND2	Smart Irrigation Controller	31.55	0.84	0.0083	\$73.07	\$2,056
ND3	High Efficiency Toilet (HET)	8.14	0.36	0.0047	\$283.30	\$4,523
ND4	Dishwasher New Efficient	2.16	0.07	0.0006	\$1,066.08	\$2,056
ND5	Clothes washing machines requirement for new residential	31.11	0.83	0.0082	\$74.11	\$2,056
ND6	Hot Water on Demand	21.33	0.83	0.0056	\$108.09	\$2,056
ND7	High efficiency faucets and showerheads	14.73	7.46	0.0039	\$156.47	\$2,056
ND8	Landscape and irrigation requirements	21.03	0.10	0.0055	\$109.60	\$2,056

Figures 2 to 5 are graphical representations of Tier Two and New Development water savings and costs for each measure in the future (2005 to 2030). Water savings are “individual year” savings and are different from the “30-year average” savings shown in **Tables 2 and 3**.

Important Note on Figures 2 and 3. Total water savings shown on **Figures 2 and 3** are approximate and slightly higher than will occur if all measures are run together as a program. This is due to multiple measures addressing the same end uses. Program savings (which account for the overlap) are provided in Section 3.

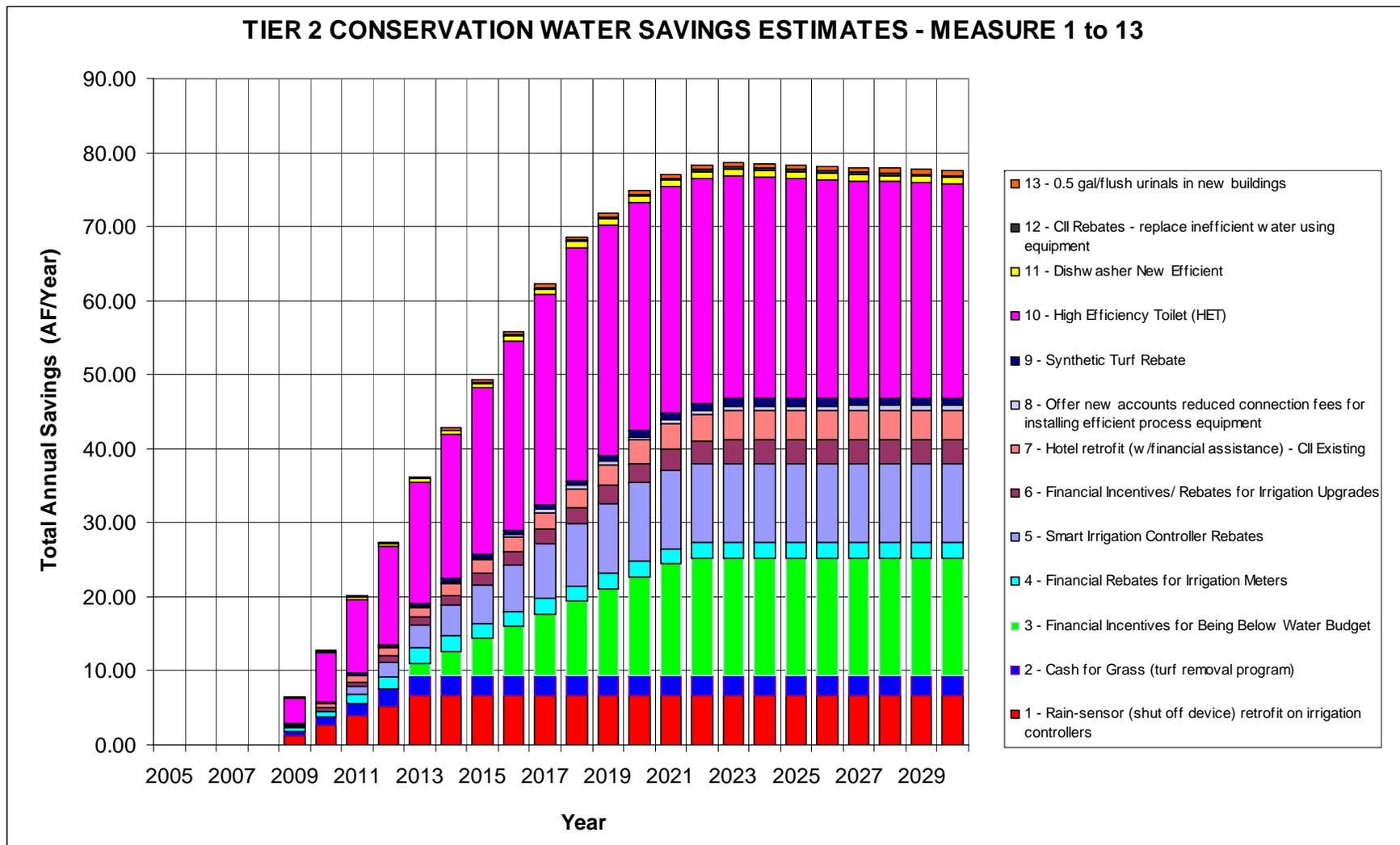


Figure 2: Conservation Savings from Tier Two Measures

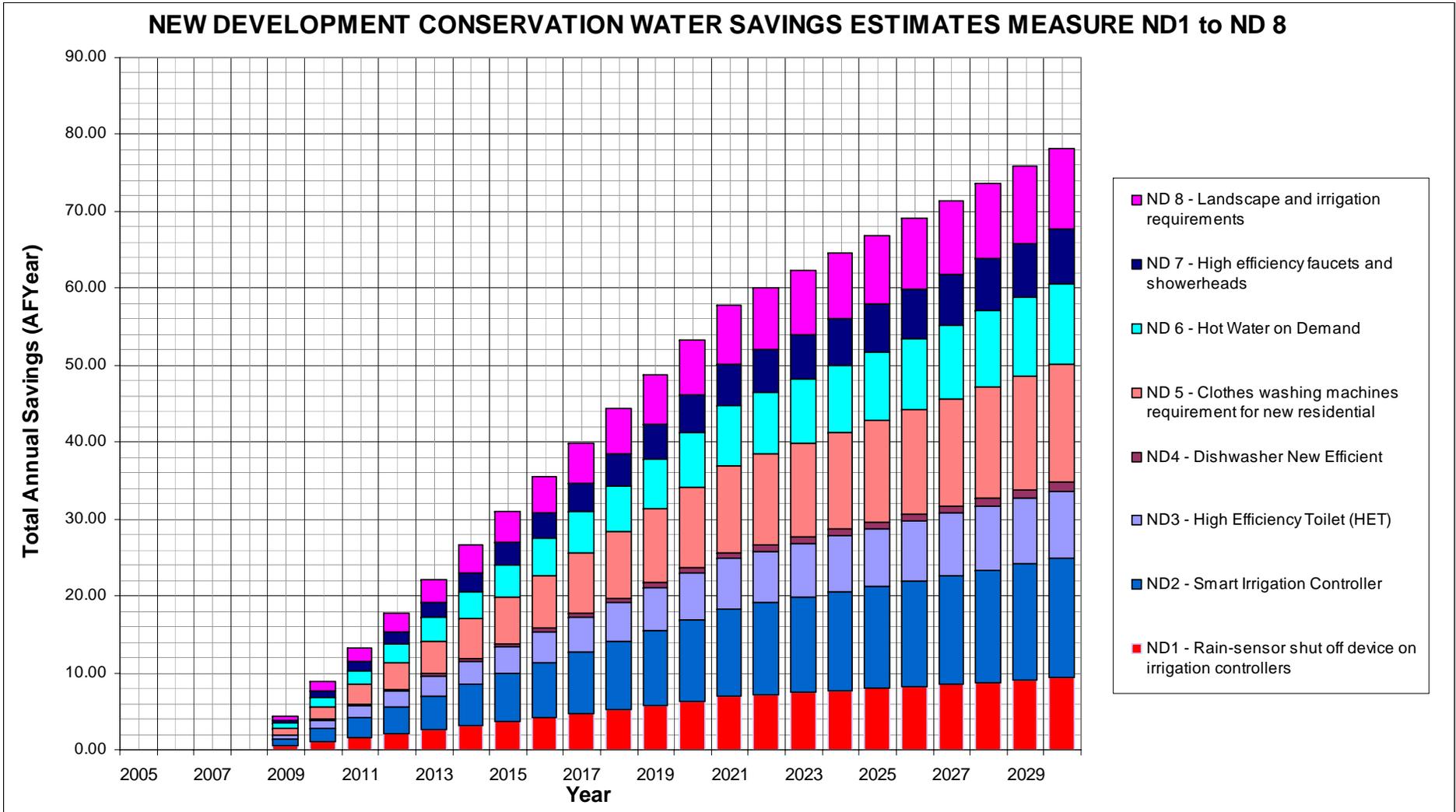


Figure 3: Conservation Savings from New Development Measures

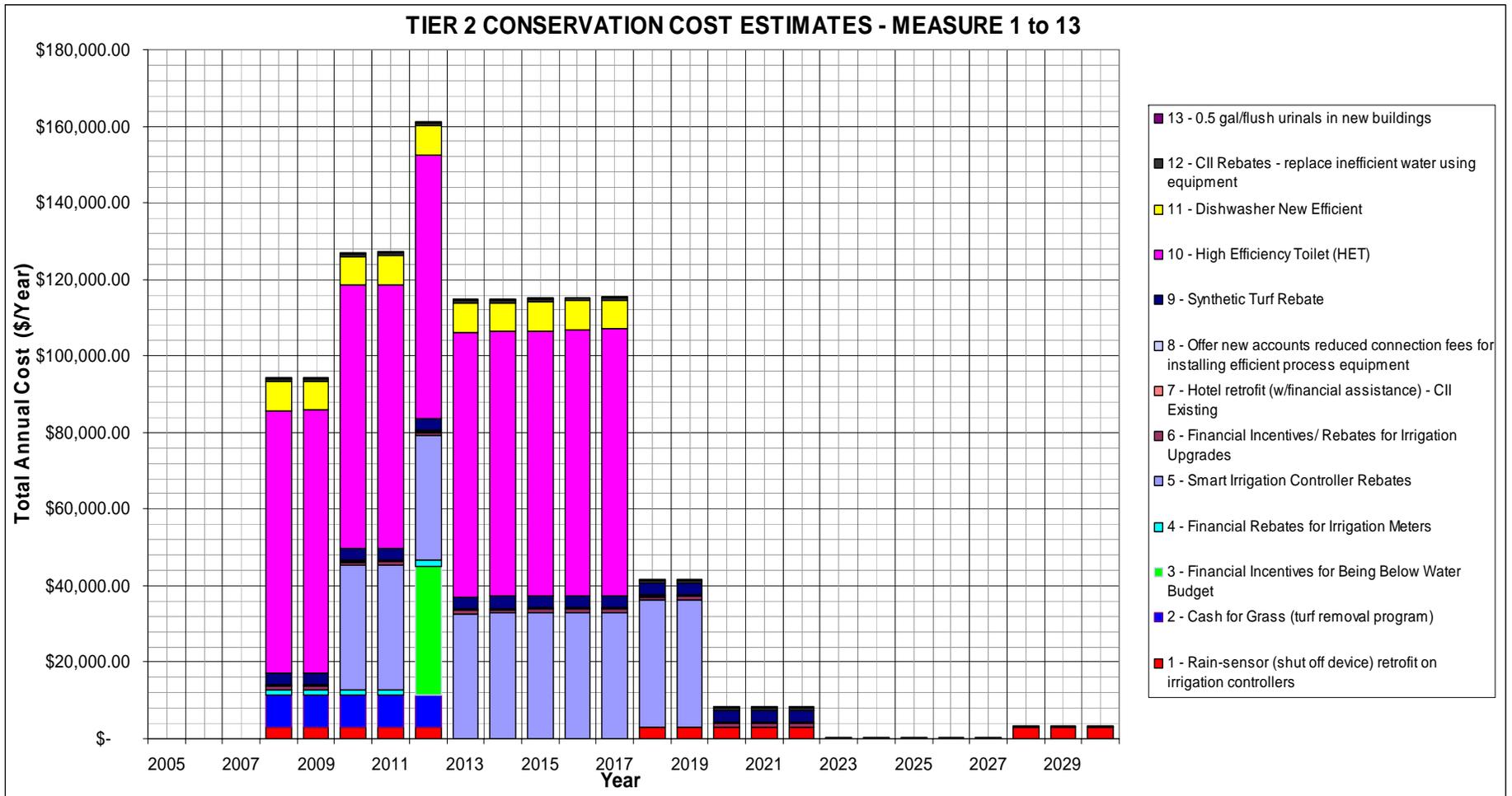
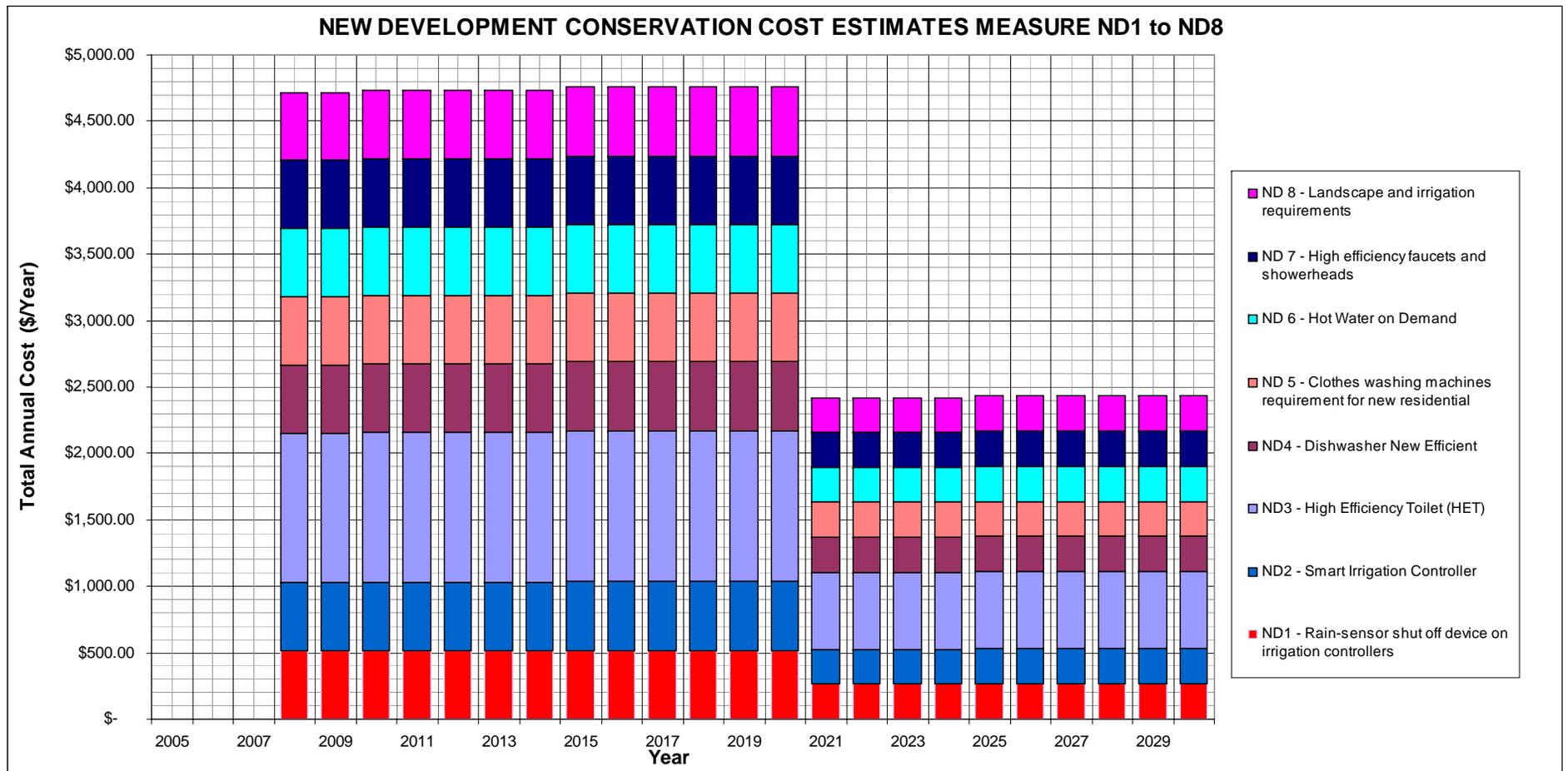


Figure 4: Conservation Costs from Tier Two Measures



Note: Utility costs depend upon the pace of new development, which depends on the projected growth in new single family accounts

Figure 5: Conservation Costs from New Development Measures

3. RESULTS OF TIER TWO AND NEW DEVELOPMENT CONSERVATION ANALYSIS

Table 4 provides a summary of which measures make up each of the three options programs. The three packages are designed to illustrate an increasing level of water savings.

These programs are not intended to be rigid programs but rather to demonstrate the range in saving that could be generated if selected measures were run together. In this step we account for the overlap in water savings (and benefits) and estimate combined savings and benefits from programs or packages of measures.

A description of each program evaluated follows. Because Tier Two will commence in 2007 and some agencies will have continued to implement some Tier One measures since the base year of 2004, it is necessary to evaluate Tier Two and New Development measures in addition to the water savings generated by the completion of Tier One. The Tier One measure parameters have been updated based on comments received from agencies. Numerical changes to Tier One measures were minor with two exceptions. Both Sonoma and Valley of the Moon had an unaccounted for water reduction measure added as per the CUWCC requirements for compliance with BMP 3. For these agencies projected water savings from Tier One measures went up significantly. Other agency water savings from Tier One measures changed very little, if at all.

Program – Future Savings for Tier One + Tier Two Measures

Program Future Savings for Tier One + Tier Two Measures includes 13 additional measures beyond the CUWCC BMPs. Tier One Future was designed to be the future program with full compliance for all the CUWCC BMPs. The participation rates starting in 2004 are in accordance with those specified in the California Urban Water Conservation Council's Memorandum Of Understanding, which may be higher (or lower) than you are currently achieving. If you continue to implement these measures, your future water demands will be reduced by the amount of conservation savings. Descriptions of the Tier Two measures are in **Table 1** and cost and saving assumptions for each individual measure can be found in **Attachment 1**.

Program - Future Savings for Tier One + New Development Measures

Program Future Savings for Tier One + New Development Measures was designed to isolate the effects of the New Development measures that would be implemented as well as the completion of Tier One measures. These eight New Development measures target new single family homes only.

Program: Future Savings for All Measures Tier One, Tier Two, New Development

Program Future Savings for All Measures Tier One, Tier Two, New Development includes all 32 analyzed conservation measures. Do note that this is the theoretical maximum amount of conservation savings that are identified at this time. Also note that measures that either saved a small amount of water or were not cost-effective (Benefit-Cost ratio less than 1.0 and a high cost of water saved) were included here so as to represent the maximum water savings. Some of the Tier Two measures are small programs in that the target number of accounts is very small. So even though they appear to be relatively expensive from a measure point of view, their impact on the overall program costs and savings is relatively minor.

Table 4
Conservation Measures Selected for Programs

Description of Conservation Activity	Corresponding Measure Number	Program Tier One + New Development	Tier One + Tier Two	All Measures
BMP 1a - Residential Water Surveys-Indoor	Tier 1 - 1	X	X	X
BMP 1b - Residential Water Surveys-Outdoor	Tier 1 - 2	X	X	X
BMP 2- Plumbing Retrofits	Tier 1 - 3	X	X	X
BMP 5a - Landscape Water Budgets	Tier 1 - 4	X	X	X
BMP 5b - Large Landscape Conservation Audits	Tier 1 - 5	X	X	X
BMP 6 - Washing Machine Rebate	Tier 1- 6	X	X	X
BMP 7 - Public Information	Tier 1- 7	X	X	X
BMP 9 - Commercial Water Audits	Tier 1- 8	X	X	X
BMP 14 - ULF Toilet Rebate- Single Family	Tier 1 - 9	X	X	X
BMP 14 - ULF Toilet Rebate- Multifamily	Tier 1 - 10	X	X	X
Tier 2 - 1 Rain Sensor Retrofit	Tier 2 - 1		X	X
Tier 2 - 2 Cash for Grass	Tier 2 - 2		X	X
Tier 2 - 3 Financial Incentives for Being Below Water Budget	Tier 2 - 3		X	X
Tier 2 - 4 Irrigation Meter Rebates	Tier 2 - 4		X	X
Tier 2 - 5a Smart Irrigation Controller Rebates – RSF	Tier 2 - 5a		X	X
Tier 2 - 5b Smart Irrigation Controller Rebates - RMF, CII, IRR	Tier 2 - 5b		X	X
Tier 2 - 6 Financial Incentives/Rebates for Irrigation Upgrades	Tier 2 - 6		X	X
Tier 2 - 7 Hotel Retrofit	Tier 2 - 7		X	X
Tier 2 - 8 New CII Reduced Connection Fees for Efficient Equipment	Tier 2 - 8		X	X

Description of Conservation Activity	Corresponding Measure Number	Program Tier One + New Development	Tier One + Tier Two	All Measures
Tier 2 - 9 Synthetic Turf Rebate	Tier 2 - 9		X	X
Tier 2 - 10 High Efficiency Toilets	Tier 2 - 10		X	X
Tier 2 - 11 Dishwasher New Efficient	Tier 2 - 11		X	X
Tier 2 - 12 CII Rebates - Replace Inefficient Water Using Equipment	Tier 2 - 12		X	X
Tier 2 - 13 New Commercial Urinals	Tier 2 - 13		X	X
ND1- Rain Sensor Retrofit	ND1	X		X
ND2 - Smart Irrigation Controller	ND2	X		X
ND3 - High Efficiency Toilets	ND3	X		X
ND4 - Dishwasher New Efficient	ND4	X		X
ND5 - Clothes Washing Machine Requirement	ND5	X		X
ND6 - Hot Water on Demand	ND6	X		X
ND7 - High Efficiency Faucets and Showerheads	ND7	X		X
ND8 - Landscape and Irrigation Requirements	ND8	X		X
TOTAL NUMBER OF MEASURES*		18	24	32

*Measures BMP 1a, 1b, 5a, 5b, 14, and Tier 2-5a and 5b are all counted as individual measures. These measures were split for more accurate evaluation.

Figure 6 shows annual water savings for each of these programs for the year 2005 to 2030.

Figure 6
Conservation Measure Programs - Annual Water Conservation Savings

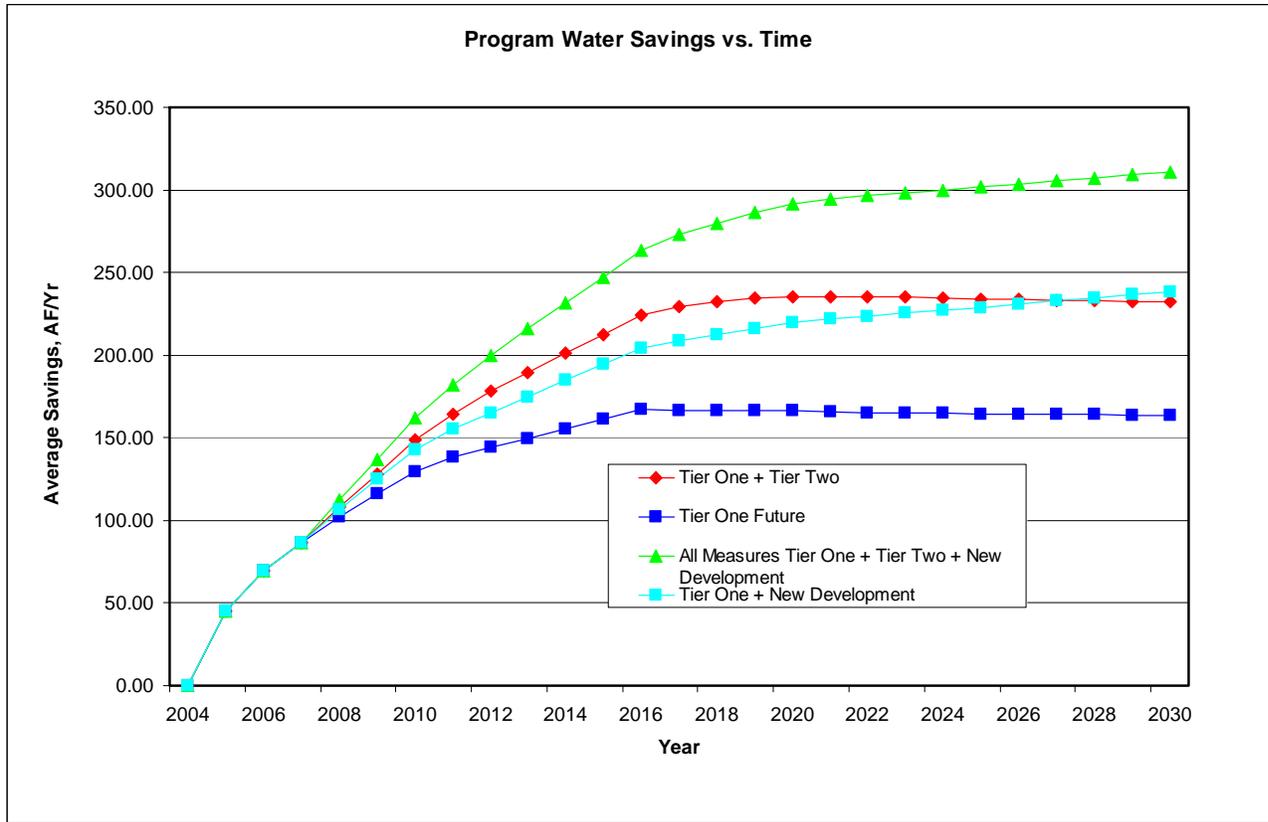


Table 5 presents key evaluation statistics compiled from the DSS model. Assuming all measures are successfully implemented, projected water savings for 2015 and 2030 in acre-feet and million gallons per day (MGD) are shown, as are the costs of achieving this reduction.

The costs are expressed three ways.

1. Total present value
2. The money utilities would need to budget in the first five years (2007-2011) to get new programs underway.
3. The cost of water saved. These costs include costs to complete Tier One measure, as needed.

The water savings are expressed as a percentage of the projected 2030 demand. The last column indicates the percentage of the new water demand for 2030 that each program could fill. That new water needed is over the next 25 years is the difference between 2005 demand with the plumbing code (3.41 MGD) and 2030 demand (3.65 MGD) with the plumbing code. The new water needed for your agency by 2030 is 0.24 MGD.

Table 5
Conservation Measure Programs - Costs and Savings

Conservation Program	Water Utility Benefit-Cost Ratio	2015 Water Savings (Acre-Feet/Yr)	2015 Water Savings (MGD)	2030 Water Savings (Acre-Feet/Yr)	2030 Water Savings (MGD)	2030 Indoor Water Savings (MGD)	2030 Outdoor Water Savings (MGD)	Total Water Savings as a % of Total Production in 2030*	Present Value of Water Utility Costs (\$1,000s)	Five Years Utility Cost 2007 to 2011 (\$1,000)	Cost of Water Saved (\$/AF)	% of New Water Needed from 2005 to 2030
Tier One Future	3.26	161.0	0.14	163.5	0.15	0.10	0.05	4.00%	\$ 1,134	\$ 426	\$ 262	61.6%
Tier One Future + Tier Two	2.27	212.7	0.19	232.3	0.21	0.13	0.08	5.68%	\$ 2,159	\$ 868	\$ 369	87.5%
Tier One Future + New Development	3.94	194.4	0.17	238.5	0.21	0.12	0.09	5.83%	\$ 1,197	\$ 444	\$ 211	89.8%
Tier One Future + Tier Two + New Development	2.68	247.4	0.22	311.0	0.28	0.16	0.11	7.60%	\$ 2,222	\$ 887	\$ 305	117.1%

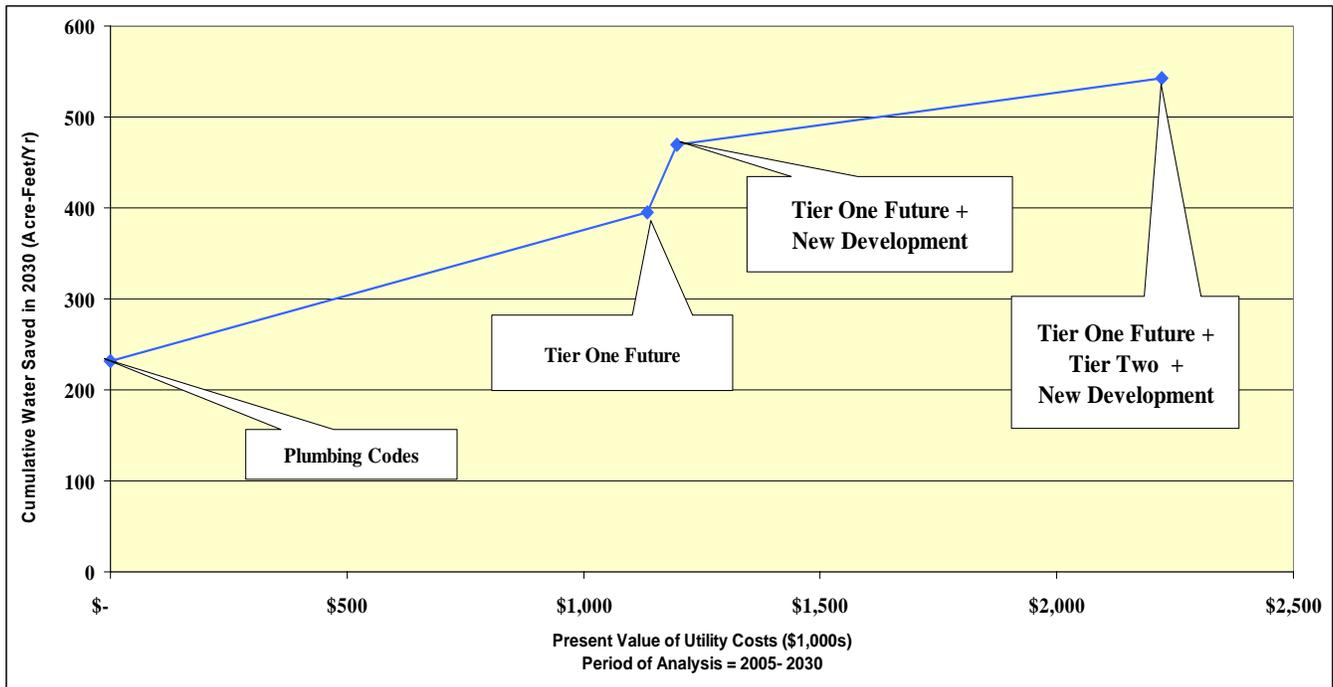
Notes:

- Present Value is determined using an interest rate of 3%
- Cost of water saved is present value of water utility cost divided by total 30-year water savings.
- Five Year Cost for all above programs is 2007 to 2011
- * % of water saved refers to the demand with the plumbing code

Figure 7 shows how marginal returns change as more money is spent to achieve savings. As the figure shows the cost versus saving curve is starting to decline after Program Tier One + New Development. This means that the added cost of going from that Program to Tier One + Tier Two will save less water per unit expenditure. In other words there are diminishing returns when the curve starts to flatten out as Tier Two measures are added to the program. It is clear that the New Development measures are more cost-effective to the utility than Tier Two measures.

Figure 7

Present Value of Utility Costs versus Cumulative Water Saved in 2030



4. CONCLUSIONS

Relative Savings and Cost-Effectiveness of Programs

VOM's service area has relatively high proportion of residential water use and a significant amount of outdoor water use. Consequently, residential conservation programs produce the most savings. Water use in the commercial sector is low, offering modest conservation potential. Overall conclusions are:

- Total savings from all conservation programs would be about 7.6 percent in 2030 (311 AF as shown on **Table 5**). Implementation of all of the programs described in this memorandum will reduce water needs in 2030 by 7.6 percent.
- Savings contributed by Tier Two measures alone are 68.8 acre-feet in 2030 or 0.06 MGD. This equates to a 1.7 percent reduction in 2030 water demand.
- Savings contributed by the New Development measures alone are 75 acre-feet (0.06 MGD). This equates to a 1.8 percent reduction in 2030 water demand.
- Because of the projected relatively low growth rate in new accounts, future Tier One measures plus combinations of Tier Two and New Development measures conservation could make up about 88 to 117 percent of the total future additional water needed by 2030.
- The average cost of water saved for all of the programs from the utility standpoint (as shown on **Table 5**) is lower than the forecasted 2020 price of \$922 per AF.
- The cost for the New Development measures is largely funded by the builders of the new homes, which tends to reduce the overall cost to the utility for all measures.

ATTACHMENTS

Attachment 1 Assumptions for the Tier Two and New Development Measures Evaluated in the DSS Model

Attachment 1
Assumptions for Tier Two Measures Evaluated in the DSS Model

Measure	T2 - 1	T2 - 2	T2 - 3	T2 - 4	T2 - 5a	T2 - 5b	T2 - 6
Applicable Customer Classes	SF	Existing Customers SF, MF, CII	IRR	Existing CII with Mixed Use	SF	Existing MF, CII, IRR	Existing MF, CII, IRR
Applicable End Uses	Irrigation	Irrigation	Irrigation	Irrigation	Irrigation	Irrigation	Irrigation
Market Penetration by End Of Program	10%	1%	100%	10%	5%	20%	10%
Water Use Reductions For Targeted End Uses	9%	33%	15%	15%	15%	15%	15%
Program Length, years	5	5	10	5	10	10	15
Measure Life, years	10	permanent	permanent	permanent	21	permanent	permanent
Utility Unit Cost for SFaccounts, \$/unit	\$ 20.00	\$ 500.00	\$ 25,000.00	\$ -	\$ 450.00	\$ -	\$ -
Utility Unit Cost for MF accounts, \$/unit	--	\$ 500.00	\$ -	\$ -	\$ -	\$ 900.00	\$ -
Utility Unit Cost for non-Res accounts, \$/unit	--	\$ 500.00	\$ -	\$ 500.00	\$ -	\$ 900.00	\$ 500.00
Customer Unit Cost. \$/unit	\$ 35.00	\$ 500.00	\$ 10,000.00	\$ 500.00	\$ 100.00	\$ 100.00	\$ 500.00
Annual Utility Admin & Marketing Cost	25%	25%	35%	25%	30%	30%	25%

Notes:

SF = Residential Single Family
MF = Residential Multi Family
CII = Commercial/Industrial/Institutional
COM = Commercial
IRR = Dedicated irrigation meters
INS = Public, buildings / grounds owned by the Water Utility or City
NRSF = New Residential Single Family Homes

Attachment 1
Assumptions for Tier Two Measures Evaluated in the DSS Model

Measure	T2 - 7	T2 - 8	T2 - 9	T2 - 10	T2 - 11	T2 - 12	T2 - 13
Applicable Customer Classes	Existing CII	New Customers: CII	IRR	SF, MF	SF	CII	COM New
Applicable End Uses	Indoor use	Indoor uses	Irrigation	Toilet end use	Dishwashers	Process end use	COM Urinal
Market Penetration by End Of Program	20%	75%	1%	20%	10%	10%	100%
Water Use Reductions For Targeted End Uses	20%	25%	90%	45 to 55%	34%	10%	65 to 75%
Program Length, years	15	30	15	10	10	15	30
Measure Life, years	permanent	permanent	permanent	permanent	permanent	permanent	permanent
Utility Unit Cost for SFaccounts, \$/unit	\$ -	\$ -	\$ -	\$ 150.00	\$ 100.00		\$ 50.00
Utility Unit Cost for MF accounts, \$/unit	\$ -		\$ -	\$ 150.00	--		
Utility Unit Cost for non-Res accounts, \$/unit	\$ 100.00	\$ 100.00	\$ 150,000.00		--	\$ 500.00	
Customer Unit Cost. \$/unit	\$ 200.00	\$1,000.00	\$ 150,000.00	\$ 150.00	\$ 700.00	\$1,000.00	\$ 500.00
Annual Utility Admin & Marketing Cost	25%	25%	25%	35%	25%	30%	25%

Notes:

- SF = Residential Single Family
- MF = Residential Multi Family
- CII = Commercial/Industrial/Institutional
- COM = Commercial
- IRR = Dedicated irrigation meters
- INS = Public, buildings / grounds owned by the Water Utility or City
- NRSF = New Residential Single Family Homes

Attachment 1
Assumptions for New Development Measures Evaluated in the DSS Model

Measure	ND 1	ND 2	ND 3	ND 4	ND 5	ND 6	ND 7	ND 8
Applicable Customer Classes	NRSF	NRSF	NRSF	NRSF	NRSF	NRSF	NRSF	NRSF
Applicable End Uses	Irrigation	Irrigation	Toilet end use	Dishwashers	Clothes Washers	Faucet and shower end use	Faucet and shower end use	Irrigation
Market Penetration by End Of Program	100%	100%	100%	100%	100%	100%	100%	100%
Water Use Reductions For Targeted End Uses	9%	15%	50 to 55%	34%	50%	14.2 gpd per house	15%	10%
Program Length, years	30	30	30	30	30	30	30	30
Measure Life, years	permanent	permanent	permanent	permanent	permanent	permanent	permanent	permanent
Utility Unit Cost for SFaccounts, \$/unit	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50	\$ 12.50
Utility Unit Cost for MF accounts, \$/unit	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Utility Unit Cost for non-Res accounts, \$/unit	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Customer Unit Cost. \$/unit	\$ 55.00	\$ 500.00	\$ 300.00	\$ 400.00	\$ 500.00	\$ 700.00	\$ 50.00	\$3,000.00
Annual Utility Admin & Marketing Cost	10%	10%	10%	10%	10%	10%	10%	10%

Notes:

- SF = Residential Single Family
- MF = Residential Multi Family
- CII = Commercial/Industrial/Institutional
- COM = Commercial
- IRR = Dedicated irrigation meters
- INS = Public, buildings / grounds owned by the Water Utility or City
- NRSF = New Residential Single Family Homes
- ND = New Development

APPENDIX C

Best Management Practices Report Filing

Water Supply & Reuse

Reporting Unit:

Valley of the Moon Water District

Year:

2003**Water Supply Source Information**

Supply Source Name	Quantity (AF) Supplied	Supply Type
Sonoma County Water Agency	2878.57	Imported
Donald Well	27.531	Groundwater
Mountain Well	41.114	Groundwater
Park Ave. Well	152.524	Groundwater
Agua Caliente Well	85.425	Groundwater
Larbre Well	208.902	Groundwater

Total AF: 3394.066

Reported as of 11/1

Accounts & Water Use

Reporting Unit Name: **Valley of the Moon Water District** Submitted to **CUWCC** Year: **2003**
01/27/2004

A. Service Area Population Information:

1. Total service area population 22958

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	6051	2090.58	0	0
2. Multi-Family	407	545.02	0	0
3. Commercial	164	214.73	0	0
4. Industrial	0	0	0	0
5. Institutional	28	97.73	0	0
6. Dedicated Irrigation	29	80.92	0	0
7. Recycled Water	0	0	0	0
8. Other	25	.75	0	0
9. Unaccounted	NA	364.34	NA	0
Total	6704	3394.07	0	0

Metered

Unmetered

Reported as of 11/1

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit: **Valley of the Moon Water District** BMP Form Status: **100% Complete** Year: **2003**

A. Implementation

- | | |
|---|------------|
| 1. Based on your signed MOU date, 10/01/2001, your Agency STRATEGY DUE DATE is: | 10/01/2003 |
| 2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys? | no |
| a. If YES, when was it implemented? | |
| 3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys? | no |
| a. If YES, when was it implemented? | |

B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	0	0
2. Number of surveys completed:	0	0

Indoor Survey:

- | | | |
|---|----|----|
| 3. Check for leaks, including toilets, faucets and meter checks | no | no |
| 4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary | no | no |
| 5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary | no | no |

Outdoor Survey:

- | | | |
|--|----|------|
| 6. Check irrigation system and timers | no | no |
| 7. Review or develop customer irrigation schedule | no | no |
| 8. Measure landscaped area (Recommended but not required for surveys) | no | no |
| 9. Measure total irrigable area (Recommended but not required for surveys) | no | no |
| 10. Which measurement method is typically used (Recommended but not required for surveys) | | None |
| 11. Were customers provided with information packets that included evaluation results and water savings recommendations? | no | no |
| 12. Have the number of surveys offered and completed, survey results, and survey costs been tracked? | no | no |
| a. If yes, in what form are surveys tracked? | | |
| b. Describe how your agency tracks this information. | | |

C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
 - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

For Fiscal Year 2002-2003 We have started to develop a strategy with the first letters to be sent to the customers offering surveys. We are also developing how to present the surveys. Our pilot program of our ET Irrigation Controller for saving irrigation water was watched and the results in the second year were not as good as the first year.

Reported as of 11/1

BMP 02: Residential Plumbing Retrofit

Reporting Unit:
Valley of the Moon Water District

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? no
 - a. If YES, list local jurisdictions in your service area and code or ordinance in each:

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no
3. Estimated percent of single-family households with low-flow showerheads: 36%
4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no
5. Estimated percent of multi-family households with low-flow showerheads: 40%
6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes
 - a. If YES, when did your agency begin implementing this strategy? 06/13/1996
 - b. Describe your targeting/ marketing strategy.

Distribute at past toilet giveaways and distribute at this District Office.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	256	51
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	246	78
6. Does your agency track the distribution and cost of low-flow devices? yes		
a. If YES, in what format are low-flow devices tracked? Manual Activity		
b. If yes, describe your tracking and distribution system :		

Addresses are recorded at front desk at District Office when cust. receives free low flow devices. This is put onto a spreadsheet at a later date. Addresses were also recorded at previous toilet giveaways.

C. Low-Flow Device Distribution Expenditures

	This Year	Next Year
1. Budgeted Expenditures	4000	4000

2. Actual Expenditures

0

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?

No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Fiscal Year 2002-2003 We did not need to purchase any inventory this year for this BMP.

Reported as of 11/1

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit: **Valley of the Moon Water District** BMP Form Status: **100% Complete** Year: **2003**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year? yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:
 - a. Determine metered sales (AF) 3029
 - b. Determine other system verifiable uses (AF) 164
 - c. Determine total supply into the system (AF) 3394
 - d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required. 0.94
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production? yes
4. Did your agency complete a full-scale audit during this report year? no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit? no
6. Does your agency operate a system leak detection program? no
 - a. If yes, describe the leak detection program:

N/A

B. Survey Data

1. Total number of miles of distribution system line. 191
2. Number of miles of distribution system line surveyed. 0

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	170000	170000
2. Actual Expenditures	92075	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
 - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Fiscal Year 2002-2003 FY 02-03 \$51,690 was funded by the Sonoma County Water Agency.

Reported as of 11/1

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:

Valley of the Moon Water District

BMP Form Status:

100% Complete

Year:

2003

A. Implementation

- | | |
|---|-----|
| 1. Does your agency require meters for all new connections and bill by volume-of-use? | yes |
| 2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? | no |
| a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed? | |
| b. Describe the program: | |
| 3. Number of previously unmetered accounts fitted with meters during report year. | 0 |

B. Feasibility Study

- | | |
|--|----|
| 1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? | no |
| a. If YES, when was the feasibility study conducted?
(mm/dd/yy) | |
| b. Describe the feasibility study: | |
| 2. Number of CII accounts with mixed-use meters. | 26 |
| 3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. | 0 |

C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

- | | |
|--|----|
| 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? | No |
| a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as." | |

E. Comments

Fiscal Year 2002-2003

Reported as of 11/1

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:
Valley of the Moon
Water District

BMP Form Status:
100% Complete

Year:
2003

A. Water Use Budgets

- | | |
|--|----|
| 1. Number of Dedicated Irrigation Meter Accounts: | 29 |
| 2. Number of Dedicated Irrigation Meter Accounts with Water Budgets: | 0 |
| 3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF): | 0 |
| 4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF): | 0 |
| 5. Does your agency provide water use notices to accounts with budgets each billing cycle? | no |

B. Landscape Surveys

- | | |
|---|------------|
| 1. Has your agency developed a marketing / targeting strategy for landscape surveys? | yes |
| a. If YES, when did your agency begin implementing this strategy? | 09/24/2003 |
| b. Description of marketing / targeting strategy: | |
| <p>Our targets with dedicated irrig. meters will be measured using GIS and Aerial Data or manually measured. We currently have an agreement with the Sonoma Ecology Center which has GIS, Aerial Data. They will start in FY 2003-04.</p> | |
| 2. Number of Surveys Offered. | 0 |
| 3. Number of Surveys Completed. | 0 |
| 4. Indicate which of the following Landscape Elements are part of your survey: | |
| a. Irrigation System Check | no |
| b. Distribution Uniformity Analysis | no |
| c. Review / Develop Irrigation Schedules | no |
| d. Measure Landscape Area | yes |
| e. Measure Total Irrigable Area | yes |
| f. Provide Customer Report / Information | no |
| 5. Do you track survey offers and results? | no |
| 6. Does your agency provide follow-up surveys for previously completed surveys? | no |
| a. If YES, describe below: | |

C. Other BMP 5 Actions

- | | |
|--|----|
| 1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program.
Does your agency provide mixed-use accounts with landscape budgets? | no |
| 2. Number of CII mixed-use accounts with landscape budgets. | 0 |

- 3. Do you offer landscape irrigation training? no
- 4. Does your agency offer financial incentives to improve landscape water use efficiency? no

Type of Financial Incentive:	Budget (Dollars/Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services? No

a. If YES, describe below:

6. Do you have irrigated landscaping at your facilities? yes

a. If yes, is it water-efficient? no

b. If yes, does it have dedicated irrigation metering? no

7. Do you provide customer notices at the start of the irrigation season? no

8. Do you provide customer notices at the end of the irrigation season? no

D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	10080
2. Actual Expenditures	0	

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

F. Comments

Fiscal Year 2002-2003 Fiscal Year 2001-2002, the Sonoma County Water Agency offered \$15,000 for Non Residential Landscape Conservation.

Reported as of 11/1

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit: **Valley of the Moon Water District** BMP Form Status: **100% Complete** Year: **2003**

A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? yes
 - a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

CII - Lite Wash Program, Authorized by the Ca. Public Utilities Commission offers Rebates of \$100 to \$150 to match this Districts portion.
2. Does your agency offer rebates for high-efficiency washers? yes
3. What is the level of the rebate? 75
4. Number of rebates awarded. 68

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	7800	5000
2. Actual Expenditures	5100	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
 - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Fiscal Year 2002-2003

Reported as of 11/1

BMP 07: Public Information Programs

Reporting Unit: **Valley of the Moon Water District** BMP Form Status: **100% Complete** Year: **2003**

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

Provide Brochures to customer's. Speaker Bureau and respond to request for information.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	1
b. Public Service Announcement	yes	2
c. Bill Inserts / Newsletters / Brochures	yes	2
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	0
f. Special Events, Media Events	no	0
g. Speaker's Bureau	yes	1
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	501.86	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Fiscal Year 2002-2003

Reported as of 11/1

BMP 08: School Education Programs

Reporting Unit:
Valley of the Moon Water District

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

1. Has your agency implemented a school information program to promote water conservation? yes
2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	4	234	4
Grades 4th-6th	yes	0	101	4
Grades 7th-8th	yes	0	0	3
High School	yes	0	0	2

3. Did your Agency's materials meet state education framework requirements? yes
4. When did your Agency begin implementing this program? 09/01/1988

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
 - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Fiscal Year 2002-2003 Regional School Program is recorded with the Sonoma County Water Agency's BMP 8 as they perform and fund this program for this District.

Reported as of 11/1

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:

Valley of the Moon Water DistrictBMP Form Status:
100% CompleteYear:
2003**A. Implementation**

- | | |
|--|-----|
| 1. Has your agency identified and ranked COMMERCIAL customers according to use? | yes |
| 2. Has your agency identified and ranked INDUSTRIAL customers according to use? | yes |
| 3. Has your agency identified and ranked INSTITUTIONAL customers according to use? | yes |

Option A: CII Water Use Survey and Customer Incentives Program

- | | |
|---|-----|
| 4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? | yes |
|---|-----|

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	28	0	1
b. Number of New Surveys Completed	11	0	1
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0
CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	yes	no	yes
f. Evaluation of all water-using apparatus and processes	yes	no	yes
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	yes	no	yes
Agency CII Customer Incentives	Budget (\$/Year)	No. Awarded to Customers	Total \$ Amount Awarded
h. Rebates	0	0	0
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	yes
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	yes
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	0
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	5.25

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	7800	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

- | | |
|--|----|
| 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? | No |
| a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as." | |

D. Comments

Fiscal Year 2002-2003 Line B-1 (\$7800) may have come from BMP 6 as a duplicate last year. FY 02-03 had no CII Washing Machine Rebates. See BMP 6 for CII Washing Machine Rebates. All Surveys & Restaurant Pre-Rinse Nozzle Retrofit were performed through the Sonoma County Water Agency.

Reported as of 11/1

BMP 09a: CII ULFT Water Savings

Reporting Unit:
Valley of the Moon
Water District

BMP Form Status:
100% Complete

Year:
2003

1. Did your agency implement a CII ULFT replacement program in the reporting year? Yes
 If No, please explain why on Line B.10.

A. Targeting and Marketing

1. What basis does your agency use to target customers for participation in this program? Check all that apply. CII Sector or subsector

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

Rebate on retrofit for CII customers of ULFT's on septic tank. Sonoma Valley Sanitation, branch of the Sonoma County Water Agency, rebates CII cusotmers on sewer system.

2. How does your agency advertise this program? Other print media
 Check all that apply.

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

N/A

B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) Yes

2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? No

3. What is the total number of customer accounts participating in the program during the last year ? 2

CII Subsector	Number of Toilets Replaced					Type Not Specified
	Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount		
4. a. Offices	0	0	0	0	0	0
b. Retail / Wholesale	0	0	0	0	0	0
c. Hotels	0	0	0	0	0	0
d. Health	0	0	0	0	0	0

e. Industrial	0	0	0	0	0
f. Schools: K to 12	0	0	0	0	0
g. Eating	0	0	0	0	0
h. Govern- ment	0	0	0	0	0
i. Churches	0	0	0	0	0
j. Other	0	0	0	0	0

5. Program design. Rebate or voucher

6. Does your agency use outside services to implement this program? No

a. If yes, check all that apply.

7. Participant tracking and follow-up. No follow-up

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

- a. Disruption to business 4
- b. Inadequate payback 5
- c. Inadequate ULFT performance 3
- d. Lack of funding 3
- e. American's with Disabilities Act 3
- f. Permitting 1
- g. Other. Please describe in B. 9. 1

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other issues affecting program implementation or effectiveness.

N/A

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

At the current time, this District offers rebates to the CII customers on septic systems only. The Sonoma Valley Sanitation Dist, branch of the Sonoma County Water Agency, offers rebates for CII ULFT retrofitting at special requests.

C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

	Budgeted	Actual Expenditure
a. Labor	0	0
b. Materials	0	0
c. Marketing &	0	0

Advertising		
d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	0	0

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution		0
b. State agency contribution		0
c. Federal agency contribution		0
d. Other contribution		0
e. Total		0

D. Comments

Fiscal Year 2002-2003 The Sonoma Valley Sanitation Dist., branch of the Sonoma County Water Agency, funds all rebates for all CII customers on the sewer system.

Reported as of 11/1

BMP 11: Conservation Pricing

Reporting Unit:
Valley of the Moon Water District

BMP Form
 Status:
100% Complete

Year:
2003

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$2320547
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$423363

2. Commercial

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$192756
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$35167

3. Industrial

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$0

4. Institutional / Government

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$85966
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$15684

5. Irrigation

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$70481
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$12858

6. Other

a. Water Rate Structure	Service Not Provided
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$0

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	30000	0
2. Actual Expenditures	30000	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
---	----

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Fiscal Year 2002-2003 This District's Board of Directors have adopted Resolution #030603, restructuring water usage charge effective Jan 1, 2004 to a 3 tiered conservation based Rate System for all meters serving 1 - 3 units. Water Rate Study was performed by CH2M Hill in May 2003.

Reported as of 11/1

BMP 12: Conservation Coordinator

Reporting Unit:

**Valley of the Moon Water
District**BMP Form Status:
100% CompleteYear:
2003**A. Implementation**

- | | | |
|---|---|-----|
| 1. Does your Agency have a conservation coordinator? | | yes |
| 2. Is this a full-time position? | | no |
| 3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ? | | no |
| 4. Partner agency's name: | N/A | |
| 5. If your agency supplies the conservation coordinator: | | |
| a. What percent is this conservation coordinator's position? | 6% | |
| b. Coordinator's Name | Robert Freeland | |
| c. Coordinator's Title | Special Programs Coordinator | |
| d. Coordinator's Experience and Number of Years | Conservation Practitioner Level 1 and 7 years | |
| e. Date Coordinator's position was created (mm/dd/yyyy) | 07/01/2001 | |
| 6. Number of conservation staff, including Conservation Coordinator. | 1 | |

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	2885
2. Actual Expenditures	2829	

C. "At Least As Effective As"

- | | |
|--|----|
| 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? | no |
| a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as." | |

D. Comments

Fiscal Year 2002-2003

Reported as of 11/1

BMP 13: Water Waste Prohibition

Reporting Unit: **Valley of the Moon Water District** BMP Form Status: **100% Complete** Year: **2003**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

Purpose is to promote water conservation and efficeint use of potable water. Prohibites washing of hard surfaces, leaks, excissive irrigation and other items. (See Ordinance 1007) Penalties can be used if necessary.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

Approximately 36 cust's in City of Sonoma. El Vernao, Boyes Hot Springs, Agua Caliente, Glen Ellen, and other small parts of Unincorporated Sonoma County that is within our District.

We issue "OOPS" in this District Advising of the ordinanec. Glen Ellen 2 Boyes Spgs 1 El Verano 2 Unincorperated 1 Total 6

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

- | | |
|--|-----|
| a. Gutter flooding | yes |
| b. Single-pass cooling systems for new connections | yes |
| c. Non-recirculating systems in all new conveyor or car wash systems | yes |
| d. Non-recirculating systems in all new commercial laundry systems | yes |
| e. Non-recirculating systems in all new decorative fountains | yes |
| f. Other, please name
Washing of Hard Surfaces | yes |

2. Describe measures that prohibit water uses listed above:

Our Board passed Ordinance 1007 on 6/6/00, instituting water waste prohibitions.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

- | | |
|---|----|
| a. Allow the sale of more efficient, demand-initiated regenerating DIR models. | no |
| b. Develop minimum appliance efficiency standards that: | |
| i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. | no |
| ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. | no |
| c. Allow local agencies, including municipalities and special | |

districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. no

4. Does your agency include water softener checks in home water audit programs? no

5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

C. Water Waste Prohibition Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	839.09	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Fiscal Year 2002-2003

Reported as of 11/1

BMP 14: Residential ULFT Replacement Programs

Reporting Unit: **Valley of the Moon Water District** BMP Form Status: **100% Complete** Year: **2003**

A. Implementation

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

Number of Toilets Replaced by Agency Program During Report Year

Replacement Method	SF Accounts	MF Units
2. Rebate	119	19
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	119	19

6. Describe your agency's ULFT program for single-family residences.

District offers rebate of \$100 per ULFT to cust's on septic systems only. Cust. must install & recycle old toilet. The Sonoma Valley Sanitation District, branch of the Sonoma County Water Agency does the same for the cust's on the sewer system.

7. Describe your agency's ULFT program for multi-family residences.

Same as above.

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

County of Sonoma Unincorporated Area and City of Sonoma.	N/A
--	-----

B. Residential ULFT Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	1000	1000
2. Actual Expenditures	600	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Fiscal Year 2002-2003 Sonoma Valley Sanitation Dist. funds their toilet program within our District. Line 2 SVSD 113 SFD and 19 Multi. The VOMWD rebated 6 SFD.

Water Supply & Reuse

Reporting Unit:

Valley of the Moon Water District

Year:

2004**Water Supply Source Information**

Supply Source Name	Quantity (AF) Supplied	Supply Type
Sonoma County Water Agency	3156.8109	Imported
Donald Well	24.9224	Groundwater
Mountain Well	73.7699	Groundwater
Park Ave. Well	83.5228	Groundwater
Agua Calinete	65.6987	Groundwater
Larbre Well	170.8173	Groundwater

Total AF: 3575.542

Reported as of 11/1

Accounts & Water Use

Reporting Unit Name: **Valley of the Moon Water District** Submitted to **CUWCC** Year: **2004**
11/23/2004

A. Service Area Population Information:

1. Total service area population 23074

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	6079	2210.68	0	0
2. Multi-Family	415	577.47	0	0
3. Commercial	165	220.26	0	0
4. Industrial	0	0	0	0
5. Institutional	28	113.32	0	0
6. Dedicated Irrigation	31	90.35	0	0
7. Recycled Water	0	0	0	0
8. Other	25	2.04	0	0
9. Unaccounted	NA	362.03	NA	0
Total	6743	3576.15	0	0

Metered

Unmetered

Reported as of 11/1

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit: **Valley of the Moon Water District** BMP Form Status: **100% Complete** Year: **2004**

A. Implementation

- | | |
|---|------------|
| 1. Based on your signed MOU date, 10/01/2001, your Agency STRATEGY DUE DATE is: | 10/01/2003 |
| 2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys? | yes |
| a. If YES, when was it implemented? | 06/30/2004 |
| 3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys? | yes |
| a. If YES, when was it implemented? | 06/30/2004 |

B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	3	0
2. Number of surveys completed:	3	0

Indoor Survey:

- | | | |
|---|-----|----|
| 3. Check for leaks, including toilets, faucets and meter checks | yes | no |
| 4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary | yes | no |
| 5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary | yes | no |

Outdoor Survey:

- | | | |
|--|-----|------|
| 6. Check irrigation system and timers | yes | no |
| 7. Review or develop customer irrigation schedule | yes | no |
| 8. Measure landscaped area (Recommended but not required for surveys) | no | no |
| 9. Measure total irrigable area (Recommended but not required for surveys) | no | no |
| 10. Which measurement method is typically used (Recommended but not required for surveys) | | None |
| 11. Were customers provided with information packets that included evaluation results and water savings recommendations? | no | no |
| 12. Have the number of surveys offered and completed, survey results, and survey costs been tracked? | no | no |
| a. If yes, in what form are surveys tracked? | | None |
| b. Describe how your agency tracks this information. | | |

C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	30000
2. Actual Expenditures	27	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
 - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

RFP's were sent out on June 30, 2004 to consultants, one to be chosen to perform inside and outside audits for this District for the requirements of this BMP. Our Program audits target is 3% of the base year of 2001 for SFD and Multi's for this first round.

Reported as of 11/1

BMP 02: Residential Plumbing Retrofit

Reporting Unit:
Valley of the Moon Water District

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? no
 - a. If YES, list local jurisdictions in your service area and code or ordinance in each:

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no
3. Estimated percent of single-family households with low-flow showerheads: 69%
4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no
5. Estimated percent of multi-family households with low-flow showerheads: 67%
6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes
 - a. If YES, when did your agency begin implementing this strategy? 06/13/1996
 - b. Describe your targeting/ marketing strategy.

Distributed at past toilet giveaways and distribute devices at this District's Office.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	400	140
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	230	16
6. Does your agency track the distribution and cost of low-flow devices?		yes
a. If YES, in what format are low-flow devices tracked?		Manual Activity
b. If yes, describe your tracking and distribution system :		

Addresses are recorded and front desk at District Office when cust. receives free low flow devices. This is put onto a spreadsheet at a later date.

C. Low-Flow Device Distribution Expenditures

This Year	Next Year
------------------	------------------

1. Budgeted Expenditures	4000	4000
2. Actual Expenditures	728	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

FY 2003-2004.

Reported as of 11/1

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit: **Valley of the Moon Water District** BMP Form Status: **100% Complete** Year: **2004**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year? yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:
 - a. Determine metered sales (AF) 3214
 - b. Determine other system verifiable uses (AF) 164
 - c. Determine total supply into the system (AF) 3576
 - d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required. 0.94
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production? yes
4. Did your agency complete a full-scale audit during this report year? no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit? no
6. Does your agency operate a system leak detection program? yes
 - a. If yes, describe the leak detection program:

This District has been replacing old Polybutylene Services which are prone to leak.

B. Survey Data

1. Total number of miles of distribution system line. 192
2. Number of miles of distribution system line surveyed. 0

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	170000	170000
2. Actual Expenditures	133738	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
 - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Fiscal Year 2003-2004

Reported as of 11/1

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:

Valley of the Moon Water District

BMP Form Status:

100% Complete

Year:

2004

A. Implementation

- | | |
|---|-----|
| 1. Does your agency require meters for all new connections and bill by volume-of-use? | yes |
| 2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? | no |
| a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed? | |
| b. Describe the program: | |
| 3. Number of previously unmetered accounts fitted with meters during report year. | 0 |

B. Feasibility Study

- | | |
|--|----|
| 1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? | no |
| a. If YES, when was the feasibility study conducted?
(mm/dd/yy) | |
| b. Describe the feasibility study: | |
| 2. Number of CII accounts with mixed-use meters. | 32 |
| 3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. | 0 |

C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

- | | |
|--|----|
| 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? | No |
| a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as." | |

E. Comments

Fiscal Year 2003-2004

Reported as of 11/1

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:
Valley of the Moon
Water District

BMP Form Status:
100% Complete

Year:
2004

A. Water Use Budgets

- | | |
|--|----|
| 1. Number of Dedicated Irrigation Meter Accounts: | 30 |
| 2. Number of Dedicated Irrigation Meter Accounts with Water Budgets: | 0 |
| 3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF): | 0 |
| 4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF): | 0 |
| 5. Does your agency provide water use notices to accounts with budgets each billing cycle? | no |

B. Landscape Surveys

- | | |
|--|------------|
| 1. Has your agency developed a marketing / targeting strategy for landscape surveys? | yes |
| a. If YES, when did your agency begin implementing this strategy? | 09/24/2003 |
| b. Description of marketing / targeting strategy: | |
| Have had 31 sites measured using aerial data and some manually. Creating Water Budgets on paper. | |
| 2. Number of Surveys Offered. | 0 |
| 3. Number of Surveys Completed. | 0 |
| 4. Indicate which of the following Landscape Elements are part of your survey: | |
| a. Irrigation System Check | no |
| b. Distribution Uniformity Analysis | no |
| c. Review / Develop Irrigation Schedules | no |
| d. Measure Landscape Area | yes |
| e. Measure Total Irrigable Area | yes |
| f. Provide Customer Report / Information | no |
| 5. Do you track survey offers and results? | no |
| 6. Does your agency provide follow-up surveys for previously completed surveys? | no |
| a. If YES, describe below: | |

C. Other BMP 5 Actions

- | | |
|---|----|
| 1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. | no |
| Does your agency provide mixed-use accounts with landscape budgets? | |
| 2. Number of CII mixed-use accounts with landscape budgets. | 0 |
| 3. Do you offer landscape irrigation training? | no |
| 4. Does your agency offer financial incentives to improve | no |

landscape water use efficiency?

Type of Financial Incentive:	Budget (Dollars/Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0
5. Do you provide landscape water use efficiency information to new customers and customers changing services?			No
a. If YES, describe below:			
6. Do you have irrigated landscaping at your facilities?			yes
a. If yes, is it water-efficient?			no
b. If yes, does it have dedicated irrigation metering?			no
7. Do you provide customer notices at the start of the irrigation season?			no
8. Do you provide customer notices at the end of the irrigation season?			no

D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	10080	1000
2. Actual Expenditures	313	

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

F. Comments

Fiscal Year 2003-2004 We have had 31 sites measured using GIS/Aerial View measurement. The Sonoma County Water Agency has paid \$10080 for this BMP.

Reported as of 11/1

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:

Valley of the Moon Water District

BMP Form Status:

100% Complete

Year:

2004

A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? yes

a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

CII - Lite Wash Program authorized by the Ca. Public Utilities Commission offers rebates of \$100 to \$175 to match this District's portion. Residential - Bay Area Water Utility Regional offers \$75 per washer administered by the Sonoma County Water Agency.

2. Does your agency offer rebates for high-efficiency washers? yes

3. What is the level of the rebate? 75

4. Number of rebates awarded. 94

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	5000	7500
2. Actual Expenditures	95	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Fiscal Year 2003-2004 Rebates are funded by the Sonoma County Water Agency which paid \$7,050.

Reported as of 11/1

BMP 07: Public Information Programs

Reporting Unit: **Valley of the Moon Water District** BMP Form Status: **100% Complete** Year: **2004**

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

Provide Brouchures to customers. Speaker Bureau and respond to request for information.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	1
b. Public Service Announcement	yes	1
c. Bill Inserts / Newsletters / Brochures	yes	4
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	
f. Special Events, Media Events	yes	1
g. Speaker's Bureau	yes	2
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	1285	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Fiscal Year 2003-2004

Reported as of 11/1

BMP 08: School Education Programs

Reporting Unit:
Valley of the Moon Water District

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1. Has your agency implemented a school information program to promote water conservation? yes
2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	6	196	6
Grades 4th-6th	yes	0	73	6
Grades 7th-8th	yes	0	0	4
High School	yes	0	0	4

3. Did your Agency's materials meet state education framework requirements? yes
4. When did your Agency begin implementing this program? 09/01/1988

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
 - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Fiscal Year 2003-2004 Regional School Program is recorded with the Sonoma County Water Agency's BMP 8 as they perform and fund this program for this District.

Reported as of 11/1

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:

Valley of the Moon Water District

BMP Form Status:

100% Complete

Year:

2004**A. Implementation**

- | | |
|--|-----|
| 1. Has your agency identified and ranked COMMERCIAL customers according to use? | yes |
| 2. Has your agency identified and ranked INDUSTRIAL customers according to use? | yes |
| 3. Has your agency identified and ranked INSTITUTIONAL customers according to use? | yes |

Option A: CII Water Use Survey and Customer Incentives Program

- | | |
|---|-----|
| 4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? | yes |
|---|-----|

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	1	0	0
b. Number of New Surveys Completed	1	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0
CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	yes	no	no
f. Evaluation of all water-using apparatus and processes	yes	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	yes	no	no
Agency CII Customer Incentives	Budget (\$/Year)	No. Awarded to Customers	Total \$ Amount Awarded
h. Rebates	0	0	0
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	yes
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	yes
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	0
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	5.59

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

- | | |
|--|----|
| 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? | No |
| a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as." | |

D. Comments

Fiscal Year 2003-2004 This District has NO INDUSTRIAL Accounts On the Coverage Report, we should have a Yes for industrial for Condition 2a. We have no industrial to survey. All surveys & Pre-Rinse Nozzle Retrofits were performed through the Sonoma County Water Agency.

Reported as of 11/1

BMP 09a: CII ULFT Water Savings

Reporting Unit:
Valley of the Moon
Water District

BMP Form Status:
100% Complete

Year:
2004

1. Did your agency implement a CII ULFT replacement program in the reporting year? Yes
 If No, please explain why on Line B.10.

A. Targeting and Marketing

1. What basis does your agency use to target customers for participation in this program? Check all that apply. CII Sector or subsector

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

Rebate on retrofit for CII customers on ULFT's on septic tank. Sonoma Valley Sanitation, branch of the Sonoma County Water Agency, rebates CII customers on sewer system.

2. How does your agency advertise this program? Other print media
 Check all that apply.

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

N/A

B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) Yes

2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? No

3. What is the total number of customer accounts participating in the program during the last year ? 1

CII Subsector	Number of Toilets Replaced				
	Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount	Type Not Specified
4.					
a. Offices	1	0	0	0	0
b. Retail / Wholesale	0	0	0	0	0
c. Hotels	0	0	0	0	0
d. Health	0	0	0	0	0

e. Industrial	0	0	0	0	0
f. Schools: K to 12	0	0	0	0	0
g. Eating	0	0	0	0	0
h. Govern- ment	0	0	0	0	0
i. Churches	0	0	0	0	0
j. Other	0	0	0	0	0

5. Program design. Rebate or voucher

6. Does your agency use outside services to implement this program? No

a. If yes, check all that apply.

7. Participant tracking and follow-up. No follow-up

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

- a. Disruption to business 4
- b. Inadequate payback 5
- c. Inadequate ULFT performance 3
- d. Lack of funding 3
- e. American's with Disabilities Act 3
- f. Permitting 1
- g. Other. Please describe in B. 9. 1

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other issues affecting program implementation or effectiveness.

N/A

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

At the current time, this District offers rebates to the CII customers on septic systems only. The Sonoma Valley Sanitation Dist, branch of the Sonoma County Water Agency, offers rebates for CII ULFT retrofitting at special requests.

C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

	Budgeted	Actual Expenditure
a. Labor	0	0
b. Materials	0	0
c. Marketing &	0	0

Advertising		
d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	0	0

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution		100
b. State agency contribution		0
c. Federal agency contribution		0
d. Other contribution		0
e. Total		100

D. Comments

Fiscal Year 2003-2004 The Sonoma Valley Sanitation Dist., branch of the Sonoma County Water Agency, funds all rebates for all CII customers on the sewer system.

Reported as of 11/1

BMP 11: Conservation Pricing

Reporting Unit:
Valley of the Moon Water District

BMP Form
 Status:
100% Complete

Year:
2004

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$2607595
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$454062

2. Commercial

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$208560
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$36317

3. Industrial

a. Water Rate Structure	Uniform Seasonal
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$0

4. Institutional / Government

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$105482
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$18368

5. Irrigation

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$83544
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$14547

6. Other

a. Water Rate Structure	Service Not Provided
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$0

d. Total Revenue from Non-Volumetric
Charges, Fees and other Revenue Sources \$0

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Fiscal Year 2003-2004

Reported as of 11/1

BMP 12: Conservation Coordinator

Reporting Unit:

**Valley of the Moon Water
District**BMP Form Status:
100% CompleteYear:
2004**A. Implementation**

- | | | |
|---|---|-----|
| 1. Does your Agency have a conservation coordinator? | | yes |
| 2. Is this a full-time position? | | no |
| 3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ? | | no |
| 4. Partner agency's name: | N/A | |
| 5. If your agency supplies the conservation coordinator: | | |
| a. What percent is this conservation coordinator's position? | 14% | |
| b. Coordinator's Name | Robert Freeland | |
| c. Coordinator's Title | Speical Programs Coordinator | |
| d. Coordinator's Experience and Number of Years | Conservation Practitioner Level 1 and 8 Years | |
| e. Date Coordinator's position was created (mm/dd/yyyy) | 07/01/2001 | |
| 6. Number of conservation staff, including Conservation Coordinator. | 1 | |

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	2885	7000
2. Actual Expenditures	8188	

C. "At Least As Effective As"

- | | |
|--|----|
| 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? | no |
| a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as." | |

D. Comments

Fiscal Year 2003-2004

Reported as of 11/1

BMP 13: Water Waste Prohibition

Reporting Unit: **Valley of the Moon Water District** BMP Form Status: **100% Complete** Year: **2004**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

Purpose is to promote water conservation and efficeint use of potable water. Prohibites washing of hard surfaces, leaks, excissive irrigation and other items. (See Ordinance 1007) Penalties can be used if necessary.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

Approximately 36 cust's in City of Sonoma. El Vernao, Eldridge, Boyes Hot Springs, Agua Caliente, Glen Ellen, and other small parts of Unicorporated Sonoma County that is within our District.

We issue "OOPS" tags in this District Advising of the ordinanec. Boyes Spgs 3 El Verano 4 Eldridge 1 Glen Ellen 1 Sonoma 1 Total 10

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

- | | |
|--|-----|
| a. Gutter flooding | yes |
| b. Single-pass cooling systems for new connections | yes |
| c. Non-recirculating systems in all new conveyor or car wash systems | yes |
| d. Non-recirculating systems in all new commercial laundry systems | yes |
| e. Non-recirculating systems in all new decorative fountains | yes |
| f. Other, please name
Washing of Hard Surfaces | yes |

2. Describe measures that prohibit water uses listed above:

Our Board passed Ordinance 1007 on 6/6/00, instituting water waste prohibitions.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

- | | |
|---|----|
| a. Allow the sale of more efficient, demand-initiated regenerating DIR models. | no |
| b. Develop minimum appliance efficiency standards that: | |
| i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. | no |
| ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. | no |
| c. Allow local agencies, including municipalities and special | |

districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. no

4. Does your agency include water softener checks in home water audit programs? no

5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

C. Water Waste Prohibition Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Fiscal Year 2003-2004

Reported as of 11/1

BMP 14: Residential ULFT Replacement Programs

Reporting Unit: **Valley of the Moon Water District** BMP Form Status: **100% Complete** Year: **2004**

A. Implementation

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

Number of Toilets Replaced by Agency Program During Report Year

Replacement Method	SF Accounts	MF Units
2. Rebate	117	13
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	117	13

6. Describe your agency's ULFT program for single-family residences.

District offers rebate of \$100 per ULFT to cust's on septic systems only. Cust. must install & recycle old toilet. The Sonoma Valley Sanitation District, branch of the Sonoma County Water Agency does the same for the cust's on the sewer system

7. Describe your agency's ULFT program for multi-family residences.

Same as above

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

County of Sonoma Unincorporated Area and City of Sonoma	N/A
---	-----

B. Residential ULFT Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	1000	1000
2. Actual Expenditures	800	

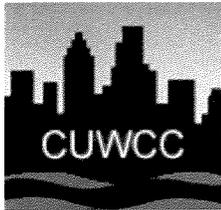
C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Fiscal Year 2003-2004 Sonoma Valley Sanitation Dist. funds their toilet program within our District. Line 2 SVSD 109 SFD and 13 Multi. The VOMWD rebated 8 SFD.

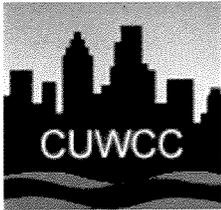


Best Management Practices Report Filing

Memorandum of Understanding

Back to
BMP Reports
List

Base Year Data	
Reporting Unit: Valley of the Moon Water District	Form Status: CUWCC Reviewed
<p>1. Your BASE YEAR is 2001. <small>NOTE: Many calculations in determining credit history and coverage requirements are contingent on your BASE YEAR, which is calculated based on the following criteria. If a Signatory signed the MOU in 1997 or earlier, then the Base Year is 1997. If a Signatory signed the MOU after 1997, then the Base Year is the year the MOU was signed. The same holds true for USBR Contractors, except the date their Base Year is calculated from is the date that their Plan was noticed in the Federal Register.</small></p>	
BMP 1	
2. Number of single-family customers in 2001	6074
3. Number of multi-family units in 2001	2435
BMPs 2 and 14	
4. Number of single-family housing units constructed prior to 1992	5809
5. Number of multi-family units prior to 1992	1868
BMP 4	
6. Number of unmetered accounts in 2001	0
BMPs 5 and 9	
7. Number of commercial accounts in 2001	175
8. Number of industrial accounts in 2001	0
9. Number of institutional accounts in 2001	28
10. Total water use (AF) by commercial, industrial and institutional accounts in 2001	410
BMP 14	
11. Average number of toilets per single-family household	1.9
12. Average number of toilets per multi-family household	1.9
13. Five-year average resale rate of single-family households	2.631
14. Five-year average resale rate of multi-family households	2.631
15. Average persons per single-family household	2.6
16. Average persons per multi-family household	2.6



Best Management Practices Report Filing

BMP 01 Coverage: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:
Valley of the Moon Water District

You are viewing coverage for:

BMP 01
03-04

◀ **YRs** ▶
DN - UP

MOU Exhibit 1 Coverage Requirement

Agency indicated "at least as effective as" implementation during report period? No

◀ **BMPs** ▶
DN - UP

A Reporting Unit (RU) must meet three conditions to satisfy strict compliance for BMP 1.

Memorandum of Understanding

Condition 1: Adopt survey targeting and marketing strategy on time

Condition 2: Offer surveys to 20% of SF accounts and 20% of MF units during report period

Condition 3: Be on track to survey 15% of SF accounts and 15% of MF units within 10 years of implementation start date.

Back to Coverage Reports List

Test for Condition 1

Latest Valley of the Moon Water District to Implement Targeting/Marketing Program:	2003		
		Single-Family	Multi-Family
Year Valley of the Moon Water District Reported Implementing Targeting/Marketing Program:			
Valley of the Moon Water District Met Targeting/Marketing Coverage Requirement:	NO	NO	

Test for Condition 2

			Single-Family	Multi-Family
Latest Year Survey Program to Start:	2002	Residential Survey Offers (%)	0.05%	
Reporting Period:	03-04	Survey Offers ≥ 20%	NO	NO

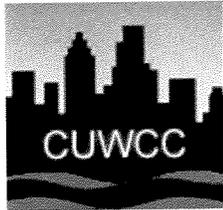
Test for Condition 3

Completed Residential Surveys

Single Multi-

	<u>Family</u>	<u>Family</u>
Total Completed Surveys through 2004	3	
Credit for Surveys Completed Prior to Implementation of Reporting Database		
Total + Credit	<u>3</u>	<u></u>
Residential Accounts in Base Year	6,074	2,435
Valley of the Moon Water District Survey Coverage as % of Base Year Residential Accounts	0.05%	
Coverage Requirement by Year 3 of Implementation per Exhibit 1	2.50%	2.50%
Valley of the Moon Water District on Schedule to Meet 10-Year Coverage Requirement	NO	NO

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Best Management Practices Report Filing

BMP 02 Coverage: Residential Plumbing Retrofit

Reporting Unit:

Valley of the Moon Water District

You are viewing
coverage for:

BMP 02

03-04

YRs

DN - UP

BMPs

DN - UP

**Memorandum of
Understanding**

**Back to
Coverage
Reports List**

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during
report period?

No

An agency must meet one of three conditions to satisfy strict compliance for BMP 2.

Condition 1: The agency has demonstrated that 75% of SF accounts and 75% of MF units constructed prior to 1992 are fitted with low-flow showerheads.

Condition 2: An enforceable ordinance requiring the replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts is in place for the agency's service area.

Condition 3: The agency has distributed or directly installed low-flow showerheads and other low-flow plumbing devices to not less than 10% of single-family accounts and 10% of multi-family units constructed prior to 1992 during the reporting period.

Test for Condition 1

Report Year	Report Period	Single-Family		Multi-Family	
		Reported Saturation	Saturation > 75%?	Reported Saturation	Saturation > 75%?
1999	99-00	18.00%	NO	21.00%	NO
2000	99-00	32.00%	NO	37.00%	NO
2001	01-02	33.00%	NO	38.00%	NO
2002	01-02	34.00%	NO	38.00%	NO
2003	03-04	36.00%	NO	40.00%	NO
2004	03-04	69.00%	NO	67.00%	NO

Test for Condition 2

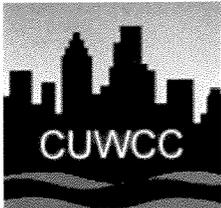
Report Year	Report Period	Valley of the Moon Water District has ordinance requiring showerhead retrofit?
1999	99-00	NO
2000	99-00	NO
2001	01-02	NO
2002	01-02	NO
2003	03-04	NO
2004	03-04	NO

Test for Condition 3

Reporting Period: 03-04

<u>1992 SF Accounts</u>	<u>Num. Showerheads Distributed to SF Accounts</u>	<u>Single-Family Coverage Ratio</u>	<u>SF Coverage Ratio > 10%</u>
5,809	656	11.3%	YES
<u>1992 MF Accounts</u>	<u>Num. Showerheads Distributed to MF Accounts</u>	<u>Multi-Family Coverage Ratio</u>	<u>MF Coverage Ratio > 10%</u>
1,868	191	10.2%	YES

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Best Management Practices Report Filing

BMP 03 Coverage: System Water Audits, Leak Detection and Repair

Reporting Unit:
Valley of the Moon Water District

You are viewing coverage for:

BMP 03
03-04

◀ **YRs** ▶
DN - UP

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

◀ **BMPs** ▶
DN - UP

An agency must meet one of two conditions to be in compliance with BMP 3:

Memorandum of Understanding

Condition 1: Perform a prescreening audit. If the result is equal to or greater than 0.9 nothing more needs be done.

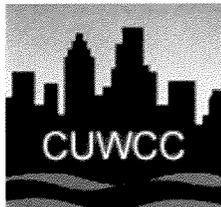
Condition 2: Perform a prescreening audit. If the result is less than 0.9, perform a full audit in accordance with AWWA's Manual of Water Supply Practices, Water Audits, and Leak Detection.

Back to Coverage Reports List

Test for Conditions 1 and 2

Report Year	Report Period	Pre-Screen Completed	Pre-Screen Result	Full Audit Indicated	Full Audit Completed
1999	99-00				
2000	99-00				
2001	01-02	YES	92.8%	No	NO
2002	01-02	YES	93.1%	No	NO
2003	03-04	YES	94.1%	No	NO
2004	03-04	YES	94.5%	No	NO

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Best Management Practices Report Filing

BMP 04 Coverage: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:
Valley of the Moon Water District

You are viewing coverage for:

**BMP 04
03-04**

◀ **YRs** ▶
DN - UP

MOU Exhibit 1 Coverage Requirement

Agency indicated "at least as effective as" implementation during report period? No

◀ **BMPs** ▶
DN - UP

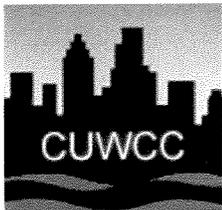
An agency must be on track to retrofit 100% of its unmetered accounts within 10 years to be in compliance with BMP 4.

Memorandum of Understanding

Test for Compliance

Back to Coverage Reports List

Total Meter Retrofits Reported through 2004	
No. of Unmetered Accounts in Base Year	
Meter Retrofit Coverage as % of Base Year Unmetered Accounts	
Coverage Requirement by Year 2 of Implementation per Exhibit 1	10.0%
RU on Schedule to meet 10 Year Coverage Requirement	YES



Best Management Practices Report Filing

BMP 05 Coverage: Large Landscape Conservation Programs and Incentives

Reporting Unit:
Valley of the Moon Water District

You are viewing coverage for:

BMP 05
03-04

◀ **YRs** ▶
DN - UP

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

◀ **BMPs** ▶
DN - UP

An agency must meet three conditions to comply with BMP 5.

Memorandum of Understanding

Condition 1: Develop water budgets for 90% of its dedicated landscape meter accounts within four years of the date implementation is to start.

Condition 2: (a) Offer landscape surveys to at least 20% of its CII accounts with mixed use meters each report cycle and be on track to survey at least 15% of its CII accounts with mixed use meters within 10 years of the date implementation is to start OR (b) Implement a dedicated landscape meter retrofit program for CII accounts with mixed use meters or assign landscape budgets to mixed use meters.

Back to Coverage Reports List

Condition 3: Implement and maintain customer incentive program(s) for irrigation equipment retrofits.

Test for Condition 1

Year	Report Period	BMP 5 Implementation Year	No. of Irrigation Meter Accounts	No. of Irrigation Accounts with Budgets	Budget Coverage Ratio	90% Coverage Met by Year 4
1999	99-00	-3				NA
2000	99-00	-2				NA
2001	01-02	-1	25			NA
2002	01-02		29			NA
2003	03-04	1	29			NA
2004	03-04	2	30			NA

Test for Condition 2a (survey offers)

Select Reporting Period: 03-04

Large Landscape Survey Offers as % of Mixed Use Meter CII Accounts

Survey Offers Equal or Exceed 20% Coverage Requirement NO

Test for Condition 2a (surveys completed)

Total Completed Landscape Surveys Reported through Credit for Surveys Completed Prior to Implementation of Reporting Database

Total + Credit

CII Accounts in Base Year	203
RU Survey Coverage as a % of Base Year CII Accounts	
Coverage Requirement by Year of Implementation per Exhibit 1	1.5%
RU on Schedule to Meet 10 Year Coverage Requirement	NO

Test for Condition 2b (mixed use budget or meter retrofit program)

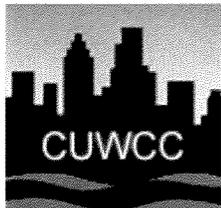
Report Year	Report Period	BMP 5 Implementation Year	Agency has mix-use budget program	No. of mixed-use budgets
1999	99-00	-3		
2000	99-00	-2		
2001	01-02	-1	NO	
2002	01-02		NO	
2003	03-04	1	NO	
2004	03-04	2	NO	

Report Year	Report Period	BMP 4 Implementation Year	No. of mixed use CII accounts	No. of mixed use CII accounts fitted with irrig. meters
1999	99-00	-3		
2000	99-00	-2		
2001	01-02	-1	32	
2002	01-02		32	
2003	03-04	1	26	
2004	03-04	2	32	

Test for Condition 3

Report Year	Report Period	BMP 5 Implementation Year	RU offers financial incentives?	No. of Loans	Total Amt. Loans
1999	99-00	-3			
2000	99-00	-2			
2001	01-02	-1	NO		
2002	01-02		NO		
2003	03-04	1	NO		
2004	03-04	2	NO		

Report Year	Report Period	No. of Grants	Total Amt. Grants	No. of rebates	Total Amt. Rebates
1999	99-00				
2000	99-00				
2001	01-02				
2002	01-02				
2003	03-04				
2004	03-04				



Best Management Practices Report Filing

BMP 06 Coverage: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:
Valley of the Moon Water District

You are viewing coverage for:

BMP 06
03-04

YRs
DN - UP

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

BMPs
DN - UP

An agency must meet one condition to comply with BMP 6.

Memorandum of Understanding

Condition 1: Offer a cost-effective financial incentive for high-efficiency washers if one or more energy service providers in service area offer financial incentives for high-efficiency washers.

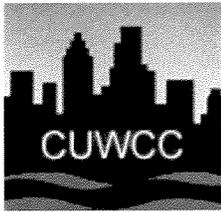
Back to Coverage Reports List

Test for Condition 1

Year	Report Period	BMP 6 Implementation Year	Rebate Offered by ESP?	Rebate Offered by RU?	Rebate Amount
1999	99-00	-3	YES	YES	75.00
2000	99-00	-2	YES	YES	75.00
2001	01-02	-1	YES	NO	
2002	01-02		YES	NO	
2003	03-04	1	YES	YES	75.00
2004	03-04	2	YES	YES	75.00

Year	Report Period	BMP 6 Implementation Year	No. Rebates Awarded	Coverage Met?
1999	99-00	-3	86	YES
2000	99-00	-2	20	YES
2001	01-02	-1	48	NO
2002	01-02			NO
2003	03-04	1	68	YES
2004	03-04	2	94	YES

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Best Management Practices Report Filing

BMP 07 Coverage: Public Information Programs

Reporting Unit:

Valley of the Moon Water District

You are viewing coverage for:

BMP 07

03-04

YRs

DN - UP

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period?

No

An agency must meet one condition to comply with BMP 7.

Condition 1: Implement and maintain a public information program consistent with BMP 7's definition.

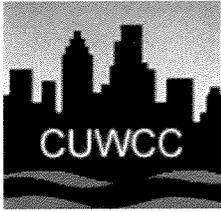
Memorandum of Understanding

Test for Condition 1

Year	Report Period	BMP 7 Implementation Year	RU Has Public Information Program?
1999	99-00	-2	
2000	99-00	-1	
2001	01-02		YES
2002	01-02	1	YES
2003	03-04	2	YES
2004	03-04	3	YES

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BMP 08 Coverage: School Education Programs

Reporting Unit:

Valley of the Moon Water District

You are viewing coverage for:

BMP 08

03-04

YRs

DN - UP

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period?

No

An agency must meet one condition to comply with BMP 8.

Condition 1: Implement and maintain a school education program consistent with BMP 8's definition.

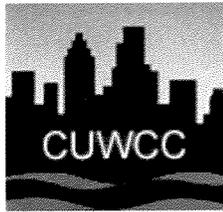
Memorandum of Understanding

Test for Condition 1

Year	Report Period	BMP 8 Implementation Year	RU Has School Education Program?
1999	99-00	-2	
2000	99-00	-1	
2001	01-02		YES
2002	01-02	1	YES
2003	03-04	2	YES
2004	03-04	3	YES

Back to Coverage Reports List

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Best Management Practices Report Filing

BMP 09 Coverage: Conservation Programs for CII Accounts

Reporting Unit:
Valley of the Moon Water District

You are viewing coverage for:

BMP 09
03-04

YRs
DN - UP

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

BMPs
DN - UP

An agency must meet three conditions to comply with BMP 9.

Memorandum of Understanding

Condition 1: Agency has identified and ranked by use commercial, industrial, and institutional accounts.

Condition 2(a): Agency is on track to survey 10% of commercial accounts, 10% of industrial accounts, and 10% of institutional accounts within 10 years of date implementation to commence.

OR

Condition 2(b): Agency is on track to reduce CII water use by an amount equal to 10% of baseline use within 10 years of date implementation to commence.

OR

Condition 2(c): Agency is on track to meet the combined target as described in Exhibit 1 BMP 9 documentation.

Back to Coverage Reports List

Test for Condition 1

Year	Report Period	BMP 9 Implementation Year	Ranked Com. Use	Ranked Ind. Use	Ranked Inst. Use
1999	99-00	-3			
2000	99-00	-2			
2001	01-02	-1	NO	NO	NO
2002	01-02		YES	YES	YES
2003	03-04	1	YES	YES	YES
2004	03-04	2	YES	YES	YES

Test for Condition 2a

	Commercial	Industrial	Institutional
Total Completed Surveys Reported through 2004	12	0	1
Credit for Surveys Completed Prior to Implementation of Reporting Databases			
Total + Credit	12		1
CII Accounts in Base Year	175		28
RU Survey Coverage as % of Base Year CII Accounts	6.9%		3.6%
Coverage Requirement by Year 2 of Implementation per Exhibit 1	1.0%	1.0%	1.0%

RU on Schedule to Meet 10 Year Coverage Requirement	YES	NO	YES
---	-----	----	-----

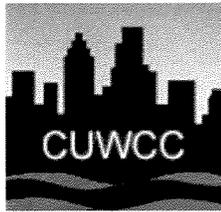
Test for Condition 2a

Year	Report Period	BMP 9 Implementation Year	Performance Target Savings (AF/yr)	Performance Target Savings Coverage	Performance Target Savings Coverage Requirement	Coverage Requirement Met
1999	99-00	-3				YES
2000	99-00	-2				YES
2001	01-02	-1	1	0.3%		YES
2002	01-02		1	0.3%		YES
2003	03-04	1	1	0.3%	0.5%	NO
2004	03-04	2	1	0.3%	1.0%	NO

Test for Condition 2c

Total BMP 9 Surveys + Credit	13
BMP 9 Survey Coverage	6.4%
BMP 9 Performance Target Coverage	0.3%
BMP 9 Survey + Performance Target Coverage	6.7%
Combined Coverage Equals or Exceeds Coverage Requirement?	YES

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Best Management Practices Report Filing

BMP 11 Coverage: Conservation Pricing

Reporting Unit:
Valley of the Moon Water District

You are viewing coverage for:

BMP 11
03-04
YRs
DN - UP

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

An agency must meet one condition to comply with BMP 11.

Agency shall maintain rate structure consistent with BMP 11's definition of conservation pricing. Implementation methods shall be at least as effective as eliminating non-conserving pricing and adopting conserving pricing. For signatories supplying both water and sewer service, this BMP applies to pricing of both water and sewer service. Signatories that supply water but not sewer service shall make good faith efforts to work with sewer agencies so that those sewer agencies adopt conservation pricing for sewer service.

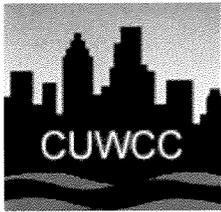
a) Non-conserving pricing provides no incentives to customers to reduce use. Such pricing is characterized by one or more of the following components: rates in which the unit price decreases as the quantity used increases (declining block rates); rates that involve charging customers a fixed amount per billing cycle regardless of the quantity used; pricing in which the typical bill is determined by high fixed charges and low commodity charges.

b) Conservation pricing provides incentives to customers to reduce average or peak use, or both. Such pricing includes: rates designed to recover the cost of providing service; and billing for water and sewer service based on metered water use. Conservation pricing is also characterized by one or more of the following components: rates in which the unit rate is constant regardless of the quantity used (uniform rates) or increases as the quantity used increases (increasing block rates); seasonal rates or excess-use surcharges to reduce peak demands during summer months; rates based upon the longrun marginal cost or the cost of adding the next unit of capacity to the system.

Test for Condition 1

Year	Report Period	RU Employed Non Conserving Rate Structure	RU Meets BMP 11 Coverage Requirement
1999	99-00	NO	YES
2000	99-00	NO	YES
2001	01-02	NO	YES
2002	01-02	NO	YES
2003	03-04	NO	YES
2004	03-04	NO	YES

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Best Management Practices Report Filing

BMP 12 Coverage: Conservation Coordinator

Reporting Unit:

Valley of the Moon Water District

You are viewing coverage for:

BMP 12

03-04

YRs

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BMPs

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Memorandum of Understanding

Back to Coverage Reports List

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period?

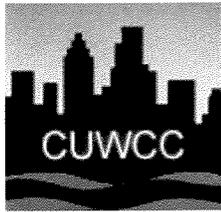
No

Agency shall staff and maintain the position of conservation coordinator and provide support staff as necessary.

Test for Compliance

<u>Report Year</u>	<u>Report Period</u>	<u>Conservation Coordinator Position Staffed?</u>	<u>Total Staff on Team (incl. CC)</u>
1999	99-00		
2000	99-00		
2001	01-02	YES	1
2002	01-02	YES	1
2003	03-04	YES	1
2004	03-04	YES	1

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Best Management Practices Report Filing

BMP 13 Coverage: Water Waste Prohibition

Reporting Unit:
Valley of the Moon Water District

You are viewing coverage for:

BMP 13

03-04

YRs

DN - UP

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

An agency must meet one condition to comply with BMP 13.

Implementation methods shall be enacting and enforcing measures prohibiting gutter flooding, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non-recycling decorative water fountains.

Memorandum of Understanding

Test for Condition 1

Agency or service area prohibits:

Year	Gutter Flooding	Single-Pass Cooling Systems	Single-Pass Car Wash	Single-Pass Laundry	Single-Pass Fountains	Other	RU has ordinance that meets coverage requirement
1999							
2000							
2001	yes	yes	yes	yes	yes	yes	YES
2002	yes	yes	yes	yes	yes	yes	YES
2003	yes	yes	yes	yes	yes	yes	YES
2004	yes	yes	yes	yes	yes	yes	YES

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Best Management Practices Report Filing

Memorandum of Understanding

BMP Activity History: Multiple-Year Overview

Reporting Unit:
Valley of the Moon Water District

INSTRUCTIONS: Exhibit 1 allows Signatories to credit BMP activity completed prior to 1998 against BMP coverage requirements. To obtain credit for this past activity you must complete the information summarized below. Choose a year and click "Go" to ADD or EDIT BMP activity data for that specific year. If you do not enter previous BMP activity, the system will have no way to calculate credit toward coverage requirements for this activity.

A. Number of RESIDENTIAL Water Use Surveys by Year						
Year	No. Single-Family Surveys		No. Multi-Family Surveys			
1991						
1992						
1993						
1994						
1995		0			0	
1996		0			0	
1997		0			0	
1998		0			0	
Total		0			0	

B. Number of LANDSCAPE Surveys Completed by Year		
Year	Surveys Receiving Follow-up	Surveys Not Receiving Follow-up
1991		
1992		
1993		
1994		
1995	0	0
1996	0	0
1997	0	0
1998	0	0
Total	0	0

C. Number of CII Surveys Completed by Year						
Year	Commercial		Industrial		Institutional	
	Follow-Up	No Follow-Up	Follow-Up	No Follow-Up	Follow-Up	No Follow-Up
1991						
1992						
1993						
1994						
1995	0	0	0	0	0	0
1996	0	0	0	0	0	0
1997	0	0	0	0	0	0
1998	0	0	0	0	0	0

Total	0	0	0	0	0	0
D. Estimated WATER SAVINGS (AF/Yr) from CII Programs by Year						
Year	Site Verified			Site Not Verified		
1991						
1992						
1993						
1994						
1995	0			0		
1996	0			0		
1997	0			0		
1998	0			0		
Total	0			0		

E. (Part I) Historical CII Ultra-Low-Flush Toilet Installations by CII Sector by Year							
Year	Auto	Food	Health	Hotel	Manuf'g	Membership	Multi-Use
1991							
1992							
1993							
1994							
1995	0	0	20	0	0	0	0
1996	0	0	6	20	0	0	0
1997	0	0	0	98	0	0	0
1998	0	0	0	0	0	0	0
Total	0	0	26	118	0	0	0

E. (Part II) Historical CII Ultra-Low-Flush Toilet Installations by CII Sector by Year							
Year	Office	Religious	Restaurant	Retail	School	Wholesale	Unknown
1991							
1992							
1993							
1994							
1995	0	0	0	0	0	0	0
1996	0	3	0	0	0	0	0
1997	0	0	0	0	0	0	0
1998	4	0	0	0	0	0	0
Total	4	3	0	0	0	0	0

F. Number of Residential ULFT Rebates / Installations by Year:		
Year	Single-Family	Multi-Family
1991		
1992		
1993		
1994		
1995	0	0
1996	931	148
1997	0	0
1998	489	28

Total	1420	176
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APPENDIX D

Water Shortage Contingency Plan

Valley of the Moon Water District

Urban Water Shortage Contingency Plan

2005



RESOLUTION NO. 050501

RESOLUTION OF THE BOARD OF DIRECTORS OF VALLEY OF THE MOON WATER DISTRICT ADOPTING THE 2005 UPDATED URBAN WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the Valley of the Moon Water District (District) provides water to more than 3,000 customers and therefore must adopt an Urban Water Management Plan in accordance with Water Code section 10620 *et seq.*, and pursuant to Water Code section 10632, one element of said Plan must be an Urban Water Shortage Contingency Plan (Contingency Plan); and

WHEREAS, the District originally adopted its Contingency Plan in 1992 and revised it in 1996, 1998, and 1999; and

WHEREAS, the District staff recommends that the Board of Directors adopt the proposed revised Contingency Plan that is attached hereto and incorporated herein, which includes updated demand projections, financial impact analysis, and a suggested conservation-oriented rate structure to be implemented during a water shortage condition.

NOW, THEREFORE, IT IS HEREBY RESOLVED by the Board of Directors of the Valley of the Moon Water District to adopt the attached 2005 Updated Urban Water Shortage Contingency Plan.

THIS RESOLUTION PASSED AND ADOPTED THIS 17th DAY OF MAY, 2005, by the following votes:

Director Woods Aye

Director Smith Aye

Director Bramfitt Aye

Director Kenny Aye

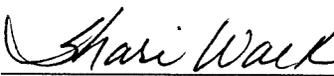
Director Prushko Aye

By 
President

By 
Secretary

AYES 5 NOES 0 ABSTAIN 0 ABSENT 0

I HEREBY CERTIFY that the foregoing Resolution was duly adopted at a regular meeting of the Board of Directors of Valley of the Moon Water District, held on the 17th day of May, 2005, of which meeting all Directors were duly notified and at which meeting a quorum was present at all times and acting.

By 
Secretary

**VALLEY OF THE MOON WATER DISTRICT
URBAN WATER SHORTAGE CONTINGENCY PLAN 2005
TABLE OF CONTENTS**

Section 1: Introduction	3
Section 2: Water Supply and Demand	3
Section 3: Past, Current and Projected Demand	4
<i>Table I Customer Class, Highest Year Demand, and Projected Demand</i>	5
Section 4: Stages of Action for Demand Management	5
4.1 Allocation Priorities	6
4.2 Stages of Action and Demand Reduction Strategies	6
<i>Table II – Stages of Action and Demand Reduction Goals</i>	6
<i>Table III – Highest Year Demand and Reduction Goals</i>	7
<i>Table IV – Gallons Per Capita Demand Allocations</i>	7
4.3 Prohibitions on Water Waste	9
4.4 Violations of Water Use Restrictions and Repeated Excess Use	10
4.5 Variance Procedures	10
Section 5: Analysis of Revenue and Expenditure Impacts	10
5.1 Water Shortage Rate Structure	10
<i>Table V Water Shortage Charge – Stages 2 and 3</i>	11
5.2 Projected Revenues and Expenditures	11
<i>Table VI Impact of Water Shortage on Revenues and Expenditures (2005)</i>	12
<i>Table VII Water Bill Impacts Under Shortage Conditions</i>	13
Section 6: Implementation of the Plan	13
Section 7: Monitoring Procedures	13
Section 8: Public Noticing and Adoption	13
Appendix 1: Valley of the Moon Water District - Water Shortage Action Plan 2005 (summary table)	
Appendix 2: Draft Water Shortage Emergency Resolution	
Appendix 3: California Water Code Section 10632	

VALLEY OF THE MOON WATER DISTRICT

URBAN WATER SHORTAGE CONTINGENCY PLAN - 2005 UPDATE

Section 1: Introduction

The Valley of the Moon Water District (District) Urban Water Shortage Contingency Plan – 2005 Update is prepared in conjunction with the Sonoma County Water Agency (SCWA) as a component of the regional Urban Water Management Plan. This contingency Plan was first adopted on January 21, 1992, in response to California Assembly Bill 11X (1991). Legislation has changed the requirements of urban water shortage contingency planning several times since the initial bill. Current requirements are in Section 10632 of the Urban Water Management Planning part of the California Water Code, which is provided as Appendix 3 to this document.

District's initial Plan was revised in 1996, 1998, and 1999. This 2005 revision is comprehensive, and includes: updated demand projections, financial analysis, and rate structure during potential shortages.

The updated Plan addresses demand reduction strategies for the District's water system. Trigger points on the Russian River system, which in turn trigger the District's program, are determined by SCWA.

Section 2: Water Supply and Demand

The District provides water to approximately 6,800 connections, with an annual total demand in Water Year (WY) 2003-04 (October through September) of 3,524 acre feet (AF). The District's primary source of water supply is SCWA, which accounted for 87.3% of the WY 2003-04 demand. The rest of the demand (12.7%) was met with water supply from District wells, either owned or leased. District's demand constituted approximately 4.6% of SCWA's total production in WY 2003-04.

The District has historically received the major share of its potable water supply from the SCWA aqueduct system, which delivers water imported from the Russian River. Under the master agreement between SCWA and its contractors (including the District) entered into in October 1974 and amended most recently in 2001, the District is entitled to delivery of water at a rate of 8.5 million gallons per day, peak month average, with an annual volume limit of 3,200 acre feet. The annual volume limit is based on water demand projections only through the year

2005, and accordingly, in April 2003, District submitted a request to SCWA for an increase in the annual volume limit to 4,200 AF.

The current annual aqueduct supply of 3,700 AF (3,200 AF from District's annual SCWA allocation, plus 500 AF temporarily made available from the Forestville Water District under an existing agreement (which expires in 2009), together with the local groundwater supply, is considered to be adequate to meet the projected demands from within District's service area in each of the next three water years, the period of projection required under Water Code section 10632 (c).

In December 1999, SCWA declared that a state of impairment existed for their delivery system, caused by delayed completion of critical pumping and conveyance facilities. The delay was brought on by Endangered Species Act consultation regarding Russian River fish species and litigation. SCWA asked its water contractors, including the District, and other customers to sign a Memorandum of Understanding (MOU) that defines certain operating restrictions and limitations during this impairment condition.

The purpose of the MOU was to optimize allocation of the available supply and avoid mandatory curtailment of deliveries during the period of temporary impairment. The MOU was executed in February 2001. Among other things, it requires the parties to the MOU to activate certain measures of their respective Urban Water Shortage Contingency Plans from June through September during the term of the MOU, which expires in September 2005. During the impairment condition, parties to the MOU also receive modified water supply entitlements. The parties to the MOU are currently in discussions about renewing the MOU for another term.

There has not been a drought-based reduction in water delivery from SCWA to the District since 1976-77. However, due to dry conditions on both the Russian River system and throughout the State, the District adopted voluntary demand reduction Resolutions in 1988 and 1991. Because of the SCWA impairment condition, the District again adopted a voluntary demand reduction Resolution in 2001, which is still in effect as of the date of adoption of this Plan.

Section 3: Past, Current and Projected Demand

The table on the next page summarizes highest historical use, and current and projected demands for the next three water years.

Table I - Customer Class, Highest Year Demand, and Projected Demand (in acre-feet)

Customer Class	Number of Active Connections WY 2003-04	Highest Actual Demand WY 2003-04	Projected Demand WY 2004-05	Projected Demand WY 2005-06	Projected Demand WY 2006-07
Single Family Residential	6,079	2,182	2,195	2,208	2,222
Multiple Family Residential	415	575	578	582	585
Commercial (1)	218	337	339	341	343
Other Accountable Uses (2)	N.A.	82	82	83	83
Dedicated Irrigation	31	92	93	93	94
Total (3)	6,743	3,268	3,287	3,307	3,327

- (1) Includes institutional connections
(2) Includes estimated usage by fire departments, District’s construction projects, flushing (a method used to clean water distribution lines) etc.
(3) Demand is approximately 7.2% lower than total production (aqueduct plus wells) due to unaccounted for water loss

Section 4: Stages of Action for Demand Management

Water Code section 10632 requires the District to provide a water shortage contingency analysis that identifies demand reduction strategies that will be employed at all stages of a water shortage, including up to a 50% reduction in available water supply. This Section includes:

- *Allocation Priorities*
- *Stages of Action and Demand Reduction Strategies*
- *Prohibitions on Water Waste*
- *Violations of Water Use Restrictions and Repeated Excess Use*
- *Variance Procedures*

The entire strategy for demand reduction is summarized in Appendix 1 of this Plan, the Water Shortage Demand Management Plan table, and is based upon and adopted pursuant to the provisions of Water Code section 10632.

In the event of a water shortage, the District’s Board of Directors shall conduct at least one publicly noticed hearing at which the General Manager shall present a summary of the current water supply conditions, the anticipated water demands by District customers, and the General Manager’s recommendations for actions to be taken by the Board in light of the totality of the circumstances.

If the Board finds and determines that there is a water shortage, it will at that time adopt a resolution, substantially in the form in Appendix 2 of this Plan, to declare the existence of a water shortage and to establish the Stage of Action and Demand Reduction Goals in accordance with the following provisions of this Section of the Plan.

4.1 Allocation Priorities

Overall demand reduction will be achieved with different reduction goals in each user class. The following priorities have been established for use in developing demand reduction programs and allocations during a water shortage. Priorities for use of available water, from highest to lowest priority are:

- Health and Safety, including non-landscaping residential use
- Commercial and Institutional
- Existing Landscaping
- New Demand – projects without permits when shortage is declared
- Crops

4.2 Stages of Action and Demand Reduction Strategies

The District has determined the following increasingly stringent stages of action for responding to reduced supply in a water shortage:

Table II - Stages of Action and Demand Reduction Goals

Supply Shortage	Action Stage	Overall Demand Reduction Goal	Program Type
Up to 15%	Stage 1 - Minimal	15%	Voluntary
15% - 25%	Stage 2 - Moderate	25%	Mandatory
25% - 50%	Stage 3 - Critical	50%	Mandatory

With the allocation priorities in section 4.1 in mind, table – III on the next page details overall reduction goals by customer class for Stages 2 and 3. Reduction goals for single-family customers are based on per capita water allocation, plus an irrigation allocation (as further described below). For dedicated irrigation accounts, the allocation is based on evapotranspiration data. For other customer classes, prior year demand is the basis for calculating demand reduction.

Table III - Highest Year Demand and Reduction Goals during Shortage Stages (in acre-feet)

Customer Class	Actual Demand WY 2003-04	Stage 2 Allocation	Reduction Goal (%)	Stage 3 Allocation	Reduction Goal (%)
Single Family Residential	2,182	1,602	27%	973	55%
Multiple Family Residential	575	431	25%	345	40%
Commercial (1)	337	286	15%	236	30%
Other Accountable Uses (2)	82	70	15%	57	30%
Dedicated Irrigation	92	62	33%	23	75%
Total	3,268	2,451	25%	1,634	50%

(1) Includes institutional connections

(2) Includes estimated usage by fire departments, District's construction projects, flushing etc.

Table IV below indicates the basis for gallons per capita demand (gpcd) allocations during Stages 2 and 3.

Table IV – Gallons Per Capita Demand Allocations, Single-Family (SF) Customers

	Actual Demand WY 2003-04	Stage 2 (25% Reduction)	Stage 3 (50% Reduction)
SF – Active connections	6,079	6,079	6,079
Average no. of people per household	2.5	2.5	2.5
Single family population	15,198	15,198	15,198
Gallons Per Capita Demand	71.1	64.5	50.6
Human consumption (acre-feet)	1,210	1,098	861
Irrigation allocation (gallons)		4,500	1,000
Total Irrigation (acre-feet) (1)	972	504	112
Total SF demand (acre-feet)	2,182	1,602	973

(1) Irrigation use for WY 2003-04 is estimated on the basis of the difference between average summer and winter use.

Details of reduction strategies at each action stage are as follows:

Stage 1 is a voluntary program with the goal of 15% overall reduction to be achieved by implementing the following strategies:

- Community-wide reduction is the goal
- Minimization of non-essential uses
- “Water-on-request” restaurant program

Stage 2 is a mandatory program with the goal of 25% overall reduction to be achieved by implementing the following additional strategies:

- Single-family customers receive up to 163 gallons per day (65 gpcd X 2.5) plus a moderate landscape allotment of 4,500 gallons per month per account from May through October
- Multi-family customers receive up to 163 gallons per day per family (65 gpcd X 2.5) plus a moderate landscape allotment per month from May through October based on net evapotranspiration-based demand for the square footage of the irrigated area
- Commercial/Institutional/Governmental accounts receive 85% of their historical water use in the most recent 12-month period during which no water shortage demand reduction program was in place
- Dedicated irrigation accounts receive a water budget based on 80% historical net evapotranspiration-based demand for the square footage of the irrigated area
- Hospitals and other health care facilities receive 95% of their historical water use in the most recent 12 month period during which no water shortage demand reduction program was in place

Stage 3 is a mandatory program with the goal of 50% overall reduction to be achieved by implementing the following strategies:

- Single-family customers receive up to 128 gallons per day (51 gpcd X 2.5) plus a minimal landscape allotment of 1,000 gallons per month per account from May through October
- Multi-family customers receive up 128 gallons per day per family (51 gpcd X 2.5) plus a minimal landscape allotment per month from May through October based on net evapotranspiration-based demand for the square footage of the irrigated area

- Commercial/Institutional/Governmental accounts receive 70% of their historical water use in the most recent 12-month period during which no water shortage demand reduction program was in place
- Dedicated irrigation accounts receive a water budget based on 25% historical net evapotranspiration-based demand for the square footage of the irrigated area
- Hospitals receive 85% of their historical water use in the most recent 12 month period during which no water shortage demand reduction program was in place

4.3 Prohibitions on Water Waste

The District adopted a Water Waste Ordinance (No. 1007) in 2000 which prohibits, among other things, the following:

- Irrigation in such a manner that water runs off or over-sprays the irrigated area
- Leaks that are known to the customer but which are not repaired

In addition to the prohibitions in Ordinance No. 1007, the following water uses are prohibited during a water shortage condition:

Stage 1

- Use of any garden or utility hose without a hose-end shut-off nozzle
- Service of water in restaurants except upon request

Stage 2 - All water use prohibitions established in the previous stage, plus:

- Irrigation is limited to the hours between 8:00 pm to 6:00 am
- Operating ornamental fountains are prohibited
- Filling new swimming pools is prohibited
- Washing sidewalks, patios, and other hard surfaces is prohibited

Stage 3 - All water use prohibitions established in the previous stages, plus:

- No landscape installation may be made in new construction
- New construction must offset new demand by conserving two times the new demand within the community
- Filling or topping-off of existing swimming pools is prohibited

The District will fine a customer to be found in violation of one of a water use prohibition if the use continues after two District written notifications for prohibited water use. Remedies for violations of these use prohibitions are set forth in Section 4.4.

4.4 Violations of Water Use Restrictions and Repeated Excess Use

Any customer whose water use exceeds the established allotment two consecutive billing cycles, or exceeds the established allotment three billing cycles within a twelve month period, or violates one or more water use prohibitions, may, at the discretion of the District's General Manager, be subject to any of the following actions:

- At the customer's request and expense, the District will perform a complete site water audit and the customer would be required to install additional water efficient fixtures on the basis of the audit.
- At the customer's expense, the District will install a flow reducing device at the water meter
- Disconnection of water service and payment of the then applicable reconnection fee for reconnection of the water service

4.5 Variance Procedures

This Plan is designed to place the responsibility for managing available water resources during a water shortage emergency on the entire community. Any customer who feels his/her established allotment needs to be adjusted may apply to the District for a reassessment. Variances will be granted, on a case by case basis, at the discretion of the General Manager, and with appeal rights to the Board of Directors. The following conditions are among those that may be given consideration in the variance process:

- Water uses that support public health and safety
- Non-residential water customers (whose allotment is based on previous consumption) who can demonstrate that water efficient hardware and conservation practices were in place prior to the water shortage emergency

Section 5: Analysis of Revenue and Expenditure Impacts

5.1 Water Shortage Rate Structure

In January 2004, the District adopted a three-tiered, conservation-oriented, inclining block water rate structure for residential customers. Water rates during a shortage condition are described in the following sections, and will be based on modifications to the tiered/flat rate structure in place at the time of the Board's determination of the existence of a water shortage.

The District's tiered water rate structure is designed to encourage efficient water use, even during normal water supply conditions. The conservation-oriented rate structure to be used during a water shortage introduces some financial risk for the District, in that some fixed costs are recovered through the commodity rate, and are based on total water usage. A reduction in water usage could result in commodity rate revenues not covering all of the District's fixed costs.

Changes to the water rate structure during each action stage during a water shortage are designed to encourage all District customers to reduce their water use in accordance with the District’s water allocations and reduction goals. In addition, the rate structure changes are also necessary to help protect the financial condition of the District’s water system as water demands are reduced.

Two lines of action for fiscal prudence are incorporated into the District’s water shortage financial strategy and rate structure.

1. The District’s operating and emergency reserves will be drawn down, but not below prudent levels, to absorb that part of the financial deficit caused by a reduction in water rate revenues (due to lower water sales) that exceeds the reduction in variable costs.
2. During Stages 2 and 3, all customers will be subject to an increased commodity rate (Water Shortage Charge) to encourage water conservation by all customers and to help protect the financial condition of the District.

It may be noted that the Water Shortage Charge (described below) is designed such that customers meeting allocation limits during Stages 2 and 3 will have lower water bills than they do with normal usage.

In Stage 1, the District’s operating and emergency reserves will be employed to offset the loss of revenue from reduced water sales and the added costs of increased staffing for the water shortage response effort. No changes to the water rate structure are planned during Stage 1.

In Stages 2 and 3, reduction in net revenue brought on by reduced water sales and increased costs for the water shortage response effort will be mitigated by both the use of available reserves and the introduction of the Water Shortage Charge (WSC) on each unit of water sold. The WSC are shown in Table V below.

Table V - Water Shortage Charge: Stages 2 & 3

Stage	Charge for water
Stage 2	Applicable tiered / flat rate + 10% WSC
Stage 3	Applicable tiered / flat rate + 30% WSC

5.2 Projected Revenues and Expenditures

Table VI that follows details the District’s projected annual revenue and expenditure status in non-shortage conditions and at each stage in the water shortage program.

Table VI - Impact of Water Shortage on Revenues and Expenditures

	Normal Supply (2004-05)	Stage 1: 15% Shortage	Stage 2: 25% Shortage	Stage 3: 50% Shortage
Sources of Funds				
Service Charge Revenues	\$ 517,000	\$ 517,000	\$ 517,000	\$ 517,000
Commodity Rate Revenues (1)	2,824,300	2,400,700	2,118,200	1,412,200
Water Shortage Revenues (2)			211,800	423,600
Other Operating Revenues	126,000	126,000	126,000	126,000
Total Sources of Funds	3,467,300	3,043,700	2,973,000	2,478,800
Uses of Funds				
Purchased Water (3)	1,195,500	1,016,200	896,600	597,800
Salaries & Benefits	901,600	901,600	901,600	901,600
Operations & Maintenance	587,500	587,500	587,500	587,500
Water Shortage Prog. Exp. (4)		15,000	50,000	75,000
Debt Service Payment	228,000	228,000	228,000	228,000
Transfer to Capital Impr. Proj.	554,700	554,700	554,700	554,700
Total Uses of Funds	3,467,300	3,303,000	3,218,400	2,944,600
Surplus/(Deficit)	0	(259,300)	(245,400)	(465,800)
Beginning Reserves (5)	1,000,000	1,000,000	1,000,000	1,000,000
Ending Reserves	\$ 1,000,000	\$ 740,700	\$ 754,600	\$ 534,200

Notes for Table VI:

- (1) Commodity rate revenues would decline in proportion with water sales
- (2) Water shortage charge (see Table-V) to be imposed in stages 2 & 3 to limit the deficit
- (3) Purchased water costs would be reduced in proportion with water sales
- (4) Additional estimated expenditures associated with water shortage program
- (5) Operating and emergency reserves assumed to be \$1,000,000 at start of shortage

The financial scenarios depicted in Table VI illustrate several key points. Both Stage 1 and 2 results in approximately the same amount of reserves being used as the Water Shortage Charge is made applicable only in Stage 2. The suggested Water Shortage Charge of 30% during Stage 3 results in approximately half of the reserves being used in one year. Consequently, two consecutive years of Stage 3 shortage will use the entire reserve. As circumstances warrant, the District may consider imposing Water Shortage Charge even for Stage 1 or higher levels of charges for Stages 2 and 3 than are currently being proposed. Furthermore, a possible reduction in spending on capital projects (which has been kept at the same level during all three shortage stages) may be considered to prevent the reserves going below a prudent level. At the time of the actual adoption of the Water Shortage Charge, these factors may need to be kept in mind as well as the then available actual reserves.

Depending on the type and intensity of shortages being experienced, more aggressive conservation measures may also need to be adopted.

Table VII summarizes the water bill impacts for typical customers falling under each of the three tiers during Stages 2 and 3.

Table VII - Water Bill Impacts Under Shortage Conditions (based on 2004-05 rates)

	Demand Mgt. Stage	Reduction Goal	Bi-monthly water usage (1)	Bi-monthly Service Charge	Standard Commodity Charge	Water Shortage Charge	Total Water Bill
Tier - 1 Customer	Normal	0%	18	\$10	\$42.84	\$0	\$52.84
	Stage - 2	25%	14	10	32.13	3.21	45.34
	Stage - 3	50%	9	10	21.42	6.43	37.85
Tier - 2 Customer	Normal	0%	40	10	121.16	0	131.16
	Stage - 2	25%	30	10	85.56	8.56	104.12
	Stage - 3	50%	20	10	49.96	14.99	74.95
Tier - 3 Customer	Normal	0%	60	10	227.96	0	237.96
	Stage - 2	25%	45	10	147.86	14.79	172.65
	Stage - 3	50%	30	10	85.56	25.67	121.23
Flat Rate Customer	Normal	0%	30	10	85.8	0	95.80
	Stage - 2	25%	23	10	64.35	6.44	80.79
	Stage - 3	50%	15	\$10	\$42.9	\$12.87	\$65.77

(1) In Billing Units (BU); each BU is 1,000 gallons

Section 6: Implementation of the Plan

At the time that it determines the existence of a water shortage, a Water Shortage Resolution will be adopted by the District's Board of Directors. A draft Water Shortage Resolution is provided in Appendix C.

Section 7: Monitoring Procedures

Daily/Monthly water production and delivery records will be monitored by the General Manager or the Manager's designee. If the overall water use reduction goals adopted by the Board are not met, the General Manager will notify the Board and may recommend more aggressive measures for adoption by the Board.

Section 8: Public Noticing and Adoption

The District adopted the first Water Shortage Contingency Plan on January 21, 1992. The Plan was subsequently updated in 1996, 1998, and 1999. This 2005 updated plan was reviewed at the District's Board meeting on April 5, 2005, and was recommended for adoption by the Board. The Board adopted the plan on May 17, 2005.

Valley of the Moon Water District - Water Shortage Demand Management Plan Table

Stage	District Actions	Customer Actions	Comments
<p>Stage I - Moderate: 15 percent overall reduction.</p>	<p>1) Adopt resolution: *Requesting voluntary water conservation with non-allotment based cut-back goals for all user classes. *Prohibiting water waste and reducing all non-essential uses.</p> <p>2) Initiate public information campaign: *Prepare and disseminate educational brochures, bill inserts, etc. *Disseminate technical information to specific customer types. *Set up public information booths urging water conservation and showing ways the public can save water. *Coordinate media outreach program; issue news releases to the media. *Explain other stages and forecast future actions.</p> <p>3) Increase District support: *Add temporary position to staff phone lines. *Initiate patrol for water waste violations and customer audits.</p> <p>4) Prepare for future stages: *Develop computer capability to initiate rationing stages. *Gather census information from residential sector for per capita allotments</p>	<p>1) Implement voluntary water use reductions.</p> <p>2) Adhere to water shortage resolution.</p> <p>3) Become aware of possible further restriction.</p>	<p>*Voluntary program, community-wide reduction goals.</p> <p>*Strong public information campaign.</p> <p>*Emphasis on elimination of waste and increased awareness.</p> <p>*Hose-end shut-off nozzles are required on all garden and utility hoses.</p> <p>*Water-on-request@ restaurant program.</p>

Valley of the Moon Water District - Water Shortage Demand Management Plan Table

Stage	District Actions	Customer Actions	Comments
<p>Stage II - Severe: 25 percent overall reduction.</p>	<p>In addition to stage I:</p> <p>1) Adopt rationing ordinance: *Assigning allotment to each water service: residential based on per capita allotment plus landscape; irrigation only based on ETo water budget; non-residential based on reduction from previous consumption. *Implement Water Shortage Charge (WSC) *Expanding prohibited uses and developing penalty structure for waste violations. *Defining criteria and administrative procedures for variances.</p> <p>2) Increase public info campaign: *Notify each service of allotment goals. *Make site surveys available to all customers</p> <p>3) Increase District support: *Establish Shortage Response Team *Administer variance program for all user classes. *Increase patrol/audit support.</p>	<p>1) Adhere to allotment for 25 percent overall reduction:</p> <p>*Single Family – 163 gpd, plus landscape allotment of 4,500 gallons per month May-Oct. *Multiple Family – 163 gpd per family, plus ETo based moderate landscape allotment. *Commercial/Institutional - 85 % of previous 12 months usage (15% reduction). *Irrigation - 80% of ETo based water budget. *Health Care Facilities - 95% of previous 12 months usage (5% reduction).</p> <p>2) Request variance where required.</p> <p>3) Eliminate all prohibited uses.</p>	<p>*Mandatory program with allotments for each service; residential with moderate landscape allotments.</p> <p>*Close tracking and feedback to community.</p> <p>*Restricted uses include: - irrigation limited to the hours between 8pm to 6am. - hosing off hard surfaces prohibited. - operation of ornamental fountains prohibited. - filling new swimming pools prohibited.</p>

Valley of the Moon Water District - Water Shortage Demand Management Plan Table

Stage	District Actions	Customer Actions	Comments
Stage III - Critical: 50 percent overall reduction.	In addition to Stage II: 1) Intensify ordinance requirements: *Prohibit installation or replanting of any landscaping. *Allowing residential use of grey water if State regulations permit to do so. *Require new construction to offset two times the new demand through upgrades to existing homes and businesses (toilet replacements, etc.). *Continue WSC 2) Intensify public information campaign: *Promote participation in new construction offset program *Develop demonstrations of grey water use. 3) Expand Shortage Response Cell and patrol/audit effort.	1) Adhere to allotment for 50 percent overall reduction: *Single Family – 128 gpd, plus landscape allotment of 1,000 gallons per month May-Oct. *Multiple Family – 128 gpd per family, plus ETo based minimal landscape allotment. *Commercial/Institutional - 70% of previous 12 months usage (30% reduction). *Irrigation - 25% of ETo based budget. *Health Care Facilities - 85% of previous 12 months usage (15% reduction). 2) Request variance where required. 3) Eliminate all prohibited uses.	*Severe penalties for excess usage. *Prohibited uses from Stage II plus: - new construction offset program - offset two times new demand. - no new landscaping. - filling or topping off of swimming pool is prohibited.

DRAFT

RESOLUTION OF THE VALLEY OF THE MOON WATER DISTRICT
DECLARING A WATER SHORTAGE AND ACTION STAGE, AND ESTABLISHING AN
OVERALL WATER DEMAND REDUCTION GOAL

WHEREAS, the Valley of the Moon Water District is a County Water District, duly organized and existing under the provisions of the County Water District Law (California Water Code section 30000 *et seq.*), and is empowered to provide water service to customers within certain boundaries; and

WHEREAS, due to current water supply conditions, the Sonoma County Water Agency (Agency) has reduced water delivery to the District and to all prime contractors which purchase water from the Agency by ____%; and

WHEREAS, due to (describe current water supply conditions – reduced deliveries, drought, contamination, etc.), the reduced water supply estimated to be available to the District from the Agency, together with the supply of water from other sources available to the District, will not be sufficient to meet the District’s customers’ normal water needs during (describe the time period); and

WHEREAS, the water conditions described above indicate that a ____% reduction in demand is required to ensure that the District will have an adequate supply of water to meet its customers’ water needs during (describe the time period); and

WHEREAS, pursuant to the provisions of Water Code section 375 *et seq.* and 10632, the District has the authority and responsibility to adopt water demand reduction measures within its area of service during the existence of a water shortage, and the Board of Directors has conducted a duly noticed public hearing on this ____ day of ____, 2__, has heard a report from its General Manager on the reduced current water supply conditions and on the need for demand reduction during this time of reduced available supplies, and has provided an opportunity for the public to be heard on these matters.

NOW, THEREFORE, IT IS RESOLVED that the Board of Directors finds and determines that under the current conditions a water shortage exists within the area served by the District’s water system, and that the water supplies available to the District are insufficient to serve the normal water demands of the District’s customers.

BE IT FURTHER RESOLVED, that the Board of Directors declares that a water shortage exists, further declares that the water shortage condition has reached Action Stage __ and hereby establishes an Overall Demand Reduction Goal of __%, as defined in the District’s Urban Water Shortage Contingency Plan, as the necessary and appropriate water conservation program in order to reduce the quantity of water used by the District’s customers during the water shortage.

BE IT FURTHER RESOLVED, that the Board of Directors finds and determines that the water shortage declaration and the water conservation program provided for herein are in the public interest, serve a public purpose, and will promote the health, welfare, and safety of the people who reside within the District.

BE IT FURTHER RESOLVED, that this resolution shall become effective immediately upon its adoption, that the General Manager is hereby directed to provide for its publication in full within 10 days in a newspaper of general circulation within the District, and for its posting in at least 3 public places within the District.

BE IT FURTHER RESOLVED, that the General Manager is hereby authorized and directed to take such steps as he shall deem necessary to implement the Overall Demand Reduction Program, shall report back to this Board on the status of the water supply and the results of the Demand Reduction Program, and shall make such recommendations for further actions of this Board as may be necessary and appropriate during the existence of the water shortage.

THIS RESOLUTION PASSED AND ADOPTED THIS ___DAY OF _____ 20_____, by the following votes:

Director _____

By _____

Director _____

President

Director _____

By _____

Deputy Secretary

Director _____

Director _____

AYES _____ NOES _____ ABSENT _____ ABSTAIN _____

I HEREBY CERTIFY that the foregoing Resolution was duly adopted at a regular meeting of the Board of Directors of Valley of the Moon Water District held on the _____ day of _____, 20____, of which meeting all Directors were notified and at which meeting a quorum was present at all times and acting.

By _____

Deputy Secretary

Approved as to form:

District Counsel

**California Water Code Section 10632
Urban Water Management Planning
Water Shortage Contingency Analysis**

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.

Weber Analytical



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